

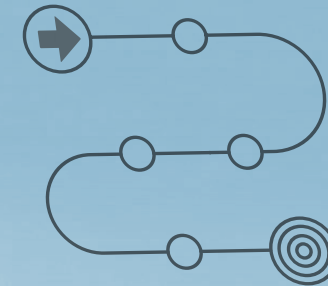
Powering Success:

**A Strategic Guide
to Energy Utilities'
Top Boardroom
Priorities**



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Introduction

The energy transition – the broad movement to cleaner energy and a heightened emphasis on electrification – is happening across the U.S. The convergence of technology, investments, and policies is spurring the need for synchronization to mitigate risk, create efficiencies and realize opportunities for optimization and innovation.

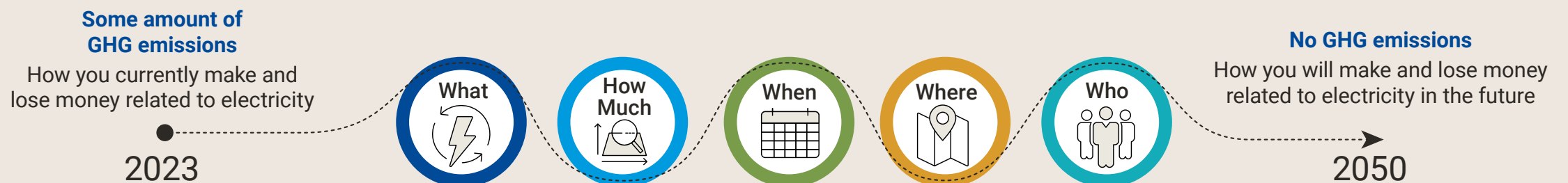
Focused on the nexus of technology, economics, and policy, there are five high-priority areas topping the list for utility boardroom executives:

- **Decarbonization**
- **Renewables and Distributed Energy Resource (DER) Integration**
- **Regulatory Affairs**
- **Shifting Workforce**
- **Digitalization and Technology Evolution**

Addressing each of these top priorities and knowing where to start can be a daunting task. Formulating the right questions sets into motion finding insights that are most useful as you navigate these dynamics.

This e-book explores the challenges and opportunities around each of these industry trends and the key questions and risks utilities must consider in order to crystallize an integrated strategy and build an achievable roadmap to guide them.

The Energy Transition



Top Boardroom Priorities

Focused on the nexus of technology, economics, and policy, there are **five high-priority areas** topping the list for utility boardroom executives.

Decarbonization

Decarbonization is a critical step in addressing climate change and reducing the impact of human activity on the environment. Electric utilities play a vital role in this effort, and their success in decarbonizing their operations will have significant implications for the future of energy production and consumption.

Technology and Digitalization

Technology and digitalization are transforming the electric utilities industry by introducing new tools, techniques, and processes that improve efficiency, reliability, and sustainability, including the use of predictive analytics to optimize grid operations and maintenance. While digitalization offers significant benefits, it also poses certain challenges that must be addressed through careful planning, investment, and management.

Renewables and DER Integration

Renewables and DER integration can present a variety of challenges for electric utilities, as these resources can be more variable than traditional power sources. With the right infrastructure and management strategies, however, these resources can provide a reliable and cost-effective source of energy.

Regulatory Affairs

Regulatory and policy mandates play a critical role in shaping the energy landscape and influencing the decisions made by electric utilities. Established targets by regulatory bodies for reducing carbon emissions and increasing the use of renewable energy are driving utilities to invest in new technologies and infrastructure to meet these goals.

Shifting Workforce

The shifting workforce in the energy industry is creating both opportunities and challenges for electric utilities. One of the most notable shifts in the industry is the increasing talent gap between the wave in retirement of older workers and an increasing demand for workers with specialized skills and knowledge to design, build, and maintain the new technology systems utilities are investing in.

Understanding Risks – The Highest Priority

The challenge with the energy transition is to get full depreciation of existing assets, attain cost recovery of new assets, and level out the trickle-down cost to consumers – yet still get there in a fast and efficient way to comply with regulatory mandates and stakeholder demands. That’s no small task! A utility’s highest priority is to understand, analyze, and prioritize their risks.

This prioritization of risk starts with the board of directors. There must be consensus across the board to embrace the energy transition and have an agreed upon outlook and agenda. Utilities often operate in silos as it relates to generation, transmission, and distribution, and rate cases are often built on the needs of one group or another.

The energy transition requires a comprehensive view of the future and its risks and requirements.



Using advanced modeling techniques, utilities can simulate their power, transmission, generation, and distribution assets under different transition and operating scenarios and determine their risk exposure. This risk should be viewed from a regulatory, economic, and political perspective, with continued energy reliability and resilience remaining top of mind. In addition to reliability, utilities across the country are taking a fresh look at resiliency and meeting the growing threat of severe weather events on energy service, driven and growing due to climate change.

Because accurate risk assessment is a powerful success factor for the utility industry, each of the five sections will have a short list of key risks concepts and questions to consider – specific to that area.

By identifying where the highest risks are and developing strategies based on that risk portfolio, utilities can:

- ✓ Efficiently allocate resources to focus on high-risk areas and avoid wasting critical resources on low-priority ones
- ✓ Define a **manageable process** to inform decisions and strategies
- ✓ Successfully **meet the business goals** that have the biggest impact

Decarbonization – Managing the Megatrend

Megatrends are large and transformative global forces that define the future by having far-reaching impacts on businesses, economies, industries, societies, and individuals. These megatrends drive fundamental changes in how utilities approach a wide range of business activities, priorities, investments, and processes.

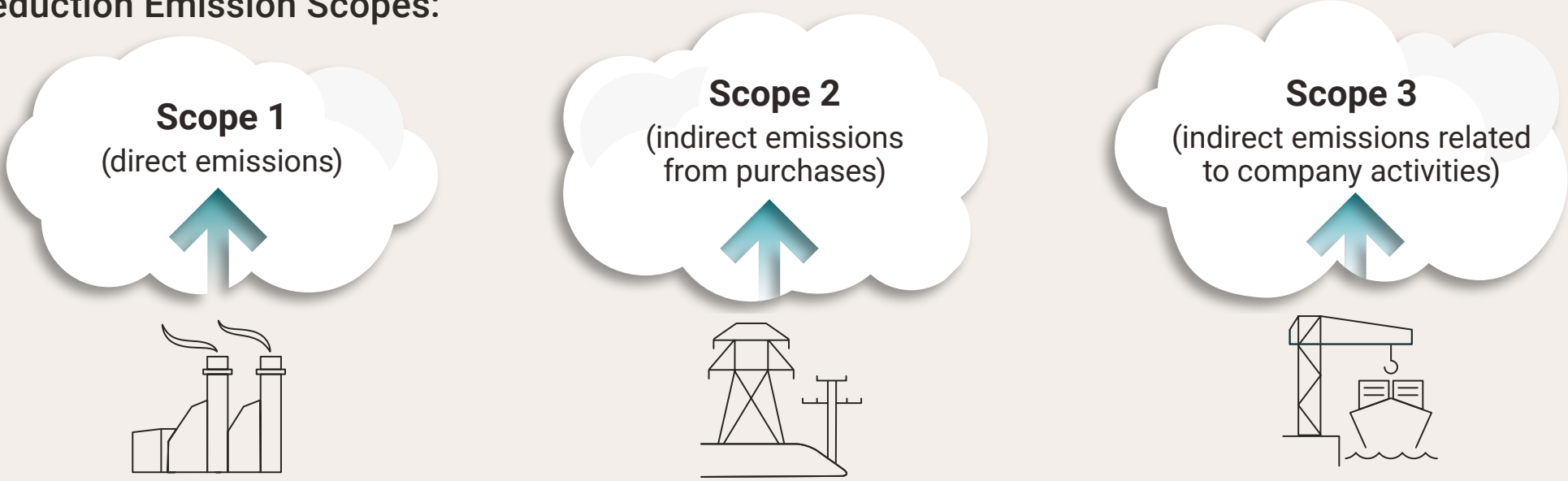
Decarbonization mandates drive new regulations, reporting requirements, investments, and accelerate a wide range of clean energy and related infrastructure projects: **this is the playing field where utility initiatives to reduce greenhouse gases will continue to evolve.**

It is important that utilities consider a range of potential technology and alternative fuel sources to identify the optimal investments and timing for their service territory. It is likely that with planned generation asset retirements and several clean energy projects spurred by their state’s renewable portfolio standard (RPS) requirements, many are already well on their way.

However, as net zero emission mandates emerge, it is vital to understand how to assess the trade-offs, impacts, and benefits when faced with potentially competing priorities to ensure that they are on target to meet their goals.

Often, these goals to achieve either a carbon reduction or net zero outcome roll-up to the utility’s environmental, social and governance (ESG) objectives, which typically engage utility executives and teams in a variety of ways.

Carbon Reduction Emission Scopes:



Decarbonization – Managing the Megatrend (cont.)



Key Navigation Principles

- Avoid the consequences of getting locked into path dependency - build flexibility into your plans
- Avoid stranding assets by picking durable and scalable technologies
- Mitigate technological obsolescence risks by testing, jointly investing, or adopting industry leading practices
- Partner with a trusted advisor who can guide you along the way



Where to Start and What to Watch For

Before breaking ground, utilities must have answers to key questions to ensure their plans have all variables considered, including expected risks and obstacles.

Have you identified all of your asset and investment risks? What are your plans for mitigating those risks?

- As technology cost curves continues to fall, (e.g., solar and battery storage may be cheaper than a new combined cycle plant), it is important to account for this in longer-term Integrated Resource Plans (IRPs).
- To mitigate, utilities must begin to move now – not wait 3 or 5 years – to formulate a comprehensive plan to ensure full asset recovery and secure capital costs for new assets associated with the energy transition. The speed of change is dramatic.

Do you have an actionable decarbonization roadmap in place? Where do you currently stand on its execution, and how are you tracking its progress?

- The risk here is that the speed of change is faster than what most of the industry is incorporating in its resource planning. The changes that will be required (or demanded by the public) may be faster than a utility's ability to recover costs for stranded assets related to their existing fossil base.
- Develop a technology and investment roadmap with a focus on least-cost solutions to achieve greenhouse gas (GHG) reduction. Look for opportunities to convert equipment away from fossil, while outlining a clear path for interim use of natural gas as a fuel source.
- Focus on opportunities for energy efficiency, heat recovery and energy re-use.
- Consider emerging technology mixes and talk to experts who are on the leading edge of new paths

Does your decarbonization plan integrate with your other plans for sustainability and reliability?

What is your customer adoption strategy? How are you communicating upcoming changes with your customer base?

What are your metrics for success, and are they the right ones considering the evolving landscape?

Renewables and DERs – Instilling Innovative Integration

Much of the bottleneck in utility infrastructure lies within today's transmission and distribution (T&D) network. As renewable sources and distributed energy resources (DER) integrate with conventional T&D systems, utilities are grappling with the fact that there's simply not enough capacity to move the renewable energy where it needs to go. If this critical infrastructure can't keep pace with industry needs, large energy buyers and renewable generation developers may be at risk of owning stranded assets and/or face investments in alternate paths to move energy.

Additionally, more weather events are happening across the country with wildfires, hurricanes, storms, and flooding reaching historical levels. These phenomena are highlighting with increasing frequency resiliency gaps with existing utility infrastructure. As these events continue to occur, business cases for significant investment in undergrounding and/or hardening infrastructure become more attractive.

Utilities are also finding that too much of the grid is still operating without the visibility and control needed to make real time decisions or system configuration changes to shorten or prevent customer outages.

Modernizing the grid unequivocally supports the integration of renewables and DERs and involves orchestration of a complex number of moving parts such that implementation success can be achieved with grid improvement programs. Ultimately, these improvement programs when successfully executed lead to expected return on investment (ROI).



Renewables and DERs (cont.)



Where to Start and What to Watch For

Do you have the tools and technology in place to enable enhanced and accurate load forecasting?

- With higher penetration of solar plus storage and electric vehicle (EV) charging, the risk is attempting to forecast load in the same manner as utilities have in the past. Forecasting should now be done more with a blend of forecasting software, managed charging, and increased investment in IT.

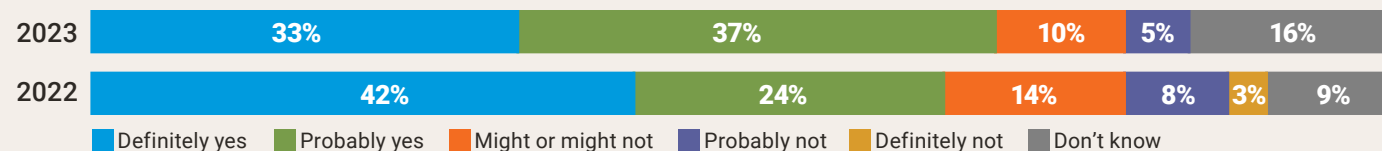
What is your plan for unifying the various internal stakeholders required to build a streamlined DER integration strategy?

- Utilities tend to have silos within IT and OT, which creates a risk. Utilities need to embrace the software engineers on the IT side and the operations engineers on the OT side and create a more integrated approach to planning.

How are you addressing the challenge around supply chain shortages? Does your strategy include both short-and long-term solutions?

Equipment availability remains an uncertainty. Distribution transformers and circuit breakers are now seeing lead times upwards of two years. Utilities should look to secure a slot reservation with a supplier. This allocates a factory slot for the equipment, and utilities can firm up details of the product needed as they get further into the advanced engineering phase of the project.

Are your organization's projects being impacted by the availability of components for transmission and distribution grid enhancements?*



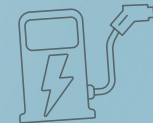
How do you plan to make the infrastructure improvements and capacity upgrades needed to harness the reliability and resiliency benefits that renewables provide – at the speed and scale required?

* Survey result from Black & Veatch's 2023 Electric Report



Opportunities on the Horizon: Driving DER Integration

DERs, including EV charging, are setting the stage for **massive increase in value for shareholders**. This comes with an equally large challenge from a regulatory and political perspective to meet the opportunity.



Integrating new technologies provides insight into the electric grid and **prompts new efficiencies and optimizations**.



Regulatory Affairs – Co-Existing in the Political World

Regulators run the full gamut of very aggressive to quite passive as it relates to greener energy. The regulatory climate and politics are inseparable, and utilities must have a plan on how and to what degree they can or will engage.

Each utility finds itself in a unique situation, and therefore should decide what role they want to play in policy formation. Choices can be summarized as Policy Taker, Policy Shaper, or Policy Maker.

All three policy formation roles work, depending on the utility’s location and their regulatory atmosphere, and should decide the role they ought to play and integrate those actions into their strategy.

Policy Takers:

- Thrive in cooperative environments.
- Work with their regulators and make the policies work for their utility.

Policy Shapers:

- Take an active role with proposals and public messaging.
- Respond to various legislation, mandates, and proposals, and aim to build good communications with all sides. Work on the inside to garner the best outcomes for their utilities.

Policy Makers:

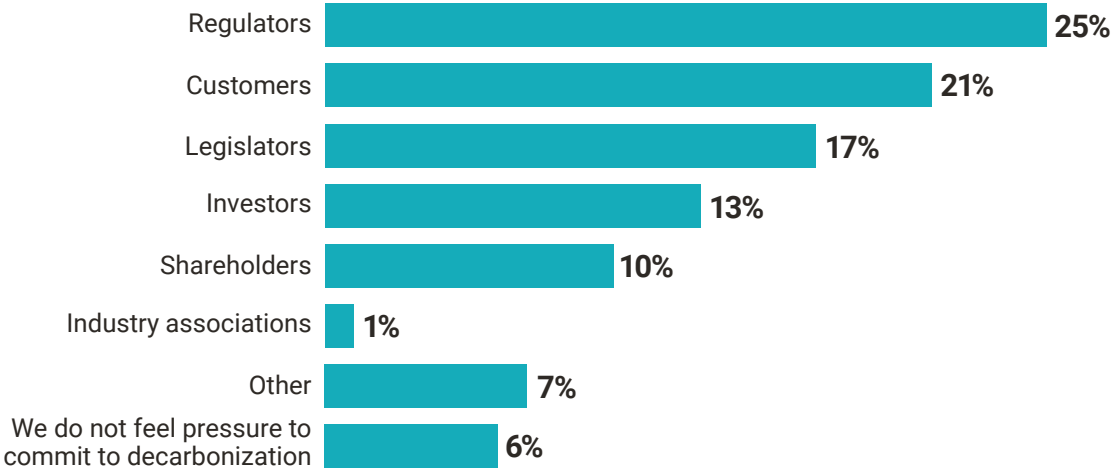
- Active participation in proposing or sponsoring legislation, with strong lobbying efforts and a PR machine that is prepared for the debate.
- May work to actively reform the regulatory system so they can pay for and operate in new ways.
- Advocate for new business models to address this energy transition.

One factor is inescapable – the need to educate and advocate. A utility should have an active educational role in helping the public understand exactly what it does, its push for a greener environment, and the challenges it faces. The general public often takes electricity for granted – until there is an outage. Be proactive in all communications and messaging.

In the 2023 Black & Veatch Electric Report, a comprehensive survey of utility decision-makers, environmental regulation was named as a top challenge facing the industry today. Much of this challenge stems from investment uncertainty. A full 34 percent of respondents said policy or regulatory uncertainty is the largest variable in their investment plan.

The report also showed that 25% of utilities surveyed feel the most pressure from regulators to be committed to decarbonization, with pressure from customers and legislators second most. This further emphasizes the importance of utilities identifying which policy formation role works best for them and communicating any strategic decarbonization goals and milestones with their customers.

From which of the following does your organization feel the greatest pressure to be committed to decarbonization?*



* Survey result from Black & Veatch’s 2023 Electric Report



Regulatory Affairs (cont.)



Where to Start and What to Watch For

How are you going to pay for the decommissioning of certain assets, while (simultaneously) paying for the construction of new carbon-free assets?

- To meet customer expectations in the current cost-of-service regime, consider new, innovative ways of pricing. Using the same method as today of simply filing more rate cases at each step and asking for more money is not dependable. Look into subscription pricing or performance-based regulation (PBR) as starting points for this conversation.

Do you have a communication plan that outlines the who, what, where and how of educating the community on your utility's goals and objectives? How are you communicating the multitude of issues you are facing with regulators, the public and key stakeholders?

- In the regulatory context, directly engage with elected and appointed policymakers to inform the decision-making process. Educate customers on the prospective impacts of utility goals and share your utility's view on the implications of suggested policies at key inflection points.

Are you taking advantage of all the IRA incentives and tax breaks that are now offered? How well do you understand the intricacies of the IRA?

- Considering the speed of change in technology, the aggressive nature of decarb policies, and the pressures on costs, the distribution network is greatly underfunded. This is occurring within an ever-escalating requirement for more capital as utilities encounter a massive increase in electrical demand in the coming decades.

What assets do you have that are at risk of not being fully depreciated before mandated retirement? Have you assessed all assets (generation, transmission and distribution) reaching the end of their useful lives?

- Utilities are increasingly concerned that their rates are fair and equitable for all user classes. Work with a utility ratemaking expert that can help attempt to ensure equitable capital recovery and that revenues are commensurate with the costs to provide service for each customer class. It is vital to include the proper recovery of utility infrastructure and assets that do not reach the end of their useful life, regardless of the reason.



Opportunities on the Horizon: Regulatory Action at the Ready!



New avenues for partnerships and industry cooperation are growing.

48%

of respondents to the *Black & Veatch Electric Report* say government incentives are spurring utility and private sector coordination and collaboration.

Shifting Workforce – Identifying Needs for the Coming Decades

Today's aging workforce is leaving decades of experience behind, and the challenge is for utilities to find ways to appeal to new job seekers to fill the exponentially widening gap. Utilities don't need to do this by themselves – this is a great opportunity to partner with colleges, vocational-tech schools, and labor unions to find and develop workers.

It is much less likely that today's job candidate will stay their entire career at any single company. Those days are gone, but utilities can make retention more attractive with training programs and by actively promoting career advancement opportunities.

Regarding decarbonization, data management, and digitalization, utilities are starting to hire specific roles for these areas. This trend is prompting utilities to build in-house teams, or partner with outside resources such as Black & Veatch for this expertise.



Shifting Workforce – Identifying Needs for the Coming Decades (cont.)



Where to Start and What to Watch For

Have you projected your workforce needs, as well as likely workforce retirement timelines, for the next 10 or 20 years, and do you have an active plan for filling all the needs? Do you know where your gaps will be?

- There is a shortage of engineering students in this country, and the risk of not filling vital positions at utilities is rapidly growing. And it is not just engineering students, it is technicians, operators, drivers, construction, maintenance and more that utilities are competing for. This is occurring as unemployment still hovers around all-time lows.
- Partner with developers and vendors to create a unified picture of the energy future for those entering the job market, including joint marketing efforts at job fairs.

What new ways have you explored to grow your workforce?

- Look for opportunities to form Registered Apprenticeship Programs (RAPs) with the Department of Labor to recruit and train new workers.
- Where workforce shortages exist, develop close relationships with outside consultants and experienced resources that can quickly fill those gaps.
- Workers will join the utility industry because they want to be part of the decarbonization solution. This is a decades-long journey, and they're attracted to being a part of the frontline effort for our planet. Utilities should enthusiastically advertise these openings and use the opportunity to promote their long-term green solutions. It is a message that can help build a stronger image with the public and help compete for talent.

How are you balancing building in-house capabilities with outsourced service provider support for what can be short-term capital project needs?

- Outsourcing engineering and EPC projects to service providers like Black & Veatch can help with short- and medium-term project needs for utilities as the large capital programs necessary to decarbonize the industry grow in the coming decades. Finding the right balance of a combination of new direct hire professionals and utilizing the proven capabilities of service providers will help utilities stay on schedule to meet decarbonization mandates and regulatory timelines.

Are you actively including Diversity, Equity, and Inclusion (DEI) in your recruiting efforts and message? What are the results?



Opportunities on the Horizon:

Working on Workforce

Create internal teams focused on the energy transition – specifically decarbonization efforts and continue the push toward more renewables. This includes data teams that can **provide insight into the health of the grid** and use predictive software to proactively manage replacement of aging devices.

Attract top tax talent to your utility to **take advantage of the IRA tax and financial incentives.** If this isn't possible, work closely with tax consultants with expertise in the utility industry.

Digitalization and Technology Evolution

The transformative evolution of technology today has enabled utilities to leverage digital technologies to enhance revenue-generating business models and other value-producing opportunities.

Three of these emerging digitalization trends include:

- A transition to the cloud environment
- An acceleration of IT/OT convergence
- The need for digitalization beyond the utility boundaries

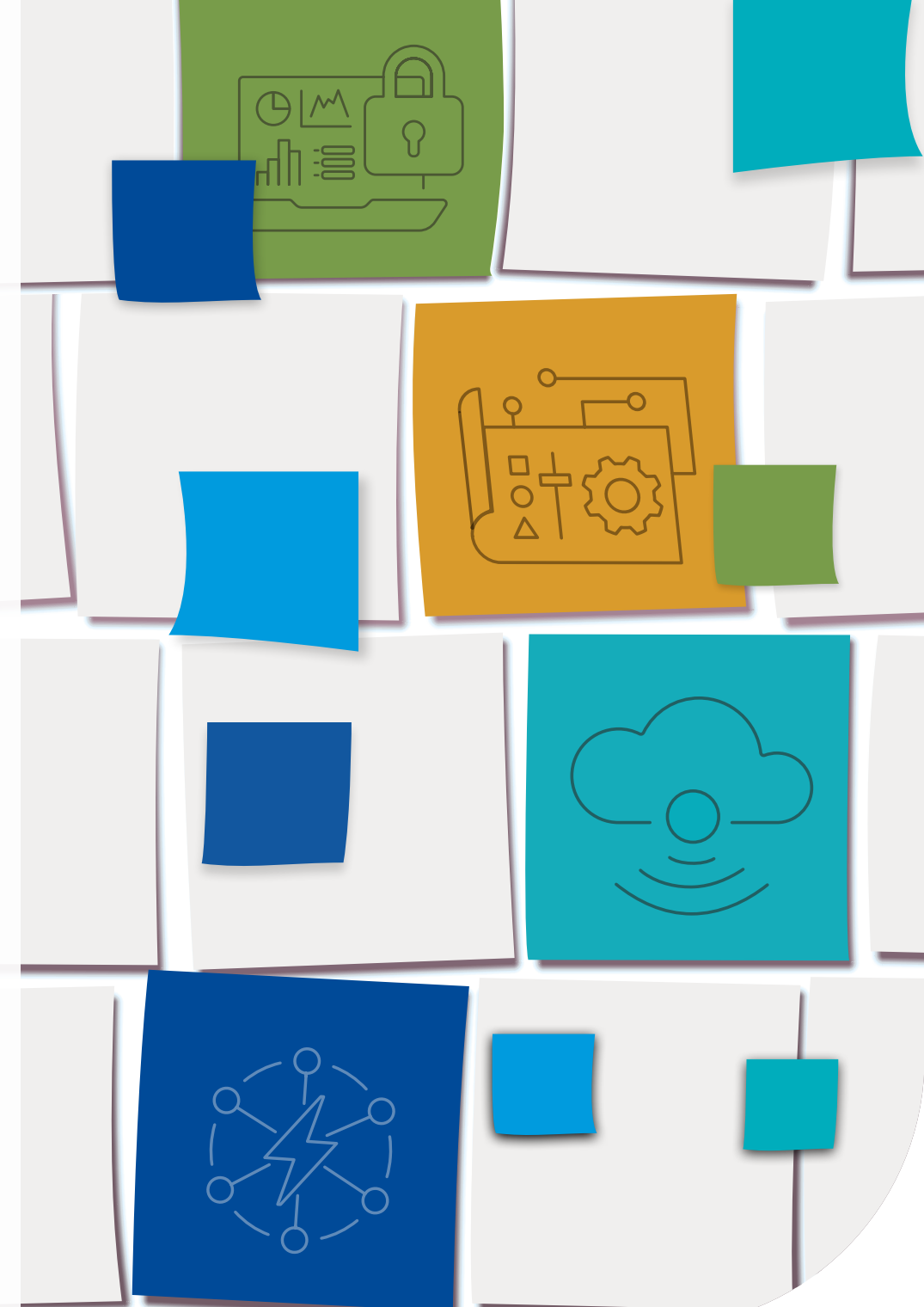
Utilities are looking to the cloud environment to consolidate and create more efficiencies for IT infrastructure and enterprise systems. At the same time, IT and OT integration seem to be accelerating toward a convergence, and a stronger move toward the cloud. This involves increased grid automation and sensors and having important performance data, some of which is provided by cloud-based solutions. This change presents both an opportunity for optimization as well as new risks like cybersecurity.

With a rapid increase of both distributed energy resources and electrification of transportation and beyond, a digitized utility will need to see and understand what's happening behind the meter.

It all comes down to data analytics and having the right tools, technology, and resources to gather, analyze and use it.

Utilities often have published targets set for 2040 or 2050 for decarbonization and clean energy solutions, but don't have a cohesive strategy and integrated plan that ties together capital investment across generation, T&D and behind the meter programs.

By effectively leveraging the data made available by digitalization and working with an industry partner that can analyze and turn that data into actionable programs, utilities can better articulate their decarbonization goals and how this transition will affect their business in the short-and long-term.



Digitalization and Technology Evolution (cont.)



Where to Start and What to Watch For

Are you utilizing technology to help guide spending and investments in the right places and driving your utility toward targets that are achievable? What combination of technologies will help you reach your goals?

- With the vast number of tools and technology available in the market, utilities risk implementing incorrect or ineffective technology solutions that will not meet their long-term needs. This can be prompted by a lack of foresight into what is needed now and what's needed in the future.
- The industry is seeing a growing trend of implementing artificial intelligence (AI) and machine learning (ML) technologies to improve the efficiency of their operations, reduce costs, and enhance customer experiences.
- A cohesive technology roadmap that specifically integrates with the infrastructure investments to drive energy transition is a must for the utilities of the future.

How do new emerging technologies integrate with your existing assets? How are you working to address the significant cybersecurity underpinning needed to securely enable the digitalization of your utility?

- More integration includes increased risk — one key risk is cyber security. Today's OT environment can be a mixed bag of old analog devices combined with new digital devices. Without a clear inventory of what devices are out in the field, there can be a lack of understanding of what data is available and how to use it, and what needs to be upgraded.
- As lines between transmission and distribution grid blur, OT cybersecurity will become a critical component of grid modernization design and implementation.

Is there potential disconnect between your future roadmap and the grid investments that you're making? Do they completely align? Have you identified all potential blind spots?



Opportunities on the Horizon:

The Digitalization Dawn

Enhanced weather forecasting:
Enabling utilities to take proactive measures to fortify vulnerable places on the grid



Artificial intelligence (AI) and real-time data analytics:
Providing utilities enhanced visibility and awareness of emerging patterns like network outages, asset and operational performance, and predictive insight to enhance grid resilience and reliability



Strategic capital programs:
Provides utilities the insight to build large capital programs backed by data for targeted investment plans for grid enhancements



What Next?

Utilities can successfully strategize and align on each priority in an integrated manner by working with an industry expert who possesses top-to-bottom visibility of their unique needs, risks, and goals to develop a strategy with actionable steps.

Knowing what questions to ask and what risks to mitigate — and more importantly, how to mitigate them — utility boardrooms can confidently plan and implement their strategic priorities, knowing they've taken all the right steps to set their organization up for long-term success.

Black & Veatch has more than 100 years of engineering, procurement, construction, and consulting experience, and are in the trenches with utilities on the energy transition journey. We know the costs and timelines involved and how to align your utility's unique goals and objectives with the speed and scale of today's energy transition.

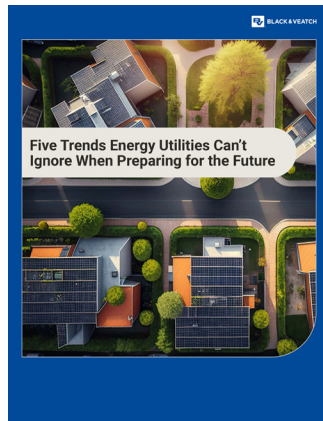
We help utilities feel confident they are spending every dollar in the right place by connecting the dots from decarbonization goals, load growth projections, cybersecurity, asset investment planning optimization, roadmap planning, and much more.

We have the experience and the expertise. Let us put it to work for you.



At Black & Veatch, our mission is to build a world of difference through innovation in sustainable infrastructure. We help organizations integrate a range of technologies and solutions to cost-effectively achieve resilience, sustainability, and growth.

Read Our Other eBooks to Stay Ahead of the Energy Transition Curve



Need to implement long-term resilience and reliability strategies for your energy utility?

Contact us 