

BIG PIVOTS

Energy and water transitions in Colorado and beyond

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'It's crazy to build 40,000 houses a year' with natural gas infrastructure

by Allen Best

ARVADA, Colo. – In 2010, after success as a wind developer, Eric Blank had the idea that the time for solar had come. The Comanche 3 coal-fired power plant near Pueblo had just begun operations. Blank and his company, Community Energy, thought a parcel of sagebrush-covered land across the road from the power plant's fenced perimeter presented opportunities.

At the time, Blank recalled on Wednesday, the largest solar project outside California was less than 5 megawatts. He and his team were looking to develop 120 megawatts.

It didn't happen overnight. They optioned the land, and several times during the next 3 or 4 years were ready give up. The prices of solar weren't quite there and, perhaps, the public policies, either. They didn't give up, though. In 2014 they swung

the deal. The site made so much sense because the solar resources at Pueblo are very rich, and the electrical transmission as easy.

Comanche Solar began operations in 2016. It was, at the time, the largest solar project east of the Rocky Mountains and it remains so in Colorado. That distinction will be eclipsed within the next several years by a far bigger solar project at the nearby steel mill.



Eric Blank

Now, Blank has moved on to other things. He wants to be engaged in the new cutting edge, the replacement of natural gas in buildings with new heating and cooling technology that uses electricity as the medium.

"There's too much benefit here for it not to happen," he said in an interview.

California has led the way, as it so often has in the realm of energy, with a torrent of bans on natural gas infrastructure by cities and counties. Fearing the same thing would happen in Colorado, an arm of the state's oil-and-gas industry gathered signatures with the intention of asking voter in November to prevent such local initiatives. An intervention by Gov. Jared Polis resulted



Colorado gained 200,000 new homes from 2015 through 2019, and this year the construction continues at Candelas, a housing development in Arvada. Photo/Allen Best

in competing parties stepping back from their November initiatives.

In Colorado, Blank sees another route. He sees state utility regulators and legislators creating a mix of incentives and at the same time nudging along the conversation about the benefits.

“It will happen because the regulators and the Legislature will make it happen,” he says. Instead of natural gas bans, he sees rebates and other incentives, but also educational outreach. “Maybe someday you need a code change, but to me public policies are in this nuanced dance. The code change is way more acceptable and less traumatic if it is preceded by a bunch of incentives that allow people to get familiar with and understand (alternatives) than just come in from the outside like a hammer.”

Blank says he began understanding the value of replacing natural gas about a year ago, when conducting studies with Chris Clack of Vibrant Clean Energy about how to decarbonize the economy. “This is just another piece of that. I think building electrification is the next frontier.”

And it’s time to get the transition rolling, he says. It just doesn’t make sense to build houses designed for burning natural gas for heating, for producing hot water and for

cooking. Retrofitting those houses becomes very expensive.

“It’s crazy to be building 40,000 new homes a year with natural gas,” he says. Once built for natural gas, it’s difficult and expensive to retrofit them to take advantage of new technology. But the economics of avoiding natural gas already exists.

To that end, Blank’s company commissioned a study by Group14 Engineering, a Denver-based firm. The firm set out to document the costs using two case studies. The study examined a newer 3,100-square-foot single-family house located in Arvada, about 10 miles northwest of downtown Denver. Like most houses, it’s heated by natural gas and has a water heater also powered by natural gas.

The study, [“Electrification of Commercial and Residential Buildings,”](#) found that employing air-source heat-pumps—the critical technology used at Basalt Vista and a number of other no-gas housing developments—can save money, reducing greenhouse gas emissions—but would best be nudged along by incentives.

“For new construction, the heat pump scenarios have a lower net-present cost for all rates tested,” the report says. “This is due

to the substantial savings from the elimination of the natural gas hookup and piping. Although net-present costs are lower, additional incentives will help encourage adoption and lower costs across the market.” The current rebates produce a 14% savings in net-present costs.

The same thing is found in the case study of a 28,000-square-foot office building in Lakewood, another Denver suburb.

The study digs into time-of-use rates, winter peak demand and winter-off peak use, and other elements relevant to the bottom lines.

The bolder bottom line is that there’s good reason to shift incentives now, to start changing what business-as-usual looks like. Blank points out that natural gas in every home was not ordinary at one time, either. It has largely come about in the last 50 to 60 years. With nudges, in the form of incentives, builders and others will see a new way of doing things, and electrification of buildings will become the norm.

Blank says he began to understand how electrification of building and transportation could benefit the electrical system that is heavily reliant on solar and wind and perhaps a little bit of natural gas when conducting studies with Clack at Vibrant Energy last year.

“I was just blown away by the benefits of electrification (of buildings and transportation) to the electric system,” he says.

Greater flexibility will be introduced by the addition of more electric-vehicle charging and water heating by electricity, both of which can be done to take advantage of plentiful wind and solar



A 3,100-square-foot house in Arvada was used as a case study.

during times when those resources would otherwise be curtailed, he explains.

Already, California is curtailing solar generation in late spring, during mid-afternoon hours, or paying Arizona to take the excess, because California simply does not have sufficient demand during those hours. Matching flexible demand with that surplus renewable energy allows for materially greater economic penetration of highly cost-effective new solar.

“In our Vibrant Clean Energy study, with building and transport electrification, we found that Colorado could get from roughly 80% to 90% renewables penetration before the lack of demand leading to widespread renewable curtailment makes additional investments in wind and solar uneconomic,” says Blank.

Electrification of new sectors also expands the sales base for distribution, transmission and other costs. Since the marginal cost of meeting this additional demand is low (because wind, solar, and storage are so cheap), this tends to significantly lower all electric rates.”

Colorado, he says, is unusually well positioned to benefit from this transition. It is rich with both wind and solar resources. Coal plants are closing, electricity costs flat or declining. Consumers should benefit. The time, he says, has come.

A menu of options for those pushing electrification

BOULDER, Colo. – Electrification of buildings has emerged in the last year as a major topic of discussion in the broader conversation about how to decarbonize the economies of Colorado and other states.

In California, Berkeley fired the gun over the natural gas bow, so to speak, in July 2019 prohibiting natural gas in all new construction, for reasons of public health and safety. It did so after finding itself lagging its 2020 climate action goals by 18%. Other California communities soon followed, as did Brookline, Mass.

None have done so in Colorado or other Rocky Mountain states, but Jim Meyers offers a menu of options for local communities that want to move the needle on electrification. He's the buildings program director for the Southwestern Energy Efficiency Project, an organization based in Boulder that has operations in all the Colorado River Basin states except for Wyoming.

"Electrifying buildings is one of the most important tools for reaching zero carbon in the built environment," says Meyers, author of a new report, ["Building Electrification: How Cities and Counties are Implementing Electrification Policies —with Adoptable Language."](#)

[See also a one-page infographic.](#)

The report seeks to walk community leaders and activists through the full spectrum of electrification policies they could adopt, along with examples of communities that have already gone down this path. This report goes a step further, providing code language for local governments to adopt directly into their building codes.

Meyers knows that world very well, as he has participated in 3 International Code Council committees and is now on the ICC Sustainability Membership Council's "Zero Energy" and "Decarbonization" subcommittees. He lives in suburbia, Centennial, south of Denver, and has been with SWEEP for 11 years.

The report lays out a menu of options, from those who want a full-immersion Baptist experience of electric only to those who want to sprinkle a little baptismal water across their building sector.

For example, with electric-only, all heating, water heating, cooking and clothes drying must be done with electricity – as no natural gas lines will run into the house

or building. "The road to adoption will depend upon the current status of the energy code, the city's ambition to reach climate goals, as well as the relationships between the building department, sustainability department, local building industry, and public," the report says.

Another approach is called electric-preferred. It falls short of an outright ban on fossil fuels but does bump up the energy efficiency requirements when fossil fuels are used. Some communities have required new homes or buildings with natural gas to be 10% more efficient than their all-electric counterparts or, in some cases, offset the natural gas consumption with solar.

Are the Rocky Mountain states ready for building electrification? The basic premise of this new wave of electrification are heat pumps, milking the heat (or coolness, as the season requires) from the experience source, either the air or, with more expense, the ground or water. That technology is evolving—but is still viewed with some wariness in cold-weather places.



Jim Meyers

Xcel Energy, for example, has warned that it's not quite ready for prime-time along Colorado's Front Range. In mountain communities, it gets far colder. Meyers's report points out that technology can now reach -20 degrees F, and dual-fuel can be an option. It will take a while for full market acceptance, he says.

But his conclusion is more bold. "Increased electrification is a must for the southwest," he writes. "All-electric buildings present significant opportunities for municipalities to support economic savings for new construction, long-term operating costs savings for owners/tenants, and reductions in carbon emissions for the community."

Xcel Energy becoming a transportation company

DENVER, Colo. – Xcel Energy announced Wednesday a vision to drive toward 1.5 million electric vehicles in its service areas—including a large chunk of Colorado—by 2030. The company also operates in seven other states.

In a sense, this announcement merely confirms the legislative marching orders given the utility by Colorado and several other among the eight states in which it operates. In the case of Colorado, SB 19-077 required Xcel Energy and Black Hills Energy, the two investor-owned utilities to apply to the state's Public Utilities Commission to build facilities to support electric vehicles and recover the costs. Xcel in May submitted its plan, which is expected to be approved later this year by PUC commissioners.

The announcement should be seen in an even broader context, says Travis Madsen, transportation program manager for the Southwest Energy Efficiency Project, a major player in driving public policy in the energy sector in Colorado.

"Xcel, he said, "is evolving beyond just being an electricity company. It's also

becoming a transportation company. I am excited that the company is embracing the idea that part of what it's doing is to enable electric vehicles."

Colorado legislators in 2019 adopted a raft of energy legislation, the most overarching economy wise decarbonization goals: 26% by 2025 and, more challenging by far, 50% by 2030. Gov. Jared Polis reasserted and expanded somewhat the goal adopted by his predecessor, Gov. John Hickenlooper, to have 940,000 EVs on Colorado roads by 2030. Polis expanded the plan by including medium and heavy-duty vehicles, although Colorado does not have tax incentives for them, unlike cars.

Xcel's ambitions and those of Colorado align very well, says Madsen. He points to an Xcel filing with the PUC of its goal of having roughly 500,000 electric vehicles in its service territory in Colorado. Xcel delivers more than 60% of the state's electricity.

Madsen says he expects Colorado will meet and then exceed the EV goals because of the simple fact that the economics of vehicle electrification are starting to align. Vehicle costs are changing, and electricity has always been cheaper than petroleum. This was noted by Xcel in the press release posted on its website. "By 2030, an EV would cost \$700 less per year to fuel than a gas-powered car, saving customers \$1 billion annually.

Xcel's goals also align with the state's efforts to decarbonize its electricity. "This activity by Xcel is one of the key ingredients in making that happen," he says. This vehicle electrification by 2030 will reduce emissions from transportation 40%.

There's another component: air quality. Air pollution poses a serious health threat to people, and new studies reinforce and expand that understanding. The northern Front Range has had air pollution issues for many decades, less now than 50 years ago, but still dangerous and with a stubborn persistence. There are multiple causes,

including oil-and-gas drilling, but transportation exhausts are the single largest cause.

“The more we learn about air pollution and how bad it is, the greater the push to switch,” says Madsen. “The switch to EVs is one of the major tools.”

In its May filings with the PUC, Xcel laid out a multi-pronged approach to aiding the charging of EVs in its Transportation Electrification Plan. It proposes to invest \$100 million during three years in electric vehicle infrastructure and programs. [See the 48-page plan filed with the PUC here.](#)

These include programs to help people rewire their garages for charging, as most charging is expected to be done at home. The program also calls for efforts to allow those in multi-family housing, such as condominiums and apartments, to have access to charging. Another component addresses fleet-charging. And, if a relatively small part of the program, Xcel proposes how it will figure out where to put expensive fast-chargers in locations that private companies, like EVgo and ChargePoint, do not, because of infrequent use.

Madsen expects PUC approval for Xcel’s plans by early 2021 and the laying out of the programs, which will then accelerate the adoption of EVs in Colorado. The deadline for adoption of the plan was specified by legislators as March 1, 2021.

Holy Cross Energy gets national recognition as coop of the year

GLENWOOD SPRINGS, Colo. – Holy Cross Energy has been named Electric Cooperative of the Year for 2020 by Smart Electric Power Alliance. The alliance has been handing out awards for 12 years to utilities, individuals, and others working on the front lines of the U.S. energy transition.



A charging station in Eagle in partnership with Holy Cross Energy.

In recognizing Holy Cross, the organization cited the effort by the Glenwood Springs, Colo.-based electrical cooperative to increase renewable energy to 70%, the innovations evident in the Basalt Vista microgrid project, and the industry-leading support for installation of on-site renewable and storage by Holy Cross members.

At Basalt Vista, Holy Cross is studying how adjusting the energy levels of homes may be more cost-effective for members than modifying production at a power plant, leading to cost savings for members.

“We are both proud and honored that HCE has now also been recognized as a national example of how groundbreaking progress in clean energy and grid modernization can be achieved without any increase in power supply costs. This aspect of the clean energy transition has become even more significant as our members and communities face the social and economic stresses brought on by the COVID-19 pandemic.”



Gravel & cobbles and the Colorado River's slow bake

by Allen Best

Gravel yards annoy me. I've driven around Las Vegas and Albuquerque, both places of considerable aridity that depend greatly upon the Colorado River. Gravel has come to dominate the front yards in both places. In Vegas, they pay people to remove their grass. I've seen a lot of gravel. Yuck.

Driving around metropolitan Denver, I see more and more gravel, too. Candelas, the giant subdivision that sits on a table just short of where the prairie sweeps up into the foothills of the Rocky Mountains, has hulking houses big enough to be gymnasiums, crowded together like rugby players in a scrum. The yards are not quite opposite, but close, the space devoted to

Landscaping in Candelas, a major new subdivision in metro Denver, where turf is more sparse—but still luxuriant compared to Las Vegas or Albuquerque. *Photo/Allen Best*

turf pinched by gravel and cobbles and water-stingy shrubs.

Is this good or bad?

As in most things, there are two sides to this story. Both sides emerged during a session sponsored by Patty Limerick's Center of the American West on Tuesday. The webinar was the first of four sessions focused on the twin topics of water and energy. Whether those two topics actually pair very well, I'm not too sure since I started Big Pivots in January, choosing to use the tag line of "Energy and Water Transitions in Colorado and Beyond." Limerick also wonders about the pairing, as became evident in that first session.

Eric Kuhn began his career at the intersection of energy and water, serving as an electrical engineer aboard nuclear submarines in the U.S. Navy and working as



a nuclear start-up engineering for the Bechtel Power Corp. Then, on whim, he applied for a job with Glenwood Springs-based Colorado River Water Conservation District.

In the nearly 40 years since, he has become among the foremost experts about the Colorado River, a topic that annually inspires yet another book or three. Kuhn has written a book, too, along with water journalist John Fleck, “Science be Dammed: How Ignoring Inconvenient Science Drained the Colorado River.” It deserves to be on the top shelf of Colorado River books.

[See my review here.](#)

In that book, Kuhn and Fleck document how the Colorado River was divvied up based not on what the river could be expected to yield, given the scientific evidence, but rather what the power brokers from across the basin (and from Washington D.C.) preferred to believe it would. They make a case that the Colorado River development reflected rotten public policy.



Eric Kuhn

Kuhn managed to be both grim and hopeful. “What we know is that in the future there will be less water than there is today, and we’re using every drop today,” he said of the Colorado River. “And in the future

The Colorado River at Palisade, Colo.

Photo/Allen Best

there will be less. That means people in the future will use less.”

Who exactly will use less? Two-thirds of the Colorado River is used for irrigation, and another one-sixth or so is for municipalities and for tribal reservations, and the rest goes to evaporation from these big reservoirs.”

And, as he said, it could get worse. Instead of the 17.5 million acre-feet (or more) presumed by the Colorado River compact, the river in a time of warming climate will produce 10.5 or 11 million acre-feet—even as environmental problems, such as struggling fish populations, and other environmental repercussions of dewatering are becoming more apparent.

Grim indeed, right? Well, maybe not. The future is bright because of conservation, conversation and collaboration,” he said. “As human beings we learn how to use less water than we have.”

Las Vegas is the shining star. In 2000 it was using 320,000 acre-feet of water. Since then, the metropolitan area has nearly approached a population of 2 million—and the water use has declined. It has banked water in Arizona. Really.

“The future of the Colorado River is all about grass: water for parks, grass or lawns. If we can manage grass, we can live with the water supply we have,” he said.

Cities along the Front Range of Colorado, he said, have yet to hit the same stride as their hotter, more arid siblings.

“If you look at the progress made elsewhere in the world, the Front Range hasn’t even dared to restrict lawn sizes or pay people to take out their turf,” he said.

Where does this subdivision called Candelas fit into this narrative? I’m not sure. Arvada gets 78% of its water from Colorado River tributaries via Denver’s Moffat diversion network in the Fraser and William Fork Valleys.

But what gives somebody in Montrose the right to have a half-acre front yard while somebody in Arvada can have one about the size of a trampoline. This discussion can go on for a while – and, in fact, has been going on for decades.

Organizers of conferences or their pandemic-equivalent Zoom sessions can safely return to this topic again and again, because it will never be answered to everyone’s great satisfaction.

Kuhn, when he ran the River District, argued the Western Slope perspective that Colorado’s growth cannot be borne on the backs of the Western Slope’s cultural history of agriculture. That is still the position of the River District.

Water can be shared, though —through agreements that allow cities to lease water from farms, to help in pinch times. This device been employed effectively by California’s Metropolitan Water District, the provider for southern California cities, in conjunction with the giant farming districts in California, Palo Verde and the Imperial Valley. In Colorado, cities have been more tepid.

But Los Angeles and its sunny southlands empire have also learned to live with less water, Kuhn noted.

Okey-dokey—but just keep in mind the heat-island effect of the warming climate and the cooling effect provided by irrigated landscapes, responded

Laurna Kaatz. She has a Ph.D. (physics), too. She is Denver Water’s climate science, policy, and adaptation program director.

“Water goes a long way to making it comfortable and livable in a semi-arid environment,” she said.



Laurna Kaatz

Every Water 101 course in Colorado must point to this fundamental

imbalance: 80% of the water falls on the Western Slope, and 90% of the population lives on the Eastern Slope, mostly in a relatively narrow corridor between Castle Rock and Fort Collins.

Another way of saying the same thing: The Colorado River produces 10 times the water of the South Platte River, where most Coloradans live, and Denver Water serves 25% of the state’s population, and those areas produce 30% of the state’s GDP—all on 2% of the state’s water (Agriculture uses 88% of Colorado water, and municipalities 8% altogether and large industry 4%).

And 80% of water that falls as precipitation in Colorado goes back into the atmosphere as a result of evaporation and transpiration.

Half of Denver Water’s supplies come from the Western Slope. But Colorado, said Kaatz, is warming more rapidly than much of the globe, because it lies in the middle of a great land mass. For Denver Water, planning for the future means trying to prepare for the next 50 years using a process called scenario planning. The goal of scenario planning might be characterized as trying to keep your options open.

At the outset, I said that this was a water-energy forum. In fact, it tilted heavily toward water. But energy and water do overlap, as Xcel’s representative, Jeff Lyng, pointed out. He’s the company’s director of energy & environmental policy. And, not

unlike the scenario planning of major water utilities,

On the environmental front, Xcel became a national front-runner with its December 2018 announcement it saw a path to 80% emissions-free electrical production by 2030 as compared to 2005 levels. Then, at mid-century, zero-emissions.

The first goal can be achieved using existing technology, Xcel said. As for that goal 30 years hence? TBD.

First things first, said Lyng. “We can’t get to zero emissions without first getting to 60% and then 80%.” By the end of last year, he said, Xcel had reduced



Jeff Lyng

emissions by 44% -- significant, he suggested, when considering what was required by the Paris climate agreement but also by what the Obama administration’s Clean Power Plan would have required, 32%.

Major challenges lie ahead before the goal of a 100% renewable grid can be achieved. It’s not realistic to hit that goal by building just more and more renewables, because of land-use constraints, unmanageable costs, and other problems.

Instead, he said other types of technologies —advanced, dispatchable renewables, zero-carbon fuels, advanced nuclear, carbon capture and utilization, long-duration storage and demand-response, among other possibilities—will deliver the answer. In other words, the answer is probably already on the table, but it just hasn’t been developed sufficiently.

As for the intersection with water, Lyng delivered this interesting factoid: energy saved is water saved, because each kilowatt-hour capacity of energy use saves roughly one-quarter gallon of water (given power plant cooling). Continued integration of

renewables, of course, will reduce that figure considerably.

Lyng’s comments about water use were nearly the only time that energy and water were joined in the same conversation—as Limerick, who has a Ph.D. in history, pointed out. “It’s interesting how the topics separate, even though we intended to bring them together.”

And Limerick also suggested why people tend to get excited about water, whereas with energy eyes soon glaze over. Water is something that people intrinsically believe they know, that they have an affinity with. Energy, well, it’s a little less tactile.

But, to the point of this publication, Big Pivots, how we produce and consume energy matters entirely to the climate. And, as Kaatz noted, climate change is water change.

Two sessions remain next week in the [“Water and Energy in Colorado: Emulsifying Two Great Challenges in Four Parts.”](#)



At the headwaters of the Colorado River in Rocky Mountain National Park. Photo/Allen Best



A wind farm in Colorado's Logan County, near the Nebraska border, in 2015.

Taxes on wind farms huge for Colorado farm counties

DENVER, Colo. – The 15 counties that comprise the mostly rural, eastern plains in Colorado have quietly been rapidly transformed in the 21st century. A new study commissioned by The Western Way finds that the counties altogether constitute 95% of the renewable energy capacity in Colorado—and more is coming.

By 2024, construction and investment of \$9.4 billion will have occurred since 2000 – with 75% of that investment occurring in 33% of that time span, 2016-2024.

[You can find the study here.](#)

Wind is critical to the employment base of the eastern plains, the study found, but since 2015 solar positions grew from 42 jobs to 151 jobs in 2019.

Greg Brophy, Colorado director of The Western Way, said the report quantifies the benefits that the region receives for its part in generating the vast majority of Colorado's renewable energy. But the report, he said, should also be a call for counties in the eastern plains without any projects to roll out the welcome mat and gain the benefits.

The report cited the testimony of Colorado Rep. Rod Pelton, who represents a big swath of the eastern plains, including

Morgan, Logan and other counties in the South Platte Valley as well as areas to the south, including Burlington and Cheyenne Wells.

“In several of the counties in my legislative district, taxes paid by wind farms make up nearly half the amount of the annual operating revenue for

county government,” Pelton said. This is a long term and stable funding source that does not fluctuate with the market, and it is enabling local governments to fund needed services without raising taxes. Take Kit Carson County (Burlington) as an example. The total local tax revenue brought in annually is just over \$525 per county resident. That is a meaningful amount.”

Cory Wall, a commissioner in Kit Carson County, said his county receives nearly \$2 million a year from the wind projects.

“Eastern Colorado has been hit hard by the covid economic shutdown and swings in commodity prices. We are thankful to have these renewable energy projects paying a steady stream of tax revenue and lease payments,” he said.

In Sterling, Logan County's economic development director, Trae Miller, points to what he called the nation's premier wind technician training program, which is a component of Northeastern Junior College.

Not all places that have strong resources have wanted them, although Brophy was reluctant to identify them. He agreed that Southeastern Colorado is the poster child of wind resources but absence of transmission.

For a deep dive on the status of southeastern Colorado, see [Windy enough in Dust Bowl land.](#)

Report finds big loss in clean energy jobs in '20

DENVER, Colo. – A report commissioned by the Sierra Club finds that clean energy jobs have fallen significantly since February, even as other economic sectors are still holding up reasonably well.

Colorado has lost 5,962 jobs since the time that New York Times columnist Thomas Friedman called Before Covid. That represents an 8.9% decline. Job growth in clean energy grew 0.2% during July.

“This fits in with what I'm hearing on solar,” reports Mike Kruger, chief executive of the Colorado Solar and Storage Association. “Installers are booking future business with the crew they have now rather than staff up to meet current demand only to have demand fall off a cliff again.”

In New Mexico, it's bad, too. That state lost 2,105 jobs, or a 16.85% decline in clean energy jobs, and since July has gained back 0.2% of them.

By far the largest state in the West for clean energy is California, with 88,158 jobs lost since February, and only 723 gained in July.

[See the report by BW Research Partnership here.](#)

The Sierra Club faulted President Donald Trump and Senate Majority Leader Mitch McConnell for failing to extend unemployment benefits, instead “prioritizing corporate pollutes and executives.”

Despite revolt, Tri-State declares many successes

WESTMINSTER, Colo. – Despite the revolt from two of its three largest members, Tri-State Generation & Transmission put on a happy face at its annual meeting.

“Tri-State is utilizing its financial strengths and positioning itself for success in an industry that is rapidly changing.,” said

Stuart Morgan, treasurer and director at Wheat Belt Public Power District of Sidney, Neb. He noted that rates will continue to remain steady into 2021, for the fifth straight year.

Member revenue has increased 9% over the last five years, which Tri-State says is strong compared to many other generation and transmission companies. It ranks as the third largest by asset size in the United States, with \$5.3 billion in assets, ranking behind Oglethorpe Power and Basin Electric.

With arrival of a new chief executive Duane Highley in April 2019, Tri-State quickly began pivoting, announcing in January the retirement of coal plants in Colorado and New Mexico and the addition of more than 1 gigawatt of additional renewable resources by 2024. “We must be cleaner, more affordable, and more reliable than any other option,” Highley said, according to a press release.

Black Hills gets closer to moving forward on a 200-megawatt solar farm

PUEBLO, Colo. – Black Hills Energy has reached the local approvals it needs to move ahead with a 200-megawatt solar project in the Pueblo area if approved by the Colorado Public Utilities Commission.

If approved by regulators, Black Hills will enter into a power-purchase agreement with the developer for all of the energy generated from the project. Construction would begin in 2021 with the project going online in 2023, according to Julia Rodriguez, Black Hills spokeswoman.

The project would result in 51% of Black Hills Energy's total generating mix coming from renewable energy resources by 2024, the Pueblo Chieftain reported.

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After the coal plants close

Story and photos by Allen Best

In 2017, when residents of the Hayden School District debated the merits of building a new pre-K through 12th grade school, little was said about the near certainty that a nearby coal-powered power plant would likely be retired long before the building's debt was. The Hayden Generating Station pays 57% of property taxes in the district.

"Nobody wanted to talk about it. Now we're talking about it pretty hard," says Doug Monger, a life-long resident of Hayden and a Routt County commissioner. "When the power plant goes away, get your checkbooks out."

Just Transition committee issues draft report. In Craig, many ideas, but most could use some assistance.

Smaller districts in and around Hayden will similarly see substantial revenue shortfalls. The West Routt Fire Protection District, for example, gets 62% of its property tax revenues from the power plant.

The hospital, library and cemetery districts get 57%.

Such revenue shortfalls are among the many impacts to communities and workers addressed by a draft report issued Aug.

1 by the state's [Just Transition Advisory Committee](#). A final report is due state legislators on Dec. 31.

Created by a 2019 law, the committee was charged with devising strategies to assist workers and communities impacted by that transition.



Work continued on the gridiron at the new school at Hayden in early August. The bond for the school was approved in 2017, when voters thought the plant’s units would stay open through 2030 and 2036.

The draft recommendations identify precise proposals to help the 2,000 coal miners, railroaders, and power plant workers who have or will likely lose jobs as Colorado shifts from coal-generated electricity to renewables during the next several decades. They’re spread across Colorado from Brush to Pueblo to Paonia.

One recommendation calls for assisting workers with wage and health differential benefits for three to five years. Depending upon how long they were in the coal-dependent jobs, the workers would get part or all of the difference in reimbursement between the old jobs and new work.

Another provision calls for up to \$30,000 in funding for new training or education for dislocated workers. Still another recommendation calls for assistance to workers who choose to relocate more than 50 miles for new work.

COVID-19 complicates potential aid from the revenue-strapped state government but

also prospective help from foundations and other sources. As one committee memo notes, new sources of revenue must be developed. Then again, the bulk of coal plants — and all of them in the Hayden-Craig area — will not begin closing until 2025, possibly after the economy has recovered.

The law also specifies that these plans must be local in origin. The state won’t tell a coal-mining community that it must become a place that manufactures, for example, tennis balls. The draft report recommends creation of new tools that could assist new business formation. One recommendation would create a state-wide investment fund focused on investments in coal transition communities.

‘The conversation changed’

In Hayden, Xcel Energy is the operator and primary owner of the power plant. A 2016 filing with state regulators projected one unit closing in 2030 and the second unit

in 2036. That was the understanding voters were operating under when they approved the \$23 million bond proposal in 2017, by a whisker-thin two-vote margin.

But that was before prices of renewable electricity had dived, causing Xcel to rethink its options. In December 2018 it announced that it intended to reduce emissions from its power generation in Colorado and other states where it operates 80% by 2030 as compared to 2005 levels.

There had been uncertainty at the time of the 2017 vote, says the town manager, Matthew Mendisco. Xcel's decarbonization pledge was sobering. "When they made their announcement, that's when I think the conversation changed," he says.

State legislators in 2019 made that pledge a legal mandate. Xcel early next year is expected to outline exactly how it will meet that requirement. Closure of the plant will also hit Peabody Energy's Twentymile Mine, whose primary market is the Hayden plant. Production was already skidding from the mine. The mine is one of the primary employers in Hayden.

In Craig, one unit was already scheduled to close by 2025, but in January Tri-State Generation and Transmission, the operator and primary owner, announced closing of the two remaining units by 2030. Also almost certainly to close will be the two coal mines, Trappers and ColoWyo, that supply them.

In early March, when the Just Transition Advisory Committee held listening sessions



Productions at the Twentymile Mine has fallen dramatically in the last 12 years. It continues to supply the Hayden power plant.

in Craig and Hayden, they heard anger, grief and uncertainty.

"They don't feel heard by the state Legislature. They know they can't replace coal jobs, and they don't see a future for Hayden without coal," reported Beth Melton, a Routt County commissioner, relaying the comments expressed at her table. Fears of lifestyle loss were mentioned often in a session held in the airport cafeteria near Hayden. The coal-based paychecks allow a reasonable quality of life in smallish, uncongested towns — not poor places, but not places of wealth either. Always there are the mountains and high desert, and sheer canyon walls of ochre, too,

the hay meadows and other manifestations of a pastoral landscape just three or four minutes away.

If there was always an understanding that someday the plants would close, the coal would play out, it always seemed too far into the future to seriously contemplate. Even those with their eyes wide open thought they had 10 to 15 years to figure out a future.

Dinosaurs to the rescue?

In theory, the lost tax base from the coal plant can be offset by increased growth. Hayden has excellent water rights — a valuable commodity in the arid West — capable of serving a population of 4,000 to 5,000. It has real estate costs that should make it an attractive option for those unable to afford housing in the prosperous resort community of Steamboat Springs 25 miles to the east. In reality, Hayden has changed very little in the last 40 years, despite its relative proximity to Steamboat. The population of Hayden was at 1,600 in the late 1970s, only lately growing to 2,200.

In Craig, a town of 9,000 people, some residents can remember life before coal became king. They suggest it wasn't a bad place then, either.

But even before the announcements of plant closures, the Yampa Valley towns needed to think about diversification, says Jennifer Holloway, director of the Craig Chamber of Commerce.

"It has been our community's mission to provide electricity, and now it has to shift," says Holloway. "Every community needs a purpose. We need to have something we work toward."

Some hope for new manufacturing to replace the manufacture of electrons. But with the closest interstate highway 90 miles



Downtown Craig has been getting spiffed up but suffers from the Walmart-on-the-edge-of-town effect.

away by twisting roads, that appears unlikely.

Tourism offers more hope. Moffat County is only slightly smaller than Connecticut and with a population of 13,000. It's uncluttered but relatively rich with high-desert attractions. For decades there has been talk about pushing for national park designation for Dinosaur, the national monument about 90 miles west of Craig. Local elected officials refused to endorse the idea for fear that it might adversely impact oil and gas extraction along its perimeter. Now, a coalition of regional governments and river groups is being stitched together for a September summit to address the idea as well as the idea of a field museum in Craig.

The Yampa River, one of the last undammed rivers of the West, flows past

Craig and through Dinosaur. Already, it adds a bit of business to Craig, if mostly boaters stop to gas up and grab groceries at the City Market. Perhaps to highlight potential opportunities, Gov. Jared Polis, when traveling through Craig in March to a listening session, stopped by a small manufacturer of rafting gear called Good Vibes. Other ideas involve what has worked for other tourism-based communities; a water park in the Yampa River between the town and the power plant, to challenge the skills of kayakers? And, in time, mountain bike trails on the slopes now being created by draglines at the Trapper Mine?

Improved mass transit, possibly including trains, could better link Craig with the wealth of Steamboat, 42 miles away, and its visitors. Colorado has three other tourist-driven trains. There's little interest, however, in becoming a bedroom community for Steamboat's poorly paid service workers. Craig will have enough of its own once the \$100,000-a-year-plus-benefits coal jobs are gone.

Others wonder if curriculum at the local Colorado Northwestern Community College can be developed to take advantage of the assets of the region, such as programs in wildlife management or archaeology.

Then there's hope for an art gallery on Craig's main street. Like many small-town downtowns, it lost vibrancy when Walmart arrived at the edge of Craig along with fast-food franchises.

How can the state help?

Altogether, the efforts suggest strategies of creating more attractive communities, creating the sort of place that will draw location-neutral people.

But to achieve this will require infrastructure — just at a time when budgets are being strangled by the pandemic. The Just Transition committee's draft report emphasizes this challenge unforeseen by legislative authors of the law.

"A significant amount of work remains to reach a final Just Transition Plan for Colorado," says the report. "Most notably, we need to better develop funding options that will be viable given Colorado's constitutional fiscal limits as well as new budget constraints in the wake of the covid-19 pandemic."

Since March, when the committee was in Craig to take testimony, for-sale signs have popped up in front of houses. Craig has been drawing people interested in fleeing the Denver metropolitan area. Unlike Colorado's mountain towns, you can buy a house in the Yampa Valley for \$200,000 to \$300,000.

Taxing districts face huge gaps as the coal properties recede. In Routt County, the Twentymile Mine and the Hayden plant together deliver 2.3% of the county budget at the courthouse in Steamboat Springs. Farther west in Craig, taxes on the two coal mines and the power plant deliver 11.3% of revenues for Moffat County's budget.

School districts will have layered effects. Colorado seeks to equalize funding for students across the state, so that in theory a student in the poorest school districts gets an equal opportunity with that in the richest. Coal assets today deliver 46% of the budget for the Hayden School District and 20.5% of the budget to Moffat County schools.

But there are other impacts, explains John Wall, the finance director for Moffat County schools. A diminished tax base reduces the district's ability to borrow money to repair the aging schools, the newest of which is 40 years old, about the same age as the coal plants.

Colorado communities must look at their assets when seeking economic development, says Paul Majors, chief executive of the Telluride Foundation, and a member of the Just Transition committee. Northwestern Colorado's rugged beauty, he suggests, lies at the top of the list.



Beth Melton, a Routt County commissioner, speaks in March as Just Transition Advisory Committee vice chair Ray Beck, left, and Dennis Dougherty, chair, look on. Beck is a Moffat County commissioner and Dougherty is executive director of the Colorado AFL-CIO.

The Just Transition committee proposes aid to the coal-impacted communities for co-work spaces, business accelerators and other initiatives. The lengthy draft report also identifies the need for new state-sanctioned tools that provide a funnel for capital investments. Legislation will help, says Majors. It will signal to investors that the state is all in, they want this to happen, they're supportive."

'More work to be done'

The intent of the Just Transition effort is not to replace lost revenue, although that could be part of the assistance. Rather, it is to help communities craft new ways to generate revenue. But the committee also recommends study of how to overhaul Colorado's tax structure, to see if constitutional requirements actually impair the ability of local jurisdictions to plan for ways to strengthen and diversify their economies.

Colorado is not known as a coal state in the same way as Wyoming or West Virginia are. But coal had been central to the economy of the Yampa Valley for the last 50 years. Because of that dependence and its

relative isolation, it stands out as among the nation's most interesting places to see how it transitions to life beyond carbon.

Kelli Roemer, a human geographer working on a dissertation at Montana State University, focusing on Colorado, Montana and Washington state, observes that Colorado stands out because of its attempt to provide planning tools. Montana and Wyoming, two states even more dependent on coal, have made no similar effort at planning.

Colorado has potential to become a model for other coal-dependent states, says Mark Haggerty, an economic geographer associated with the Headwaters Economics, a Montana-based think tank and an advisor on Colorado's effort. "Discussions and draft recommendations are headed in the right direction, but there is more work to be done, and ultimately the model taking shape will need support from the Legislature and the governor."

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