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California's race against time to build power lines

An electric transmission line passes through Roosevelt, Utah.
(Robert Gauthier / Los Angeles Times)

By Sammy Roth Staff Writer

Want to live in a world where heat waves stop getting hotter, wildfires stop getting bigger, water shortages stop getting more severe and storms stop getting more destructive?

Then you should probably cozy up to electric power lines.

Solar panels and wind turbines take up a lot of the oxygen in conversations about clean energy solutions. But for solar and wind to supply ever-larger amounts of electricity — and replace the coal, oil and natural gas cooking the planet — the United States will need a lot more transmission lines, to carry renewable electricity from the nation's sunniest, windiest places to the big cities that suck up huge amounts of power.

How significant is the need for new transmission? The REPEAT Project, which is led by Princeton University researchers, reported last year that 80% of the potential cuts in carbon pollution made possible by the Inflation Reduction Act — the climate bill signed by President Biden — could be lost if the U.S. fails to accelerate the build-out of its electric grid.

There's a similar reality at work in California, where state law requires 90% clean energy by 2035 and 100% by 2045 — on a power grid big enough and robust enough to support tens of millions of electric cars, home heating systems and stoves.

A new report puts some numbers to the urgent need to build power lines — and upgrade existing wires.

Over the next decade, the California Independent System Operator says in the draft report, the state should spend at least $7.5 billion on transmission projects that would support renewable energy growth. Plus another $1.8 billion on projects that would help prevent blackouts — which are getting more difficult to avoid as rising temperatures drive up demand for air conditioning, and as the power grid becomes increasingly reliant on solar panels that stop generating electricity after dark.

Power lines run through California's Imperial Valley, an agricultural region that also produces growing amounts of solar energy.
(Robert Gauthier / Los Angeles Times)

Those new and upgraded power lines would be paid for largely by customers of the state's major monopoly utility companies: Southern California Edison, Pacific Gas & Electric and San Diego Gas & Electric. The billions of dollars in expenditures would add to utility bills at a time when electricity costs are already rising rapidly, straining cash-strapped families and making it less likely that Californians will want to replace their fossil-fueled cars, furnaces and stoves with electric alternatives.

Nobody said solving the climate crisis would be easy. But getting the ball rolling on new power lines has been especially tough. Hardly anybody wants to pay for them, even if they'll save money — and lives — in the long run. And getting permission to string wires over long distances — with some routes traversing multiple states and hundreds of landowners — can take a decade or more.

So what kinds of tricks might California have up its sleeve? Here are four things to know.

1. This isn't a new problem

It's been clear for at least a decade that new and upgraded power lines would be needed to facilitate construction of more solar farms in California's Central Valley, geothermal plants by the Salton Sea and floating wind farms off the coast.

But for the most part, those projects haven't gotten built. Inertia has prevailed over action.

When I asked Elliot Mainzer — chief executive of the California Independent System Operator, which oversees the electric grid — whether anything's really going to change after his agency's report, he offered several reasons for optimism.

First, he said, the system operator reached a new agreement in December with the state's Public Utilities Commission and Energy Commission, the other entities responsible for planning and approving power grid projects. It should lead to closer coordination among the agencies as they provide direction to companies proposing power plants and transmission lines, he said.

Second, the system operator is reworking its process for responding to "interconnection requests," in which energy developers apply to hook up their power projects to the grid. Right now, there are so many requests — many of them for plants unlikely to ever get built — that the agency is moving far too slowly to study and approve badly needed solar and wind farms.

Better processes don't always lead to better outcomes. But Mainzer insists these are important steps.

"We're trying to take any barriers off the table," he said. "It's a big lift. But failure's not an option."

The draft report still needs to be approved by the system operator's board of governors. And even if the board signs off on the billions of dollars in projects, the Public Utilities Commission still needs to give them the OK, too — a much bigger lift.

2. We're talking mind-boggling amounts of clean power

Solar projects surround farm fields in California's Imperial Valley, near the U.S.-Mexico border. (Robert Gauthier / Los Angeles Times)

Some of the numbers in the new report are hard to wrap your head around.

Right now, California has just over 80 gigawatts of electric generating capacity. The system operator and other agencies envision adding 70 gigawatts over the next decade — and an additional 50 gigawatts by 2045, the deadline for 100% clean energy.

So we're talking about more than doubling the size of the power grid.

The transmission projects outlined in the report would enable 17 gigawatts of solar development, from the Central Valley to the Mojave Desert to neighboring regions of Nevada and Arizona; eight gigawatts of offshore wind; eight gigawatts of onshore wind, more than half of it coming from Idaho, New Mexico and Wyoming; and at least a gigawatt of geothermal energy.

Those facilities could dramatically reduce the need to burn natural gas, which in 2021 supplied more than one-third of the state's electricity. But they wouldn't eliminate the need for gas plants, many of which are in low-income communities of color burdened by high levels of air pollution. Even with lots of new solar and wind — and batteries — officials expect there will still be a need for gas turbines that can be fired up on the hottest summer days, when demand for air conditioning strains the power grid.

One transmission line not yet endorsed by the California Independent System Operator could change that equation.

The report notes that the system operator has had discussions with the L.A. Department of Water and Power — which runs its own independent electric grid — about an undersea cable called the Pacific Transmission Expansion. The proposed multibillion-dollar power line would hug the California coast for 200 miles, with the ability to carry offshore wind energy to the Los Angeles Basin and potentially reduce the region's reliance on a fleet of dirty — and at least recently, expensive — gas plants.

Will Los Angeles take the unusual step of partnering with other power providers on the undersea cable, which could reduce costs to ratepayers and help bring the project to fruition? Possibly. DWP spokesperson Ellen Cheng told me via email that the utility has identified the proposal as "an opportunity for collaboration with neighboring electric utilities in the region."

3. None of this will be cheap

The system operator estimates that the $9.3 billion in projects it's recommending would raise electricity costs by half a cent per kilowatt-hour — a small fraction of the 26 cents, on average, that homes served by SoCal Edison currently pay.

But with electricity bills forecast to keep rising for all sorts of reasons — including utility investments to prevent wildfire ignitions, the costs of which are passed along to customers — lawmakers and regulators are justifiably wary of anything that will add to the burden on low- and middle-income families. Even power lines needed to confront the climate crisis.

"We're trying to come out with the most efficient, cost-effective plan we possibly can," Mainzer said. "This is going to unleash a tremendous amount of clean energy and help support reliability for the fourth-largest economy in the world."

Four of the most expensive transmission projects recommended by the system operator — with an estimated cost of more than $5 billion combined — will be put out for competitive bidding. That means rather than Edison, PG&E or SDG&E being awarded the lucrative projects by default, independent developers will have an opportunity to step in at a lower cost.

Power lines near Nevada's Eldorado Substation, not far from the California state line. (Robert Gauthier / Los Angeles Times)

Houston-based developer Grid United may submit a bid. Chief Executive Michael Skelly — whose efforts to string electric lines from the wind-rich Oklahoma Panhandle to Tennessee were the focus of a book about the challenges of building transmission — told me he thinks California will be able to actually move projects forward. He praised the system operator for taking a proactive approach in its new report, mapping out where specific power lines will be needed to enable renewable energy growth.

"California is saying, 'OK, y'all are ready. We're here to receive you with open arms,'" Skelly said.

Although competitive bidding could lower costs for some power lines, it won't address a key reason other transmission projects are so expensive: guaranteed profit margins authorized by the Federal Energy Regulatory Commission, which allow utilities such as Edison and PG&E to charge customers not only for the costs of building a line, but also a cut for their shareholders. Critics say the profits allowed by the agency are far too high, while utilities counter that they're needed to reduce financial risks. When I asked Mainzer about the utility profit question, he told me he doesn't have "a major position on that."

4. Getting permission to build is not easy

Two recent reports show just how hard it can be to build power lines in California.

One, from the Clean Air Task Force, lays out the arduous approval process at the Public Utilities Commission, with environmental reviews required by the California Environmental Quality Act that can take as long as four years. The other report, from consulting firm GridLab and clean energy advocacy group CEERT, notes that it took 12 years for Edison to finish a project to bring thousands of megawatts of wind power from the Tehachapi area in Kern County to the Los Angeles Basin.

The Public Utilities Commission process "is too cumbersome and takes too long," said V. John White, CEERT's executive director. He thinks the state's Energy Commission ought to take over permitting from the beleaguered utilities commission. "We've got to make it go faster, better, cheaper," White said.

Several bills proposed in the Legislature could speed things up. One of them, Senate Bill 420, from Sen. Josh Becker (D-Menlo Park), would allow state officials to designate power line proposals as "environmental leadership development projects." That would require environmental lawsuits designed to block those lines to be resolved within 270 days. The legislation would also eliminate what Becker's office describes as "duplicative economic review" at the utilities commission for transmission projects already deemed necessary by the system operator.

Then there's Senate Bill 619 from Sen. Steve Padilla (D-Chula Vista), which would designate high-priority transmission lines for fast-track state review. Plus Assembly Bill 914 from Assemblymember Laura Friedman (D-Glendale), which would exempt some power line projects from the California Environmental Quality Act if they would help the state meet its climate goals.

"These projects are transformational for California," White said. "We can't treat them as unimportant." Something's got to give. Until then, here's what's happening around the West:

TOP STORIES

People living near the Martinez oil refinery are under a health advisory not to eat food grown in their gardens. (Anda Chu / Bay Area News Group)

A mysterious pale residue fell on the San Francisco Bay Area city of Martinez the day after Thanksgiving. Turns out it was hazardous material from the nearby oil refinery — so why weren't residents told sooner, and why is soil testing taking so long? My colleague Tony Briscoe tried to answer those questions. In another oil industry story, L.A. Times columnist George Skelton took on Gov. Gavin Newsom's recent victory over Big Oil, writing that Newsom was able to push a possible profits cap through the state Legislature by getting aggressively engaged behind the scenes, which was unusual for the governor.

Skelton also explored his own transformation on petroleum politics, explaining that his dad worked in California's booming oil fields in the 1920s — and today his daughter is part of the Biden administration, where she helps fossil fuel workers find clean energy jobs.

Can music inspire people to care about climate change? I absolutely loved this column and podcast from The Times' Rosanna Xia, about efforts by famed Southern California earthquake expert Lucy Jones to communicate the dangers of global warming — and inspire action — through music. Jones plays the viola da gamba, a cello-like instrument, and she convened "a remarkable group of scientists, psychologists and composers to figure out how to write music that would break through the fears and human instincts usually stopping us from thinking about the future of our planet," Xia writes. I'd encourage you to read and listen as Xia and Jones grapple with some of the big existential questions of modern times, and explore how music might help.

California's snowpack has more water than Lake Mead right now, with a record 306% of average snow in the southern Sierra Nevada. Details herefrom my colleagues Sean Greene and Hayley Smith. Stunning satellite photos show the state's abrupt shift from dry to lush, and the sudden change of scenery at San Luis Reservoir, which has gone from mostly empty to nearly full. The benefits are being felt all over California: Creeks flowing down from the Santa Monica Mountains are bursting with life; oak woodlands that protect snowpack are on the rebound; flooded wetlands are providing habitat for migratory birds; there's less air pollution than at any time since at least 1999. The Times' James Rainey wrote about the joys of our winter bounty.

Many communities, though, are still reeling from recent storms. State and federal officials are finally coming through for the farmworker town of Pajaro after floods displaced thousands of people, with President Biden signing a major disaster declaration. But it's not clear how fast Pajaro's broken levee can be fixed, and whether it can be made better than before, The Times' Susanne Rust reports. First responders in Pajaro are doing their best to communicate crucial info to evacuees — many of them Indigenous Mexican farmworkers who speak Mixteco, Ruben Vives and Melissa Gomez write. In the San Joaquin Valley, residents worry that runoff from dairies, poultry farms and a sewage facility could pollute groundwater supplies if melting snow brings more floods, Brennon Dixson and Rust report — and many other parts of the state face their own spring and summer flood concerns. In Los Angeles County, meanwhile, residents of two tiny lakeside communities don't want a flood control district, which they see as too much government — but they definitely need help with climate whiplash, Louis Sahagún writes.

POLITICAL CLIMATE

Alabama Hills National Scenic Area, in California's Inyo County, is overseen by the U.S. Bureau of Land Management. (Allen J. Schaben / Los Angeles Times)

In a major new initiative to protect public lands, the U.S. Bureau of Land Management plans to measure the health of all 245 million acres it oversees, designate more protected areas and lease out land for conservation to offset the impacts of energy development. Here's the storyfrom Scott Streater at E&E News, who describes a mixed reaction from environmentalists, with some praising the plan from Interior Secretary Deb Haaland and others calling it wildly insufficient.

In Nevada, meanwhile, conservationists say the Biden administration has failed to shut down speculative oil and gas leasing as required by the Inflation Reduction Act, per Claire Carlson at the Nevada Independent. And in Alaska, groups challenging Biden's decision to approve the Willow oil project lost their first court battle to pause construction, Becky Bohrer reports for the Associated Press.

California regulators may approve an exemption to the state's clean vehicle rules that would allow 10,000 natural gas-fueled garbage trucks to keep spewing pollution until 2042. "We're basically carving out exemptions because of political protest from people who made bad investments," Sasan Saadat, a policy analyst at the environmental group Earthjustice, told the Sacramento Bee's Ari Plachta. "You'll end up in this absurd situation where vehicles ready to go electric at a fast pace will be put on the slowest timetable in communities most overdue for relief." At the federal level, new rules unveiled by Biden administration officials will make many electric passenger cars ineligible for tax credits, the New York Times' Ana Swanson and Jack Ewing report — a result of the Inflation Reduction Act, which largely limits the credits to cars with American-made parts.

THE ENERGY TRANSITION

A new study links drought and heat waves to air pollution spikes in low-income and nonwhite communities, because there are more fossil-fueled power plants firing up to supply electricity for air conditioning. Part of the problem is reduced hydroelectricity production, which increases the need for coal and gas plants, as my colleague Dorany Pineda reports. Speaking of which, efforts to tear down four dams on the Pacific Northwest's Snake River — which would help struggling salmon populations but result in less hydropower output — are probably dead in the water, at least for now, with Republicans who oppose dam removal in charge of the House of Representatives. Details here from Crosscut's Nicholas K. Geranios.

Jim Bridger, the West's largest coal plant, will stop burning the dirtiest fossil fuel in 2030, seven years ahead of schedule — but another coal unit elsewhere in Wyoming will stay online 12 years later than expected. That's the timeline laid out in the latest resource plan from Rocky Mountain Power, part of Warren Buffett's PacifiCorp electric company. The Casper Star-Tribune's Nicole Pollack wrote about the plan, noting that PacifiCorp wants to nearly quadruple its wind and solar capacity. In Montana, another coal plant looks like it will unexpectedly survive past 2025, with two Washington utilities agreeing to sell their shares to owners who hope to keep the thing running, Benjamin Storrow reports for E&E News. The Biden administration, meanwhile, just rolled out new incentives to support renewable energy development in coal communities, per E&E News' Robin Bravender.

Amazon is so committed to its "climate pledge" of net-zero carbon pollution by 2040 that the company paid to have the Seattle Kraken hockey team's arena christened the Climate Pledge Arena. But in Oregon, Amazon helped defeat a bill that would have required its growing fleet of data centers to eliminate their emissions by 2040 — yes, the same year the company has publicly committed to, the Washington Post's Caroline O'Donovan reports. An Amazon spokesperson told the Post that the bill in question "does not address the build-out of electric infrastructure that is needed to bring more clean energy to the grid."

AROUND THE WEST

The Yellowstone River carved its own Grand Canyon.
(Sammy Roth / Los Angeles Times)

A massive bison hunt just took place outside Yellowstone, with members of eight Native American tribes killing 1,150 buffalo and rounding up hundreds more as they left the national park. The hunt is meant to protect cattle from an infectious disease common among bison — and help Indigenous tribes restore their historical connection with the animal — but the larger-than-usual number of creatures killed this time around has stirred up opposition, Jim Robbins reports for the New York Times. I was especially struck by Michael Hanson's intimate photos of Native Americans harvesting and processing bison remains.

North America's largest carbon capture machine was unveiled in a nondescript warehouse district in Colorado. "The shed-size machine draws carbon dioxide out of ambient air for reuse in industrial products or sequestration in underground caverns, a technology that could be replicated thousands of times around the globe to combat the buildup of CO2 from a century of burning fossil fuels," Michael Booth writes for the Colorado Sun. Although scientists say we need to remove large amounts of carbon from the atmosphere, some activists worry fossil fuel companies will use the technology as an excuse to keep polluting.

Former California Gov. Jerry Brown now has a beetle named after him. UC Berkeley researchers discovered the "Bembidion brownorum" species on the off-grid Colusa County ranch that Brown shares with his wife, Anne, SFGate's Alec Regimbal reports. The former governor had previously declined to have just about anything named after him, but he relented in this case. "Suffice it to say he derives a good deal of satisfaction that a humble beetle discovered at the Mountain House will help his legacy live on," Brown biographer Miriam Pawel writes in an L.A. Times opinion piece.

ONE MORE THING

In last week's newsletter, I linked to a new poll from climate news startup Heatmap finding that 79% of Americans believe moving slowly on renewable energy to protect wildlife and natural landscapes from solar and wind farms is more important than moving quickly on renewable energy to reduce climate pollution.

This week, climate journalist Emily Atkin published a critique of that poll in her Heated newsletter. She spoke with experts — and a U.S. senator — who described "renewable energy vs. wildlife conservation" as a false choice, and said the poll's wording failed to make clear just how dangerous global warming is for animals and ecosystems.

As a reporter who has spent most of the last decade writing about conflicts between clean energy and conservation, I found the Heatmap poll interesting and worthwhile. Much as journalists should strive to foster a thoughtful, nuanced debate aimed at bringing about climate solutions — which I have tried very hard to do! — it's also useful to know where the public stands, which isn't always based on much nuance. The Heatmap poll offers a valuable glimpse at public opinion.

I also agree that the "renewable energy vs. conservation" question was too simplistic, and left out important information. I'm super curious what people would have said if they'd been told or reminded that climate change is bad for wildlife.

So everybody is trying their best, and now we can move forward. How's that for a hot take?