A CONVERSATION ON CALIFORNIA'S CLEAN ENERGY FUTURE

Can we have too much of a good thing?

BY TONY EARLEY, CHAIRMAN & CEO, PG&E CORPORATION

ON FEBRUARY 19, 2014, WITH NO FANFARE at all, something momentous happened in California. Between 11:11 a.m. and 2:01 p.m., our state briefly produced more green power than all of our homes and businesses could use.

Since then, we've reached that milestone three more times. And as we continue to produce more and more of California's electricity from renewable sources, such occasional abundance will quickly become a frequent phenomenon.

That's something to celebrate, of course. But, as the saying goes, "there's no free lunch." Our success has consequences that we must address right now.

As long as excess green power has nowhere to go, state grid managers are forced to stabilize the electric system by ordering producers to curtail their output of wind, solar, and conventional power. If current trends continue, in less than a decade we could see an annual oversupply of 13,000 megawatts—enough to meet the needs of nearly 2.8 million homes. Because unused electrons perish in a nano-second and idle plants yield no revenue, such an imbalance would threaten the economic viability of all sources of power.

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What's the solution? We need to move from a just-in-time power delivery system to one that allows us to store surplus electricity until we need it. The problem is how to do that.

Indeed, some experts call the search for affordable energy storage the "holy grail" of the electricity industry. Utilities could use it to handle periods of peak demand without firing up fossil-fueled generators; smooth the natural fluctuations from wind and solar farms; and defer upgrades to electrical lines by avoiding imports from distant out-of-state plants.

Unfortunately, affordable storage technologies are still not available. California is calling on investor-owned utilities such as PG&E to bring new energy storage projects on line by 2024—if it can be done cost-effectively. Policymakers hope utility purchases will create a large market for new storage technology, just as similar programs did for renewable energy. In short, if we buy it, others will find a way to build it.

PG&E's pumped-hydro facility east of Fresno is one example of how energy can be stored and delivered to the grid during periods of high energy demand.

At PG&E, we've had experience with one proven kind of energy storage—in the form of hydroelectric dams—for more than a century. We even built a special "pumped-hydro" facility east of Fresno that lets us push water uphill at night, when power is cheap, and release it during the day to satisfy peaks in demand. Its 1,200 megawatt capacity is roughly the size of two large, traditional power plants.

We're also testing battery installations, near Vacaville and in San Jose, to better understand how that technology can be applied throughout the state. We are developing a large underground energy storage facility using compressed air as a medium. In January, we announced a partnership with automaker BMW to test how used electric vehicle batteries might help make our power grid even greener and more reliable.

And last December, PG&E began soliciting proposals from independent developers for storage projects to enhance the operation of three of our Central Valley solar farms, as well as five electric substations.

We are excited to be involved in this groundbreaking work. It is consistent with our heritage as one of the most innovative utilities in the U.S. But we also know that every day our customers want safe, reliable, and affordable energy. While there is no silver-bullet solution, we are committed to do these things and more.

Given California's track record of inventiveness, we're hopeful that breakthroughs in storage technology will help everyone in our state—and ultimately the world—enjoy the benefits of clean energy, without letting a single green kilowatt go to waste.

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