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PAST AS PROLOGUE: MORE THAN 20 YEARS LATER, CALIFORNIA FACES ANOTHER MAN-MADE ELECTRICITY CRISIS

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TOPLINE POINTS

- More than twenty years ago, California's leaders unduly interfered in the state's electricity market with hasty mandates and price controls to the detriment of residents who endured rate spikes and electricity shortages.
- Today, California's leaders are progressively imposing renewable electricity source mandates, the inherent unreliability of which risks shortages and rate hikes similar to those of the early 2000s.
- To ensure a consistent electricity supply and stable rates, state leaders must allow for an electricity portfolio that includes proven and reliable carbon and nuclear sources.

Introduction

Californians can be forgiven for experiencing *dejà vu* during the “flex alerts”¹ issued in the hottest days of summer 2022. Indeed, the electricity shortages and the specter of blackouts California faced in 2022 bear a striking resemblance to the California energy crisis experienced in the wake of partial energy deregulation in 1996 and the unforced errors in its implementation—namely, mandating price caps and not anticipating supply shortages in periods of peak demand.

As California now pursues mandates for unreliable renewable energy sources—dependent on weather patterns and the time of day—among other mandates, Gov. Gavin Newsom (D-CA) and his allies in the legislature risk hastening another electricity crisis. Indeed, California risks being perpetually on the precipice of significant energy

¹ According to the California Independent System Operator (CA ISO), “A Flex Alert is a call to consumers to voluntarily conserve electricity when the ISO anticipates using nearly all available resources to meet demand. Reducing energy use during a Flex Alert can prevent more dire measures, such as moving into EEA notifications, emergency procedures, and even rotating power outages” ([CAISO, 2023](#)).

emergencies unless it categorically rejects anti-competitive and unrealistic renewable energy mandates.

California's Coming Electricity Crisis

More than two decades after the California energy crisis that occurred in the wake of poorly executed and impartial energy deregulation, it can be easy to forget the state's dramatic and feckless response at the time. From the then-governor immediately turning off the state Christmas tree right after its yearly lighting ceremony to the rolling blackouts that plagued large swaths of the state, most tragically, through the 2001 summer months. The crisis also sent shock waves through the state's political system. Indeed, the saga's civic fallout culminated in the 2003 recall of then-Gov. Gray Davis, in what was widely seen as a referendum on his failures to manage and resolve the crisis competently ([Patterson, 2003](#)). The immediate cause² was a systemic power shortage due to an aging power grid, insufficient power plants, and price caps during the 1996 partial electric energy deregulation (California Energy Commission, 1998, as cited in [U.S. EIA, n.d.](#)). These price caps were an especially harmful intervention because of their effect on electricity supply. Shielded from the rising costs of their electricity use, consumers could not adjust their behavior and reduce consumption. The rate caps also weakened the incentive for energy suppliers to build new electricity plants and maintain existing ones, which was especially needed given the state's population growth during these years.

The more recent threat of blackouts due to an overtaxed energy grid during the summer of 2022 reminded Californians that nearly 24 years after the previous energy crisis, the state is still dangerously close to rolling blackouts and regular "flex alerts" as supply issues continue to plague California ([California Independent System Operator, 2022](#)). It is essential to identify the elements causing California's electricity shortages to understand the current reliability challenges. It is also essential to understand why these elements, while superficially distinct, are nevertheless remarkably similar to those that caused the state's early 2000s energy crisis: an overdependence on unreliable energy sources, a resistance to proven energy supplies (carbon-based sources in particular), and ever-expanding regulations in an already over-regulated sector.

California is now well down the path toward mandating which electricity sources consumers may use. While all of this repeats the mistakes that led to the first California energy crisis, the renewable energy mandates and subsidies pose the most imminent risk of creating shortages. Electricity from renewables such as solar and wind also contribute to shortages as they cannot be generated at will and are dependent on uncontrollable

² Allegations of corporate market manipulations revealed in the waning days of the crisis do not negate the effect of rate caps and electricity shortages in precipitating the crisis. According to the Federal Energy Regulatory Commission (FERC) report on the crisis, "Without underlying market dysfunction, attempts to manipulate the market would not be successful" ([FERC, 2023](#)).



factors, such as weather patterns and the time of day. Unless Californians address these primary drivers of electricity shortages, the state risks perpetually suffering from major energy emergencies.

We've Been Here Before: Government Mandates Mean Shortages

Introductory economics teaches us that heightened demand for limited resources will raise prices, at least until the supply is increased to meet such demand. The energy sector is no exception. [AB 1890](#) in 1996 restructured the state's electricity market by “break[ing] up the utilities and creat[ing] competitive markets in both the generation and the retail marketing of electricity” ([Weare, 2003](#)). California utilities received incentives to divest generation facilities and eventually sold all their fossil fuel plants, constituting almost 19,000 MW of generating capacity, according to a 2003 report produced for the Public Policy Institute of California ([Weare, 2003](#)). During this period, consumer electricity rates were frozen until these utilities completed divestiture. Unable to pass along rising energy generation costs, utilities incurred significant losses from purchasing wholesale electricity at higher rates ([FERC, 2003](#)).

The California legislature intervened further when it approved [AB 265](#) (2000). According to a digest of the bill, the legislature temporarily capped at 6.5 cents per kilowatt hour the energy portion that customers of San Diego Gas and Electric Company paid until December 31, 2002. Thus, consumers were initially sheltered from the true costs of rising electricity demand, then suddenly confronted with exponentially higher prices once the rate freeze was lifted. They were understandably shocked, as rates increased as much as 200 percent during scorching summers when air conditioning use drove electricity demand to its highest point of the year ([SF Chronicle Staff, 2001](#)). The Congressional Budget Office's (CBO) analysis of the crisis further explains the problems Californians faced:

California responded to its immediate concerns about the availability of electricity and the volatility of prices by directly intervening in the market—a response that could prove costly to electricity consumers and taxpayers. Long-term solutions to California's electricity problems will most likely require ... removing regulatory restrictions on the sale of power throughout the broad western market. Those actions would help make the supply of electricity more responsive to changes in prices. On the demand side, the prospects for successful restructuring would also improve if consumers faced the full costs of electricity and were better able to adjust their use of power in response to changing prices (Congressional Budget Office ([CBO](#)), 2001).

Indeed, the CBO here invokes a core economic tenet that, when faced with these true, higher prices, consumers will adjust their behavior and tend toward reduced consumption during times of peak rates and stabilize the state's supply.



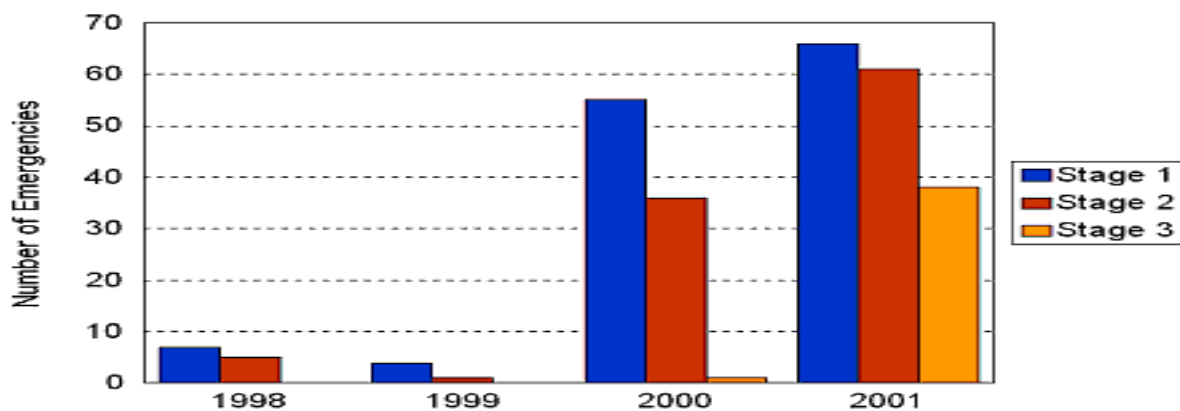
The constrained supply in the early 2000s, when consumers did not have the opportunity to adjust their behavior, was exacerbated by the fact that California did not build any new power plants in the decade preceding the crisis. And many aging plants were taken offline. This constrained capacity was made worse by a simultaneous spike in natural gas prices, which at the time accounted for nearly a third of the state’s electricity. This confluence of factors meant the state was unable to meet the electricity demand that came with considerable population growth during that same period ([SF Chronicle Staff, 2001](#)).

As noted, the state’s economic and population growth sharply increased demand for electricity in the years following the restructuring, yet California’s generation capacity remained stagnant, then progressively waned. Also, by the summer of 2000, when extreme heat increased consumer demand, many of the aging plants had decades of deferred maintenance, and nearly 20 percent of the state’s generating capacity remained idle ([CBO, 2001](#)). The congressional report on this crisis attributed the “halt in construction of new facilities” to the above-noted market intervention in the form of temporary but prolonged rate freezes, noting that “the state had a large and costly reserve of generating capacity” in the mid-1990s but that the “uncertain investment climate” kept the state’s supply from keeping pace with increased demand by the summer of 2000 ([CBO, 2001](#)).

California’s decision-makers at the time worsened the crisis by ignoring such obvious tenets of market economics. The trend of more frequent power emergencies that emerged when the temporary rate freezes were still mostly in effect during the early 2000s is obvious, as illustrated in the chart below:

Figure 1

California’s Declared Staged Power Emergencies, 1998–May 22, 2001



Source: California Independent System Operator

Note: **Stage 1** emergency notice is declared any time an operating reserve shortfall (less than MORC minimum) is unavoidable or when, in real-time operations, the operating reserve is forecast to be less than minimum after using

available resources. **Stage 2** emergency notice is declared any time it is clear that an operating reserve shortfall (less than five percent) is unavoidable or when, in real-time operations, the operating reserve is forecasted to be less than 5 percent after dispatching all resources available. **Stage 3** emergency notice is declared any time it is clear that an operating reserve shortfall (less than 1.5 percent) is unavoidable or when, in real-time operations, the operating reserve is forecasted to be less than 1.5 percent after dispatching all resources available ([U.S. EIA, 2003](#)).

Electricity rates, the cost of which could not be passed on to consumer ratepayers while the caps were in place, soared once the rate caps were lifted. With consumers sheltered by these artificially constrained rate caps, they did not have the time to adjust their consumption to correspond to higher rates or make demands on policymakers for greater supply. Consequently, demand remained high relative to supply. Furthermore, the inability to pass these increased rates on to consumers reduced incentives for energy providers to build and adequately maintain power plants. These factors combined to create critical electricity supply shortages during summer days of extreme heat, as Californians sought to keep their homes and workplaces cool and electricity demand increased significantly.

When the state faces these power emergencies, regulatory agencies are compelled to declare emergency alerts, advising residents to decrease consumption. In the most extreme cases, these agencies decide to order rolling blackouts as demand exceeds supply.

Today, California’s leaders, by imposing new so-called “clean energy” mandates and disregarding the reality and nature of markets, risk precipitating another electricity crisis. As the next section will argue, the pattern of market interventions severely restricts supply, and the phenomenon of electricity shortages in California is only accelerating.

Different Mandates, Similar Results

Renewable sources currently make up a substantial proportion of the state’s electricity supply, and mandates will likely cause this proportion to increase. The EIA estimates that in 2021, “nonhydroelectric renewable resources provided 34% of the state’s utility-scale net generation. With small-scale solar PV included, they supplied 40% of California’s total in-state electricity generation” ([U.S. EIA, 2023a](#)). Nuclear energy accounts for only eight percent of California’s electricity, which is not even half of its share in 2011.³ Yet carbon-based plants—specifically, gas-powered plants—still make up a sizable portion of California’s electricity and will for the foreseeable future.

³ “Nuclear power’s share of California’s total electricity generation was about 8%, which was less than half the power nuclear supplied in 2011. The decrease resulted from the shutdown of the San Onofre nuclear power plant in January 2012. The state now has only one operating commercial nuclear power plant—the two-reactor Diablo Canyon facility” (U.S. [EIA, 2023a](#)).



As evidenced by the “flex alerts” issued in the late summer of 2022, electricity generation did not meet consumer demand during times of peak usage as inland California temperatures rose to among the warmest in the Nation and residents resorted to air conditioning to maintain livable conditions ([Toohey, 2022](#)). The California Independent System Operator reportedly attributed these shortages primarily to some uncertainty about the amount of production available from renewable sources, “primarily solar, during the heart of the afternoon” ([Toohey, 2022](#)). Consequently, the state had to rely on carbon-based sources to meet increased demand—specifically, activating and increasing output from gas-fired power plants.

It is here, with future electricity shortages—inevitable if the state continues to increase its dependence on fundamentally unreliable renewable sources—that California will confront an inescapable reality: Renewables are inherently intermittent and, at this point, do not provide reliable energy.

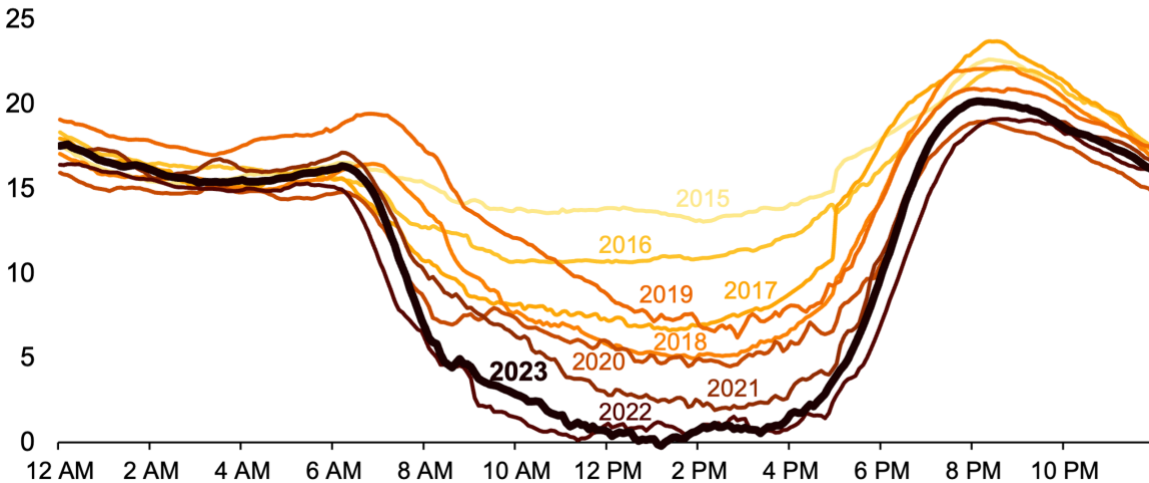
One example is electricity generated from solar energy. A 2017 brief from the Department of Energy points to a marked difference in California in the demand for electricity and the “amount of solar energy available throughout the day” ([Jones Albertus, 2017](#)). Indeed, as the report describes it, during clear days, the sun inundates the market with solar energy, but this excess supply quickly dissipates in the evening, when demand is highest. This dynamic creates a glut of energy production at a time other than when it is most needed. A prominent example of this discrepancy occurred in March 2017, when solar energy reached a then-unprecedented 40 percent of the state’s electricity generation due to bright and clear skies, but mild spring temperatures in California kept the energy demand from matching this generation. Of course, this phenomenon does not account for solar energy’s obvious challenges at night or in inclement weather. Without large-scale and meaningful ways to store the excess energy generated from solar, the misalignment of peak generation and peak demand will persist, if not worsen.

Multiple studies have shown that points of peak electricity demand are mismatched with the times of day that renewable energy is generated. Faced with a shortfall, the state is forced to use electricity from traditional energy sources, such as natural gas-powered plants, which are easily dispatched on demand ([U.S. EIA, 2023b](#)). This reality, when represented as a model on a graph, is called the “duck curve” for the shape of the lines resulting from the incongruent data points, as the image below demonstrates ([U.S. EIA, 2023b](#)):



Figure 2**California's duck curve is getting deeper**

CAISO lowest net load day each spring (March–May, 2015–2023), gigawatts



Each line represents the incongruity between California's electricity demand and generation during specific times of the day from 2015–2023 between the months of March and May ([U.S. EIA, 2023b](#)).

Over the seven-year period represented above, which correlates with the implementation of renewable energy mandates constituting an ever-larger portion of the state's energy portfolio, the imbalance between generation and demand has only grown. This trend will undoubtedly continue over the remainder of this decade, as the mandate for renewable sources is set to double from its 2020 level of 30 percent to 60 percent by 2023 ([CEC, 2019](#)).

Averting the Next Crisis

If the past is prologue, California appears to be repeating precisely the type of mistakes that created its previous energy crisis and continues to lay the groundwork for shortages in the future. Just as the constraints on energy producers that the state imposed in the wake of its 1996 deregulation scheme contributed to electricity shortages and rolling blackouts in the ensuing years, so will the state's current market intervention in the form of progressively increasing renewable energy source mandates. California's leaders must accept that there is no large-scale way to compensate for the inherent disadvantages of so-called renewable sources without making use of proven electricity sources that they have largely eschewed. For the sake of controlling energy prices and ensuring consistent electricity supply, the state must repeal its renewable energy mandates. Additionally, state subsidies give renewable sources an artificial advantage over time-tested and reliable sources. They must be dropped in order to level the playing field and promote marketplace competition and innovation. So long as these subsidies exist, renewable



sources will only expand their share of the state’s energy portfolio and lead to ever-growing shortages.

In addition to betraying a lack of knowledge of the nature of markets, the legislature is ignoring lessons from California’s past. These trends and market interferences will only hasten shortages and expose Californians to onerous price spikes. California’s leaders also have resisted nuclear energy—an easily dispatchable source, the byproduct of which avoids the concerns environmentalists raise with fossil fuels.

Also, natural gas plants, historically a sizable portion of the state’s electricity generation capacity, are becoming progressively “cleaner.” Excluding these natural gas plants from the state’s electricity sources eliminates a proven, reliable, and environmentally sustainable option. These plants should be improved and expanded.

If consumer behavior and the market incentives for innovators to improve energy extraction are manipulated, the state risks another misalignment between electricity demand and available supply. For the sake of our state’s livability and economic vitality, reliable and dispatchable sources must be maintained and expanded, as they constitute an essential part of our state’s energy portfolio.

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