

SoCal IOU CEO on the Energy Transition

Conversation with Southern California Edison CEO Steve Powell,
co-moderated by PUF's Steve Mitnick
and Guidehouse's Chris Rogers



The energy transition in California continues with eye-popping decarbonization targets and renewables going in at a rapid pace. But changes inevitably bring with it challenges and opportunities in abundance. The Golden State is watched closely by all in the energy and utilities industry as it deals with the complexities of moving forward amidst heat waves, wildfires, and high demand for energy. That's why Southern California Edison is fortunate to be led by CEO Steve Powell, an engineer with the management and operational experience that pays off in these challenging times.

To find out how the utility is grappling with many tough issues, an engaging conversation brought together Steve Powell with Public Utilities Fortnightly's Steve Mitnick and Guidehouse's Chris Rodgers. This is a discussion not to be missed.

PUF's Steve Mitnick: What can Southern California Edison be doing in the short-term to help avoid the crunch like what happened last summer? California came close on supply and demand.

Steve Powell: For the last three years, we've been working with agencies and electric companies throughout the state to figure out how to provide reliable electricity in large heat waves.

In 2020, we had a massive west-wide heat wave, and ended up with one afternoon of rotating outages in California. That made us work more closely together to accelerate different solutions.

We've been revamping customer demand-management programs and conservation. We've got more than a thousand megawatts of customer demand response at SCE.

We're layering in virtual power plant projects, leveraging customer's battery storage that's already been installed. Customer demand programs are one big piece that we have been doing, and we will continue to do more.

Energy storage is a huge part of the solution, especially in California, in terms of getting more capacity on in the relative near term. SCE has signed more than four thousand megawatts of energy storage projects.

There are more to sign over the next number of years, just like the other California utilities are doing. When the heat wave came in early September this year, we got close to the edge. What got us through were huge amounts of customer demand response programs, conservation on top of it, and the energy storage that's been built in the state over the last two years.

There were more than three thousand megawatts of energy storage producing during the peak period of that September heat wave.

We're focused on getting more energy storage, both under contract, as well as utility owned.

We're building five hundred thirty-seven megawatts of utility owned energy storage, at three substations across our service area.

The State has a big focus on keeping Diablo Canyon running, but we need to keep some of the gas plants running for now, while we bridge through this transition period, until we have enough additional capacity from storage and other solutions online.

We're also interested in how to broaden the energy markets. That's the energy imbalance market that already exists, and

Energy storage is a huge part of the solution, especially in California, in terms of getting more capacity on in the relative near term. SCE has signed more than 4,000 MW of energy storage projects.

the enhanced day-ahead market that everybody's working on with the California Independent System Operator.

Finally, part of the long-term solution is how to have a broader western RTO-type market? That will take more time, but it's important we get the right resource sharing. When we get into these crunches heading into each summer, we're out getting as much import resources

as we can, as well as resources inside the state.

PUF's Steve Mitnick: I don't know that the people and companies of California get enough kudos for that amazing response. It was maybe a historic demand response.

Steve Powell: What was amazing was we had flex alerts for nine or ten straight days, and customers continued to respond.

The state pulled new levers. The state sent out that emergency alert message on mobile devices on the toughest day, and a huge drop in demand came at that time.

A number of other programs came on, and with those programs plus the alert, we were able to see a two thousand megawatt dip in customer demand in less than a half hour. It's about collaboration across the various entities in California, to make it all work.

Guidehouse's Chris Rogers: The demand for the electrons has never been greater, and that curve is only going to get steeper. If the forecasts are directionally correct, and we believe they are, it's going to be substantial. How is that impacting the thinking, and the strategy of investment for you, and SoCal Edison?

Steve Powell: We align with and agree on many of the studies. They're all pointing to the fact that now, twenty to twenty-five percent of end-use energy is electricity and by the time you get to 2045, it's probably in the ballpark of fifty, sixty percent, maybe

greater. You're going to see a tripling of people's dependence on electricity in our lives.

That means a lot of things. It means you need more capacity and more resources to deliver all that energy.

In California, we're going to need at least eighty gigawatts of new renewables by 2045. We're going to need at least thirty gigawatts of energy storage. On the customer side, we need half the homes to have rooftop solar, and ten gigawatts of energy storage.

Three quarters of light duty vehicles, two thirds of medium duty, and a third of heavy duty will need to be electrified. We believe you'll have a sixty percent increase in total energy demand, and a forty percent increase in peak demand.

The grid has to enable all of it, and both deliver to customers and adapt to continued changes on the climate side. So, you're looking at investments for climate mitigation, as well as investments for climate adaptation. On the mitigation side, you've got to build transmission to connect all these additional renewables, and it depends on where those renewables will be.

The state's integrated resource plans are for offshore wind, out-of-state wind, in-state solar, and storage, all requiring certain sets of transmission. That transmission system's going to have to be more robust.

We did our Climate Adaptation Vulnerability Assessment, and sent that to the commission in May, as well as released a white paper. It points to some of the resiliency challenges the grid has to withstand.

We've seen the impact of wildfires and expect the average amount of land burned each year could increase by a quarter by the time you get to 2050. It's also the impact of wildfires going through transmission corridors.

You used to line up a few transmission lines in a single corridor, but we've seen that a big fire can take out that transmission. If that happens during a heat wave, there are struggles. Looking at additional redundancy in transmission will be important. That requires differences in our design standards and criteria.

The existence of a wildfire during a heat wave happened in July 2021, when we were in a moderate heat wave and had the Bootleg fire on the California/Oregon border. It went under transmission lines, and took out about four thousand megawatts of capacity, right when we needed it most.

That's more likely to happen in the future. It's that view of not just looking at how do you meet the customer demand for energy, but how do you build the resiliency into the grid, whether it's for wildfires, or extreme heat?

We expect by 2050, you're seven times more likely to hit your ninety-ninth percentile heat wave and temperatures. That means less capacity available, because transmission lines are going to be de-rated by ten percent to twenty percent.

Then, going down to the distribution layer, and needing to

serve more energy from all this electrification, but needing to serve it quickly. I've been talking about 2045 but come back to today. If you can't deliver for customer charging of new vehicles in the next couple of years, you're going to stunt the growth of that market.

We're focused on how to build in solutions in the distribution grid. In some cases, we'll need to build ahead of the customers. It's understanding where customers may show up and building the grid out where more concentrated load is needed to serve customers.

PUF's Steve Mitnick: How do you look at balancing the goals of decarbonization and affordability?

Steve Powell: There are a bunch of pieces around affordability. First is the work we've done looking at the cost of decarbonization and what it means for customers down the road.

Part of the long-term solution is how to have a broader western RTO-type market? That will take more time, but it's important we get the right resource sharing.

When we look at the analysis for 2045, if we manage the transition for decarbonization effectively, we believe that customers' all-in energy costs will come down. Looking at gasoline plus electricity plus natural gas, on average, the customers' energy costs would come down by about a third.

That's the carrot we're all working toward. The challenge becomes then the transition, because there is a

lot of investment required to get there, and some of the costs of these technologies haven't come all the way down.

Frankly, our customers have seen large rate increases over the last few years, which is common across California. The reality is you have to keep the electricity portion affordable so that customers can afford electrification.

How do you survive to get to that better place? There are a couple of pieces. You have to think about overall costs. It's the total costs on average for customers. There are usual efficiencies you can run in your business to bring costs down.

We also have to look at more integrated planning, so we don't plan for each of the pieces separately. When you plan for them separately, you're going to spend a lot more.

For the electric grid, if you're doing load growth over here, climate adaptation investments here, and electrification enablement and modernization there, it's a lot. If you are able to plan, optimize, and leverage investments for multiple objectives, you could bring the overall cost of those investments down.

I would also like to talk about relative affordability. It's not just about the average customer, it's about how we bring along

all customers, including those who can least afford it. We look at the total energy burden for customers. I mentioned the cost of electricity, gasoline, natural gas relative to income.

In California while our electric rates are high, our average energy burden for SCE customers is not too different than across most of the states. But, while on average our energy burden might be in the ballpark of seven or eight percent, it can be greater than twenty percent for those who can least afford it. So much of their costs are going toward energy.

It's making sure you've got the allocation of costs appropriate. Making sure the lowest-income people who can't afford solar aren't paying for those who do have solar.

You also have to look at where you put your programs. In our electrification programs, whether it's our Charge Ready programs for vehicles or the building electrification program we've applied for with the PUC, a significant portion of those costs are directed toward disadvantaged communities, low-income, and incrementally sensitive communities.

We have to be supporting at the federal level, programs such as additional rebates, EV rebates for secondary use vehicles. With used vehicles, it's bringing the cost down further so it's accessible to low-income customers.

Chris Rogers: As you look at that journey to the pathway to 2045, single out what you feel are the biggest challenge and biggest opportunity for SoCal Edison on that journey.

Steve Powell: We are an electric-only business that is primarily a wires business. So, for us, the biggest opportunity is making sure the electric grid is the platform that can enable a lot more electrons to flow through it. It needs to deliver a lot more to customers. It has to become the platform that people can exchange energy on.

They're not just taking energy off the grid; they're also putting energy back onto the grid. The electric grid becomes that platform that allows everyone to share in the benefits, but also in the costs of the transition.



The biggest opportunity is making sure the electric grid is the platform that can enable a lot more electrons to flow through it. It needs to deliver a lot more to customers. It has to become the platform that people can exchange energy on.

That's the opportunity. It's going to need investments in supporting load growth. It's going to need investments to make it more robust against extreme weather events, whether that's for wildfires or for sea level rise or for extreme heat.

We're making sure we're filling out each of those components, and it's got to help enable the use of all of these customer-side resources. How do we better leverage electric vehicle and electric vehicle charging? As customers decide they want storage in their

home as backup for when the power is out, how do we leverage that storage and give them additional value?

That's going to require modernization from a technology perspective, more sensors, high-speed communication, automation, planning tools, and operational tools. That modernization of the grid has to come with hard core infrastructure replacement work.

I point to the people who it's going to take to make it all happen. It's not just quantity of labor, but it's a new skill set needed to interact with a grid that is much more IT-enabled. Then you've got to manage all the engineering, planning, and everything upstream of that.

The demands on the workforce are going to be a challenge because it's not just our industry doing it. It's all the utilities across the nation and other industries that are trying to tap into those same resources. The key to unlocking all this is managing the workforce transition.

PUF's Steve Mitnick: What's on your priority list besides just surviving?

Steve Powell: The last number of years it has been making sure we are continuing to drive a reduction in wildfire risk, and that remains near the top of the list. By the end of this year, we'll have installed forty-three hundred miles of cover conductor in our high fire areas.

Covered conductor is our primary grid hardening tool against wildfire. That plus our vegetation work, our inspections, and our public safety power shutoff program have helped reduce our risk of igniting a large wildfire by sixty-five to seventy percent.

It's continuing to get that grid hardening done so we rely less on PSPS and bring the risk down. Those are near the top of the

list. Beyond that, we want to continue to look for opportunities for more utility owned storage. There's such a supply crunch.

The other part that I'll point to is we went through a large customer system re-platforming two years ago. That's consumed much of our focus, so we're getting back to the customer experience.

What can we do to help with customers who have increasing bills and haven't experienced levels of reliability that they expect over the past number of years?

I point to the people who it's going to take to make it all happen. It's not just quantity of labor, but it's a new skill set needed to interact with a grid that is much more IT-enabled.

We're making sure we're looking at all the customer pain points and driving improvements because it'll be that much more important when electricity plays an even larger role in their lives.

Chris Rogers: It's November 1, 2045. There is a headline about SoCal Edison. What is it, and what do you want it to be?

Steve Powell: I'd love to see something along the lines of SoCal Edison as the first utility in the nation to enable

entirely electric transportation and buildings. If that happens, that means we're a hundred percent clean energy and customers are paying less. It's enabled fully electrified transportation and buildings without any carbon emissions. We'll be in an amazing place if we've been able to accomplish that over time. **PUF**

Important Voices

(Cont. from p. 4)

of the European Union Agency for the Cooperation of Energy Regulators, Clara Poletti, says in her interview:

"There is an ongoing debate on [electricity] market functioning. There are countries in Europe that are more sensitive to it. Those countries are reluctant to touch the market. The European Commission and the Council up to now have been careful to limit the interventions [into the market] to just a few months or to the end of next year depending on the type of measure..."

We are also discussing long-term measures at the EU level, because a lot of people are saying that the current market design is not fit for a market where electricity fixed-cost plans are the dominant share of the portfolio...

Market design is back in town together with the discussion of capacity mechanisms. Can we support long-term contracts?

Can we reach a situation where markets provide long-term price signals for investments in renewables and energy efficiency?"

Fresh from the natural gas industry's version of NERC's GridEx resilience exercise, this issue has American Gas Association's Amanda Sramek reporting that:

"The purpose was to stress test the [natural gas] industry's ability to respond if a combination cyber-physical incident were to occur. We made it a bad day for operators, because you'd rather have a bad day in your playground than in a real-world incident."

Last though not least, in a conversation with the PUF team, this issue has Oracle's Brad Williams talking about a unique project his firm recently completed:

"The biggest success factor was FirstEnergy employees. They treated this as we [FirstEnergy] are going to own this. We are not going to outsource this project to Oracle or another SI [system integrator] because at the end of the day, the success is on us."

There's so much more within these pages. Browse away. **PUF**