Two Utility CEOs on Their Transformation Priorities

Conversations with San Diego Gas & Electric CEO Caroline Winn
and Xcel Energy CEO Bob Frenzel,
with PUF's Steve Mitnick
(also sitting in, Guidehouse's Chris Rogers)

Decarbonization is the talk of every town. San Diego Gas & Electric and Xcel Energy are two major utilities that recently released studies providing important insights into how to achieve that cleaner energy future in their service territories, states, and regions.

Xcel Energy issued a ten-year capital forecast, the first time it provided that kind of visibility into needed investment for its electric energy transition across all business segments. San Diego Gas & Electric issued a first-of-a-kind study aimed at developing a roadmap to decarbonize its state and region, while ensuring grid reliability.

To find out more about these strategic issues, PUF's Steve Mitnick along with Guidehouse's Chris Rogers, sat down with the leaders behind these big ideas aimed at fighting climate change. San Diego Gas & Electric CEO Caroline Winn and Xcel Energy CEO Bob Frenzel have a lot to say about the future of clean energy. Listen in.

Caroline Winn

San Diego Gas & Electric CEO

PUF's Steve Mitnick: San Diego Gas & Electric did this study, The Path to Net Zero: A Decarbonization Roadmap for California. What were your main takeaways?

Caroline Winn: It was a year-long study intended to develop a roadmap that would decarbonize our state and region, while also ensuring reliability of the grid. Our study is first-of-a-kind, because all the other studies didn't take into account the reliability criteria we hold ourselves to.

This is an important piece of work for several reasons. One is that climate is our business strategy and something at SDG&E we've been addressing for years.

We have led the clean-energy charge in the region by being the first utility in California to get to forty percent RPS (Renewable Portfolio Standard), with all the work in our wildfire mitigation efforts, all the undergrounding. We have eleven microgrids that are either completed or in construction.

We have batteries. We'll be tripling the amount of battery capacity on our system in the next year, and electrification of vehicles, are just a few examples of our commitment. We have an aspirational goal of net-zero greenhouse gas by 2045 across all three scopes.

It was important that we involve third parties as we do this study. We partnered with Black & Veatch, which did all the modeling. We partnered with Boston Consulting Group, and we also partnered with a UC San Diego climate expert, David Victor.

At a high level, the optimal solution based on the technologies that we know today, based on our modeling, is a diversified approach centered on expedited electrification but paired with clean fuels and carbon removals. Think of green electrons paired with these green molecules.

There are probably four key takeaways. One is that the electrification of buildings, transportation, and vehicles is going to be critical for our state, and electricity consumption in the state could nearly double by 2045.

This paper has served as a good foundation to have these deep policy discussions necessary in the next three to five years, for us to have a chance of making it by 2045.

That's a big finding, which will require a significant expansion to the power grid to meet the emissions reduction target, but also maintain greater reliability.

Point number two is that clean fuels, such as green hydrogen, are needed for two reasons.

They're needed to decarbonize emissions from sources that maybe can't easily be electrified, like heavy-duty trucks and many industrial processes. Also, to complement solar, wind, and battery storage, enhancing the reliability of the grid. Green hydrogen can serve as a longer storage unit.

Finding number three is after we do all that, carbon removal is still necessary to achieve net zero by 2045.

The last finding is that the road ahead is going to require policy changes supported by regulatory and political support. We have to maintain affordability and enhance equity, and the way electricity is priced is going to be a headwind to all the electrification, and we need to reform the electricity rates in California from fully volumetric to cost-based.

In addition, we are seeking federal and state dollars to help offset the cost of this clean-energy transition. We're also going to need the regulators and policymakers to prioritize electric system reliability. We need to incorporate this into the state's long-term planning.

We need to create a regional transmission organization to ensure that Californians are saving money in this whole

clean-energy transition. We're also going to need it because the amount of solar, wind, and batteries is great.

My last point is in order to enable the deployment of this infrastructure, and it's not just infrastructure, but we need the right frameworks. We need to enable carbon capture and enable storage. We need to simplify the regulatory process to do so.

This paper has served as a good foundation to have these deep policy discussions necessary in the next, three to five years, for us to have a chance of making it by 2045.

Guidehouse's Chris Rogers: How do you reconcile balancing the urgent need for significant investments in climate adaptation and mitigation, and as you were talking about, keeping the cost of energy affordable for your demographic in your service territory? We all watch the news. Inflation didn't come down as much as expected. How do you balance those?

Caroline Winn: It's a huge priority, especially in our service territory. As leaders, we have a responsibility to balance the need for affordable bills with the imperatives to make strategic investments to tackle climate change, to comply with growing regulations, and maintain safety, and reliable and resilient operations. That's a delicate balance.

The climate is getting worse. We have to continue to invest and ensure the communities that we live in and serve are safe and our grid is resilient. Striking that balance is more difficult than ever before, because of the state of the economy, with inflation, the pandemic's lingering impacts, and volatility in global energy markets.

Everywhere you look, costs are going up, cost of gas at the pumps, natural gas as a commodity, the cost of supply chain, the cost of cable, transformers, energy storage, and parts. It's gone up everywhere. It has put a significant financial strain on our customers, our O&M, and capital programs.

Decarbonization is going to require unprecedented investments in the future, grid mod, and development of new clean fuels. It's not sustainable to put all these climate-related costs on our customers. We need to find other funding mechanisms.

We have legislation we're working on to have the California state surplus budget pay for some of these public purpose programs such as energy efficiency and low-income programs. We're working to try to get some of these federal dollars as it relates to electrification of transportation and hydrogen hubs.

A headwind is going to be electric rates. Because today in California, it's one-hundred-percent volumetric, which was developed decades ago, because we wanted conservation. We didn't want people to use electricity. Now we want people to use electricity.

It's not going to happen with high electric rates. There have to be incentives for customers to move to electrification. That's going to be a big piece of the work that still is needed to be done in all these policy discussions.

There's much work ahead, in addition to all the work we're doing to be more efficient as a company, to look for technology solutions. A great example is we're using a lot of artificial intelligence. Instead of having hundreds of people analyzing data, some of this artificial intelligence could do it much quicker.

Another example is we're trying to underground some of the riskiest overhead lines. Today, we send out hundreds of people in the field before a high-wind event to make sure there're no impediments. We don't have to do that for underground power lines. We don't have to trim those trees like on overhead lines.

There are all these ways to bring down costs. With all this electrification, there's going to be more usage on the grid and that's going to lower rates over time.

Steve Mitnick: How do you see the role of hydrogen in the energy transition?

Caroline Winn: There are going to be hours of the day the sun's not shining, the wind stops blowing, and there's not enough energy storage to serve California. That's why some type of clean fuel, such as green hydrogen, is going to be essential for the future reliability of the grid.

Our study, this path to net zero, estimates that by 2045, there will be a demand for six and a half million metric tons of hydrogen in California. Almost all of that, eighty percent, is going to be used to enhance electric grid reliability.

The grid is going to continue to incorporate more renewable energy, moving to sixty percent and then to a hundred percent. We have to develop new dispatchable, clean-generation resources that can be turned on in seconds, which can ramp quickly to fill those lulls in solar and wind production, especially if you have multiple solar drought days.

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We have two pilot projects going on now. Our Borrego Springs Green Hydrogen project started construction earlier this year and will leverage hydrogen for long-duration energy storage.

The storage is going to be tied in with an existing microgrid and will be all dispatched by California ISO. It will support grid reliability in this remote desert community called Borrego Springs.

The other pilot is at our Palomar Energy Center, one of two major power plants. We're installing an electrolyzer powered by these new onsite solar canopies to produce hydrogen onsite. We're going to blend that with natural gas as fuel for the generators.

We believe these experiments are going to play a role in decarbonizing natural gas. We're working with our sister company SoCalGas on this, and their studies show that up to twenty percent hydrogen blend can be used in home gas appliances. There's more research to be done.

We have another project we'll be announcing in June with a university on hydrogen blending. The biggest challenge is going to be proving the technology and ensuring the cost of producing this clean hydrogen is affordable on a large scale.

Chris Rogers: What do you see are the key needs from policymakers and regulators to facilitate and enable this energy transition over the coming years?

Caroline Winn: I talked about some of it before but what is imperative is that we need to maintain affordability and enhance equity. So, in addition to reforming how electricity is priced, we need to look at gas.

Gas usage on our system is expected to decrease by 2045 as more electrification happens. Those who can't afford to electrify their homes, are going to be paying enormous amounts of money for natural gas, so it's another opportunity for reform.

We can't leave low-income communities behind and we need to ensure our grid can accept electrification. We need to make sure we're providing incentives for low-income customers and neighborhoods to get into electric vehicles.

I believe there's a huge secondary EV market and we're working on rebates for low-income customers to adopt electric vehicles.

We also need to make sure state planners and our regulators prioritize system reliability and they need to do that by incorporating a longer-term planning window.

I believe a regional transmission organization in the west is going to give us more guaranteed access to some of these resources when we need it. It's going to bring down prices for Californians. It's going to be the most efficient way to do that.

Policymakers need to incentivize innovation and adaptability by encouraging research and development for these carbon-capture technologies. We need to find ways to fund hydrogen hubs and pipelines.

A headwind is going to be electric rates. In California, it's 100% volumetric, which was developed decades ago, because we wanted conservation. We didn't want people to use electricity. Now we want people to use electricity.

Policymakers also need to enable deployment of this infrastructure, by simplifying regulatory reviews, the way we get permits. It can't take five or ten years to site a transmission line. It can't if we're going to meet these timelines.

Steve Mitnick: What are the trends you see on transportation electrification, including big commercial fleets? You are way ahead of the rest of the country. How deep can transportation electrification get?

Caroline Winn: In California, the electrification of transportation accounts for over forty percent of GHG and in our region, it's over fifty percent. This is the single largest area we can make an impact in.

Over fourteen percent of new car sales are electric in California and all major OEMs are offering multiple EV models. In addition to light-duty EVs, I believe the next few years we're going to see significant movement and momentum in the medium- and heavy-duty fleets transitioning to zero-emission vehicles. We're already starting to see it with Amazon and the UPS vehicles.

Utilities have a role to play in planning and building the infrastructure that's needed to support the additional load coming from transportation electrification. We held our first EV fleet day last month and it attracted significant interest from EV manufacturers and fleet operators.

Recently, our local public transit agency set a goal to transition the entire bus fleet to zero-emission vehicles by 2040, and this same agency broke ground on a state-of-the-art overhead electric charging system at one of its operation depots.

At our local port and airport, some of these large commercial operations have also begun to incorporate electric drayage trucks, shuttles, forklifts, and some of the ground equipment into their fleets. We're getting one of the first electric tugboats.

Beyond environmental benefits, when you switch to clean vehicles, you can save on the fuel cost. We're seeing the price at the gas pump continue to go up. But it also simplifies maintenance and operations.

There's growing recognition that EVs can provide resiliency benefits with the bidirectional charging. We're doing this pilot with a San Diego company called Nuvve, where electric school buses are doing a vehicle-to-grid pilot. They're providing energy back into the grid.

The DOE recently launched Vehicle to Everything, the V2X initiative and we signed the MOU to be part of that.

Chris Rogers: Energy resilience and energy security have become more important than ever. As climate and geopolitical threats continue to create disruptions, what can utilities do to strengthen resiliency and ensure people are getting the electrons they need?

Caroline Winn: We've been very focused on building redundancy and flexibility into our energy systems, not just to support our operations, but also the operations of first responders and other essential service providers. We have an important role in serving electricity to many, besides creating it ourselves.

We recently installed a zero-emission, energy-storage microgrid at one of our main hubs. It's a regional aerial firefighting base. It's providing backup power for Cal Fire in the U.S. Forest Service. This is the main hub.

When a fire happens, all the aerial assets are dispatched and run out of this base. But they're right in the middle of a high-fire threat area, so there are times where we might have to do a public safety power shutoff.

It was important that this air base, which is central to any firefighting agency, is in that area to continue to have service. The growing risk of these catastrophic wildfires, coupled with record drought conditions, made this project a no-brainer.

We're also tackling reliability from the demand side, the customer side. We're implementing a virtual power plant.

The virtual plant is another experiment and is going to investigate how distributed energy resources such as smart thermostats, load controllers, battery energy storage, or some low-emissions generators can be aggregated and integrated to serve as a resource to balance supply and demand on a grid.

Those are a couple of diverse examples of what we're doing in the resiliency area. We're going to continue to do more experiments. Resiliency and security are top of mind.

Cybersecurity is another huge area. We're doing a lot with our employees in terms of, we have a company goal around email phishing rates. We're counting, we send out these simulated phishing attack emails, and seeing how many employees are clicking on it.

Bob Frenzel

Xcel Energy CEO

PUF's Steve Mitnick: How do you see the current state of the utilities industry and Xcel Energy's role in it?

Bob Frenzel: We are experiencing the most exciting time in this industry's history, with the exception of when Nikola Tesla and Thomas Edison started it all some one hundred twenty-five years ago. And we have a new Tesla that's helping generate even more excitement.

We're leading the clean-energy transition at Xcel Energy; we've been the leading provider of wind for fifteen years to our utility customers. We expect to continue that leadership.

It started with us being the first major electric provider to announce a one-hundred-percent carbon-free vision that we would achieve by 2050. We also set an aggressive interim target of an eighty-percent carbon reduction from 2005 levels by the end of the of decade.

Working on the electric energy transition is exhilarating for us as well as the industry. Then couple that with Xcel Energy's announcement last November on our natural gas distribution business.

We declared a goal to be net-zero emissions in our gas distribution business by 2050 and a twenty-five percent reduction in this decade. All that clean energy made us want to help other

industries reduce carbon-dioxide emissions in the states we serve.

We also set a goal to provide electric transportation for 1.5 million customers – twenty percent of our footprint – by the end of this decade. We'll be able to interface with our customers in a way we haven't had the chance to over the last five decades. It's a tremendously exciting time for Xcel Energy.

Steve Mitnick: Xcel Energy is in a number of states. A lot of your customers like to see this progress and these goals you've been executing on. That's part of your mission.

Bob Frenzel: We serve eight states, almost six million electric and gas customers. The most important part of our job is providing a positive, life-changing product to people.

Delivering energy reliably, affordably, and sustainably. Particularly as we see other pressures impact our customers' businesses, lives, and homes. The ability for us to be a stable and dependable company delivering this essential product is increasingly important.

Guidehouse's Chris Rogers: A lot more change is in front of us. With this great change, comes challenges and opportunities. What do you see are the greatest challenges facing the industry and specifically Xcel Energy over the three-year time horizon?

Bob Frenzel: Challenge and opportunity are the flip side, generally, of the same coin. This opportunity to invest, to change how we create, transmit, and deliver electricity and natural gas to our customers is a real opportunity for our industry.

I read a study that says, "Today, twenty-five percent of all our customer's end-use energy runs through an electric or gas utility. However, by mid-century that number could be seventy-five percent." Think about the growth prospects of customer energy use, being provided by a company like Xcel Energy, it's an exciting time.

But that enthusiasm means we have significant investments to make. We have new wind, solar, transmission, distribution, and information technology, to make sure we can deliver a clean, reliable, and affordable product. Also, a resilient product in the face of increasing climate change and the impacts from it.

So, while we've got infrastructure to build, we've got an essential product to deliver, and we do see growth in our business. We certainly have a current global supply chain challenge, which increases pressure on affordability from higher interest rates, and higher commodity prices.

Steve Mitnick: How do you prioritize? There are several strategic initiatives, as we're not only talking about resilience, but affordability and the need to attract enough capital to invest in the infrastructure for the transformation for reliability. How do you and your team balance that?

Bob Frenzel: It's critical that we don't lose sight of the end goal for Xcel Energy, which is cleaner energy, though the climate challenge is a real issue. We are focused on keeping the momentum of our clean-energy transition, whether that's on the electric side or the gas side of the business. Doing it reliably and affordably is paramount.

So, we prioritize excellence in operations, commercial acumen, supply chain effectiveness, the ability to think creatively, and to use new technology to drive outcomes and lower costs. That may be different than the business-as-usual way, but it's critically important as we continue to make our clean-energy transition.

I also think that communication is critically important, and it takes a couple of forms. First, is with our partners in the states and the local governments, as well as at the federal level, so they understand our priority is the clean-energy transition, but we are working on the challenge to achieve that outcome.

The other communications channel to consider is to signal to other industries that we rely on for technology advancements, to let them know there are markets developing for new products. We've demonstrated that this is critical in both wind and solar.

We've just received permission to build a $2 billion transmission project in Colorado to bring clean energy from the great energy resources in the eastern and southern plains of Colorado to the metroplex of Denver, Colorado Springs, and Pueblo.

Over the past decade, you've seen terrific technological advances and the price per unit has come down in both wind and solar. You're seeing that in energy storage, as well as with electric vehicles.

We need to continue sending signals to other industries so people will continue investing in research and development for new technologies. We can't, as an industry, achieve one-hundred-percent carbon reduction, without new technologies in generation.

I recently attended a Nuclear Energy Institute board meeting and think we need to send the signal to the Original Equipment Manufacturers or OEMs and people who are looking at our industry and say, "there's a real market here for your product, and we can help." It's true in nuclear, as well as other next generation technologies.

Steve Mitnick: Drill down a bit more on innovation within but also through partnerships and cross-industry.

Bob Frenzel: This industry has been innovative for its entire history. Think about the capturing of electricity and we've already talked about innovations from both Edison and Tesla.

More recently, think about the advancements we've made in wind and in solar, and customer-facing aspects like advanced grid initiatives. And we are currently installing the most advanced

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meters in our country. Each new meter has a microprocessor, and the ability to have grid-edge intelligence at the customer premise, which will enhance our ability to drive an improved customer experience home.

Technology behind the meter has greatly advanced. Our ability to drive a customer solution with better tech will only enhance the products and services available.

Chris Rogers: How optimistic are you about how the industry will perform over the next ten-year horizon through this change?

Bob Frenzel: I'm incredibly optimistic. Last year, we put out a ten-year capital forecast. It's the first time we'd ever seen that kind of visibility into an investment pipeline that's necessary for the groundbreaking transition that we are leading across all segments of our business.

We talked about energy supply, and having wind, solar, storage, and other forms of generation. We haven't talked about clean fuels, but the opportunity is there for renewable natural gas and different forms of hydrogen to lower costs of both our generation business and natural gas distribution business.

We see significant investments in transmission, where we've just received permission to build a two billion dollar transmission project in Colorado to bring clean energy from the great energy resources in the eastern and southern plains of Colorado to the metroplex of Denver, Colorado Springs, and Pueblo.

In the upper midwest, we're partnering with the Midwest Independent System Operator to build out its vision that considers different scenarios and allows for various futures for the region. We're going to be a big part of that.

On the distribution side, we talked about the excitement of Advanced Metering Infrastructure and customer-facing products. You also can't forget electric vehicles and what they are going to bring in terms of discreet and distributed storage assets all over our system, and the ability to optimize that for the benefit of our customers.

Every piece of our business has significant change happening simultaneously, and while that can be daunting, it's also incredibly exciting.

Steve Mitnick: What can state government policymakers, regulators, think-tanks, vendors, and so forth, do to keep momentum and the companies like Xcel going?

Bob Frenzel: There're two real opportunities here, though they come with a tone of caution. We have not experienced an investment profile like this as an industry – with a period of high-priced commodities, high inflation, and in a tighter supply chain.

A commonality of interest with our legislators and our regulators is really important. We need to make sure we work our way through some of the challenges that come with higher commodity prices and higher interest rates. That we work collaboratively to address these policies, as we're strategically aligned with our stakeholders.

We need to make sure that we don't let the day-to-day get in the way of the long-term vision. There's an opportunity and a cautionary tale here, which means working closely with our regulators and legislators to achieve common strategic goals.

The second area that is critical is around resource adequacy. We believe strongly that the energy transition needs to happen. However, that transition will slow down if it gets too expensive, and it will stop if reliability is not maintained.

Today wind, solar, and storage provide an enormous amount of opportunity to clean up the product that we deliver. However, we can't lose sight of the need for dispatchable generation resources to maintain reliability. Today, those sources are nuclear and gas.

We've committed to exiting coal completely. But as coal declines, we need to make sure we preserve the existing nuclear fleet and natural gas fleet.

We've committed to exiting coal completely. But as coal declines, we need to make sure we preserve the existing nuclear fleet. We also need to make sure that we're preserving the existing natural gas fleet.

But as we are looking for cleaner fuels for that gas generation fleet, it's essential we maintain reliability. We need to make sure our product remains reliable and affordable to our customers.

Reminding stakeholders that the industry and Xcel Energy, will move as fast as technology will let us, but we have to make sure we keep affordability and reliability in place as guardrails. PUF