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Carbon capture bill advances despite misgivings of some about risks & costs

by Allen Best

On the first Friday in January, three days before she was sworn in as a new state representative from Denver's south metro area, Ruby Dickson was part of a tour of relatively new businesses in the Boulder area.

This was not your typical chamber of commerce tour, though. It had been organized by then State Rep. Tracey Bernett, who had taken an extraordinary interest in climate change legislation during her first two years in the General Assembly.

The four businesses had in common the goal of drawing carbon dioxide from the air, in the case of one business through the technique of biochar, or creating new processes that eliminated need for emissions such as exist now with virgin steel-making.

If ebullient during the tour, Bernett was under a storm cloud, accused by the district attorney in Boulder County of falsely claiming residency in Louisville, a part of her old district but apart from her home near

Longmont that had been put into a new district. Two days later, she resigned.

In leaving, she handed off an idea for legislation to the incoming representative Dickson.

That bill, [HB23-1210](#), "Carbon Management," easily passed its first legislative test on March 9, getting approval from the House Energy and Environment Committee in an 8-3 vote.

If it becomes law, the legislation will crack the door open in Colorado for new technologies and practices that many climate change activists insist will be necessary for the state to meet its mid-century decarbonization goals. But many activists who worry just as intensely about the risks of climate change are convinced it's a misstep.

The bill has two components. One would

make "carbon management projects" eligible for grants under the state [Clean Air Program](#) that was established by legislators in 2022 with funding of \$25 million. Potential applications among the 11 defined in the bill include

bioenergy with carbon capture and storage, durable geological carbon sequestration, and direct air capture and storage.

Enhanced oil recovery—a practice that has provoked hurricane-strength opposition in other places—is expressly excluded from potential grant application.

The program requires cash matches to the grants before the program expires in 2028. The first round of grants will become available in spring 2023.

"The first step in making Colorado the national and even global leader in carbon management."

**State Rep. Ruby Dickson
Bill co-sponsor**

The second major component of the bill directs the Colorado Energy Office to work with a contractor to create a carbon management roadmap in consultation with stakeholders. It is to be delivered to legislators by February 2025.

This proposed roadmap would be an extension of and complementary to the legislative recommendations issued in late February by the Colorado Oil and Gas Conservation Commission. That 67-page document, [“Creating Colorado’s Carbon Sequestration Framework,”](#) goes into great detail regarding the questions that Colorado must resolve if it is to find ways to sequester carbon emission from hard-to-decarbonize sectors in decades ahead.

That new report was triggered specifically by Colorado’s landmark legislation in 2019 that adopted sweeping economy-wide carbon reduction goals for 2025, 2030, and 2050.

An economist, Dickson has a master’s degree from Oxford and, according to her LinkedIn profile, seems to speak Chinese. The thesis for her undergraduate degree was an analysis of Chinese citizens’ investment habits.

She’s a researcher for [Rethink Priorities](#), a consultancy that tries to help organizations identify what resources would be most effective in addressing animal welfare, climate change, and other causes.

“A lot of the things I’ve worked on involve climate change,” she said in an interview with Big Pivots several days prior to the committee hearing. “I have worked on carbon management technology from that perspective. That is why I was so eager to work on this when I went into the Legislature this year.”

Told that Sen. Chris Hansen had been engaged in something similar, she went to him to solicit interest in a co-sponsorship.

“It was a pretty easy conversation,” she reports.

Dickson in the interview stressed the stopping of further emissions and then

actually removing emissions from the air. “There are a lot of potential solutions here, and we shouldn’t leave any stone unturned,” she said.

When this reporter suggested she expect an 8-3 vote along party lines, the three Republicans on the committee all in opposition, she said she reserved hope. One of her bills, regarding work force transition, had gained unanimous Republican support in its committee hearing, she noted.



Rep. Ruby Dickson

In this case, though, she was wrong—although Rep. Ty Winter, a rancher from the natural-gas rich Las Animas County whose district extends from Trinidad to the Kansas border, did tell her that he appreciated her efforts to consider the

needs of his rural constituents.

“Respectfully no, but I appreciate you thinking about this stuff,” he said in explaining his vote.

Dickson had said that many of the people who would most benefit from and take advantage of the new technologies would be rural people “and people whose jobs are being affected by the transition away from fossil fuels.”

In her opening pitch to the committee, Dickson emphasized both the emergency and the opportunity.

“We really need to set our sights on a net-zero goal very soon,” she said. Colorado, she went on, has an abundance of resources to achieve this, both solar and wind, but potential geologic reservoirs, underground geological formations where carbon emissions can be stowed with some confidence that they will not find their way to the surface. The Canon City Embayment is the most prominent such geological formation in Colorado, but there are others.

Dickson also talked about Colorado’s highly-educated demographics but also the

workers being disrupted by the new energy economy. This bill, she said, recognizes the need for guardrails to consider environmental justice. She talked about extensive conversations with environmental and labor groups, and the potential to create well-paying jobs.

This will not pose a cost to Colorado. “I also think there is something to be said for doing our part for the climate crisis and because it’s the right thing to do.”

Where this will go, she acknowledged, is unclear.

“We don’t know what it will look like over the next couple of decades. It could end up being a serious positive for our economy here. We have so many advantages.”

And her takeaways:

“This is the first step in making Colorado the national and even global leader in carbon management,” she said.

“We need to push down the cost curve by learning by doing,” she said, anticipating one counterargument.

Dickson’s bill did get pushback, primarily from the hardest-core environmental activists who, in an unusual way, found common ground with the Legislature’s most ardent climate change denier.

Rep. Ken DeGraaf, who is from Colorado Springs, used the occasion to again suggest that carbon dioxide is not a problem to human health until it gets to be something like 12,000 parts per million. And, he suggested when quizzing witnesses, wasn’t this an extravagant cost for Colorado to attempt to trim emissions when it would make very little difference anyway on a global scale?

Morey Wolfson, who has been in Colorado’s environmental trenches for about 50 years, had testified that carbon removal is extravagantly expensive.

“Here’s the math,” he said. To reduce atmospheric carbon dioxide concentrations,

now at 420 parts per million, by just one part, will require removal of 8 billion tons at a cost of \$100 per ton. That, he said, will cost \$800 billion. “Your state budget is \$42 billion.”

“There are so many inexpensive ways to not put carbon into the atmosphere in the first place,” he said.

Jan Rose, from the Colorado Coalition for a Livable Climate, warned that the bill lacked the guardrails needed when moving carbon



Loren Burnett, the chief executive of Prometheus Materials, a Longmont-based company that hopes to use microalgae in cement to void carbon emissions. Photo/Allen Best

dioxide around in a gaseous form. She also suggested room for missteps. “I see red flashing signs that say Solyndra,” she said, referring to California solar company that filed for bankruptcy in 2011, defaulting on \$535 million in federal loans.

Leslie Glustrom, testifying on behalf of Clean Energy Action, urged amendments to recognize risks. “If your pipeline breaks, your local concentrations are high enough to kill you,” she warned.

“Prioritize public health and safety first” before enabling companies to chase the Q4 tax credits delivered by the Inflation Reduction Act, she said. The IRA provides tax credits designed to encourage innovation of carbon-removal technologies.

Glustrom also warned against “group think behavior”—a statement again seized

upon by DeGraaf, who reporting seeing a “large degree of group think” in play.

Wolfson, too, warned of the “bandwagon effect.”

“Those who support carbon dioxide removal and carbon capture and sequestration, 99% have not done the math that I am talking about,” he said. “I have read thousands of articles, and only 1% of the articles ever tell you that removing 1 ppm will cost you \$800 billion.”

Several other witnesses pushed back. Christopher Neidl, who describes himself as a carbon removal evangelist from Austin, Texas, downplayed the the threat from leaks from pipelines.

“They’re not exactly an enormous health threat,” he said. He urged approval of the bill so that “Colorado is in the front of the line instead of being a taker of the technology when it comes.”

Individuals from a new organization called the Signal Tech Coalition also testified. “We are not going to meet our climate goals without carbon removal technologies,” said Quinn Antus, the co-founder and executive director.

The Polis administration has also endorsed the bill’s contents. Keith Hay, the senior director of policy at the Colorado Energy Office, called it an “important first step” to reduction of emissions from economic sectors of Colorado’s economy that will be particularly difficult to decarbonize.

“It sends a signal to the marketplace that Colorado is serious about creating a marketplace for the technologies and that jobs that come with it,” he said. He also noted a “number of Fortune 500 companies that are looking to move into a state with carbon capture technologies.”

Representatives from the Blue-Green Alliance; Healthy Air Water Colorado; Boulder County; Colorado Communities for Climate Action; and Xcel Energy also testified in support. The Xcel rep said that this was among the technologies that it is monitoring and evaluating.

Dickson wrapped up her case by citing a study by Lazard, the consultancy, that found solar prices had dropped 99.5% between 1975 and 2019. (\$115/watt to 27 cents/watt). On-shore wind dropped 70% from 2009 to 2021.

The cost of this large-scale drawdown, she said can’t be known now. “But I would guess—and I think a lot of the data show—that the more we try, the cheaper it is going to be.”

As the votes were taken, there was one interesting additional interplay. McGraaf dismissed the value of such work. He also said he was “just not a fan of government interference in the market, as was brought up with the Solyndra example that was cited. I am not a fan of government picking winners or losers.”

Rep. Mike Weissman had a lengthy response. He addressed the roadmap and the “very broad spectrum of potential technologies,” and suggested there will be “downstream policy choices and investment choices that we could make.”

Then he addressed the idea of markets free of policy choices. “Frankly, we never have had a free market for energy policy in this country in a couple of key perspectives. We have never adequately internalized the cost of pollution with anything we do, and that’s why we are here today. We have also made policy choices, from the very earliest phase of our country in terms of subsidizing different things.”

Weissman then went on to describe various policies from the opening of federal lands for coal extraction beginning in 1840 to the Energy Act of 2005 that all, in some way, subsidized fossil fuel extraction and use.

“And on and on and on and on,” he continued.

“The question is not whether policy has something to say what about how the market works and energy, but what we say.”



4 Corners Carbon Coalition awards grants for projects

A relatively new group of four local governments in southwestern states has awarded \$389,000 to projects in Boulder, Lyons, Durango, all in Colorado, and in Flagstaff, Ariz.

They all are trying to reduce or eliminate the carbon emissions associated with concrete by sucking carbon from the atmosphere.

The 4 Corners Carbon Coalition was created in 2021 when sustainability teams from Boulder County and from Flagstaff, Ariz., discovered a common interest in carbon dioxide removal. They had introduced it as a formal component of their broader strategies. In the case of Boulder County, that was in 2018. They have more recently been joined by Santa Fe and Salt Lake City.

“The science is clear. In concert with rapid efforts to dramatically reduce greenhouse gas emissions, humanity must also pursue carbon dioxide removal (CDR) at an unprecedented

Sarah Williams, the chief executive of Minus Materials, a company in Boulder, monitors growth of microalgae that produce carbon-negative, bio-renewable limestone. That process has allowed Minus Materials to produce the world’s first carbon-negative Portland cement, the company says.

pace and scale,” [says the coalition on its website.](#)

It cites the assertion in the Intergovernmental Panel on Climate Change Working Group III 2022 report of the “need for large-scale CDR as an essential pillar to limit warming to no more than 1.5°C, for which CDR also serves as a crucial tool for scenarios that limit warming to no more than 2°C by 2100.”

The IPCC report added: “This requires rapid scale-up and massive deployment of all viable CDR methods, underscoring the limited state of commercial deployment at present. ... Communities at all scales across jurisdictions have crucial roles to play as innovators and host locations for CDR activities.”

CDR—it’s time to get used to another acronym—is described by the coalition as the process that pulls carbon dioxide out of the

atmosphere and locks it away in geological, biologic, and synthetic formations for at least a century.

Omnipresent in industrialized nations, concrete produces emissions generally estimated to constitute 7% to 8% of global carbon-dioxide totals. In their book, "The Big Fix," Hal Harvey and Justin Gillis say that every year the world produces more than 5 tons of concrete for every man, woman, and child on Earth.

On a per capita basis, said the journal, "Nature," in a September 2021 editorial, that is 3 times as much as 40 years ago.

Why such high emissions? It's the cement part of concrete, which requires using fossil fuels to heat a mixture of limestone and clay to more than 1,400°C in a kiln. Also, when limestone (calcium carbonate) is heated with clays, roughly 600 kilograms of carbon dioxide is released for every ton of cement produced. [See this explanation.](#)

Susie Strife, director of Boulder County's Office of Sustainability, Climate Action & Resilience, cited the synergy of local governments working together.

"Pooling resources can amplify innovation and the creative deployment of the integration of carbon removal and concrete," she said in the [announcement posted on the county's website](#). "These awardees will turn

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their breakthroughs into real world projects right here in the Western United States. We are thrilled to provide seed funding to catalyze this work."

Grant proposals were evaluated based on five criteria: removal; removal quality; innovation; scalability; and future impact. A workbook planned for an April release will unpack the details of the evaluation process in greater detail.

What are the projects?

Flagstaff

The largest grant, \$150,000 went to a project at Block-Lite, a masonry business in Flagstaff. With Block-Lite, two California companies aim to be the world's first to use atmospheric carbon to produce ultra-low carbon concrete.

[Aircapture](#), a company based in Berkeley, has direct air capture technology to remove it from the air, and [CarbonBuilt](#), based in Torrance, uses it to harden low-carbon concrete masonry blocks, resulting in 70% to 100% less embodied carbon than traditional concrete.

Boulder

[Minus Materials](#), which received \$10,000, will use algae to convert atmospheric CO2 into organic biomass and bio-renewable limestone. It intends to cultivate coccolithophores, a unique type of calcifying microalgae, that will yield approximately 100 kg of bio-renewable limestone over the material use. This will then be used as a carbon-negative filler in a Portland limestone cement or limestone calcined clay concrete slab demonstration project.

Boulder

[Travertine Technologies](#) received \$20,000, and it generates carbon-negative precipitated calcium carbonate using waste feedstocks from the mining and fertilizer production industries.

The project goal is to demonstrate the beneficial use of travertine's process in the production of low-carbon-intensity cement binder for permanent carbon dioxide removal and sequestration.

Travertine, which is based in Boulder's climate-technology sector, was founded by University of California-Berkeley Professor Laura Lammers.

Durango

Hemp lies at the center of this project, which received a grant of \$119,000. A two-story office warehouse will be constructed using a "tip-up, hempcrete, structural panel system as well as through biochar used in the building's cementitious materials."

"We are excited to demonstrate a new method to build affordable, low-maintenance, nontoxic, fire and mold resistant buildings with carbon negative biogenic materials," said Steve Heising, director of [Citizens for Clean Energy](#), a Longmont-based organization.

What is carbon dioxide removal? 4 Corners defines it a dozen ways, from no-till agriculture to fertilizing selected areas of the ocean to building machines that suck carbon dioxide directly out of the air. It is not the same as carbon capture and storage.

"While CDR addresses legacy and difficult to abate emission by removing carbon dioxide from the atmosphere, carbon capture and storage is a 'point-source' approach that captures carbon dioxide from industrial smokestacks, such as those on coal-fired power plants, or cement and steel factories, and then sequesters it underground."

The money for the first grants came entirely from Flagstaff and Boulder. Leaders hope for an upcoming multiplier campaign that will expand funding. 4 Corners plans at least two more rounds of grants in the next 12 months.

Maury Galbraith becomes first executive director of transmission authority

Maury Galbraith will become the inaugural executive director of the new Colorado Electric Transmission Authority effective April 3.

CETA was created by Colorado legislators in 2021 with a mandate to plan, finance, build and operate new electric transmission lines and storage facilities.

Galbraith has more than 20 years of experience in electricity policy and utility regulation in the West. He most recently served as executive director at the Denver-based [Western Interstate Energy Board](#). There he led engagement in Colorado and 10 other Western states



Maury Galbraith

as well as two Canadian provinces in wholesale electricity markets, regional resource adequacy programs, and bulk electric system reliability.

Prior to that, Galbraith held regulatory and economic analyst roles at the Oregon Public Utility Commission and the Northwest Power and Conservation Council. Galbraith has a master's degree in economics from Washington State University and a bachelor's degree in economics from the University of Oregon.

Galbraith will report to a nine-member board of directors. The salary range in advertisements was \$160,000 to \$210,000.

Kathleen Staks, chair of the CETA board of directors, said Galbraith's "leadership experience, regulatory expertise, and knowledge of public economics will ensure CETA is able to quickly startup and begin evaluating new electric transmission lines as a means to providing a clean, economic, reliable, and secure electricity grid for Colorado citizens."



A mystery within the Capitol pep rally about climate and energy legislation

by Allen Best

Colorado Gov. Jared Polis called a press conference on the west steps of the Capitol on March 8, and it's still not entirely clear to me exactly the news that was being shared. It was mostly a mid-session pep rally built around the admittedly impressive lineup of legislation that seeks to allow Colorado to make good on its ambitious carbon reduction goals adopted in 2019.

But amid the remarks was a disclosure that remains a mystery to me. It's about interim greenhouse gas reduction goals. I'll get to that.

Polis opened the session talking about "an exciting path forward to further establish Colorado as a leader on clean energy, saving people money, cutting red tape, to accelerate the clean energy transition, making sure that Colorado is *the* national leader on clean energy solutions."

In his four-plus years as governor, Polis has consistently emphasized incentives. This was no exception. He talked about new \$3,000 tax credits for high-efficiency heat pumps and had a couple from near the fire-ravaged fire that ripped through Louisville in December 2021 to testify about their effectiveness.

He pointed to tax credits for electric vehicles and e-bikes, and noted that Colorado has become fifth in the nation in sales of EVs.

He talked about geothermal, his pet project as chair of the Western Governors Association,

and about his response and the response of legislators to the high heat bills of earlier this winter. And, of course, he talked again about "money-saving opportunities" from the new technology.

Then he shared the lectern with legislators who talked about some of their bills. They talked about innovation, about leadership, and about jobs—always there is mention of jobs.

This year is indeed shaping up to be another major year for legislative efforts to shape and guide the decarbonization effort in Colorado. The "package" issued by the governor's office cited 13 bills, not including the agrivoltaics study bill.

I hear of at least a couple more bills of considerable significance that are still being shaped. This might not match the energetic push of the 2021 session, when I think it was 29 climate and energy bills that became laws, but it's impressive.

But what caught my ears, despite my struggles to hear against the roar of traffic on Lincoln Avenue a few hundred feet away, was Polis saying he is on board with the interim greenhouse gas reduction targets in a Sen. Chris Hansen's bill, [SB-23-016](#), "Greenhouse Gas Emission Reduction Measures."

In this bill, Hansen and his co-sponsors propose to add new stairsteps to the state's

greenhouse reduction ambitions beyond the 50% target of 2030:

- 65% by 2035
- 80% by 2040
- 90% by 2045.

Existing goals jump from 50% by 2030 to 90% by 2050. This revised goal-setting would up the latter to 100%.

This is just one section among many in the Hansen bill, a giant proposal that covers everything from electric-powered snowblowers to efforts to align investments by the Public Employees' Retirement Association, or PERA, with the state goals.

[As reported by Colorado Newsline in](#)

[January](#), the Polis administration opposed this provision of the bill at its first legislative committee hearing. Don't get ahead of the technology, the committee members were told. Xcel said the same thing.



Chris Hansen

At the press conference last week, Polis cited the proposed interim goals in the Hansen bill, suggesting that he supports it.

And when Hansen got to the lectern, he said he believes his bill has a "clear path to get this to the governor's desk."

What caused the reversal? I reached out to the Colorado Energy Office, which delivered to me by e-mail a non-answer answer:

"The administration supports bold climate action and believes that changing statewide greenhouse gas targets should be a thoughtful process that incorporates data-driven solutions, while also ensuring the General Assembly provides the resources and regulations needed to achieve these targets in a way that saves people money. The clean energy and climate package proposal announced this week includes incentives and

regulatory pathways that will be critical to achieving both deep emissions reductions in the interim between 2030 and 2050, and net-zero emissions by 2050. The ability to achieve these bold climate goals is dependent on having every tool available to meet the goals, including carbon capture and management, clean and green hydrogen, and other emerging technologies. The governor and his team will continue to follow these bills as they move through the process and look forward to reviewing the final bills."

Hansen, during a grueling Friday session in the Senate as Republicans did their best to thwart gun-control legislation, promised to get back to me but did not. Incidentally, he is running for mayor of Denver, a full-time job itself. He's a busy guy.

The mystery remains, some interior politics that I cannot explain. Why the reversal?

Why do these goals matter? I first heard Hansen argue their need at a fundraiser in September 2021. His bill in the 2022 session fell just short of crossing the finish line.

In December, [when I interviewed him](#), he explained that having no goals against which to measure progress, it would be too easy to slacken the pace between 2030 and 2050.

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Can Craig coal plant be repurposed into new energy center?

by **Allen Best**

Congress has allocated \$200,000 to allow Tri-State Generation and Transmission to study the feasibility of repurposing the existing coal plant at Craig to test and demonstrate clean and low-emission energy technologies.

Black Hills Energy has taken note of potential federal funding from two giant federal bills, the Infrastructure Investment and Jobs Act of 2021 and the Inflation Reduction Act in its clean energy planning.

Xcel Energy also has its eyes on federal money as it looks to transition from coal-based generation. The IRA provides a 10% bonus for production tax credits and 10% points bonus of investment tax credits if an

eligible facility is built in an energy community.

All three items were contained in reports submitted to the Colorado Public Utilities Commission in recent weeks in a new proceeding that was initiated in January. Three groups—Western Resource Advocates, the Office of Utility Consumer Advocates, and the Colorado Energy Office—said why not ask the utilities regulated by the PUC to report how they see themselves availing of the extraordinary federal funding.

The 2021 infrastructure law provides \$73 billion in funding for power and grid improvements, including money for the electric vehicle sector, clean energy transmission, and cyber security.

The 2021 IRA provides \$370 billion, according to the PUC filing (although some analysts have suggested the true potential funding may be double that once all the rules are adopted) in incentives to modernize and decarbonize the energy system.

In essence, the PUC wants to know how the utilities see these funding opportunities shifting and perhaps accelerating their plans

Utilities report how they see taking advantage of new federal funding

in everything from transmission to energy efficiency programs.

The PUC decision acknowledged that the funding programs are “vast, and entities may not yet know each opportunity they may pursue.”

The decision applied to Xcel and Black Hills, who provide both gas and electricity, and Atmos and Colorado Natural Gas, both exclusively natural gas providers.

The decision did not apply to Tri-State or other cooperatives or municipal providers, but Tri-State chose to share its thinking in some detail.

“At this time, Tri-State’s priority areas for pursuit of funding include transmission system investments for grid resilience, distributed energy resource management systems, and distributed generation and storage integration,” said a March 2 letter from Barry Ingold, the chief operating officer of Tri-State.

“Tri-State is also evaluating funding availability to support other elements essential to its energy transition, including clean resource investment, stranded asset relief, and emerging technology investments. Additionally, Tri-State is interested in opportunities that are impacted by the transition away from coal.”

In the context of Colorado, that would be Craig, where the three coal-burning units are scheduled to be retired between 2025 and 2030.

The new federal funding for the study of a new energy center at Craig was not part of either of the federal landmark laws, but rather at the behest of a special request funneled through U.S. senators Michael Bennet and John Hickenlooper and the former U.S. Rep. Ed Perlmutter.

Tri-State said this coming study will enable it to understand the subsequent steps and estimated costs that would enable the transition of the site and further support the transition in the Craig community.

Transmission—not surprisingly—ranks high in the specifics of how Tri-State sees

opportunities. It sees some possibility for grants for three different projects under the 2022 infrastructure law.

Both Tri-State and Xcel Energy are among the 11 members of the Rocky Mountain Region Transmission Coalition, an effort led by the Colorado Energy Office that is seeking federal funding to study what Tri-State calls an “East-West DC tie interregional transmission project.”

That same effort is focusing on identifying the most beneficial transmission route between the sunshine-laden San Luis Valley and the Front Range.

Xcel also noted the IRAtax credits that will “both increase affordability and drive investment in hydrogen.” Xcel is a partner in the Western Interstate Hydrogen Hub, a coalition of four states that will be submitting a proposal to the Department of Energy in April 2023.

“We are currently exploring plans to incorporate hydrogen into an upcoming proposal for hydrogen-capable combustion turbines,” the company said.

“We have plans to start testing the ability to blend hydrogen into a small area of the natural gas distribution system in Colorado.”

Xcel’s report also describes its attention to other sectors, including energy storage, building electrification, and transportation.,

The two federal laws have funding to accelerate electrification of transportation. But, says Xcel in its filing, together they “likely do not provide all the funding necessary to reach (Colorado’s) EV goal of 940,000 vehicles by 2030 nor (Xcel’s) vision of 1 in 5 electrified vehicles by 2030. Estimates from other organizations indicate that a business-as-usual forecast of EV adoption could increase by about 20% because of the IRA. While such an increase in EV adoption would certainly be material, it would not close the gap between pre-IRA expectations and the amount of electrification needed to meet the state’s clean transportation goals.”



A three-wire winter on the Yampa. What will it do for Powell and Colorado River?

by Allen Best

During early March I traveled to Colorado's Yampa Valley to see, hear, and feel what a big-snow winter looks like and to ponder the implications for the Colorado River. This has been an epic winter, both wondrous and awful.

Ranchers in that valley have long measured snow depths against three-wired stock fences. In Steamboat Springs and along flanks of the Park Range, it's three wires and

Colorado's Yampa River Valley has had an epic winter. Has drought ended? Not likely.

more. Nearing Hahns Peak, only dimples in the snow marked the tops of fence posts.

Along the Wyoming-Colorado border, rancher Patrick O'Toole reported that this has been the hardest winter since he arrived in 1976. That includes 1983, when snowstorms persisted until June, catching Colorado River water managers flat-footed. Gargantuan flows into Lake Powell nearly ruptured Glen Canyon Dam.

"This year is more," said O'Toole.

O'Toole's family operation moved 7,000 head of sheep from winter range north of Craig to more hospitable desert range. The deep snow, cold, and winds that seem to be worsening were too much for his woolies. He told of pronghorn antelope left behind, some just lying along roads, too weak to stand.

"And there's a lot of winter left," he said.

In Craig, walls of icicles hung from roof edges, and the motel parking lot had snow and ice a half-foot thick. Along the edges of the frozen Yampa River, six cow elk huddled, looking perplexed, as another storm



Icicles drooped from many roofs in Craig on March 5, and in Steamboat Springs, sidewalks were in many places separated from streets by head-high or taller snowbanks.

moved in. Glancing at my phone, I saw that in Denver, the temperature was near 50. In the opposite corner of Colorado, Lamar had been warned of potential prairie fires.

While examining this snow-covered landscape, I thought often about Helen Henricks Perry. In the early 1980s, the late Ed Quillen and I had written a story about a family that in 1904 had traveled from Nebraska and homesteaded at about 9,000 feet in elevation at the headwaters of Troublesome Creek, at the foot of the Rabbit Ears Range northeast of Kremmling.

All ranchers lived lives of isolation, even in the decades after automobiles arrived.

But the Henricks family lived in a place that is remote even during summer months. And the winters were long. Helen told us that one of the happiest days of her life occurred after she had moved to Kansas City and it snowed. The next morning, she got up and the snow melted.

Driving twisting, snow-covered county roads made me tense, but the whitened landscapes blanketed by snows filled me with joy. My mind's ears erupted in the "Hallelujah Chorus."

The Steamboat ski area surpassed last season's total snowfall in mid-January. In the town itself, banks of carefully placed snow



head-high and taller form a labyrinth of slots and passages, the city's streets, sidewalks and driveways. Gary Suiter, the city manager, told me that the snowbanks we saw along city streets had shrunk considerably from a month before. Mindful that

spring will eventually arrive, his city crews have already ordered sandbags.

Nobody can know for sure when melting will begin in earnest. Along the Elk River, north of Steamboat, Jay Fetcher has faithfully recorded the day each year that the final snow on his pasture melts. His father began the records in 1949. The "snow off meadow" date varies, as do the snowpack and temperatures, but has arrived on average one day earlier every five years.

Will this epic snowpack end the drought, fill Lake Powell, and cause Colorado River states to get chummy instead of testy?

It's still early March. Much uncertainty remains. The Upper Colorado Basin River Forecasting Center report on March 1 projected runoff for the Yampa and White rivers at 120% to 170% of average as defined by runoff totals during the last three decades.

Will the weather stay cold and snowy or, as has happened in some recent years, will it turn warm and dry in April, May, and June? In 2020, for example, a mid-March snowpack of 108% snow-water equivalent yielded runoff of 79% of average. On the Colorado River altogether, an average snowpack that year yielded runoff 52% of average.

How much melted snow will the thirsty soils sop up? Last year's summer rains



The Colorado River at Windy Gap, just west of Granby. Below elk huddle on the banks of the frozen Yampa River near Craig.

restored the soil moisture somewhat in northwestern Colorado, but the soil remains thirsty. Runoff will likely again underperform the snowpack.

It's also useful to note that not all sub-basins in the Colorado River Basin have had the same plenitude as the Yampa. On the Green River, upstream of Flaming Gorge Reservoir, the runoff is forecast to be only 84% of average. That forecast seems terribly odd given the tremendous depths of snow in the Red Desert along I-80 between Rawlins and Rock Springs. Keep in mind, though, that most of that water in the Green River comes from the Wind River and Wyoming ranges, far to the north.

As for Lake Powell, the runoff from the Yampa can help—but only so far. The massive reservoir was 21.8% full on Tuesday, March 7. One winter's heavy snows will not refill it, though. Colorado State University climate researcher Brad Udall told KUNC's Alex Hager in January that it will take five or six winters of 150% snowpack to refill Powell and Lake Mead.

Jack Schmidt, director of the Center for Colorado River Studies

at Utah State University, told CNN that the total storage in the Colorado River reservoirs is at 34% of capacity.

Flaming Gorge and other upper-basin reservoirs drawn down to keep Powell levels high enough to produce electricity need to be refilled. Peter was robbed to pay Paul. Now Peter's pockets need replenishing. That will take time, too.

This has not been drought, as conventionally understood. Udall and other climate researchers call it a "hot drought," the result of rising temperatures caused by atmospheric pollution.

"We are not changing any of our tactics based on one year," said Lindsay DeFrates, a spokesperson for the Colorado River Water Conservation District in Glenwood Springs. "It's such a long game. We need to be sure we are prepared for a hotter, drier future."

This year's epic snow in the Yampa Valley means plenty of water for ranchers to grow grass this summer. Beyond that, little can be said.



Ean Tafoya on what he would do if elected as mayor of Denver

Ean Tafoya, who is one of 17 candidates for mayor of Denver, lives in Bear Valley, just off Wadsworth, on the edge of Denver. It was his grandmother's place, for whom he was a caregiver until her death last year. It's in a nice neighborhood.

His identity, though, was shaped by his earlier years, when he lived in Denver's Barnum and Cole neighborhoods, both places abutting industrial areas.

In a sense, Tafoya has spent his life on the borders.

In the last several years he has headed the Colorado division of GreenLatinos, an advocacy group. His tasks, he says, have taken him to nearly all of Colorado's 64 counties to unite with others impacted by environmental issues.

Big Pivots: Why do you want to be mayor of Denver?

Ean Tafoya: We need to bring the people together to protect the planet and those who are the most marginalized in our community.

Pivots: What might you do if elected in the realm of energy and climate and perhaps water?

Tafoya: Water, that's one of my favorite topics to talk about. Actually, I have a one-world, one-water certificate from Metro State. Water is so fascinating because you have so many pieces: quantity, quality, stormwater management, wastewater management, lead-pipe replacement.

At the end of the day, the ultimate goal is clean water for all. You know, the unhoused in Denver do not have access to the critical public health resources they need, like drinking water or public restroom access. To me, that's a water issue.



Definitely want to see improvements in our green infrastructure planning and how we manage our stormwater. That's going to be even more critical with this large Army Corps of Engineers money that was just approved for the city and county of Denver.

We know we have PFAs (per- and polyfluorinated substances) in our water. We know there's concerns about lead pipes. We need to be working to replace those as fast as possible. We need to be working with our utility providers and the state government to advocate for the strictest and strongest water quality standards possible.

And at the end of the day, quantity and quality come down to education of our communities and, in particular, conservation. When you start talking about E. coli, which is one of the largest issues and concerns in the Platte River, that comes back to education as well as infrastructure, right? You have to have an infrastructure to handle your waste appropriately. Public restroom facilities for unhoused, and educating people about picking up their dog poop. I mean, all of those things impact E. coli and stormwater.



The South Platte River flows past downtown Denver and then to the Globeville area near the intersection of I-70 and I-25.

And when you start talking about climate and clean energy, I think we need to be talking about how is Denver going to harness the vast amount of resources that have now been made available from federal and state funding that we've advocated for. We make sure it comes home to our communities for businesses and for homeowners and for renters. All that requires financial literacy and education. We need to bolster the programs in the government that actually interface with the public so they understand that they, too, can be a part of this green revolution that we need.

We have to do it ourselves. The government has to lead the way. They have to be working to make sure all government buildings are electrified, that fleets are some of the first to actually electrify.

I want to be clear, electrification isn't the only answer to energy consumption. The bike lanes, walking, and public transit also play a part in changing the amount of emissions that are coming out from our transportation sector. And we have to acknowledge that just because we electrify doesn't mean the power plants still aren't in brown communities. It's brown air for brown communities around these energy sites. And that needs to change.

Pivots: How can you change that in the context of Denver?

Tafoya: Well, the City and County of Denver advocates in a lot of these rulemakings at the Air Quality Control Commission, with ozone state implementation planning, and we talk about Xcel Energy and its resource planning. Denver plays a part in all of that. We need to be using our resources to advocate for the best public health income outcomes for disproportionately impacted communities. They also offer grants through the environmental justice program that communities like mine, the company I work for now, can use to commit more resources to engaging the community in these outcomes.

Let's be real, Denver is going to have a big decision to make and leverage over Xcel Energy, as the utility's franchise is about to come up in 2026. Those negotiations are going to begin during this administration. We will have a big conversation about our franchise agreement, about where we want to go.

Pivots: Xcel has a reputation of being very much at the vanguard of the nation's investor-owned utilities. That being said,

how would you want to move the needle with Xcel?

Tafoya: We have to be in conversation with Xcel. For example, through my day job, we've negotiated community solar and produced reinvestment in disproportionately impacted communities. But we have to have leverage as a franchise about where we want to see our energy mix, where we want to see it in our communities.

We must work as quickly as possible to transition these gas power plants in southwest Denver, in North Denver, where low-income, predominantly Latino communities are being exposed to pollution. We have to be pushing to bring more renewables and probably make investments ourselves in new technology. We should be a hub here in Denver for new technologies like battery storage.

Pivots: Has the existing administration fallen short in any substantial way in this?

Tafoya: I can think of one example. Denver initially supported the continuation of the operation of Comanche 3 or Tower 3 in Pueblo until 2070. That's simply unacceptable. It's unacceptable to continue to operate coal facilities for another 40 years that we should not have invested in.

This goes hand in hand against our environmental justice goals that we fought so hard for in Denver. It's so unfair of us to take the power and expose another community like Pueblo to the air particulate pollution for our own power generation.

Pivots: I don't quite understand that. You're saying that the City of Denver supported continued operation of that plant until 2070?

Tafoya: They did.

Pivots: When was this?

Tafoya: This was in the Xcel electric resource plan. Ultimately they didn't. We shifted them. I ran a campaign of a hundred days of action on Xcel Energy that included direct action protesting on the headquarters

of Xcel in addition to engaging Denver and Boulder. Ultimately they shifted, but initially they were signaling support of the continued operation of this coal power plant. And their feeling, as I recall, was that they were concerned that it may ultimately result in new gas power plants being built. That's a fight for us to have. When Denver takes the power and Pueblo gets the pollution. That's not regional leadership.

Pivots: Can you explain to me the sites in question.

Tafoya: The Cherokee gas plant is located exactly on the border of Denver and Commerce City. You could actually see it from my mother's front yard. Grew up looking at it for many years of my life. Former coal facility turned gas-peaker plant.

Another one of them, Arapahoe, is at Ruby Hill, a predominantly Latino community as well.

If we were to just use Tower 3, Arapahoe and Cherokee —they're all located in communities of color, predominantly Latino communities.

Pivots: Tell me a little bit about your personal history. You grew up in Lakewood?

Tafoya: I grew up in West Denver, in the Barnum neighborhood around First and Federal. My mother was a union phone operator. When you dialed zero on the phone, she answered. When US West was bought by Qwest, my mom lost her job. My mom's job was automated.

When we have these just-transition conversations with people across the state of Colorado, I firsthand know what it's like to have your mother go from having a good-paying job to having nothing and having to change your lifestyle.

My mom switched careers, to being a social worker, first at the Denver Housing Authority and then at Mi Casa Resource Center for 15 years. They had non-traditional jobs for women. In the '90s they were doing green job deployment and green energy

deployment. And so I actually toured facilities of solar panels and things when I was a kid. Today, we're not nearly going fast enough.

I lived in Barnum until I was 14 years old. Then my mom got a house in the Cole neighborhood (bisected by I-70 northeast of downtown Denver). This is within eyesight of the Cherokee gas plant and across the street from Suncor and so many other kinds of pollution. My mother's property, the residential property was a cleaned-up Superfund site from the Asarco explosion in the '80s.

The first job I ever had was at the Museum of Nature and Science. I was a teacher's assistant there. And that had a huge impact on my love of science, my love of public health, my understanding of anthropology, and so much more.

I went to Metropolitan State University. I worked my way through college teaching early childhood education and youth summer programs. It all stems from being a teacher's assistant when I was really young.

I also worked as an electrical apprentice. I spent a couple summers as an electrical apprentice working specifically on government bids at Cherry Creek High School, the Thornton Civic Center, the Olde Town Arvada Library.

I graduated from Metropolitan State with a degree in Political Science & Native American Studies. I'm a horticultural therapist with a certificate from Colorado State University, in addition to my water certificate and certificate in early childhood education. So I have a wide variety of education.

Pivots: The certificates?

Tafoya: The horticultural therapy I have is from Colorado State University. Think art therapy or music therapy with plants. So it's part psychology, part therapy, part horticulture. I did my undergrad research on increasing yields in greenhouses with organic means.

I graduated as the valedictorian of Art and Science from Metro State in 2012, and I went

to work in the mayor's office. There, I first worked on an urban agriculture white paper, and then I was the aide to the Director of Community Affairs.

Then I went to Denver City Council where I worked in legislative services and I worked for all the council members, staffed all the committee meetings, eventually working directly for the executive director of city council and as a secretary of the city council.

At age 28, I made the decision to run for city council in Denver. It was in opposition to the criminalization of homelessness and the I-70 expansion. I saw it as an act of self-defense. That was 2015.

Pivots: How did it grow you?

Tafoya: At 28 years old, rarely are you asked by others and by yourself personally to truly evaluate your opinions on such a wide variety of topics. I felt like I left that process knowing myself and my values and my feelings on issues more than I did before.

I'm writing a book about it. The title is "Jury Duty on Tax Day," because I got jury duty on tax day. A lot of people were like, "you can't go to jury duty, you're too busy. You got a campaign." And I said, what kind of leader would I be if I get out of jury duty?

I learned a lot about how to not take it personally when people let you down or when expectations aren't what you expect. I learned a lot about how to manage my time. I learned a lot about how to do positive

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engagement. You begin to get better by taking that walk. At the end of the day you have to believe in yourself. You need a strong support system.

Pivots: What came next?

Tafoya: After that, I started working for myself independently. I worked on campaigns. I worked in media and large events doing community engagement for some of the largest festivals in Colorado. I made a documentary about the drug war, had a television show. I was a radio DJ and talk-show host for many years. I also ran ballot issues during that time.

Pivots: I don't see a closet big enough for all those hats you've worn.

Tafoya: I did. I worked on the Denver Green Roof Initiative 2017, Resilient Denver, which was an energy tax that became a climate tax in 2019. Waste No More, a universal zero-waste ordinance. I've been working on that one for the last two years. And my company, GreenLatinos, called me four years ago and said, Hey, how would you feel about launching a program in Colorado to advocate for environmental justice?

Pivots: You say it's a company?

Tafoya: We're a non-profit national organization founded in Washington DC as the National Latino Coalition on Climate Change in response to cap-and-trade in 2008. It became GreenLatinos.

Pivots: What are three different projects you have worked on with GreenLatinos.

Tafoya: Some of three things that people might know me for through GreenLatinos? I chaired the State's Environmental Justice Action Task Force and worked for the passage of the Environmental Justice Act. I think those are both critically interlinked. I released a report about North Denver, which identified 189 violators of federal environmental laws in four square miles, naming the names of the businesses.

I'm really, really proud that we were the first environmental justice organization to engage in proceedings with the Air Commission, the Public Utilities Commission, and the Water Quality Control Commission. And this year we actually successfully filed for the first ever people-driven rulemaking at the water commission and one to upgrade protections on the Platte River.

Pivots: What should we understand about environmental justice?

Tafoya: That's a really good question. It's legacy. It goes back a very long time. And what you often see is that people take it personally, right? That they feel the community's demanding change. We need to recognize that the community and the people working in the government, and often these businesses, weren't the ones that made those decisions a hundred years ago, but we have the responsibility to do something about it now. We have to be all working collectively to try to right the wrongs, whether that be redlining, whether that be toxic legacy pollution.

Pivots: Are you saying that there's a tendency for defensiveness?

Tafoya: Around environmental justice? Absolutely. Especially I think in the government. Having been a government employee, I can tell you that you don't always get the nicest calls.

You are also dealing with people who—let's be real, in environmental justice communities kids are missing school because they're sick. Your families are dying because of leukemia. You may end up paying higher energy rates. You're living in a community where you can't even recreate fairly. By the time you are dealing with a government

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worker, you maybe aren't the happiest you've ever been. So that interaction can really be a challenge. In my coaching of people around the state I teach them how to work with government workers. Having been one, I definitely think that's critically important.

Pivots: What do you tell them?

Tafoya: It depends on what their issue is, and how many times have you talked to them? We tell them to remember that these people are empowered to help. It's better to have a positive relationship with them than a negative relationship. Also, it's their job. So even if you have a bad interaction with them, that doesn't mean you can't repair it and have an improved relationship going forward.

It's also really important for you to understand what a person's limitations are and to work with them within those limitations. If that means you have to go above them or talk to another agency, that's okay. But you need to work with them to understand what their limitations are.

Then you have a responsibility to pivot, to say this isn't where I'm going to get my resolution. Where else can I go?

Lastly, document your journey to rectifying whatever your problem is so that you can go to the next person and say, well, we did this, this, and this. What's the next step?



Back to the environmental justice. I think this is a really critical thing. One of the things I've learned the most about environmental injustice is it thrives the most in the borderlands, whether that be actual borders between two cities and two counties, because people can point directions on whose responsibility it is. And also if a polluter is in one jurisdiction and you're in another jurisdiction, you maybe have less leverage over them to do the right thing than the people who are in that jurisdiction. And then that borderlands are not just geographic boundaries, right? It's also jurisdictional boundaries from, for example, the Environmental Protection Agency to the Colorado Department of Public Health and Environment to say Denver Public Health and Environment. And who ultimately holds the responsibility, who has primacy over issues? Where do local control boundaries end? I think these are things that you're not taught in school.

I think if you get involved in environmental law, you have to be able to play more than one sport in environmental justice, right? Because the PUC operates differently than the Air Commission operates differently than the Water Commission. They might be similar, like tennis and racquetball are similar, but they're not the same sport and they have different rules. And part of the Environmental Justice Action Task Force (goal) is to make changes so that you feel like you can interface it with one of them more reasonably without having to have a degree in it.

Guzman and Fountain in 2028

Big Pivots 68 gave the incorrect year for when Guzman Energy will begin supplying electricity to the City of Fountain. The correct year is 2028.