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Best of Utilities: Summer Reading List

A collection of insights from Accenture Utility industry leaders

Contents

Foreword

Businesses have always had to reinvent themselves to better serve an evolving society, but the current energy transition is unlike anything we've seen in decades. For (arguably) the first time, citizens, businesses, and governments all agree on the need for clean, reliable, affordable energy. As both established and emerging industries look to develop sustainable solutions for a world fast-approaching net zero, their evolving demands and expectations will land at the feet of utilities. Taking charge of the unfolding transition, and scaling the progress made to date despite the unfamiliar, intense change happening all around them, requires that utilities to focus on digital technology and sustainability – a 'Twin Transformation'.

Embracing the changes ahead and focusing on this Twin Transformation can have a number of benefits, such as increased operational efficiency, stability and safety – but it can also help attract tech-savvy talent and investors who assess opportunities in a more holistic way. The urgency of these changes is undoubtedly uncomfortable for electric, gas, and water utilities. However, organizations that put digital and sustainability at the core of their business, will deliver greater value to all stakeholders.

Accenture is here to help our clients and ecosystem partners capture this opportunity. This collection of articles provides insights to help utilities and their partners reinvent their businesses for growth in a new, net zero world.

I hope you find it useful and interesting, and I welcome your thoughts on the perspectives shared so please contact me should you wish to discuss further. I wish you a safe and relaxing summer.

Stephanie

By Stephanie Jamison,

Senior Managing Director,
Global Utilities Industry Lead - Accenture

Taking charge of the energy transition

Chapter 1

Stephanie Jamison
Senior Managing Director
Global Utilities Industry
Lead - Accenture

Will they still be "utilities" by 2030?

From the way we commute and work to the structure of investment funds, the energy transition is changing everything. It is a shift like no other, offering real rewards to organizations aiming to make a net-zero world possible.

The lure of new possibilities has attracted players from almost every sector and changed the makeup of the energy market. As the boundaries between industries blur, utilities are being challenged to build on the progress they have already made and continue leading the way to net zero.

But what exactly will they become? As they set their course through unchartered territory, it's a question that must be answered today to take charge of tomorrow.

Green is the new black

> **For (arguably) the first time, consumers, employees, investors, and legislators have agreed that they need sustainable, safe, reliable low-carbon solutions.**

It's a consensus years in the making. Having seen the potential of renewables, progressive policy makers and organizations have helped to make clean power mainstream.

The businesses that acted early have been rewarded, and many now have a market cap that rivals the oil majors. With clean electricity taking a central role in the new energy model – one that oil has played for many years – now is the time for the industry transition to reach another level.

So, what's next?

The next phase of the ongoing evolution of the industry will emphasis downstream solutions and Utility-scale renewables through the deployment and integration of new, low-emission technologies that enable the end consumer to play an even more active role.

This amplifies the change that has fallen at the feet of utilities.

In what feels like no time at all, the ask has gone from maintaining, monitoring, and modernizing the network to preparing an entirely new, data-driven system that's ready for a surge in batteries, decentralized generation and electric vehicles.

The deadline to make these changes? A few asset life cycles.

LEARN MORE: Taking charge: Utilities lead the way to net zero.

To meet those demands, investments in new technologies and capabilities will need to be increased, quickly.

Funding such a fundamental shift while minimizing the impact on consumers, and maintaining industrial competitiveness, will call for widespread digitization: not only to enable the shift to a data-driven energy system and reduce costs, but also to attract investment.

With investors increasingly assessing opportunities based on the financial, environmental, and societal risk, utilities will need to match their accelerating digitization with a focus on sustainability and ESG compliance: a code that the so-called "Green Energy Majors" have already cracked.

For many, widespread electrification seems to be a core part of the answer to the questions posed by the energy transition.

Within an adequate energy mix, electrification can drive decarbonization, create new jobs, and yield significant returns. – and we expect E to replace I as the mark of progressive products as we race towards 2030, a significant year in many net zero timeframes.

LEARN MORE: How can European utilities accelerate towards net-zero? Five drivers for success.

Although the era of electricity can help to overcome many of the obstacles on the way to a low-emissions world, it does put the utility industry under even more pressure.

With deadlines looming, government and business leaders alike have already turned to utility providers for the digital offerings they need.

Are today's utilities equipped to answer the call?

From backstage to center stage

Utilities' unique expertise and assets mean that they can take a leading role in the energy transition – and many already are. By reinventing themselves around sustainability and continued digitization, forging new alliances to acquire new capabilities at speed and scale, and working across emerging and established industries, utilities can take the reins and drive change rather than reacting to it.

> **LEARN MORE:** Taking charge: Utilities lead the way to net zero.

But this is not another round of reinvention. We expect today's utilities to become tomorrow's energy service providers: the collaborative, connective link that makes entirely new industries possible by supplying the platforms and products that help every industry get to net zero.

Will they still be "Utilities" as we know them by 2030? No – they will become infinitely more.

Wytse Kaastra
Managing Director
Accenture energy retail and customer services

Opportunities for a demand-driven electric decade

When I talk to my European utilities clients, the road to net zero is top-of-mind. And that's no surprise, with the EU's 2030 commitments, signalling a new level of ambition, and a new expectation of scale and speed. Only nine years remain to meet the EU 2030 target of reducing greenhouse gas emissions by 55%.

So what's different about this decade compared to the last?

Answer: it's not just about ramping up supply of renewables. It's now at least as much about demand for reliable, affordable renewable electricity, from consumers, businesses and governments. Why? Because reducing greenhouse emissions in the end happens where energy is being converted or used. If industry or individuals won't or can't use renewable electricity, then the supply doesn't scale, and the target will be missed.

Ultimately, the energy transition will only work if it's demand-led.

To unpack what that means... I'd encourage you to read the new 'Electric Decade' report from Accenture and Eurelectric. And to get the ball rolling, here I want to reflect briefly on the implications for electric utilities.

LEARN MORE: Electric decade report.

It's not just about ramping up supply of renewables... it's also about demand for reliable, affordable renewable electricity.

The electric decade: E becomes the new I

Electrifying society is really what we're talking about.

From electric trucks to electric heating to electric cities and beyond, electricity will be front and center.

And similar to the way "I" was used to signal intelligence built into a product, "E" will redefine new and converging industries. For example: electricity + chemicals + manufacturing = eIndustrials.

The biggest challenge and largest opportunity lies in decarbonizing industry. Think retrofitting an industrial plant to use green hydrogen. It's potentially complex and more importantly time-constrained like never before. It adds up to a need for the utility industry to not only decarbonize production, but also engage with their customers to provide decarbonization services and support them on their journeys.

Getting it right counts, with around 40% of industrial emissions candidates for abatement by 2050 through electrifying light industries alone. Industrial players are at the very heart of the demand shift we need to see.

The net zero consumer

But the individual consumer also has a major role to play in this demand-driven decade.

And the COVID-19 pandemic has accelerated a shift that was already happening, with more than 50% of residential consumers saying they're more likely to invest in energy efficiency now than before.

Many have overhauled their energy lifestyle at home over the last year, whether a home office in the garden or do-it-yourself solar. So much so, "do-it-yourself innovation" is one of the key themes in **Accenture's 2021 Fjord Trends.**

In essence, the consumer is looking for more from their electricity provider: a new customer experience, a relationship beyond billing, and value-added services. Example: the electricity provider who also leases you an electric vehicle (EV), installs your charger (and decides when to charge your car for you overnight based on the grid), charges you a green tariff, and tells you the story about how your actions are abating emissions.

The scaling imperative

This all suggests innovation lies at the heart of the energy transition.

Take carbon capture and storage (CCS), as one just one example. But innovation alone isn't the answer. It's about scalable innovation. For example, electric and renewable heating solutions (e.g., heat pumps) can grow to meet close to 65% of residential heating system sales by 2030. And that kind of growth relies on highly scalable approaches for among other aspects, infrastructure and customer experience (e.g., the packaged services they'll expect, in a seamless way).

Technology underpins so much of this. And leaders know they need it, but are yet to fully capitalize on it, with only around a third of utilities saying they've achieved value from their technology investments. But the timing is now right, with sustainability and digital coming together like never before—"twin transformation"—for new sources of value.

The foundation must be new ecosystems and new collaborations to facilitate the business models that are emerging, and must continue to develop. Think about mobility. The old model of car manufacturer building the car, the energy company providing the fuel (and no more) is over. New players and ecosystems must join up charging facilities (at the office or home—B2B and B2C); data, analytics and integration to manage customers and their new complex relationships with those who serve them.

There is an ocean of great ideas out there on how to make the energy transition real. But the winners will be those who can select the right ones, double down on them, and execute at scale with C-suite support.

In short

It's now clear the energy transition will accelerate in a whole new way.

The ambition is huge, and the scalability of the solutions must match, as must the demand from B2B and B2C customers.

And electrification of society is mission-critical. And while it's easy to explain how the world needs to look, it's less easy to get there.

When I talk to my clients, I find myself saying this: there is an ocean of great ideas out there on how to make the energy transition real. But the winners will be those who can select the right ones, double down on them, and execute at scale with C-suite support. Scale is the name of the game, and the driver of success or failure.

The time to act is now because failure is not an option. We all have a part to play and together we can achieve our collective goals. I invite you to read our new report and welcome an opportunity to talk more about the way forward.

Caroline Narich

Managing Director and North America Energy Transition Services Lead

Storage: The glue of the low carbon economy

In the United States, more states and utilities are setting ambitious clean energy and electricity targets.

Energy storage has been tapped as one critical enabler to achieving these targets, for its ability to level the variability of renewable energy, which in turn can increase grid reliability and stability.

While positive steps have been taken to encourage adoption of energy storage, barriers remain. Today, the economic realities of deploying storage have limited the amount of storage available, highlighting a gap against its potential to support the path to net zero.

In collaboration with the University of California, Berkeley, we conducted a study to understand how the energy transition is unfolding in the Western U.S. region and the role that storage can play in the path to net zero. While the study is focused on the West, there are important insights relevant for all markets.

I recently caught up with Professor Daniel Kammen, Director of Renewable and Appropriate Energy Laboratory (RAEL) at the University of California, Berkeley; a co-author of the report to explore the findings from the report, what key actions industry practioners can take away from the report and how those actions can help utilities on their path to net zero.

Why is storage such a hot topic for utilities today?

Daniel Kammen

I would say the fundamental one is that we now see jurisdictions around the world, here in California, now federal in the United States, and China, Korea, across Europe, all embracing the 100% clean energy target roughly by mid-century. And to do that we're going to need all of our clean energy options. But we're also going to need dynamic and smart storage. And our study is all about how to innovate for that and how to integrate that, not only technically but in terms of ways to really make the markets excited and hum in this new direction.

Why do you think this is different from other studies on the same topic?

Daniel Kammen

The crucial thing you need to look at is not just how the technology is evolving, which we do in the study. But it's to understand where the markets are, where the markets are opening, where they need some policy and regulatory support. And everyone from businesses, to policymakers, to investors to environmental groups that want to see real progress, all are looking for studies like ours, that integrate the technical progress with the policy in the market progress.

What did the study really validate for you and what surprised you most?

Daniel Kammen

That we are far better armed with tools to make energy storage a technical and economic reality than many people realize. We tend to look at the learning curve, the cost curve as a starting ground. But the fact that storage is diverse in its technologies, and that there's options for the shorter-term storage like lithium ion batteries. A whole range of emerging long-term options, including flow batteries and flywheels and hydrogen.

But what the study really validated for me was that as much as we push the prices down for renewables, it means far less unless we also not only push the price down for energy storage, but also push it into the market. We need to have experiments done by cities and states and nations and provinces and cantons to really figure out which aspects are going to best meet their local market conditions.

We are far better armed with tools to make energy storage a technical and economic reality than many people realize.

What do you think are the key takeaways for industry practitioners?

Daniel Kammen

We actually have a chart in the report that highlights there are so many different economic opportunities for storage, it's not just providing that backup power, its ancillary power, it's cold storage capability, its frequency regulation, it's a whole range of things. And there's no market in the world that values, even a fraction of them. Some are good on one, some are okay on the other, but we don't have a holistic perspective on all of the different services that storage provides.

And when you get into those details, you really find that even very traditional utilities could leapfrog to a much smarter system if storage was entered in; it removes, of course, any anxiety about intermittency of renewables.

But it also provides a higher level of resilience and backup. And it's not just a normal operation, when we have crises or power lines go down or fire, something we have in California, unfortunately now, all of those things, storage has been a real winner in allowing us to move to a smart grid.

And so I see that package is something that every investor, every technologist, and every policymaker should think through because these are the markets of the future. And if we're serious about 100%, clean energy, which we must be, we've got to think of storage as a co equal as the glue to hold that low carbon economy together.

James Mazurek
Managing Director
North American
utilities strategy

US administration jobs plan: Impact on utilities

Further clarity from US administration on infrastructure plan; profound impacts on utilities.

Recently, the Biden Administration detailed its domestic infrastructure spending priorities with the unveiling of the first of two Build Back Better policy proposals —"The American Jobs Plan."

The $2.3 trillion plan reflects the intersection of accelerating the clean energy transition, job creation, and equitable impacts to disadvantaged communities. It will also have an outsized impact on the utilities industry. This plan outlines hundreds of billions of dollars in energy investments, new funding avenues for U.S. utilities to advance clean energy, as well as infrastructure and modernization projects.

As the pathway to unlocking future stimulus programs becomes clearer, there are steps for utilities to take now to position themselves for success.

Overview of the American jobs plan

The plan seeks to re-construct the economy and advance the clean energy transition.

Through historic levels of investment in clean energy generation, modernizing the electric grid, repairing core infrastructure, providing affordable access to broadband internet, retrofitting homes and commercial buildings, and revitalizing the manufacturing industry. This proposal is the first push to the administration's target of achieving a zero-carbon power sector by 2035, in addition to generating good-quality jobs, while addressing long-standing and persistent equity issues across disadvantaged communities. We expect a second administration infrastructure proposal later this spring, but the bulk of the administration's clean energy proposals are likely baked into this plan.

The plan proposes $2.3 trillion in investments across **five focus areas:**

1. **Transportation Infrastructure** – Approximately $610 billion allocated towards modernizing infrastructure and upgrading public transit options
2. **Clean Water, Electric Grid, Broadband** – Approximately $311 billion focused on building a more resilient transmission system, improving water infrastructure, and expanding affordable broadband service
3. **Homes, Schools, Buildings** – Approximately $380 billion towards generating affordable housing options, and upgrading public schools, community colleges, childcare facilities, hospitals, and federal facilities
4. **Care Economy** – Approximately $400 billion targeting home- or community-based care for the elderly as well as people with disabilities
5. **R&D, Manufacturing, Small Businesses** – Approximately $580 billion to accelerate R&D investments for clean energy, manufacturing and creating a network of small business incubators and innovation hubs

Specific funding opportunities for U.S. utilities

The plan will have a very significant impact on the utilities industry, adjacent industries such as automotive and telecom, and the communities these industries serve.

While detailed legislative text is in the process of being developed, a sharper view is coming into focus on how three of the plan's five focus areas will impact utilities:

Transportation infrastructure

- $174 billion of funding will be dedicated to electric vehicles (EV) – the focus will be on creating domestic supply chains, creating tax incentives around American-made EVs, and incentivizing the private sector to build a national network of 500,000 EV chargers by 2030. It would also electrify at least 20% of U.S. school buses and replace 50,000 diesel transit vehicles with zero-emissions vehicles.
- For utilities, there will be opportunities for stimulus in supporting investments for distribution grid readiness ("make ready", infrastructure upgrades).
- There also may be opportunities for utilities to receive funding for public charging infrastructure in disadvantaged communities.
- Broadly, utilities could benefit from dramatic increases in beneficial electrification and the opportunity to play a leadership role in further evolving the EV ecosystem with its customers and communities.

Clean water, electric grid, broadband

- $100 billion of funding will be dedicated to expanding electric transmission across the U.S. to improve delivery of renewable electricity to urban load centers.
- Transmission funding will be facilitated through investment tax credits (ITC) and establishment of "Grid Deployment Authority" to facilitate 20 GW of transmission growth.
- There will be substantial opportunity to accelerate additional clean energy technologies, such as energy storage, through a 10-year extension expanded direct-pay ITC and production tax credits (PTC).
- The plan is also targeting an additional $100 billion of funding toward high-speed broadband infrastructure to underserved communities and removing barriers for electric cooperative utilities to serve these markets.

R&D, manufacturing, small businesses

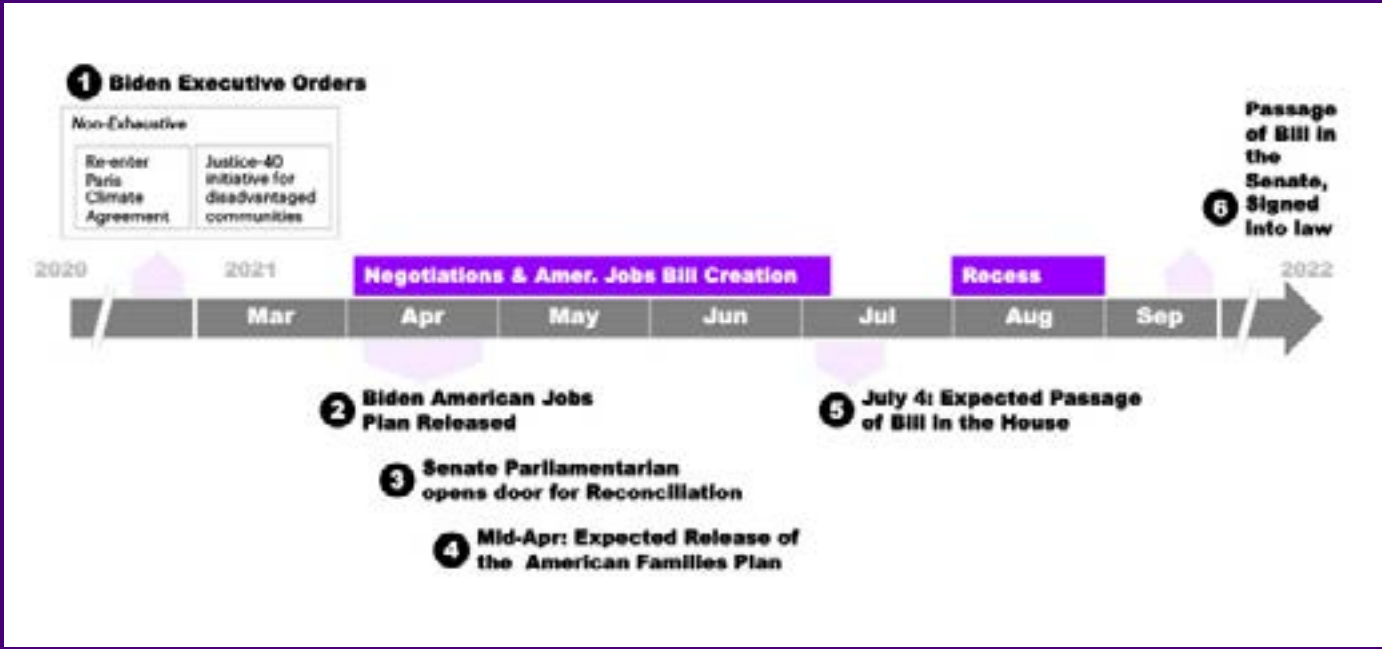
- Provide $35 billion to develop technology to address climate change and develop clean energy resources. The research provisions include Biden's previously announced intention to launch an Advanced Research Projects Agency focused on climate change, or ARPA-C.
- The plan would also provide $15 billion for demonstration projects, including advanced nuclear, carbon capture, utility-scale energy storage, floating offshore wind turbines and hydrogen.
- As part of the plan's commitment to equity, these projects will include 15 decarbonized hydrogen demonstration projects in distressed communities through a PTC.

Potential timeline for future funding

> **The administration's infrastructure proposal will need to advance through the U.S. House and Senate to unlock funding and implementation through the various agencies (U.S. Department of Energy, Department of Transportation, and Federal Energy Regulatory Commission).**

As we've seen before, some of the more ambitious components of the administration's plan could face headwinds from Congress, which means the new administration may look for other ways to advance large portions of its climate agenda. Democrats may need to utilize the fast-track budget reconciliation process for a second time this fiscal year in order to secure passage of more controversial provisions, shielding the legislation from a likely filibuster that would otherwise require 60 votes to overcome. The administration will also likely have to make concessions to moderate Democrats to get the consensus needed to pass a bill.

While the Biden Administration acted quickly with executive orders earlier this year, there is still work to be done to ensure legislation is passed by the end of the year.



If any version of this bill is to become law, expect it to occur before September 30, 2021, the end of the federal government fiscal year, when the current surface transportation authorization expires. That would put any final legislation to implementation by the federal agencies in late fall 2021.

What should utilities be doing now?

The 2009 American Recovery and Reinvestment Act (ARRA) provides a good blueprint for how the infrastructure plan might unfold and steps utilities could be taking now.

Looking back to the 2009 ARRA legislation, there is one major lesson learned: the utilities that were prepared and acted early generally were the biggest winners. These were the utilities that ultimately received funding for their smart meter/smart grid programs that are the foundations of current grid modernization programs.

In light of the expected fall 2021 implementation timeline, utilities should first be examining their "long list" of projects in their multi-year asset investment plan to understand which ones may be candidates for external stimulus vs. those that may be eligible for rate-based investment. With this lens, utilities should then isolate projects that are best aligned with the goals of the five areas of the plan.

Coalition-building will be important for these stimulus project candidates, and framing potential solutions through a "**system value**" lens can help highlight the different dimensions of value through advancing the clean energy transition while creating economic, environmental, societal and energy value. Utilities can structure a messaging campaign to garner support with key stakeholders and coalition partners.

Finally, now is the time to add the muscle needed to plan, design, deliver and operate new clean infrastructure to maximize capital efficiency and minimize any associated O&M burden on the utility. This includes strengthening capabilities such as capital project management, using automation and AI-enabled technologies to help enhance productivity, and next-generation asset management. With equitable job creation as an explicit requirement of any stimulus-funded projects, utilities should be working to identify and activate potential partners that can catalyze local community workforce development.

Utilities that act soon could be ideally positioned to benefit from future funding to the industry.

Stephanie Jamison

Senior Managing Director
Accenture Utilities

Roberto Bocca

Head of Shaping the Future of Energy and Materials; Member of the Executive Committee, World Economic Forum

Industrial clusters: Four solutions to net zero

- **Industrial clusters can play a major role in helping countries achieve their net-zero ambitions.**
- **Accenture and the World Economic Forum have developed a 4 solution framework to help clusters reduce their emissions.**
- **This approach could result in a decline of up to 40% of European industrial emissions by 2030.**

Countries representing 70% of the global economy have committed to net-zero emissions targets by 2050 – and major energy ecosystems such as industrial clusters will play a pivotal role in helping these countries meet their climate goals.

Industrial clusters are geographic areas encompassing co-located companies that represent either a single industry (chemical parks, for example) or multiple industries (such as steel and cement). Examples of large industrial clusters around the world include the Humber Cluster in the UK, Suzhou Industrial Park in China and the Port of Rotterdam in the Netherlands.

An integrated approach to enable net-zero industrial clusters

Accenture, in collaboration with the World Economic Forum, has developed a framework built around four key solutions to help reduce emissions in industrial clusters:

1. **Systemic efficiency and circularity**
2. **Direct electrification and renewable heat**
3. **Hydrogen**
4. **Carbon capture, utilization and storage (CCUS)**

Adopting these solutions could result in a decline of up to 40% of European industrial emissions by 2030 (up to 12% of overall European emissions). The key is approaching this through multi-stakeholder collaboration and in an integrated manner. Industrial clusters are a way to reduce emissions, generate new jobs, and deliver vital benefits like better air quality and health.

1. Systemic efficiency and circularity

Energy efficiency and circularity are common industry themes – but we can push these concepts much further. For example, Meishan, a hub for logistics and high-tech industries in China, has set an ambitious target of carbon neutrality by around 2050. To achieve this and similar targets, multi-stage resource utilization will be a key area of focus. One example could involve recovering the cooling load from a liquified natural gas (LNG) terminal to support a freezer warehouse, and the subsequent recovery of this cooling to support a snow park.

2. Direct electrification and renewable heat

The economics of clean electricity and the need to recover on past asset investments has limited the electrification of industrial processes. However, around half of industrial emissions are derived from light or medium industries such as food processing or equipment manufacturing; these use low and medium-temperature processes that can be electrified using commercially available technology. The attractiveness of electrification is rising due to the falling cost of renewables, higher carbon pricing and shared infrastructure such as microgrids. For example, Suzhou Industrial Park in China has implemented an all-in-one microgrid solution that provides power, cooling and heating as required.

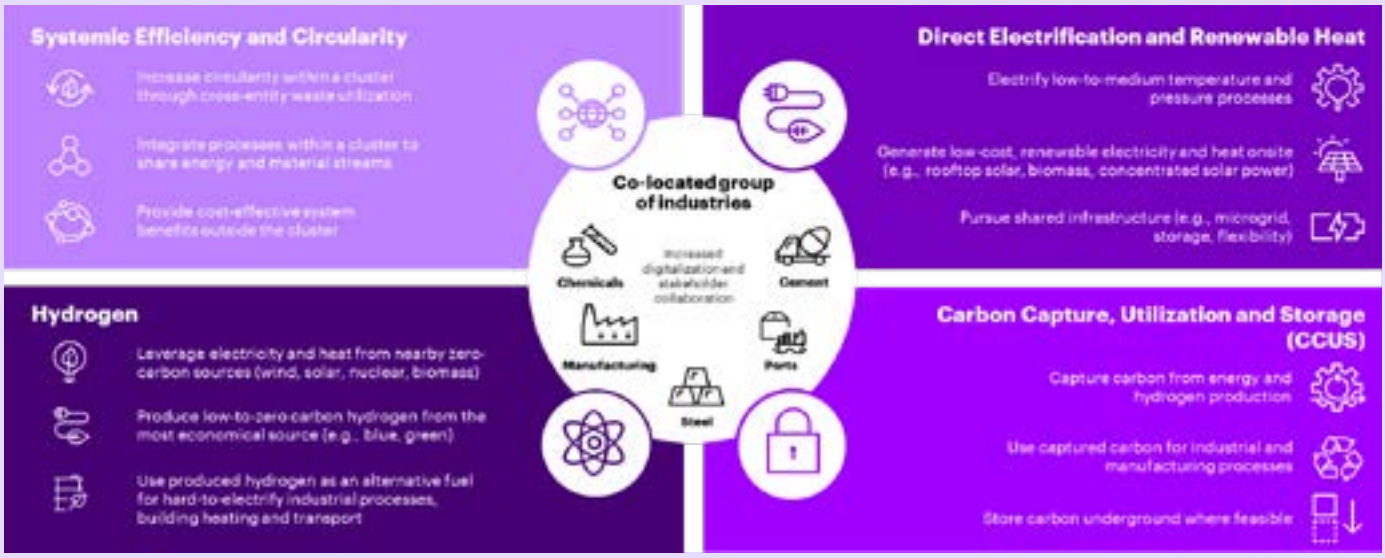
3. Hydrogen

Hydrogen can address emissions in hard-to-abate sectors such as steel and chemicals. Applications include hydrogen as a feedstock for products and in chemical reactions as well as high value uses in certain forms of transport and power storage. Industrial clusters can create an internal market for hydrogen, where production and consumption are co-located. For example, the Spanish electricity company Iberdrola, in partnership with fertilizer manufacturer Fertiberia, will build one of the largest green hydrogen production plants in 2021. Iberdrola will supply solar PV electricity to power an electrolyzer that will provide green hydrogen, which will in turn be used in Fertiberia's production plant, resulting in significant emissions reductions.

4. Carbon capture, utilization and storage

Major CCUS hubs are emerging across the globe, providing alternatives for industries struggling to reduce their CO2 emissions. However, given the sizeable investments in transport and storage required to implement CCUS, such projects require a certain amount of scale to be feasible. Industrial clusters can provide this scale given the concentration of heavy industry and therefore the aggregation of demand. For example, the UK expects to capture and store up to 10 million tonnes of CO2 by 2030 via projects such as those at the Humber industrial cluster in the North of England, where an onshore pipeline is being developed to collect captured CO2 from multiple carbon abatement projects in the region. The captured CO2 will then be transported offshore and stored under the seabed of the North Sea.

Industrial clusters are a way to reduce emissions, generate new jobs, and deliver vital benefits like better air quality and health.



An integrated approach to industrial clusters

Multi-stakeholder collaboration

> **Companies in industrial clusters already have a long history of collaboration when it comes to sharing resources, challenges and solutions.**

But there is a new driving force for co-location: net-zero commitments at the national level.

The opportunity to reduce emissions in industrial clusters is significant. The time to act is now. New partnerships, combined with new approaches to policy, financing and scaling of technologies will be key to accelerating the transition to a net-zero economy. These partnerships and approaches will be built on the pillars of greater multi-stakeholder collaboration and greater trust.

What are the next steps? Companies in new and existing industrial clusters will need to come together and align on common net-zero goals, followed by the development and implementation of clear road maps that set out how to achieve these targets. Putting in the effort now will help us to ensure a cleaner, greener and more prosperous future.

Generation net-zero

Chapter 2

Bethany Patton
Senior Manager
Strategy & Consulting, Utilities

Terry Maxey
Managing Director
Utilities, Global Power Generation Lead

No nuclear, no net zero

> **When I talk to my clients about their role in the energy transition, the conversation generally turns to investments in renewables like wind and solar.**

And of course, renewables have a real and important role to play as we collectively look to net zero over the coming decades.

But operationally, there are limitations based on rated capacity (average wind turbines only run 30% of the time), curtailment, congestion and battery storage availability.

This all means nuclear has and will continue to have a vital role to play in the energy transition. And it's time for a more open, neutral conversation about exactly that.

#1. Nuclear is the ultimate smoother

> **For my utilities clients, resilience remains a major challenge. Load and demand changes are the perennial problem, and increasingly so.**

And across the board, with changes to cyclical weather patterns on the rise, the need for a diversified power supply is increasingly apparent. In these scenarios, power sources that rely on environmental factors like wind and solar see impacts to capacity, potentially contributing to more power blackouts and all the consequences of those.

For example, the recent Texas blackouts would have been worse without nuclear—the nuclear facilities either continued to operate normally or returned quickly to service at the industry-leading capacity factor of greater than 92% while other power sources went down for days on end.

On a more daily basis, grid fluctuations come at times of peak demand, such as on a hot summer day when whole neighborhoods turn up their air conditioning. So how do grid operators prevent the lights from flickering due to those demand peaks? In these scenarios, nuclear plants are often called on by the grid operator to provide reactive power at short notice, when conditions change. Nuclear is therefore essential for providing the flexibility to "smooth the peaks" and add the needed stability.

#2. Nuclear is inherently carbon free

> **Nuclear power plants continue to run in the background, with no fanfare, but contributing significant amounts of power to the grid, about 20% of the US electricity produced.**

One reason we never hear about them is this: nuclear is a close-to-net-zero technology, producing greater than 55% of the carbon-free electricity in the United States.

There is a mining element required for nuclear fuel, which does contribute to greenhouse gas (GHG) emissions. However, let's remember that solar panels or wind turbines also need to be manufactured, which generates some level of GHG emissions. The thing is, nuclear plants need very small amounts of fuel, and that fuel is replaced around every 18 to 24 months For example, one uranium fuel pellet the size of the end of your finger creates as much energy as one ton of coal. And modern safety controls and systems have layers of safeguards that minimize risk like never before. The chances of an incident are vanishingly small, and lessons have been learned from those incidents that have occurred, meaning nuclear has never been safer.

Prematurely pulling the plug on nuclear would be tantamount to pulling the plug on net zero, and that's something we can't afford to do.

#3. Nuclear is the essential buffer to 2050 and beyond

> **Let's imagine nuclear keeps pumping out steady power for the next 40 years, while renewables challenges are solved (think fuel cells, hydrogen, etc.).**

It's already becoming a reality, with regulators already approving life extension projects for up to 40 years (buffering beyond the 2050 net-zero date everyone is working toward).

And existing nuclear plants may only require select equipment upgrades and maintenance activities over those 40 years. Their workforces are highly skilled and trained constantly, meaning they are important to retain in the war for talent.

And this is not to suggest we should not consider decommissioning in the light of economic challenges as a conversation or possibility. The closer society gets to net zero, the more active a discussion/decision we can have about decommissioning, with a strategy that maintains grid stability and meets demand. Meanwhile, let's not forget that decommissioning is a one-way street, and so should be driven by a clear rationale.

Here and now, prematurely pulling the plug on nuclear would be tantamount to pulling the plug on net zero, and that's something we can't afford to do.

Nuclear is essential to, and entirely compatible with, the road to net zero. Contact me to talk more about why and how.

Andre Begosso
Managing Director
Global Utilities Growth
& Strategy Lead

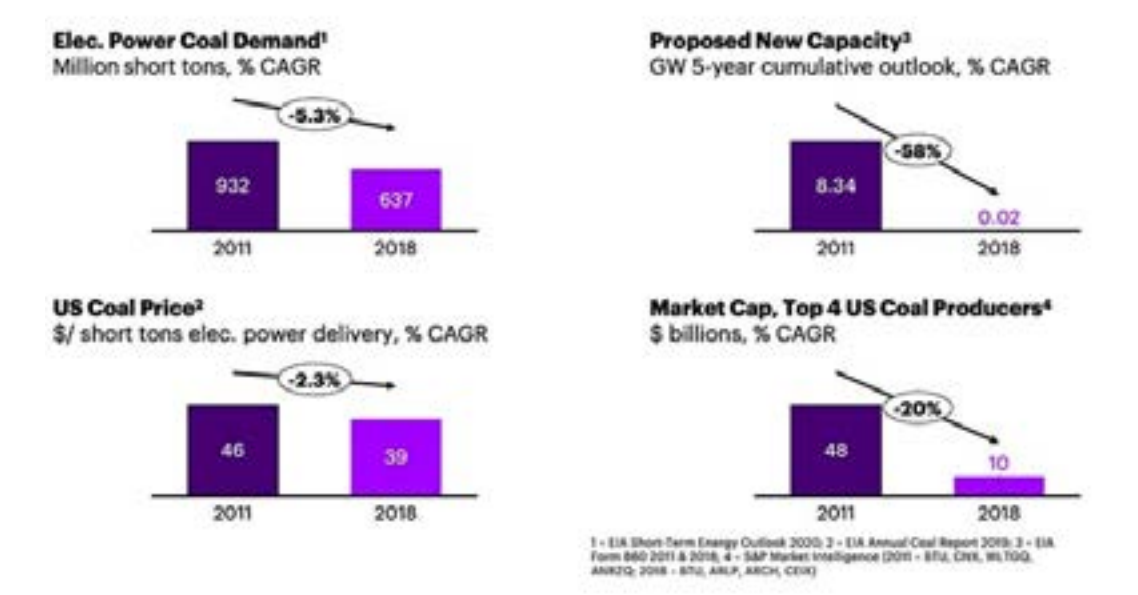
Energy transition: Unlock incremental value from retiring coal plants

In brief

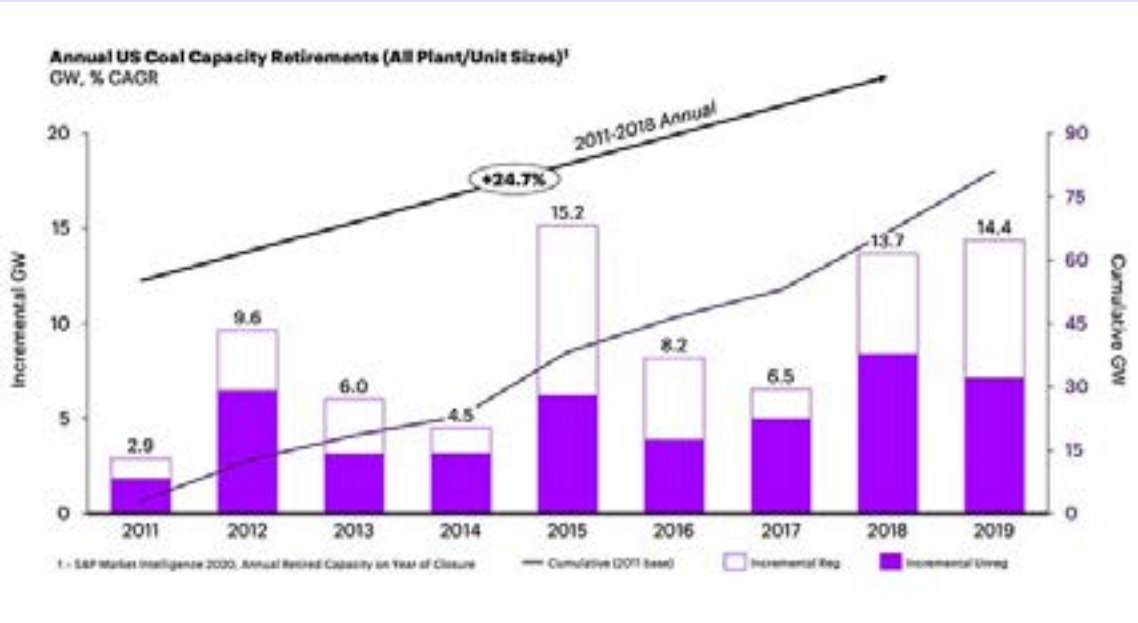
- The US coal market is declining, with the market capitalization of the top four US coal producers down by around 80% from 2011 to 2018.
- Market, regulatory, and investor forces have prompted an acceleration in coal generation plant retirements, with closures quadrupling since 2011.
- Pennsylvania, New Jersey, Maryland Interconnection's large coal (>500 MW) operating capacity expected to fall by up to 50% by the end of 2035.
- Coal operators can achieve big savings by adopting a "run to retire" strategy, while also transitioning to a renewable generation portfolio.

The US coal industry is facing declining growth. Raw material prices and electric power demand for coal have experienced single-digit compound annual growth rate (CAGR) declines, proposed new coal generation capacity has evaporated, and the total market capitalization of the top four US coal producers has diminished by close to 80% from 2011 to 2018. Unprecedented uncertainty has accelerated the pace of coal generation retirement, quadrupling annual closures over that same timeframe.

The coal industry is experiencing declining growth



Coal generation plant retirements are accelerating



Cost pressure is mounting

> **Under mounting cost pressure, plant operators need to better understand and quantify three categories of risk—market, regulatory, and investor—each of which has the potential to push coal "out of the money" and drastically accelerate the pace of closure.**

Variables influencing this are:

1. **Deflated power market pricing** resulting from an influx of cheap gas, rapid buildout of renewables with low-to-no marginal cost, plus dampened electricity demand.
2. **New hurdles driven** by stringent emission controls, state renewable policies, and changing power market rules (e.g., potential repeal of FERC's Minimum Offer Price Rule).
3. **Less attractive financing options** given emerging focus on environmental, social and governance (ESG) factors, and a renewed willingness to securitize debt in order to accelerate closure (e.g., ratepayer-backed, anticipated renewable portfolio revenues).

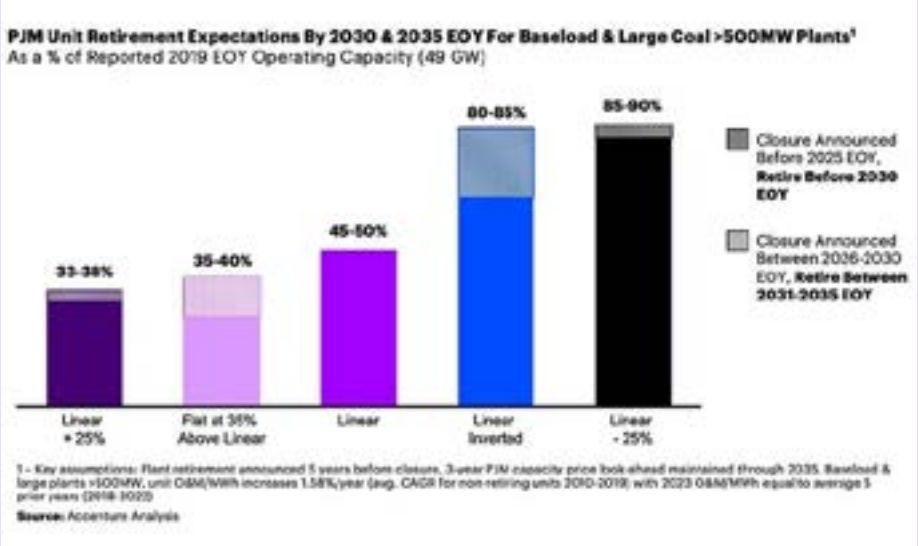
Our analysis

Our analysis suggests power market pricing heavily influences operator decisions to expedite plant shutdowns—starting with the least efficient units as defined by O&M cost and heat rate. We found that from the time of announcement to approximately 5 years prior to closure, retiring baseload coal plants' median O&M cost per MWh is 25% higher than that of the operating fleet.

Examining market risk in isolation, up to 50% of PJM large coal (>500 MW) capacity is expected to retire by the end of 2035 if market capacity prices follow the same linear trajectory as 2018-2022 auction prices[3]. A 25% step reduction of the forecasted capacity price curve, however, could lead to a near doubling of closures.

Power market prices will have a significant impact on the pace of coal plant closure

Up to 50% of PJM capacity is expected to retire by 2035 EOY if capacity prices follow a linear trajectory



Operators should recognize the long 8-10 year planning cycle and adopt a meaningful "run to retire" strategy—one that unlocks incremental value by optimizing the organization and supply chain, managing assets for recovery, and honing planned capital expenditures, while retraining and transitioning the workforce.

Cost savings delivered

Experience tells us operators can achieve meaningful cost savings (potentially in the millions of dollars) in three cost categories:

1. **>25% in annual non-fuel O&M**
2. **>5% in fuel O&M**
3. **40-50% of typical maintenance capital expenditure**

Savings	Strategies	Key Opportunities
>25% in Annual Non-Fuel O&M	Organization Optimization	• Right-size and optimize the organization • Retrain skills (e.g., field service solar/wind engineer, sustainability reporting) • Anticipate impact & assess options
	Labor Productivity	• Reduce time spent on non value-added work • Assess new safety dangers • Outsource outage maintenance craft labor
	Asset Management	• Optimize outage timing • Assess critical assets and determine predictive measures • Evaluate site conditions for reuse of equipment
	Additional Productivity Including Procurement, HR, Labor Relations, Work Management	
>5% in Fuel O&M	Fuel Management	• Reduce the coal pile • Blend low cost/BTU coal • Assess fuel management impacts and strategies; evaluate market factors
40-50% of Maint. CapEx	Capital Projects Deferral / Elimination	• Eliminate/defer projects that are not time critical • Determine impact on supply chain

Adopt a "run to retire" strategy

To achieve these incremental savings, coal operators should adopt a "run to retire" strategy, ideally 8-10 years before closure, that:

1. Evaluates, and ultimately secures, asset transition and financing options over the planned shutdown period.
2. Establishes a short- and long-term roadmap that defines the implementation strategies for budget/investments, organizational change, asset management risks, workforce transition plans, supply chain, and third-party contract modification. It sets out an end state vision for the property and reduces shared service costs.
3. Includes a phased stakeholder change management and communications plan, for internal as well as external audiences.
4. Develops an internal governance committee of executives and experts, how often they will meet, and how they will make decisions, including assessing (and correcting) the plan as needed.

Market, regulatory, and investor forces are squeezing coal generation profitability. And units with the highest operating costs are most at risk of being pushed "out of the money." Operators have a unique opportunity to unlock incremental value by adopting a "run to retire" plan that focuses on optimizing the organization, workforce, assets, and planned capital projects, while at the same time transitioning to a renewable generation portfolio.

Sources:
1 S&P Market Intelligence (2011 Market Capitalization – BTU, CNX, WLTGQ, ANRZQ; 2018 Market Capitalization – BTU, ARLP, ARCH, CEIX)
2 Accenture Analysis of 596 coal baseload and large units, of which 110 retired between 2015-2019
3 PJM Resource Clearing Price Auction (CP, BRA, RTO Prices)

Grid talk

Chapter 3

Summer Reading List

Dondi Schneider

Managing Director
Consulting, Global Utilities, Transmission and Distribution

Distribution's charge for change

In February, I exchanged my "retail hat" for the global leadership role in Accenture's transmission and distribution group. As such, I'm pleased to launch our latest Digitally Enabled Grid report, **The Charge for Change: Powering distribution businesses for the energy transition.** It's the seventh edition of this research, but my first since joining the T&D group. After 21 years working on the customer side of the utility business, I'm excited about the industry's transition to cleaner, greener energy that focuses on customer demand, experience and social responsibility. And through that same retail lens, I can see how vital consumers are to the future distribution network.

Each year, as part of our research, we ask distribution utility executives about their perspectives and experiences on current or emerging industry priorities. This year's findings are fascinating and prove out the level of disruption businesses are facing amid the evolving energy transition. In fact, all 250 executive respondents report already experiencing some form of energy transition-related disruption in their operations.

What shines through is the urgency with which distribution companies need to move toward building more a data-driven, intelligent and visible energy system. There are many opportunities and threats to manage, grounded in external trends including increased distributed generation (DG), electrification of transport (EVs) and heating, energy-efficiency demands and more active, environmentally conscious consumers, many of whom are also prosumers.

Prosumers and EVs as major triggers

> We'll be hearing a lot more about tipping points for disruption from the energy transition—86% of respondents who expect a tipping point to occur believe it will be triggered within the next 10 years.

Residential solar generation is creating a growing number of energy prosumers. And the current grid can only cope with so much prosumer activity before it becomes untenable.

This disruption can show up in reliability issues or in complications with outage resolutions. EV growth can produce similar impacts. For example, we found that 72% of respondents believe EV growth will be more rapid than the grid capacity can be built to accommodate them. While EVs are great for the overall energy transition, the cross-industry impact between automotive, utility and manufacturing needs to be acknowledged in a planful way.

Globally, the majority of executives believe the growth of grid-connected DG will be the most common tipping point trigger. A more flexible grid—one with better visibility of smart devices at the periphery and a deeper understanding of customer requirements—can help distribution businesses delay or avoid at least some of the huge capital costs required to upgrade network capacity and respond more speedily to customer requirements.

Flexibility solutions over network upgrades

> One way to resolve issues of growing DG is to invest heavily in network upgrades, which comes with questions about how, where and who will pay for it.

While this has been a more traditional move, in our research, we found that most will turn to technology first.

One of the stand-out findings from this year's survey: 94% of executives think deploying non-wire solutions will be key in delivering the energy transition at speed.

When asked about delivering increased flexibility, respondents point to four key priorities—three of which relate directly to visibility of the grid: power status, consumer demand, prosumer exports and grid-connected assets. The clear message: building distribution companies of the future hinges on technology and business models that provide greater visibility and control.

Distribution's customer directive

> **It's clear distribution must be ready to act and, when it comes to its customers, reinvent itself around consumer expectations for service and sustainability.**

Prosumers and consumers alike continue to expect safe, reliable and resilient service—but are now also open to new participation opportunities, visibility and rules of the road. There's a level of social responsibility and sense of greater control driving this new generation. It requires distribution utilities to recognize that understanding those needs is critical and will be the difference between leading the energy transition and being left behind.

The risks of doing nothing are significant, endangering a distribution business's operations, their ability to comply with regulations, fend off competition, and their reputation and relationships with customers. For example, customers won't tolerate supply disruptions when charging their EVs or curtailing of the dispatch of their self-generated power onto the grid. Any such shortcomings could see utilities taking reputational hits for stalling the energy transition. Our survey shows that if distribution companies cannot deliver, consumers will turn to other providers—high tech, startups, automotive and others—all ready to jump in to fill a perceived gap.

Leading the charge for change

> **As the transition continues, there will continue to be opportunities for distribution businesses to apply technology solutions—cloud capabilities, 5G, new grid management devices, edge, IoT and others.**

There will be new business models as well, such as programs for prosumers to contribute to supply, and initiatives that create affordability for entry. All will help increase visibility, control and ultimately, grid flexibility.

Beyond the technology and business models, a part of this move toward net zero is about distribution businesses understanding and anticipating customer needs, patterns, level of social responsibility—and partnering with an ecosystem of cross-industry product and service providers to be ready when grid flexibility is required at scale.

It doesn't fall short to say that the energy transition could pose risks to all stakeholders—consumers, prosumers, utilities, regulatory bodies and society at large. But in this new world, transformation is the imperative. More than three-quarters of executives surveyed agree that current regulatory models are unfit for purpose to deliver the energy transition. However, 80% also believe that regulators are waiting for distribution to propose innovative models that incentivize greater flexibility. We agree: the utility industry are the ones to lead the charge for change.

It's not just energy that's in transition. It's the very core of our world.

Miki Deric
Managing Director
North America
Utilities

Dan Stevens
Senior Manager
Resources - Operational
Resiliency Lead

A race against time: Using technology to develop prompt, accurate estimated time of restoration

> **Consumers have zero tolerance for poor communication and uncertainty – particularly in times of crisis such as widespread outages due to extreme weather events.**

They expect instant access to timely, accurate and useful communication on a channel of their choice, and failure to meet that expectation can drive negative sentiment that leads to irreparable brand damage, regardless of how effective the operational response may have been.

For utilities, communication with customers during major outage events is as important as the efficiency of the restoration itself; and yet, despite rapid development in analytics, modelling, and communication technology, many customers are still unable to access real-time accurate information about power outages.

Considering that only **24% of utilities executives feel very well-prepared to manage the challenges of extreme weather,** how can utilities leverage technology to develop the timely, accurate estimated time of restoration (ETR) so that their customers no longer feel powerless during outages?

The one day assessment

> **There are three critical components that empower utilities to generate and disseminate accurate, timely restoration information.**

First is the damage assessment (DA) itself. Traditionally, this labor-intensive process involves teams walking the grid to identify and isolate the cause(s) of an outage – which is still manually noted in some cases – before deploying a crew to conduct repairs. Even more advanced utilities with access to mobile field devices are finding their crews reverting to traditional paper or call-in methods of reporting.

Completing a thorough damage assessment as quickly as possible is essential to providing customers with the clarity they need, as well as identifying the resource requirements and developing priorities. The ideal timeframe? 24 to 48 hours in a major event where restoration can take ten or more days.

Achieving this target requires utilities to leverage multiple technologies to capture and catalogue the damage in full. For example:

- An OMS (Outage Management System) can help to identify which circuits have been affected and cross referenced with other operation technologies such as Advanced Meter data.
- Suspected damage can be identified through aerial inspections, such as satellite imagery.
- Appropriately sourced insights from external stakeholders, such as from first responders, which can be uploaded through customer-facing apps.
- Artificial Intelligence, Machine Learning and advanced analytics can also be used to assess images regardless of their source.

Once these sources of information are aggregated, recorded, and associated to the assets in the geographic information system (GIS), they can be loaded into the OMS to identify embedded outages and tie them to specific sectionalizing devices.

A model strategy

> **With a clear understanding of the damage, utilities can determine more specific ETRs early in the restoration process and provide customers with more meaningful information than a global ETR offers.**

Using on-site crew feedback, the detailed outage information gathered during the damage assessment can be used alongside resource availability to feed pre-built algorithms and create customized circuit or customer-level updates.

These algorithms empower utilities to model and assess multiple restoration scenarios and provide location- and customer-specific information and ETRs early in the restoration process. Once the ETRs for each customer are established, an automated analysis can be developed to identify expiring ETRs, so that any unforeseen delay can be proactively managed.

This level of personalization and accuracy is invaluable, as it can help customers avoid costly, and even dangerous, mistakes. Take for example the owner of a small grocery store who has to make a decision whether or not to put a hold in their supply of perishable goods; or the nursing home on limited generator capacity that may need to evacuate residents. These are dangerous and costly decisions.

Sending the right message

> **With customer specific ETRs in place, the final hurdle that utilities must overcome is the abundance of customer communication channels available.**

Almost every utility still runs a call center and hosts an outage map on their website, but these one-way channels put the responsibility on the customer to find out what's going on – and cannot be relied upon if fixed phone lines are down or if internet connectivity is also affected by the event.

Two-way conversation channels such as outage apps - which carry the added advantage of push notifications and chat functionality – as well as social media and text-based chatbots allow utilities to connect with their customers on their terms. During severe events, SMS texts are often the most reliable way to get information across limited communication availability. Customer feedback can even be used to inform aspects of the response and form a living picture of the scenario as it unfolds.

Bringing these channels together seamlessly, and ensuring that all customers receive the latest, most relevant information, requires alignment across IT, operational technologies (OT), and the business as a whole. It's important to keep in mind that not all customers are residential, so getting the right information to the right stakeholders is essential. Take for example local emergency managers and first responders, the level of detailed information demands a different message to enable a coordinated response.

In addition, developing that level of alignment requires frequent stress testing of the IT/OT systems and telecommunications capacity, so that systems meet customer demands during high transaction volume times, such as during major storm events. Although complex, embracing customers' preferred channels can help alleviate pressure on the OMS by proactively providing clear, timely information.

In conclusion

Outages are a very human problem, but in this case, many hands do not necessarily make light work. To ensure that customers receive the clear, personalized ETRs they need to make informed decisions, and avoid negative backlash, utilities should use technology and analytics to support their DA and ETR processes, and ultimately, deliver a better business experience.

Miki Deric
Managing Director
North America
Utilities

John Alford
Senior Manager
Consulting, Utilities,
Transmission and Distribution

Vegetation management: Key levers for cost savings

What if I told you that advanced analytics and technology can save 10-15% of vegetation management costs annually?

Utilities spend around $6-8b dollars annually on clearing vegetation from overhead lines. Vegetation management is the largest single operations and maintenance (O&M) expense for most of the utilities in North America and is almost entirely spent on third party suppliers who perform various aspects of the program. Reducing this spend by 10-15% would put almost a billion dollars to the bottom line.

Trees are the leading cause of electric service interruptions, especially during major weather events (e.g., ice storms, hurricanes) and can create public and employee safety hazards, so reducing the spend requires a thoughtful and planful approach to program optimization.

While it is difficult to replace labor that performs line clearance, their work can be optimized using emerging technology, tools and advanced analytic approaches. A careful investment and deployment of these new tools can help utilities save 10-15% of their annual vegetation management spend without reducing the reliability, safety and customer satisfaction as a result.

So, how can advanced analytics and technology improve vegetation management? Here, we focus on three specific aspects of the program.

#1 Optimize the allocation of the annual preventive vegetation management spend

> Some utilities trim their circuits on a fixed cycle (usually 4 or 5 years) or use outage data from the previous year to determine what the next year's circuit trim list should be.

However, neither one of these approaches takes into account the longer-term experience and view of the reliability associated with the different circuits.

Using advanced analytics and tools, leading utilities have developed predictive models to create predictive failure and trimming cost curves to optimize the trim cycle at the individual circuit level.

Tree Trimming Model (TTM) is one example of such a tool that can be used to model 10 years of reliability related to vegetation management based on different cycles, budgets and targets. It has been used to support utilities discussions and agreements with regulators to secure sufficient funding for the vegetation management preventive maintenance program.

In an actual scenario, where a utility was on a fixed 5-year cycle (i.e., trimmed each circuit on a 5 year cycle), TTM was able to take the same spend over a ten-year period, optimize it and improve reliability by 10% over that period of time

#2 Re-imagine work planning through the use of advanced analytics

> In order to increase the productivity of the VM crews, utilities typically send planners to "walk the circuits" that are identified for trimming and determine what trees have to be trimmed, which ones need to be removed and which customers need to be notified.

During COVID-19, these in-person discussions with property owners, to get their approval for removal, have become much less common.

As a result, there is an opportunity to rethink the entire process and figure out how to leverage image analytics (e.g., satellite, drone) to identify the work; submitting approval requests to property owners electronically (e.g., e-mail, text).

While there are challenges in using this type of advanced analytics in the areas where there is overhang and satellite imaging cannot certify the distances, it can still be used to identify 80% of the work that needs to be done by applying machine learning (ML) and artificial intelligence (AI) algorithms to image analytics. These technologies are already available and there is an opportunity to deploy them and leverage the experts (i.e., Foresters) to train these algorithms and build confidence that they are working properly over the next couple of years. At that point, the results from this analysis can be used to further refine the priorities, optimize the crew assignments and minimize the cost of acquiring property owner approval.

The experienced resources and experts should be used to deal with any escalations from the field and manage more complex issues, while the technology is used to build 80% of the plan.

#3 Automate the quality assurance/quality control process

> As we mentioned previously, most of the field work related to the VM program is conducted by third party suppliers.

In order to ensure that the circuits which were trimmed have adequate clearances, utility foresters conduct either 100% or statistical sample QA/QC reviews of the work.

Sometimes these field inspections are done soon after the work is completed and other times a few weeks or months later. When the inspectors find an issue, they refer it back to the contractor who then has to roll another bucket truck to make the correction, which one way or another adds costs.

With the proliferation of the technology and image analytics, the QA/QC process can be almost fully automated.

Imagine the future, where the trimmer can take a picture of the span that has have just completed using an app that automatically submits that image for analysis against a database using ML and AI algorithms.

The trimmer then gets immediate feedback that identifies where there may be a lack of clearance, so that the crew can move the bucket truck 15 yards and fix the issue right away. This way, they would eliminate the need for rolling another truck (each roll costing about $200-300 all in) and minimizing the cost of conducting field reviews of the contractor work. Finally, it provides a clear record of the work (from the images) and the audit path for the invoices.

Cost benefits realized

> Vegetation remains one of the main causes of outages for utilities and the single largest O&M expense.

With a capital investment in new technologies and advanced analytics over the next couple of years, utilities can sustainably reduce their VM O&M spend by 10-15% a year over the longer term. The cost benefit realized from this investment makes it an easy business case for both internal approval and regulatory return on investment. Contact me to learn more.

Sources:
1 Accenture analysis of Federal Energy Regulatory Commission (FERC) Form 1 filings and client experience

The new energy consumer

Chapter 4

Wytse Kaastra
Managing Director
Accenture Energy Retail
and Customer Services

Embrace new connected energy business models

In brief

- Today's commodity energy retail business, focused on pure electricity and gas, is moving toward an energy transition with sustainability at the core.
- New connected energy business models hold great potential for energy companies to find new growth, but it is still unclear which will be profitable.
- This report explores the most promising models, centered on distributed energy resources and eMobility, to identify where value will be in 2030.
- While change isn't easy, to capture the most value energy companies should lead with a holistic view that is strategic, coordinated and pragmatic.

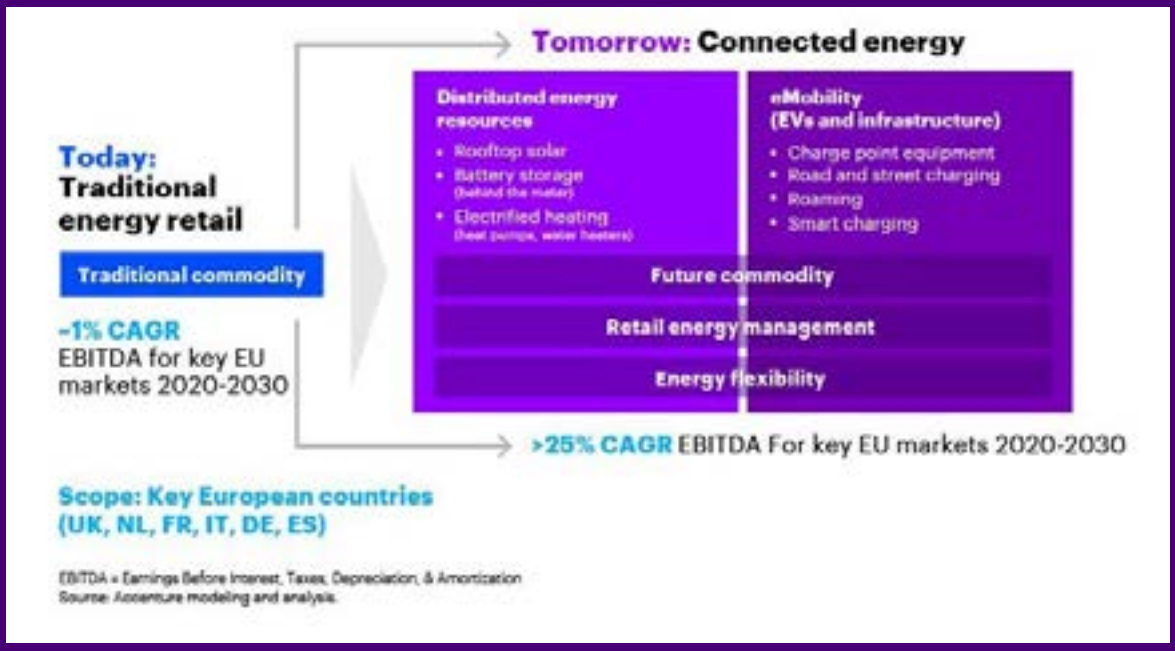
The value of new connected business models

The unfolding energy transition is characterized by rapidly growing renewables, distributed energy resources (DERs), electric vehicles (EVs), increasing customer demand for new energy services, ambitious climate targets and cross-industry convergence. And all is further complicated by the impacts of the COVID-19 pandemic.

With this energy transition comes an array of new possibilities. Our latest New Energy Consumer research takes a critical look at what this means for energy companies over the coming decade. Among the most compelling opportunities: a variety of connected energy business models related to distributed energy resources (DERs) and eMobility (electric vehicles, or EVs). However, the question remains: Which will be profitable?

This report explores those connected energy business models centered on DERs and eMobility across six key European countries: Spain, Italy, France, Germany, the Netherlands, and the United Kingdom. Through our assessment, we identify where we believe value will exist in 2030 and lay out pathways for energy companies to make these new business models a reality.

Connected energy business models offer the potential for significant growth over the next 10 years.



Our findings suggest connected energy business models could yield between €7.2 billion and €8.8 billion of total EBITDA across the industry within 10 years.

A diverse menu of connected energy services

For the core of our analysis, we examined four strategic plays energy companies can consider as they look to the future.

1. **Energy Value Provider:** Commodity focus, with value-added perks to improve retention.
2. **Energy + Home Services Provider:** Adding "status-quo" services in tandem with commodity.
3. **Connected Energy Services Provider:** Offering future-forward energy products and services.
4. **Beyond Energy:** Pivoting to address emerging needs in the new power ecosystem.

The "Connected Energy Services Provider" play focuses on emerging energy business models nearing their tipping point. Here, energy companies can offer future-forward products and services in areas like eMobility, DERs, energy management and flexibility.

The focus for eMobility is on business models related to EV charging infrastructure and services. DER business models focus on rooftop solar, battery storage and smart heating applications such as smart heat pumps and smart water heaters.

For batteries and smart heating, energy companies can also offer flexibility services that allow customers to tap into the devices' storage capabilities, which in turn helps to improve their efficiency behind the meter and aggregate and sell the flexibility externally in the markets.

Retail energy management services are included as components of several models such as rooftop solar + storage, standalone storage and smart water heating, which rely on these services to operate and create value.

A menu of pure-play connected energy products and services

Several of these business models can be offered via two distinct, but not mutually exclusive, approaches to asset ownership—Buy and Lease/Rent. Both can play a part in an energy company's portfolio of services to suit different customer needs. In addition, in some cases, such as public EV charging, the asset is simply "Used" by the customer rather than bought or leased/rented.

Charting a path with eMobility and DER

The "Connected Energy Services Provider" play focuses on emerging energy business models nearing their tipping point. Here, energy companies can offer future-forward products and services in areas like eMobility, DERs, energy management and flexibility.

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Retail energy management services are included as components of several models such as rooftop solar + storage, standalone storage and smart water heating, which rely on these services to operate and create value.

eMobility pure-play services.

The value opportunity for eMobility is projected at approximately €5 billion in 2030 for the six countries we assessed. We estimate that more than 40% of this value will be in home and fleet charging for B2B and B2C applications. Nearly 30% of the total value is projected to come from the sale of additional electricity needed to meet the demands of the growing number of EVs. Value opportunities also come from charging on the go, roaming charging and demand-side flexibility.

Distributed energy resources pure-play services.

In 2030, value opportunities for DER business models are projected to represent approximately €3 billion for the six countries we assessed. These business models can be considered "by technology," or alternatively "by service."

By technology, the DER opportunity can be viewed in two key categories: rooftop solar and battery storage, and electrified heating. By service, about three-quarters of projected value is associated with the Lease/Rent asset ownership approach—subscription services primarily for standalone rooftop solar and rooftop solar + storage models.

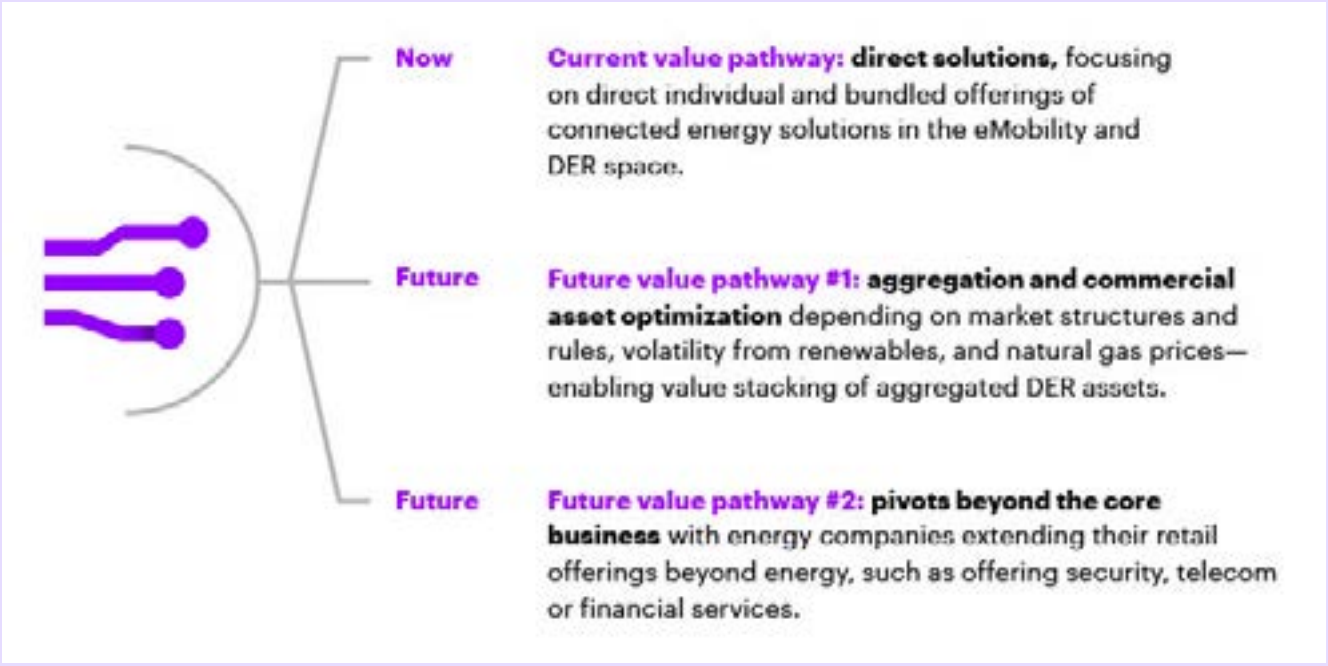
Standalone rooftop solar contributes 54% of the total EBITDA market for DERs in 2030, and rooftop solar + storage represents most of the remaining potential (45%), with only limited opportunity from electrified heating.

Bundling for greater benefit.

Bundling across multiple business models could offer value greater than the sum of its parts. We see great untapped potential for energy companies here. The opportunity for energy companies to offer true end-to-end bundles could represent a strong differentiating factor against other entrants competing in the energy services space.

Making new business models a reality

When considering the pursuit of future energy business models, timing is key. We see three value pathways that can help structure planning and execution: one that is currently viable, and two that are likely to become more broadly viable at scale in the future.



Value pathways to help make new business models a reality.

For energy companies, the window of opportunity is open, but time is of the essence. To execute effectively, the shift from a commodity-centric business to a digital energy services company will be part "evolution" (leveraging and building on existing capabilities to play to competitive advantages), and part "revolution" (rapidly developing the new capabilities necessary for successful execution).

Navigating these challenges will not be easy, but the energy companies that do so can successfully position themselves to execute and capture value as the energy transition continues to accelerate.

Annette Rust
Senior Manager
Interactive Utilities Lead - Europe

Richard Wilshire
Principle Design Director
Fjord, Part of Accenture Interactive

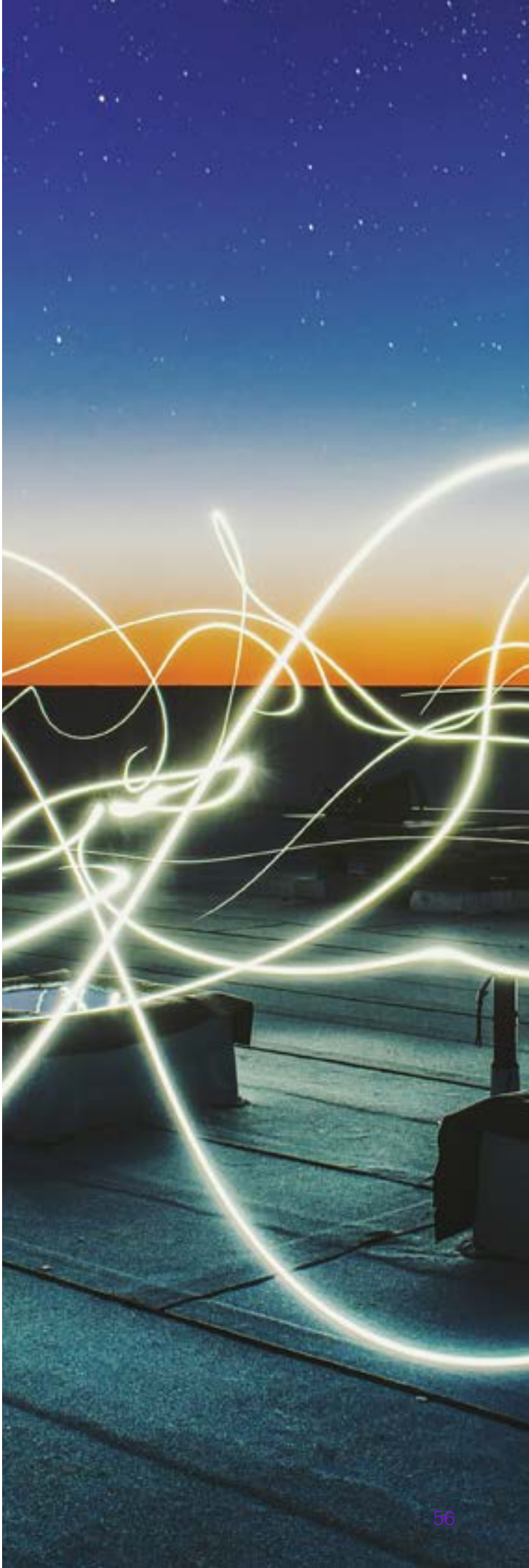
Fjord trends 2021: Energy retailers enter new territory

Accenture Interactive recently launched the 2021 Fjord Trends, our fourteenth year unpicking how consumers are changing and what that means for the businesses that serve them. And what a year it's been.

We're seeing long-held assumptions about what consumers want, how they expect to be served and how adaptable they are falling away. And in a year when telemedicine became the norm, and Zoom birthday parties were serious business, every standard benchmark on consumer attitudes and actions became obsolete overnight.

The 2021 Fjord Trends will permeate industries in different ways. **Read our utilities perspective** for the detail about the five trends we believe will shape energy retail as we move forward.

But here's a taster. Overall, we think the trends represent a re-leveling of the playing field for energy retailers. And an opportunity for them to recast their relationships, services, and brand recognition. Ultimately, to reposition from commodity provider to collaborator and contributor to people's lives. And become businesses' trusted partner in the energy transition. How? Here is a snapshot of two of the most relevant trends for energy retailers.



Collective displacement

When footfall on the high street is gone, traditional advertising (think bus, poster, store window) no longer works. It creates a vacuum and represents a more level playing field for industries like utilities, who aren't traditionally the visible, high-street advertisers. When no brands are being seen, all brands are more equal.

Meanwhile, the way customers engage with companies has also been shaken to its core. Customers have had to change channels fast, with online customer experience increasingly the norm across industries. Customers have adopted and adapted in unprecedented ways.

And it adds up to a once-in-a-generation openness for new relationships with companies.

So what's the delta for energy retailers? It means there's now a window for them to recast their relationships with consumers through strong product and service experiences (rather than old-fashioned advertising). Example: energy retailers can transcend the standard billing relationship with consumers and become a trusted electric vehicle (EV) charging partner. That might mean leasing you a car; installing your charger; figuring out the best green tariff to charge it; helping you upgrade to the next generation of EV as it comes online.

And this is equally true in a business to business (B2B) scenario. Every business is going to need a trusted partner for the ever-pressing energy transition. Another window for energy retailers to move in and occupy that space.

These services have the chance to perform along every single touchpoint with the brands promise and purpose along with the excellence in experience they provide to the customer.

Interaction wanderlust

> **And for consumers, so much of this comes down to the stories energy retailers tell them and engage them in.**

In 2021, people are searching for connection, meaning, cohesiveness of experience.

For energy retailers it means connecting the dots for their customers, many of whose energy bills will have gone through the roof over the past year! So how do you engage those people? Tell them the story when you send them the bill. Provide content and information around their numbers and the impact, each of us has on climate changes, less pollution, water saving. So e.g. their costs are up, but their green tariff meant their carbon impact was much lower than it could have been. Quantify that impact and make it meaningful (in terms of cars on the road for instance).

Humanity, relevance and personalization will be central to how energy retailers communicate. And the corollary is that misdirected information will turn a customer off like never before. If you live in an apartment, do you want to hear about solar panels? Maybe, but only if it's handled the right way! You want a panel but don't have your own roof? No problem. Choose it from the solar farm and rent it.

It's also about channels, technologies and experiences that delight. We know customers are now far more ready to try immersive technologies when dealing with companies. And video boiler diagnostics are already happening, with the engineer one end of the country and the customer at another. Meanwhile, Chinese EV maker NIO has embraced live streaming for car viewing, having used it to drive sales while dealerships were closed.

But this also holds for energy retailer employees, where experiences are equally vital. For instance, Chevron is already equipping field technicians with Microsoft Hololens for routine maintenance tasks. Using Hololens means technicians can get remote technical help while performing challenging tasks, improving efficiency and effectiveness.

But operations will need to keep up

> **For energy retailers, the 2021 Fjord Trends also represent a recalibration of operational norms.**

For example, residential energy consumption patterns will change as people work and learn more from home and expect more comfort in their home "multiverse." And as a result planned daytime outages for maintenance may have to become a thing of the past.

Contact centers, channels, personalization will also require new systems, processes and investments, with cloud a key lever in keeping some or all agents remote and flexible. And all that interaction means a focus on green cloud will be key.

It's going to require energy retailers to reshape not only how they deal with customer contacts; rather, how they provide service to both businesses and consumers.

But the opportunity is big for those who can rise to the occasion. Contact us to talk more about how.

Mark Sherwin
Managing Director
Accenture Interactive

Growth: It comes down to experience

In brief

- Focusing just on customer experience (CX) is no longer enough for utilities to succeed.
- Utilities must take a new approach and organize the whole enterprise around the delivery of exceptional experiences to customers.
- We call it the Business of Experience (BX) a new category of leadership that savvy CEOs and their leadership teams will embrace.
- Our research shows businesses that reoriented around practices that we defined as important for BX grow more than their CX-only counterparts.

An experience renaissance to reignite growth.

The energy ecosystem is at an inflection point in the transition to a decarbonized future. Powerful forces are driving this change. It's evident in new market entrants, evolving policy and regulatory models, and investor focus on the green future. And at the heart of this transition is the evolving energy consumer.

The structure of almost everything we do—how and what people buy, how and where they work, how they interact with others—has been upended by world events in 2020. The consumer behavior shifts we're seeing today are not a blip. They are likely to stay with us for a long time, some likely forever. Some have been in motion for years, and many have been accelerated by the COVID-19 pandemic.

And right now, an experience renaissance is afoot – one that is galvanizing utilities companies to push beyond the CX philosophy and organize the whole business around the delivery of exceptional experiences. These experiences must respond to customers' new, often unmet and frequently changing needs and enable them to achieve their desired outcomes. This is the Business of Experience (BX).

It's time for utilities to reimagine business through the lens of experience.

An evolution of CX, BX is a more holistic approach that allows utilities organizations to become customer-obsessed and reignite growth.

Whereas CX was limited to the chief marketing officer's (CMO) or chief operating officer's (COO) purview, BX is in the board room as a CEO priority because it ties back to every aspect of a company's operations. BX is very much a new category of leadership that savvy CEOs and their leadership teams will embrace as we move deeper into the coming decade.

An innovative approach to boost business

In our research, we spoke to 1,550 executives (nearly a quarter of them CEOs) in 21 countries across 22 industries, including respondents from utilities. We found that the organizations that embraced and reoriented around practices that we have defined as important for BX grow their profitability year-on-year by at least six times over their industry peers.

On average, BX leaders outperform CX-oriented companies in year-on-year profitability growth* by:

1yr	3yr	5yr	7yr
6.5x	6.4x	6.4x	6.3x

*Accenture Interactive identified the top 15% BX companies based on their survey responses to questions around BX capabilities. Using publicly available financial data, Accenture Interactive calculated industry-indexed EBIT for each company for 1-, 3-, 5- and 7-year CAGR, and then compared BX companies to their peers.

BX doing

Through talking to clients who are doing or at least aspiring to do BX, we've identified four winning ways to help you realize its promise. Our research shows that BX leaders (i.e., companies that are independently performing well in terms of financial growth and business cycle endurance) are far more likely to take the following approaches, enabling them to consistently outperform peers who don't:

1. **Obsess about customer needs—and use that as your compass.**
2. **Make experience innovation an everyday habit.**
3. **Expand the experience remit across your organization.**
4. **Sync the tech, data and human agendas.**

The incredible impact of meaningful business

Every utility company today is looking at how to manage its way through the economic and health crises unfolding around us and come out on the other end not only stronger, but also poised to compete in what many are predicting will be a robust decade. Each utility must examine and pivot its business to find new ways to offer meaningful experiences to customers who are also grappling with many of the same challenges.

There's no better time than now for utilities to discover what a BX versus CX approach can do for your business. We believe it will ignite growth and deliver the outcomes desired by your customers and for your business, even as uncertainty continues to swirl. Is it easy? No. But it's essential.

BX may be a significant mindset shift, but we believe that over the years, it's going to be an incredible engine for meaningful disruption, market differentiation and customer satisfaction.We can show you how.

Digital and sustainable enterprise

Chapter 5

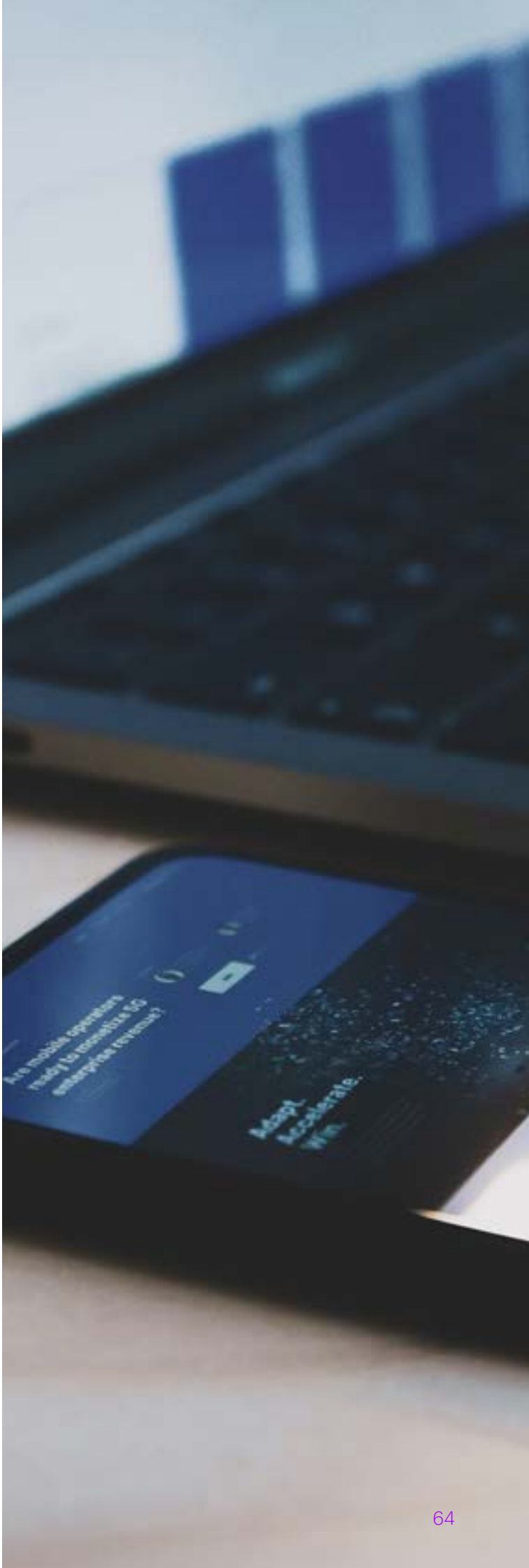
Richard Jones
Principle Director
Consulting, Utilities, Grid Security and Compliance, North America

For utilities, cybersecurity is an increasingly urgent business issue

With operational technology (OT) now core to distribution networks and extreme weather threatening operations, transmission and distribution utilities should think far more broadly about security. How? Below are my thoughts.

As the headlines show with painful clarity, cyberattacks are on the rise. Thankfully, leadership has been investing accordingly, with more than 90 percent of utilities spending more than 20 percent of cybersecurity budgets on advanced technologies. But more is needed.

For today's transmission and distribution (T&D) utilities, greater connectedness brings greater risk of attacks by malicious (and sometimes state) actors. This is compounded by a significant increase in the type and volume of users, which expands the potential for a serious breach that can affect customers and the public.



The ominous lessons of the FireEye and SolarWinds attacks

> **The layers and implications of these hacks, discovered in December after months of burrowing into the networks of companies and government agencies, are still being peeled away.**

But it's clear that they are serious – so egregious that they prompted the chief executive officers of the largest American utility companies to hold an urgent, all hands call to discuss possible threats to the power grid.

Dragos, a threat intelligence firm, urged utilities to assess the exposure in their operational technology (OT) environments because "supply chain compromises, like SolarWinds, provide illicit and malicious access to OT environments, facilitating possible disruption," said Sergio Caltagirone, the firm's vice president of threat intelligence for industrial cybersecurity.

This is why security is a challenge for the business at large

> **If we layer on extreme weather and other natural disasters, utilities are in emergency response mode more often, for longer and in more complex ways.**

This means their security strategies and approaches must be tested and watertight. They need to be increasingly agile and able to adapt to non-traditional operating models such as remote workers. All of these steps can help them reduce risk and accelerate analysis and remediation of attacks like FireEye and SolarWinds.

Put governance at the top of the security "to-do" list

> **How to handle security on an end-to-end basis?**

First, think about moving it out of IT. Some utilities are creating a chief security officer (CSO) role to bring IT, OT, supply chain and insider security concerns under one roof. In some cases, physical security is also part of the CSO's purview. This approach to centralizing security can be an effective way forward. But to really drive a security culture, establish shared accountability with the business: T&D Leadership should explicitly share responsibility for security and for any breaches, behavior driven by shared incentives and objectives.

Think of cybersecurity differently

Move from a compliance mindset to a capability approach: "How do I build an effective end-to-end capability that can evolve along with – or even ahead of – security demands?" This also aligns with the direction many regulators are taking.

The end game is increased security resilience and for utilities to take ownership for building security into the design of their infrastructure and systems. It's a step change, a step toward a more forward-looking and proactive approach that is increasingly essential as the scale and nature of threats continue to ramp.

Design-in protection, with emergency response in scope

> **To be effective at security, from the control-center to the grid-edge, explicitly design it in, starting during planning.**

Too often, security is a bolt-on and budgeted after everything else, so funding is often nominal. Make it a priority by budgeting it as a line item upfront. Then keep it at the top of the list.

Make security part of the emergency response cadence

> **When you go into emergency mode, do not allow security to fall away. Infuse it into every process and system, including communications with field crews.**

or example, during regular and emergency operations, control center personnel communicate with field crews through a variety of paths typically secured (if they are indeed secured at all) via end-point encryption. Whether communications use cell or mesh networks, VoIP, satellite, traditional telephony or a hybrid, establish secure backup communication paths. This can reduce the risk of surveillance and/or data theft.

Our research shows only a quarter of utilities executives we surveyed feel very well prepared to deal with extreme weather events. Given that emergency response is an orchestrated, pre-planned process—one you will enact repeatedly—security considerations need to be one of the highest priorities in crisis management in the T&D business.

Get the right people in the room

> **How to design-in security?**

Gather all "security" stakeholders – this should include T&D operations, telecommunications, IT & OT leadership, along with the people from security and compliance to – to help budget for security concerns during design, not after-the fact.

Plus, make security a business-wide remit by encouraging all stakeholders to establish strong relationships and to share accountability. When the storm hits, relationships count. If there's one thing we can guarantee, the storm—or hurricane, or cyclone or wildfire or cyberattack—will hit again.

Bottom line

> **The lesson of FireEye, SolarWinds and other attacks is that like all other organizations utilities should aim for proactive, end-to-end security resilience. Please contact me to find out more.**

Paula Clark
Managing Director
Technology Consulting
Resources

Utilities tech vision: Become a master of change

As we all know from experience, the energy industry has endured significant upheaval over the past decade.

The pandemic brought further disruption, forcing utilities to invest in new technologies to support remote working and field worker safety. In the research for our Technology Vision 2021, 99% of utilities executives said the COVID-19 pandemic created an unprecedented stress test for their organizations. Furthermore, technology architecture was ranked as the area where the stresses were greatest.

While the world is now looking to move beyond the pandemic, the energy industry will feel its impact for years to come. Many countries will accelerate their decarbonization policies as part of COVID recovery programs, further intensifying disruption over the coming decade. Already, a majority (59%) of utilities executives report the pace of digital transformation is accelerating. The rest will follow suit soon.

A new leadership mindset is needed to drive success in the energy transition

> As the energy transition gathers pace, it's forcing a reinvention of how to deliver sustainable, affordable, reliable power.

As competitive pressures intensify, new business models will be developed at a faster pace than many utilities are used to. A new technology infrastructure is needed to support this rapid innovation. And a new leadership mindset is needed to power a new era of transformation.

Why must utility infrastructure be replaced? The stark answer is that legacy architecture will be pushed well beyond its limits. This infrastructure was designed for a stable, predictable environment – not to support prosumers, EV charging, flexibility markets, or the rapid development and deployment of new business models.

Utilities also face new and significant competitive forces that will reshape the electricity value chain. Why? Because utilities are not alone in their pursuit of these new opportunities. Oil majors will increase their investments in renewables and storage, while telcos in deregulated markets will increasingly bundle power with other services. And cloud-native start-ups will threaten incumbents with Amazon-like customer-centric business models.

To ride out these disruptions and turn them to their advantage, utilities should harness technology innovation. The five trends called out in our Technology Vision 2021 show how they can do this.

Stack strategically

> By stacking strategically, utilities will maximize the benefits from advances in technology by architecting a better future.

In our Technology Vision research, 83% of utilities executives agree that their organizations' business and technology strategies are becoming inseparable – even indistinguishable. Selecting the right technologies to support changing future needs is required, including how to adopt new cloud-native business models. For the new utility leadership, mastering change means mastering technology selection and integration. For many this will mean shifting to a modular, vertical landscape built on micro-services. An adaptive, reusable approach to technology and a fresh strategy to application development will create an architecture that allows the business to travel in new directions – at pace.

Mirrored world

> As utility leaders thread technology through all aspects of the business, the data generated is used to build massive networks of intelligent digital twins.

The mirrored world these next-generation twins create is fueling change by unlocking the currently trapped value of data and allowing utilities to simulate, predict, and automate by seamlessly bridging the divide between digital and physical.

This mirrored world will facilitate an agile and intelligent future for the industry. A digital twin becomes the energy system's system of record, and an essential strategic planning tool for asset managers, regulators, policy makers, and transport system owners – a shared analytics platform to perform scenario planning from large-scale generation through to customer modelling. Many have already started their digital twin journey: 28% of utilities executives report their organizations are experimenting with digital twins this year.

Overwhelming 87% of utilities executives believe technology democratization is becoming critical in their ability to ignite innovation across their organization.

I, technologist

> **Technology democratization places powerful capabilities with all utility employees.**

It augments existing technology approaches to innovation by putting the right tools in the hands of staff. And it decentralizes innovation, where staff are free to innovate on their own, in their own timeframes, without the need for specialized IT resources. An overwhelming 87% of utilities executives believe technology democratization is becoming critical in their ability to ignite innovation across their organization.

All utility employees can become innovators, using RPA, NLP, BI tools, and low-code or no-code platforms to innovate on the new business models that will deliver the energy transition. And this is not just for individuals: technology democratization also enables collaboration, within teams, between teams, and with stakeholders outside the organization.

Anywhere, everywhere

> **The mass move to work from home (WFH) has redefined working culture.**

Many industries have developed "bring your own environment" (BYOE) strategies to address the security ramifications of remote work. Clearly, the utilities industry—given its unique governance frameworks—won't be able to fully embrace remote working for its asset-focused workforce. But utilities can apply BYOE best practices in customer operations, and use them to optimize flexibility within regulatory constraints. This will be done by deploying new technologies—particularly 5G, edge computing, and self-serve analytics—which will help utilities to create a new environment that enables a very different way of working in the field.

From me to we

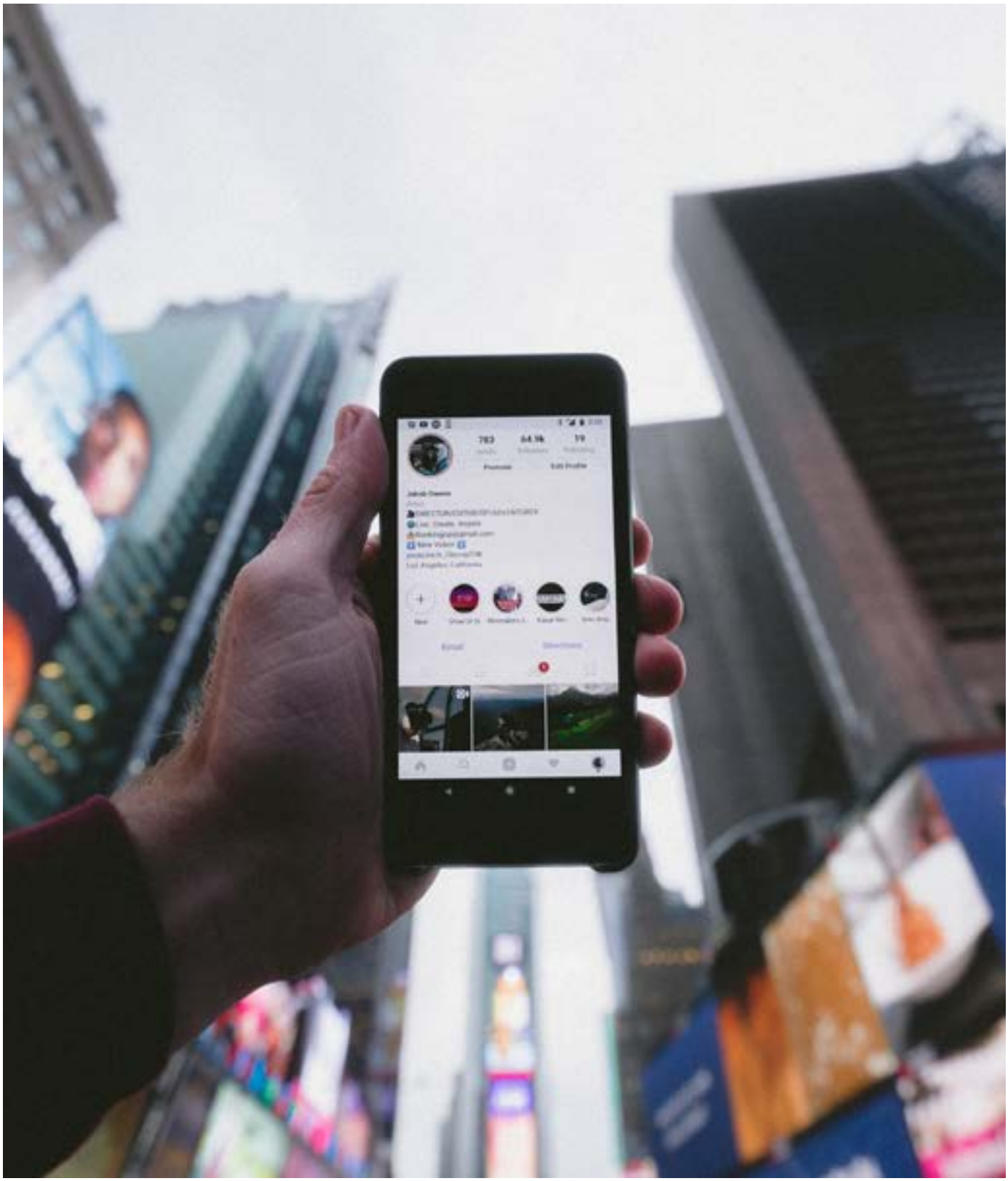
> **The energy transition creates many new opportunities to generate additional value.**

91% of utility executives state that multiparty systems will enable their ecosystems to forge a more resilient and adaptable foundation to create new value with their organization's partners. But these new business models create a more varied and complex energy value chain, which is no longer linear but diffuse and decentralized. Importantly, utilities will no longer own all of this infrastructure.

Rather, it will be a multiparty system: a data-rich infrastructure shared between stakeholders that drives efficiency and builds new business and revenue models. Based on technologies including blockchain, distributed ledger, distributed database, and tokenization, these multiparty systems will enable business model changes that maximize returns within the new environment. They will help different stakeholders manage the rapidly increasing deployments of electric vehicles (EVs) distributed energy resources (DERs) the creation of virtual power plants (VPPs) and support flexibility programs. How? By creating a trustworthy and resilient data sharing platform as the foundation for existing and future partnerships.

What's next?

That's how our Technology Vision is helping to shape the future as utilities focus on delivering the energy transition in the post-pandemic world. Contact me to learn more.



Chris Manshio
Managing Director
Talent and
Organization

Reinventing the utility employee experience

In brief

- Accenture and the Center for Energy Workforce Development (CEWD) explored how utilities can help reinvent the employee experience for the future.
- Accenture found that by meeting six fundamental human needs through work, companies—including utilities—can unlock their people's full potential.
- Boosting these "Net Better Off" dimensions can create meaningful, trusting relationships with employees and increase business performance.
- We identified five leading practices that utilities can apply to improve employees' experience while attracting the talent needed for the future.

More than three-quarters of U.S. utilities report difficulty in the ability to hire new employees.

A utility workforce in transformation

The utility workforce is in the early stages of what we believe will be a deep, lasting transformation, accelerated by the COVID-19 pandemic, but reflecting major shifts in the way people think about their providers of heat and electricity.

The traditional view of utilities—as companies providing steady, if unexciting, jobs leading to a comfortable retirement— is disappearing fast. What is also becoming clear is the critical role utilities have to play in the energy transition, with a commitment to providing affordable, clean power to customers.

Despite these changing views, negative perceptions of utilities as a place to work, which include a lack of room for career growth, a slow-moving industry culture and a view of the industry as unexciting, persist.

One issue we have seen is a continued lack of critical focus on the part of utility companies to unlock the potential of their workforce. Prior to the pandemic, Accenture interviewed 3,200 senior executives—half of them decision-makers in human resources—as well as more than 15,000 workers spanning 15 industries and 10 countries in a comprehensive, first-of-its-kind study to determine how companies can capture and maintain employee trust by meeting the needs of what matters most to them.

A groundbreaking new model: Net Better Off

The research enabled us to develop a new model called "Net Better Off."

We found that nearly two-thirds of an individual's potential—as defined by the skills, strengths, and capabilities they bring to work each day—is influenced by whether they feel better off across six key dimensions.

Getting the Net Better Off model right is important for unlocking employee potential, but also vital for unlocking the potential of the business. Employers that create meaningful, trusting relationships with their employees see an increase in business performance.

We found that each of the six dimensions of Net Better Off were significantly correlated with people trusting their employer. Also, we found that Net Better Off statistically drives people's trust at work.

The Net Better Off framework addresses six fundamental human needs.

Fortunately, there are ways to transform the utility employee experience to leave people feeling net better off in the workplace.

The employer/employee relationship paradox

> **Utility companies want their people employees to recommend them to others, trust them as an employer, remain loyal, stay inspired and motivated, and apply their full range of skills.**

Employees, on the other hand, seek emotional, physical, and personal connections to the workplace. But these are exactly the needs for which employers feel least accountable. Companies are often neither aware of nor focused on providing employees with what they really want.

We can see that people want company leadership to help them become net better off, but leadership still needs to catch up.

Leading practices for a new utility work environment

In this new environment, utilities have taken several steps to limit the risks associated with customer and employee interaction. We have identified five leading practices that can be integrated and incorporated into these measures to create a Net Better Off workplace.

Five leading practices	RESULTING WORKFORCE BEHAVIOR	PERCENTAGE OF UTILITY ORGANIZATIONS CLAIMING TO LEAD IN THIS PRACTICE
Enable continuous learning to ensure a future-ready utility workforce that can shift at scale.	**98%** of workers would recommend their employer to others.	**20%**
Listen to what your people need, using active listening programs and empowering them with real-time data.	**91%** of workers effectively adapt to change.	**15%**
Use technology to enable flexible work arrangements and more creative work for your utility workforce that is increasingly dispersed.	**85%** are more likely to feel fulfilled in their work.	**20%**
Champion workforce well-being and equality. Safety and relational needs are more important than ever.	**87%** put significantly more effort into their work.	**17%**
Set and share people metrics. Take accountability for diversity and equality, and be transparent and engage in intentional conversations that matter to your people.	**69%** have a positive experience at work.	**15%**

Looking to the future

More utilities are taking the kinds of action needed to build engagement with their workforce, encourage innovation and creative thinking, and foster commitment and a sense of purpose among employees.

We find it helpful for utilities to think about the "big three" audiences for these initiatives—employees, new talent and managers of people—each with its own specific concerns and requirements.

Utility companies have recognized an increased responsibility to not only protect and compensate their employees, but also help them reach their full potential as workers and human beings. Using Net Better Off as a framework for specific, data-driven actions, utilities can improve their employees' experience while attracting the talent needed for a challenging future.

Craig Richey
Senior Managing Director
Consulting, Global Utilities, CFO & Enterprise Value Lead

Nick Farwig
Managing Director
Consulting, Utilities, CFO & Enterprise Value

Helping utilities CFOs be future ready

In brief

- To address the massive scale and swift pace required for today's decision-making, Utilities CFOs must use technology to unleash breakthrough speed.
- The requirements of the CFO's core function are evolving, and an elite group is already embodying three new roles.
- CFOs who emulate their behaviors could almost double the compound annual growth rate of their organizations, according to our research.

Speed matters in any business function.

But for today's utilities CFO, who is making billion-dollar decisions on a weekly or daily basis, there's a chasm that grows by the minute between those who harness speed and those who can't.

For utilities, managing the impact of Covid-19 only added to a long list of complex and extremely important challenges. Above all, businesses in the sector are striving to create an industry that is powered by clean energy. The technology exists to transition to a sustainable energy system by 2050, so many are focusing their energies on adaptation at speed.

Utilities are also navigating an uncertain economy. The IMF and World Bank expect the world to return to growth as the crisis recedes, but they disagree on the speed and consistency of recovery.

Then there are internal initiatives. Utilities are embracing high-powered analytics tools and seeking to invest effectively. The need for new IP also applies to skills: the sector is in competition with other, newer industries for the smartest talent. Taking decisions against this backdrop is not straightforward.

Utilities CFOs ready to confront challenges head on

Accenture's latest CFO Survey reveals they are more likely than their counterparts in other sectors to consider themselves accountable for navigating upheaval.

We find it helpful for utilities to think about the "big three" audiences for these initiatives—employees, new talent and managers of people—each with its own specific concerns and requirements.

Utility companies have recognized an increased responsibility to not only protect and compensate their employees, but also help them reach their full potential as workers and human beings. Using Net Better Off as a framework for specific, data-driven actions, utilities can improve their employees' experience while attracting the talent needed for a challenging future.

85%

of utilities CFOs who believe they amongst all C-suite executives, are best placed to ensure the resilience of the organization in today's operating climate.

84%

of utilities CFOs agree that, whatever happens in the broader economy, the businesses must not lose sight of what is required to improve competitiveness and drive new growth.

42%

of utilities CFOs who say they have been involved in business-wide transformation.

The industry is feeling pressure to change more quickly, driven by increases in internal and external challenges putting pressure on the financial instruments of the company.

Speed within reach

> **Many CFOs acknowledge the opportunities that speed and technology present: insight-driven decisions and new business opportunities.**

But there's also a large gap between what finance leaders say they want to accomplish and what they're able to do in terms of accelerating their predictive ability and expanding their influence. In organizations that far exceeded revenue growth expectations over the past year, CFOs have occupied new and expanded roles

CFOs as economic guardians: lead an efficient and effective finance function focused on predictive insights in a volatile world.

CFOs as architects of business value: Collaborate with the C-suite to drive strategic change across the enterprise.

Catalyst of digital strategy: Create insights for new business models and realize value in a digital world.

A roadmap for success

> **Utilities CFOs are steering their businesses through uncertainty, driving widespread transformation, and they are ambitious to create new value.**

How, then, to manage this demanding workload – to deliver across three significant and interrelated objectives?

1. Close the gap between the CFO and operational finance

Right now, 78% of utilities CFOs concede there is a gap between the CFO's strategic endeavors and the priorities, responsibilities and performance yardsticks throughout the rest of the finance function. The result is that too often, finance leadership and operational teams are focused on different goals.

2. Collaborate and integrate

CFOs are determined to be their organizations' change-makers and value creators, but they must accept this is a shared endeavor. Without building stronger relationships with the rest of the enterprise, such ambition is likely to come up short. The good news is that utilities CFOs recognize that lack of integration and collaboration stands in their way as they drive strategic change: 34% cite this problem. Now they must overcome it.

3. Invest now to stay ahead of future regulation

Compliance with regulation across jurisdictions will be a priority in the years to come. In regulated environments, public authorities set the terms of engagement, so the key is to focus on the direction of travel rather than the immediate constrains.

ABOUT ACCENTURE

Accenture is a global professional services company with leading capabilities in digital, cloud and security. Combining unmatched experience and specialized skills across more than 40 industries, we offer Strategy and Consulting, Interactive, Technology and Operations services—all powered by the world's largest network of Advanced Technology and Intelligent Operations centers. Our 537,000 people deliver on the promise of technology and human ingenuity every day, serving clients in more than 120 countries. We embrace the power of change to create value and shared success for our clients, people, shareholders, partners and communities. Visit us at **www.accenture.com**.