



# MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

*Rely on us.*

TO: Commissioners Schlossberg, Brown, Carlson, Barofsky and McRae  
FROM: Frank Lawson, CEO and General Manager  
DATE: September 30, 2021  
SUBJECT: EWEB/City of Eugene Joint Work Session Recap and Follow-Up  
OBJECTIVE: Information Only

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## **Issue**

The following is my response to questions and comments made during the September 27, 2021, Joint EWEB/City of Eugene Council Work Session.

## **Background**

During the meeting, I presented the high-level preliminary results of EWEB's (Phase 2) Electrification Impact Analysis Study (EIAS), information on efficiency and conservation programs, and the impacts of electrification. Given that one of the conclusions of the EIAS, as published in the premeeting materials, was that "...*dual-fuel technology should be explored further as an opportunity for carbon savings, value from all perspectives (participant, ratepayer, society), and lowest peak electricity impact*", I offered for your consideration a proposal to investigate a potential alternative.

Chelsea Clinton, City of Eugene, presented information on the status of Eugene's Climate Action Plan, and the many ways EWEB and the City work together on Climate Change opportunities.

## **Discussion**

My overall impression of the meeting was that many attendees had little interest in genuinely sharing information and ideas on the selected subjects other than to position themselves by asking questions and making statements intended to support their existing views. Recognizing that it is difficult to communicate a complex subject in a few minutes, my intent was to show where there are greater opportunities for policy and programmatic collaboration, and even innovation to address carbon emissions in the energy sector. I felt that many of the questions were more focused on confirming opinions/perspectives and left little time for problem-solving dialogue. Although we continue to look for ways to improve and innovate, the organization you govern (EWEB) contributes significantly to the community by making prudent decisions, and offering numerous climate, conservation and efficiency, financial assistance, and customer service programs. Our actions are numerous and align with our values of safety, reliability, affordability, environmental responsibility, and community. We also intend our actions to be foundational and sustainable over time. We plan and operate this way because if utility bills go up or are inequitable, the lights go out, the water tastes bad, or if we are environmentally irresponsible, people hold us accountable. We embrace that responsibility.

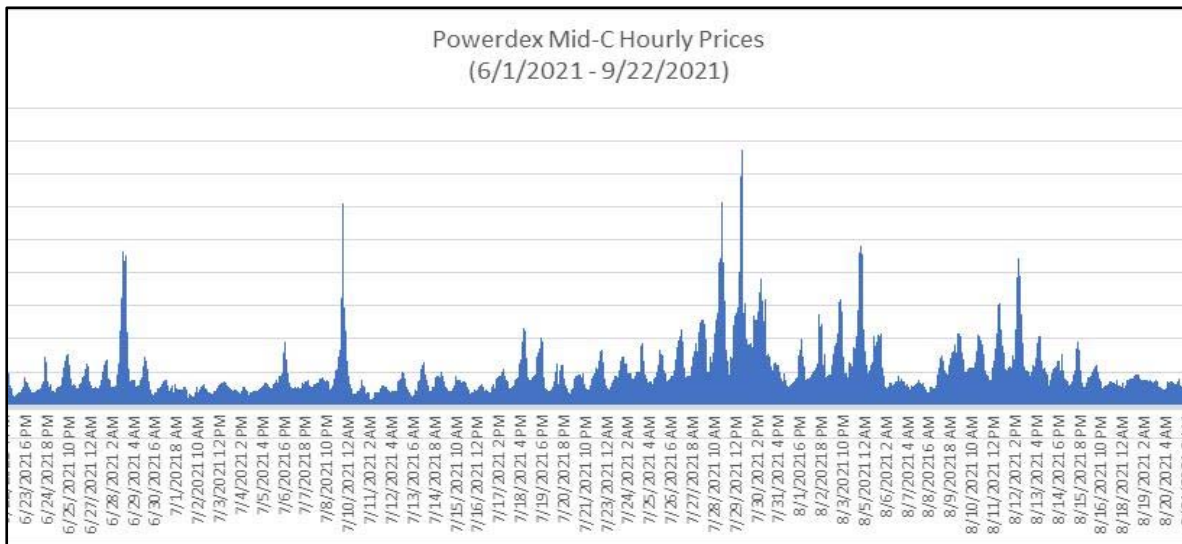
I want to take this opportunity to respond to several questions and statements from the meeting and provide some additional information for your benefit.

***Does the Board want electrification or “smart electrification”?***

Electrification is important in combating climate change. According to our strategic plan, we value the safe, reliable, affordable, environmentally responsible, and equitable delivery of electricity (and water). The important word is “and”, which means we need to optimize our approaches to maximize all of these values. EWEB Policy SD15 indicates the Board “*authorizes, delegates and directs the General Manager to assist customers with their carbon reductions through technical assistance and resources that support energy efficiency, alternative fuels, electric and water conservation, and smart electrification.*” The draft Electrification Impact evaluates value from multiple perspectives, including placing a value on reduced carbon emissions. Additionally, the study attempts to account for the cost, reliability, and environmental risks, which occur primarily at peak conditions across the grid. Therefore, from a utility perspective, management expects “smart electrification” to provide carbon emissions benefits (environment), value to all participants (affordable/equitable), and not exacerbate peak conditions (cost, reliability, environmental) that are difficult and/or expensive to mitigate.

***“We can’t treat exceptional weather events as the new baseline”***

The February event I presented as an example is not the exception, but only one example of supply volatility. Periodic scarcity and volatility are the new normal, with pricing as just one indicator. Below are detailed hourly market prices for PNW electricity, June-August. So far this year, normal prices of \$25-40/MWh have spiked to over \$100/MWh 243 times, over \$200/MWh 48 times, and over \$300/MWh 12 times.



The average price is still low, but the volatility is increasing. We do have tools to mitigate this, but this year we have paid \$15.3 million more for power than budgeted, about 1/3 because of increased retail consumption. We are increasing EWEB’s power purchasing budget next year by \$21 million, \$17 million is because of these market conditions. When the strategic plan references *scarcity and volatility*, this is what it means and it is going to get more challenging with changing weather, tightening supplies, contract uncertainties, hydro impacts, and variable loads. We will have to work the supply side and with customers on the consumption side, which is why the strategic plan states “*how effectively EWEB synchronizes customer consumption with the future’s increasingly volatile and scarce water and electric supply resources will determine our success at delivering safe, reliable, affordable, environmentally responsible, and equitable services to our community, including during the occurrence and threat of disruptive events.*”

***“Rolling blackouts were to prevent forest fires”***

While California has implemented some Public Safety Power Shutoffs (PSPSs), these are not rolling blackouts. The attached WSJ and Forbes articles describe blackouts and California’s situation. We want to solve the climate crisis without creating the unintended peak energy demand challenges that California is experiencing. This summer/fall, they are looking at 3,500 MW of shortfall and taking steps backwards like procuring 5 new “temporary” natural gas-fired power plants. California's grid operator has asked the Biden administration to allow some natural gas power plants to operate without pollution restrictions to shore up the state's tight electricity supplies, Governor Newsom has directed marine load to disconnect from the grid (some burning diesel), and FERC recently approved California’s ability to hold back power during emergencies already purchased by utilities in other states (launching a regional fight over a now more precious resource). Between 2011-2019, electricity prices in California increased 6 times faster than the rest of the nation.

***How much are hydro conditions being impacted by weather?***

Most studies indicate that hydroelectric production will decline by around 20% by 2080. The studies indicate seasonal changes, including more extreme wet and dry periods, some wetter falls and winters, and some drier summers. More winter precipitation will fall as rain instead of snow, producing more runoff in the winter, earlier runoff in the spring and less water in the summer. The runoff volume from January through April is projected to exceed normal flows on the Columbia by 20 to 85 percent. The June through August runoff declines, varying between 65 and 95 percent of normal flows. This seasonal change will impact hydroelectric ability to contribute to summer peaks, which because of climate change will become more prevalent. For reference, hydroelectric generation contributed 42% of the region’s average electricity, but 57% of the region’s peaking capacity. This may accelerate if hydro becomes more uneconomic, as relicensing costs and operating restrictions increase.

***Did the Electrification Impact Analysis breakout types of “participants” like limited income?***

No, the study did not segment the Participant category. However, persons in poverty in Lane County is 13.9%, as published by census.gov and was the result of The Small Area Income and Poverty Estimates (SAIPE). Consistent with the County’s percentage, approximately 14-17% of EWEB’s residential energy efficiency savings is achieved from limited income qualifying households. Year to date, approximately 27% of residential conservation investments have gone to limited income residential households.

***I have an impression EWEB isn’t interested in pushing solar.***

EWEB continues to support solar investment through incentive and grant programs, funded largely through our Greenpower Program. However, rooftop solar does not help mitigate peak energy needs, and as a utility that is “long” on energy on an average basis, additional incentivization is not financially prudent or equitable under the existing rate design. We structure our incentives so that homeowners who adopt solar technologies get the value of that investment without impacting other customers who cannot afford or are otherwise unable to put solar on their rooftops (i.e. renters). When the value of that solar generation increases for the entire customer base, we pass along that benefit to the solar customers. Through “net metering”, customers can offset their energy cost and when customers generate electricity in excess of usage, we pay for that energy at our avoided cost.

***“Doesn’t the carbon intensity diminish as we build new renewable resources?”***

Yes, as part of our benefit/cost modeling in the Electrification Impact Analysis (Phase 2), we included decarbonizing of both the electric grid, based on regional regulations already in place, and the gas grid, based on NW Natural’s commitment to SB98 standards, which also drove up the modeled natural gas prices over the study period. Over time, the “Society” benefit increases primarily because of increases to the social cost of carbon, making any carbon reduction more valuable.

***What is this new approach?...“you never brought this up in any of our meetings...I’m skeptical of NW Natural...reservations with our publicly owned and governed utility partnering with a private for-profit energy company”***

EWEB routinely partners with all types of energy companies (including for-profit, federal, and consumer-owned), including NW Natural. The proposal was to simply investigate a potential alternative solution (and use the winter season to gather data) rather than only considering an “all or nothing” option. Based on the response, it is an alternative solution that received little interest from several of the meeting attendees. Therefore, other than for our own system planning purposes, I don’t plan to pursue the option further unless directed to by the Board. For your information, here’s the approach.

Dual Energy Concept Evaluation

As one of the first in the U.S., the goal of the approach is to dramatically cut the use of natural gas, and then de-carbonize the lesser amount of gas (more expensive RNG and synthetic) still needed for reliability. It is potentially the most efficient and effective way to decarbonize both energy sectors without adverse unintended consequences because dual-fuel heat pumps can use clean electricity most of the time and use a much smaller amount of gas only during the coldest weather. This would allow for decarbonization in the near term, while helping EWEB avoid adding to our winter peak loads (which we believe are likely to have higher peak pricing signals in the future). The concept involves two pieces.

1. Dual-Energy Agreement: This idea was triggered by the attached recent article, dated August 19, 2021 (not that we would copy this exactly). As stated in the article, *the heat pumps, which can warm buildings more efficiently than traditional heaters in all but the coldest weather, will reduce overall natural-gas usage by about 70 percent in buildings that install them...when temperatures plunge to lows that would force heat pumps to turn on energy-hungry auxiliary electric resistance heating elements, heaters running on natural gas will kick in. That will save Hydro-Quebec (the electric utility) from having to build or buy the resources needed to serve a major new load on a grid that already faces severe periods of peak demand.*
2. Carbon Intensity of Energy Delivered. This half of the idea was stimulated by (not identical to) a City of Eugene Memo, Attachment C (Skov/McRae) to the Mayor and Council, dated November 13, 2018, which describes a simple franchise fee mechanism including “*a portion of the franchise fee will be scaled to reflect the gas intensity (or “carbon intensity”) of the gas delivered to the community.*” I expanded on this concept to include all energy (not just gas), which will drive decarbonization of both electricity and gas, and to potentially include building standards. Similar to energy efficiency standards, this is a policy opportunity to drive increasingly cleaner energy consumption, either through building code advancements (i.e., calculated intensity) or measured (audited) carbon content of the consumed energy. It potentially could be applied to both

new construction and retrofits. In both cases, similar to other direct-carbon methods, the standard would become more stringent over time requiring both the electricity and the remaining gas (a lot less after step 1 above) to reduce the “carbon intensity of energy delivered”.

The efficacy of the concept would be easy to prove or disprove with a pilot project generating data this winter. An EWEB manager has a dual-fuel heat pump already, and is willing to have measurement equipment set up to measure electricity and gas consumption patterns versus temperature, grid carbon levels, set points (to adjust the crossover point to adjust between gas and electricity), etc. The electricity vs. gas heating transfer point can be adjusted to evaluate sensitivity. New installations, and potentially multi-family housing, can eventually be piloted also.

Similar to other EWEB incentives and direct-carbon programs, this program could allow special conditions for limited income housing, rental upgrades, or energy intensive trade exposed (EITE) businesses. NW Natural is willing to collaborate in the evaluation process with us, understands their potential impacts and regulatory hurdles, and is familiar with the Quebec Dual-Energy Agreement. Over time, a variety of other stakeholders would need to be involved also.

Recognizing the sense of urgency for actionable solutions, I volunteered myself to evaluate the alternative, and placed the 6-week deadline on myself.

### **Final Thoughts**

EWEB will thrive and strive to help our community no matter what environment that we are operating in. Our planning and operating environment is significantly impacted by outside (federal, state, and local) policy makers crafting energy policy, along with plenty of other social and political dynamics. This is called out in our strategic plan as “*the most immediate challenge facing EWEB is effectively planning and operating in a turbulent environment, including a changing climate, new technology, developing markets, political and regulatory flux, natural and human threats, and evolving diverse community expectations*”. The hope is that those developing energy policy will consult with EWEB, and other experts, and be willing to accept alternative perspectives in that process. The journey will be interesting.

### **Requested Board Action**

No action is requested at this time.

### **Attachments**

WSJ Article – *Why California keeps having blackouts*

Forbes Article - *Why California’s Climate Policies Are Causing Electricity Blackouts*

Canarymedia – *Quebec utilities have a plan to curb gas use and cut emissions...*

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<https://www.wsj.com/articles/why-california-keeps-having-blackouts-11598198401>

## BUSINESS

# Why California Keeps Having Blackouts

Much like two decades ago, when it faced rolling blackouts, the Golden State has to buy sizable volumes of electricity on the spot market—this time as solar power fades out



Power lines and transmission towers in Crockett, Calif. When the sun starts to fall, the renewable energy the state is increasingly dependent on begins to wane.

PHOTO: DAVID PAUL MORRIS/BLOOMBERG NEWS

By [Rebecca Smith](#) and [Katherine Blunt](#)

Aug. 23, 2020 12:00 pm ET

When rolling blackouts darkened parts of California this month, Frank Wolak, an economics professor and energy-markets expert at Stanford University, had a painful sense of déjà vu.

Mr. Wolak was among the people who helped California chart a course out of crisis in 2001, when a poorly conceived state electricity-deregulation law resulted in frequent power shortages, sporadic blackouts, astronomical wholesale prices and market manipulation.

As Californians again experience rolling blackouts, and millions more are threatened with losing power, a warning that continues through Monday, Mr. Wolak said it was clear that “California policy makers completely forgot the lessons from the crisis...in their rush to go green.”

Once again, a big part of the problem is that California regulators have left the state dangerously exposed to buying large amounts of imported electricity on the spot market during peak periods on days when there is extreme energy demand—what Mr. Wolak likened to going to the airport on Thanksgiving and expecting to fly standby.



WSJ NEWSLETTER

## Notes on the News

The news of the week in context, with Tyler Blint-Welsh.

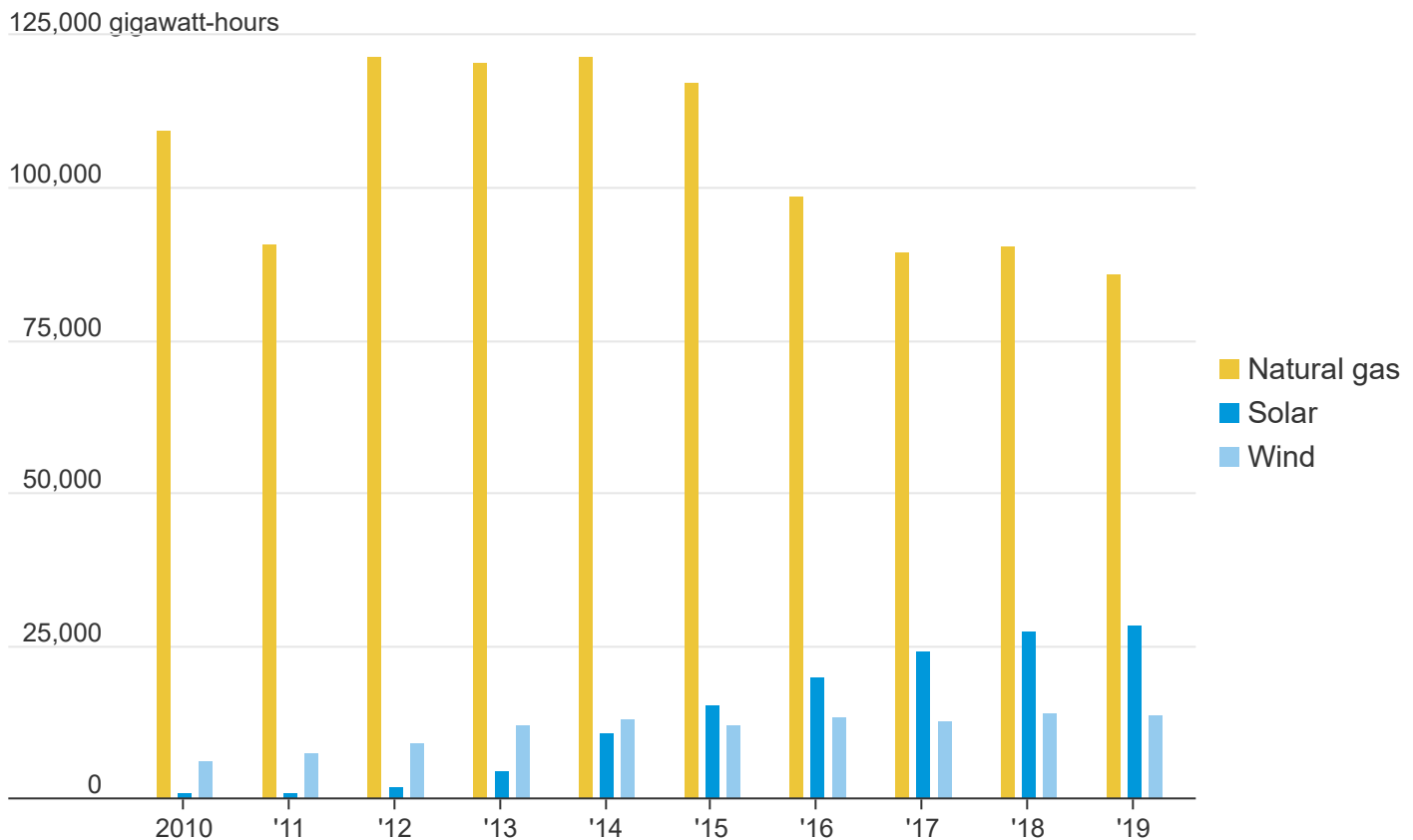
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Only this time, the crunchtime for the state’s grid operator isn’t the actual power demand peak in late afternoon—it is when the sun starts to fall in early evening, and the renewable energy the state is increasingly dependent on begins to wane.

## California's in-state electricity production, by source



Note: Excludes hydroelectric, nuclear and small thermal sources.

Source: California Energy Commission

On many days, California's grid operator now has to find 10,000 to 15,000 megawatts of replacement power—sometimes 25% to 50% of what it needs to keep the lights on—during a three-hour period as solar, and to a lesser degree, wind power, falls off.

California often relies on imported power from other states to help fill its void. But when a historic heat wave gripped the Western U.S. this month, the state struggled to find a way to replace up to 8,000 megawatts of disappearing renewable energy each evening. It came up short on some days by as much as half that amount and had to call for rolling blackouts on Aug. 14 and 15.

The events, which have occurred as the state is also fighting a multitude of wildfires, and millions are hunkering at home due to the coronavirus pandemic, have coined a new word in California, used by critics of the state's renewable energy emphasis: "greenout."

Investigations are under way to determine what went wrong and why, but it appears that resources that were expected to provide electricity failed to come through in some cases. One gas-fired power plant tripped and haze and low wind speeds crimped the contributions of some solar and wind farms.



Two numbers help explain why California finds itself scrounging for megawatts on many evenings. Between 2014 and 2018, the state reduced its consumption of electricity from natural gas-fired power plants by 21% according to the state's energy commission. Over that same period, it increased renewable energy consumption by 54%.

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## GREEN POWER

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[Green-Energy Shares Rise Along With Joe Biden's Polling](#) (Aug. 20)

[California Blackouts a Warning for States Ramping Up Green Power](#) (Aug. 17)

[Utilities Cash In on Green Energy Subsidy for Bigger Wind Farms](#) (Aug. 16)

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Michael Peevey, who served as president of the California Public Utilities Commission under three governors before stepping down at the end of 2014, was a key figure in implementing increasingly ambitious mandates by state politicians that required utilities to purchase more wind and solar power, as California pushed to become a leader in combating climate change.

He was one of the chief architects of a policy to guide resource additions after the 2001 energy crisis, which established a pecking order that gave priority to energy efficiency and renewable power over gas-fired generation.

In an interview, Mr. Peevey said rigid adherence to that policy might have gone too far, particularly in light of state decisions to shut down two big sources of round-the-clock power, the San Onofre nuclear power plant in 2013 and the last remaining nuclear plant in the state, Diablo Canyon, after 2025.

“It worked well until these last few years, apparently,” Mr. Peevey said. He added that he worried the state didn't reserve enough round-the-clock power generation “during this rush to renewables.”

California regulators have known since at least 2017 that the state could face a power capacity shortfall, although the state grid operator thought it would squeak by this summer. In 2018, the state utility commission asked the grid operator, as well as utilities and power generators, to weigh in on whether additional resources were needed.

The California Independent System Operator and Southern California Edison said they felt the state could be short at least 2,000 megawatts of capacity by 2021. Experts at the utility

commission flagged reliance on imports from other states as dicey, noting that many coal- and gas-fired power plants in those states were closing.

Last year, the commission ordered utilities and retail power suppliers to procure 3,300 megawatts of additional capacity between 2021 and 2023, calling it a “‘least regrets’ strategy, since electricity shortages would most certainly lead to regrets.” It also recommended to the state’s water agency that coastal gas-fired power plants—heavy users of water for cooling—be allowed to run beyond mandated retirement dates.

Now that California has experienced rolling blackouts for the first time since the 2001 crisis, few in the state dispute the need for more contracted sources of power to address what went wrong. But whereas some believe the state has gone too far in squeezing out gas-fired generation, others are urging state officials to accelerate the transition to a fossil-fuel-free future.

In a letter to Gov. Gavin Newsom, the state’s utilities commission and grid operator were unequivocal in their commitment to the state’s clean-energy goals. The letter cautioned that renewables shouldn’t become a scapegoat and said, “Clean energy and reliable energy are not contradictory goals.”

“There’s pretty strong antigas sentiment in California,” said Jan Smutny-Jones, head of the Independent Energy Producers Association, a trade group that represents many renewable generators. “Gas has become the new coal for California.”

Calpine Corp. is one of the companies that has struggled in recent years to keep its gas-fired power plants running profitably in California, as the state has passed laws requiring utilities to buy renewable power in ever-increasing quantities.

In 2016 and 2017, Calpine decided it would need to shut several power plants. But since the state utility commission’s decision to require suppliers to procure 3,300 megawatts of additional capacity, Calpine was able to bring a mothballed plant near Yuba City, Calif., back into service.

Steve Berberich, the chief executive of the California Independent System Operator, said the state’s problem isn’t so much overreliance on solar power, as insufficient battery storage to soak up power when there is an excess and release it later when needed.

“We’re going to have to expand renewables to charge batteries,” he said in a recent briefing, indicating that the state needn’t turn back.

Batteries remain an expensive solution, however, and the amount California would need to help bridge its power gaps and balance out its renewables would be enormous. One California ISO estimate is that the state could need up to 15,000 megawatts of energy storage capacity—many multiples of what it has today, at just a few hundred megawatts—to reach its goal of eliminating carbon emissions from power generation by 2045.

For all of the U.S., large-scale installed battery capacity today totals approximately 1,000 megawatts, according to the Energy Information Administration.

Write to Rebecca Smith at [rebecca.smith@wsj.com](mailto:rebecca.smith@wsj.com) and Katherine Blunt at [Katherine.Blunt@wsj.com](mailto:Katherine.Blunt@wsj.com)

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Aug 15, 2020, 05:25pm EDT | 110,072 views

# Why California's Climate Policies Are Causing Electricity Blackouts



**Michael Shellenberger** Contributor

Energy

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California denied millions of people electricity they needed for air conditioning because it had ... [+] AP, GETTY

Millions of Californians were denied electrical power and thus air conditioning during a heatwave, raising the risk of heatstroke and death, particularly among the elderly and sick.

The blackouts come at a time when people, particularly the elderly, are forced to remain indoors due to Covid-19.

At first, the state's electrical grid operator last night asked customers to voluntarily reduce electricity use. But after power reserves **fell to dangerous**

levels it declared a “Stage 3 emergency” cutting off power to people across the state at 6:30 pm.

The immediate reason for the black-outs was the failure of a 500-megawatt power plant and an out-of-service 750-megawatt unit not being available. “There is nothing nefarious going on here,” [said](#) a spokeswoman for California Independent System Operator (CAISO). “We are just trying to run the grid.”

But the underlying reasons that California is experiencing rolling black-outs for the second time in less than a year stem from the state’s climate policies, which California policymakers have justified as necessary to prevent deaths from heatwaves.

In October, Pacific Gas and Electric cut off power to homes across California to avoid starting forest fires. The utility and California’s leaders had over the previous decade diverted billions meant for grid maintenance to renewables.

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And yesterday, California had to impose rolling blackouts because it had failed to maintain sufficient reliable power from natural gas and nuclear plants, or pay in advance for enough guaranteed electricity imports from other states.

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It may be that California's utilities and their regulator, the California Public Utilities Commission, which is also controlled by Gov. Newsom, didn't want to spend the extra money to guarantee the additional electricity out of fears of raising California's electricity prices even more than they had already raised them.

California saw its electricity prices **rise** six times more than the rest of the United States from 2011 to 2019, due to its huge expansion of renewables. Republicans in the U.S. Congress **point** to that massive increase to challenge justifications by Democrats to spend \$2 trillion on renewables in the name of climate change.

Even though the cost of solar panels declined dramatically between 2011 and 2019, their unreliable and weather-dependent nature meant that they **imposed** large new costs in the form of storage and transmission to keep electricity as reliable. California's solar panels and farms were all turning off as the blackouts began, with no help available from the states to the East already in nightfall.

Electricity from solar goes away at the very moment when the demand for electricity rises. "The peak demand was steady in late hours," said the spokesperson for CAISO, which is controlled by Gov. Gavin Newsom, "and

we had thousands of megawatts of solar reducing their output as the sunset.”

The two blackouts in less than a year are strong evidence that the tens of billions that Californians have spent on renewables come with high human, economic, and environmental costs.

Last December, a report by done for PG&E **concluded** that the utility's customers could see blackouts double over the next 15 years and quadruple over the next 30.

California's anti-nuclear policies also contributed to the blackouts. In 2013, Gov. Jerry Brown **forced** a nuclear power plant, San Onofre, in southern California to close.

Had San Onofre still been operating, there almost certainly would not have been blackouts on Friday as the reserve margin would have been significantly larger. The capacity of San Onofre was double that of the lost generation capacity that triggered the blackout.

California's current and former large nuclear plants are located on the coast, which allows for their electricity to travel shorter distances, and through less-constrained transmission lines than the state's industrial solar farms, to get to the coastal cities where electricity is in highest demand.

There has been **very little electricity from wind** during the summer heatwave in California and the broader western U.S., further driving up demand. In fact, the same weather pattern, a stable high-pressure bubble, is the cause of heatwaves, since it brought very low wind for days on end along with very high temperatures.

Things won't be any better, and may be worse, in the winter, which produces far less solar electricity than the summer. Solar plus storage, an expensive attempt to fix problems like what led to this blackout, cannot help through long winters of low output.

California's electricity prices will continue to rise if it continues to add more renewables to its grid, and goes forward with plans to shut down its last nuclear plant, Diablo Canyon, in 2025.

Had California [spent](#) an estimated \$100 billion on nuclear instead of on wind and solar, it would have had enough energy to replace *all* fossil fuels in its in-state electricity mix.

To manage the increasingly unreliable grid, California will either need to keep its nuclear plant operating, build more natural gas plants, or pay ever more money annually to reserve emergency electricity supplies from its neighbors.

After the blackouts last October, Gov. Newsom attacked [PG&E Corp.](#) for "greed and mismanagement" and named a top aide, Ana Matosantos, to be his "energy czar."

"This is not the new normal, and this does not take 10 years to solve," Newsom [said](#). "The entire system needs to be reimagined."

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**Michael Shellenberger**

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# Québec utilities have a plan to curb gas use and cut emissions during winter heating season

 canarymedia.com/articles/quebec-utilities-have-a-plan-to-curb-gas-use-and-cut-emissions-during-winter-heating-season

August 19, 2021



Utilities in Québec have crafted an innovative plan for reducing the use of natural gas — without provoking the ire of the natural gas sector. In fact, the Canadian province's primary investor-owned gas utility, Énergir, is the co-creator of the plan.

Natural gas and electric utilities are, unsurprisingly, often on opposite sides when it comes to the debate over whether to heat buildings with gas or electricity. That's why it's so noteworthy that Énergir and state-owned electric utility Hydro-Québec have come up with a new “dual-energy” agreement.

In the next few weeks, the two utilities will ask energy regulator Régie de l'énergie to approve a carbon emissions reduction plan that combines government incentives for electric heat pumps with a continued role for natural gas in residential, commercial and institutional buildings.

The heat pumps, which can warm buildings more efficiently than traditional heaters in all but the coldest weather, will reduce overall natural-gas usage by about 70 percent in buildings that install them, with a potential reduction of 540,000 metric tons of CO<sub>2</sub> emissions overall.

But when temperatures plunge to lows that would force heat pumps to turn on energy-hungry auxiliary electric resistance heating elements, heaters running on natural gas will kick in. That will save Hydro-Québec from having to build or buy the resources needed to serve a major new load on a grid that already faces severe periods of peak demand in winter.

## **A lower price tag than all-electric**

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Replacing all of that natural gas with electric heat pumps would cost about \$2.6 billion over 10 years, both for Hydro-Québec to supply its new peak demand and from rate hikes both utilities would need to impose to cover the costs involved, according to Énergir spokesperson Élise Ducharme Rivard. Going instead with the dual-energy approach should save \$1.5 billion compared to the all-electric scenario, while still reaching the province's goal of cutting carbon emissions from buildings in half by 2030, she said in an email.

“There are lots of ways to decarbonize heating,” Philippe Dunsky, founder and president of Dunsky Energy + Climate Advisors, said in an interview. “Sometimes they're blunt and can be pretty expensive, and sometimes they're more nuanced and can be less expensive.” In the case of the new Québec plan, he said, “The utilities convinced the government that they could be trusted to go do it.”

Dunsky's firm helped Énergir develop the plan, he noted. It also led the Québec government's electrification working group, tasked with finding ways to decarbonize buildings, transportation and industry as part of the province's goal of cutting economywide carbon emissions by 37.5 percent by 2030.

Énergir will see reduced sales of natural gas under the plan, he pointed out. But as part of the proposed dual-energy rate that Hydro-Québec and Énergir intend to ask regulators to approve, “the electric utility is going to pay the gas utility for the peak value that it's providing” with a rate structure that enhances the returns from providing heating fuel at times of greatest grid stress. “That's the real innovation here,” Dunsky said.

In February, Énergir released a climate resiliency plan using the guidelines set by the Task Force on Climate-Related Financial Disclosures, a group formed by the G20's Financial Stability Board to enhance corporate disclosure of climate risk. The plan sets “concrete measures [on] energy efficiency, renewable natural gas, innovative energy complementarity...that allow us to remain a key player in addressing climate, economic and social issues for our customers and for Québec,” Rivard said. “We need to find ways to meet our customers' needs and ambitions of reducing emissions to remain relevant for them. Not addressing those would be worse.”

To be clear, Dunsky said, “at the end of the day, the gas utility is still going to end up short” of revenue it would have generated if it hadn’t agreed to the plan. But Énergir “sees the writing on the wall, sees that it needs to reduce its sales of conventional natural gas dramatically... and [will figure out] how to do this in a way that hurts...the least.”

## **Compromise versus conflict in the battle of electricity vs. natural gas**

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Québec’s approach stands out in an environment that’s seen natural gas utilities fighting hard — and some say dirty — against efforts to phase out natural gas in buildings. Across the U.S., local government efforts to restrict natural gas in new construction have been met with heavy pushback from the natural gas industry. In response, a growing number of state legislatures have passed laws restricting cities and counties from setting their own policies on this front.

By contrast, California just passed new building codes that will make all-electric homes and certain commercial buildings the default for new construction starting in 2023. The state has seen two of its major investor-owned utilities — the all-electric Southern California Edison and the dual-fuel Pacific Gas & Electric — express support for a shift toward electric buildings. But its primary natural gas utility, Sempra Energy subsidiary Southern California Gas, has mounted an expensive lobbying campaign against the nearly 50 city and county bans on natural gas that have been passed in the state so far.

Dunsky highlighted how the partnership in Québec differs from these more fractious approaches to switching from natural gas to electricity. For starters, Énergir’s ownership structure is unlike most natural gas utilities. It’s owned by Caisse de dépôt et placement du Québec (CDPQ), the investment fund that manages public pension plans and insurance programs for the provincial government.

In June, CDPQ bought out a significant stake in Énergir held by Alberta, Canada–based natural gas company Enbridge. Now CDPQ can guide Énergir’s strategy in line with its arguably longer-range view and an approach more focused on the public good.

Québec’s energy landscape is also unusual compared to much of North America, Dunsky said. The province already gets 95 percent of its electricity from hydroelectric dams and another 4 percent from wind power, giving it one of the lowest-carbon grids in the world.

At the same time, it faces a significant winter peak demand from the roughly 85 percent of homes that already use electric heating instead of fossil fuels, the outcome of a decades-old push to replace oil-fired furnaces with resistance electric heating systems that run on cheap hydroelectricity.

In that sense, said Dunsky, “Hydro-Québec is basically the future of a lot of utilities in the Northeast [U.S.] as we electrify heating loads,” as well as those in the upper Midwest and Pacific Northwest, where heating loads already drive steep winter grid peaks, compared to

the summer-peaking patterns driven by air conditioner use that are common across most of the country.

## Addressing winter peaks without new-build gas

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A [report](#) from the American Council for an Energy-Efficient Economy (ACEEE) has identified a series of efficiency and electrification measures that could reduce the need for new power plants to [serve the growing winter peaks](#) that will be exacerbated by the shift to electric heating and electric vehicles. At the same time, this year's [winter blackouts in Texas](#), and previous cold snaps that pushed Northeast grids to their limit, have highlighted the dangers of failing to prepare for these changing peak patterns.

“These hybrid programs are an important option to consider in the use cases where full electrification doesn't yet make sense, because of reliability, comfort or cost challenges,” Rachel Gold, ACEEE utilities program manager, said in an email. It's important that programs like this come with controls to make sure backup gas systems only start up when heat pumps can't meet full load, she emphasized. What's more, it's essential that any other upgrades include better insulation and air sealing.

Mike Hennen, a principal on the Carbon-Free Buildings team at nonprofit RMI, noted that states like Maine and Vermont have run successful heat-pump incentive programs, aimed at replacing the oil-fired heaters prevalent in the Northeast. Programs like these have helped build the private-market ecosystem for heat-pump manufacturers, distributors and building contractors and installers to bring down the cost of making the switch, without which “we probably wouldn't be in a good position to get whole-home electrification done now.”

RMI supports a complete phaseout of fossil fuels in buildings in the long run, Hennen stressed. He says it's particularly important to stop building natural-gas infrastructure for new buildings. At the same time, partial electrification efforts like the Hydro-Québec and Énergir partnership that can slash 70 percent of building emissions “can be a helpful step in the right direction” — although “ultimately you're going to need to address the other 30 percent as well.” (Canary Media is an independent subsidiary of RMI.)

## Policy carrots and sticks

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It's also important, said Hennen, to give utilities an incentive to craft ways to shift from natural gas to electricity without causing undue financial disruption — or leaving the costs of supporting the remaining natural gas infrastructure on the shoulders of customers who can't afford to switch to electric heating and appliances. Colorado lawmakers recently passed a “[Clean Heat Standard](#)” that gives natural gas utilities some leeway to cut emissions through efficiency, electrification, reducing natural-gas leakage or replacing fossil gas with hydrogen, biomethane or recovered methane.

In that light, Québec’s “creative structure where there is some flow of funding between the gas provider and the electricity provider is very interesting,” Henchen said. “There could be any number of creative ways in which that could come into play.”

Dunsky noted that Canada’s national goal of reaching net-zero carbon by 2050 will require programs like Québec’s to end reliance on natural gas in the future. But in the near term, “if we say we want everyone off gas tomorrow morning, we’ll spend the next 10 years fighting it. Instead, we’ll spend the next 10 years with the gas utility being an active participant in decarbonizing and reducing emissions by a third in the heating sector.”

*(Lead image: [Julie Boulanger](#))*



## **Jeff St. John**

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Jeff St. John covers technology, economic and regulatory issues influencing the global transition to low-carbon energy. He is former managing editor and senior grid edge editor of Greentech Media.

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