

Association of Energy Engineers (AEE) SoCal Annual Training Conference September 2019

Keynote Address: “Safety, Security and Sustainability: A View from the CPUC” delivered by CPUC Commissioner Cliff Rechtschaffen

This year’s AEE conference focuses on three very important themes - safety, security and sustainability. I want to highlight some of the actions that the CPUC is taking in these areas.

I’ll mostly focus on safety and sustainability in my remarks in the interests of time, happy to answer questions about security later on.

The legislature has provided us with clear mandates and ambitious goals for advancing safety and sustainability, which include directives that go beyond the traditional regulatory goals for utilities. At the CPUC, we regulate utilities and are responsible for coming up with a pathway to realize these goals. In other words, it is our job to get the details right.

Central among the big questions that we think hard about are:

1. How to ensure the safety and security of our energy system.
2. How to accelerate the transition to a clean energy economy.
3. How to ensure that utility systems are resilient and adaptable in the face of inevitable climate change.

We also of course must ensure that our system is reliable, which is a challenge with the growing penetration of renewable energy sources and the decentralization of our energy system, and that rates are affordable, a point that I will touch briefly later on.

Let me turn to the three issues I identified in turn.

I. Safety and security: How to ensure the safety and security of our energy system

Elevated wildfire risk is California’s “new abnormal,” as former [Governor Brown](#) so cogently put it. Some have said that what has happened to PG&E this year is “[the first climate-change bankruptcy.](#)” While that may be true, if it is, it certainly won’t be the last.

7 of the 10 most destructive wildfires have occurred in the last 4 years, and last year was the deadliest, including the Camp fire in Paradise which claimed 86 lives.

At the CPUC, we are responding to this risk in many ways – stronger risk mitigation rules, leveraging technology, and enabling better utility and customer responses to disasters and emergencies. Let me talk about these in turn.

1. Stronger risk mitigation rules

The first category involves stronger risk mitigation rules:

- In high fire threat areas—which are vast, comprising close to 45% of the state –we now require more frequent inspections, more rigorous line clearance and vegetation management and other measures.
- Utilities also are now required to file very detailed wildfire mitigation plans that include performance metrics, grid hardening & plans for vegetation management.

2. Recognizing the importance of technology in helping mitigate risk

The second element is recognizing the importance of technology in helping mitigate risk. In March, we convened a Wildfire Technology Innovation Summit with the tech industry, at which we learned about many promising technologies that can be used to help address wildfire risk. This includes, for example, tools to remotely monitor the State’s thousands of miles of transmission and distribution lines, and to detect latent faults in electric lines. Our energy utilities have already been adopting new technologies such as weather stations with high-resolution monitors and employing supercomputers and machine learning, to create highly sophisticated fire prediction models that go beyond our traditional “red-flag” alerts.

3. Improving responses to disasters and emergencies

The third element is improving responses to disasters and emergencies both at the utility and customer levels.

(a) Improving utility response

- All of the major electricity utilities have developed plans for proactively de-energizing their power lines to avoid fires ignited by contact with vegetation during extreme weather events. De-energization – essentially power shut offs - can have significant health, safety and economic impacts especially for customers who depend on electricity for life sustaining medical support. I have heard about this firsthand at public meetings from disabled customers who rely on medical equipment. I have also met with tribes such as the Campo Band of Indians, for whom loss of power means loss of the ability to pump water, loss of power for emergency services communications and spoilage of two weeks’ worth of refrigerated food; the members of that community tend to shop and store in bulk because of the remoteness of their lands to grocery stores.
- We require utilities to resort to power shut offs only as a last resort, and to comply with strict customer notification protocols when they do.

(b) Enabling better customer response

- To help mitigate some of the impacts from power shut offs, we recently created a program to promote battery storage as a means of providing backup power for vulnerable customers in high fire threat areas. That decision, in our Self Generating Incentive Program (SGIP), will provide incentives for customer-owned batteries interconnected to the electric grid that can operate safely without power from the grid

during shut off events, i.e. island mode. These systems could provide electricity for hours during power shut-offs, and are especially valuable if paired with on-site solar. Eligible customers include both individuals and entities providing critical care and infrastructure services. You'll hear more about storage in later panels.

We are also focusing on developing the microgrid market, which you'll also hear quite a bit more about later today. As I'm sure most everyone here is aware, microgrids are basically energy systems that can operate independently of the grid. They have the potential to keep the lights on during power shutoffs, which can be particularly valuable in fire-prone areas. To date, the commercial microgrid market has been nascent. At the CPUC we are developing interconnection rules, standardized protocols, and rates for microgrids to create predictability and address barriers to the commercialization of microgrids. While microgrids have typically been powered by diesel or other fossil fuels, they increasingly combine solar power and lithium-ion batteries, and that's also a development we'd like to encourage.

These are some of the specific measures we are taking to ensure safety in the wake of the increasing risks that our utility systems are facing. I also want to mention broader efforts that we have been pursuing starting in response to the San Bruno pipeline explosion in 2010. Since then, the CPUC has been engaged in a multi-year effort to heighten the focus of our agency and utilities on promoting safety. While I don't have the time to talk about this effort in detail, one of the central components has been revamping how utilities approach risk evaluation and prioritization. Especially in the last couple of years, working with the utilities and other stakeholders, we have made considerable progress in this area.

Until recently, utility decision-making about safety risks on their systems has always been something of a black box, shaped by subject matter experts. Following a decision we issued last year, we now require utilities to quantitatively evaluate the risks they face from all sources, prioritize where to spend money to get the biggest risk reduction bang for their buck, and publicly present their analyses. This means that we at the CPUC, as well as the public, are much better equipped to critically evaluate utilities' funding requests which can run into hundreds of millions of dollars. That's a very positive improvement for customers.

II. Sustainability: How to accelerate the transition to a clean energy economy.

Now let me turn to sustainability. California has very ambitious decarbonization goals, as far reaching as any state in the country. We have a goal of 60% renewables by 2030, 100% zero carbon electricity by 2045, and beyond that, 100% carbon neutrality throughout our economy, by 2045.

There are many important steps we need to take to meet our clean energy goals; I will focus on three.

1. Grid Decarbonization

The first step is to decarbonize our grid.

Here, I am happy to report that we are making very solid progress. Our current share of renewable energy in CA is 34% and greenhouse gas emissions from the electricity sector have been steadily declining. GHG emissions in the electricity sector are 20% lower than in 1990.

But we have a big challenge to meet our ultimate goal of a completely carbon free electricity system. Among the questions we will have to answer include: will we continue to procure increasing amounts of solar energy because it is the cheapest source (and getting cheaper), even if it means increasingly curtailing the use of solar energy during portions of the day? Will it be economical to procure the large amount of battery storage needed to complement 100% zero carbon sources, or will it make more sense to rely on technologies such as carbon capture and sequestration? We are starting to grapple with these important questions.

Our next step is electrifying our transportation and building sectors – some of the biggest sources of GHG emissions in CA. Let me talk about transportation electrification first.

2. Transportation electrification

Transportation emissions represent the biggest share of statewide GHG emissions – about 40%. We currently have a goal to have 5 million Zero Emission Vehicles on the road in California by 2030. How are we doing? Well, currently we have well over 600,000 EVs in California, with the pace of adoption increasing.

While very encouraging, that still is only a relatively small share of all the vehicles in the State, since we have close to 30 million registered vehicles. Many consumers are still not aware of the benefits of zero emission vehicles and their up-front purchase price is still higher than that of conventional cars.

At the CPUC, we have several goals relating to transportation electrification. First, of course, we want to provide clean electricity-- we want to make sure as demand grows, the electricity provided to power these vehicles is as clean as possible.

Beyond that, our objectives include addressing grid impacts, promoting affordable charging, and building the necessary infrastructure for charging.

a. Grid impacts

We want to make sure that the grid can handle the increased loads that will come with increased electrification. We also are working on policies to promote smart charging, i.e. what we call V1G, and at a slower pace, to promote two- way charging, V2G. While there are challenges, this holds a lot of promise to help with some of our grid challenges—i.e. having car batteries charge and store energy during off-peak hours and discharge during peak hours or provide ancillary services to the grid.

b. Rates

The next issue relates to rates that consumers pay. We want to make sure that charging is at least as cheap if not considerably cheaper than buying gas. We are getting there. Let's use the example of Southern California Edison, the service territory we are located in. If a car owner here charges off peak, i.e. after 11 pm, she *could* power her car at approximately one-half to one-third of the equivalent cost of filling up at

the gas station. That's a good deal. We also want to make sure that commercial and industrial users aren't discouraged from electrifying because of high demand charges (charges based on their maximum load).

c. Infrastructure

Finally, we want to help incentivize building of the infrastructure that is needed to spur widespread electrification. We want to authorize utility investment in charging infrastructure where the private market is not providing sufficient incentives to invest, and allow the utilities to own infrastructure (that is put in their capital base and earn a rate of return) where they are the most natural providers of it. This, for example, includes upgrading the electrical conduit to "make ready" customer facilities for EV chargers to be installed.

3. Building decarbonization

Let me now talk about building decarbonization.

Emissions due to thermal load from the building sector are roughly 12% of the State's GHG emissions. Gas combustion in buildings also causes local emissions. The State has made relatively limited progress in decarbonizing our heating fuels. Recently, however, the technology for heat pumps, hot water heat pumps and induction stoves has been steadily improving.

We have a lot of work to do in this space. In California, we rely more on gas heating for our appliances than the rest of the country does— approximately 2/3rd of residential heating in CA is powered by gas. Switching out these appliances will be a real challenge.

So what are we doing in this area?

We are starting two programs that provide incentives for electric space and water heating technologies in the early stages of market development, and that also subsidize the installation of heat pumps for space and water heating in new and existing buildings. In that proceeding, we will more broadly consider what policies are needed to facilitate the decarbonization of buildings.

We recently adopted a new "fuel substitution test" to remove barriers to using our energy efficiency rebate programs to fund switching from electric to gas appliances. In the past, actions were not eligible unless they reduced energy consumption. Now, efficiency rebates can be used to switch to efficient electrical appliances that reduce overall GHG emissions.

The recent SGIP decision I mentioned also provides incentives for electric water heaters which can act as thermal batteries, storing energy charged during the day and discharging at peak times.

III. Resilience and Adaptation: How to ensure that utility systems are resilient and adaptable in the face of increasing climate risk.

Let me turn now to resilience.

Our sustainability and safety challenges are intertwined with the need for utility systems to adapt to climate change. Robust climate adaptation planning is necessary to ensure the safety and reliability of utility operations.

Just to take a couple of examples: The probability of wildfire exposure for some major transmission lines may increase by as much as 40% due to climate change at the end of the century, and modeling shows that we may need up to a 38% increase in peak electricity generation capacity.

We have opened a climate adaptation proceeding through which we will develop new rules to identify and standardize data, tools, and resources necessary for utility planning related to climate adaptation. We are also developing guidance on how to incorporate adaptation into utility planning and operations, and what steps need to be taken to protect disadvantaged and vulnerable communities from climate change's impacts.

Affordability

One final brief comment. My fellow Commissioners and I are mindful that meeting our safety, sustainability and adaptation goals will require significant investments, and that keeping rates affordable is a vitally important challenge in a state like California with high housing and other costs, where close to one in five people are living in poverty, and where the rate of disconnections for failure to pay energy bills has risen sharply over the past decade.

Last year we opened a new affordability proceeding, which I am leading, that is identifying metrics for determining what level of total expenditures on utility bills for energy, water and telecommunications should be considered affordable. Please stay tuned for updates relating to that important effort.

V. Conclusion

I hope this gives you a snapshot of some of the most challenging issues we are trying to address at the CPUC. We can't solve them without input from industry, advocacy groups, experts, the public, and other stakeholders. We recently have been putting renewed effort into ensuring that our processes make it easy for everyone to participate in our proceedings and engage with us. I hope that I have convinced at least some of you to work with us in trying to find answers to these difficult questions.

Thank you.