

 **2014** first annual report

THE STATE OF THE ELECTRIC UTILITY

Find out what **500+ electric utility professionals think about:**

Demand Growth
Distributed Generation
Power Supply
Regulatory Models
Electric Vehicles
...and more



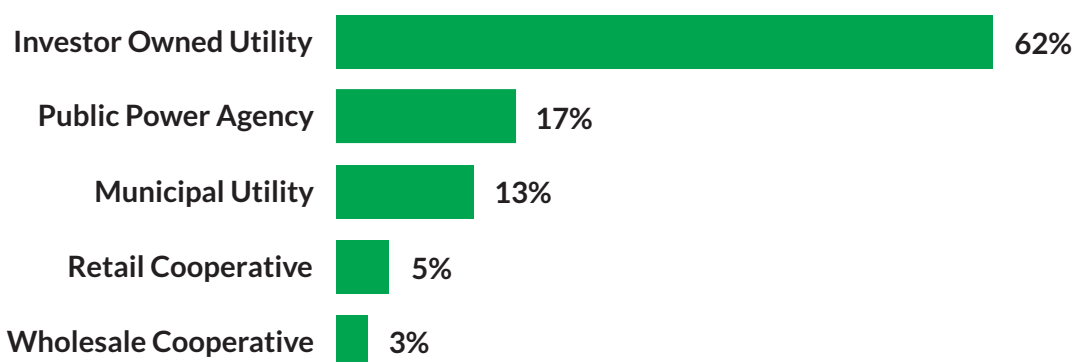
About the Survey

Electric utilities today are confronting disruptive challenges that may not only transform them, but the sector as a whole.

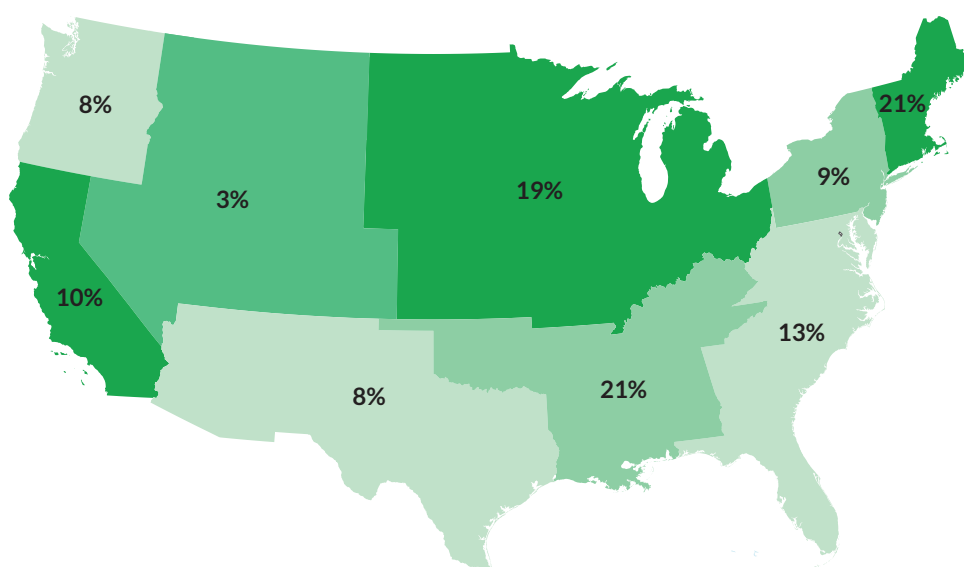
To better understand how utilities see themselves meeting these challenges, Siemens commissioned Utility Dive to survey 527 U.S. electric utility professionals on the state of the industry in 2014.

Because each electric utility and their service territory is different, we asked those surveyed to provide information on the type of utility they work for and the region they operate in.

Q. What type of utility do you work for?



Q. Where is your utility located?



Disruptive Challenges

Aging infrastructure emerged as the top challenge facing electric utilities in 2014, followed by the current regulatory model and the need to replace an aging workforce.

It's no surprise that utility professionals see these as some of the most important issues they're dealing with.

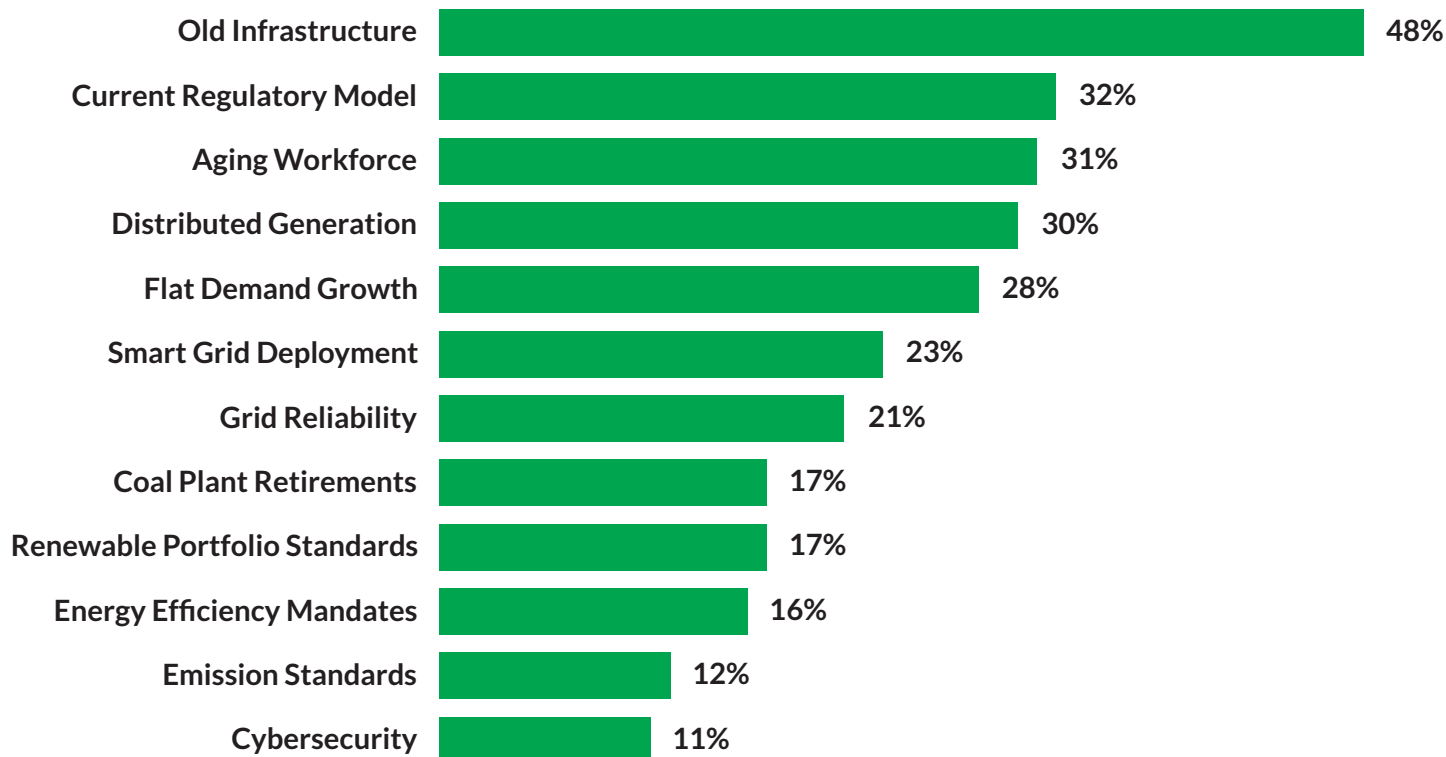
Basic infrastructure – power plants and power lines – and the work force that maintains them are central to the core mission of electric utilities: providing reliable power 24/7. The process of replacing and upgrading old substations, power lines and power plants and bringing in a new generation of employees provides utilities with a chance to remake the sector with new technology and savvy workers.

Utilities are also contending with slack demand growth and the rise of distributed generation, a threat to the centralized utility model. Both of these newer challenges feed into an even greater issue: the current regulatory model, which is by and large poorly designed for the evolving industry.

Surprisingly, utility professionals were least concerned about retiring coal-fired power plants, emissions standards, and renewable mandates. It could be that these challenges, while major, are related to power supply, an issue that has been at the core of utility service since utilities were first formed.

Electric utilities in 2014 appear to be very aware of the disruption they face, and it will be interesting to watch how they deal with these challenges in the years to come.

Q. What are the three most pressing challenges for your utility?



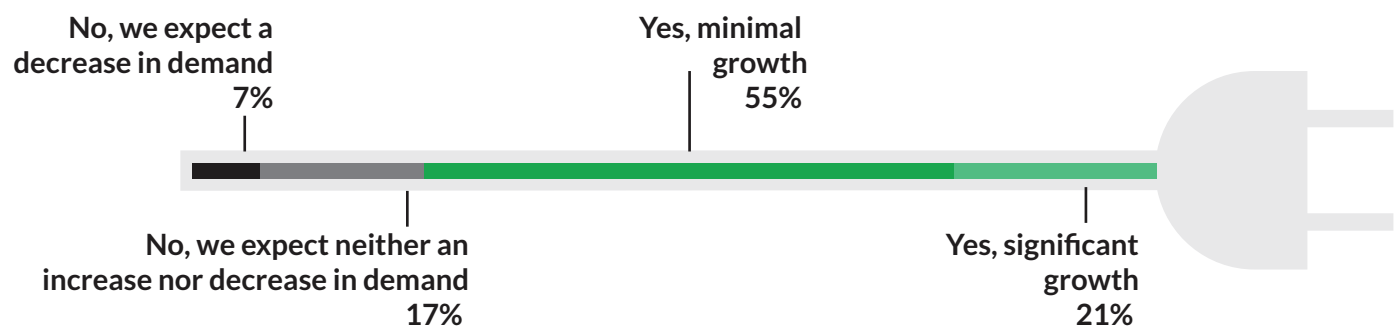
Demand Growth

The days of robust demand growth appear to be over. The vast majority of respondents said their utilities anticipate little to no demand growth in the next five years. Nearly one-quarter expected zero or declining load growth.

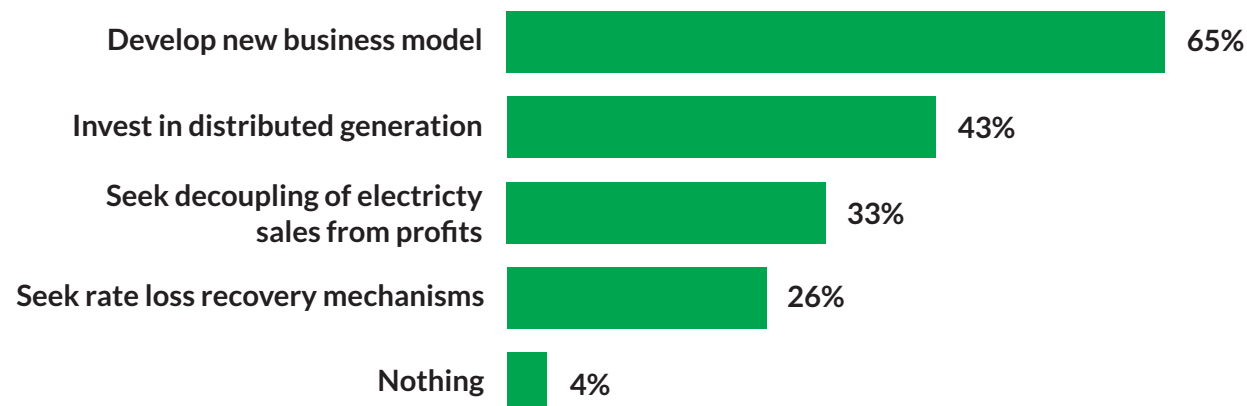
This is a big issue for a couple reasons. First, in the past, utility profits were partly tied to rising electric use. Second, growth meant utilities needed to build more power plants and power lines, increasing their ratebases.

With demand no longer growing at past rates, utilities are struggling to spread the cost of infrastructure investments among their customers. As rates rise, demand-side management and distributed generation become more attractive, further reducing demand. Lower sales could lead credit rating agencies to downgrade debt issued by utilities, thereby increasing utilities' cost of capital. This is optimistically referred to as the "utility death spiral."

Q. Does your utility expect electricity demand to grow over the next five years?



Q. Assuming low-to-no growth in electric sales in the coming years, what should your utility do?

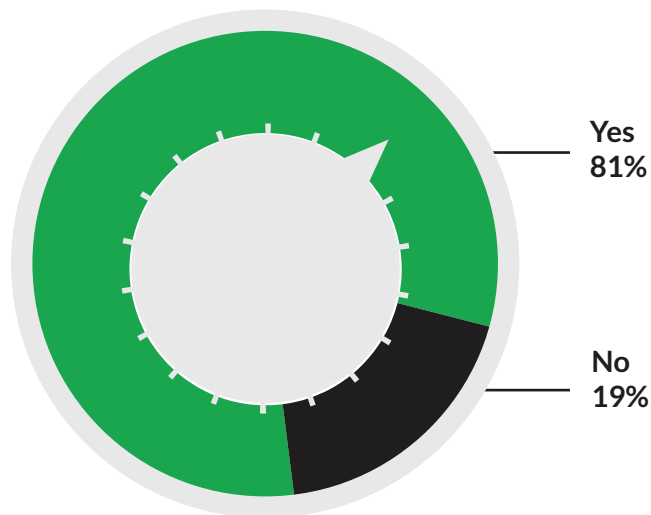


Demand Response and Energy Efficiency

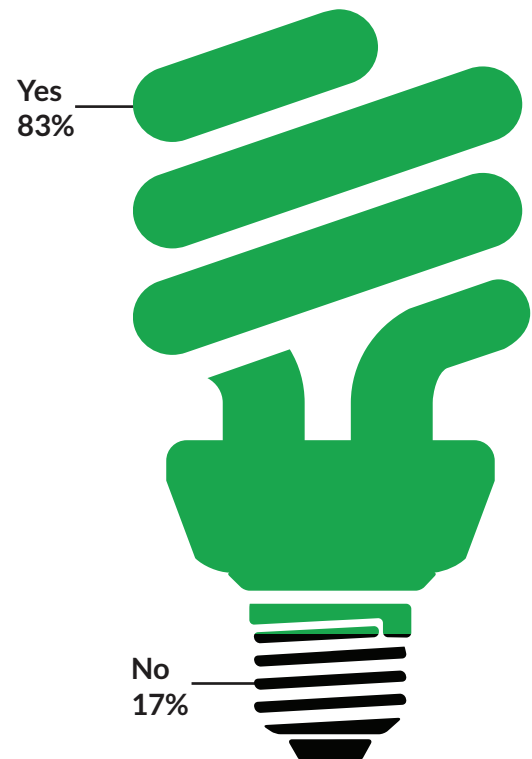
Utilities will continue to expand their energy efficiency and demand response programs, according to over 80% of respondents. This will put a damper on electric sales, but should also provide revenue streams from energy and capacity markets while increasing customer engagement and satisfaction.

State regulators are increasingly setting policies that allow utilities to earn a return on efficiency investments like they do for building power plants. This has set the stage for utilities to transition away from a kWh sales-based model.

Q. Is your utility planning to grow its demand response programs over the next five years?



Q. Is your utility planning to grow its energy efficiency programs over the next five years?

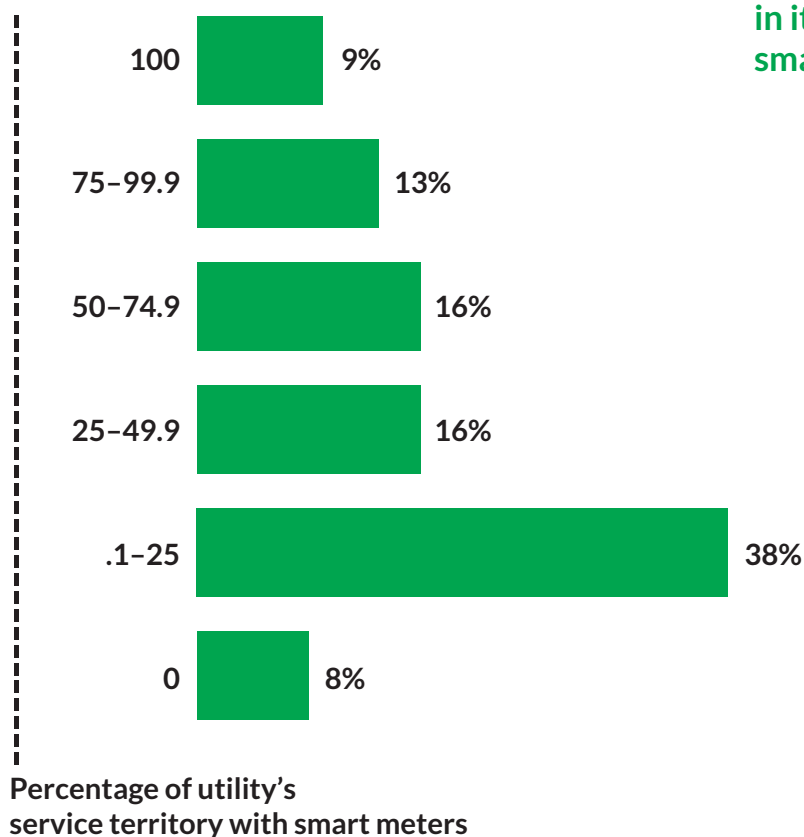


Smart Grid

The transition from yesterday's one-way grid to the decentralized, interconnected two-way system of tomorrow is well underway.

After the first few waves of deployment, smart meters have arrived in big swaths of utilities' service territories. Only 8% of respondents work for utilities without any smart meters, while almost 40% work for utilities that have smart meters in at least half their customers' buildings.

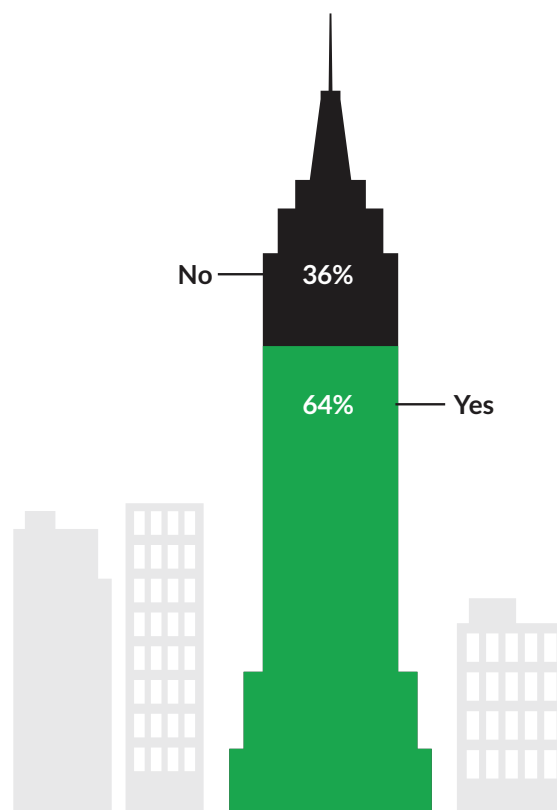
Q. What percentage of your utility's service territory has smart meters?



The smart grid can be leveraged to create new business opportunities and help build stronger relationships with customers. Some utilities are already using the technology as part of their efficiency and demand response programs.

Key to fulfilling the promise of the smart grid is working with cities and local government to pursue deployment. This represents an area of opportunity for utilities, especially where old infrastructure needs to be replaced. Building community support for smart grid technology can strengthen relationships with local officials and help make the case for new infrastructure to state public utility commissions.

Q. Is your utility working with major cities in its service territory to pursue and deploy smart grid infrastructure?



Dynamic Pricing

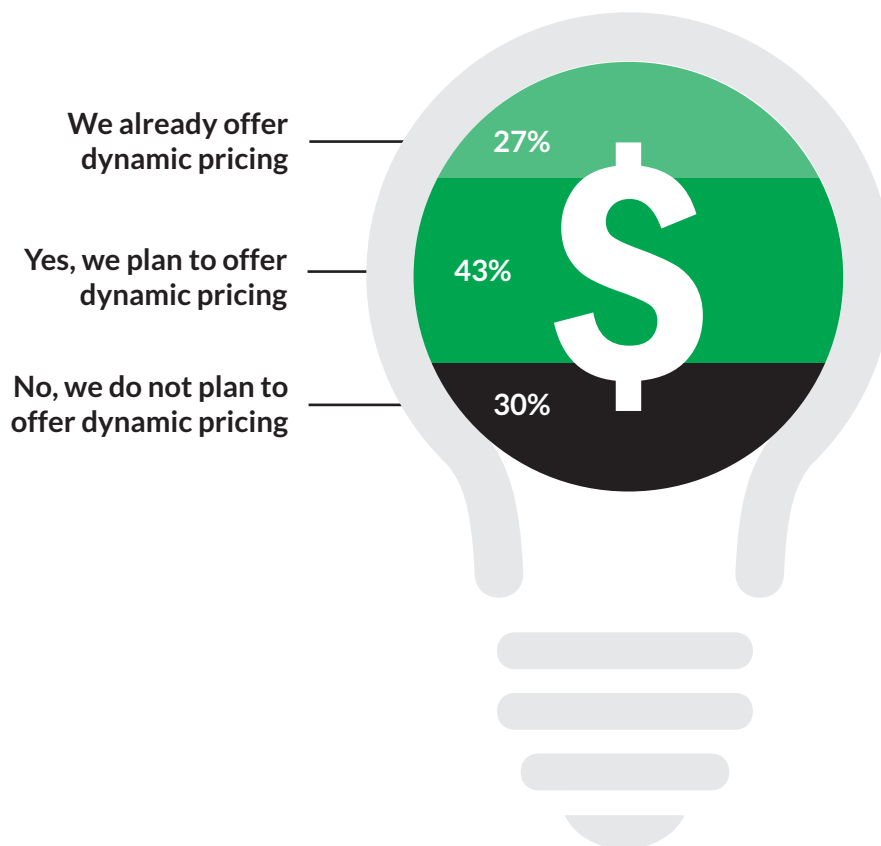
Despite an initial lack of implementation, dynamic pricing appears to be on the rise.

A big part of the promise of the smart grid is the idea of having electricity prices reflect the variable costs of supply. Dynamic pricing can also be used to manage peak load through the practice of cutting prices or offering rebates to spur customers to cut their energy use.

Typically, the only time customers think about their utility is when their bills are too high or their power goes out. For dynamic pricing to work, utilities need to actively engage their customers.

But with 70% of respondents saying they work for utilities that offer or plan to offer dynamic pricing in the next five years, this signals a major change in the relationship between utilities and their customers.

Q. Does your utility plan to offer dynamic pricing options – even on a limited basis – to customers within the next five years?



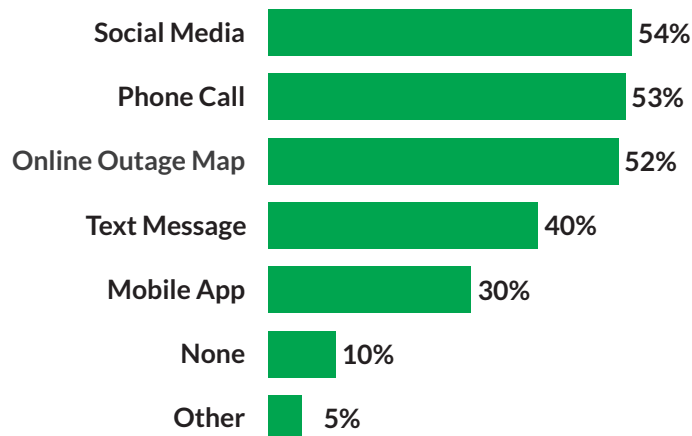
The Customer Relationship

Nothing gets the customer's attention like losing power. As quickly as a tree limb can fall, customers start thinking about electricity and all the things it helps them do.

Increasingly, utilities are using social media and the Internet to communicate with their customers about power outages. But with only about half the respondents working for utilities using social media and online outage maps, there is plenty of room to expand customer contact around even just the critical issue of power outages.

Strengthening these relationships could increase the chance that customers will be more open to participating in utility and demand response programs, and the utility could well be seen as a more reliable brand in an increasingly competitive marketplace.

Q. How does your utility communicate with customers during outages? Check all that apply.



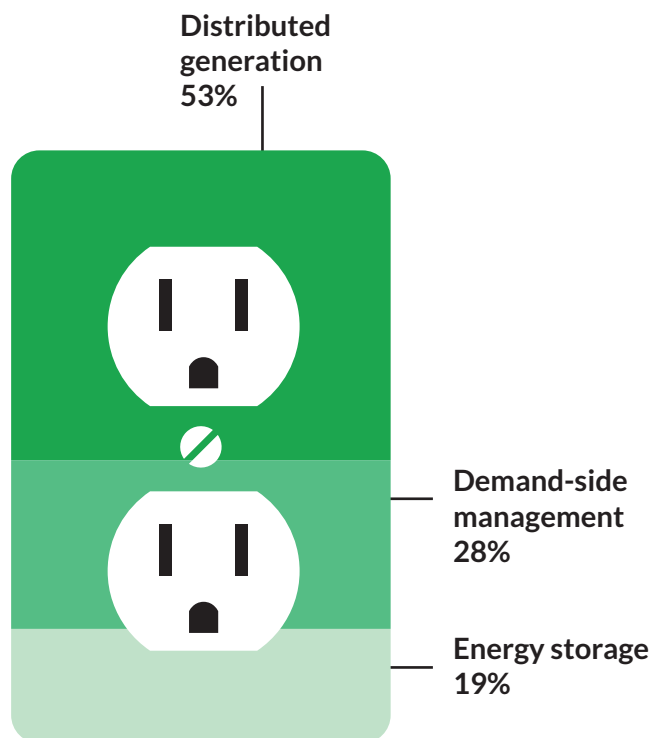
Distributed Generation

In the last few years, the price of installing solar panels has plunged. With net metering and innovative financing, homeowners and businesses are putting solar panels on their rooftops in record numbers. In particular, states with high retail rates are fertile ground for solar.

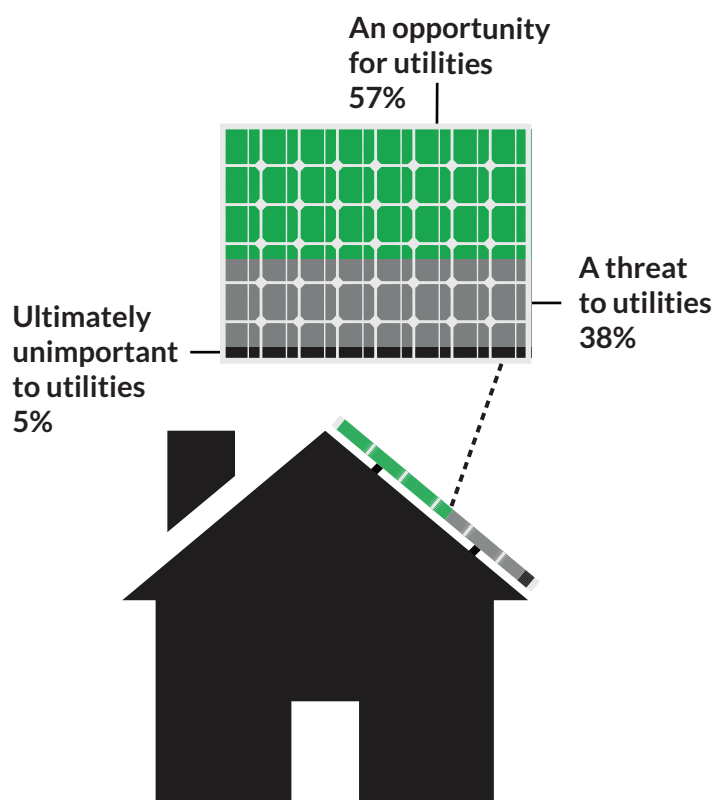
Not surprisingly, a majority of utility professionals think distributed generation is the biggest disruptive threat to the traditional utility model. But when asked if distributed is a threat or an opportunity, most responded they believe it is an opportunity.

In fact, a significant majority – 67% – believe utilities should take a direct role in supplying distributed generation to their customers, either through owning and leasing distributed assets or by partnering with established distributed generation companies. This would open up a new avenue of utility revenue.

Q. What technology provides the most disruptive potential to your utility's business model?



Q. How do you view distributed generation?



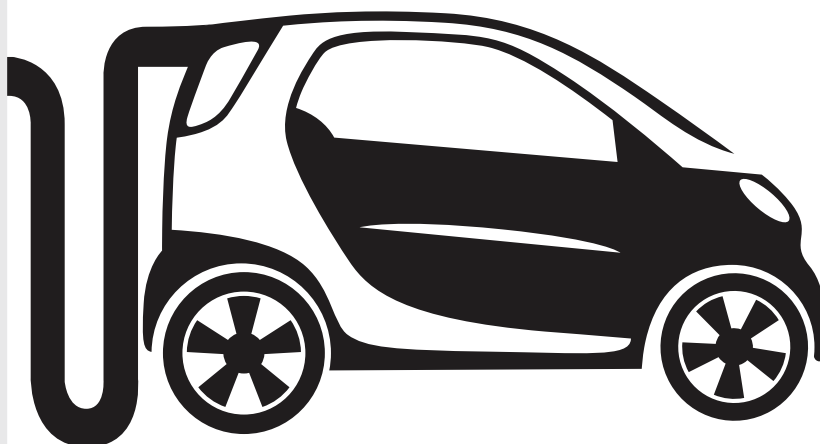
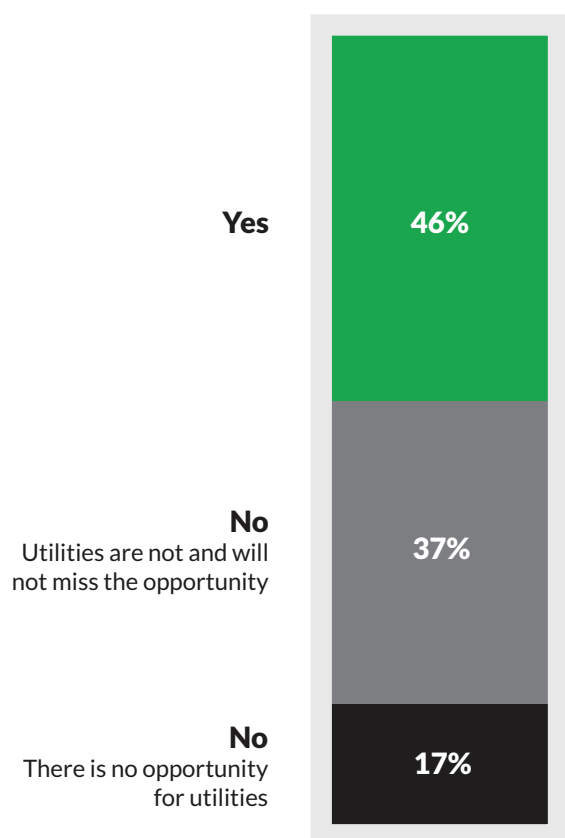
Electric Vehicles

Distributed generation isn't the only avenue for utility growth. The electrification of transportation could provide a new source of electric demand, while deploying charging stations for electric vehicles would also allow utilities to earn a return. Charging stations will be built near offices, in parking lots, and along highways.

Growth in the number of electric vehicles on the road has been slow so far, but they are crucial to any federal or state plan to cut greenhouse gas emissions from the transportation sector. Electric vehicles will get better,

batteries will improve, prices will fall and, ultimately, we should see increased adoption. Supporting electric vehicles is a perfect growth opportunity for an industry looking to expand.

Q. Are utilities missing an opportunity to deploy public charging stations for electric vehicles?

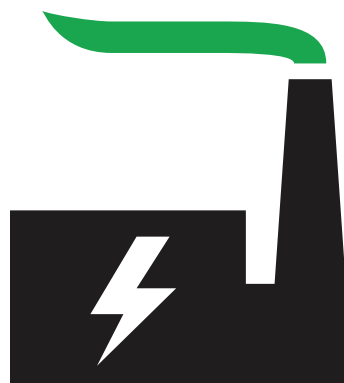


Power Supply

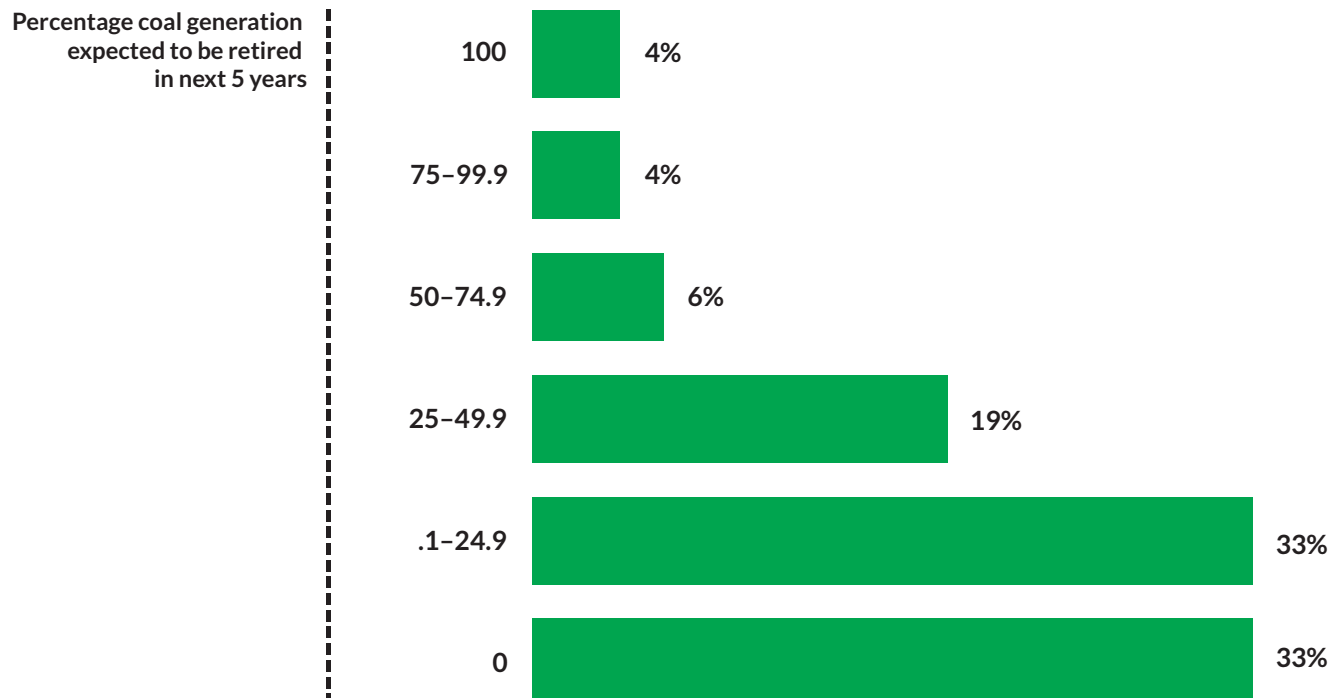
Nearly every power plant running today could be retired by 2050. That represents a massive challenge for electric utilities going forward.

Smaller, older, and more inefficient power plants face imminent retirement while coal-fired generation in particular is taking a big hit due to emissions standards.

As the U.S. moves to a cleaner and more sustainable energy economy, look for regulators to incentivize utilities to accelerate the transition.



Q. How much coal generation does your utility plan to retire in the next five years as a percentage of its portfolio today?



Natural Gas

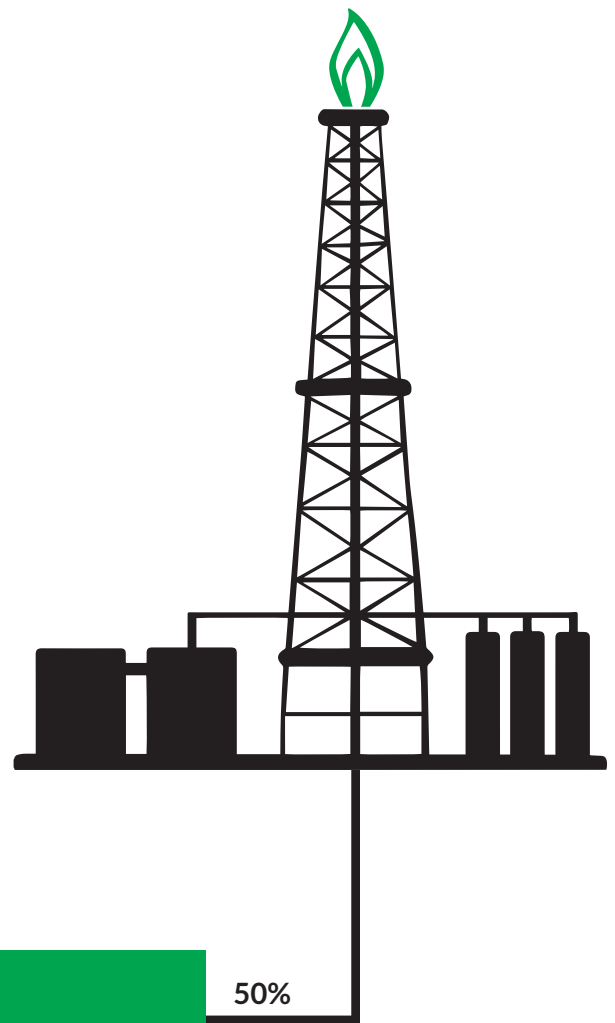
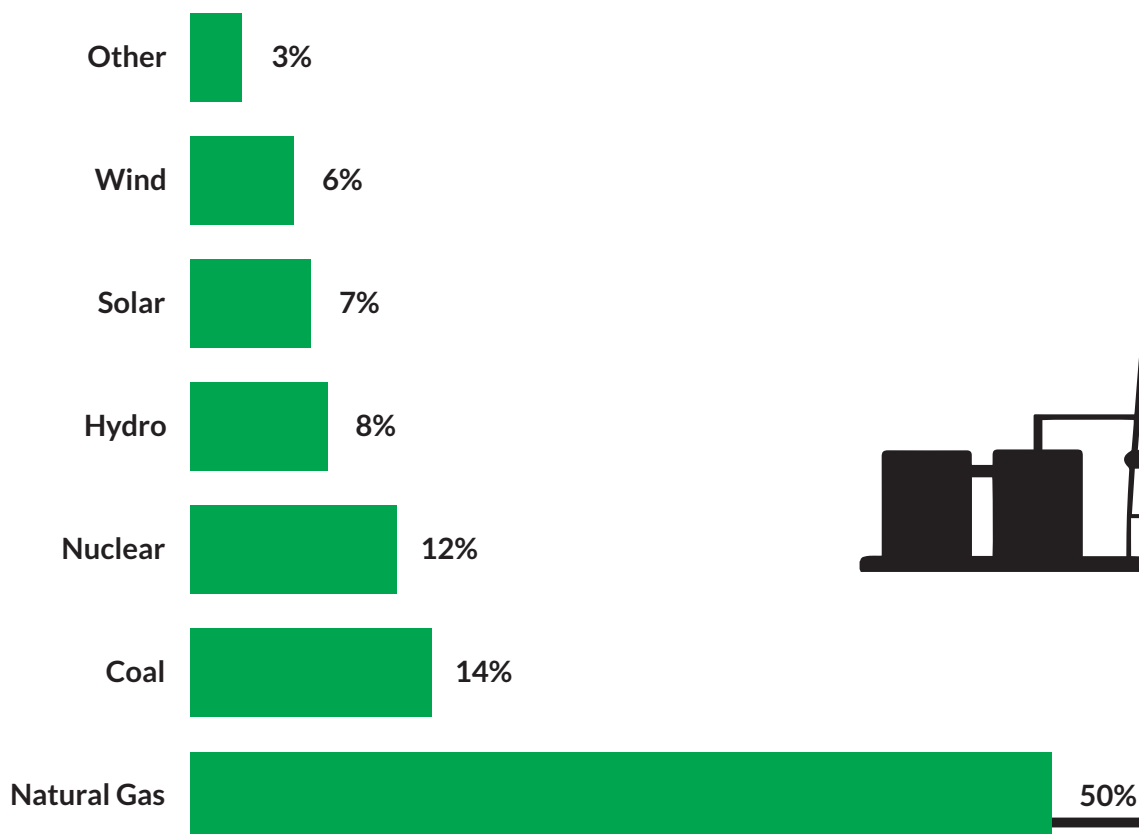
Natural gas is poised to be the dominant fuel for electric power generation in the years to come.

With abundant sources of natural gas in the U.S., prices are expected to remain relatively low. On top of this, natural gas plants produce about half the carbon emissions that coal-fired plants do.

Natural gas plants can also typically be ramped up or down quickly to match the output from intermittent renewables like wind and solar, further adding to their value.

Utilities could, however, become over-reliant on natural gas, making themselves vulnerable to unexpected price spikes or supply disruptions.

Q. What do you think your utility's primary generation fuel will be in 20 years?



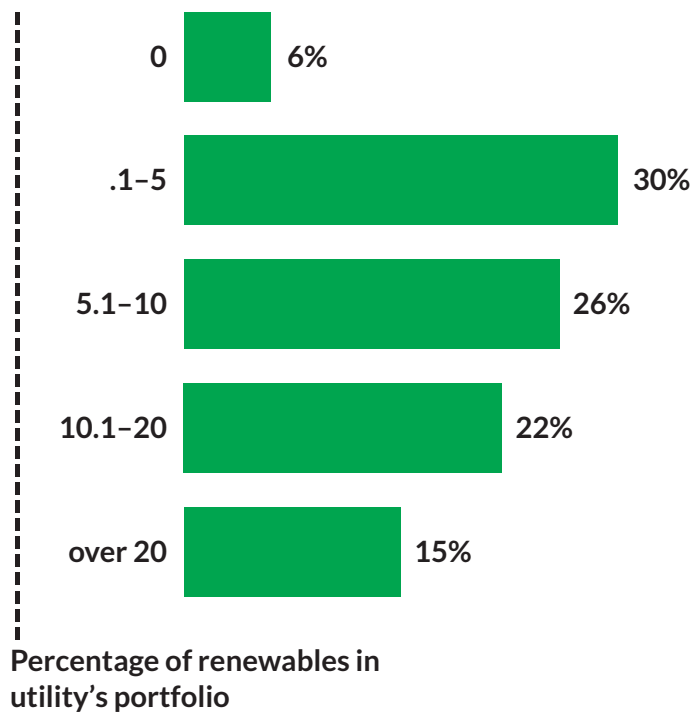
Renewable Energy

Renewable energy is a growing part of the electricity generation mix. This trend will only become more prominent as coal-fired power plants retire.

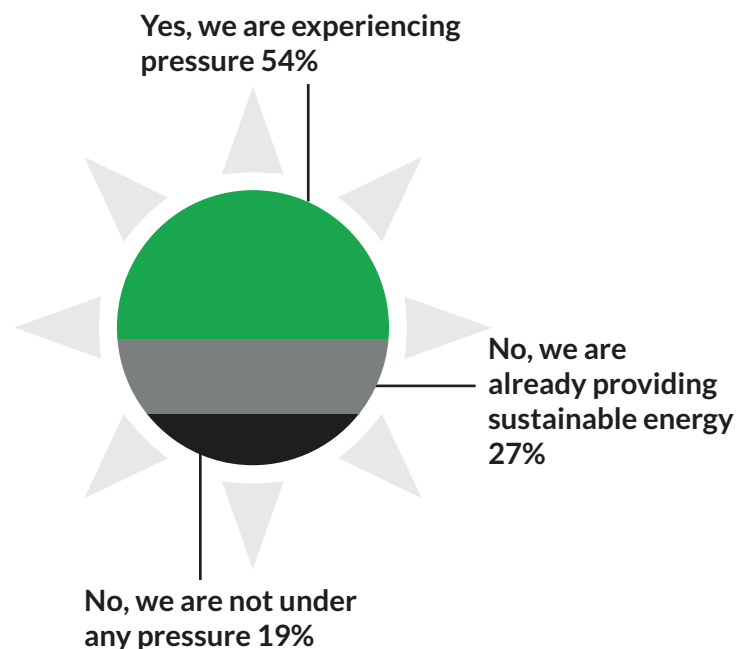
Nearly all utilities include some renewables in their fuel mix, but stakeholders are pressing utilities to provide more clean energy, while regulators and policymakers continue to set and raise renewable portfolio standards.

For utilities that own their own power plants, building new renewable plants can be a profitable revenue stream. But no matter how they procure their renewables, utilities can offer green pricing programs to meet growing demand for sustainable energy from their residential and business customers.

Q. Renewables currently make up what percentage of your utility's generation portfolio?



Q. Is your utility under pressure from stakeholders to provide them with clean and sustainable energy?



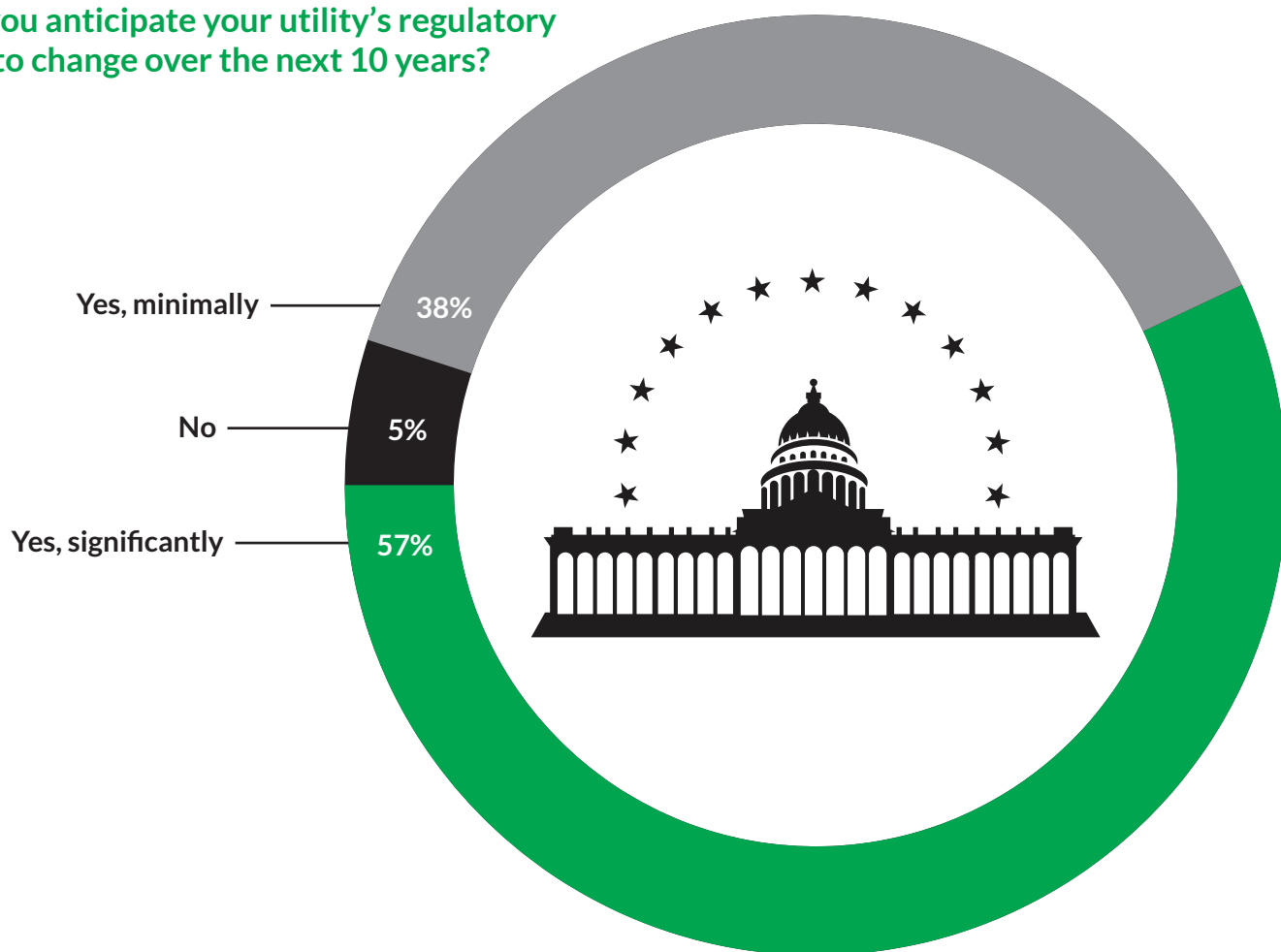
New Regulatory Models

With the sector in a state of flux, utility business and regulatory models are expected to change.

New business models will require support from regulators, who can steer utility investments by offering incentives. Conversely, a lack of incentives can deter utilities from investing.

Each state will adopt regulatory tools that make sense for their needs. Public utility commissions are likely to adopt incentives that steer utilities down preferred policy paths.

Q. Do you anticipate your utility's regulatory model to change over the next 10 years?



Looking Ahead

In 2014, U.S. electric utilities face an uncertain future.

Coal power is being phased out. Electric sales growth is largely stagnant. An aging workforce is retiring. Old infrastructure is giving way to new.

Despite these significant challenges, new opportunities are materializing.

Natural gas, energy efficiency and renewables are supplanting older and less clean resources. Information technology is turning yesterday's one-way grid into the two-way, interconnected grid of tomorrow. Solar panels are being installed on rooftops, electric vehicles are hitting the road, and the Holy Grail of the sector — cost-effective energy storage — is on the horizon.

New regulatory and business models are needed to meet challenges and capitalize on new opportunities. As the grid of the future takes shape, a new utility must emerge as well. When one door closes, another opens.

