THE ARIZONA REPUBLIC

# Coal plants are closing fast across the West, but not fast enough to meet climate goals

*Economics are forcing an unprecedented shift in how the West makes electricity, but is it enough to avoid climate disasters?*

By Ryan Randazzo

A skeleton crew of workers gathered for a morning safety meeting in the control room at the Coronado Generating Station coal plant in eastern Arizona, near the New Mexico border.

More than 200 miles away in Phoenix, the July heat was beginning to bake the city as the sun rose. Normally, the two generators at Coronado would ramp up to match demand from Salt River Project customers' air-conditioners.

But not anymore. The generators ran at partial capacity, burning just enough coal to keep the furnaces on.

SRP has an agreement with the EPA to limit the use of the plant. Coronado simply isn't needed as much as it was in the past. Nor is it the most cost-effective plant in the company's fleet.

It's a phenomenon seen across the West and the nation.

Low natural-gas prices and increasingly cheap renewable energy from solar and wind plants are forcing the closure of the region's biggest coal plant, the Navajo Generating Station near the Grand Canyon.

Dozens of other plants that have filled the landscape with haze since the 1960s and '70s soon will be gone. A decade ago, coal provided about half the country's electricity, but that fell to less than 28% last year.

More than half of the 70 generators operating at coal plants in Western states — 36, to be precise — are proposed by their owners to close before 2031, an Arizona Republic review found.

Some observers project that the other 33 will be shuttered during the next decade, despite their owners' current plans, as renewable energy sources outcompete coal on price.

Closures planned in the next five years include the single remaining plants in Washington and Oregon, as well as the San Juan Generating Station outside Farmington, New Mexico. Early

closure of other plants is also getting serious consideration, including the Martin Drake plant towering over Colorado Springs, Colorado.

"There’s not too many periods in the history of electrical technology when we’ve seen such a dramatic transformation in the fuels we use and the ways we produce power," said Paul Hirt, a professor of history and sustainability at Arizona State University whose work has focused on energy and water policy.

Hirt also is one of SRP's 14 board members, elected in 2016 after campaigning for more renewable energy at the utility. He voted to shut down the Navajo plant.

"Most Americans would prefer to use clean energy," he said. "Most utilities would prefer to use clean energy. Cost has been the prohibitive factor."

Few people 10 or even five years ago predicted how low renewable-energy prices would be today, he said.

"Nobody can say clean energy is too expensive anymore," he said.

Back in the control room at Coronado, Supervisor Jarvison Littlesunday reviews safety hazards with the crew.

Outside the room, the noise of the plant is deafening, with a massive coal furnace overhead, large hissing pipes of pressurized steam, and turbines spinning like gigantic washing machines.

The day before, one of the generators nearly tripped offline when coal dust covered a critical sensor that keeps the boilers burning.

Littlesunday goes around the room, man by man, and asks for an update on any hazards they are watching for that day. At the conclusion, he sends them off with a message.

“Everyone be safe out there,” he says.

**How we got here**

The big coal plants that dot the West were a product of the increasing need to power growing cities like Phoenix, Las Vegas and Los Angeles, all of which took electricity from the shuttering Navajo plant at one point.

Electric companies from about the 1920s through the 1970s sought to benefit from economies of scale by building bigger and bigger plants, which lowered the cost of each kilowatt-hour of electricity they generated, Hirt said.

Even when one utility alone didn't need all the power a large plant could produce, utilities pooled their resources to build plants that they co-owned.

They focused on coal because natural-gas prices were seen as too volatile, and the most convenient places to build hydropower dams eventually all were taken. The Navajo plant actually sprung from negotiations to prevent additional dams on the Colorado River.

Considering the U.S. was estimated to have more than 200 years of coal in the ground, coal plants were an easy answer to the nation's growing power needs.

"A lot of people thought that would be the best way to get unlimited power at the lowest price possible," Hirt said. "The resource was there and it was incredibly cheap. The power was incredibly dirty, but it was abundant and cheap."

Shutting down smokestacks is positive for the environment, but comes with a cost. The plants and mines that feed them are ingrained in the mostly rural economies of the West.

"Closing NGS was very difficult for the owners of the station," Hirt said. "They got a lot of pushback. The Trump administration has been promising to keep coal plants open. The Republican party is really upset when there's talk of closing a coal mine or coal plant."

SRP had established strong relationships with Page and the Navajo Nation over nearly a half-century of running the plant, he said.

"It’s hard to tell them they are going to take away their livelihood," Hirt said.

**More closures needed to meet climate goals**

As positive as the closures sound from an environmental perspective, they aren't coming fast enough for environmental advocates, who see a rapid retirement of greenhouse-gas emitting power plants and a shift toward energy-efficient cars and appliances as the last hope of staving off a massive disruption of the earth's climate.

Groups such as the Sierra Club are trying to persuade electric companies, historically known to run their businesses conservatively, that such a monumental shift in power generation is not only environmentally responsible but also the cheapest path for customers.

Utilities say they need a more cautious approach to ensure there’s always enough power on the grid, but that they are moving away from coal.

SRP is planning to reduce power plant carbon emissions 62% by 2035, based on its emission levels in 2005, and 90% by 2050. It will do that with help from 1,000 megawatts of new solar by 2025, enough to power about a quarter-million homes when the sun is shining.

Despite the big carbon reductions, it's not enough to prevent serious consequences from global warming, according to the most recent report from the International Panel on Climate Change.

The panel last year said that a 45% reduction is needed by 2030 and that by about 2050, carbon emissions will need to be "net zero" to prevent major climate repercussions.

There's also concern that utilities will rely too much on new natural-gas plants to replace coal.

Natural-gas plants have lower carbon emissions than coal, but a wholesale shift from coal to gas would not be a large enough reduction in carbon emissions to limit climate change as advised by the International Panel on Climate Change.

Much of the retiring coal will need to be replaced with renewables to meet the goals.

**Economics fuel coal closures**

Advocacy groups are no longer restricted to environmental arguments against burning coal. They now argue coal plants should be closed for economic reasons.

“We think the West will be coal-free by 2030 at the latest,” said Evan Gillespie, Western director for the Sierra Club’s Beyond Coal Campaign in Los Angeles.

The resource plans that dictate which power plants remain open and which close are constantly changing, but one trend among them is clear: Electric companies are more commonly deciding it's better to retire coal plants early than to make expensive upgrades and repairs to keep turbines spinning.

Utilities must justify their expenses to regulators and the public — coal is becoming harder to justify, he said.

“In most states, that’s a very hard, if not impossible, task," he said. "In most cases, it is cheaper to build new clean energy today than to maintain investment in a coal plant.”

Coal's drop off is unmistakable. Consider:

• U.S. utilities retired 546 individual coal generators from 2010 through early 2019, according to the Energy Information Administration.
• In 2018, coal consumption fell to the lowest level since 1978.
• In April of this year, renewable energy provided 23% of the country's power, for the first time topping coal, which provided 20% that month.

“We are seeing the market move pretty quickly,” Gillespie said.

And these closures are coming despite President Donald Trump's pledge to help the coal industry and his administration's rollback of the previous administration's Clean Power Plan, which would have accelerated coal retirements.

It's simply too difficult to deny the low prices being asked for renewable energy.

California has been ridiculed in more conservative states for its anti-fossil fuel policies, including a requirement that 100% of energy in that state is climate-friendly by 2045. But the Los Angeles Department of Water and Power recently approved a deal to buy power from a massive solar

project with batteries for about 3.3 cents per kilowatt hour, less than it would cost to get that power from natural gas and far less than coal.

Minneapolis-based Xcel Energy, which has customers in eight states, plans to reduce carbon 80% by 2030 and be carbon free by 2050. The governor in one of those states, Colorado, wants to have 100% renewable energy by 2040.

Pacificorp, based in Portland, is the biggest power grid operator in the West, with 1.9 million customers in Oregon, Washington, California, Idaho, Utah and Wyoming. The company in early October released a proposal to dramatically speed up the closure of several coal generators.

While the company is considering multiple alternatives, it said closing some plants early could save customers nearly $600 million in expenses in 20 years, according to Pacificorp's own assumptions.

If that plan moves forward, it will sting in Wyoming, a state where it runs coal plants and where lawmakers are highly protective of the industry.

Gillespie said Arizona utilities stand out among the West for their slow move toward renewables.

The Sierra Club recently commissioned a report, conducted by Strategen Consulting, that concluded Arizona utilities could save $3.5 billion by retiring 11 individual units that serve the state ahead of schedule and replacing them with solar and batteries.

The study said those savings would occur even factoring in what the utilities would spend to purchase power on the market to back up the solar and batteries and provide the equivalent amount of energy as coal plants.

The closures aren't isolated in the West, with economics forcing closure of plants in other parts of the country.

FirstEnergy Solutions announced in August it would close the Bruce Mansfield Unit 3 in Pennsylvania on Nov. 7, darkening what once was the largest coal plant in that state.

**The coal cost crossover**

The variable nature of sunshine and wind previously gave utilities a convenient reason to defer major investments in renewables. But competitive bids for batteries the size of shipping containers that can store power on the grid are simply too lucrative for utility executives to ignore any more.

Arizona Public Service Co. officials said in February that solar paired with batteries was the cheapest way to provide customers electricity, and the company was going to lean heavily on the technology to meet growing customer demand.

That announcement attracted national attention from the utility industry because it was seen as something of a turning point, with renewables winning the low-price competition even with a utility that had just spent heavily to defeat a renewable-energy ballot measure.

An April fire at one of the APS batteries that harmed firefighters is being investigated, but APS said it remains committed to the technology once an investigation determines what went wrong in that event.

“One of the key questions for us is energy storage,” said Brad Albert, vice president of resource management for APS. “It’s commonplace for renewable-energy facilities to be built. Large scale solar photovoltaics. But it’s energy storage facilities that will unlock it to allow it to really contribute to meeting peak-load needs.”

APS' new confidence in renewables is not unique.

Three-quarters of the coal plants running in the U.S. today could be economically replaced with renewable energy built within 35 miles of the coal plant, according to advocacy group Energy Innovation.

By 2025, that will be true for 86% of the existing coal fleet, according to the group.

**SRP says transition takes time**

Hank Courtright, senior director of corporate strategy, planning and innovation for SRP, said the utility is moving to wind down all the coal plants and build a mostly renewable power system.

“But you can’t do that overnight,” he said. “We are trying to manage this orderly transition over the next decade, in which most coal assets of SRP would be approaching shutdown. Few would approach the 2035 period.”

Courtright said reports that indicate renewables are cheaper than coal don’t tell the whole story.

While it might be true that 500 megawatts of solar is cheaper to build than maintaining 500 megawatts of coal, the solar plant will only run from sunrise to sunset. The coal plant will run perhaps 80% or more of the time, and be available around the clock.

“There are times coal might be out of the money in terms of a comparison to natural gas right now, and some new solar facilities,” he said. “But we need those coal plants to be able to carry the high seasonal load we have.”

He said SRP anticipates it will need additional natural gas facilities to balance the grid and back up renewable energy.

“We don’t have as much wind potential as some other states," he said. "We think we will be primarily solar and batteries, with some gas principally for stability and to help the ramping as solar comes on in the morning, and as solar goes off in the early evening.”

SRP earlier this year bought the Coolidge Generating Station, a natural-gas fired combustion turbine with the ability to fire up quickly.

And in recent years it has bought three power blocks at the Gila River Power Station, which has quick start capabilities and a more efficient combined-cycle plant. That is what SRP will use to replace the power it loses when the Navajo plant shuts.

**Deciding what to keep in the coal fleet**

Like many Western utilities, SRP's plans for its coal plants are in flux as the company maps how to reach its carbon goals. All of them will close. It's a question of how soon.

The last coal plant built in Arizona was Unit 4 at the Springerville Generating Station, going online in 2009, and SRP takes all of that power as well as some from Unit 3, which went online in 2006.

"It will probably be the one that helps us in our last transition out of coal," Courtright said. "We haven't even envisioned a shut date for that yet. Definitely before 2050."

The Coronado Generating Station is the only coal plant SRP owns and operates without partners. One of the two units at Coronado is scheduled to shut in 2025 unless SRP decides to add costly environmental controls.

**Why some resistance persists**

Researchers increasingly say that the economics favor a speedier shift to renewables than the pace utilities have set for themselves.

Last year, the Colorado-based Rocky Mountain Institute, a nonprofit energy research group, singled out Tri-State Generation and Transmission in a study of its coal fleet.

Tri-State, based in Westminster, Colorado, provides power to cooperatives with more than 1 million customers across Colorado, New Mexico, Wyoming and Nebraska.

Tri-State co-owns the Springerville plant in Arizona and the Craig plant in Colorado with SRP.

The study found Tri-State could save customers $600 million through 2030 by retiring most of its coal fleet and moving to more wind, solar and purchasing some power on the market to ensure sufficient supply.

It also found that if the utility wanted to keep coal plants operating, it could save customers money by investing moderately in solar and wind and simply running the coal plants less.

"Importantly, this opportunity is ripe for action today," the report said.

Author and Rocky Mountain Institute researcher Mark Dyson said coal is simply uneconomical. The few exceptions today, he said, might be Unit 4 at Springerville and the relatively new Unit 3 at the Comanche plant in Colorado, and a few power plants sitting at the mouth of mines feeding them in Montana and Wyoming.

“The prediction game is hard,” Dyson said. “Just looking at the fundamental economics today, most of the coal plants are out of the money. They are no longer valuable to their owners.”

Tri-State wasn’t receptive to the report, he said, with executives saying the institute doesn’t have the company’s data (which Dyson disputes, saying all data was taken from Tri-State regulatory filings) and that the company already is investing in renewables.

“One thing Tri-State didn’t say, which I think is important, is that they have hundreds of employees who mine coal or burn coal," he said. "That is a large number of people and a lot of institutional momentum and sunk costs.”

Courtright, from SRP, affirmed that one reason utilities don't take lightly the idea of closing coal plants is concern for the affected workers and communities.

“Once we get to firm commitments (to retire a plant), we want to work with communities,” Courtright said. “We want to try to give a good five years so the community has that schedule and we can help and work in terms of the community changing.”

Back at the Coronado Generating Station, that concern for employees resonates. About 10 of the workers at the plant today recently transferred from the Navajo Generating Station because of its closure.