Can We Have A Power Grid That Is Both Renewable and Reliable?

By Julia Levin, Special to CalMatters | October 27, 2020

IN SUMMARY: Solar, wind and batteries are critical to California's clean energy future, but they are not enough. Here's how to diversify the state's renewable energy portfolio.

With more than 4 million acres burned this year – shattering a state record – California's wildfire season came with a wicked ferocity, along with the climate-induced crises of crippling heatwaves and forced power outages.

The rolling blackouts we experienced in August led critics, from the White House to mainstream media, to question whether California's decision to make renewables the bedrock of our electrical power grid has jeopardized the fundamental stability of that grid – and our ability to rely on power when we need it most.

In the wake of more recent power outages, the question has taken on new urgency: can we have a grid that is both renewable and reliable?

The answer is an emphatic: "Yes!"

But while we've made tremendous strides in adopting solar and wind power, those two technologies are by their very natures intermittent – they don't work when the sun isn't

shining and the wind isn't blowing. Many people think that battery storage can bridge the gaps. Batteries can provide energy storage for a few hours, but not for days or weeks, which is what's needed to maintain reliable electricity supplies.

Solar, wind and batteries are critical to California's clean energy future, but they are not enough. California needs to diversify its renewable energy portfolio and increase the use of carbon negative, renewable resources that can fill in around solar and wind power. In particular, California should move quickly to:

Accelerate the adoption of renewable fuels, such as biogas and green hydrogen. Both biogas and green hydrogen can provide renewable power to fill in around solar and wind. They can also provide long-duration energy storage, which is critical to achieve a 100% renewable and reliable electricity grid. And they can provide carbon negative emissions that are vital to achieve carbon neutrality by mid-century. Biogas is generated from organic waste such as food and yard waste, wastewater treatment, dairy and agricultural waste, organic waste diverted from landfills, and forest biomass removed for wildfire mitigation and forest restoration projects. Green hydrogen can be generated from organic waste, excess solar and wind power, and other renewable sources. Biogas and green hydrogen production are increasing in California, but the state needs to accelerate their use dramatically to meet its carbon goals and maintain grid reliability.

Quickly expand renewably fueled microgrids. Microgrids – self-sufficient electricity "islands" that operate when the rest of the grid is shut down – can provide safe and reliable power for emergency and essential services, including hospitals, schools, water infrastructure and more. They can provide power during Public Safety Power Shutoffs, rolling blackouts and unplanned grid disruptions. Microgrids also avoid the need for long transmission lines that have caused numerous fires. Given the many threats to California's larger grid, microgrids should be quickly expanded and should include clean, dispatchable fuels and long-duration energy storage to complement solar, wind and batteries. California should not rely on diesel backup generation or other fossil fuels to ensure microgrid reliability when a more diverse portfolio of renewable fuels and clean generation technologies can provide the same reliability. We should expand renewably fueled microgrids that include biogas generation, fuel cells, linear generators and other renewable technologies that ensure reliability without increasing climate or air pollution.

Renewably fueled microgrids are more essential now than ever. After the 2018 Camp Fire, California enacted legislation to spur the commercialization of microgrids. The California Public Utilities Commission should expand microgrid development beyond a few technologies and a small number of pilot projects. Instead, it should encourage private investment and innovation, as has been done in Japan and Australia, and should require utilities to expand renewably fueled microgrids, including biogas and green hydrogen instead of diesel and other fossil fuels.

California does not have to choose between renewables and reliability. We can have both. But only if we pursue a diverse portfolio of renewable resources, including biogas generated from organic waste and green hydrogen.