



## → Building the 22<sup>nd</sup> century utility

How a utility CEO remakes her business to survive—and even thrive—into the future.

By Val Jensen, ICF

### Executive summary

Utility-of-the-future investigations almost invariably view tomorrow's utility as a modified version of today's business. This is both fascinating and limiting: fascinating for what it says about our general discomfort with uncertainty; limiting in that if we can only see a future that is a straight line from today, we are denied the chance to explore an extraordinary range of possibilities. Wanting to see the future utility as a continuation of today's, except better, makes it hard to see the circumstances under which significant value is lost, or won, for the companies or their customers if the industry takes a sharp turn.

One way to counter this "tomorrow is today plus 1.0" perspective is to imagine what the future could look like. This changes the question from, "What will the world look like in 20 years and how do we prepare for it?" to,



“What do we want the world to look like 20 years from now and what can we do to create it?” In the former case, an unpredictable event can undercut our entire strategic foundation, since our strategy is about prospering in a future that now looks entirely different. In the latter case, what we want the future to look like has not changed, though the pathway there may have.

## What would Sam Insull do? A case study on building the 22<sup>nd</sup> century utility

Imagine a modern-day Sam Insull<sup>1</sup> is hired as the CEO of an investor-owned utility and receives the mandate to remake the business to survive into the 22<sup>nd</sup> century. She is certain this world will be more digital, more connected, and decarbonized, if the world is to avoid catastrophic climate change. But it is as much defined by what she doesn't know, given increasingly rapid and disruptive technological advances in areas such as artificial intelligence and the ever-shifting political landscape.

Taking stock of what she has to work with, she sees what most utility executives see today:

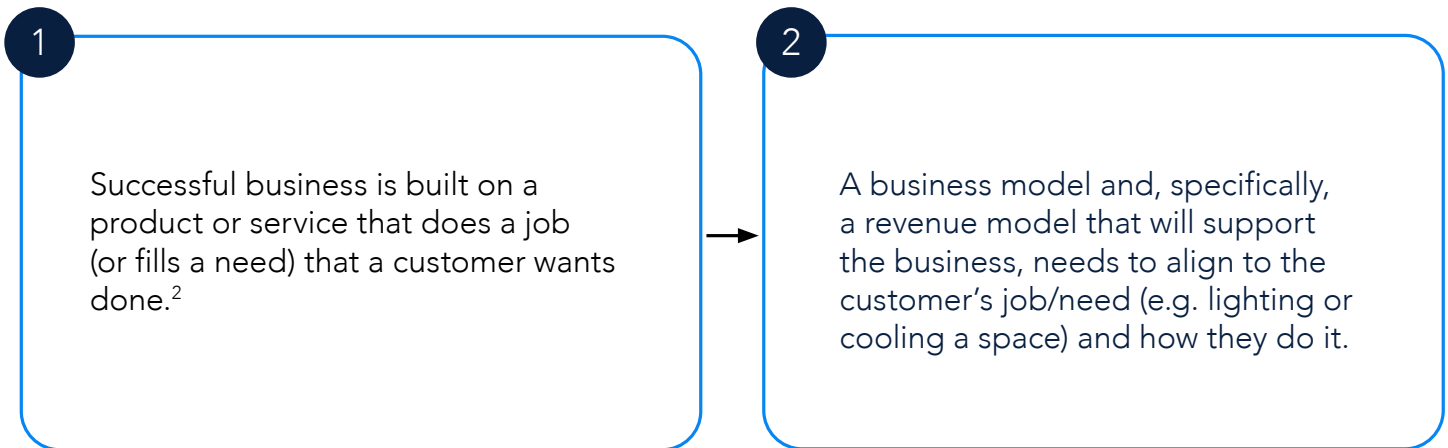
- An economy vitally dependent on electricity.
- An existing network of electric power infrastructure that is extraordinary in its reach and complexity.
- A wholesale power market that is coming apart, jostled by stagnant demand, significant zero marginal cost resources flooding markets, state policies that favor non-fossil resources, demand response, the rise of storage, and aggregated distributed resources.
- Electric pricing is a mess, with costs recovered via an administratively set price per kWh logged.
- The revenue model is wrong. Distribution companies charge volumetric prices for a product (i.e., electricity) that they do not actually produce, while

customers and regulators pursue decreased energy use.

- Rapidly developing technology across the whole electric power value chain from generation to use is getting smaller, better, cheaper, smarter, cleaner, more connected, and more ubiquitous. Almost anyone can be their own power producer.
- The technology to sense, measure, and control electricity use is rapidly getting better and cheaper, creating opportunities for new transactions and new architectures.
- Demand for electricity is generally stagnant. The services that rely on electricity, however, seem to be growing rapidly.
- The interconnectedness of electricity, telecommunications, and transportation is increasing.
- The climate is changing: weather patterns are more volatile; extreme and horribly damaging climate-driven events are more common.
- Many in the consumer base readily turn over their money and decision-making to organizations that promise to simplify things.
- Design is king in everything from thermostats to home batteries, customer web portals and apps, cars, and even customer bills.
- Customers seem to be focused on “the local,” and increasingly look to municipalities for action on climate change and social justice.
- The existing industry is very much focused on generating, distributing, and selling electricity as opposed to what customers are actually doing with the electricity.

Besides these observations, Sam comes to the job with two related core beliefs about building a sustainable business.

<sup>1</sup>Sam Insull was an assistant to Thomas Edison who later founded Commonwealth Edison Company in Chicago and was responsible for many of the business-model and regulatory innovations that gave rise to the electric power industry as we know it. While the original Sam was a man, in this instance, his modern-day namesake is a woman.



### The new utility<sup>3</sup>

Given these initial conditions, what kind of business would Sam build, and how?

The business rests in part on observation of what seems likely, and in part on conviction. Sam's vision is of a business that creates broad financial and public value by closely aligning with its customers through a services enterprise that thrives in a decentralized, distributed, democratic (in the sense that consumers have a wide range of choice), decarbonized, and just manner.

Armed with this vision, Sam needs a business model. Success requires her to understand what customers are really buying. In a world where technology is creating more and more options for customers to get electricity somewhere else, believing that customers really want monopoly-supplied electricity is a dead-end.

The activities customers undertake with electricity are durable, and many—lighting, heating, cooking, transporting, communicating, and entertaining—they've done since before electricity. After observing how customers fill these needs, Sam designs a two-tiered business model that gives the utility both revenue stability and also mines the opportunity inherent in technological change.

### Tier 1: Sell network and platform service

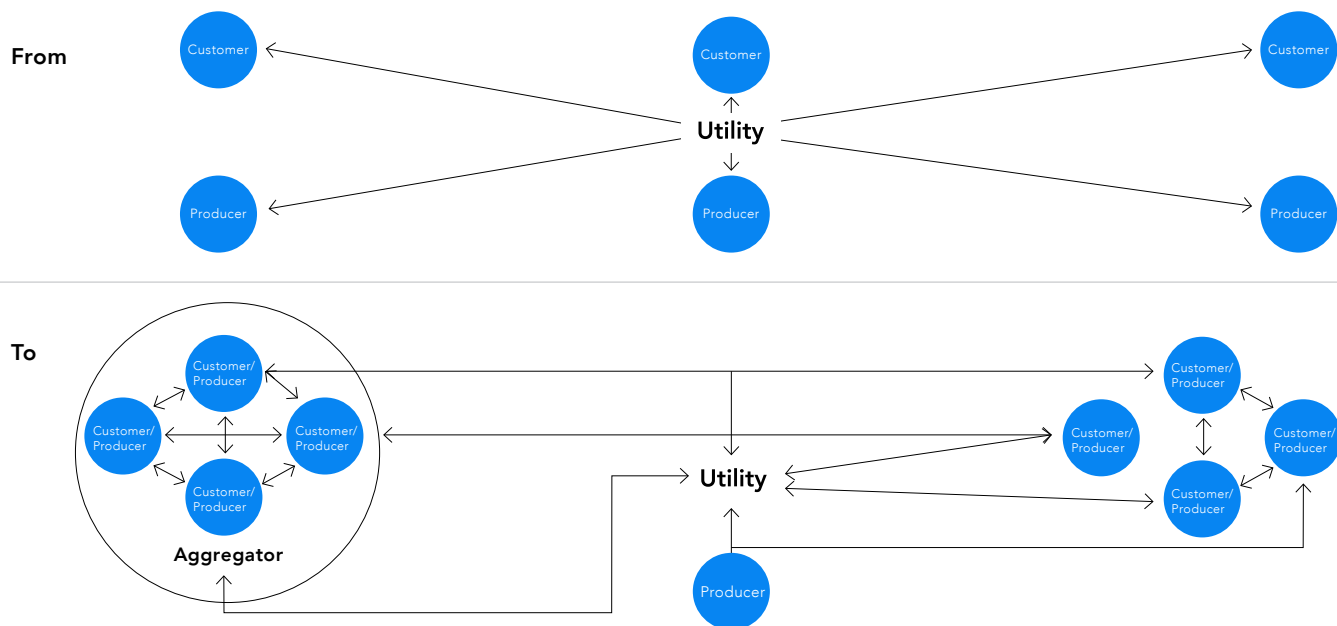
Even though electricity per se might not be a growth business, virtually every customer still buys at least some centrally generated electricity. More important, though, is that most customers still see the network as their lifeline. Even most solar and storage customers maintain their interconnections and take power from the grid when it's cheaper or when power from their systems is insufficient, and to provide a sink for their own excess generation. Therefore, what customers buy is the connection and the ability to transact with other parties. In fact, the more customers can do on this platform, the more valuable it becomes.

These connections will change as more distributed energy resources are installed. What begins as a hub-and-spoke architecture will evolve into a web.

Over time, Sam's network begins to look like a cluster of smaller networks all coordinated, balanced, and supported by the utility. Over the long run, as distributed technologies improve, it is possible that these smaller networks—community energy systems—could rely less and less on the utility grid.

<sup>2</sup>Our modern-day Ms. Insull got this idea from Clayton Christensen and Michael Raynor, *The Innovator's Solution: Creating and Sustaining Successful Growth* (Harvard Business School Press, 2003). The influence of Levitt is clear.

<sup>3</sup>We are assuming the business is an investor-owned utility. While municipal and cooperative utilities face many of the same broad challenges, their governance structures and the fact that most states do not regulate munis and coops, opens a different set of options for responding.



### Tier 2: Energy-as-a-Service (EaaS)

EaaS will provide some optionality if smaller, less grid-reliant networks become the norm, but also offers substantial midterm upside potential. Selling a service allows Sam to differentiate her product and to price it based on the value of the service to the customer.

It's clear that, even within service categories, product differentiation is possible and valuable. A customer can activate a light with the flip of a switch, a motion-detected step into a room, a voice command, a location sensor, or any number of other ways. And since the customer cares only about the lighting (and what it costs), Sam can mix and match electricity from the grid, the solar panel, and the battery with a myriad of lighting technologies and controls. As the costs of these various inputs change, or as parts and pieces become more sophisticated, she can change the input mix. Marketing energy-as-a-service will be key.

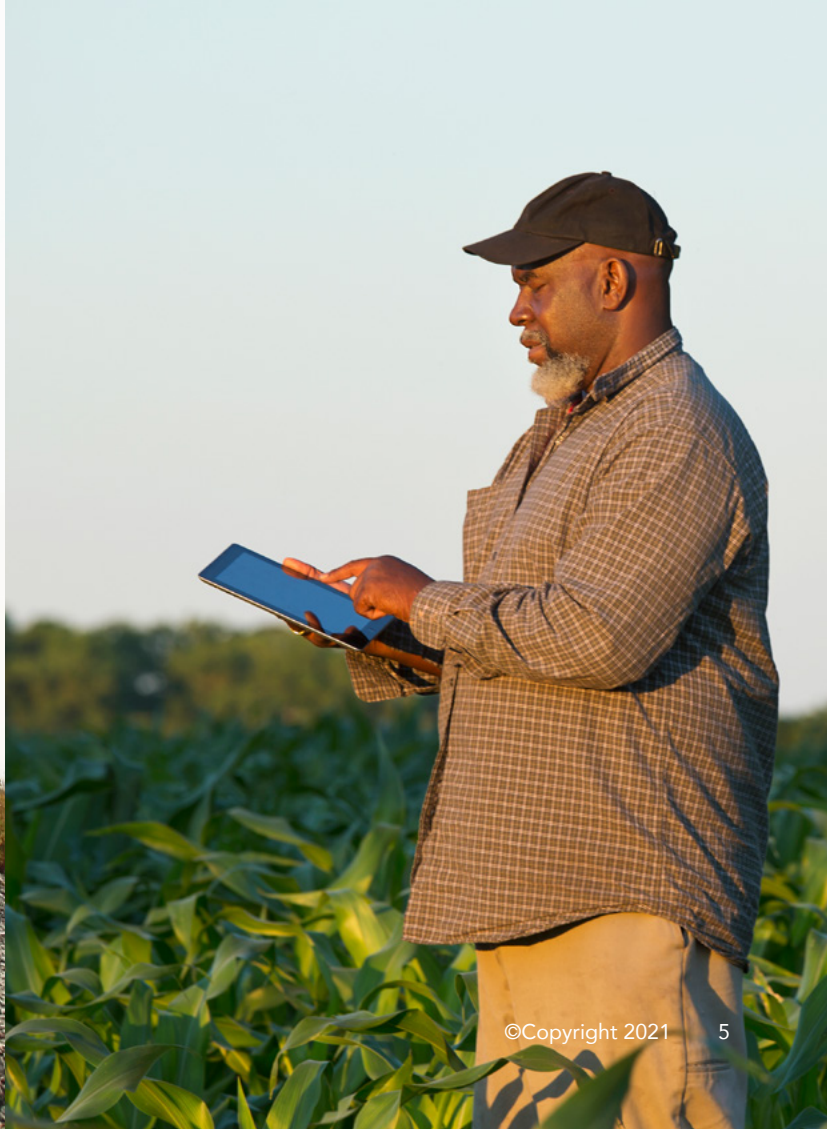
### Steps for the new utility to manage barriers to the two-tier model

Prior EaaS models have failed in part because the commodity risk-management piece was too hard to solve. Though not entirely without risk, the availability of inexpensive and unobtrusive control technology combined with lower electricity market price volatility and the ability to self-generate gives Sam a much more powerful arsenal of risk-management tools.

Given that Sam runs a utility, the obvious challenge to this new two-tier model is that utility regulation prevents

it from readily moving into either tier. The state views the utility as a monopoly that cannot be allowed to extend its economic power into a competitive services market. The state also sees the utility as being in the kWh business, rather than in the connection business. Near-term steps Sam can take to help make the new model a reality include:

- **Establish a competitive services affiliate.** This affiliate, whatever its legal construction, needs to operate very separately from the rest of the company. Services businesses are, in their most basic form, anti-utility. Their success lies in believing that their mission is to disrupt the utility business.
- **(Re)negotiate franchise agreements that enable community-based energy systems.** Today's utilities often see these agreements as necessary but contentious instruments used by municipalities to extract concessions. Sam recognizes that franchise agreements are also an opportunity to test ideas related to: (1) leveraging the network to support other local infrastructure; (2) enabling and coordinating community-based energy systems (like microgrids); and (3) delivering energy-as-a-service to municipal facilities. Most importantly, she sees the franchise agreement as the manifestation of the nature of a public service company, and, by working with a municipality to re-envision the terms of local service, she sees an opportunity to redefine the



meaning of such a company in terms more aligned with the 21<sup>st</sup> and 22<sup>nd</sup> centuries rather than 19<sup>th</sup> and 20<sup>th</sup>.<sup>4</sup>

- **Invite stakeholder and policymaker collaboration.**

Some amount of co-design by a range of stakeholders, including customers, is essential. A co-design process will lay the essential foundation without which progress will arrive more slowly and at greater cost. In the short run, collaboratives can focus on any number of compelling issues, such as clean energy investment, electrification, or non-wires alternatives. However, what Sam really needs to engage stakeholders on is distribution pricing. This model of a platform and energy service company will not work with a pricing structure based on electricity throughput, something that has little to no relationship with what her business provides.

### Make a decision on any existing owned generation assets

Sam's utility currently owns a mix of fossil and nuclear power with some wind. She doesn't want to hold large generating assets in the long run, since these are inflexible to changes in markets and grid architecture, making them financially risky, in addition to being environmentally problematic.

If Sam's utility is fully integrated, existing generation enjoys some protection through its inclusion in rate base. However, realizing that state policymaker attitudes can shift quickly, selling the assets might make more sense. And there are few, if any, synergies with a platform and energy services business. Sam decides to bet on her network and to spin off or sell her generation portfolio, strengthening her ability to pursue investments and acquisitions more aligned with her model.

Confident in that model, Sam turns her attention to her company's physical, digital, and human assets. These assets were acquired and developed for the original utility business model.

### Implement future-ready grid and grid management

While the utility has invested in some aspects of an intelligent grid, including smart meters, it has not invested in the sensing, supervisory, and control technologies required to support a highly transactional, bi-directional web.

One of the most strategic grid investment choices Sam must make relates to the management of distributed energy resources (DER). She needs to choose between managing DER directly or partnerships with third parties who will aggregate DER. The argument for direct management and control is compelling. The utility has an obligation to maintain the integrity of its system, and the uncoordinated operation of hundreds of thousands of distributed resources could imperil that stability under plausible conditions.

The alternative is to forge partnerships with third parties who market DER to customers and aggregate the installed capacity. The purpose of the aggregation is to be able to sell energy, capacity, or ancillary service to the utility or into the wholesale market.

Will she invest in a DER management platform to control every endpoint, or to connect aggregators' systems? The choice depends as much, or more, on vision and commitment to a still-forming business model than on dollars and facts on the ground.

When the objective is to maximize transactional volume, it should not matter whether one's partners sell energy-consuming or energy-producing machines. Sam ultimately invests in a Distributed Energy Resource Management System (DERMS) designed to manage connections with aggregators—to become an aggregator of aggregators—rather than the controller of every end point.

### Build future-ready customer systems

The utility's customer systems are still rooted in a meter-to-cash culture that has characterized most utilities for decades.

<sup>4</sup>Using franchise agreements to explore alternative models is an incomplete solution given that Sam's entire territory includes a variety of unincorporated areas that do not have franchise agreements. This approach does, however, provide an opportunity to test ideas that can then be explored more broadly if they are successful.

Sam knows that the utility's success depends on greatly increasing its transactional flow. She wants customers to use the utility's platform to transact. It needs to create more options for transactions by broadening service offerings and that requires systems that facilitate and clear transactions of many types.

Sam's first act is to update the utility's core billing, payment, and customer relationship systems. Out of the thousands of system requirements, the bottom line is that the nature of transactions (some of which can't even be contemplated today) should determine the billing and accounting approach, rather than vice versa. At a minimum, this system has to be able to easily manage payments from, to, and between customers for commodities and services.

Second, Sam knows she needs to rethink and rebuild her customer-facing user interface. Sam aspires to turn the company's website into an energy services hub—one that invites customers to learn about and engage in a wide variety of transactions, from acquiring energy efficiency and demand-management devices, rooftop solar and battery storage, and electric vehicles, to enrolling in various pricing and energy services programs.

Consistent with her view on how the DER market will evolve, Sam does not envision her utility as selling these products and services. Instead, she views her digital platform as a place to connect customers with those from whom they can acquire these products and services, and then to connect those products and services easily to the grid.

This greatly increased focus on digital customer assets combined with required investments in sensing, controls, and grid management makes clear that information technology (and associated skill sets) is becoming as central to Sam's business as physical infrastructure, with broad implications for talent acquisition and development, corporate organization, and culture.

Finally, Sam understands that none of this is possible unless her utility, by working with its stakeholders, finds a more effective and sustainable way to address affordability. Almost one-third of her customers are

economically challenged, and there is no path to a better and more sustainable business model that does not confront their ability to afford essential energy services.

As with issues of pricing and a shift into services (and away from kWh), addressing affordability effectively requires deep collaboration with policymakers and stakeholders.

### Co-create a future-ready regulatory model

The investment needs are substantial, but this is still a regulated utility and it needs permission to recover investment and operating costs. Sam appreciates that she will not win permission to invest billions of dollars in system improvements under the current model, unless she can demonstrate the value she creates with her investments and expenditures is equal to or greater than the cost to customers. Rather than waiting for a major rate case defeat, Sam decides to propose a regulatory model reform with the following elements:

- A set of performance metrics tied to the rate of return on rate base so that, as the utility's performance rises or falls against the metrics, shareholders will feel the impact.
- A transparent capital planning process. Transparency with respect to utility investment plans can build confidence in utility decision-making, which can ease the actual cost recovery challenge. Sam sees this as an opportunity to explain the utility's thinking and to benefit from stakeholders' input in a less adversarial proceeding than a rate case.
- A clear definition of utility service. What Sam's utility does (or what she believes it should do) is quite different than what a utility did (and how regulators defined utility service). Sam argues for the definition of utility service to include giving consumers and producers the ability to distribute and take delivery of electricity essential to consumption of energy services, including activities required to ensure the safety, security, reliability, affordability, and environmental quality of that service.

### Embrace the 'public' in public service company

Sam's utility business has, as its purpose, the creation

of customer value that exceeds the cost to create and deliver it. That ambition aligns it with most successful companies. What sets it apart is that it operates in the interests not just of its private customers and owners, but also of the wider public. The utility provides an essential service for public safety and welfare.

A vibrant service territory provides not only a platform for utility financial success, but also a pool of qualified employees and suppliers and an engaged set of stakeholders. An unhealthy community means customers struggle to pay bills, growth disappears, civic institutions decay, the labor pool stagnates, and worker safety becomes a concern.

Beyond the value of the utility network, the role of the new public service company extends in several directions. As one of the largest local employers, Sam recognizes the opportunity and obligation to help develop a strong workforce through a job-training program focused on systemically under-employed community members. She asks her supplier/contractor network to join the initiative. She invests in next-generation workers through supporting STEM programs. She revamps her supply chain to focus more on local sourcing from disadvantaged businesses.

None of these actions is purely altruistic. Being a major contributor to community health is a prerequisite to local stakeholder support for the investments Sam will need to make. Community building is an essential part of adding value.

## From story to strategy: Recognize truths, assess what they mean, act deliberately

In sum, the story of Sam building her business into a 22<sup>nd</sup> century utility can be distilled into three parts.

### 1. She recognizes the four fundamental truths about this business

1. Technology is leading the energy services industry toward a more distributed future.
2. As a result, consumers have more control, whether or not they choose to exercise it, and more choice, which they demand.
3. Customers largely want a specific end—jobs done

and service provided—and utilities provide the means—electricity. Lots of others in the market want to help customers use less of what they sell and even they offer large energy efficiency programs.

4. Sam's new utility is expected to be part of a climate solution.

### 2. She recognizes what the four truths mean about the future

Understanding the above truths offers all Sam really needs to and can know. The energy services business will become more distributed, decentralized, democratic, and clean. Sam knows that it needs to be affordable and just. Her current business is misaligned with this future. She chooses to set her company on a course to be the platform on which these new distributed energy services will be built and to, ultimately, be a company that thrives as an energy services solution provider.

Changing the model to meet a changing world carries very apparent risks—there is no way to know how and when technology will alter the world in a way that requires a fundamental business model change. Getting it wrong could involve major mis-investment and the risk of disallowance. There is always the fear that a radical shift could impair reliability or customer service, and no executive wants to cede control or territory to would-be competitors.

### 3. She rebuilds the business to serve her vision

The architecture and construction of the grid needs to be rethought as a web, with huge implications for investment. Sam needs to reinvent the customer side of the business with new systems and a different culture. And she needs to bring about a very different regulatory model while she secures cost recovery for the investment in the new business.

Accepting the four basic truths about the business doesn't inexorably lead through the three parts of Sam's journey. It does make strategy a deliberate process. It becomes about what she can and will do to shape her environment to enable success. Being deliberate does not guarantee success. However, a successful strategy is a deliberate effort to build the





company or industry or future that we want given what is real or true about the world. And it is the future that Sam is intentionally trying to build that conveys value to her investments.

A deliberate plan requires deliberate investment, which may not show returns for years, if ever, and which will be characterized by a range of risks.

That said, the vast majority of a utility's investment is to ensure that its facilities and systems can meet current expectations under current or near-term expected conditions. Sam needs a different approach.

The utility still needs to prioritize investment in plant and equipment that is at risk of failing. But that investment should be subject to the additional criterion of whether it would make sense if conditions changed. Beyond replacing high-risk equipment, every other investment should be subject to a stronger "what if" analysis. Would the utility still invest in the same substation if the area it served became part of a microgrid-supported community energy system?

The investment planning process certainly becomes more complicated, but this is the type of investment problem many businesses face and sound tools are available to help structure the decisions. Sam's success or failure rests on how this process is managed, because the way the utility invests its money is how it builds its future.

It actually doesn't matter if the day of reckoning is five or 25 years from now; a company that is not deliberate in its approach to changing to meet its world will succeed only by chance. All of the other changes Sam wants to make flow into or from the capital allocation process. As she works to convince stakeholders that she is building a new utility that will better serve its public service company purpose, this is the curtain that she will need to open.

## What is your story?

There are real Sams out there thinking about how to remake their utilities to thrive as a vibrant business into the 22<sup>nd</sup> century, and it is highly likely the makeover differs from the one described in this scenario. A complicated process has been made to look like a straightforward series of executable steps and, by doing so, has maybe made the story seem naive.

Transformation is risky. But the risks of not rewriting the narrative are also high.

The financial community sees the same set of truths reshaping the industry's environment that Sam does. A leader staying the course will signal that there is no real plan for future growth; that the leader is banking on policymakers to hold back the combined pressures of technology, customers, and climate so that the company can adjust incrementally.

History is rich with examples of industries that fell under technology and consumer pressure while believing that regulation meant protection. The electric utility world is changing in some very clear ways, and if a leader does not act to align with the change, they will only achieve their aims by chance. Don't leave the future of the utility you lead, regulate, or rely on to chance. Explore how to put into place the elements of the new utility:

- Recommit to the utility as a public service company.
- Re-engineer the business model by offering platform services to maximize transactions and creating an affiliate to offer energy as a service.
- Plan and implement a new architecture for the grid and for customer transactions.
- Create a sustainable approach to affordability.
- Engage policymakers and regulators with positive intent and the spirit of quid pro quo.

## About the author



### Val Jensen

Senior Fellow, Energy Utility Services

Val Jensen is a senior fellow within ICF's energy practice, focusing on important issues facing the utility industry.

Val brings over 40 years of energy industry experience, most recently as senior vice president for strategy and policy at Exelon Utilities. In this role, he led the development of the company's technology and business strategy, supported policy, and coordinated strategy development for Exelon's family of operating utilities. Previously, Val served as senior vice president for customer operations at Commonwealth Edison (ComEd), where he managed development and delivery of the utility's customer-facing products and services, including its \$250 million annual portfolio of demand response and energy efficiency programs.

Val returned to ICF in 2020. From 2001–2008, he served as an ICF senior vice president, where he helped grow ICF's Commercial Energy business and then later managed its San Francisco office. During this time, he specialized in the design and management of energy efficiency programs for numerous utilities including ComEd, WE Energies, Wisconsin Public Service, Nevada Power, Ameren, and PG&E.

Val previously served on the boards of the Chicago Lighthouse for the Blind, Energy Foundry, Alliance to Save Energy, and the Smart Grid Consumer Collaborative. He also served on the U.S. Department of Energy's Electricity Advisory Committee and was a founding board member of the Midwest Energy Efficiency Alliance.

Val holds a master's in public administration from the University of Minnesota and a bachelor's in political science and government from Hamline University.



**Val Jensen**  
val.jensen@icf.com

---

[icf.com/work/energy](https://icf.com/work/energy)

-  [twitter.com/ICF](https://twitter.com/ICF)
-  [linkedin.com/company/icf-international](https://linkedin.com/company/icf-international)
-  [facebook.com/ThisIsICF](https://facebook.com/ThisIsICF)
-  [#thisisicf](https://instagram.com/thisisicf)

---

### About ICF

ICF (NASDAQ:ICFI) is a global consulting and digital services company with over 7,000 full- and part-time employees, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future. Learn more at [icf.com](https://icf.com).