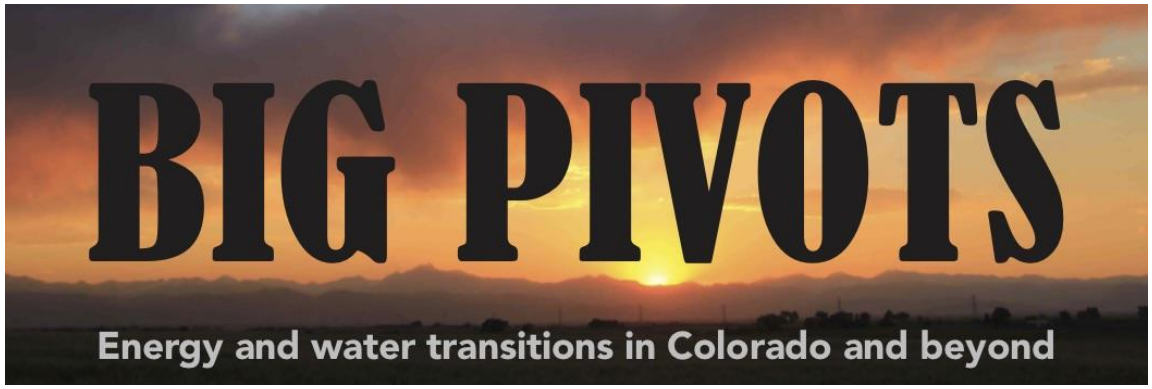

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http://mountaintownnews.net

Shutting down coal plants and adding EVs will fall short in hitting GHG targets

by Allen Best

In 2019, Colorado lawmakers approved a bill that calls for economy wide reductions of greenhouse gases of 50% by 2030. A new report commissioned by two environmental groups finds that Colorado will fall far short if only existing policies and those currently being proposed are adopted.

Study says far more robust policies to achieve 50% GHG reduction target by 2030

Closing down coal plants, as have been announced, won't do it. Nor will simply adding more electric vehicles onto highways at the current projected rate. Improved buildings codes, tighter restrictions on emissions from oil and gas fields—they add up to a lot, but still fall short.

There needs to be more, according to the analysis conducted by the consulting firm M.J. Bradley & Associates, if Colorado is to hit the economy-wide goal of 50% reduction of greenhouse gas emissions by 2030.

The goal was identified by Colorado's Climate Action Plan, also known as House Bill 19-1261. The targeted goal is compared to 2005 levels.

To hew to the existing pathway already identified, however, will deliver reductions of only 13%.

More expansive policies and actions, including some proposals now before state legislators, could ratchet the gains to 30% in the next decade—impressive, but still well short of what is needed.

Colorado's goals were identified as what will be necessary not only in Colorado but other jurisdictions globally if temperature increases are to be kept within a 1.5-degree C rise advised by alarmed climate scientists. Temperatures have already increased about 1 degree C.

The Colorado White Paper was commissioned by the Environmental Defense Fund and Western Resource Advocates. They released it Tuesday afternoon. On Thursday, the Colorado Air Quality Control Commission takes up consideration of proposed regulations to more tightly limit emissions from the oil and gas sector.

Also on the agenda of the agency's meeting on Thursday is a report from Will Toor, director of the Colorado Energy Office, and Energy and Environmental Economics, a consultant retained by Toor's agency, about the status of the study underway as part of the process of creating a GHG Pollution Reduction Roadmap. That study was launched in November and is scheduled for completion later this year.

The environmental groups say they felt the conversation needed to get underway about the need for larger and more tools sufficient to achieve the scale of reductions identified by the law, called the Air Pollution Prevention & Control Act.

The law sets GHG reduction targets for 2025, 2030 and 2050, but also requires the Air Quality Control Commission by July 1, 2020, to lay out those measures that "would cost effectively allow the state" to meet its GHG goals.

The report makes no mention of carbon pricing, let alone advocate a precise answer. However, representatives of both groups said in interviews that they believe a carbon tax, cap-and-trade or some other mechanism should be discussed.

Stacy Tellinghuisen

"We do think a market mechanism could help provide the right incentives to spur innovation and drive development of new technologies that will help us meet these goals," said Stacy Tellinghuisen, senior climate policy analysist for Western Resource Advocates. Putting a price on carbon emissions could spur revision in land uses that increase carbon sequestration or incentivize industry to develop and perfect carbon capture and sequestration.

"Looking beyond 2030, if we are to reach the deep carbon reductions we need the proper market mechanisms in place," she added.

The state law identified a target of 90% reduction in greenhouse gas emission by 2050. That target corresponds with mainstream thinking of climate scientists.

Pam Kieley, the senior director of regulatory strategy at the Environmental Defense Fund, didn't single out a particular policy. Carbon prices drive lowest-cost solutions, she said. But best would be for Colorado to "build a policy from the ground up that is tailored to the unique circumstances of the state." There are ample models to work with, she added.

"First and foremost is that we put big tools on the table and don't take any tools off the table," she said. But there must be some regulatory limit on pollutants. "Without that, it will be very, very hard for the state to meet its goals."

Colorado Gov. Jared Polis sees carbon pricing at the state level as impractical.

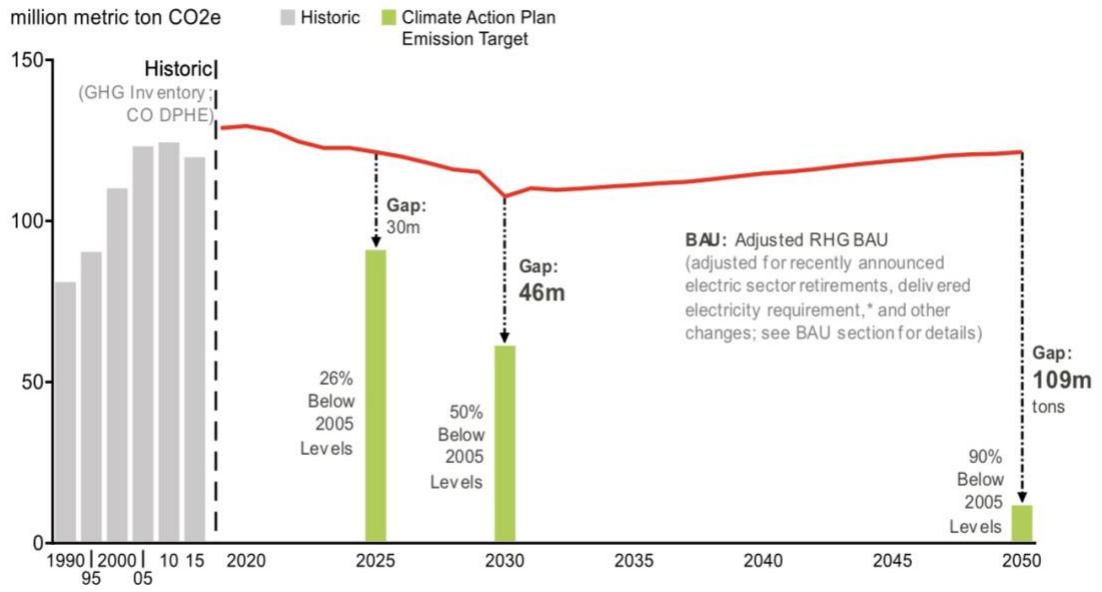
In an op/ed published last Saturday in the Pueblo Chieftain, Polis said a state-level cap-and-trade policy "would be unworkable in our state because we don't benefit from the same economies of scale as a nationwide carbon market and could shift even more pollution to less-wealthy communities that are already bearing the brunt of poor environmental quality.

"It is not always the case that our financial incentives align with our moral imperatives," he added.

Jared Polis

Instead, Polis called for working "with companies and communities on tailored solutions so we can make this transition

Figure 3: Projected Economy-wide Emissions Reductions Required



*Illustrative estimates for Colorado's delivered electricity emission reduction requirement assume that emission reductions come from reduced output at in-state coal-fired power plants with zero-emitting resources replacing lost output for the most part. It is beyond the scope of this paper to estimate with any degree of accuracy the actual sources of abatement that a utility may use for compliance, which would depend on regional electricity grid dynamics.

work for everyone."

The Air Quality Control Commission, a focal point for the state's efforts to reduce air pollution, tomorrow will consider regulations that would create a framework for monitoring, record-keeping and reporting requirements for owners and operators of certain facilities that directly emit GHGSs, and retail or wholesale electric service providers. The rule-making would also address "use of certain hydrofluorocarbons in aerosol propellants, chillers, foam and stationary refrigeration end uses." Hydroflurocarbons constitute a particularly powerful greenhouse gas.

Tellinguisen confirmed that the timing of the report's release was not entirely coincidental. "We are hoping that this spurs a higher conversation at the air commission, that helps them take a look at a broader set of policies," she said.

The white paper dissects Colorado's emissions sector by sector. For example, several coal-plant retirements have also been scheduled. Might those closings be accelerated and expanded? It adds up to a lot—just not enough.

The next single largest potential source of reductions considered by the study comes from the oil and gas sector. The Environmental Defense Fund has estimated that implementation of a law passed last year that is expected to tighten methane emissions from the oil and gas sector could reduce another 4 million to 5 million metric tons of carbon dioxide-equivalent emissions by 2030.

Again—a lot, but not enough.

That is the theme as the report examines a low-carbon fuel standard for medium and heavy-duty vehicles, electrification and alternate fuel use in homes and businesses, beefier building codes and curtailment of hydrofluorocarbons.

A letter from the law firm Kaplan Kirsch Rockwell sent to the Air Quality Control Commission on Tuesday spoke in terms of million metric tons of emissions. The most ambitious policies currently identified would reduce emissions by only 21 million metric

tons by 2030, leaving a gap of 25 million tons from the target identified in the law adopted last year.

Even if state agencies "enact a variety of sector-specific policies to reduce GHG emissions, including adoption of a low-carbon fuel standard, acceleration of coal power plant retirements, additional methane controls in the oil and gas sector, meeting the Governor's goal of 940,000 electric vehicles on the road, and building codes to drive beneficial electrification, our 2030 goals will remain well out of reach, *unless we do more*," the letter said.

To get to the 2030 target, Colorado must achieve an average annual decline rate of almost 5% in the next decade. That's close to the same pace identified by California, New Mexico, Nevada and Oregon.

Said Tellinghuisen, "The takeaway from the report for us is that this is a really big challenge, and we need to increase our ambitions and our urgency. We need to think bigger about the types of policies and actions."

Pueblo voters to decide fate of municipalization

Voters in Pueblo will decide at a May 5 election whether to municipalize electrical delivery.

If they approve, the city would condemn assets of Black Hills Energy, an investor-own utility, and place resource planning under the arm of Pueblo Board of Water Works. San Isabel Electric, a cooperative that serves areas west of Pueblo, has offered its services to do the line-and-pole work.

The Pueblo Chieftain reports that Pueblo Water estimates the process to take 5 to 8 years and cost $10 million in legal fees. No estimates of the cost of acquiring Black Hills' assets have been offered, which the Chieftain says concerns several Pueblo City Council members. The Chieftain pointed out that Boulder, which has already been seeking to break away from Xcel Energy for a decade, has spent $20 million so far.

"Could municipalization work? Sure it could. But we don't have enough information yet to feel comfortable that it would," the newspaper opined.

Longs Peak and Mt. Meeker from Pawnee Buttes on Feb. 2

Northern Water's demonstration gardens at its Berthoud campus.

In water, Colorado has a conversation with a new slant in the 21st century

by Allen Best

The Colorado Water Conservation Board, the primary water-policy agency for the state, met last week in Westminster, and afterward I had dinner with a friend. The friend, who has long worked in the environmental advocacy space, spoke of some matter before the board, and added this: "Twenty years ago this conversation never would have happened."

Water politics in Colorado have undergone a Big Pivot. As the century turned, environmental issues had made inroads into the conversation, but water development remained a dominant theme. Then came the drought of 2002, which more or less changed everything. So has the growing realization of how the changing climate will impact the already over-extended resources of the Colorado River.

Instead of a deep, deep bucket, to be returned to again and again, the Colorado River has become more or less an empty bucket.

Those realizations were evident in a panel discussion at the Colorado Water Congress about water conservation and efficiency. Jeff Tejral, representing Denver Water, spoke to the "changes over the last 20 years" that have caused Denver Water and other water utilities to embrace new water-saving technology and altered choices about outdoor water use.

Denver Water literally invented the word xeriscaping. That was before the big, big drought or the understandings of climate change as a big, big deal. Twenty years ago, the Colorado Water Congress would never have hosted panels on climate change. This year it had several.

Tejral pointed to the growth in Denver, the skyscrapers now omnipresent in yet

another boom cycle, one that has lifted the city's population over 700,000 and which will likely soon move the metropolitan area's population above 3 million. That growth argues for continued attention to water efficiency and conservation, as Denver—a key provider for many of its suburbs—has limited opportunities for development of new supplies. "The other part of it is climate change," he said. "That means water change."

Jeff Tejral

Denver Water has partnered with a company called Greyter Water Systems on a pilot project involving 40 homes at Stapleton likely to begin in June or July. It involves new plumbing but also water reuse, not for potable purposes but for non-potable purposes. John Bell, a co-founder of the company, who was also on the panel, explained that his company's technology allows water to be treated within the house and put to appropriate uses there at minimal cost.

"It makes no sense to flush a toilet with perfectly good drinking water, and now with Greyter, you don't have to," he said.

For decades Denver has had a reuse program. Sewage water treated to high standards is applied to golf courses and other landscaping purposes. Because of the requirements for separate pipes—always purple, to indicate the water is not good for drinking—its use is somewhat limited.

A proposal has been moving though the Colorado Department of Public Health rule-making process for several years now that would expand use of greywater and set requirements for direct potable reuse. The pilot project at Stapleton would appear to be part of that slow-moving process.

Greyter Water Systems, meanwhile, has been forging partnerships with homebuilders, the U.S. Department of Defense, and others in several small projects.

"It seems like 40 homes in Colorado is a small step," said Tejral, "but a lot of learning will come out of that, which will open the door for the next 400, and then the next 4,000."

There are limits to this, however, as water cannot be recycled unless it's imported into a basin. Water users downstream depend upon releases of water from upstream. Water in the South Platte River Basin is estimated to have 6 or 7 uses before it gets to Nebraska.

In the Eagle River Valley, the streams gush with runoff from the Gore and Sawatch ranges, but there can be pinches during years of drought. That area, said Linn Brooks, who directs the Eagle River Water and Sanitation Districts, has a population of between 35,000 and 60,000 between Vail and Wolcott, "depending where we are during our tourist year."

Water efficiency programs can make a big difference in what flows in the local creeks and rivers. Brooks pointed to 2018, a year of exceptionally low snowfall. New technologies and policies that put tools into the hands of customers reduced water use 30% during a one-month pinch, resulting in 8 cubic feet per second more water flowing in local creeks and rivers. During that time, Gore Creek was running 16 cfs through Vail. It flows into the Eagle River, which was running 25 cfs. "So saving 8 cfs was really significant," she said.

Many of Eagle Valley's efficiency programs focus on outdoor water use. That is because the water delivery for summer outdoor use drives the most capacity investment and delivery expenses. "Really, that is the most expensive water that we provide," Brooks said.

Tap fees and monthly billings have been adjusted to reflect those costs. One concept embraced by Eagle River Water and

Sanitation is called water budgeting. “Our hope is that water budgeting will continue to increase the downward trend of water use per customer that we’ve had for the last 20 years for at least another 10 years,” she said.

Eagle River also has tried to incentivize good design. The district negotiates with real estate developers based on the water treatment capacity their projects will require. “That is a way to get them to build more water-efficient projects, especially on the outdoors side,” explained Brooks. “When we execute these agreements, we put water limits on them. If they go over that, we charge them more for their tap fee. That can be a pretty big cost. We don’t like to do that, but we have found that in those few cases where new developments go over their water limits, we have gone back to them and said, we might have to reassess the water tap fees, but what we really want you to do is stay within your water budget.” That tactic, she added, has usually worked.

Linn Brooks

In this concept of water budgeting, she said, “I don’t think we have even begun to scrape the surface of the potential.”

Outdoor water use has also been a focal point of efforts by Northern Colorado Water Conservancy District, the agency created to deliver water to customers from the trans-mountain diversion at Grand Lake. Municipalities from Broomfield and Boulder north to Fort Collins and Greeley, even Fort Morgan, get water from the diversion.

Frank Kinder was recently hired away from Colorado Springs Utilities to become the full-time water efficiency point person for Northern. Part of the agency’s effort is to introduce the idea that wall to wall turf need not be installed for a pleasing landscape. Instead, Northern pushes the idea of hybrid landscapes and also introduces alternatives for tricky areas that are hard to irrigate. The ultimate goal falls under the heading of “smiles per gallon.” Some of the district’s thinking can be seen in the xeriscaping displays at Northern’s office complex in Berthoud.

Kevin Reidy, who directs water conservation efforts for the Colorado Water Conservation Board, said the Colorado Water Plan posited a goal of reducing water use by 400,000 acre-feet. Don’t get caught up in that precise number, he advised. “It’s really about trying to figure out a more stable water future for our cities,” he said. Readers might well be confused by an agency named “water conservation” having an employee with the title of “water conservation specialist.” The story here seems to be that the word conservation has changed over time. In 1937, when the agency was created, water conservation to most people meant creating dams and other infrastructure to prevent the water from flowing downhill. Now, conservation means doing as much or more with less.

On why Eagle River Water takes aim at outdoor use

The amount of water used outdoors is generally twice that used for indoor purposes, and only about 15% to 40% of water used outdoors makes its way back to local waterways.

None of this water is returned to local streams through a wastewater plant. Most of the water is consumed by plant needs or evaporation; what is leftover percolates through the ground and may eventually make its way to a local stream.

—Eagle River Water website

A dairy herd south of Fort Morgan. Photo/Allen Best

Legislator proposing renewable natural gas standard makes case for diversity

by Allen Best

Colorado would require natural gas utilities to integrate renewable energy under a far-reaching bill introduced in the state legislature.

Senate Bill 20-150 would require Public Service Co. of Colorado, a subsidiary of Xcel Energy, to use 5% renewable natural gas by 2025 and 15% within a decade. The proposal would also require the state's Public Utilities Commission to develop renewable natural gas programs for smaller utilities and require municipal utilities to report emissions from natural gas.

Bill also seeks to prod hydrogen as way to better use excess renewable energy

Renewable natural gas differs from conventional natural gas in that it is sourced from sites such as landfills and agriculture waste. Once captured and processed, the methane gas can be added to pipelines and burned alongside conventional natural gas to produce electricity, heat homes or fuel vehicles.

The bill's author, state Sen. Chris Hansen, believes that his proposal would help dairies develop new revenue streams from waste products while also reducing environmental impacts. Other sources would include wastewater treatment plants and coal-bed methane emissions, as well as waste carbon dioxide.

"I don't see this as a stand-alone policy," Hansen said. "I see it as one of the many levers, one of many tools we need to rapidly decarbonize the economy in Colorado. And

it will take every tool in the kit to meet our targets."

The proposal also seeks to create a market incentive for utilities to adopt hydrogen in what Hansen describes as part of Democratic legislators' effort this year to fill in the gaps of last year's sweeping, economy-wide decarbonization legislation. Hydrogen itself is a fuel medium, meaning it can be put to many uses, including in the transportation sector.

Hansen sat down with the **Energy News Network**, where this was originally published on Feb. 11, a few days prior to its first legislative hearing.

Why is this bill needed?

In the last legislative session, we made great progress on the electrical sector. We made major progress in the transportation sector. I think now we need to look hard at how to decarbonize the building sector. That will quickly become the largest category of emissions if we don't start making progress now.

Chris Hansen

My idea is to use local resources to rapidly decarbonize tough emission sources and get net benefit for building emissions. Think about existing sources of coal-bed methane. There are natural and man-made sources all over Colorado. This bill would be designed to capture and utilize that resource. And we all know that methane is a very powerful greenhouse gas, almost 25 times as powerful as carbon dioxide.

Second, we have a significant need for creating methane molecules from waste products like dairies, landfills, and metro wastewater districts. There are already great examples of this in Colorado and across the country. We have the technology. We have the resources. Now we need the standard in place to provide the market pull to get that investment to happen.

It is very analogous to what we did with the renewable portfolio standard for electricity. We show the market a clear demand for that product, and the market then innovates and delivers the lowest-cost options for the customer. The overriding headline is the huge amount of benefit on carbon and greenhouse gas emissions.

Is there any way to estimate that?

We have really good information on the emissions savings on the potential of these resources and really good information on existing projects in this area.

Other parts of the country offer case studies. For example, Vermont, which has a lot of dairies, has this wonderful program where they use bio-digesters to make methane gas from the waste product of dairies. The dairies meet 20% of demand for natural gas in their state. In my research last year, I found a lot of latent potential in Colorado.

SB 150 has a pretty exhaustive list of all the things that would count toward meeting the target. Remember it's not just about turning the methane molecules into the natural gas supply chain, the pipeline. It also counts if you use that to make electricity or transportation fuel. It gives a lot of flexibility not only for the source of gas but also the final use.

You mentioned coal-bed methane. To my knowledge, we just have one or two coal mines, both in the North Fork Valley, where that would be relevant.

There are also opportunities near Montrose and in the Raton Basin [surrounding Trinidad and Walsenburg]. That part of the state badly needs investment, badly needs the jobs.

Of the many potential sources acceptable for meeting the renewable requirement, what do you think might have the most sweeping repercussions?

I think this could be a real game-changer for the dairy industry. They are spending a lot of money right now remediating the waste from those operations. What if instead they could turn those into a profit center? That holds huge potential. In Vermont, they went from spending money to remediate waste products to now creating a product that has a lot of value in the market. I think this could be a big deal for dairies in Colorado.

I think it could be a big deal for landfills around Colorado. I was told in Denver that they could double or triple their capacity on the use of landfill gas. I have also been told something similar from metro wastewater districts, Colorado Springs and metro Denver obviously being the largest.

Do you see this bill as a way to jumpstart hydrogen as a fuel medium?

Yes, I think this will be a great way to demonstrate the value of hydrogen production, have it count toward these targets. I think it will take several years to mature.

I am very specific about the idea of green hydrogen versus blue hydrogen. It's an important distinction, because you can create hydrogen gas by steam reclamation of methane. That does not give you a great emissions profile. But if you are using excess electricity to make the hydrogen [from water] through electrolysis, that has very little emissions associated with it, almost zero.

There is a very plausible future for Colorado where, during some times of the year, we have excess renewable energy capacity. There might be a lot of wind blowing overnight but very little demand. We essentially put the brakes on the wind turbines and don't make any power because we don't have any place to use it.

What if we take all that excess electricity to make hydrogen gas, and use that hydrogen gas to displace use of fossil fuels? You can then take the hydrogen and fossil fuel used in a pipeline or use it in a fuel cell. This is a massive opportunity in Colorado.

Does hydrogen require water as a base?

Yes, if you're doing electrolysis, you are basically putting two electrons into a pot of water. It's not a lot of water relative to other uses in the state. This would be a very small amount of consumption.

Are there other implications for water?

Because of how water has a nexus with energy production and use, if we are

A bit about me and this idea of Big Pivots

This is the third issue of Big Pivots in Energy and Water. Big Pivots is all about this gigantic energy transition that is both urgent and broad, but also water, because there are parallels.

Colorado is a great place to study all this, and my first level of interest. From time to time, Big Pivots will go beyond Colorado.

I'm not asking for money, at least not now. I am asking to hear from you:

- What do you think?
- Do you want to be on this mailing list while I get my legs under me? If so, send me an e-mail: allen.best@comcast.net
- Can you think of somebody you believe might like to see this. Again, no cost.

Ultimately, will need collaborators and, ultimately, deeper pockets. That's how almost all good journalism occurs these days.

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displacing some fossil fuels, that will have a net benefit of saving water. As for dairies, the ag wastes can sometimes have a negative impact on water quality. If you are doing proper remediation by using bio-digesters, you significantly reduce the impact on local groundwater and water quality.

The bill applies to utilities with 250,000 or more customers. That would seem to eliminate all but the Public Service Co. of Colorado, the subsidiary of Xcel.

It applies more broadly, but the large definition means that the large utilities must submit a plan to the Public Utilities Commission and demonstrate compliance. Black Hills Energy will likely also reach that 250,000 threshold at some time.

For the small utilities we have left it to the discretion of the PUC to develop a plan that fits their circumstances. They will then have to comply with whatever program the PUC creates for small utilities. They still have to comply, they still need to implement a renewable natural gas program. But they have more flexibility than the large investor-owned utilities.

For municipal utilities like Colorado Springs Utilities, they would have voluntary compliance but mandatory reporting because the municipal utilities are not under PUC jurisdiction.

Do you expect pushback on this bill? If so, how will you respond to the questions or dissent?

My guess is that some utilities may be reluctant to have a set mandate. They would rather do voluntary programs. There could be pushback from some of the environmental groups that broadly object to natural gas infrastructure. There is a very strong environmental case I will be ready to make if that objection is raised.

Postscript: What was said at Senate committee hearing

A diversity of proponents The Senate Energy and Transportation Committee approved the bill 4-1 on Feb. 11 with several amendments. It has been sent to the Appropriations Committee.

Hansen emphasized geographic diversity of projects in his opening comments, and his witnesses made the same point.

Those testifying include representatives of both **Atmos Energy,** which has 120,000 natural gas customers across Colorado, including residents of Steamboat Springs, Salida, Gunnison and Cañon City, and **Black Hills Energy**, which has 192,000 customers in Pueblo and surrounding areas.

Also testifying was a representative of the **Metro Wastewater Reclamation District,** who emphasized on the need for a market to fully use the gas generated in wastewater treatment.

Evan Vessels, from **Vessels Carbon Solutions**, testified about use of methane being emitted by mines near Paonia in the North Fork Valley. His company about a decade ago installed equipment that generates electricity from methane exhausted from the Elk Creek Mine. Aspen Skiing Co. is paying a premium for electricity from that electricity, but the project is also funded by offset money generated by California's cap-and-trade market.

Vessels testified that much methane continues to be emitted absent a market to pay for capture. The greenhouse gas impact of those emissions, he said, was equivalent to those of 770,000 cars. Colorado has 1.7 million registered cars.

Mark Sexton, owner of **Evergreen Natural Resources,** also testified on behalf of the bill, saying it would allow coal-bed methane harvesting from west of Trinidad.

Hansen said the intent is to send a very clear market signal, one that capital markets would find comforting, as most of the projects require a 20- to 25-year payback.