

# BIG PIVOTS

ENERGY and WATER transitions in Colorado and beyond

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## With red-flag days on the rise, electric utilities take steps to mitigate risks

by Allen Best

Earth Day this year had red-flag weather along Colorado's Front Range. It wasn't just the temperature, which hit 89 at Denver International Airport, a record for April 22. Wind gusts of 50 to 75 mph were predicted – and realized – and the humidity was just 5%.

From his office at United Power in Brighton, Bryant Robbins was closely monitoring conditions, particularly where the Great Plains begin wrinkling into the Rocky Mountains. Using information from the Colorado State Forest Service and Colorado State University, United's 30-page fire preparedness plan had identified those first four or five miles of foothills as the most dangerous for wildfires. That service territory includes many exurban homes in the area between Central City and Nederland.

"These fires have already started," fretted Robbins, United's chief operating officer, while awaiting the predicted winds. "We usually don't see them until later in the

year. I am highly concerned about our lack of moisture, especially in the foothills west of Arvada, and I'm just worried sick about that."

Other electrical utilities have similarly been growing wary. They appear to be growing their budgets to remove vegetation from along distribution and transmission lines. They're ponying up more money for fast-advancing technology such as aerial photography and lidar (light detection and ranging) to find problems in electrical wires and conductors before they can cause wildfires. This isn't just guys driving down the road, doing visual inspections.

The Marshall Fire of late December has only added to their worries. It provided evidence of a wildfire season that, at least compared to much of the last century, has grown longer and less predictable.

Now comes a spring with drought maps yet again showing most of Colorado in hues of brown and, in the San Luis Valley, red.

"When people say it will be a long wildfire season, I feel it already," said Ruth Marks, vice president of transmission maintenance for Tri-State Generation and Transmission, on yet another day of strong winds. Tri-State, the wholesale supplier for 42-member distribution cooperatives in Colorado and three adjoining states, has 5,700 miles of transmission lines. Marks says that about 500 miles, or 90% of the total transmission has been classified as either "high risk" or "very high risk." She identified the Meeker-Craig area of

### On the edge about the expanding fire risk



## NWS Issued for Counties/Zones for State of Colorado Red Flag Warning (FW.W) Issued by Year, Month

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006 -				23	13	20	1	1				
2007 -			1	2	2	8	6	1	2	9	6	1
2008 -	1		13	34	26	16	5	7		1		
2009 -	8	13	21	6	4		1	2	2	1		
2010 -	1		3	18	27	18	3	3	18	5	15	1
2011 -		11	30	32	28	43		2	2	10	8	
2012 -	2	7	31	17	23	40	6	14	8	21	7	2
2013 -	2	4	5	17	22	39			1	3	5	
2014 -	4	6	12	17	21	18	2			2	1	
2015 -			10	31		4	5	6	4	3	3	
2016 -	1	8	28	9		7	18	2	12	16	4	1
2017 -		22	34	11	6	10			9	6	7	11
2018 -	4	9	31	35	23	33	5	4	14	1		1
2019 -		5	2	5		5	7	14	12	32	2	
2020 -	2	3	13	15	35	41	12	15	18	40	14	
2021 -	4	7	12	37	13	15	3	6	5	13	14	17
2022 -		3	15	62	11							

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northwest Colorado as a “great place to invest money in doing more vegetative management and applying prescriptive measures.”

Also a prime candidate: southwestern Colorado around Cortez.

**A**pril was also exceptionally dry and the [windiest in south-metro area of Denver since 1989](#).

In Colorado, April had 62 red-flag warnings, almost a third above the previous single-month record of 43 since the National Weather Service began using this metric in 2006.

Might Colorado also break the previous annual high of 208 red-flag warnings? Through April this year there were 80, a faster pace than was set in the big fire year of 2020 but only marginally more than in 2018.

“We are getting forecasts of temperatures above normal and precipitation below average between now

and June,” says Angela Boag, the assistant director for climate, forest health, and energy for the Colorado Department of Resources.

“With 100% of the state in drought and roughly half of the state in severe drought or worse, it means we are going to see the emergence of above-average fire potential, especially in eastern and southern Colorado.”

In New Mexico, major wildfires were on the march beginning in April, leaving the foothills of the Sangre de Cristo Range near Las Vegas charred while another fire – at 204,000 acres as of Tuesday morning – threatened Los Alamos and caused some homeowners in Santa Fe, less than 10 miles away, to examine the limits of their insurance policies.

Wildfires can destroy transmission and distribution infrastructure. As of late April, Tri-State had already lost 5 wooden transmission poles.

In 2018, Aspen nearly lost electrical deliveries when a wildfire nearly severed transmission. It was, says Jeff Wirsing, vegetation management supervisor for Holy Cross Energy, “kind of an eye-opener for us.”

Utilities also worry about whether they can cause wildfires, as has happened repeatedly in California.

A lawsuit alleges that power lines from Xcel Energy caused the Marshall Fire on December 30. Investigators have not released conclusions about what caused the fire that started at the hamlet of Marshall, south of Boulder.

Representatives of Colorado’s larger electrical utilities have met each of the last three years to compare notes about best practices. Their meeting last week lasted two days and drew 80 people.

It was followed on Friday by a two-hour meeting of the Colorado Public Utilities Commission with representatives of Xcel Energy and Tri-State, the state’s two largest wholesale providers.

“Clearly this is an issue of enormous importance to the state to understand the steps the utilities are taking to mitigate risks,” said Megan Gilman, a PUC commissioner.

Nationally, nearly all fires are caused by distribution lines, such as you see along streets or country roads. Not the big transmission wires that sprawl across the landscape like burly lumberjacks. No evidence has been presented that Colorado is different. Xcel Energy has both distribution and transmission lines, but Tri-State just transmission. Just the same, Tri-State has stepped up its vigilance.

“We have inspections that we can see from the sky to the ground, and from the ground up,” said Marks. She and representatives from a large team from Xcel Energy described easily a dozen or more types of technologies and programs they have adopted.

Clearly, the state’s largest utilities are devoting substantial resources to mitigating risk of wildfires to their infrastructure and the risk of their electrical infrastructures starting wildfires. And they emphasized how rapidly technology is upgrading.

The question may be whether the utilities, if now more nimble, are still nimble enough given the risks.

In a recent webinar, Cody O’Neil, vice president of operations at Holy Cross Energy, noted that utilities can get trapped into the thinking that if it’s not broke, don’t fix it. “Getting ahead of the risk is a huge challenge,” he said.

**F**ire is natural. Many ecosystems depend on fires for replenishing themselves. Some native American tribes used fire as a tool, to cultivate land. Gold and silver miners use fire to expose the geology of hillsides. Evidence of a fire in 1879 can be seen even today in the Back Bowls of Vail.

And 20th century fires were not unknown—even during winter. An assessment of the Marshall Fire [issued by the Western Water Assessment in January](#) points out that a 32,000-acre grassland fire in January 1950, killed 9 soldiers and volunteer firefighters at Fort Carson, south of Colorado Springs.



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The most general trend, though, was of successful fire suppression and very small-sized fires that grew in size during the 1980s and 1990s.

You can see a sign west of Craig, along U.S. 40, about the “I Do Fire,” named that because it started on the wedding day of one of the firefighters. It burned 15,000 acres, the most in Colorado’s recorded history when it occurred in 1988, the sign says.

Today, that fire doesn’t even rank in the [top 20 fires](#). Fires have grown larger and larger, the damages ever more extensive.

One notable year was 2002, which had a spring eerily like this one, maybe even milder. Then, in early June, three major fires broke out: one north of Durango, another in Glenwood Springs, and the third west of Colorado Springs. The latter, the Hayman Fire, burned 138,000 acres. It remains the fourth largest fire in terms of acreage.

The Front Range had several big fires a decade ago. A big year was 2012. The Waldo Canyon fire destroyed 346 homes along winding, suburban streets on the outskirts of Colorado Springs. In the foothills west of Fort Collins, the High Park Fire burned 259 homes. The next year, the Black Forest fire north of Colorado Springs burned 409 homes.

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Three other fires may have had greater influence in spurring utilities to up their game. In New Mexico, the Las Conchas Fire of 2011 burned 156,593 acres after an aspen tree fell onto power lines in the Jemez Mountains northwest of Santa Fe. At its height, it was burning an acre a second.

[Jurors in 2015 concluded](#) that Jemez Mountains Electric Cooperative was 75% negligent for the wildfire, Tri-State as the wholesale provider 20% and the US. Forest Service 5%. The next year [a law firm summarized the issue](#) in this way:

“Property owners blamed the coop for not properly clearing away trees that were tall enough to fall on the line, but they also blamed the Forest Service for not giving the coop a wide enough easement to prevent such problems.”

A [2020 paper by the Colorado Rural Electric Association](#) said that although the electrical cooperative and Tri-State reached a settlement for the damages, “there are lasting impacts on the cooperatives such as higher insurance premiums and rate increase for consumer members.”

That same white paper, “Wildfire Mitigation and Vegetation Management: How Public Policy Can Reduce the Risk of Wildfires in Colorado,” made the case for three policy options for Colorado lawmakers and regulators: 1) setting standards for vegetation management for electric utilities; 2) standardizing evaluating utility rights-of-way policies; and 3) clarifying Colorado wildfire liability laws. “Without clear standards or best practices, it is unclear if a utility’s vegetation management plan is sufficient to protect the utility from wildfire,” the white paper asserted.

Remembers one cooperative director: “The Jemez fire REALLY got people’s attention in the Tri-State board room over fears that even a small fire with losses could bankrupt a small co-op.”

**W**ildfires have bankrupted the largest of utilities. The hell called the Camp Fire destroyed the California town of Paradise in November 2018. It also killed 85 people, destroyed more than 18,000 structures, and yielded a cost, including suppression, calculated at \$16.65 billion.

Drought was a factor. Paradise, one of two towns in the foothills of the Sierra Nevada that was almost entirely incinerated, normally received 5 inches of rain in autumn months; that year it had received one-seventh of an inch before the fire began on Nov. 18.

The cause, however, was a faulty electrical line.

Personnel from Tri-State who were dispatched to assist Pacific Gas & Electricity, the electrical utility whose wires started the conflagration, saw the devastation in person.

"I think that's really when we when we started understanding the implications of wildfire from a public safety standpoint," said Tri-State's Marks. "Those crews came back, and we started thinking about what Tri-State could do to better position ourselves going forward."

The Western Slope, because of its often-rugged terrain, poses a particular challenge for Tri-State, as does Northern New Mexico.

Federal land agencies have become more accommodating of allowing access for vegetative management.

"This has really changed over the last 5 years," Marks said at the PUC meeting. She cited a project planned in the Telluride area. "In the past, this would have been difficult to get the kind of approvals that we need for a large-scale vegetation program. This time around, it was pretty easy to do. Everybody was on the same page."

"Situational awareness" programs came up often at the PUC meeting. Such programs try to assess risks, such as

whether trees are in danger of tipping into the electrical lines.

Cameras mounted on the transmission infrastructure enable remote sensing, but they cost \$20,000 per structure.

"It is all new technology, and a lot of it is just being piloted by various utilities, and it is expensive," says Marks.

Xcel Energy may be the leader among Colorado utilities in getting ahead of problems before they happen. It costs money. The utility uses helicopters, infrared technology, drones, and high-resolution cameras that can allow study of transmission and distribution lines, conductors, and poles.

Andy Stewart, president of EDM International, who conducts wildfire risk mitigation for Xcel, Tri-State, and other utilities, said the task of finding problems in electrical distribution and transmission is like looking for a needle in a haystack.

"With high-resolution imagery, we can zoom in and see the damage to the conductor that is getting close to failure. We are able to detect and take action and mitigate it before any other problems occur."

Xcel has programs that try to address the structural integrity of poles in winds of 90 mph or more. The company's Kris Farruggia, the regional vice president for



distribution operations, several times mentioned “increasingly extreme weather conditions.”

Holy Cross Energy has contracted with a firm called Overstory to provide satellite images of its network of distribution and transmission lines in the Vail-Aspen-Rifle areas. In a [webinar/infomercial on the Holy Cross website](#), Overstory’s Kate Burson explained that her company provides the “vegetation intelligence and actionable work plans to our utility partner to help you reduce risk and save money. We use satellite intelligence to help you identify hazard trees, hot spot and vegetative encroachments, and then we prioritize and verify the work.”

Holy Cross employees testified to what they expected to gain from the new technology. “Being able to see our whole system in that snapshot is going to be really beneficial,” said Wissing, the vegetation management supervisor. Cody O’Neil, vice president of operations, said the satellite images will not be used to the exclusion of lidar technology. Instead, the satellite images use the more expensive lidar technology “in a more focused way.”

United Power has contracted with another company for a similar service for its service territory along the Front Range. Since 2015, it has also been using drones to inspect the 20-foot rights-of-way for its distribution lines. The taller transmission lines of Tri-State and Xcel have wider rights of way, for example 100 feet for a 115-kilovolt line, but the widths vary.

Working with Gilpin County’s emergency management center, it has sensors in certain areas that can detect smoke from a local fire. “It gives you a 30-minute head start, and it can differentiate that which is local and the smoke that is coming in from California or somewhere else,” says United’s Robbins.

United Power also has sprung for more expensive measures. Nearly all its powerlines along Highway 93 between

Golden and Boulder are underground. It also has 28 miles of covered overhead conductor cable, which is not underground but also comes at a higher cost and largely eliminates risks. United also requires distribution lines to some residences be installed underground.

The Marshall Fire was sobering to many utility supervisors. Despite the major fire that occurred mid-way through the 20th century at Fort Carson, utilities — like the general public — have tended to think of wildfires as something from forested mountain landscapes, not the Great Plains.

“The Marshall Fire is really changing how we look at wildfire risk,” says Tri-State’s Marks.

The red-flag warning issued by the National Weather Service in advance of the wind storm motivated United Power to adopt a new policy for times of wind gusts that echoes the Xcel policy. Electrical transmission will not restart automatically after a situation called a non-reclose. Instead, a visual inspection will be necessary. Power may be lost for awhile to customers. It’s another reflection of the increasing caution of utilities.

**A**lmost certainly we’re at the start of an era of hotter and mostly drier conditions, particularly in southern Colorado. Temperatures have already increased an average 2 degrees Fahrenheit across Colorado in the last 30 years. The Department of Natural Resource’s Boag points out another 2.5 to 5 degrees is expected by 2050 unless humanity can miraculously bend down its emissions.

On the Western Slope, it was a wet April. Kathleen Kelley shared photos from her ranch near Meeker of horses bathing in ponds and spring flowers even as she assembled plans for fire.

“It’s a hot dry wind licking at the back door,” she said. “We can lose everything we’ve gained in just a few days to high temps and wind.”



## Marshall Fire should expand notions of risk along the Front Range

The most common reaction to the Marshall Fire in late December was, “We never thought it could happen at the foot of the Rocky Mountains.”

Two weeks after the first, the Western Water Assessment issued a report that stressed the theme of a perfect storm:

- An unusually wet spring — the 6th wettest on record in Boulder during March through July — that supported high growth of grasses in the prairie that covers much of the open spaces where the fire spread.

- In the second half of the year, there were different extremes. August-December was the second driest on record in Boulder going back almost 130 years. November-December was the third hottest on record.

- Complete absence of snow that could have prevented spread of wildfire. “Snow drought, not just drought conditions, was a primary factor in creating the conditions that allowed the Marshall Fire to occur.”

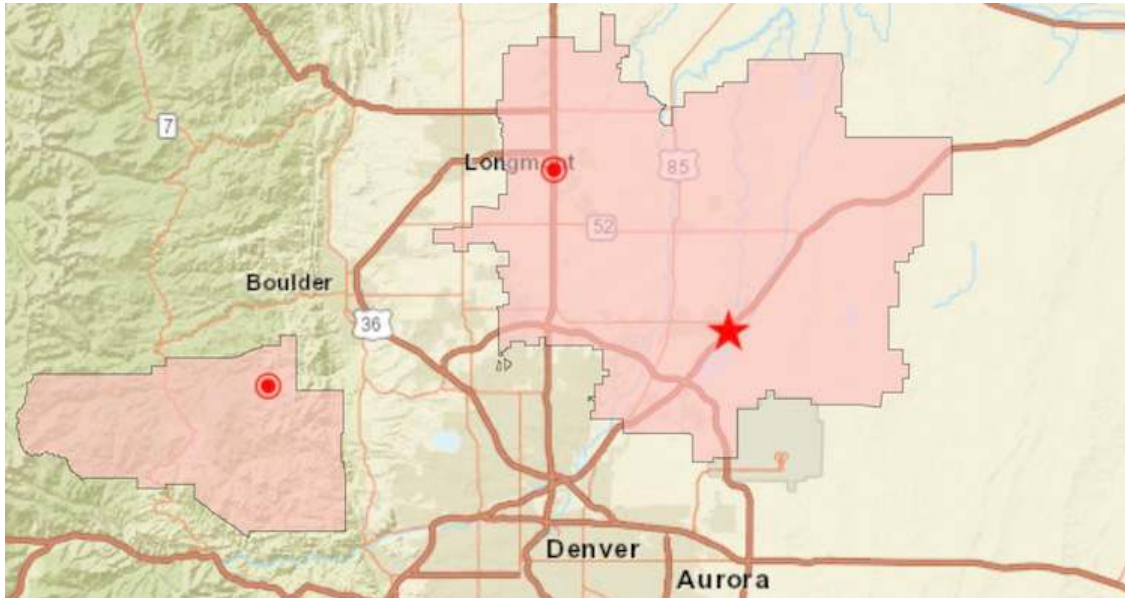
- Wind gusts that peaked at between 68 and 108 mph were measured at weather stations near the fire in Boulder County.

It was a combination of these, says Western Water Assessment.

“It is extremely unlikely that a wet spring, drought, snow drought, high temperatures or the downslope windstorm ALONE could have created the conditions necessary for the Marshall Fire’s ultimate extent in devastation. All five of these natural hazards were required for the extreme fire conditions present on Dec. 30th. If any one of these hazards were less severe or happened in a different order, the fire would not likely have spread so quickly and widely.”

There was also a human component, a gap between perception of wildfire risk compared to the actual wildfire risk.

“Many residents, hazard professionals, and scientists alike did not think a fire could burn so far into suburban areas, especially in December,” said the report. “The Marshall Fire, fueled by compound hazards and climate change ... should expand the notion of both timing and location of fire risk on the Front Range of Colorado and in similar communities across the West.”



## It's off the fence for United Power: It *will* leave Tri-State G&T —by May 1, 2024

Any element of fence-straddling has ended for United Power, the 103,000-member electrical cooperative that has a service territory on the northern flanks of metropolitan Denver.

United, by far the largest member of Tri-State Generation and Transmission, will leave the “family” of that wholesale provider on May 1, 2024. It made this decision with strengthening evidence that it is likely to pay far, far less to leave than what Tri-State twice last year insisted was proper.

United in December had filed a “conditional withdrawal notice” from Tri-State with the Federal Energy Regulatory Commission. The condition was how much United would have to pay Tri-State. This “fair and equitable exit fee”—how much the cooperatives must pay to

### United Power's service territory.

hold remaining members harmless—has been in dispute for several years.

A Colorado administrative law judge in 2020 essentially drew the line between two prior fees charged departing cooperatives, Kit Carson Electric in 2016 and Delta-Montrose in 2020, to come up with a fee for United.

In its December filing, United said it intended to be gone by Jan. 1, 2024 — conditional upon what exactly that exit fee would be. In other words, it was hedging its bets.

Tri-State and some of its other members said you can't have it both ways. FERC agreed.

“As the all-requirements supplier to its utility members, Tri-State has an obligation

to acquire sufficient capacity for all its utility members, and significant uncertainty regarding the amount which could have cost impacts for all

Tri-State utility members,” FERC said.

This, said Tri-State chief executive Duane Highley in a press release, “supports the important principles of fairness and equity for all of our cooperative members, ensuring remaining members are unharmed

### FERC staff report gives cooperative confidence



should another member pursue the early termination of its long-term, all-requirements power contract.”

The setback for United was not even temporary. Prior to FERC’s April ruling about the need to get off the fence, an economist for FERC had issued a report in March that gave United Power directors the confidence they needed. That report recommended a methodology that would have United Power paying Tri-State \$153.8 million upon its exit. That’s roughly a tenth of what it would have been required to pay under the methodologies that Tri-State had proposed.

The staff economist, Gregory Golino, defined the challenge of coming up with a “fair and just” exit fee in this way:

“An exit fee that is too large creates an unreasonable barrier for a member to exit a cooperative (co-op) and enter the market. Such barriers suppress competition and ultimately lead to inefficiencies such as higher prices. An exit fee that is too small will not only make rates increase for remaining co-op members but cause the co-op to unravel as more and more members leave and expenses for remaining members spiral out of control. A too small exit fee will also leave the remaining members with too much debt and power purchase agreement (PPA) obligations so that it is untenable to continue operating the co-op and untenable to dissolve the co-op without declaring bankruptcy. When potential lenders or co-op members believe that a particular co-op are too risky, they will not lend capital for necessary projects or will charge the co-op too high an interest rate. This results in a reduction of service or service quality, which will be borne by the end users.

Tri-State had proposed two different approaches and United Power a third. The economist found fault with all three but especially those of Tri-State. He found four weaknesses in the United approach. He recommended a hybrid model of that

proposed by United with other considerations.

The decision, though, he concluded, will be that for the FERC commissioners to make as they consider stranded costs, safeguards, and what degree of protection should be accorded Tri-State.

FERC launched a hearing on May 3 — which is continuing this week — to consider the report by the economist and to hear other witnesses.

**M**eeting on April 27, directors of United Power decided to go forward with the non-conditional notice of intent to leave Tri-State without waiting for the outcome of the FERC hearing now underway.

That filing was made April 29 — to allow the May 1, 2024 exit. A 2-year notice is required.

On May 2, United requested proposal for wholesale electric power supply to serve a peak load of up to 600 megawatts and retail sales of 3,000 gigawatt hours.

Mark Gabriel, the chief executive of United, confirmed that the report by the FERC economist was “absolutely” crucial. “The information affirmed the range of numbers that we had anticipated since this whole episode began,” he said.

In addition to the existing numbers in the Kit Carson and Delta-Montrose cases, there are now numbers for the partial-requirements contracts that Tri-State has agreed to with La Plata and San Miguel.

United did not wait for the FERC hearing this week before, whatever it decides, the outcome will be litigated. Every month that United stays with Tri-State, said Gabriel, it’s paying more money than what it should be, by his estimate 20% above market costs.

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## UK sanctions Evraz, but still no U.S. sanctions against owner of giant solar project at Pueblo

The [British government has sanctioned](#) Evraz, the steel company whose largest shareholder is Roman Abramovich, the Russian oligarch said to be close to Vladimir Putin. The United States still has taken no similar steps, as the Ukrainian government has hoped that he can influence Vladimir Putin to end his attack.

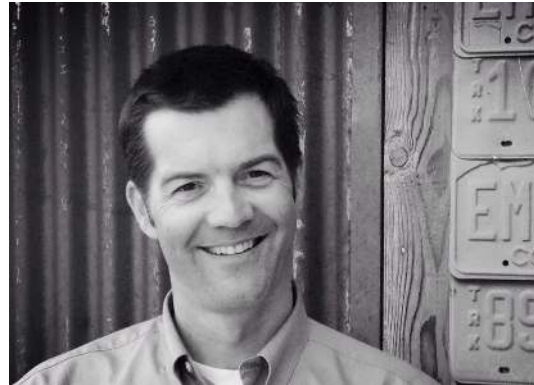
Evraz purchased the steel plant in Pueblo in 2007 along with a steel mill in North Portland, Ore. The company also has four operations in Canada.

A 300-megawatt solar project called Bighorn completed last November on the Evraz mill at Pueblo will provide nearly all the electricity needed for production of rails at a \$700 million long-rail mill being built.

[In an April 6 story](#), Pueblo's KRDO reported that a communications director for Evraz in North America emphasized the separation between Evraz NA and the parent company.

"Our financing is North American, and our people are North American. We are a North American company," said Annie Stefanec. Stefanec said Evraz NA does not, has not, and will not provide steel for the Russian military, and the revenues from the United States are reinvested into North American facilities.

The British Foreign Office cited the central role of the company within Russia's economy. "Evraz PLC produces 28% of all Russian railway wheels and 97% of rail-tracks in Russia. "This is of vital significance as Russia uses rail to move key military supplies and troops to the front lines in Ukraine," the British Foreign Office said.



## Adam Palmer remembered in community solar garden

The late Adam Palmer will be remembered going forward in a new community solar garden located near the Eagle County Regional Airport.

The solar project in Gypsum will allow for the expansion of the income-qualified community solar program sponsored by Holy Cross Energy.

Palmer, a long-time director for Holy Cross Energy and also the sustainability director for Eagle County, died in an avalanche in January 2021 while skiing in the San Juan Mountains. [See Auden Schendler's eulogy here.](#)

The completed solar garden will provide up to 50% reduction in electric bills of 50 income-qualified members of Holy Cross Energy. In addition, the solar garden will assist Eagle County in attaining its goal of 80% clean energy by 2050.

"Adam was a strong leader within Eagle County and advocated throughout his career for 100% clean, renewable electricity for our region," said John Gitchell, environmental manager for Eagle County.

The Town of Eagle – where he was a town trustee — has also created the Adam Palmer Sustainability Fund. The mission, said Laura Hartman, director of the fund, is to "spur community and economic development through the lens of sustainability by establishing a revolving loan fund to support projects with direct carbon-reduction impact."



## Fossil-free fuel that keeps a home cozy in frigid Fraser

by Allen Best

The coldest temperature this winter at the new home of Joe Smyth and Kristen Taddonio was 17 below. They live in Fraser, the Colorado town that used to get far, far colder.

Still, that February night was cold enough to test the design and technologies employed in construction of the couple's 1,176-square-foot house. They insulated carefully, of course, and have solar panels. Even after charging their electric car, their house produces more energy than it consumes.

An air-source heat pump was central to their mission in creating a net-zero home,

Joe Smyth and Kristen Taddonio well equipped their house with air-source heat pumps — and had no need for the electrical resistance heating, but did not need it.

one gutted of emissions from fossil fuels. It extracts heat from outside, even on chilly nights, to warm the interior.

The Mitsubishi model used at the Fraser house promises to deliver the necessary indoor heat even when outside temperatures dip to 13 below. To supplement the air-source heat pump should temperatures dive to 30 below, as was once common, the couple also installed electrical-resistance heating. It wasn't needed.

Colorado needs many more air-source heat pumps — and fewer carbon emissions from buildings — to meet its mid-century decarbonization target goals of 90%.

Getting this right during housing construction costs less in the not-very-long

term. Building permits for 48,200 housing units, both single-family and multi-family, were issued last year, according to the Colorado Business Economic Outlook. That's like adding a new Greeley each year along with a few small towns.

Retrofitting our older buildings is laborious and expensive. I know, because my house was built in 1889. You don't swap out buildings the way you would computers or cars.

Several bills working their way through the Colorado Legislature this spring would nudge Coloradans toward low- and no-carbon technologies. All cost more upfront, but save money, sometimes lots of it, over time, while reducing or eliminating emissions.

Carrots would be offered by [SB22-051](#) to those who purchase air- and ground-source heat pumps. Purchasers would be allowed income-tax exemptions of up to 10% of the purchase price.

Other provisions in the bill approved by the House Energy and Environment Committee offer tax incentives for energy storage and buildings materials with low levels of embodied carbon.

Christine Brinker, representing the Southwest Energy Efficiency Project, testified that her family's air-source heat pump paid for itself in six years because of lower energy costs. Air-source heat pumps help residents of Geos, a project in Arvada, to pay as little as \$6 a month in energy costs.

"It is just more efficient to move heat than to create heat," said Rep. Mike Weissman, a Democrat from Louisville and a bill supporter. "I think we can do some good here by amending that pay-off time curve just a little bit. That's something that we need to do to facilitate our transition" from fossil fuels.

Air-source heat pumps can also move heat from inside buildings during summer, effectively becoming air conditioners. Even

in Winter Park, real estate buyers expect air conditioning.

The second bill, [HB-1362](#), would require towns, cities, and counties to adopt the 2021 International Energy Conservation Code before 2025. This latest code advances efficiency 8% to 9% compared to the 2018 iteration.

Natural gas will still be allowed, but air-source heat pumps more efficiently meet the 2021 code's elevated standards.

The Colorado Municipal League objected to loss of local control. Two representatives of rural areas described it as onerous for small towns despite \$3 million earmarked for training. Homebuilders argued that the advanced standards would make already expensive housing less affordable.

**H**oward Geller, representing the Southwest Energy Efficiency Project, cited a study from the Pacific Northwest National Laboratory that found the latest code would indeed add \$200 to the cost of an average mortgage in Colorado built to this latest code. Lower energy costs will more than recoup that extra cost, he said, even in the first year.

Rep. Tracey Bennett, a Democrat from Longmont whose district includes nearly half the 1,084 homes destroyed by the Marshall Fire, said she sponsored the bill with full confidence it will help, not harm, her constituents.

These bills both moved from the House committee on strictly party-line votes, Democrats in support. A third bill, [HB22-1381](#), has bipartisan sponsors — and bipartisan support. It would allocate \$20 million for grants to further geothermal development by tapping the year-round heat of 55 degrees found 8 to 10 feet below the surface.

As with air-source heat pumps, sponsors said the market needs to be nudged to adopt technology that costs more upfront than installing natural gas

infrastructure but pays off in the long term. “This is something we don’t do enough of,” said Rep. Hugh McKean, a Republican from Loveland, who is installing geothermal in a house he is constructing.

“I really like this bill,” said Perry Will, a Republican from New Castle, citing the experiences of family members with the technology at Rulison and elsewhere.

**P**ost script: This above column was published at BigPivots.com on April 29 and also in about 15 different newspapers and websites in Colorado, from Sterling to Grand Junction.

Here’s what had to be cut out because of space limits:

**Andy Miller**, who built the house:

“I like to see a product that is new and innovative but has been in field long enough to know it will work.” Heat pumps, he said, fall into that category.

As an (outgoing) Fraser town trustee of the last 8 years, Miller has also monitored the debate about the building codes bill, including the opposition of local jurisdictions who don’t want their authority pre-empted by state mandate.

“We have to take a larger view of this,” he said. “This is all boils down to the urgency of the climate crisis.”

We don’t like to be told what do, he added but we also have responsibilities – and reducing fossil fuel use through improved buildings is one way.

**Joe Smyth** said this about their house (which, incidentally, last year won the national Solar Decathlon top prize as an entry sponsored by the University of Colorado-Boulder):

“The impressive performance of the house helps show why it makes sense to ensure that all new homes are, at the very least, ready to be all electric — wired for a level 2 EV charger and solar, and an electric panel big enough to handle all electric

heating and cooking. All electric homes are healthier since no fossil fuel combustion occurs in the home, better for the climate (especially as we replace Colorado coal plants with renewable energy), and can be cheaper to operate.

“The overall costs depend a lot on whether homeowners have to spend a lot to switch from gas to electric, which is why it’s so important that new homes are built ready to be all electric. By preparing for the transition to all electric homes, we help keep upgrade costs low, so we can do it as quickly and affordably as possible.

He cites a Rocky Mountain Institute study that shows homes in Denver (and other cities) are cheaper to heat with heat pumps than gas furnaces.

And he recommends the [Mitsubishi Electric website](#) as useful.

**Kristen Taddonio**: “Heat pumps don’t necessarily cost any more upfront. If you are going to install an air conditioner anyway, for a few hundred more you can make it a heat pump. It’s the same technology. Compare to spending thousands on a gas system.

The main reason I support the bill is because the newest and best heat pumps and air conditioners use more efficient and more environmentally friendly refrigerants like R32.

Manufacturers want to sell R32 and other newer refrigerant containing products in Colorado, but can’t. They can’t because so many jurisdictions have outdated codes that effectively force the sale of the older type of equipment. That sucks for consumers, companies and the climate. This bill has a provision that fixes the problem, which is why the Air-conditioning Heating and Refrigeration Institute (AHRI) supports it. That’s a big deal: they are the major US industry trade association that makes heating and cooling equipment (including equipment that burns gas).



## New way to measure whether a gas plant can be justified

*This story was posted on April 27 to BigPivots.com.*

**by Allen Best**

An agreement filed Tuesday with state regulators proposes a sharper, faster pivot by Colorado's largest electrical utility from coal to renewables and alternative technologies.

The settlement agreement filed by Xcel Energy and other parties calls for retirement of Comanche 3, the state's youngest and most powerful coal plant, "no later than" Jan. 1, 2031. Retirement could actually occur sooner.

As for new natural gas generation, the agreement calls for a new measuring stick: How cost-effective can the gas plant be if it operates only 25 years?

**The Pawnee coal-fired power plant near Brush is to be converted to burn natural gas before 2026. Photo/Allen Best**

This could potentially result in Xcel Energy reducing carbon emissions from its electrical generation 88% by 2030 as compared to 2005 levels. As of 2021 Xcel's electrical generation in Colorado was 39% carbon free.

But the proposal would also kick some major decisions down the road to 2024 and 2025. "The modeling and technologies need just a little more time to improve," said Gwen Farnsworth, managing senior policy advisor in Colorado for Boulder-based Western Resource Advocates.

Among the items almost certain to be taken up in 2024 are questions of whether new programs and business models can be used to configure demand for electricity to better match supplies. For example, can batteries of electric cars be charged during the middle of night, when wind turbines in eastern Colorado most reliably whirl? Can peak demand be shaved more on hot

summer afternoons? Such strategies and new technologies could reduce need for new generation, both fossil and renewables,

Those decisions include when exactly Comanche 3 needs to close. When the \$1 billion plant opened in 2010, it was projected to operate until 2070. It has had a troubled history, a largely unreliable source of electricity with massive amounts of debt remaining. The 750-megawatt plant has been idled – again – since January, with no certain date for reopening.

Noting that lack of reliability, two of the three PUC commissioners in March indicated that they saw no good reason for the plant to remain operational beyond 2029.

Xcel last year proposed continuing operations to 2040, then agreed to a 2034 closing. This moves up the no-later-than date to the end of 2030.

“No-later-than is a key phrase, because it allows for flexibility and even improving the results of this settlement over time,” said Farnsworth. She said the accelerated retirement of Comanche 3 by just four years will save Xcel ratepayers up to \$39 million.

And having Comanche off-line this year has helped save money because otherwise production from wind farms and other renewable generation would have been curtailed.

As for new natural gas, Xcel originally proposed 1,300 megawatts of “dispatchable” resources, meaning natural gas or other fossil fuels. Dispatchable resources can – at least in theory – be turned on quickly to meet demand. In practice, it’s more complicated. See Comanche 3.

### ***How much natural gas?***

Some of Xcel’s plans for natural gas remain. The coal-burning Pawnee Power Plant near Brush, about 90 miles northeast of Denver, is to be converted to natural gas

no later than January 2026. Still in question is how much additional natural gas generation Xcel will acquire.

Xcel could still propose new natural gas plants to go on line in 2030, for example, but they would have to cease producing emissions by 2050.

But the settlement agreement also will result in new modeling that the Sierra Club’s Anna McDevitt says will allow battery storage coupled with renewable generation to better compete with natural gas in giving Xcel the confidence it can meet demands. Previous modeling used what the Sierra Club believes were flawed assumptions that favored natural gas.

“There is much in the settlement that will result in less likelihood of building new gas plants,” she said.

Xcel, in a presentation to investors in November 2021, estimated its Colorado division would spend \$9.9 billion from 2022 through 2026, not quite two-thirds for electric distribution and transmission but almost a quarter for natural gas.

Another major component of the plan calls for Xcel to continue property tax payments to Pueblo and Pueblo County districts from 2031 through 2040, the previous retirement date.

Holy Cross Energy, the electrical cooperative serving the Vail and Aspen areas, owns 8% of Comanche 3. That translates to a potential 60 megawatts of production.

The agreement specifies that Holy Cross will be able to continue to use Xcel Energy’s transmission lines from eastern Colorado for an equal amount of electrical production, either from the resources owned by Holy Cross or from the new generating resources being brought on-line by Xcel in coming years.

Xcel’s plans for new generation, to be determined by competitive bidding, are estimated to include 2,400 megawatts of new wind, 1,600 megawatts of large-scale solar, 400 megawatts of energy storage,

and nearly 1,200 megawatts of distributed solar resources.

“In a way, we are held harmless by the early retirement” of Comanche 3, said Bryan Hannegan, the chief executive of Holy Cross.

Holy Cross is currently projected to pay off its portion of the Comanche 3 debt in 2042.

Sedalia-based CORE Electric Cooperative, the state’s largest electrical cooperative, which serves Castle Rock and other suburban and exurban communities on the south flanks of metropolitan Denver, owns 25% of Comanche 3.

Hannegan and many others credited Xcel with a major achievement in getting a diverse set of parties – Boulder, Pueblo and other cities, as well as labor and business groups, environmental organizations, and still others – to come to a compromise.

Release of the agreement was accompanied by press releases from many organizations with a chorus of hosannahs.

“This agreement is a significant step toward meeting Colorado’s climate goals,” said Will Toor, chief executive of the Colorado Energy Office. “We’re so proud to lead the charge on reducing carbon emissions in Colorado,” said Alice Jackson, president of Xcel’s Colorado division. The Natural Resources Defense Council’s Noah Long also saluted a future of “savings for Xcel Energy customers and cleaner skies for Colorado.”

Farnsworth, of Western Resource Advocates, offered similar praise, but also pointed to a strong motivation: “I think the parties all made it possible because there’s a common understanding of the urgency of addressing climate change and also the urgency of moving this resource planning process forward in time to benefit from the federal tax credits for wind and solar.”

That, she added, made everybody want to reach compromise and avoid litigation.

The key word used by many was “flexible.”

### ***Forward movement, but...***

Not all were equally enthused. “Any date for shutting Pueblo unit 3 that isn’t 2022 is the wrong date,” said Leslie Glustrom of Boulder-based Clean Energy Action, referring to Comanche 3. “The climate crisis now is clear to everyone.”

The Colorado Renewable Energy Society policy committee members were miffed that the social cost of methane was not used in the agreement as they had advocated.

“A big move forward, but there are pieces missing,” said the group’s Laurent Meillon. He charged that the plan still favors Xcel building generating facilities — that it can then use to justify higher-than-necessary rates to customers.

“Xcel is orienting itself toward the construction of unnecessary gas plants, thus maximizing its investments and profits, right before it becomes entirely too obvious that only renewables and efficiencies are worthy of more investments. A repeat of its profitable coal mistakes, despite the current early coal closures with decades left to amortize those stranded assets,” he wrote in an e-mail.

CRES members, Glustrom and others, say that Xcel must more aggressively pursue strategies that shave peak demands. Others involved in the agreement said they believe that those programs will become a central component of discussions in the middle of this decade. Xcel is beginning an update this summer of the thinking behind its programs.

All in all, how might this settlement be seen in a broader context – say, the United States? Farnsworth offers what must be considered a hometown view but one worth considering.

“Colorado might be on a smaller scale than some other states, but Xcel and this settlement are really on the leading edge.”