

**March Hare Madness**

“Some people think they are concentrating when they're merely worrying.”

**Bobby Jones**

“As a mother I think you often get so caught up in trying to take care of everyone else that you forget to take care of yourself. But I'm a much better wife and mother when I take the time to take care of myself.”

**Mia Hamm**



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One mustn't complain about the rain, must one? It's a tempting thought tempered by memories of the last three years agonizing over the extended drought. A while ago the reference seemed natural; how soon we forget. This week in

Southern California people commented, "Well, I'm getting sick of the rain, but we sure need it; don't we?" We are silently pining for the unfamiliar dry sunny day with gentle breezes and 70-degree afternoon temps. And speaking of low-level grumbles, the Daylight Savings Time change simply snuck up on me last weekend. I wasn't alert to the loss of an hour despite one very amusing reference to the seasonal adjustment during the Academy Awards by emcee Jimmy Kimmel.

Digital technology linked to the Internet removes the need to reset a clock. *Por otro lado*, the country of Mexico took care of the issue another way starting this year ... it simply eliminated Daylight Savings Time entirely except for the border cities in the north. Now, instead of saying "*mañana*," one can say, "*mañana más o menos una hora*."

What did you think of the Sunday evening show about the movies and actors granted an Oscar? While watching, I realized that I hadn't seen any of the films, yet, and more than a few titles (and actors) were unfamiliar. Separately, the chic gowns worn by the red-carpet ladies (the carpet was white this year) looked ridiculous. The nouveau nude look lacked class and style ... and we worry about what our children view on video games and TV sitcoms. Whatupdat?

**One Correction from Last Week**

It was mistakenly stated that the Ormond Beach coastal gas-fired power plant was owned by AES. It is owned by GenOn. Jesus Arredondo clarified the passage as follows: "*Specifically, the report recommends that the State Water Resources Control Board allow three extensions:*

*AES' 1,137 MW Alamitos and 226 MW Huntington Beach; GenOn's 1,491 MW Ormond Beach facilities to stay online another three years, to the end of 2026.*"

California's aged gas plants don't die, they don't even fade away. They simply exist by necessity until further notice.

**Western States Playbook**  
*CAISO YTD Renewables Curtailment:*  
 As of 1/31/23: 53,198 MWh

% of solar and wind output curtailed:  
 YTD as of January 2023 1.47%  
 YTD as of January 2022 1.66%

*WPTF on LinkedIn:* Follow the group on LinkedIn by clicking [here](#).

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## Speaking of Things For Which I Wasn't Ready ...

The failure of the Silicon Valley Bank (SVB), a backyard staple when I lived on the Peninsula in Northern California, remains a shock. Not just to me but to the White House, the Treasury Department, banking regulators, and the stock market. I won't review the details herein because the story has been amply covered in the mainstream media. However, there appears to be repercussions in our industry as well. The month of March is always loaded with surprises besides a Cinderella basketball team making it to the NCAA Finals. Last year, the Russian invasion of Ukraine was the tumbler that disrupted so many global energy markets. This March, the U.S. banking system is experiencing fits and worries that are going beyond the failures of a few relatively middle-sized regional banks.

The analysts at Bank of America Securities (BAS) reported on the heels of last week's financial disclosure that energy project loans and interest-rate swaps are syndicated and diversified. Thus, one failure doesn't spell immediate doom. However, credit requirements will tighten up in the aftermath: *"We emphasize that even if companies do not have direct exposure, there are secondary and tertiary contagion risks. Silicon Valley Bank was reported as the 16th largest bank in the United States and follows the collapse of Silvergate Capital (SI - Not Rated) just the prior day. Understandably, investors are acting first and asking questions later. Many of the companies rely on adequate, relatively frictionless, and affordable access to credit markets. The relentless march higher of short-term interest rates (now ~5.2% for three-month LIBOR) will pressure returns, notably higher .... The companies that have historically relied on SVB and other smaller financial institutions will likely look to diversify their capital relationships."* Makes sense and I would have thought by this week the news about bank failures would have quieted. But that hasn't been the case.

The [WSJ ran many stories about it and the one that caught my attention](#) was Wednesday's piece entitled, "SVB Collapse Threatens Funding Source for Climate Startups." How so? Projects in the category of early-stage development for new clean-energy technologies often placed the funds received from Silicon Valley investors (e.g., hedge funds) in SVB deposit accounts. Therefore, a relationship between SVB and many clean energy types started there for good reason. Per the [WSJ](#), *"Silicon Valley Bank was best known for its connections to software and biotech startups. The bank also had niche businesses serving winemakers and, more recently, climate-tech companies. Its collapse threatens a key source of financing for entrepreneurs trying to reduce carbon emissions."*

You know, a new clean-energy product prior to full-scale manufacturing and revenue realization needs capital, most of it through venture debt and lots of it to fulfill its business plan. The funding requirements to get from a design to full-scale production are large for all sectors of the economy but more so for energy businesses. It's the nature of the beast. *"For SVB, the loans snared banking customers that could eventually become significant clients. The loans typically coincided with venture-capital funding rounds, and would often be paid back over time with that money ... Of SVB's \$74.3 billion loan book at the end of 2022, SVB didn't disclose how much of that went to climate tech."* Anyone involved with early-stage energy development knows how difficult it is to secure lending during the pre-revenue phase. Been there, tried that, and was never part of a successful outcome.

The other side of the story is what SVB did or didn't do to hedge the risk for its loan book. When inflation wasn't a factor, I'm sure the risks were reasonable. However, things changed in a hurry and the bank was caught flat footed. Amazing that in the cradle of high-tech such mistakes could come about and create ripples across a wide pond.

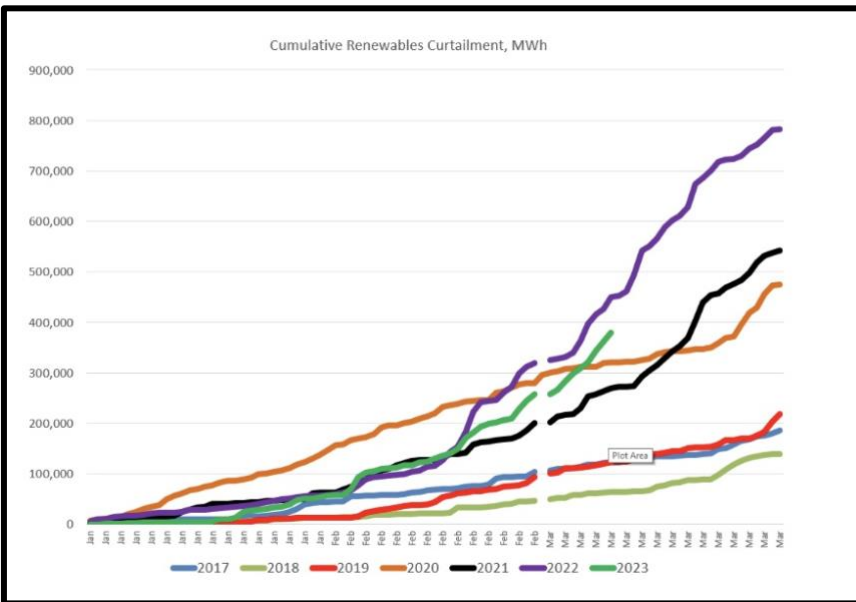
### What we believe...

1. Competition yields lower electricity rates.
2. Stable and transparent rules and regulations promote private investment.
3. Private investors, rather than utilities, will spend money on new power plants and transmission facilities if they can earn a return that is balanced with the risks.
4. Private sector investment results in

## Renewables Curtailments, Power Imports and Regional Price Spreads

Kind of a catchall title for three things that I regularly review in the Burrito. By March of each year the renewables curtailment numbers rear its head as the rains and eventual snowmelt becomes fuel for generating hydropower. The Pacific Northwest hydropower supplies the CAISO with power imports, and this year PNW hydro has been limited relative to that in California. If power imports flow in abundance to the CAISO, and CAISO renewables blossom due to longer daylight hours, then too much of a good thing means a larger share of the renewables must be pared. That also imposes large intraday price swings for wholesale power. So, you see, all these things are connected but in different ways depending on the season and other particulars such as the Washington State's auction price for GHG allowances that last month eclipsed the California allowance by \$20/ton which roughly converted to energy means an additional spread of about \$6/MWh.

If this stuff isn't interesting to you, then why are you reading the Burrito? [Skip to the stories](#) in the Odds & Ends section, [below](#).



Thus far this year, renewables curtailments have fallen short of last year's. The chart to the left has the Year-to-Date cumulative curtailments for the six previous years and 2023. Recently, this year's accumulation surpassed 2020 ... which was a great year if you liked pandemics.

Here is what is curious about the closeness of 2022 and 2023: although the latter lags the former by 16% as of March 9<sup>th</sup>, CAISO solar production has been down 11% YoY due to rain and cloudy skies. Plus, behind the meter rooftop solar production has also been down for the over 1.5 million California homeowners with that capability. So, in 2023 there has been less solar production to curtail even though the fleet has grown. There has been greater

demand for electricity for the grid-scale renewables to serve as rooftop systems ebb, and a larger battery storage inventory to absorb excess solar production. All three factors should tamp down curtailments as we can readily see. But look at the relative trends ... it seems that the 2023 value is rapidly approaching 2022 parity! What would those two curves look like had last year's weather existed this year? And what the hell are those battery energy storage systems doing? Well, I do not foresee the 2023 cumulative curtailments surpassing 2022 by the end of this month. Maybe by mid-April.

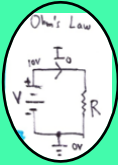
A fine point but related, abundant hydropower historically has eased wholesale power prices in the CAISO not only in spring during the snowmelt runoff but also across the year. Historically, Pacific Northwest Power was lower than either of the CAISO hubs. But look at the ICE forward prices as of Tuesday in the figure below. The price spreads between either NP

WEST ICE CLEARED FORWARDS											
	Palo		Mid C		NP-15		SP-15				
		Net Chg.		Net Chg.		Net Chg.		Net Chg.		Net Chg.	
MAR-23	60.76	0.41	MAR-23	92.21	-0.52	MAR-23	77.86	0.60	MAR-23	62.38	0.97
APR-23	44.30	0.55	APR-23	71.00	-1.05	APR-23	54.80	0.65	APR-23	39.50	0.55
MAY-23	39.10	-0.45	MAY-23	52.50	-2.45	MAY-23	45.25	-0.45	MAY-23	31.50	-0.45
JUN-23	89.20	-1.70	JUN-23	68.95	-1.30	JUN-23	60.25	-1.45	JUN-23	52.50	-1.50
JUL-23	188.85	3.90	JUL-23	133.90	2.00	JUL-23	93.05	2.00	JUL-23	92.00	2.00
AUG-23	225.80	1.30	AUG-23	221.10	-0.95	AUG-23	123.95	-0.95	AUG-23	128.90	-0.95

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or SP and Mid-C tighten in May and June. However, the summer differences are phenomenal. Don't the forward prices foretell of a situation whereby prospective imports to California may change direction and go to bilateral deals in either Arizona or Washington State? Won't that put more downward pressure on the supply of power imports to the CAISO? Me thinks it will. Especially in August with a spread of \$100/MWh.



## Catch Some Z's

[Click here to learn more about Ziad Alaywan](#)

### Part II: Reflecting on CAISO's 25<sup>th</sup> Anniversary

*As we celebrate the 25th anniversary of the California ISO at the end of March, many people ask why was its headquarters based in Folsom? The town is known for many things—from its gold rush heritage to singer Johnny Cash's recording about Folsom Prison.*

*Many people don't know about Folsom's small brick hydroelectric powerhouse that generated the first long-distance transmission of electricity in the U.S. [The linkage lit up the California State Capitol 22 miles away in Sacramento.](#)*

*On March 31, 1998, the 22,000 circuit-mile transmission network established a forefront for a competitive market for wholesale electricity. As fate would have it, the initial home of the ISO control center (before it moved to its permanent facility) was located only two miles from the historic Folsom Powerhouse.*

*The Folsom location was first discussed in mid-1996, when all the interested parties gathered to discuss the establishment of the CAISO. I was one of the individuals assigned to this task while employed at PG&E and took a more active role when I left PG&E to work at the CAISO. The team identified one priority early on—we did not want the control center to be located near an earthquake fault but in California that was not easy to find.*

*We also wanted the headquarters for the CAISO to be near a major airport, and a community that would be a draw for employees that we planned to recruit from all over the country. That meant a locality that provided high quality, low-cost living, and excellent schools.*

*Folsom was such an easy choice. It is where we found an extremely affordable lease site, with fiber optics, large enough that it could easily be transformed into a one-stop energy emporium for electricity, complete with an expansive, state-of-the-art 15,000 square foot control center. Then the politics started.*

*Some utilities wanted the CAISO to be in southern California. Others tried to punt the decision because the CAISO was not yet formed, and who would sign a 10 year-lease with an entity that did not legally exist?*

*Then PG&E stunned everyone and offered to sign the lease on behalf of the CAISO until the CAISO was formed. I will never forget delivering the lease to VP Jim Macias of PG&E and leaving his office with a signed contract and a PG&E check. That was it!*

*Folsom was to become home of the first competitive wholesale electricity market in North America. The race was on to make*

It reminds me of what happened in August 2020. We recall the outage event in California that rocked the world. But as part and parcel of the outage was the separation of regional prices. I quoted Tim Belden of Energy GPS in the August 28, 2020 Burrito as follows: "The four major WECC markets – Mid Columbia, Northern California, Southern California, and Palo Verde – all separated from one another. The correlation between the markets broke down – and importantly, there was no reliable way to move additional energy between the regions, which is why the regional spreads blew out. In the Northwest, the supply-demand balance was healthy – US northwest hydro production in August 2020 has averaged about 1,000 MW above normal and around 3,000 MW above August 2019 ... Stated simply, the Northwest grid was healthy and exports to the south were constrained by limited southbound transmission. Within California, the north to south transmission lines (Path 15 and Path 26) were full. As a result, NP15, while still at a high price, cleared well below SP15. Within the CAISO, SP15 was the premium market. **But Palo Verde was the belle of the ball that week.** Normally, the prices at Palo Verde are tethered to the SP15 prices because when Palo Verde prices climb too far above SP15, traders simply export power from the CAISO and deliver it to Palo Verde."

Do you see where I am going with this? Mid-C this August may be the belle of the ball, or possibly both Mid-C and Palo Verde will share that honor. God save us everyone if there is a heat storm in California this summer. Power outside of CA will go to both WA and AZ rather than CA, and power inside of either WA or AZ will stay there. Is this starting to sink in? If not, then [skip to the stories](#) in the Odds & Ends section, [below](#).

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## Did They Say RTOs are Sick, Dying, or Dead?

Mark Twain was incorrectly credited with the quotation that rumors of his death had been greatly exaggerated. He never said that explicitly, but it would have been delightful had he. [Similarly, Utility Dive ran an Op Ed by Messrs. Gifford and Larson](#) of the law firm Wilkinson Barker Knauer entitled, "Are RTOs and ISOs Sick, Dying or Dead?" The authors use three very recent examples to back their claim.

The first example is the Capacity Auction re-do at PJM that I wrote about last week. The article included a reference to Commissioner Danly's dissent that I also lauded. The second example of RTO/ISO "failure", and one that I didn't know about although it is in my state of residence, is the Nevada Governor's executive order promoting energy independence from neighboring states. Huh? What? Nevada has a law on the books requiring its electric service providers to join a regional transmission entity on or before the end of 2030. Per the Op Ed: "[A Governor's] executive order directing electric providers to develop in-state generation to avoid the need to rely on the broader power market, noting the economic development, cost, and workforce benefits of doing so." The devil you say. Does this strike you as being patently opposite from either the CAISO or SPP developments to broaden the Western power markets? I give the authors a big plus for noting things Nevada.<sup>1</sup>

### What we believe...

6. Competition yields lower electricity rates.
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9. Private sector investment results in

The third example is proposed legislation in both Connecticut and New Hampshire to, "Look at a future beyond the RTO/ISO. Regardless of outcome, the symptom is clear: state leaders have discomfort with entrusting their energy future to the RTO/ISO model. From the days of *Hughes v. Talen Energy*, to the emergence of back-door nuclear energy subsidies through state zero emission credit mandates, to state-mandated specific resource procurements such as California, Massachusetts and New Jersey have required, state political imperatives have bristled — and often broken through — the Procrustean logic of the RTO/ISO." Yeah, but ... but, the benefits in grid efficiency from coordinated operations and regional transmission planning are overwhelming compared to the market imperfections noted in the article. And, frankly, the so-called

RTO failure in Nevada is no different from individual states trying to map their own energy futures. If one is an example of RTO/ISO failure, then what is the other? A non-RTO/ISO failure? It doesn't add up.

## Shephard's Pie with [Laura Manz](#)

*"Three weeks into a broken wrist, I have come to appreciate the acts of kindness to get through a few disorienting weeks of healing. Shepard's Pie was especially welcome as I didn't have to try to cut anything into manageable pieces and it was delicious. This version opts for a mirepoix of onions, carrots, and celery rather than a traditional toss of peas and carrots. At the end, we determined that a handful of peas brought the right balance of tradition, texture, and taste."*

Prepare a meat layer: Heat 2 Tbsp. of olive oil in a large skillet. Add 1 cup diced onion and cook for five minutes until soft. Add ¾ cup diced carrots and ¾ cup sliced celery and cook for 10 more minutes. Add 1 lb. lean ground beef, lamb, or turkey. Brown the meat and add 2 tsp. of dried parsley, 1 tsp. of dried rosemary, 1 tsp. of dried thyme, ¼ tsp. of nutmeg, ½ tsp. of salt, and ½ tsp. of pepper. Cook for 5 minutes and add 2 Tbsp. of Worcestershire sauce and 1 Tbsp. of minced



<sup>1</sup> And just this week the [NPUC approved two new gas-fired generating units \(400 MW\) for NV Energy](#) at the Silverhawk Power Plant outside of Las Vegas.

garlic. Cook for 2 more minutes the incorporate 2 Tbsp. of flour and 2 Tbsp. of tomato paste. Cook until the mixture is smooth, and the tomato paste begins to brown. Add one cup of beef or chicken broth and ½ cup frozen peas. Bring the mixture to a boil then reduce heat and simmer for 5 minutes, stirring occasionally until thickened.

Prepare the potato layer: place 2 lbs. of cubed russet potatoes into a large pot and cover with water. Bring to a boil then reduce heat and simmer until potatoes are fork am tender, about 10 minutes. Drain the potatoes then return to the pot. Add ½ cup (1 stick) unsalted butter, 1/3 cup half & half, 1 tsp. of garlic powder, ½ tsp. of salt, ½ tsp. of pepper. Mash until well combined. Add 1/4 cup parmesan cheese.

Layer the meat mixture into a 9"x9" baking dish. Then evenly layer mashed potatoes on top. Place the dish on a rimmed baking sheet. Bake uncovered for 25-30 minutes at 400° F. Let rest for 15 minutes before serving.

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Outstanding, Laura. However, you still haven't told me how you broke your wrist. That kind of news is the meat and potatoes for Burrito readers.

Here's your M&P for this week:

>>> Things in the People's Republic of California

@@@ A Tale of Two Different Capacity Counting Rules

>>> Shout Outs and Murmurs (👁️ & 🗣️)

>>> Odds & Ends (!!)

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>>> **Things in the People's Republic of California**

@@@ A Tale of Two Different Capacity Counting Rules

Modern-day power markets can be very complicated things. This is the burden we accept working for businesses that dabble in such and for regulators who oversee the same. However, there are few things more complicated than assessing the effective capacity contribution of each grid resource at the time of the net peak. Why? Because there are more supply options during critical hours such as renewables with variable output, battery energy storage systems (BESS) with varying degrees of performance, demand response, thermal plants, and hydro generation. Each option must be correctly evaluated for the grid operator to be assured that there are sufficient resources to meet demand, plus reserves to cover possible contingencies.

Therefore, I will review two items that have recently become public documents. [The first is a study](#) on the Effective Load Carrying Capability (ELCC) for resources that are procured for meeting the Mid-Term Reliability (MTR) targets established by the CPUC. [The second is a Proposed Decision \(PD\) on a radical reformation of the CPUC's Resource Adequacy \(RA\) paradigm](#) that has been in development for the last three years. Both the study and the PD take careful aim at counting rules for capacity to get it right. Unfortunately, the two methods are different rather than being the same. Someone more knowledgeable than I

**... and, what we should do:**

1. Believe in ourselves.
2. Encourage creation of independent, multi-state regional transmission organizations that coordinate policies with respective state utility commissions.
3. Support rules for resource adequacy that applies uniformly among all load-serving entities.
4. Enforce competitive solicitations by utilities for purchasing either thermal or renewable power.
5. Support choice among retail electricity customers.
6. Lobby for core/non-core split of retail customers.
7. Advocate against policies that limit, through bid mitigation, merchant returns

might be able to explain why two different methodologies are employed, but I can't. It often confuses me to discuss the topic of Net Qualifying Capacity (NQC) without a reminder about which compliance element is being considered: RA or MTR. This would be a good break-time to consider what I just wrote and re-evaluate your interest in working in the power biz. No hard feelings if you believe a mistake of cosmic proportions has misdirected your life. Or you can [skip to the stories](#) in the Odds & Ends section, [below](#).

The study that was released last January was prepared by consultants to the Cappuccino and entitled, "Incremental ELCC Study for Mid-Term Reliability Procurement (January 2023 Update)." The update refers to a precedential study that was completed in 2021. Page for page, the updated study is a great analysis to parse the supply and demand-side resources that must be evaluated to achieve a reliable grid, and to prepare for such in advance. An ounce of prevention, etc. Plus, it serves as a wonderful tutorial that proves we always need refreshing on the topic of RA counting. Here are some key ideas to keep in mind:

- The CPUC's Mid-Term Reliability (MTR) orders the procurement of 11,500 megawatts (MW) of net qualifying capacity (NQC) and requires standardized effective load carrying capability (ELCC) values.
- The report presents updates to the previously reported ELCC values for 2025 ("Tranche 3") and 2026 ("Tranche 4") compliance dates.
- The study examines the incremental ELCC of energy storage, solar photovoltaic (PV), and wind in the CAISO footprint to provide ELCC assumptions to LSEs for compliance with the CPUC's MTR Decision. The study focused on Tranches 3 and 4: pertaining to requirements of 1,500 additional MW by 2025 and 2,000 additional MW by 2026.
- Loads were held constant at the 2030 level; the system was calibrated to the reliability standard LOLE of 0.1 days/year.
- The ELCC results are "incremental" point estimates applied to the applicable resource types, and as such adjust over time to reflect shifting of the net load shape to later in the day and expected changes in load growth and diurnal net load shape. As the penetration of a resource type increases, its "effectiveness" declines (all, not just the last one added, i.e., incremental for the fleet of said resource types). The question is how to set the NQC for each so that compliance can be achieved and grid reliability be reasonably assured?

**Table 1. Incremental ELCCs by MTR Tranche**

	From prior study, for reference only		Updated values from this study		Additional Proposed MTR Tranches <sup>7</sup>	
	Tranche 1 2,000 MW	Tranche 2 6,000 MW	Tranche 3 1,500 MW	Tranche 4 2,000 MW	Tranche 5 2,000 MW	Tranche 6 2,000 MW
	2023	2024	2025	2026	2027	2028
<b>4-Hour Battery</b>	96.3%	90.7%	75.1%	76.6%	74.0%	76.5%
<b>6-Hour Battery</b>	98.0%	93.4%	79.6%	80.3%	80.5%	83.3%
<b>8-Hour Battery</b>	98.2%	94.3%	84.0%	84.0%	87.1%	90.1%
<b>8-Hour PSH</b>	N/A	76.8%	82.6%	82.6%	85.7%	88.7%
<b>12-Hour PSH</b>	N/A	80.8%	86.6%	86.6%	89.7%	92.7%
<b>Solar - Utility and BTM PV</b>	7.8%	6.6%	6.6%	7.0%	7.5%	8.8%
<b>Wind CA</b>	13.9%	16.5%	12.0%	13.2%	14.0%	14.7%
<b>Wind WY</b>	28.9%	28.1%	31.0%	33.0%	31.7%	30.9%
<b>Wind NM</b>	31.1%	31.0%	30.0%	35.0%	33.7%	31.9%
<b>Wind Offshore</b>	N/A	N/A	48.0%	46.0%	44.0%	44.7%

Unlike the earlier evaluation of the 4-hour BESS whereby the ELCCs were in the 90 percent band, the revised values for 2025 and 2026 are much lower, in the mid-70s. BTW, PSH stands for pumped storage hydro. The solar ELCCs are not much changed, but one should appreciate the challenge of swapping thermal resources with sunshine when the regulator is telling you that for every 100 MW of solar added only 6 MW or 7 MW counts as NQC. The ELCCs for WY and NM wind speak for themselves. Why are we waiting so long?

Switching now to the [PD on the Slice-of-Day](#) (SOD ... with all due apologies to our U.K. readers), it would be fair to state that the entire venture remains a work in progress. I consulted with WPTF's expert on CPUC matters, [Gregg Klatt](#), to narrow the scope of topics in the PD down to one, and that was the counting rules for RA compliance. Here is what Gregg advised: "*Perhaps the most debated issue during the workshops on this item was the exceedance level that should be used to calculate the qualifying capacity (QC) values of **solar and wind** resources. Just summarizing the proposals on this topic (and various modifications proposed in comments) takes up 11 pages of the PD. But to cut to the chase: the PD adopts PG&E's proposed methodology and elements of a couple of other proposals. The adopted methodology will be used to set month-specific exceedance levels for different technologies (e.g., solar fixed, tracking, and solar thermal) and for different regions, which will then be updated annually.*"

Terrific! Fantastic news! Just one question. What the hell is an exceedance level? Is it akin to an Excedrin headache? I hope so because I'm getting one. Whatever it is, the ELCC it is not. Unlike a point estimate for each resource that supposedly represents the contribution at the time of net peak (i.e., ELCC), exceedance establishes a threshold as a percent of nameplate capacity that is available for RA counting purposes. So far there have not been any explicit percentages attached to specific resources. But there is a proposed methodology. It is based on resource measurements during high-load days during the last six years, averaging the values, establishing monthly values for each resource type that will employ the exceedance across the 24-hour load shape for that month, measuring the impact on system loss of load probability, and then some gentle massaging of the outcomes to make it look official. Wow, that is a big step or series of steps. I don't doubt the motivation for the exceedance calculation, but it comes at a price in terms of lack of simplicity and the use of black-box mathematical models. Worry not because the earliest test year for the new paradigm is 2024. Cross your fingers and your toes.

### >>> Shout Outs and Murmurs (👂 & 🗣️)

Paul Hunt sent this letter regarding the EV charging experience I related in last week's edition: "*I understand the frustration of your anonymous EV renter who had to wait for an hour in San Dimas to recharge. But '\$18 for the power to go the last 17 miles' doesn't sound right to me. I have a plugin hybrid (2017 Ford C-Max Energi) and it typically travels three miles or more per kWh. Granted, it is a small car and your pal may have been driving something that is less efficient. But 37.5 kWh should have provided much more than 17 miles of range. What am I missing? Did he or she have to return the car immediately? Perhaps that is the answer.*

*"Having said that, I think your main point is correct for now. In my recent travels to Yosemite Valley, I have thought that it is now the playground for folks from Silicon Valley (or was before the bank failures this week). But when I visited last December, I observed very few electric vehicles there, despite that fact that there are EV chargers at Yosemite Lodge.*

*"There is also the issue of fuel cost. Using rough numbers, \$0.48 per kWh equals \$0.16 per mile. My C-Max Energi, when running on gasoline, often reports 40 miles per gallon, so \$0.48 per kWh would be equivalent to \$6.40 per gallon of gasoline.*

*"For long-range travel, an ICE-powered car is still superior. But for local everyday travel, the C-Max in EV mode wins if it can be charged at home. Unlike Kent Fickett, I am still a net producer during my current Relevant Period that ends in April (NEM 1.0), so my electric fuel cost is effectively zero. That will change once my wife purchases an EV to replace her ICE-powered SUV, as she is threatening to do. I hope to convince her to purchase a plugin hybrid, but that may be an uphill battle."*

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Great letter, Paul, and good luck on your uphill battlefront.

Here is a letter from [Mothusi Pahl](#) about a technology entrant that makes sense based on what he sent me. I asked Mothusi to write a letter for the Burrito explaining the new venture he is assisting. " *While Burrito readers such as Les Giuliasi and Bob Hoffman know that I spend most of my time these days in/around [decarbonizing the heat side of the energy marketplace](#), distributed applications for power generation and grid stability are always of interest.*

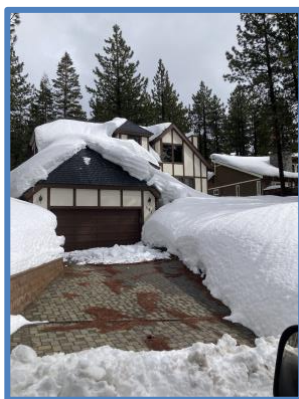
*"Needless to say, recent geological thermal storage research in Kern County, and startup projects like Premier Resource Management's long-term thermal reservoirs for concentrating solar thermal in the west side of the San Joaquin Valley would seem to be one of potential scale and economic decarbonization fit with CA's objectives.*

*"Mike Umbro's & J Lederhos' rechargeable geothermal battery still requires long-haul electrical transmission. But leveraging Central Valley geology and existing Bakersfield-type hardware and know-how to store and dispatch clean peak power deserves a deeper look.*

*"Similarly, given the often-conflicting objectives between our state's climate goals, versus our citizens' energy appetites, versus the economic interests of our legacy oil and gas industry, this pilot-scale approach could be appropriately expanded to both meet peak electricity needs and drive a transformational opportunity for the decarbonization of Kern County's high-skilled oilfield economy. Here's a [recent link from a parallel NREL project](#) located out-of-state."*

Thx, Mothusi. I like the concept but of course the operational details are above my paygrade. Terrific press release you sent us from NREL. Good luck with your project. Don't use SVB as your lender ... just saying.

### >>> Odds & Ends (!\_)



A few of you have inquired about my health and safety at my home in Lake Tahoe. Fear not, it's all good. On the left is a pic that my handyman took and sent to me. It idealizes the virtue of natural gas used to heat the glycol that runs under my driveway pavers, and the power needed to pump the same ... and most of the power is generated using natural gas, some coal, and a smattering of other resources. Pretty good result, eh?

No Burrito next week. *Voy a ir a Ciudad de México. Así, yo te doy tus historias.*



### Senior Truisms

1. The biggest joke on mankind is that computers have begun asking humans to prove they aren't a robot.
2. When a kid says "Daddy, I want mommy" that's the kid version of "I'd like to speak to your supervisor."
3. I don't mean to interrupt people, but I just randomly remember things and get really excited.
4. I thought growing old would take longer.
5. It's weird being the same age as old people.
6. I'm at that delusional age where I think everyone my age looks way older than I do.
7. Just once I want a username and password prompt to say CLOSE ENOUGH.
8. If I am ever on life support unplug me and plug me back in and see if that works.
9. Do you ever wake up in the morning and look in the mirror and think... "That can't be accurate.?!"

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10. I see people out there zip lining and mountain climbing and here I am feeling good about myself because I got my leg through my underwear without losing my balance.
11. Last night the internet stopped working so I spent a few hours with my family. They seem like good people.
12. If Adam and Eve were Cajuns they would have eaten the snake instead of the Apple and saved us all a lot of trouble.
13. We celebrated last night with a couple of adult beverages...Metamucil and Ensure.
14. You know you are getting old when friends with benefits means having someone who can drive at night.
15. Weight loss goal: To be able to clip my toenails and breathe at the same time.
16. After watching how some people wear their masks, I understand why contraception fails.
17. Some of my friends exercise every day, meanwhile I am watching a show I don't like because the remote fell on the floor.
18. For those of you that don't want Alexa listening in on your conversation they are making a male version....it doesn't listen to anything.
19. I just got a present labeled, From Mom and Dad, and you know damn well Dad has no idea what's inside.
20. Now that I have lived through a plague, I totally understand why Italian renaissance paintings are full of fat people lying on couches.
21. Now that we have everyone washing their hands correctly...next week.....Turn Signals.

### **Groaners and Dad Stuff**

I have a few jokes about unemployed people.....but none of them work.

Will glass coffins be a success?.....Remains to be seen.

What's the difference between a hippo and a Zippo?.....One is really heavy and the other is a little lighter.

Two windmills are standing in a wind farm. One asks, "What's your favorite kind of music?" .....The other says, "I'm a big metal fan."

Hear about the new restaurant called Karma?.....There's no menu - you get what you deserve.

I went to buy some camouflage trousers yesterday,.....but couldn't find any.

What do you call a bee that can't make up its mind?.....A maybe.

I tried to sue the airline for losing my luggage.....I lost my case.

Is it ignorance or apathy that's destroying the world today?.....I don't know and don't really care.

I wasn't originally going to get a brain transplant,.....but then I changed my mind.

I saw an ad for burial plots, and I thought:....."That's the last thing I need!"

Sleeping comes so naturally to me.....I could do it with my eyes closed.

What do you call a super articulate dinosaur?.....A Thesaurus.

You're not completely useless,.....you can always serve as a bad example.

I broke my finger last week.....On the other hand, I'm okay.

Don't spell PART backwards.....It's a trap.

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What is the best thing about living in Switzerland?.....Well, the flag is a big plus.

Did you hear about the guy who got hit in the head with a can of soda?.....He was lucky it was a soft drink.

To the mathematician who thought of the idea of zero.....Thanks for nothing!

Son: "Dad, can you tell me what a solar eclipse is?".....Dad: "No sun."

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We're done. See y'all in two weeks and have a wonderful and fully lubricated St. Patrick's Day.

gba