BIG PIVOTS

ENERGY and WATER transitions in Colorado and beyond

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# Wildflowers and the warming of Alpine and Arctic

Those gamboling across the tundra of Colorado's high mountains this summer have been posting photographs of prolific wildflower displays to social media sites.

But what all has been happening up there beyond the dazzle?

It's been warming, of course, like all other places. Research published in June has found that warming temperatures are causing plants to stay green longer and flower earlier. But their reproductive cycles are not responding in the same way.

A research team at the University of Colorado Boulder synthesized 30 years of experimental warming data from 18 different tundra sites, both in Arctic and Alpine areas, across the globe. What they found confounded simplistic explanations.

"This research shows how difficult it is to make broad-scale predictions about what's going to happen with global climate change, because even with 30 years of data at 18 sites, there's still very complex responses that are happening," said Courtney Collins, a postdoctoral researcher in the Institute of Arctic and Alpine Research at CU Boulder and the lead author of the study that was published in Nature Communications.

The research included studies on Niwot Ridge, located in the Front Range of Colorado northwest of Boulder.

"The tundra is warming much more rapidly than other parts of the world. In some places, it's happening at twice the rate of warming (of the rest of the globe), and so these changes are occurring extremely fast and they're happening as we speak," said Collins in a story issued by the university.

Warming of Arctic areas of permafrost had long worried climate scientists. As the Washington Post noted in a story this week, they call it the "methane bomb." They worry about melting of the vast permafrost in Siberia.

"What we do know with quite a lot of confidence is how much carbon is locked up in the permafrost. It is a big number, and as the Earth warms and the permafrost thaws, that ancient organic matter is available to microbes for microbial processes, and that releases CO2 and methane," said Robert Max Holmes, a senior scientist at the Woodwell Climate Research Center.

Holmes was consulted by the Washington Post's Steven Mufson after a new report was published in the Proceedings of the National Academy of Sciences about a surge of methane emissions from Siberia's

permafrost. This was a different source than expected. Thawing wetlands release microbial methane from the decay of soil and organic matter. Thawing limestone – or carbonate rock – releases hydrocarbons and gas hydrates from both below and within the permafrost.

Surface temperatures during the heat wave in Siberia had soared to 10.8 degrees Fahrenheit above the norms of the 20th century.

Holmes, the scientist, called the finding intriguing. “It’s not good news if it’s right. Nobody wants to see more potentially nasty feedbacks, and this is potentially one.”

In Colorado, temperatures have been rising for decades. A study conducted since the 1980s at the Rocky Mountain Biological Laboratory near Crested Butte has attempted to predict the future of mountain meadows with rising temperatures. The bottom line: more sagebrush, fewer wildflowers.

Also at Gothic, site of the outdoor laboratory, David Inouye studied wildflower blooms for decades. In 2014, he reported results of his 39 years of study. More than two-thirds of alpine flowers had changed their blooming patterns, he found. The blooming season that had formerly run from late May through early September now lasts from late April to late September.

The spring peak, when masses of wildflowers burst into bloom, had moved up by five days per decade, he found.

**Photos by Peggy Williams**


# Can G&Ts serve a useful purpose in fast-changing world of energy?

**by Allen Best**

Tri-State Generation & Transmission has been reinventing itself at break-neck speed as compared to 5 or 10 years ago.

Coal plants are closing. The wholesale provider to 42 member electrical cooperatives in Colorado and three adjoining states has been pushing to create a new market structure called a regional transmission organization that likely will result in deeper penetration of lower-cost renewables. And the company may get engaged in research about hydrogen, what could be a game-changing storage technology.

But Tri-State has not yet embraced the deeper, broader reforms that several of its larger members say must happen for it to remain relevant in the fast-changing world of energy, a time fast becoming one of solar panels on roofs and battery packs in garages.

To regain its relevance, say those critics, Tri-State must return to its roots. It was formed in 1952 by its member cooperatives in Colorado and adjoining areas of Nebraska and Wyoming to transmit power from hydroelectric dams. In time, it began building generation. Like those of the investor-owned utilities, including Xcel Energy, the power plants got bigger and bigger.

Now, say critics, Tri-State needs to invert its mission. Instead of being a G&T, it needs to be a T&G, transmission once again coming to the fore as member cooperatives develop their local generating assets, connected by Tri-State's 5,665 miles of high-voltage transmission lines. It must become more of a facilitator.

> Critic say the business model of Tri-State and other G&Ts is a relic of another time where electrification at scale was the goal.

Glimmers of these disagreements were evident during Tri-State's annual meeting on Aug 4-6 at a Denver-area hotel. It was the first annual meeting of Tri-State to be governed by a new Colorado law, House Bill 21-1131, which requires the annual meetings be open to news media.

Duane Highley, the chief executive of Tri-State since April 2019, paraded the

organization's accomplishments and plans but didn't entirely ignore the challenges, either. He mentioned an essay several days prior to the meeting in Utility Dive, a national publication, that had suggested Tri-State was failing to deliver what its members want: lower costs, cleaner generation, and increased flexibility. Those critics, he suggested, had failed to acknowledge Tri-State's plans for transformation.

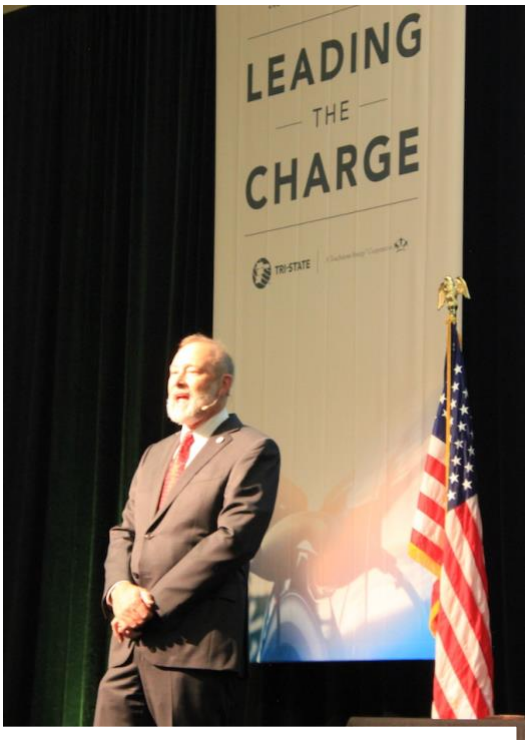
Tri-State plans a hard pivot from coal. Renewable generation provided 36% of electricity in 2020, nearly identical to the 36.1% of Xcel Energy, which is seen as national leader in this pivot.

By 2024, Tri-State expects to hit 50% renewables. And by 2030, it will be at 70% in its four-state operating area. In Colorado, it vows an 80% reduction in carbon emissions as compared to 2005, in line with other major utilities.

Annual rate increases, the subject of annual complaints from the coops for many years, ceased in 2020 and in 2021, a 2% rate decrease occurred, with another 2% scheduled in 20222. This was due, at least in part, to addition of what Highley called the "green dividend," low-priced wind that can be had for 1.57 cents a kilowatt-hour, far less than coal.

Wind, if cheap, poses challenges, as was demonstrated by the winter storm of Feb. 12-18. "Reliability comes first," he said. "If the lights aren't on, people certainly die, as we saw in Texas."

Texas utilities had extended power outages for reasons that involved both natural gas and wind generation. Tri-State had its own problems during the mostly windless week. Of Tri-State's 405 megawatts of wind-generating capacity, the average wind output was 51.2 megawatts. The nadir was on Sunday, Feb. 14, when turbines were producing just 0.9 megawatts to meet peak demand.




**Tri-State CEO Duane Highley**

Tri-State managed to survive the fiasco with minimal damage, said Highley, because of its diversified resource portfolio that included fuel oil. He reported that Tri-State spent $11 million in additional costs to ensure electricity during the storm. Xcel Energy, which in Colorado is roughly twice the size of Tri-State, spent $600 million and wants a rate increase to recover its costs.

Current storage technology is not sufficient to allow Tri-State and other utilities to ensure reliability during multiple windless days. Hydrogen represents one possible advance for multi-date storage.

Highley said Tri-State has partnered with the state of Colorado in an application to the U.S. Department of Energy for funding for a proposed Craig Energy Research Center. The research at Craig, site of three coal-burning units operated by Tri-State, would explore the feasibility of green hydrogen. Created from water through electrolysis, this green hydrogen could provide the backstop for the intermittency of renewables while also using the high-voltage transmission lines to and from

Craig. It could also provide a bridge for coal workers and the Craig community, he suggested.

The pace of change at Tri-State has quickened remarkably. want faster change.

United Power, the largest member of Tri-State as measured by electricity sales and meters, is among those advocating for a sharper pivot. United is a giant still growing. Membership has doubled since 2004 as the one-time farm country north of Denver between I-25 and I-76 has filled with warehouses and distribution centers, oil-and-gas mining infrastructure, and subdivisions and more subdivisions.

Earlier in the conference, Mark Gabriel, the chief executive since April at United Power, called for additional reform.

"We need Tri-State to realize that the dynamics of a changing industry mean more of our members want to generate electricity locally, to be untethered from fossil-based resources and released from the paradigm of centralized generation that is decades old," he said. "This will require a dramatic new business model, deep cost-cutting, and jettisoning of inefficient generation even in the face of financial hurdles."

Although Tri-State has committed to being out of coal in Colorado by 2030, it has made no such plans for its share of the Laramie River Station plant in Wyoming or the Springerville plant in Arizona. Coal must go, said Gabriel, not because of politics, but because of the shifted economics of energy.

United wants Tri-State to give its members more freedom to generate their own electricity. The existing relationship is largely one of hub and spokes. The new future envisioned by United and others is for Tri-State to be a hub, but with more power in the spokes.

Tri-State and several of its largest members have for several years been legally wrestling. The filings at government agencies in Denver and Washington D.C. have been thick, and there's also a lawsuit. The disagreement is partly about what it would cost for United and now seven other members to get out of their all-requirements contracts. Those contracts will expire in 2050. Tri-State has delivered what appear to be preposterously high numbers for those wanting to exit their contracts, in the case of United Power well north of a billion dollars.

Gabriel describes this so-called all-requirements contract as "Hotel California" rules, where you can get in but you can never leave. Any contract, he said, is subject to modification, whether it's for a mortgage on a house or marriage that, at the extreme, ends in divorce.

United is a dwarf among Tri-State cooperatives in geographic size, covering just 90 square miles, but a giant in terms of customers and electrical demand, just recently surpassing 100,000 members.

**Mark Gabriel**

This year alone it expects to add 5,000 new meters. By comparison, more than half of Tri-State's member cooperatives have 10,000 or fewer members/customers. The smallest has just 1,500 members.

Gabriel said he expects peak demand from his cooperative to reach 600 megawatts this year. That's enough to absorb the capacity of one coal-fired power plant or several wind farms.

If United has seen extraordinary changes, the smaller cooperatives in farm country have started seeing shifts that have caused them to begin rethinking their futures.

Not long after Highley's remarks, Gabriel was talking in the hallway of the conference

hall with the manager of a Nebraska cooperative. There, the cooperative has started losing revenue as farmers start employing solar generation to lift water.

"This is a societal change we are facing," Gabriel said in an interview. "It is not just United Power. It is faster at United because of our proximity to Denver. But it will affect everybody in this century."

Just as electrical cooperatives must alter their relationship with their members to recognize changing technology, such as Tesla batteries in homes, Tri-State must also alter its relationship with member cooperatives, he said.

"The expectations of a two-way relationship with your energy supplier is here and it's now."

For all the disagreements with Tri-State, Gabriel said United sees advantages to staying. How so when independent coops – Kit Carson in New Mexico and Holy Cross in Colorado—appear to be doing so well?

There is risk in going it alone, said Gabriel.

Hours after Tri-State's meeting wrapped up, formation of a new group called NextGen Coop Alliance was announced. It aims for reform of what it calls the "outdated G&T business model that is a relic of another time where electrification at scale was the goal." NextGen leaders say the timing of their announcement and the Tri-State meeting, as well as the Utility Dive article, was coincidental.

NextGen consists of just five members, two of them in Colorado: Durango-based La Plata Electric and Ridgway-based San Miguel Power. Others are in South Dakota, New Mexico, and Indiana. Leaders say they hope to recruit similarly minded "progressive" cooperatives in Texas and the northern Great Plains.

Jessica Matlock, chief executive of La Plata Electric and the chair of the new group, talks about the need for local cooperatives to think about dual benefits. An example for Durango, she said, would be creating a solar program at local Fort Lewis College to help create qualified workers for a more local, bottoms-up power supply model.

Matlock, who has been in Durango since July 2019, was previously with the Portland-based Bonneville Power Administration for 4 years and then for 13 years with Bonneville's large customer. The same discussions about change that are occurring in the Rocky Mountains, she said, are taking place on the West Coast. The top-down approach of recent decades must be reversed, to maximize local benefits.

**Jessica Matlock**

"The key is about joint community benefits," she said. "If you are in a one-sided power contract, how can you possibly create joint benefits for your community?"

Tri-State has tentatively moved in this direction with a new policy that would allow La Plata and other cooperatives greater authority to develop solar and other local generation sources. That policy has been submitted to the Federal Energy Regulatory Commission. Matlock said she's waiting to see if the actions match the words.

"I believe Duane (Highley) is trying hard," she said. "I believe he has a governance issue that stalls him on what he needs to get done."

Luis Reyes Jr., the vice-chair of Next Gen, said the complaints are not unique to Tri-State. "It is kind of universal," said Reyes, and the chief executive of Taos-based Kit Carson Electric Cooperative. "Most G&Ts have lost their way in serving their memberships. They have gotten too big for their britches, so to speak."

Kit Carson provides a possible model for United, La Plata, and other dissident coops. It broke free from its contract with Tri-State in 2016 and expects to have paid off its $37 million exit fee by summer and without debt on stranded fossil fuel assets. It will have sufficient solar capacity by the end of 2021 to meet day-time needs while also adding storage to improve resiliency.

It has done this in partnership with Guzman Energy, a relatively new power provider with no generating assets of its own. Guzman helped Kit Carson in developing its solar resources, and it is now doing the same in Western Colorado with Delta-Montrose, which exited Tri-State in 2020.


**Luis Reyes Jr.**

In buying time to thwart the exodus of members, Tri-State sought refuge in rate-making and other review by a federal agency, the Federal Energy Regulatory Commission. If likely effective in the short term, it remains to be seen how well that strategy will work for Tri-State. This strategy was approved by Tri-State's member coops.

If this is not in their best interests, why did these cooperatives approve it?

Reyes says that the fundamental problem is that the larger members within Tri-State and likely other G&Ts are subsidizing the smaller ones. And this poses questions about the governance model. United Power with its 100,000 members and La Plata with its 46,000 members each get one vote in Tri-State matters. It's the same with Southwestern, a 1,500-member cooperative in New Mexico, and the 3,000-member cooperatives of Colorado and Wyoming.

It's like the U.S. Senate, where California has 68 times as many residents as Wyoming but equal representation. But in Congress, there is also the House of Representatives, for both better and worse. Reyes says the G&T model needs more checks and balances.

He sees a Congressional role in reordering the governance. Co-ops are a creation of Congressional legislation in the 1930s, a response to the laggard electrification of rural areas. He also wonders if smaller cooperatives need to merge with others, to achieve a critical mass.

Matlock says the key to moving forward is to expand the diversity of voices, something the new organization she leads hopes to foster.

## How soon before an RTO in the Rockies?

Can a full-scale regional transmission organization be far off? Colorado Springs Utilities several months ago threw its lot with the Southwest Power Pool energy imbalance market, tilting the scales slightly in favor of an RTO organized by the Arkansas-based SPP.

Directors of the SPP in late July approved policy-level terms and conditions for an expansion into the Western Interconnection.

Tri-State, the Western Area Power Authority, Deseret Power, and others are also in the energy imbalance market organized by SPP.

Meanwhile, the Colorado Public Utilities Commission continues its review of arguments and debates about whether an RTO would benefit Colorado consumers.

The main argument for an RTO is that it will allow connection of resources across broader geographic areas, improving geographic diversity and bringing down costs while increasing resilience.

Big Pivots will have much more on this topic in a coming issue.

# A step forward & a step back at Colorado River headwaters

**by Allen Best**

In the early 1980s, when a dam on the Colorado River near its headwaters was proposed and Andrew Miller was a writer for the Winter Park Manifest, he wrote an editorial called "Requiem for a Cottonwood Grove."

The headline was premature because the dam at Windy Gap, where the Fraser River flows into the Colorado, had not yet been constructed. But it soon was, causing the cottonwood trees to be felled and allowing water from the new reservoir to be pumped uphill to Grand Lake. From there the water flows into diversion under the Continental Divide called the Alva Adams Tunnel to be distributed among cities and some farms in the northern Front Range.

But that story almost 40 years later continues, as news of a settlement suggests. The Grand Foundation will soon receive $15 million remediation for work in Grand County, where the Colorado River originates. The money will be used to try to create strategies for preserving trout and other aquatic life in the warming but ever-more shallow waters.

**Settlement involving Windy Gap yields $15 million for science-based work**

The big story here is of incremental depletions of the Colorado River at its headwaters by growing Front Range cities now colliding with the impact of the warming climate, hotter and drier. The two, each powerful, leave in doubt how long cold water-loving trout can survive.

"Trout need water temperatures below 70 degrees, and we are regularly bumping up against 70 degrees in our rivers," says Miller, now a contractor and president of

the Upper Colorado River Watershed Group.

The $15 million will come from the municipal subdistrict of the Northern Colorado Water Conservancy District responsible for this incremental diversion. The district built Windy Gap to divert the waters to the northern Front Range. A subsequent project spurred by the distressing drought of 2002 and those of later years yielded an expansion of the diversions at Windy Gap.

The additional water will be stored, in part, at a new reservoir snuggled among the foothills rising from the Great Plain southwest of Loveland. The dam to create that 90,000-acre-foot reservoir, called Chimney Hollow, has not yet been constructed.

The political subdivision responsible for the new diversion consists primarily of towns and cities, from Broomfield, Superior and Fort Lupton on the south to Loveland and Greeley on the north.

Save the Colorado and the Sierra Club, among other groups, in 2017 had sued Northern, arguing that the process used to review the impacts was deficient in failing to adequate address cumulative impacts. In December 2020 a federal court ruled in favor of Northern, but the environmental groups appealed.

In April, a compromise was announced. The environmental groups dropped the lawsuit and Northern agreed to the $15 million settlement in what Northern described as a productive alternative to costly litigation.

The financial documents of the settlement agreement were signed by directors of Northern on Aug. 6 and by the Grand Foundation on Aug. 10. Because of delays in signing, Northern will transfer the first payment totaling $5 million immediately after the Grand Foundation signs, says Gary Wockner, of Save the Colorado and an allied group, Save the Poudre.

Administering the $15 million grant will be the Grand Foundation, which is to consist of three members from Miller's organization, the Upper Colorado River Watershed Group. In addition to Miller, Dave Troutman the treasurer, and Geoff Elliott, the staff scientist, will be on the committee responsible for overseeing allocation of the grant. Northern Water has authority to name the three other members.

"Our charge over the next 10 years is to spend $15 million in ways that improve Grand County's watershed in a collaborative process," explained Miller. "In some ways, we are on opposite sides of the fence," he said, referring to the Northern District's appointment members. "But in many of the important ways we are on the same side. We both depend upon high-quality water, Northern almost more than us."

Other measures in the agreement address water quality and provide more water for Western Slope users.

Separately, Northern plans to create a new channel around Windy Gap Dam, to allow the Colorado River to flow without impoundment. The channel is intended to allow fish, macroinvertebrates, nutrients

and sediment in the river to bypass the dam and reservoir. The project is called the Colorado River Connectivity Channel. The bypass channel will be the result of a settlement negotiated by Trout Unlimited and others, says Wockner. No draft environmental assessment has been released. “It remains to be seen if the channel will be permitted, funded or built,” he says.

Because of its proximity to the northern Front Range farms and cities and its relative plentitude of water-producing snow, Grand County has been the go-to place for trans-mountain diversions since the late 1880s. The two most significant are those accomplished by the 6.2-mile pioneer bore of the Moffat Tunnel, which allowed diversions from the Winter Park and Fraser area to begin in 1936; and the 13.1-mile Adams Tunnel, which began delivering water to the Estes Park area in 1947.

Miller sees pressing task of the foundation set up to administer the settlement funds will be to lay down a baseline of existing conditions. The existing data, says Miller “really aren’t that good.”

Beyond that, the challenge will be more difficult, perhaps impossible.

“Basically we need to figure out how to run a watershed when we only have 30% of the natural water, which is about all we have left after the diversions by the Front Range.”

In addition to the stepped-up diversions by Northern Water, Denver Water also wants to take additional water through the Moffat Tunnel for impoundment in an expanded Gross Reservoir.

By at least some estimates, 70% of the native water of eastern Grand County currently gets exported to the Front Range. With these new diversions, exports will increase to 80%.

When these incremental diversions were first conceived not quite 20 years ago, the science of global warming was firming up but the effects were not yet evident, at least not like now. Even a decade ago, after significant drought had begun and temperatures had clearly started rising, the big picture was more tentative.

Miller’s group contends no water remains available from the Grand County headwaters of the Colorado River for additional diversion.

“I don’t think anybody realized how persistent this drought would be,” says Miller. “It could be a forever thing. We have created a new climate, and we will never see the rainfalls and snow we have in the past.”

# Eagle adopts goals of 100% net-zero by ‘30

Eagle’s town council in July adopted aspirational goals for achieving net-zero carbon emissions in internal operations of the town government by 2028 and for the town altogether by 2030.

The town of 7,000 residents has no roadmap for achieving this, making the goals aspirational in nature. This was debated before the resolution was adopted unanimously by the town council, reports the Vail Daily.

“It is aspirational because when I put my engineer hat on, we have no clue how we’re going to get there or if it’s even attainable,” said David Gaboury, a town council member.

Two other Colorado jurisdictions that adopted 100% goals in years past seem to have backed off from them. Pueblo drew national attention about 4 years ago with its 100% pledge, and was later joined by Pueblo County.

Now, they say it’s important to keep the Comanche 3 power plant operating until 2040, as Xcel Energy, the operator, proposes, because of the tax base and the jobs it provides.

# Will green hydrogen research at Craig be part of the answer to the big question?

**by Allen Best**
***Freshwater News***

Utilities with goals of producing 100 percent renewable energy in Colorado must figure out how to reliably deliver electricity when relying upon resources, primarily wind and sunshine, that aren't always reliable.

The answer may lie in water, and some of that water may come from Colorado's Yampa River.

Colorado's two largest electrical utilities, Xcel Energy and Tri-State Generation and Transmission, are talking about the potential for green hydrogen and other possible storage technologies associated with their existing coal-fired power plants, at Hayden and Craig, in the Yampa Valley. Both plants are scheduled to shut down, with Hayden slated to close by 2028 and Craig by 2030.

Duane Highley, the chief executive of Tri-State, told member cooperatives in a meeting Aug. 4 that Tri-State and the State of Colorado have partnered in a proposed Craig Energy Research Station.

Hydrogen has been described as the missing link in the transition away from fossil fuels. It can be produced in several ways. Green hydrogen, the subject of the proposal at Craig, is made from water using electrolysis. The oxygen separated from the H2O can be vented, leaving the hydrogen, a fluid that can be stored in tanks or, as is in a demonstration project in Utah, in salt caverns. The hydrogen can then be tapped later as a fuel source to produce electricity or, for that matter, put into pipelines for distribution to fueling stations.

Multi-day storage crucial to realizing dreams of 100% renewables

How much water will be required to produce green hydrogen isn't clear. But the Yampa Valley's existing coal-fired plants have strong water portfolios that could be used to create green hydrogen or another storage technology called molten salt. The latter is the leading candidate at the Hayden plant, co-owned by Xcel Energy and its partners.

Craig Generating Station in 2021 is projected to use 7,394 acre-feet of water, according to a Tri-State filing with the Colorado Public Utilities Commission. By 2029, the last year of coal generation at Craig, Tri-State projects water use will decline to 4,270 acre-feet.

Xcel Energy also has water rights associated with its somewhat smaller two-unit Hayden Generating Station.

When Tri-State first announced last year its plans to close its coal units, some hoped the utility would allow the water to continue downstream, aiding fish and habitat in the Yampa Valley. The Yampa, arguably Colorado's least trammeled river, since 2018 has been plagued by drought. In early August, water managers placed a call on the middle section of the Yampa River for only the third time ever.

Western Resource Advocates, which works in both energy and water, has supported the green hydrogen proposal. But there's also hope that a water dividend will still be realized in this transition, resulting in more water available for the Yampa, which is a major tributary to the Colorado River.

"If we do it right, we have the chance to equitably share the impacts and solutions to climate change all across Colorado and the West, with benefits for communities, economies and the environment," says Bart Miller, director of the Healthy Rivers Program for Western Resource Advocates.

Green hydrogen, similar to wind and solar in the past, has a cost hurdle that research at Craig, if it happens, will seek to dismantle. The federal government's Energy Earthshots Initiative announced in June hopes to drive the costs down 80% by the end of the decade. That is the program in which Tri-State hopes to participate.

Tri-State's Highley suggested at the meeting last Thursday that the Craig site should swim to the top of the proposals, because it is an existing industrial site, and the Craig and Hayden units also have high-voltage transmission lines. This is crucial. Those lines dispatch electricity to the Front Range and other markets but they can also be used to import electricity from the giant wind farms being erected on Colorado's Eastern Plains as well as solar collectors on rooftops and in backyards.

In addition, Craig and Hayden have workforces that, at least in theory, could be transitioned to work in energy storage projects.

Western Resource Advocates, in a June 30 letter to the Department of Energy, made note of that consideration. "A green, zero-carbon hydrogen project at Craig Station is an opportunity to demonstrate how the clean energy transition can also be a just transition for fossil fuel-producing communities," said the letter signed by Erin Overturf, the Clean Energy Program director.

Colorado Gov. Jared Polis also submitted a supporting letter for the pilot project as a possible "path for a just transition for energy producing communities," Polis wrote.

Several state agencies will likely play a role, said Dominique Gomez, deputy director of the Colorado Energy Office, including the Office of Just Transition that was established in 2019 and the Office of Economic Development and International Trade.

At Craig, the vision is "to provide researchers access to the key resources necessary to perform their research,

**The Yampa River, above, just below the takeout for the Hayden coal units and, on the first page, near the pumping station for the Craig coal-fired plants. *Photos/Allen Best***

including water, transmission and site space," Tri-State spokesman Mark Stutz said in an e-mail. "As the initial step, Tri-State and the state plan to engage a group of stakeholders to facilitate the development of the center."

The Department of Energy has not indicated when it expects to announce the finalists or grant funding.

Another idea for energy storage is pumped-storage hydro. Colorado's biggest storage project even now, in the age of lithium-ion batteries, is Xcel Energy's Cabin Creek pumped-storage hydro project. The water is released from a reservoir between Georgetown and Guanella Pass that tumbles 1,200 feet to a second record, producing electricity in twin 162-megawatt turbines as needed to meet peak demands, then pumped uphill when electricity is plentiful.

At least two proposals involving pumped-storage hydro in the Yampa Valley have surfaced, but neither amounts to much more than ideas on paper. Pumped-storage hydro recycles water, with some loss to evaporation but little consumptive use.

At Hayden, where the coal units are scheduled to close in 2028, Xcel Energy says it is in the early stages of studying potential for molten salt, the leading energy storage technology at this time, but also green hydrogen.

Water use will depend upon the size of the projects, said Xcel representative Michelle Aguayo in a statement. "It's important to remember the amount of water used in power generation in Colorado is relatively small, representing 0.3% of water diversion in the state."

Xcel already participates in a hydrogen pilot project in Minnesota, its home state for operations, and has proposed natural gas plants in North Dakota and Minnesota that are to be designed to use hydrogen technology when it becomes viable and cost-effective.

"As we've said before, we're focused on identifying and exploring technologies that will allow us to bring our customers carbon-free energy by 2050, technologies that are not available or cost effective today," she said.

*A slightly shorter version of this story was published by Fresh Water News.*

## Some experts say that a nuclear pilot planned in Wyoming is quite risky

Proponents of a nuclear demonstration project in Wyoming described as having advanced technology has drawn great interest from local communities, with coal plants scheduled to close, as well as from state officials.

Bill Gates has money in the proposal by TerraPower, and U.S., Department of Energy and the utility giant PacifiCorp are also involved. Gov. Mark Gordon called it a "game-changing and monumental in Wyoming."

In a 3,500-word piece, WyoFile found several well-informed individuals who think it's anything but a game changer. They say the technology actually isn't altogether new. Designs of today, said Edwin Lyman, the nuclear power safety director for the Union of Concerned Scientists, are largely descended from decades-old models.

"There may be some variations on them, but you know it's not like this hasn't been tried (in) many different countries for many decades," he said.

Colorado's Fort St. Vrain power plant, located along the South Platte River near Platteville, was one of these ancestors of plant being planned for Wyoming. It operated from 1979 to 1989. It was, says Wikipedia, one of two high-temperature gas-cooled power reactors in the United States.

This demonstration plant would employ molten salt, boosting the capacity to 500 megawatts.

"It would be quite a feat to pull off," said Allison Macfarlane, chair of the Nuclear Regulatory Commission from 2012-2014.

Risk comes in various forms, and Macfarlane said a key one is that valuable resources will be funneled to nuclear energy that could go elsewhere in the climate crisis fight.

"We can't pin our hopes on [nuclear] as the thing that's going to get us out of the next 20 years, and the next 20 years are absolutely crucial," she said. "And so we absolutely have to just throw what we have behind renewables … because we know that technology works."

## Durango wants to divert organics from landfill

Durango has started asking for proposals to launch a voluntary composting program that it hopes to make 100% within three years.

The Durango Herald says a 2015 survey found that food waste constituted a fifth of residential and a quarter of commercial waste. Another 27 of residential waste came from other organic material, including yard debris.

In an editorial, the newspaper hurrahed the idea. "If we are to reduce greenhouse gas emissions and ultimately save ourselves and the planet from climate disaster, we have a lot of work to do," the blog said. "We know about the big initiatives, but we can also take other small actions that, when combined with societal efforts, can make a big difference."

Composting is one of those little things that, in other and larger American cities, has reduced landfill-bound trash by up to 78%.

## Why utilities merger in New Mexico should occur

New Mexico's PNM, the state's largest utility, wants to merge with Avangrid. Go for it, says Steve Michel, deputy director of the Western Resource Advocates Clean Energy Program.

"Avangrid is the world's largest developer of renewable energy," he writes in the Santa Fe New Mexican. "It's committed to combating climate change.

The terms we have negotiated with Avangrid show that commitment. Unlike other utilities I've dealt with over the years, Avangrid fully embraced what we asked them to do on climate change and understood the importance of it."

If the merger goes through, Avangrid will work to decarbonize PNM's electricity fully by 2030, a decade sooner than state law requires.

And what about locally owned public power? Michel poo-poos that. Such efforts by Albuquerque and Las Cruces in the 1990s only resulted in years of litigation and millions wasted on legal fees. "And public power does not necessarily mean clean power," he added. "Many municipal utilities happily rely on fossil fuels."

## Electrify everything? Not so fast, say New Mexico right-leaning group

Support by U.S. Sen. Martin Heinrich, a Democrat from New Mexico, of electrification of transportation and buildings provoked a sharp attack by the non-partisan but reliably right-thinking Rio Grande Foundation.

"Just a decade ago, the Sierra Club and other environmental groups supported natural gas as a cleaner-burning alternative to coal,' write the Rio Grande Foundation's Paul Gessing. "Now, Heinrich, counter to the economic interests of the state he represents—New Mexico is a major natural gas producer—and against the expressed preference of consumers who use such appliances, is pushing to eliminate natural gas."

He cites a Wall Street Journal story in reporting that Sacramento recently became the 46th U.S. city to begin "phasing out natural gas in new buildings." But it's not just California: Seattle, Denver, and New York City have all enacted or proposed measures to ban or discourage the use of the fossil fuel in new homes and buildings.

## Why so few solar farms in windy Wyoming?

A 97.8-megawatt solar farm completed in 2018 remains Wyoming's only utility-scale solar farm, although another 30,000-panel array has been proposed.

Why so little solar, wondered the Casper Star-Tribune?

"Solar is good here, but it's affected by latitude, simple as that," said Connie Wilbert, director of the Wyoming chapter of the Sierra Club. "We're a northern state. And the farther north you go, the more seasonal difference you see."

Bruce Parkinson, a professor of chemistry and energy resources at the University of Wyoming, points out that wind and solar could be complementary on transmission lines. "Wind in Wyoming is pretty much late evening, early night—and solar, of course, is only during the day. And so any extra transmission capacity can be pretty optimally used if you have both wind and solar connected to it."


**Textile recycling is a theme at the Outdoor Retailer show at the Colroado Convention Center this week.**

# Social cost of methane changes the equation for Colorado utilities

**by Allen Best**
***Energy News Network***

As a growing list of states pass laws aimed at curbing carbon emissions, Colorado has widened its scope, taking the groundbreaking step of requiring state officials to consider the social cost of methane in regulatory decisions.

Methane, the primary constituent of natural gas, has powerful heat-trapping properties before it breaks down into water vapor and carbon dioxide after 12 years. It is 84 to 87 times more powerful than carbon dioxide over a 20-year span, according to the U.S. Environmental Protection Agency.

"By focusing on methane reduction now, it has the greatest potential to bend the curve on fighting climate change," said state Rep. Tracey Bernett, a Democrat from Boulder County and a prime sponsor or co-sponsor of several bills passed this year that instruct state utility regulators to use the social of cost of methane when evaluating proposals.

Other successful bills seek to reduce natural gas in buildings and other applications, and to stanch leaks in the supply chain of natural gas. Most natural gas is extracted from geological deposits by drilling.

Legislative and environmental advocates say the new laws have made Colorado the national leader in tackling emissions from buildings.

The social cost of methane emissions was set most recently at $1,756 per short ton by the U.S. Interagency Working Group on Social Cost of Greenhouse Gases, compared to $68 for carbon dioxide. Both metrics estimate the economic damages of releasing emissions into the atmosphere.

A Bernett bill, HB 21-1238, tilts the regulatory table in favor of demand-side management programs offered by private utilities that sell natural gas for use in buildings. State regulators must now take a longer-term view of the cost savings of reducing energy use. With that longer view, more programs that reduce demand

**Geos, a neighborhood in Arvada, was built without natural gas lines, although the purchaser of remaining entitlements plans natural gas.**

through improved insulation and other devices will be justified as cost-effective.

In deciding what programs are cost-effective, state regulators must incorporate into their evaluations "the costs of greenhouse gas emissions, including the social cost of carbon dioxide and methane leaked or emitted into the atmosphere," the law says. It also says regulators must use a discount rate of 2.5% or less. The lower the discount rate, the greater the future benefits of not producing greenhouse gas emissions.

Another provision of the law tells state regulators to get the best available information about leaks of methane upstream of buildings, beginning with its extraction and processing, then delivery through an elaborate network of pipelines.

"We need to reduce the demand for methane by improving the energy efficiency of the building sector through weatherization, more highly efficient space and water heaters, and aggressive adoption of clean-heat technologies," Bernett said.

**Tracey Bernett**

"Reducing greenhouse gas emissions in the building sector is what I've called the hardest nut to crack because it will take the longest time to convert the building sector to clean-heat technologies, especially retrofitting existing buildings," Bernett said. "That's why we need to start now."

The law requires utilities to submit plans in 2022. Bernett expects rapid results in improved energy efficiency, still the most economical answer to reducing emissions.

Other legislation passed this session requires plans to be filtered through the social cost of methane and carbon. A beneficial electrification law, SB21-246, requires utilities to submit program proposals by July 1, 2022, for converting existing gas boilers and other uses of fossil fuels in buildings and industrial electrical applications.

Colorado aims to rapidly decarbonize its electricity generation this decade. Renewables provided 30% of electricity in 2020, but utilities have pledged to close all but one coal plant by 2030, allowing them to achieve a minimum 80% reduction in emissions as compared to 2005. Some smaller utilities have vowed to get to 100% renewables.

Still another new law, SB 21-264, pokes the elephant of methane from yet another side. The state's four largest gas distribution utilities must file plans with state regulators about how they will adapt resources to meet clean-heat targets. The most important target requires a 22% reduction in carbon dioxide intensity by 2030 as compared to 2015 levels. Costs for doing this are capped at 2.5% of revenues for the three investor-owned utilities — Xcel Energy Colorado, Black Hills Energy, and Atmos — and at 2% for the municipal Colorado Springs Utilities.

State regulators must use the social cost of methane and carbon in evaluating the proposed clean-heat plans.

The clean-heat law gives utilities many tools for achieving the required reductions. They can harness other existing sources of methane, including emissions from landfills, dairies, and sewage-treatment plants. They can also take methane leaking from existing coal mines. But these recovered methane techniques can constitute no more than 5% of the target of 22%.

Utilities also have the option of developing green or blue hydrogen to be delivered in lieu of natural gas. Green hydrogen is made from renewable sources, and blue hydrogen can be made from fossil fuel, but only when the emissions are

captured and stored. The law also gives utilities the option of ramping up methane leak detection from their distribution networks.

Integrating the social cost of methane into decisions will not necessarily produce specific outcomes, said Erin Overturf of Western Resource Advocates, a regional environmental conservation group based in Boulder.

"I just think it will lead to a more accurate accounting [of the costs and benefits] as we do these evaluations at the Public Utilities Commission," added Will Toor, the director of the Colorado Energy Office, which helped shape many of the laws. "I think it will lead to significantly larger investments in efficiency and beneficial electrification, particularly in the clean-heat plans submitted by gas utilities."

The Natural Resource Defense Council's Alejandra Maija Cunningham said these and other bills put Colorado at the forefront of states taking actions to wring emissions caused by buildings.

More important than the new tool of the social cost of methane, she said, is how it's being used to lower emissions from buildings. "It's not just that they use the social cost of methane, but that it is being used to require a 22% reduction in this sector by 2030."

Several other new laws make no mention of the social cost of methane or of carbon but also seek to suppress emissions caused by buildings. For example, HB 21-1286 requires owners of buildings of 50,000 square feet or more to benchmark energy use. These data will then be scanned as state and local officials assemble standards that seek to achieve a 7% reduction in emissions by 2025 and a 20% reduction by 2030, both compared to a 2021 baseline.

A more general provision requiring the integration of the social costs of greenhouse gas pollution in decision making is in a law that overhauls the state's transportation funding. That generality allows policymakers to look at less common but still potential greenhouse gases, including nitrous oxide and hydrofluorocarbons.

A guiding document for the legislation was the Colorado Greenhouse Gas Pollution Reduction Roadmap, which was released in January, just prior to the start of the legislative session. The 206-page document lays out the challenges for Colorado to meet its economy-wide emissions reduction targets of 26% by 2025 and 50% by 2030. In hewing to the recommendations of climate scientists, the 2019 law also requires a 90% decline by 2050.

As coal plants have started closing, transportation has become Colorado's largest source of greenhouse emissions, according to the roadmap, followed by fugitive emissions from the oil and gas industry, and then buildings.

"To achieve the state's 2025 and 2030 emissions goals, methane emissions from the oil and gas sector as a whole will need to be reduced by at least 33% by 2025 and over 50% by 2030," the roadmap declared. It said the reductions are both economically and technically feasible. The roadmap also said methane emissions from landfills, sewage plants and other sources would have to be cut for Colorado to hit its 2030 goal.

Colorado in 2014 adopted regulations that became a model for other states and the federal government in squeezing fugitive methane emissions from oil and gas operations. A state agency, the Air Quality Control Commission, is expected to produce rules that will achieve a 30% reduction by 2025 and over 50% by 2030.

All this is a lot — but it's not enough for Laurent Meillon, a board member for the Colorado Renewable Energy Society and a solar thermal entrepreneur. He said the social cost of

methane needs to be applied to electric resource planning, too. Without it, he said, utilities may want to build or buy gas-burning power plants.

He also wants to see the metrics apply to what he called the "de facto billion-dollar infrastructure investments into gas lines" by Xcel Energy, the state's largest gas distribution company.

An even more piercing appraisal comes from 350 Colorado, an affiliate of the international climate action group. Colorado ranks fifth in oil production and seventh in natural gas, but most doesn't stay in Colorado.

"We export about 90% of our oil and 75% of our natural gas production, and Colorado is turning a complete blind eye to all those emissions," said Micah Parkin, the executive director. Those exported emissions altogether dwarf those occurring inside Colorado, she said. "It's like saying we're going to have a drug-free house but we're making crack and selling it."

Parkin says she's skeptical Colorado's efforts to clean up the natural gas supply lines will succeed to the extent that state leaders propose. Methane, she said, "is very leaky." Her solution: phase-out oil and gas drilling.

Others note that Colorado is not Oklahoma or Texas, but it's still a purplish state. Colorado can only achieve what it has the power to do, and reducing demand for natural gas from buildings will reduce fugitive emissions from wells and pipelines, said Howard Geller, senior policy advisor for the Southwest Energy Efficiency Project.

Colorado, Geller insisted, should be seen as a national leader after this legislative session, one that has created strong legs to go along with its aspirational goals that were adopted in 2019.

"A lot of cities and states have adopted ambitious targets for 90% reduction emissions by 2040 or 2050," he said, "but very few are adopting packages of specific policies for reaching those targets."

# Colorado completes first airborne survey to monitor for methane

Aerial surveys intended to monitor methane and other missions at major oil and gas sites north of Denver have begun.

The first flight mid-July was in preparation for a larger concentrated aerial survey in September and October, according to a statement on the Colorado Department of Public Health and Environment website.

The state agency is working with Colorado State University, the University of Arizona, Scientific Aviation (a private company based in Boulder), the University of Colorado, and the University of Maryland.

Colorado is funding the aerial surveys with money from the settlement with Kerr McGee that was related to the 2017 explosion in Firestone that killed two men.

In September, the Air Quality Control Commission will take up rulemaking intended to further reduce emissions from oil and gas operations.

# State agency adds staff for environmental justice

Joel Minor has been hired as environmental justice program manager by the Colorado Department of Public Health and Environment. He had worked in the rulemaking to implement SB 19-181, the state law that created new rules for the oil and gas industry. He has also worked as an attorney for Earthjustice.

Also new to the CDPHE staff is Nathalie Eddy. She will be the air quality environmental justice liaison for the state agency. She had most recently worked for Earthworks, an environmental organization, in communities impacted by pollution from oil and gas communities.

**A pumping jack near Dacona along Colorado's northern Front Range, August 2020. *Photo/Allen Best***

# Crimping methane from oil-and-gas in Western states

**By Tim Lydon**
***Writers on the Range***

New Mexico, the third-ranking U.S. oil producer, has moved to curtail methane pollution from the oil and gas industry, moving it closer to neighboring Colorado's leadership. Methane is a dangerous greenhouse gas that contributes to climate change and also damages human health.

With the United States among the world's top methane polluters, and the Biden administration promising tighter nationwide rules, these two Western states set a bar for other states to follow.

For decades, the oil and gas industry has freely discharged the colorless pollutant from tens of thousands of wells as a cost-savings measure. Then this March, New Mexico banned the wasteful venting and flaring of natural gas, which is comprised almost entirely of methane. New Mexico is only the third state, after Colorado and Alaska, to ban the practice.

This May, New Mexico also proposed a final rule to stanch leaking of methane from across the state's oil and gas supply chain, which includes part of the mammoth Permian Basin it shares with Texas. The leaking occurs at well pads, pipelines, compressors, storage facilities, and more.

It's a system-wide problem that generates methane plumes large enough to detect from space.

The proposed rule on leaking, now up for public comment, improves on a December draft that offered broad loopholes. When it's made final, it will require regular inspection and repair of leaky equipment, which today goes largely unmitigated as yet another industry cost-savings measure.

The state effort means New Mexico is catching up with Colorado. In 2014, Colorado became the first state to regulate methane and has twice strengthened its original rule. Colorado has also modernized its oil and gas regulatory agency's mission so that it includes safeguarding public health. And it is reworking oil and gas bonding requirements so taxpayers don't get burdened with plugging leaky "orphan wells" abandoned by producers.

Colorado's rules were a model for the first national methane regulations, implemented under President Obama in 2016. Unfortunately, the Trump administration dismantled those rules.

Controlling methane is a climate imperative. Because the gas has 80 times the heat-trapping potential of carbon dioxide, it's a potent driver of climate change. NASA says it has fueled a whopping 25 percent of the human-caused global warming that today increasingly jeopardizes Western water, agriculture and recreation.

Research also shows that methane is entering the atmosphere from sources such as wetlands or thawing permafrost. In the latter, warming tied to methane begets more methane. It is the ominous type of feedback loop that global warming alarmists have warned us about for decades.

The good news is that methane only survives in the atmosphere for about 10 years, unlike the centuries-long lifespan of carbon dioxide. Consequently, methane rules today could produce swift returns on climate as the world grapples with the harder problem of carbon dioxide.

But methane and associated pollutants also contribute to harmful ground-level ozone, which is linked to premature birth, respiratory sickness and other illnesses. New Mexico Gov. Michelle Lujan Grisham made this part of her campaign for regulation, pointing out that poor air quality disproportionately harms poor communities.

That concern helped build support from indigenous and other groups, outweighing fears that new regulations would detract from drilling royalties, which provide over a third of New Mexico's revenue for education, health and other services.

Part of the New Mexico governor's strategy in winning support for methane control was focusing on fiscal accountability. Venting, flaring, and leaking -- all monumentally wasteful practices -- send an estimated $43 million in potential state revenue into New Mexico's thin air every year.

At the national level, President Biden campaigned on restoring federal methane regulations rolled back under Trump. Biden issued executive orders on his first day in office that set a September goal for proposing a new strategy. Crafting new federal rules are expected to take years, but New Mexico and Colorado now offer strong examples. By applying rules to both new and existing oil and gas infrastructure, they exceed the original Obama regulations, which only addressed new permits.

Today, Western states, along with heavy oil producers Texas and North Dakota, offer only a patchwork of tax incentives and voluntary targets. Limited rules, however, often tilt in industry's favor. Now, with fossil fuel production ramping back up and global temperatures rising, New Mexico and Colorado show that tougher regulations are the way to go.

*Tim Lydon is a contributor to Writers on the Range, writersontherange.org, a nonprofit dedicated to spurring lively conversation about the West. He writes from Alaska.*

# Marathoner, mother and now a legislator on how she sees her work for Colorado

**By Rep. Tracey Bernett**

What is the social costs of carbon? To many in our community, this remains an abstract concept, one comprised of complex economics and a sea of variables.

To me, the social costs of carbon are more than numbers and variables, they are lived experiences which affect the most important aspects of my daily life.

For almost my entire life I have been an avid runner. Over the years I have trained to become a world class competitor. In addition to being a veteran of 36 marathons and having represented Team USA at the 2018 World Masters Athletics outdoor competition in Malaga, Spain, I also suffer from asthma.

I am particularly sensitive to ozone, and Colorado's Front Range is one of the worst places in the United States for ozone pollution. While other runners check the weather before they run, I have to check the ozone levels before I leave my home.


**Tracey Bernett competes in marathons and other running events.**

Like me, my son also has asthma. At the age of 2, he had a life-threatening asthma attack. I saw my precious little boy hooked up to all sorts of medical equipment, his little belly blown up like a balloon because he couldn't get air, and convulsing so violently I had to hold him down in his crib, for fear that he would convulse right over the sides of the crib.

As the doctors huddled around trying to save his life, all I could do was pray. Since that terrible day, I have had to take him to the ER multiple times because of air pollution caused by massive wildfires.

As climate change continues to increase severe weather patterns, natural disasters, and air pollution, I worry about his safety and health in the decades to come. When I think about him, and that day, and I am reminded why we must do everything in our power to fight the terrible effects of climate change.

This is not just about me and my family. From wildfires that tear through our mountains at speeds and sizes never seen before, to floods like the one that devastated Boulder County in 2013, families across our community struggle with the effects of climate change.

Even more pressing than the headline disasters is the slow and gradual changes that are taking place. Drought, volatile weather, decreased crop yields, erosion, reduced water quality, expansion of disease vectors, and air pollution are also some of the many devastating effects felt across our state. Our climate is becoming increasingly unstable, caused in large part by carbon dioxide and methane being released into the atmosphere by burning of fossil fuels.

These subtle changes to our climate are just as devastating as the major disasters.

Associated with all of this is a huge economic burden borne by each and every citizen of our great state. Climate change isn't just about our health and safety, it's about our homes, jobs, communities, economy, national security, and yes, our very existence. This is the social cost of carbon: the devastating impact, every day, to people caused by an increasingly warmer climate.

Even before being elected to represent Colorado's 12th State House district, I was a strong community advocate for the need to take action to stop climate change. Now, as a policymaker, I have the opportunity to take bold action to address the social costs of carbon on our communities.

Often, the most effective solutions are pragmatic and simple solutions that use existing systems to make effective change. I am working with my colleague Sen. Chris Hansen to pass legislation which will reduce the amount of methane used to heat homes and businesses by encouraging Coloradans to replace their gas furnaces and water heaters with more efficient gas appliances as well as transitioning to clean heat technologies.

This legislation, HB21-1238, does this by using a mechanism called demand side management (DSM), a tool that has been used by utility companies for decades to encourage both gas and electric energy efficiency for their customers. By making the switch, not only will our emissions decrease, but consumers in Colorado will also see hundreds of millions of dollars in savings over the next decade.

HB21-1238 takes an unprecedented step forward in modernizing gas DSM programs by requiring the Public Utilities Commission, which regulates investor-owned utilities, to include the social costs of carbon dioxide and methane in a cost-benefit analysis of gas DSM programs and takes into account the impact of these two potent greenhouse gases over the generations to come.

This is one of the many practical approaches we can take to stopping climate change. Because the social costs of carbon are felt across our state, it is important that we take a unified stand to fight climate change to preserve and protect a future for our children and the Colorado we all know and love.

*Tracey Bernett can be followed on Facebook and on Twitter.*

## And more about the natural gas moratorium in Fraser and Winter Park

The natural gas moratorium for new natural-gas hookups in parts of Fraser and Winter Park was discussed on Wednesday morning by the Colorado Public Utilities Commission.

As first reported by Big Pivots (June 18 issue), Xcel Energy started telling contractors in early June that there wasn't sufficient gas capacity for all new buildings coming on line. There were presentations before the Winter Park and Fraser enough natural.

The biggest takeaway from the discussion was the comment by Commissioner Megan Gilman about the absence of a robust planning process for natural gas with Xcel. The PUC in recent months have been spend much time talking about that very fact.

PUC staff member Gene Camp reported that a newspaper account in Grand County on July 21 suggested that the PUC was somehow to blame. That annoyed the PUC staff, who thought the statement was inaccurate. Xcel suggested that perhaps the reporter took the statement somewhat out of context.

"When questioned why the reinforcement wasn't started earlier, (Xcel Communications Director) Flenniken cited restrictions in the Colorado Public Utilities Commission regulations that limit proactive capital improvements.

"It makes it hard for us to build on a forecast," she said. "There were a lot of projects in the pipeline, and we knew that, but they hadn't crossed over to that place where the Public Utilities Commission is comfortable with us moving forward with investment."

Also at issue was whether Xcel should have taken action sooner, given the need was identified as early as 2015.