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## **Support for green electrolytic hydrogen and long duration energy storage research in the DER Research Roadmap**

I write in support of placing high and near-term priorities on research related to green electrolytic hydrogen and long-duration energy storage. This research is needed now to inform utility planning and private sector investment in clean energy and resiliency projects.

CEC and other state agencies are currently modeling scenarios for complying with the state's pioneering 100 percent clean energy law, SB 100. In initial scenarios presented by the CPUC during the November SB 100 workshop, they highlighted an ongoing reliance on most of the existing natural gas fleet "and therefore significant remaining carbon emissions from the power sector in 2045 " while noting that the biggest reliability constraints in the future are cold, cloudy weeks in winter.

The prevailing models used in these assessments only include storage technologies capable of storing power for 4-12 hours. They do not include long duration storage technologies that would be capable of filling these multiday gaps with clean energy, avoiding an ongoing reliance on fossil fueled generation. Green electrolytic hydrogen, in particular, is capable of storing renewable power for months at a time, so that excess sunshine from spring or summer months can power the state through cloudy winter days.

The state's current modeling tools aren't designed to solve for the reliability constraints of the future with clean energy, and they need to be updated to include green electrolytic hydrogen and other long duration storage technologies capable of storing power for days, weeks, or even months at a time. The CEC should immediately fund research needed to adequately incorporate these technologies into the state's modeling efforts and should also support demonstration projects to accelerate the deployment of long duration storage in California, including green electrolytic hydrogen. In particular, it should consider targeting an existing natural gas plant in the state for conversion to green electrolytic hydrogen and deploying fuel cells using green electrolytic hydrogen as a community and grid resiliency solution.

On a distributed scale, green electrolytic hydrogen can provide a critical clean energy and resiliency solution. As the state faces the increasing wildfire threats and public safety power shutoffs become the new normal, communities face the prospect of losing power for days at a time. While solar and batteries are important aspects of our clean energy transition, and provide resiliency benefits, those benefits are limited to a few hours of backup power and on limited scale. Residential batteries are not sufficient to power houses through multiday power outages, and solar and batteries can't keep hospitals, grocery stores, police and fire stations, telecommunication centers, and other

critical facilities powered for an indefinite period of time.

Recognizing this reality, the CPUC just approved PG&E's proposal to deploy hundreds of megawatts of diesel generators to minimize the impact and reach of their expected public safety power shutoffs. There is certainly a better way. Green electrolytic hydrogen used in fuel cells or turbines could power communities indefinitely without pollution. CEC should immediately prioritize research and demonstration projects related to green electrolytic hydrogen in new, clean distributed energy and resiliency solutions.