



KERN RIVER BOATERS¹
KR3 RECREATIONAL FLOWS PROPOSAL
SPRING 2024

INTRODUCTION

The Kern River No. 3 run-of-river hydroproject (KR3) diverts 605 cfs out of the North Fork Kern River (NFKR) at Fairview Dam into an artificial conveyance and does not return that water to the river until it reaches the KR3 Powerhouse just north of Kernville. The result is that 16 miles of river are dewatered — 15 of which have been federally designated with Wild & Scenic River status due to their outstandingly remarkable value in aesthetics, recreation, and wildlife. Since KR3 lacks any water storage, the project contributes nothing to our society’s needs for flood control, agriculture, recreation, or the environment, and cannot target its generation for peak demand; it just constantly takes water out of the river.

This is by far the closest river to Southern California that offers the potential for perennially enjoyable flows of exceptional quality. As an additional benefit, this river is roadside, making for easy public access and widespread recreational use. The whitewater it hosts is world-class — when there’s water. The North Fork Kern is a publicly owned treasure.

As shown in Figure 1, the Federal Energy Regulatory Commission (FERC) license that authorizes KR3 to divert water out of the NFKR creates a hydrograph below Fairview Dam that is unrecognizable in comparison to the natural inflows above the

¹ Kern River Boaters is a California Public Benefit Corporation with federal 501(c)3 status representing the interests of noncommercial recreation on the NFKR. See our work and community at kernriverboaters.com & fb.com/groups/kernriverboaters, respectively. Contact us at kernriverboaters@gmail.com.

dam, damaging the health of the river's ecology and decimating the recreational opportunities it would otherwise afford the public.

Investor-owned utility Southern California Edison (SCE) is presently seeking a new license from FERC to encumber the North Fork Kern with its diversion at Fairview Dam for the next 40 years. FERC is charged with formulating the new license so as to balance the need for this source of electrical power against our society's needs for recreation and a healthy environment. In short, FERC must decide the highest and best use of this river in the public interest.

Kern River Boaters believes the highest use is to leave flows in the riverbed during times when electrical demand is low, wholesale electrical prices are cheap, and our grid has massive unused capacity from renewable generators. These times form the belly of the so-called "duck curve" (see Figure 16), when the glut of solar energy in our state is so great that renewable generators are "curtailed" — forced to stand down and stop generating — and are readily available to replace energy from KR3. CAISO reports an average curtailment of more than 1,600 MW during these hours that is available to replace KR3's average of just 19MW, as shown in Figure 13. At these times — daylight hours during the low-demand seasons of late winter and spring — the water at Fairview Dam is far more valuable to Southern Californians being left in the river rather than being diverted into KR3's pipes; we just don't need excess power from KR3 at those times with other renewable generators standing by idle.

In that light, Kern River Boaters presents the following recreational flows proposal for the next KR3 license:

PROPOSAL

Recreational Flows: Between 6 a.m. and noon on these days, SCE shall limit its diversion of water at Fairview Dam to no more than 45 cfs:

- “Long Weekends” (Friday, Saturday, Sunday & Monday) in February & March;
- Every Day in April, May & June;
- July 01 through July 05; and
- Weekends (Saturday & Sunday) in October & November.

Exceptions: SCE need not limit its diversion any day where the 6 a.m. hourly inflow reading at Fairview Dam two days prior is less than 400 cfs. SCE may divert all incoming flows at Fairview Dam over 2,000 cfs. Edison need not limit its diversion during a Stage II or greater power emergency declared by the governing ISO.

RATIONALE

Scope. The current recreation regime affords boaters a small amount of extra water (150 cfs on average) on a small number of days (less than 8 a year on average). That is flatly inconsistent with the quality of the dewatered reach below Fairview Dam (world-class whitewater, roadside access, Wild & Scenic status) and the vast population it serves (Southern California). As Figure 2 shows, our proposal offers near-natural flows (all but 45 cfs) on an average of about 67 days a year — a scope worthy of our community and our river.

Planning. Under the current regime, boaters cannot tell whether additional water will be afforded until midnight the day of the potential release, leaving most with no effective notice of the release. Such extremely late notice is anathema to planning. Our proposal offers two full days notice that additional water will be available. This will drastically improve the ability of Southern Californians to schedule and book commercial rafting trips and greatly benefit local businesses.

Timing. The additional water provided by the current recreational regime doesn't get to the popular Cables run until very late in the afternoon. Under our proposal, the full river will be boatable by late morning and Cables will be runnable late into the afternoon. Our six-hour “bubble” of recreational flows is twice as long as that afforded at the South Fork American — the most popular and successful recreational regime in California, if not the entire country.

Peak Focus. Our proposal is focused on providing near-natural flows during the peak of the runoff season — every day in April, May, and June, when flows are historically at their highest, regardless of water year type. That maximizes all boaters ability to enjoy this river, whether in rafts, kayaks, duckies, or innertubes. Nature sets the unique water level — low, moderate, or high — and boaters of all craft the opportunity to use it on their choice(s) of runs as they see fit. See our proposal’s positive effects on hydrographs representative of varying water year types in Figures 4 through 9.

Shoulder Season Boating. Our proposal provides for shoulder season boating opportunities on long weekends (Friday through Monday) in February, and March, and weekends in October and November. This affords this generation of Southern California boaters — and the next generation, and the one after that — the opportunity to hone their whitewater skills and grow the sport almost year-round.

Valuable Flows: Since the early 1990s, the NF Kern boating community, and local businesses, and American Whitewater have all seen strong value in providing lower flow whitewater recreation, when those are the only flows available, due to the unique geomorphic composition of the river as well as its heightened importance for Southern Californian boaters. In some years, low flows are all we get, and they’re usually all we have during the shoulder seasons. Our proposal regains that lost value by providing additional water whenever flows reach 400 cfs, opening valuable opportunities for recreation in low water years and the shoulder seasons of others. It also recognizes that, as flows increase, the effects of KR3’s diversion, which is capped at around 600 cfs, are less strongly felt. Our proposal accordingly permits Edison to divert flows below 400 cfs and above 2,000 cfs — though we continue to urge them not to divert water from the Upper Kern when other renewable generators are available.

Targeted Energy Markets. As shown in Figures 10, 13 & 16, our energy market is characterized by the “duck curve,” renewable curtailment, and times of low-to-negative wholesale energy prices — all of which are a consequence of the explosion of renewable generators in our grid footprint. CAISO explains that these phenomena — and the opportunity they provide for keeping water in the Kern River — will only grow over time. Our proposal reduces KR3 output at times of the day and months of the year when energy demand and energy prices are at their lowest. In fact, as shown in Figure 3,

implementing our proposal would cost Edison less than 3% of the wholesale revenue KR3 generates. The public interest is best served by leaving the water in the river when energy prices are that low.

Green Replacement Energy. Since our proposal is targeted at times when there is heavy curtailment (forced outages) of substantial renewable generators (daylight hours of low demand months), the energy needed to replace that lost by KR3 will likely be sourced from modern, green, sustainable generators. KR3 historically generates at an average rate of just 19 MW per hour during these times, while more than 1,600 MW of renewable generates sit offline, ready to backfill losses from KR3. That amount will only grow over the next 40 years.

Responsible Government Oversight. Kern River Boaters recognizes the historical importance of KR3 in our state's energy production. At its commissioning in 1921, the powerhouse was a symbol of innovation and new technology. But now, more than 100 years later, KR3's contribution has decreased year after year and today contributes less than .04% of the state's energy, as shown in Figure 14, at great cost to the natural and social environments. Further, as shown in Figure 15, KR3 generates mostly in late winter and spring, when demand is low and modern renewables are forced to shut down for lack of demand. In 1921, little consideration was given the environment, whether for its contribution to society as place to "re-connect" with nature, or as a place for recreation. FERC should craft a 40-year license that recognizes these massive technological and cultural changes and not just fiddle around the edges of the *status quo*.

Stable Electric Bills. KR3 is not essential for dependable electrical service in the Kern River Valley. KR3 went offline for 16 consecutive months a decade ago and electrical service was not disrupted, as replacement energy was easily sourced from Delano through the Vestal transmission line. Nor did local bills go up, even though KR3 and its local sister plant (Borel) were offline at the same time. During the times our proposal asks for reduced generation, KR3 is usually *exporting* power out of the Kern River Valley. Our proposal permits Edison to continuously divert 45 cfs for power production to limit the need for imports. And at a *wholesale* revenue cost of less than 3% from this small generator and only minor increased transmission costs (see Figures 14 & 15), our proposal offers no basis for Edison to seek higher electrical bills. Our proposal ensures

that the Kern River — and the local and regional communities it supports — thrive for the next 40 years.

No Blackouts. As Figure 11 shows, our proposal is focused on leaving water in the river at times when electrical demand is low and excess renewable generation capacity is available. We value electricity, so our proposal asks for no water when demand and/or the threat of loss-of-load (blackouts) are at their highest: mid-July through the end of September. Nor does it ask for water during the morning or evening net energy ramps. And our proposal allows SCE to divert all the water it can during any Stage II or greater power emergency. Our proposal focuses on times when our grid is threatened by the risk of over-generation (as reflected in low market prices and curtailments); it does not impact times of under-generation.

Corporate Responsibility. The heart and soul of the Kern River Valley is the river itself, not only for boaters, but also for families to camp on, fish on, swim in, hike along, or simply sit on its banks and enjoy its natural beauty. It is also a major economic resource to the local community. More visitors would come and enjoy the community if its river was not so exceedingly dewatered by KR3 as it is today. Indeed, most people who love this valley support returning this river to its natural state. Sadly, due to (in our opinion) antiquated FERC regulations, that dream is not presently on the table. KRB nevertheless encourages SCE to give meaning to its stated Environmental Mission goals of “protecting natural and cultural resources.” We hope the company “protects biological and cultural resources and restores and preserves habitats” while seeking this license. In its Community Mission Statement, SCE claims it uses “shareholder funds from our parent company, Edison International, [to] support local organizations that help our communities shine bright.” Supporting our proposed recreational flows would show Southern California and the Kern River community that SCE stands behind what it says.

Community Development. The Kern River brings life to the Kern River Valley. It provides an incredible setting in which to live and is the heartbeat of the local economy. Kernville in particular touts itself as the “Whitewater Capital of the West.” There is a hunger in Southern California for more boating opportunities on the Upper Kern — meaning more dollars spent locally and more jobs for residents. Unlocking our river’s potential will lead to local prosperity that is currently locked away in a diversion for midday energy we don’t need.

Feasibility. Our proposal is eminently feasible. The current regime results in a “bubble” of flow; our proposal has one as well, but better timed and triggered. Our allows the public and SCE 48 hours notification to plan accordingly. Our proposal is targeted at times of the solar glut when wholesale electrical prices are low or negative and replacement energy would come from curtailed renewables. The water of the Kern is more valuable to society in the river than in Edison’s tunnels at these times. Our proposal permits Edison to always divert 45 cfs to mitigate swpeculative effects of tunnel cycling and small losses from the transmission of imports. (Of course, all though our proposal does not require it, we urge Edison not to divert this water if feasible and other renewable generators are available.) Finally, our proposal reduces the wholesale generation of KR3 by less than 3% to radically increase this river’s recreational potential in the public interest. We ask our boating community, the people of the Kern River Valley and Southern California, the managing agencies, and SCE itself to support and implement our proposal for the next 40 years of KR3 operation.

Figure 1. Project Effects, Median Water Year

This graph depicts flows above & below Fairview Dam for the median water year of the SCE dataset, 2018. The difference in flows is wholly attributable to the diversion of water into the KR3 hydroproject, dewatering 16 miles of river below the dam.

Source: SCE WR-2 Hydrology Hourly Dataset (2023)

Mean Flows, NFKR Above & Below Fairview Dam, Representative Median WY 2018 (cfs)

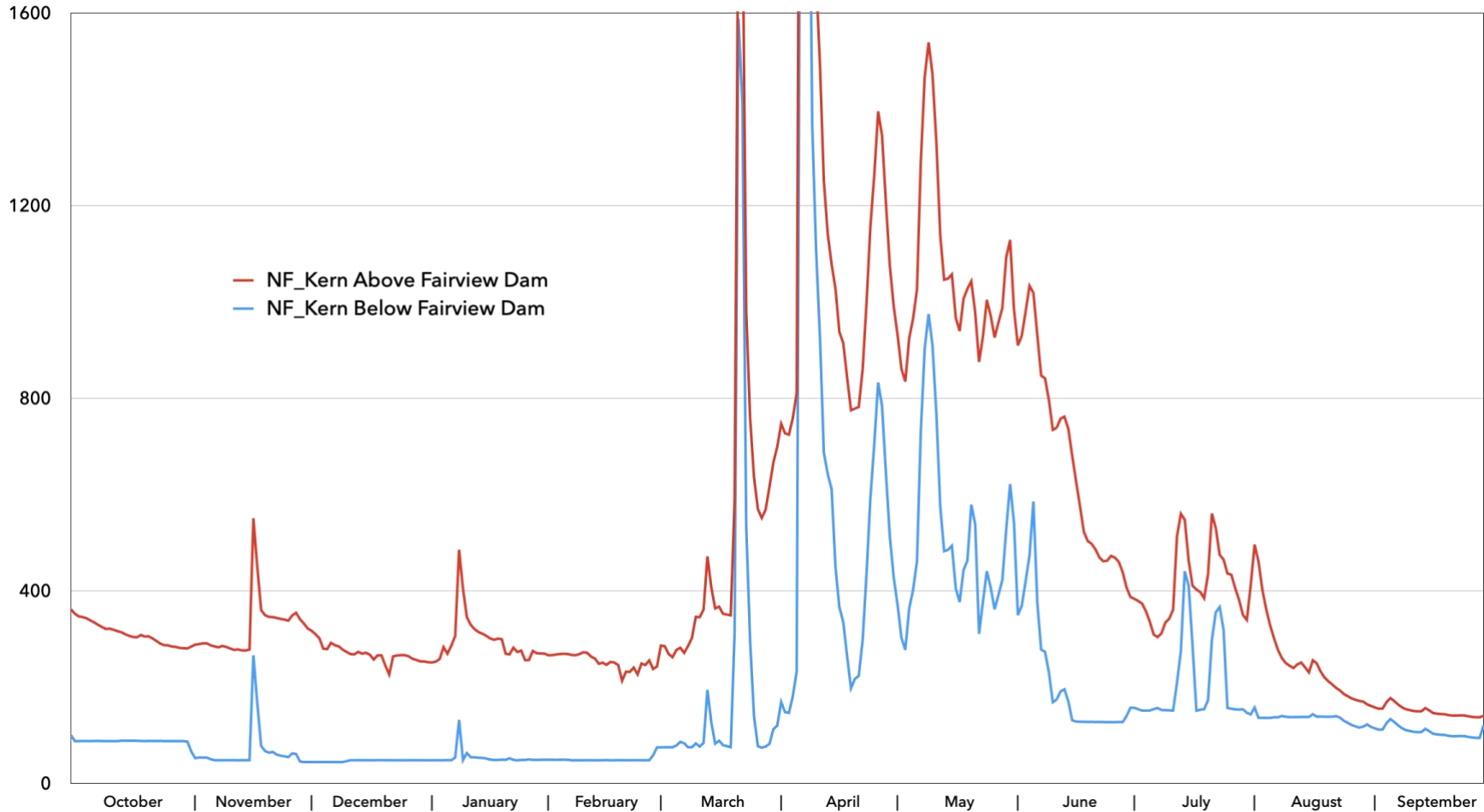


Figure 2. Proposal: Days With Additional Water

This chart depicts the average numbers of days per month the KRB Rec Flows proposal would provide additional water for recreation. Source: SCE KR3 Hydrology Dataset (2023)

Average Days Per Month with Additional Water under Kern River Boaters' KR3 Rec Proposal

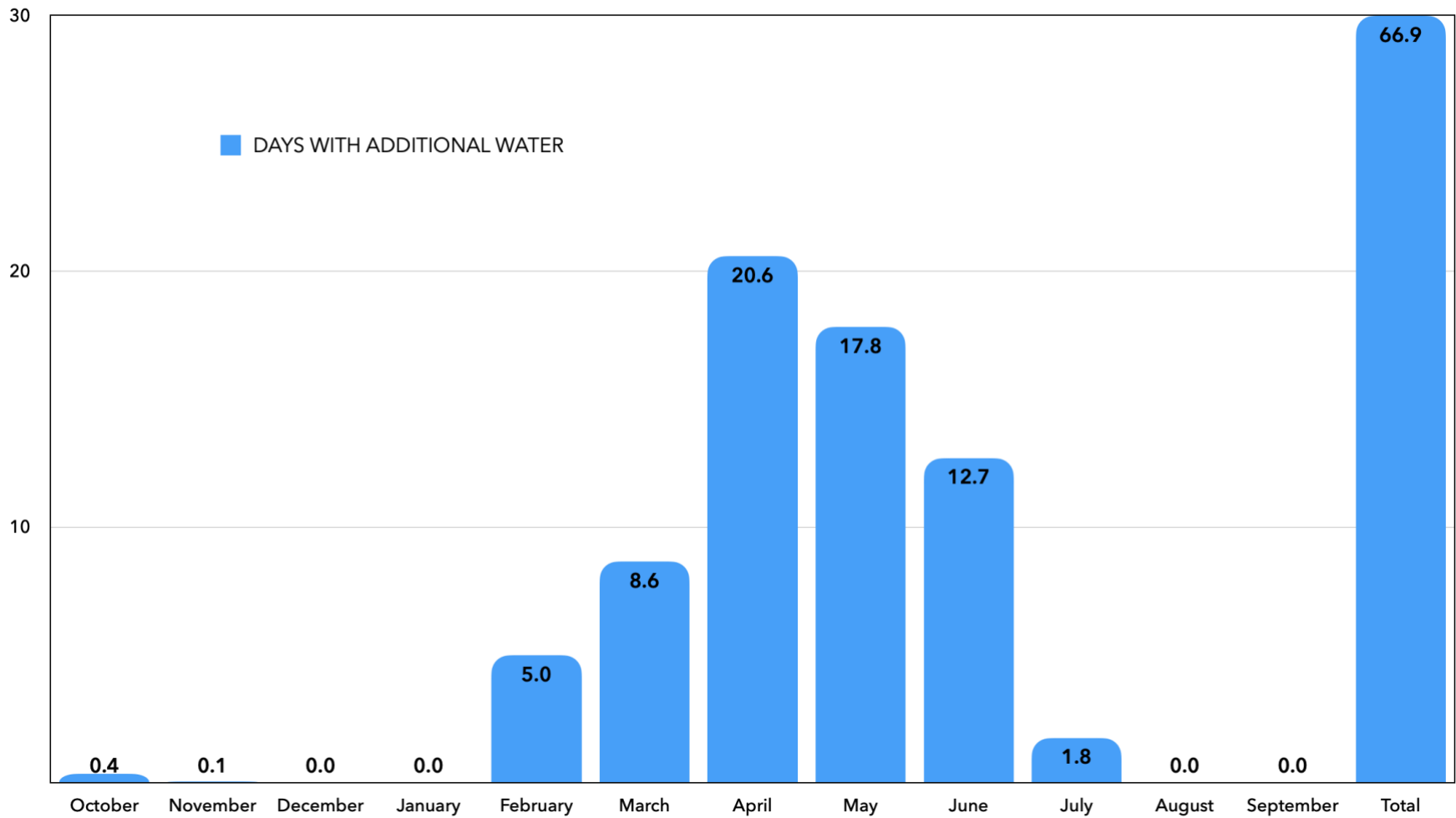


Figure 3. Proposal Energy Cost

Our proposal provides an annual average of 67 Rec Day releases (additional water) at near-natural flows (all but 45 cfs) during times when energy prices are low and replacement energy is likely to be provided by otherwise-curtailed renewable generators at a cost of less than 3% of revenue. Source: CAISO (<http://oasis.aiso.com/mrioasis/logon.do>) & SCE KR3 Hydrology Dataset (2023).

Kern River Boaters' KR3 Rec Proposal, Lost KR3 Revenue

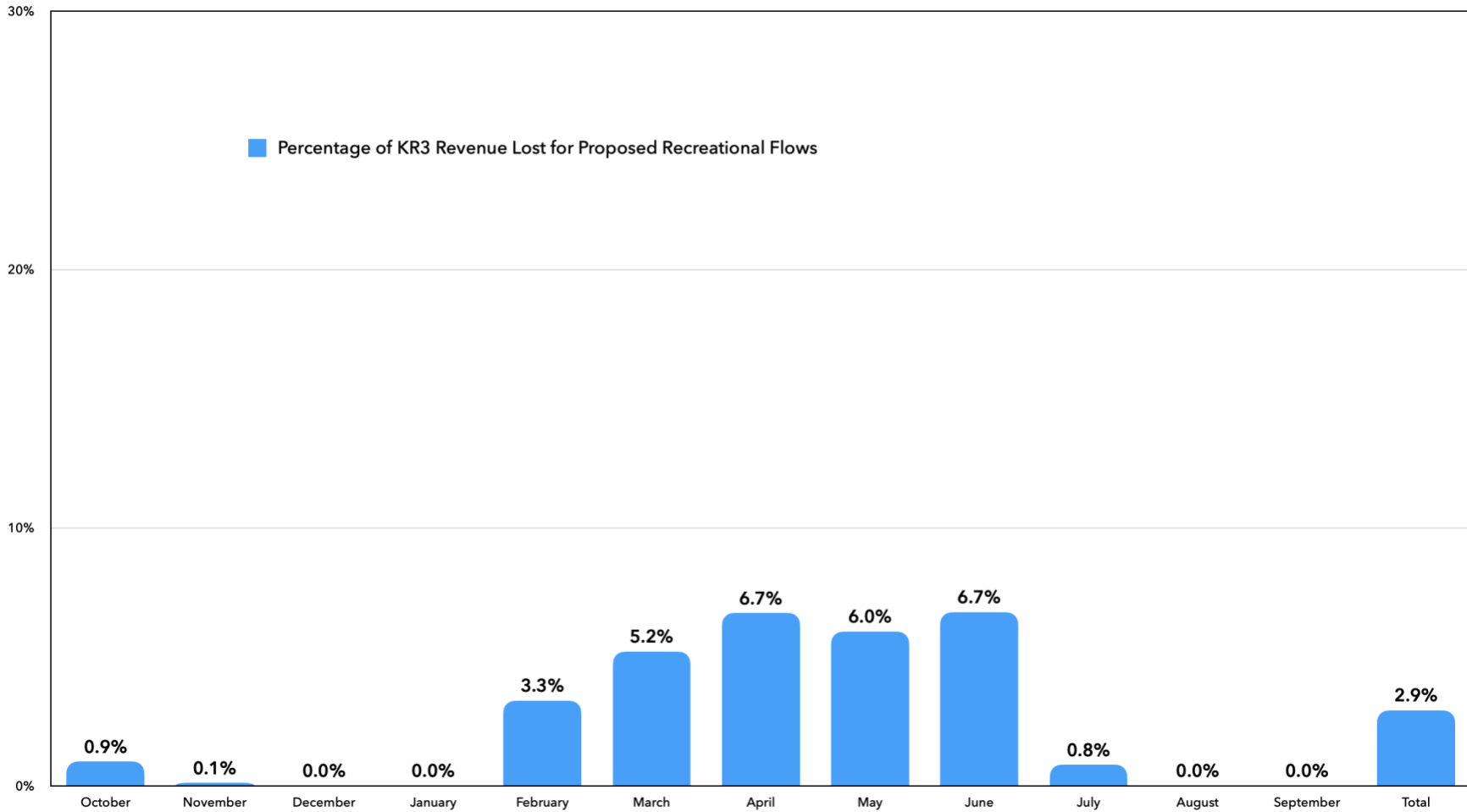
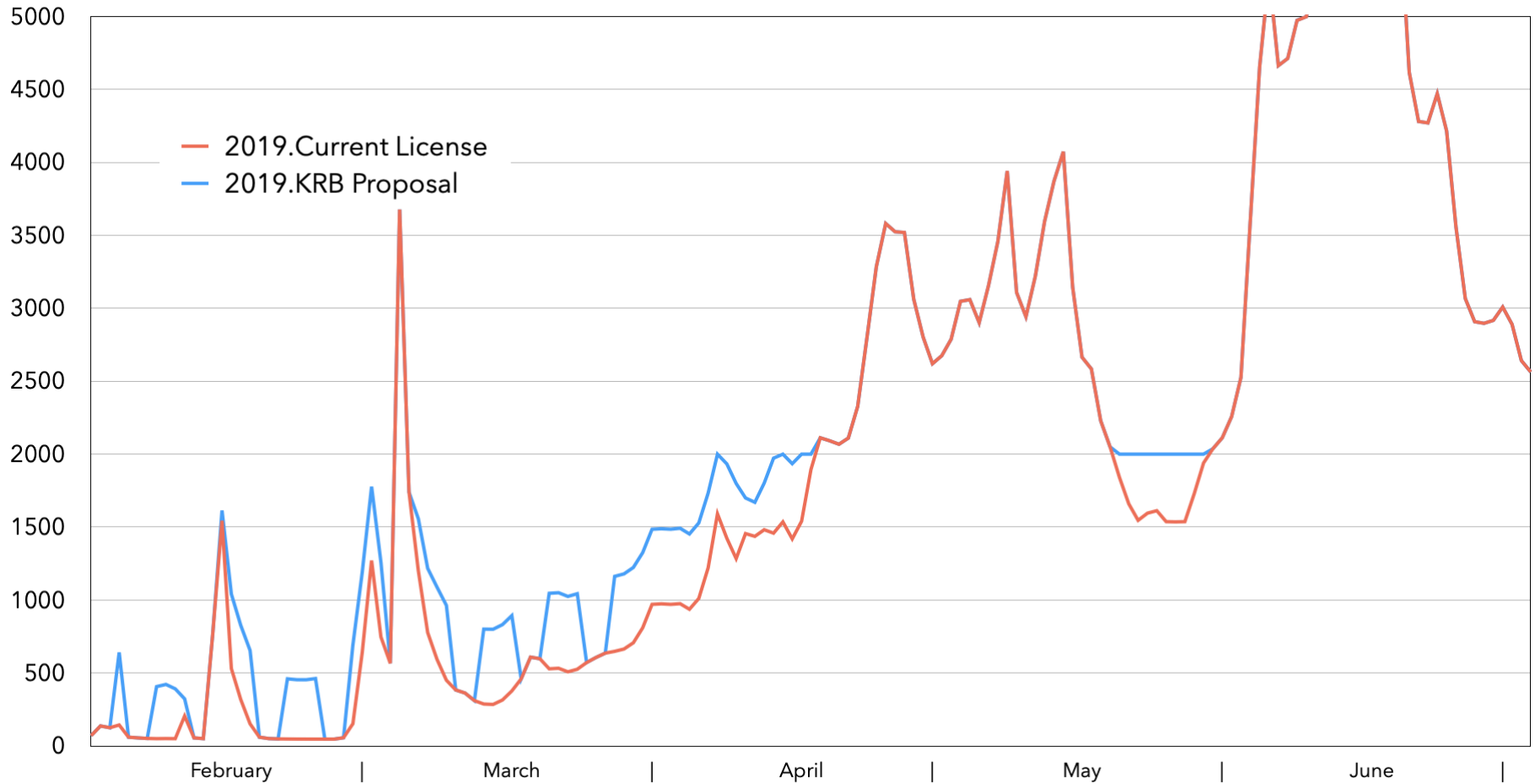


Figure 4. Flow Comparison, Wet Year 2019

This chart compares flows below Fairview Dam under the current license against those our proposal would provide, using the representative "Wet" water year of 2019.

10am Flow (cfs), KRB REC PROPOSAL v. CURRENT REGIME, Representative "Wet" Year (2019)

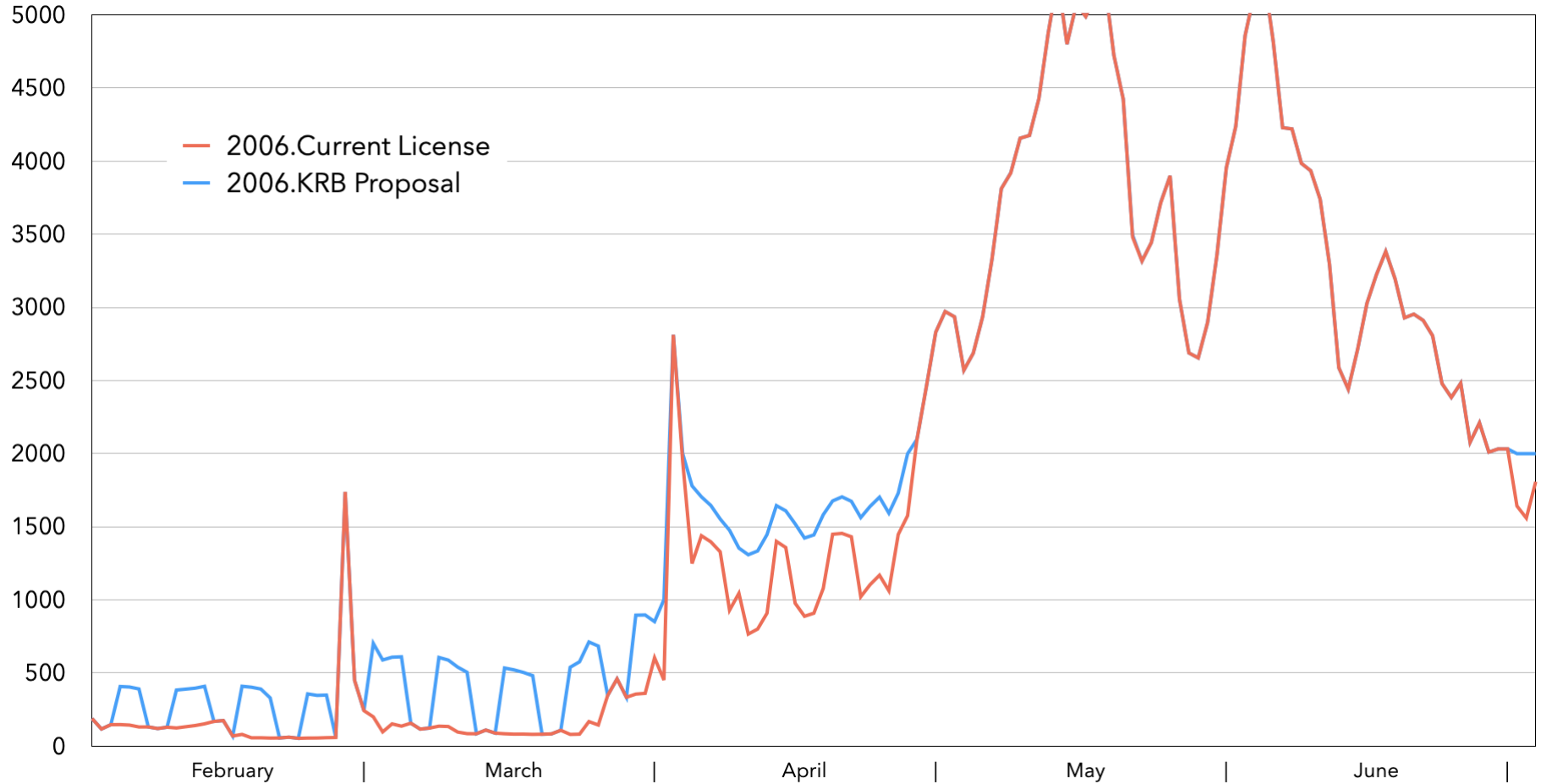


Source: SCE KR3 Hydrology Dataset (2023), KR3 License

Figure 5. Flow Comparison, Wet Year 2006

This chart compares flows below Fairview Dam under the current license against those our proposal would provide, using the representative "Wet" water year of 2006

10am Flow (cfs), KRB REC PROPOSAL v. CURRENT REGIME, Representative "Wet" Year (2006)

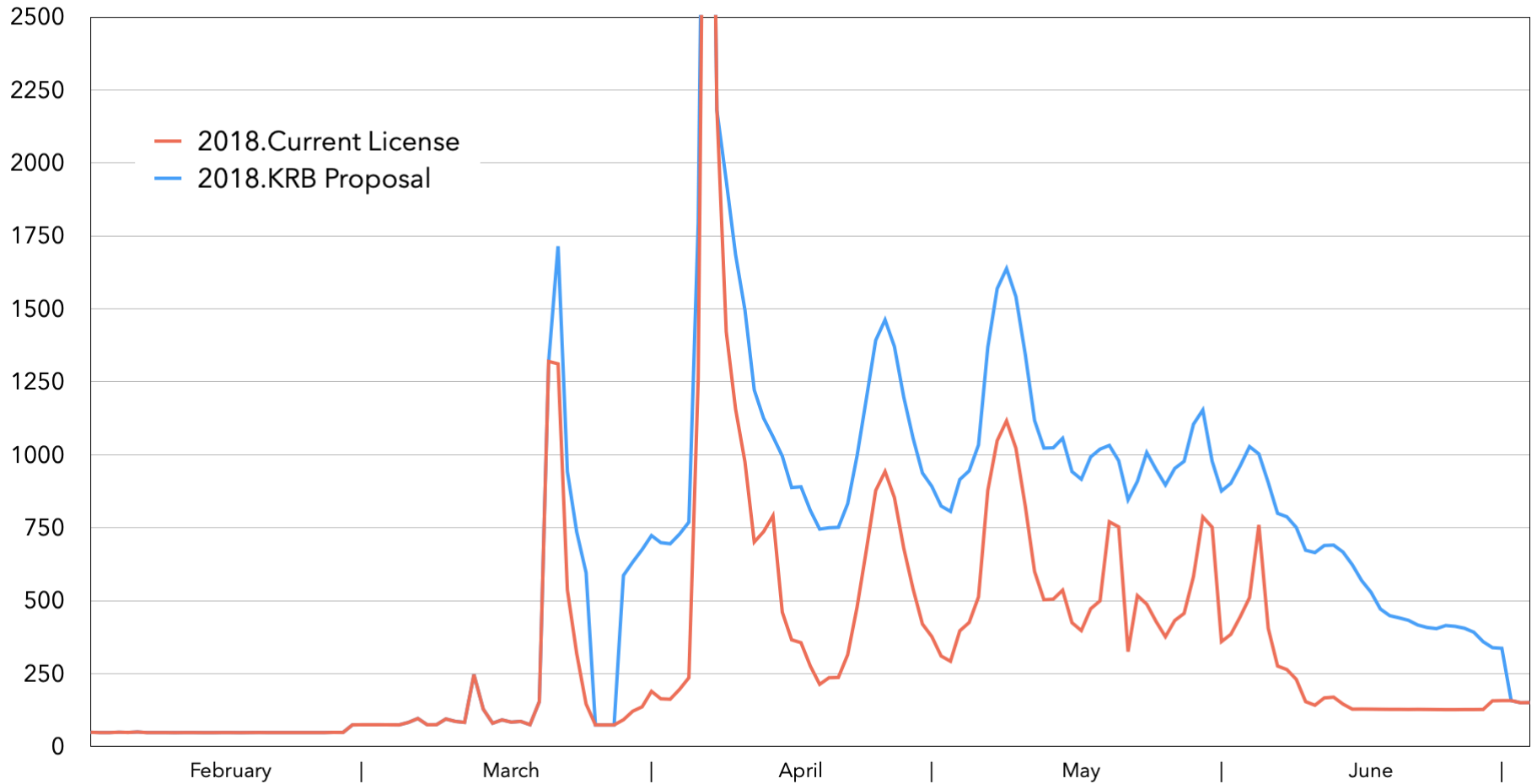


Source: SCE KR3 Hydrology Dataset (2023), KR3 License

Figure 6. Flow Comparison, Moderate Year 2018

This chart compares flows below Fairview Dam under the current license against those our proposal would provide, using the representative “Moderate” water year of 2018

10am Flow (cfs), KRB REC PROPOSAL v. CURRENT REGIME, Representative “Moderate” Year, 2018

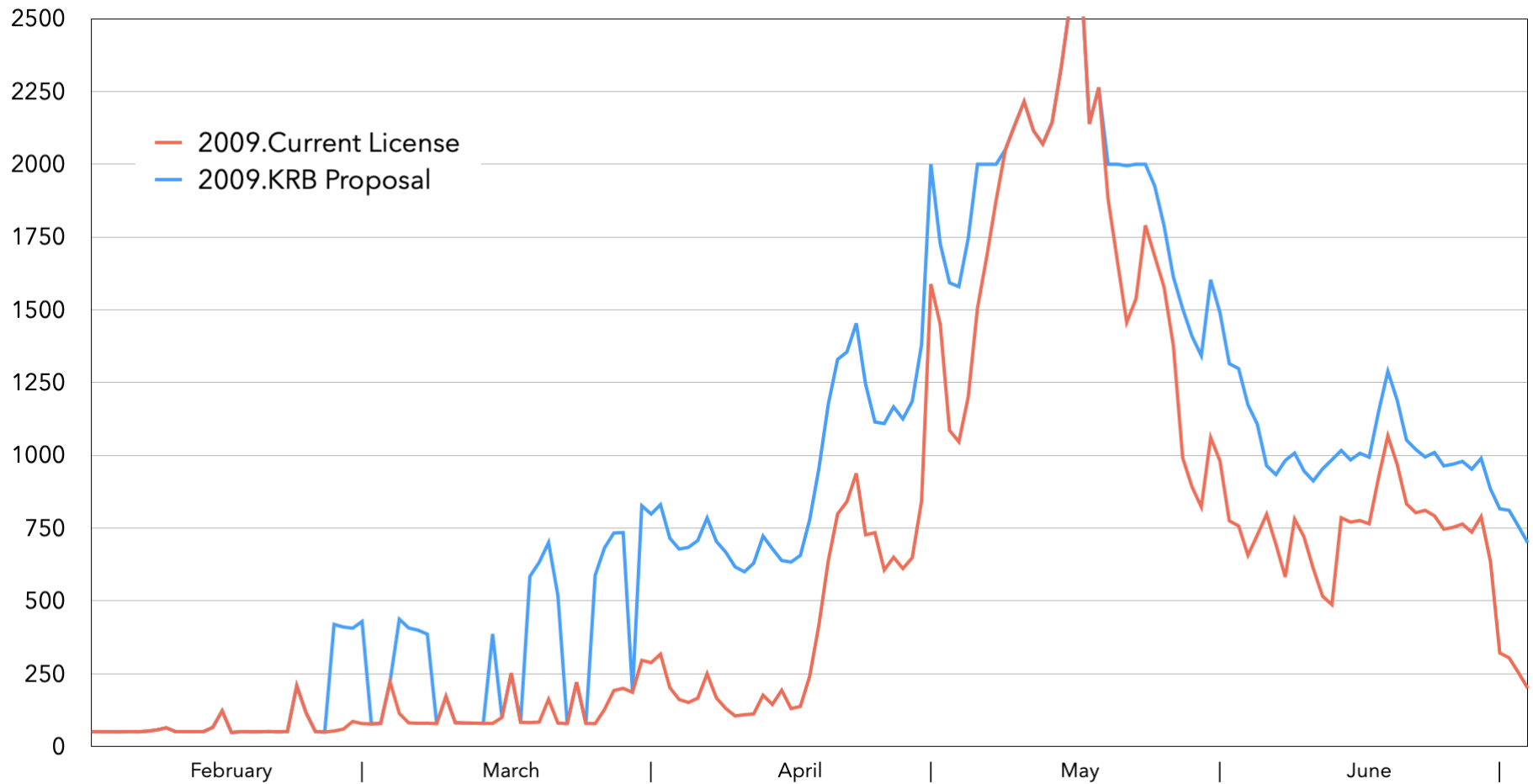


Source: SCE KR3 Hydrology Dataset (2023), KR3 License

Figure 7. Flow Comparison, Moderate Year 2009

This chart compares flows below Fairview Dam under the current license against those our proposal would provide, using the representative "Moderate" water year of 2009

10am Flow (cfs), KRB REC PROPOSAL v. CURRENT REGIME, Representative "Moderate" Year, 2009

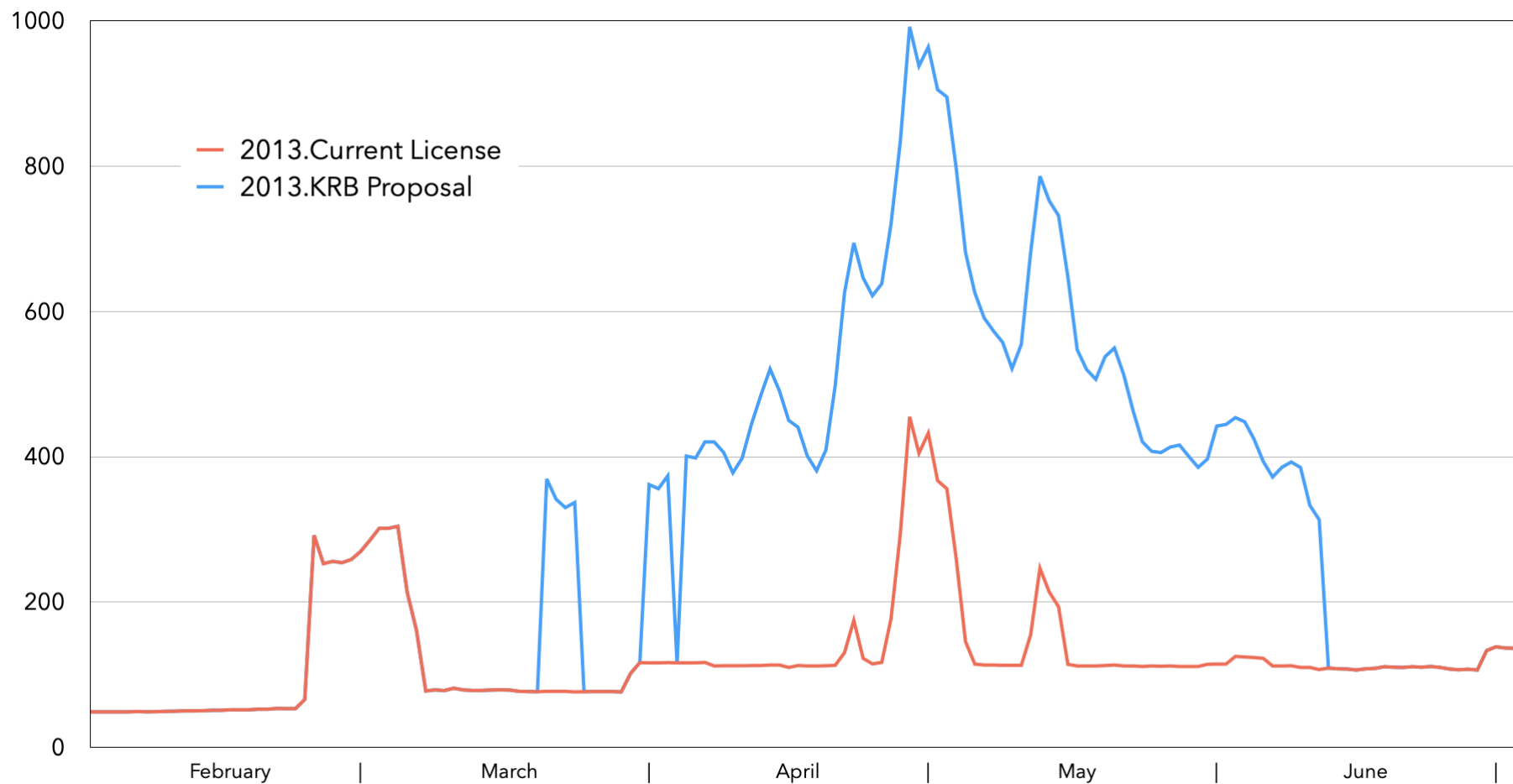


Source: SCE KR3 Hydrology Dataset (2023), KR3 License

Figure 8. Flow Comparison, Dry Year 2013

This chart compares flows below Fairview Dam under the current license against those our proposal would provide, using the representative "Dry" water year of 2013

10am Flow (cfs), KRB REC PROPOSAL v. CURRENT REGIME, Representative "Dry" Year, 2013

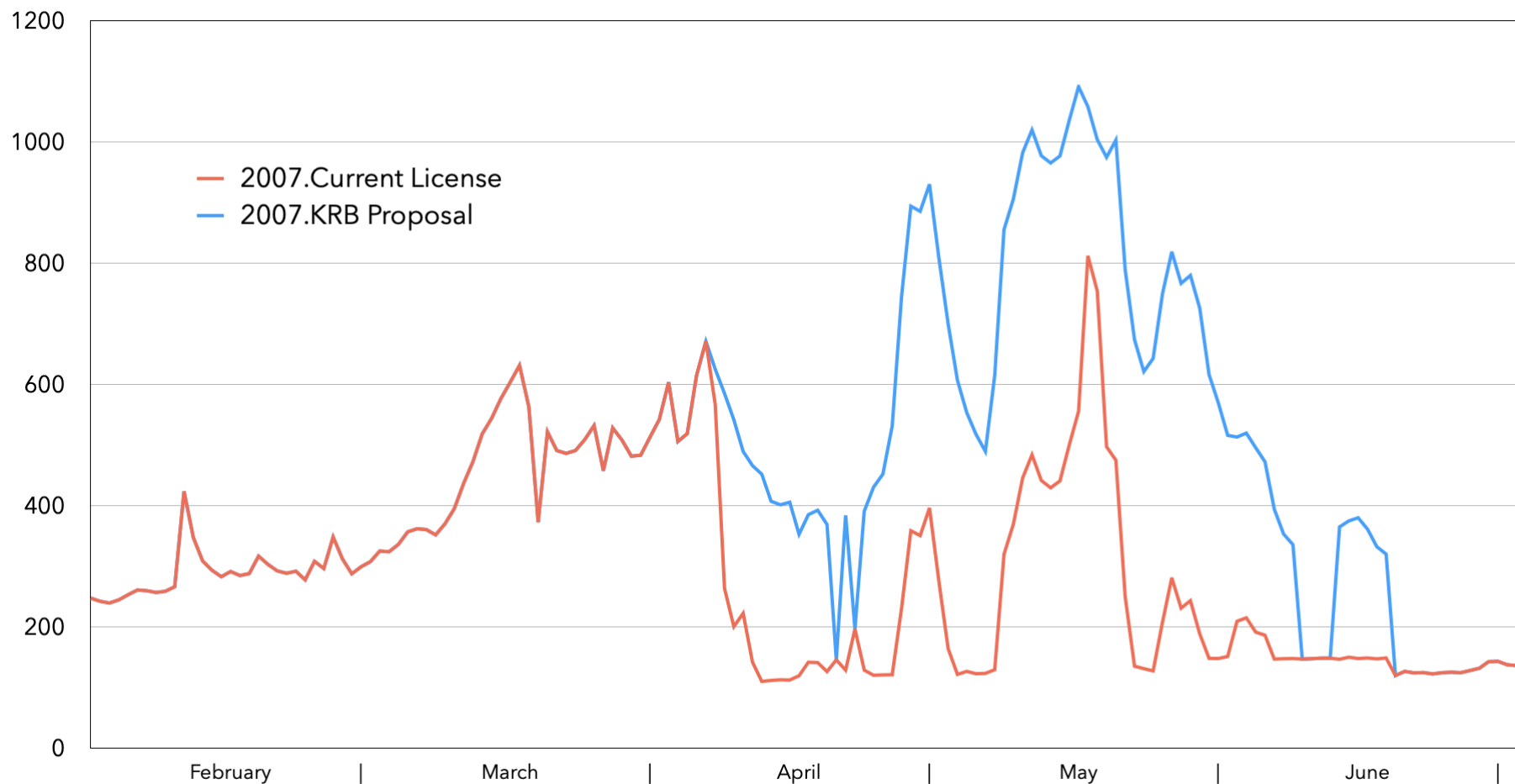


Source: SCE KR3 Hydrology Dataset (2023), KR3 License

Figure 9. Flow Comparison, Dry Year 2007

This chart compares flows below Fairview Dam under the current license against those our proposal would provide, using the representative "Dry" water year of 2007

10am Flow (cfs), KRB REC PROPOSAL v. CURRENT REGIME, Representative "Dry" Year, 2007



Source: SCE KR3 Hydrology Dataset (2023), KR3 License

Figure 10. Peak Solar Hours (9a-3p) Electricity Pricing

This graph depicts the average price per Megawatt-hour of electricity at the CAISO node closest to KR3 over the last three full years, broken out by times of curtailment (9a-3p) against all other hours and by weekends against weekdays. Source: CAISO (<http://oasis.caiso.com/mrioasis/logon.do>)

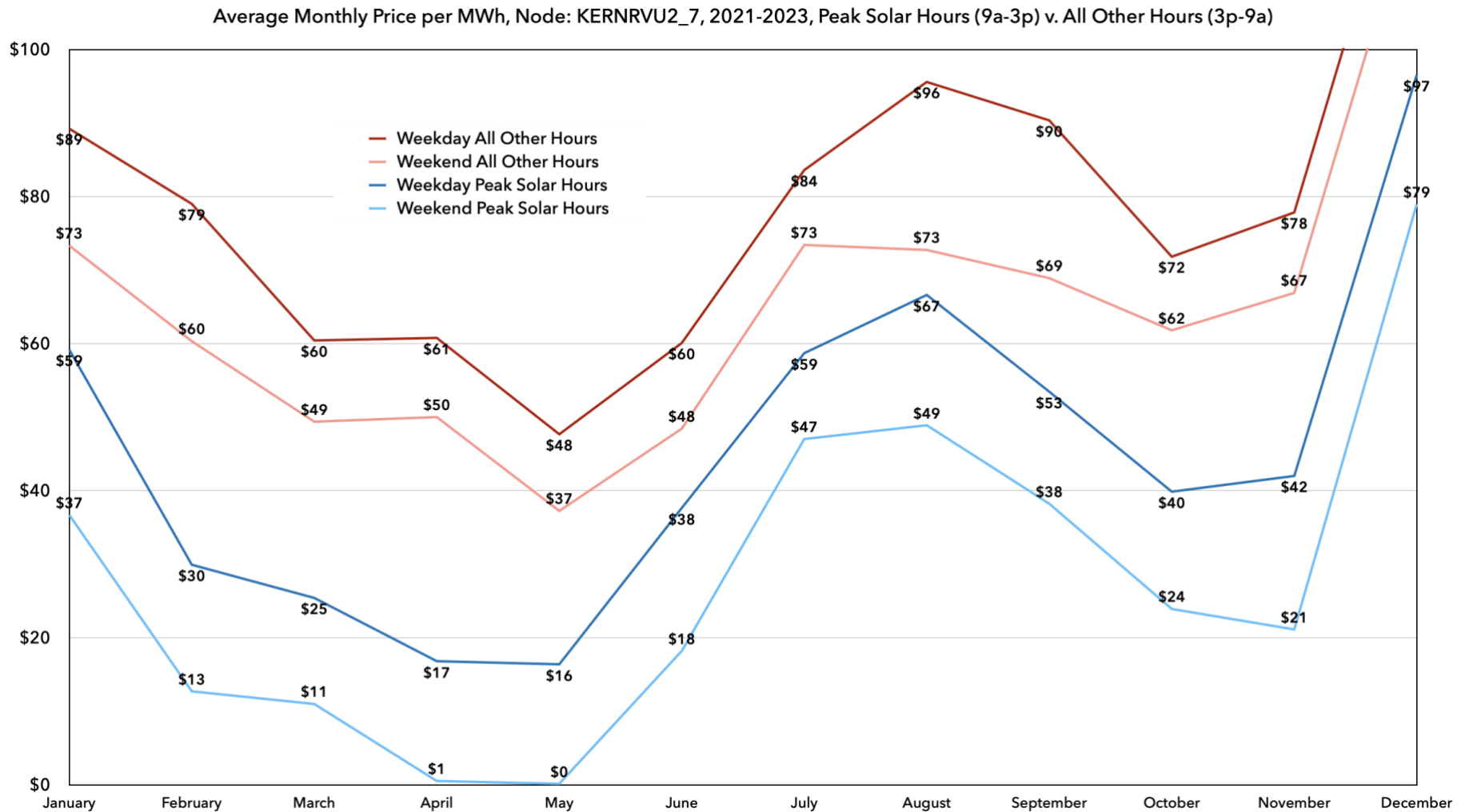


Figure 11. KRB Rec Proposal Targets Low Energy Prices

This graph, using the same data as above, shows the times of day and year the KRB Rec Proposal asks for a reduction in the KR3 diversion at Fairview Dam.

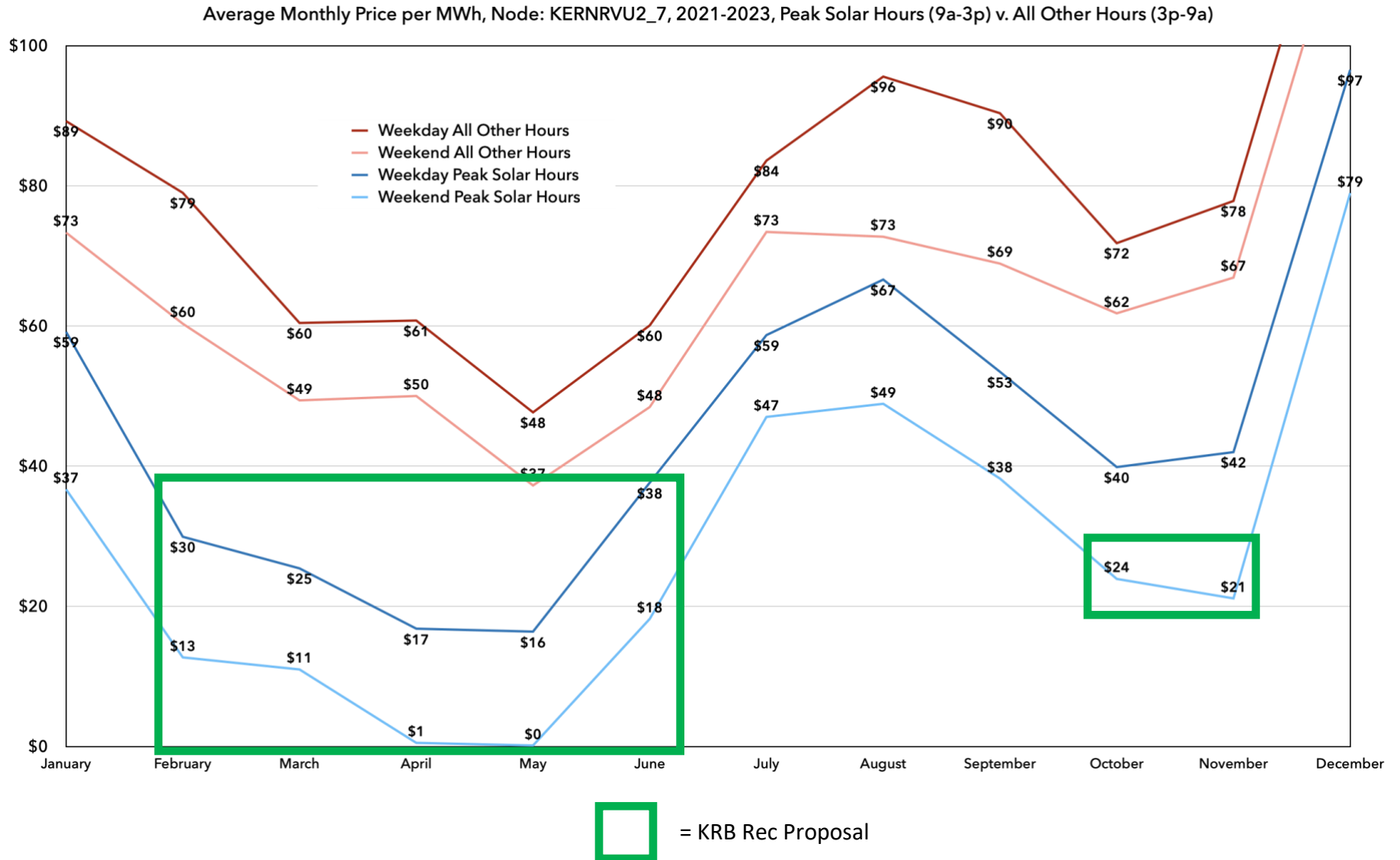


Figure 12. “Renewable Curtailment” (Shutting Down Solar + Wind) Is Increasing

This graph depicts the average hourly curtailment of renewable generators in the CAISO footprint by month. According to CAISO: “Curtailment is the reduction of output of a renewable resource below what it could have otherwise produced. . . . [T]he issue is expected to intensify in the coming years [We should] explore policies to reduce minimum operating levels for existing generators, thus making room for more renewable production.”

Average Hourly CAISO Renewable (Solar + Wind) Curtailments, by Month, 2019-2023 (MWh/h)

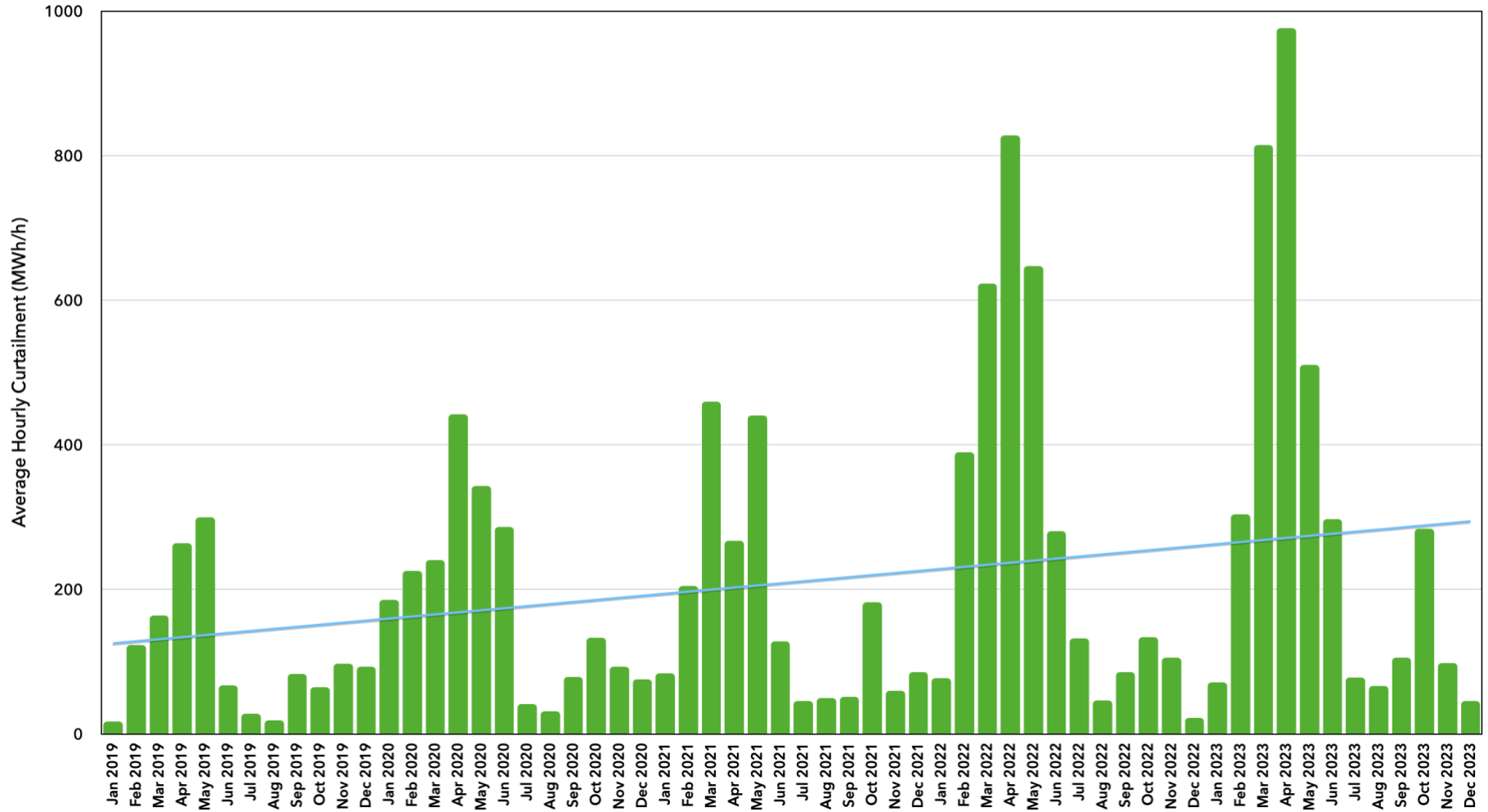


Figure 13. 9a-3p, February to June, Renewable Curtailments Dwarf KR3 Generation

This Chart depicts the hourly average of renewable curtailment in the CAISO grid for FEB-JUNE of the year 2023. It shows a vast excess in generation potential during daylight hours (9a-3p) due to wind and solar generators, who are forced to go offline, and who dwarf the average generation of KR3. The scale of renewable curtailments— but not the average rate of KR3 generation during these months (19.1 MW) — will keep increasing into the future.

Average CAISO Renewable (Solar + Wind) Curtailments per Hour, 9 a.m. to 3 p.m., FEB-JUN 2023

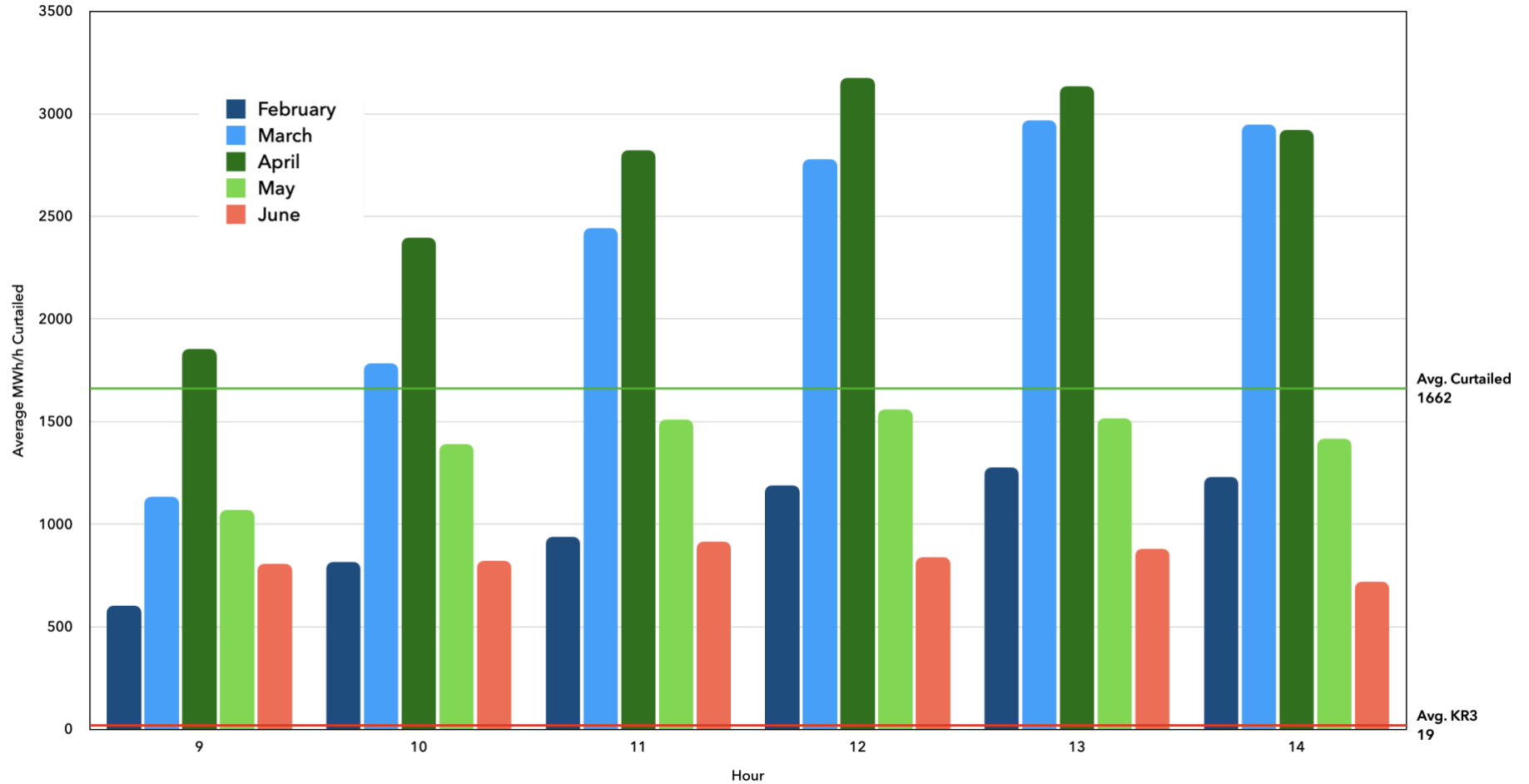
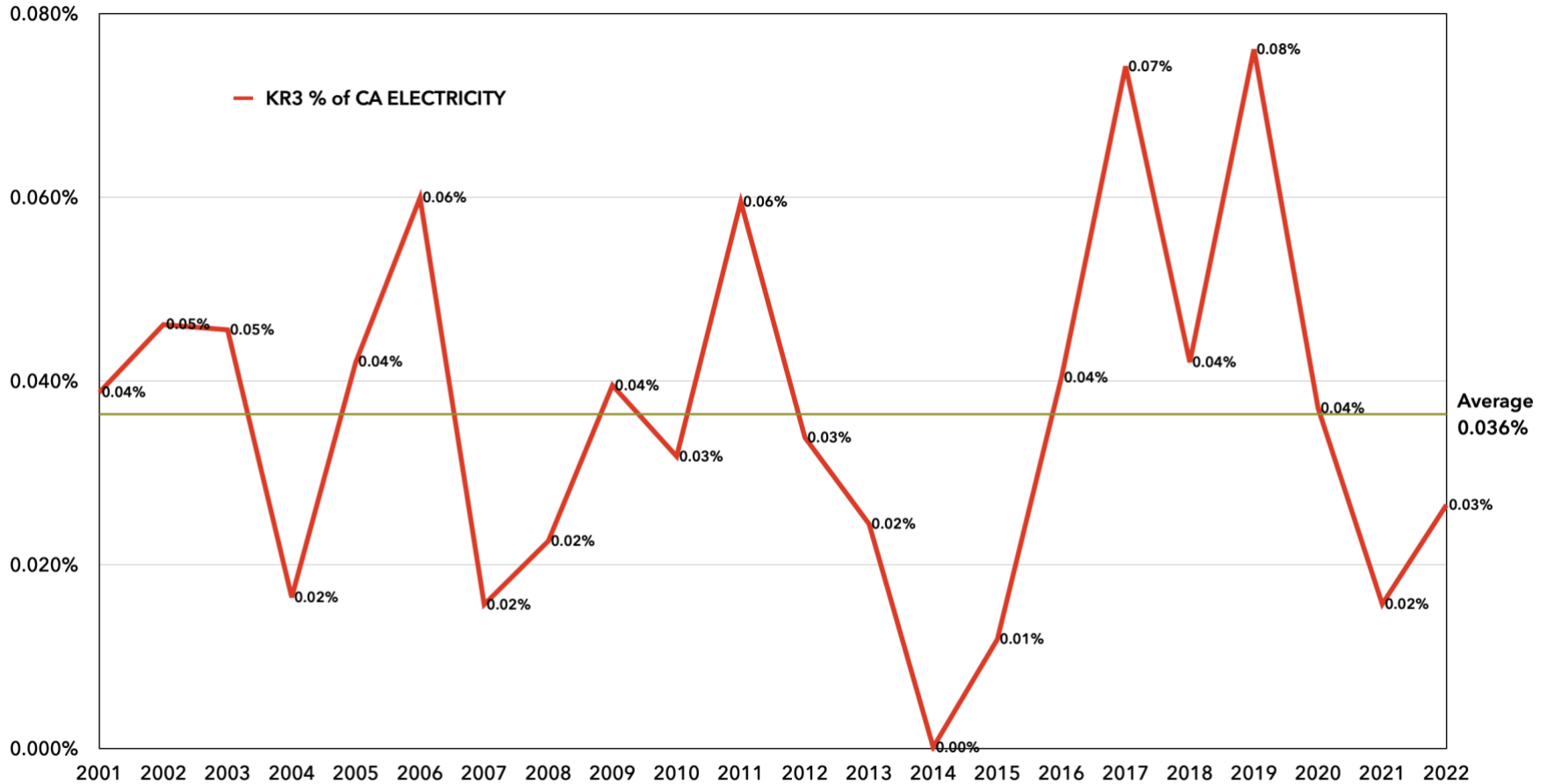


Figure 14. KR3's Annual Contribution to the California Grid

The following graph illustrates KR3's share of contribution to the California grid the last several decades, amounting to just under 1-part-in 3000. Note: KR3 generated nothing in 2014, and electrical service in the Kern River Valley was unaffected

KR3 PERCENTAGE OF CALIFORNIA ELECTRICAL DEMAND, 2001-2022

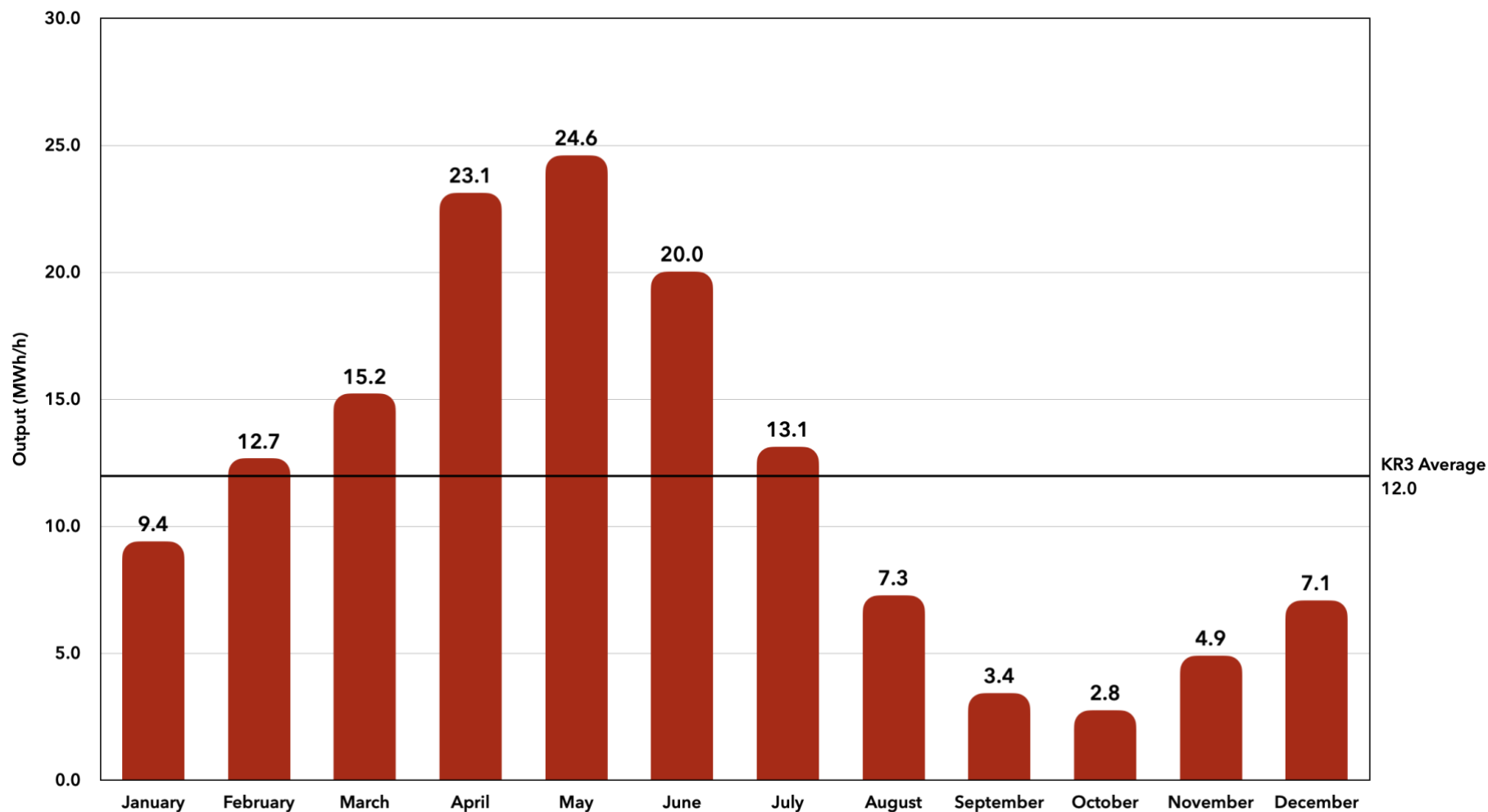


SOURCE: CALIFORNIA ENERGY COMMISSION (<https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-electrical-energy-generation>)

Figure 15. KR3's Monthly Contributions to the Grid

This graph depicts the fact that KR3 generates the bulk of its electricity in spring — when demand is low and more modern renewable generators (wind + solar) are being curtailed — because KR3's "fuel" is spring snowmelt

KERN RIVER NO. 3 AVERAGE RATE OF OUTPUT (MWh/h), 2001-2022



SOURCE: CALIFORNIA ENERGY COMMISSION (<https://www.energy.ca.gov/filebrowser/download/4567>)

Figure 16. The "Duck Curve."

The "duck curve" is driven by the ever-increasing deployment of renewables, resulting in low (sometimes negative) wholesale energy prices and the threat of overgeneration. Source: [Caiso.com](https://www.caiso.com); Illustration: [Masterresource.org](https://www.masterresource.org).

