

“The opposite of courage in our society is not cowardice, it is conformity.”

Rollo May

“The SVB bailout has turned the tech ecosystem into an overpriced public utility.”

John Dizard



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You'll have to excuse my overbearing happiness this week. Last Saturday, my son and daughter-in-law called me with the news that they are expecting their first child in October. That elevates my status from human to grandparent. This was the

announcement that I felt I would never hear. I tried to keep it on the downlow but, you know, when you write a newsletter for over 4,000 readers it's not going to happen. I'm bursting with pride. One more Ackerman, God willing, walking planet earth.

Ironically, when I visited my son in Seattle last January, it was probably before they were pregnant. He and I had a serious discussion about my after-life arrangements. I didn't care one way or another, but I thought my son might. I asked him think about the options and let me know. A few weeks later, and possibly by then they were aware that she was in her first term, he stated that if possible he would like me interred in the same cemetery in Costa Mesa as his grandparents, i.e., my parents, and a few other family members. I was relieved to hear his thoughts because left to my own devices I simply was paralyzed with indecision. That done I am now working on my epitaph: I Came, I Saw, I Argued.

Western States Playbook
CAISO YTD Renewables Curtailment.

As of 4/19/23:	1,447,378 MWh
As of 4/19/22	1,208,143 MWh

% of solar and wind output curtailed:
 YTD as of April 19, 2023 8.66%
 YTD as of April 19, 2022 7.09%

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

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Mopping Up an Error

In last week's Burrito, I reported on the CAISO's recently released draft transmission plan. One of the bullet items I wrote was: "The proposed plan to set an underwater HVDC line from Diablo Canyon into the LA basin was not evaluated because LADWP has been able to decide upon its interest in the project." I forgot the important word, the second "not." I meant to write, "has not been able ...". Small error, big impact.

Berkeley Gets Stuffed

The Honorable Ninth District Court of Appeals reversed a lower court ruling that upheld the City of Berkeley, California's ban on new natural-gas appliances, importantly gas stovetops and ovens. We live in an age where the courts provide a thin line between freedom and insanity. The [WSJ ran an editorial last Monday](#) that explained the course of events. "The California Restaurant Association challenged Berkeley's ban in federal court, arguing that the Energy Policy and Conservation Act (EPCA) pre-empts local regulation of gas appliances. A lower-court judge disagreed but was overruled Monday by a three-judge Ninth Circuit panel." The EPCA explicitly prohibits

states and localities from regulating "energy efficiency, energy use or water use" once a federal energy conservation standard becomes effective for a covered product. The law's federal pre-emption covers local regulations concerning gas appliances. A pity. Further litigation may ensue if the SCOTUS chooses to hear a petition by the City with ample support from the Biden (sic) Administration. The editorial concluded, "But as usual, progressives are seeking to advance their anti-fossil fuel agenda through a legal back door when they can't get it through Congress." Amen and goodbye.

Put Some Irony in Your Nuc

In a separate [article in the WSJ last Monday](#), there was a story about Finland firing up a new 1,600 MW nuclear plant on the same weekend that Germany shut down its last three remaining nuclear facilities. Entitled, "[Europe's Largest Nuclear Reactor Launches as Continent Splits Over Atomic Energy](#)," it details the vast differences in national energy policy amongst Western European nations. Germany, Lithuania, and Italy have shuttered their nuclear facilities; Belgium, Spain, and Switzerland are planning to close their nuclear plants within the decade; however, France and the UK are embracing the nuclear option. Whereas I thought the German government by now would have come to its energy senses after the Russian invasion of the Ukraine, the extension of the three nuclear plants was only three or so months into 2023 to get the country through the winter. So, those permanent closures were a bit of sad news.

On the other hand, I didn't know that Finland was building a new nuclear plant. According to the article, "*Initially due to open in 2009, the Olkiluoto 3 plant faced lengthy planning delays partly as a result of the construction of advanced safety features. It had been producing energy as part of a testing phase for the past year, and will supply electricity for at least 60 years.*" The plant will provide 30 percent of Finland's electric energy and the resource, along with the two older Olkiluoto plants will complement the country's other clean energy resources such as hydro power and wind. Attitudes about nuclear power continue to shift in a positive direction, but not uniformly as the range of countries' energy policies presently sits very differently. Based on recent Finnish polls, 60 percent of the population favors nuclear energy and only 11 percent are against it. Per the [WSJ](#), "*Even Finland's Greens party has dropped its opposition to nuclear power, unlike its counterparts in other European countries.*"

In the U.S. and California in particular, the fate of the state's last nuclear plant, PG&E's Diablo Canyon, hangs in the balance at the Nuclear Regulatory Commission, which is awaiting PG&E's formal application to extend the plant's life beyond 2024/25. There hasn't been much public protest. However, I did read this item, which [ran in the AP on April 11](#): "*A complaint filed in San Francisco Superior Court by Friends of the Earth asks the court to prohibit the utility from sidestepping its 2016 agreement with environmentalists and plant workers to close the twin-domed Diablo Canyon Nuclear Power Plant by 2025.*" I've been expecting to see something like that since last September when the California legislature and Governor Newsroom ran roughshod over the previously inked agreements and statutes to close Diablo. But the recent protest is a whimper rather than a bang. It reaches to the state court system to uphold an item currently before federal review. The logic of the protest is plain, but the politics seem to disfavor removing Diablo Canyon anytime soon.

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 lower average prices without risking consumers' money.

Mid-C Prices Show that Water Flows Uphill

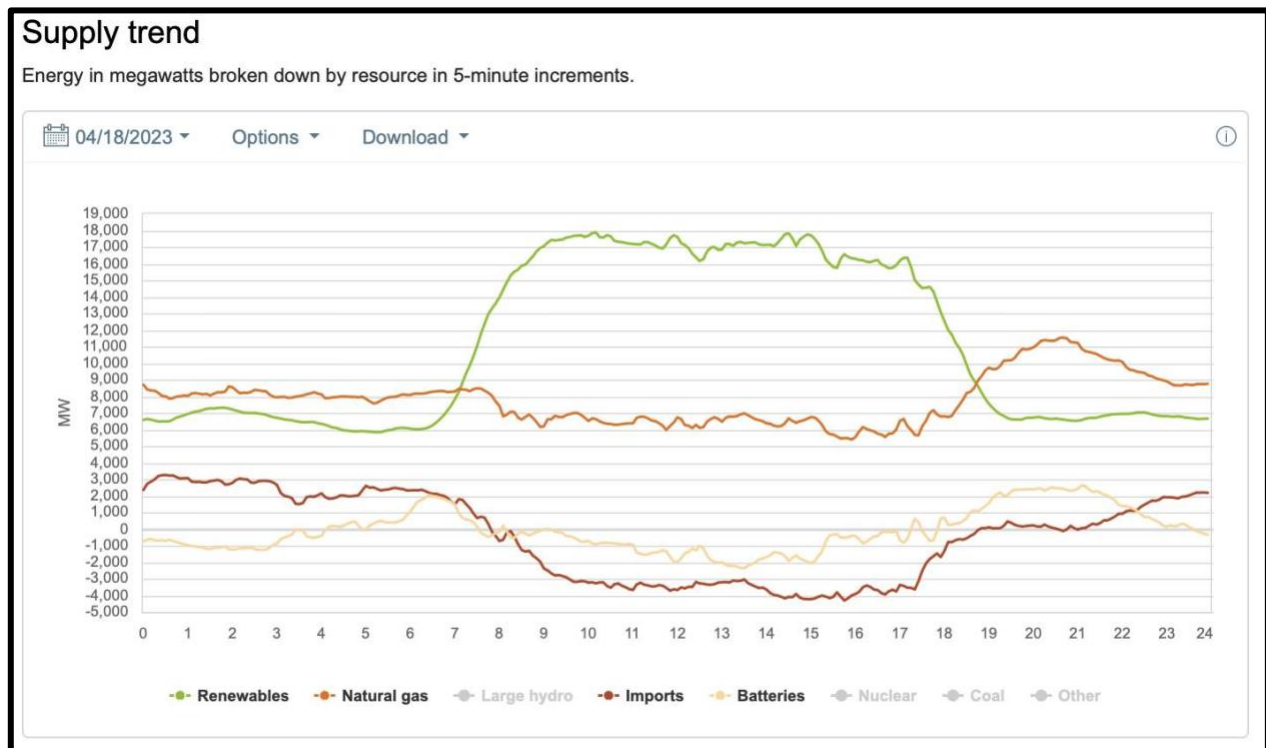
Help me get this right. It is April ... check. The spring snowpack runoff starts around now ... check check. Ample excess energy floods the markets (great word to use in this context) ... uh, sort of checked. Power flows from the Pacific Northwest into California ... uhm, no. No check. Power is flowing in the opposite direction ... from the CAISO and Desert Southwest to the Mid-C trading hub. Whatever might have been true in the past is no longer relevant. We can throw out the playbook about what has happened in the past. It's a new game and it might be permanent.

The trading fundamentals serve us well in this context. Mid-C prices have been almost double those at Palo Verde, and the spread is even greater than those relative to SP15. Note, too, that Palo Verde's nuclear units are currently at half the plant's fully rated capacity ... for refueling of Unit 2 (offline) and maintenance on Unit 1 (at half of full capacity). Check out the ICE

Weekend ICE Clearing Prices								Tuesday ICE Clearing Prices							
WEST Day Ahead Indices								WEST Day Ahead Indices							
Hub	Wtd Avg Index	Change(\$)	Change(%)	High	Low	Vol(Mwh)	No. of Trades	Hub	Wtd Avg Index	Change(\$)	Change(%)	High	Low	Vol(Mwh)	No. of Trades
Mead Off-Peak	69.33	10.08	17.01%	70.00	68.00	1,200	6	Mead Off-Peak	60.75	-8.58	-12.38%	62.00	58.00	800	4
Mead Peak	56.00	-4.25	-7.05%	57.00	55.00	800	2	Mead Peak	52.00	-4.00	-7.14%	52.00	52.00	800	2
Mid C Off-Peak	89.86	-6.04	-6.30%	95.00	87.00	4,000	20	Mid C Off-Peak	100.56	10.70	11.91%	104.00	95.00	1,800	8
Mid C Peak	119.93	5.94	5.21%	126.00	115.00	20,000	49	Mid C Peak	111.99	-7.94	-6.62%	120.00	108.00	19,200	48
NP15 EZ Gen DA	53.13	2.88	5.73%	53.50	53.00	3,200	7	Palo Verde Off-Peak	59.73	-10.31	-14.72%	60.00	58.00	2,600	13
LMP Peak	70.04	2.31	3.41%	71.00	68.00	2,800	14	Palo Verde Peak	54.07	-5.88	-9.81%	58.00	53.00	6,000	15
Palo Verde Off-Peak	59.95	-0.08	-0.13%	63.00	58.00	10,800	27	SP15 EZ Gen DA	63.10	-9.78	-13.42%	64.00	62.00	2,000	5
Palo Verde Peak	44.58	0.92	2.11%	45.00	44.00	18,400	41	LMP Off-Peak	39.44	-5.14	-11.53%	43.00	38.50	14,000	33
SP15 EZ Gen DA								SP15 EZ Gen DA							
LMP Peak								LMP Peak							

day-ahead results for last Friday (left) and Tuesday, above:

These are not one-off pricing opportunities in the sense that it's here for a day or so and then vanish. It appears to be systemic and the outcomes for last weekend and earlier this week show a lasting disparity. Might this help explain, for



April 21, 2023

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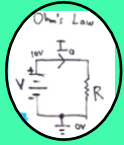
example, why the CAISO has been a net exporter for the last two weeks? For example, the CAISO was a net exporter last Tuesday from 7:50 a.m. to 6:45 p.m. as the chart below shows:

The day prior, on Monday, the CAISO was a net exporter until 9:30 p.m. There are 288 five-minute intervals in a day and on Monday for 176 of those intervals the CAISO was net exporting. Any uncommitted MWh in the CAISO were able to travel north and given the price differentials cited above, there was ample leeway to cover the export fees, congestion costs, transmission costs, and the market value of carbon in Washington State (about \$30/MWh¹). In fact, the trend above has been ongoing since April 7 (see the [feature article below](#) for more details) for reasons that stymie the unimaginative brain, lacking a conspiracy theory that the CAISO was on a tear to reduce renewables curtailments. But that theory would hold as

¹ For details on Washington State's Carbon Market and the key components that drive the Western energy markets, specifically the Mid-c trading hub, contact the Energy GPS team at sales@energygps.com.

much water as a Pacific Northwest hydro forecast for this winter because the CAISO doesn't mandate the clearing prices in its markets or at the Mid-C. It simply clears bids subject to operating constraints at what the market participants bear. I think. I hope.

Treatise on Why Bank Failures are Necessary and Efficient



Catch Some Z's

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

Time to Get Real

With the CAISO past the quarter century mark, it is time to assess the progress made toward regional expansion. Although I am agnostic about this topic, I remember the RTO West discussions of the late 1990s and the many attempts since then to turn the CAISO into an RTO.

On the surface, it makes a lot of sense. Historically, California imported 25% of its energy from out-of-state suppliers. It is also interesting that four out of the last five CAISO CEOs were non-Californians, and two were from the Northwest. I imagine every new CEO quickly understood that the only way to reduce CAISO costs, including transmission, was to expand the CAISO footprint.

Twenty-five years later, with regional EIM representing only 5% of the market, regional expansion is still far off. I have always wondered whether governance is really the main obstacle preventing regional expansion! Why should anyone expect an out-of-state utility in Oregon to join the CAISO when California utilities such as LADWP, SMUD and IID, which have more load than the states of Oregon and Nevada combined still are not part of the CAISO? Maybe we should prioritize finding ways to attract those in-state utilities to join the CAISO. This would clearly lead to improvements to the existing market.

Since the summer of 2020's one-day shortage event, the CAISO implemented a rule whereby exports from CAISO to any non-CAISO utilities, even if it is in California, can be curtailed before CAISO firm load is shed. This can occur even when the CAISO is a net importer. Implicitly, the CAISO would rather shed load served by utilities outside of the CAISO rather than do the same within its footprint.

After 25 years, the CAISO is here to stay, but instead we may reconsider focusing inward. Let's face it, when my wife goes back to her home in Montana, she would rather rent a car in Montana rather than drive her California car showing California license plate. Why? I will let you figure it out. Hint! We are not welcomed with open arms outside of our Golden state.

John Dizard enjoyed a stellar career as a regular columnist for [The Financial Times](#) for more than 20 years and now has a private [Substack blog named, "Thinking Ahead."](#) John was also a keynote speaker at WPTF's last general meeting in Palm Springs, which I reviewed in the [March 10 Friday Ol' Man Atmospheric River Burrito](#). His latest entry is entitled, "Venture Capital Needs a Reset," and I believe the topic and his commentary are germane to the clean-energy epoch that has launched startup technologies that feed the collective fantasy of the 100% net neutral gang ... ranging from hydrogen production for power generation to advanced long-term battery storage systems. John's article deserves a close read because it makes a strong case for ... dare I say it ... bank failures.

His thesis is, "*If venture investing is underwritten like a Federal agency, then there is no good case for it to earn premium returns through informed and responsible capital allocation.*" In other words, lax performance and shadow securitization underwritten by federal regulators make for ill-informed, mis-spent capital that warrants a wipeout rather than a savior. The Silicon Valley Bank (SVB) failure demonstrated the inefficiency of saving mid-size banks that take on reckless risks.

It's a harsh reality that smacks of evolution by elimination of less competitive species, but can it be denied? Do we owe venture capitalists an out for bad decisions? John wrote: "*Entrepreneurs are having to accept 'down round', or lower valuations for their companies when they raise new money. Loans for startups without revenue are drying up. Otherwise, though, within a couple of weeks SVB's failure had become, as one VC told me 'an afterthought'. ... SVB's failure should have been allowed to trigger a purgative crash in venture investing and poorly conceived and managed startups ... Instead, several more years will be required to cut the excesses and recreate innovation*

finance. For now, the VCs are over-funded and so are under little pressure to shed their underperforming investments and partners." John provides several examples of the up-and-down cycles of venture financing, typically the most expensive type of money for a new business in startup mode. It makes sense in down business cycles that under-employed resources

combine into new groups of talented enthusiasts launching new and creative ideas. But to get to that point, a fertile bed of circumstances must exist: "Failures are necessary, though, to force us to abandon outdated technologies and liquidate unproductive or marginally productive capital."

Bruschetta with Chef [Laura Manz](#)

"I was delighted to receive a last-minute dinner invitation and this recipe for bruschetta made sure I was a contributor to the festivities. The best part about bruschetta is that you can make it as simple or complex as time and interest permits, so have a little fun with your masterpiece. A loaf of good French baguette or crusty Italian bread becomes your canvas."



Slice and either toast or broil the bread slices until slightly browned. Rub each piece using a clove of garlic that has been cut in half. Brush each piece with extra virgin olive oil.

5. However, when IOUs do the investing, the risks to them are minimal or non-existent because ratepayers cover all the costs.

What we believe... (cont.)

6) Overcapacity lowers electricity spot market prices; yet retail rates can increase in this case due to full cost-of-service regulation.

7) Markets work best when there

In a small bowl, chop two large heirloom tomatoes, add minced herbs such as basil, oregano, thyme, etc. Spread the mixture on the toasted bread, use salt and pepper to taste. Arrange on a platter and garnish with a sprinkle of more herbs and optional a splash of aged balsamic vinegar. For a cheesy alternative, top the bread with shredded mozzarella and return to the broiler until it is brown and bubbly before topping with the tomato mixture.

Thanks, Laura. I pine for the warm bruschetta with cheese, but the cold version is okay too. Can't over emphasize the importance of good bread. That might be the most difficult ingredient to find.

Here is your toasty app for this week:

- >>> Things in the People's Republic of California
 - @@@ Why are Gas Plants Running Every Hour Each Day?
 - >>> Shout Outs and Murmurs (👁️ & 🗣️)
 - >>> Odds & Ends (!_!)
-

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

@@@ Why are Gas Plants Running Every Hour Each Day?

As I noted in the discussion on [Page 3, above](#), I have pondered why a portion of the CAISO natural-gas fleet has been producing energy every hour of every day. [Last week I noted](#) that, "If you wish to conclude that California is on the yellow brick road of climate salvation, then explain why the gas units were operating at that level or any other level? Was California exporting gas-fired MWh? Obviously, that is an oversimplification because the data lacks the granularity to determine why the gas units need to remain online through midday. It could be for reliability requirements (i.e., local congestion, ancillary services), or that the CAISO operators wanted to make sure the system was ready for the evening ramp." My wonderment continued this week because CAISO exports were way up, [as I wrote above](#), and there was a blog item I read boasting how the CAISO is meeting demand almost entirely with renewable energy. First question: If the CAISO is almost 100% clean energy, then typically why are 4,000 MW or more of gas capacity dispatched across all hours on these same days? Second question(s): Can the gas units be replaced with battery energy storage systems (BESS) in any way, shape, or form to meet the system demand, the evening ramp, local congestion, voltage support and overall grid reliability? Can natural gas be eliminated from the CAISO grid?

The first question can be approached in several ways. For example, I can do an armchair analysis based on conversations with colleagues as to their thoughts and summarize accordingly. However, those conversations lead to other unanswered questions, none of which my pals or I could answer without more data. But where can data be publicly found?

The leading answer among the cognoscenti thus far has been that gas plants are scheduled across the midday even while the sun is beating down on solar panels and wind turbines spinning to prepare for the evening ramp. That is, as the sun sets the grid must be ready to provide flexible supply to meet the net demand. On Wednesday, for example, the average ramp was 14,622 MW. However, if the gas units that have been committed for the day are running at minimum load during midday then it doesn't seem likely that the total minimum online capacity for any five-minute interval would be as high as 4,000 MW, or higher. Possibly 3,000 MW or less but that is just a wild-ass guess.

Therefore, I endeavored to scrape the April "Today's Outlook" data provided by the CAISO for the first 19 days of the month to examine ... well, I wasn't sure what I wanted to examine but eventually I settled upon daily maximum and minimum dispatch of the gas fleet and the minimum net load for the same. The results are shown in the table below:

The first seven days of April, and last Wednesday (April 19) were ones when the CAISO was a net importer of energy (muddy brown) and renewables curtailments were enormous. On the green dates grouped between April 8 and April 18

April	Min Gas Production	Max Gas	Min Net
1	4086	7217	5327.00
2	3206	6847	4315.00
3	4472	9332	4860.00
4	4715	11263	4143.00
5	6026	12263	6456.00
6	5419	11055	6145.00
7	6054	10802	5790.00
8	4485	9817	2474.00
9	4097	11177	939.00
10	5528	13081	2855.00
11	3732	11030	2205.00
12	4612	11053	603.00
13	4888	10581	1754.00
14	4709	10654	1130.00
15	4264	10710	1420.00
16	2923	8431	(825.00)
17	5290	13063	225
18	5389	11541	1576
19	5026	10484	5296.00

the CAISO was a net exporter and renewables curtailments were modest ... very much so. Check out the minimum net load on those latter dates ... it's like someone flipped a switch in the control room and allowed the minimum net load to fall significantly from 4,100 MW or more to perilously close to zero. In fact, the minimum net load on April 16 was -825 MW ... a new record as far as I know. Regardless, my heuristic evaluation of that data did not show any significant differences in the min and max gas throughput.

Equally surprising to me was that the swing in natural gas dispatch across all the days was roughly in the same ballpark. That is, anywhere between 3,000 MW and 7,000 MW ... which is far less than the evening average ramp. I thought gas was the whole story behind the ramp and that's why the fleet idled at minimum load across the afternoon. But gas only explains half or less of the resources for ramping up. Large hydro, and imports seem to be in play as well.

My next foray into the data was the percent of net load served by either natural gas or net imports. I started by collecting the data for Saturday, April 1 and at first I limited the observations to the

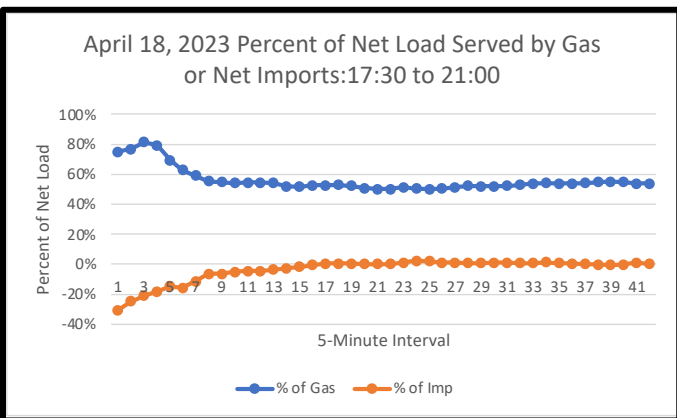
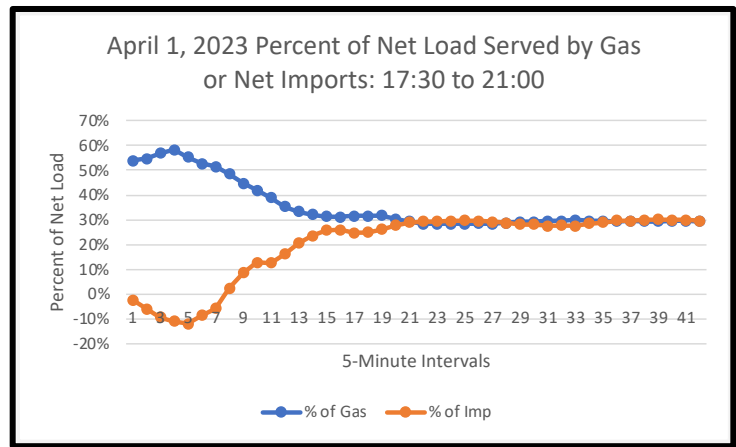
availability hours between 17:30 and 21:00. I did not expect to see the curious diagram shown on the right:

- ... 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

Damn, what did I stumble upon? At first I thought it represented the price parity between imports and gas marginal costs. But I discarded that idea because the percentages of net load fall on top of one another around 30% each ... meaning that I was looking at the result of an import nomogram whereby the cocktail requires one unit of gas for each unit of net import. Is it possible that this dispatch result is solely the outcome of the bid stack in the day-ahead and real-time markets? Grumble grumble.

I checked the same info for other April days and the alignment of the tail percentages wasn't as tight as for April 1. As you can imagine, as the net load fell in the midday and net imports go negative (thus, net exporting)

the percentages for gas and imports were meaningless. However, from the evening ramp throughout the nighttime and until the morning ramp the next day, the two percentages in early April were very close, but eventually spread such that by this week if there was a nomogram enforced then I surely could not see it. For example, see the April 18 plot below left.



So, in conclusion, sort of, the gas fleet is carrying the CAISO grid throughout the day to assure there is ample capacity to meet the ramp even though gas is only half or less of the average ramp rate during the critical hours. Apparently, net imports are coming in slower during the evening ramp meaning the gas fleet has become more critical as the month progresses.

My second question was: Can the gas fleet effectively be replaced with a larger BESS fleet? Given current lithium-ion technology, no, BESS cannot replace gas if the current market mechanisms remain. There would have to be a stacking of BESS projects that have full states-of-charge before the start of

the evening ramp, which by necessity means CAISO command and control dispatch. Otherwise, all players in a larger BESS fleet would want to act unilaterally based on the same market-price signals. I mean, which BESS assets go first and which would have to wait for their turn to discharge? It would be a bloody mess.

I checked with my colleague Phil Muller to see if he could imagine a BESS-for-gas replacement scenario that could be modeled, and he wrote: "I looked at today's numbers and the difference in net demand from 16:00 to 20:00 was around 20,000 MW, which would be about 5,000 MW per hour. Thus, 5 GW of fully charged 4-hour batteries would be needed to meet the ramp. A couple of weird days (i.e., Winter (Energy Inaccessible) Renewable Drought), there would probably not be enough solar and wind to sufficiently charge the batteries to make it through the ramp.

"I don't see how to get rid of gas in any way shape or form, until whole lots of other changes to both supply and demand make it through WEIRD times. Substantial amounts of long-duration storage would be needed to get through those periods. I imagine that the cost of all that incremental storage would be much greater than the cost of using natural gas to store the energy and use it when needed. Lots more baseload GHG-free generation - geothermal, hydro and nukes - could maybe charge the batteries on WRD days, but gas currently exists and is relatively clean versus alternatives."

Perfecto, Phil. The natural gas fleet is needed and here to stay regardless of what the System Planning Coloring Books say.

>>> Shout Outs and Murmurs (👏 & 🗣️)

Alan Padgett sent this note about the CAISO draft transmission plan: “I thought I would share with you the link to the [slide deck on 2022-2023 Transmission Plan](#). The second section on Frequency Response Assessment and Data Requirements, caught my attention in that it seems to paint a rosy picture that inverter based resources (IBR, mainly renewables and batteries) can provide adequate frequency reserves, but fails to highlight the risk if these resources do not have length. The last two words on the conclusions slide should be in bold: ‘adequate headroom.’”

Thanks, Alan, and I’m glad you wrote to me about that overlooked item. I was going to plow into the topic in my review last week, but I feared that too many readers would not be attuned to the issue to profit from my thin understanding of the topic. But it is critically important that excess charging or discharging capacity be available to react in a timely manner to frequency disturbances.

The draft plan explains headroom as follows: “Headroom is the difference between the maximum capacity of the unit and the unit’s output. Units that don’t respond to changes in frequency are considered not to have headroom. Solar and Wind plants are designed to extract as much energy from the environment as possible and (BESS) plants when charging have a large headroom for under-frequency events.”

>>> Odds & Ends (👀)

No Burrito next week. Here are your stories for those who were given permission to peek:



After hearing input from some members, the WPTF Board has asked Gary to eliminate the “Below the Belt” section of the Burrito distributed to WPTF members. The Board appreciates there can be differing views on content like this that are intended to entertain.

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That’s a wrap and a half. We’ll do it again in May. Have a good couple of weekends.

gba