BIG PIVOTS

ENERGY and WATER transitions in Colorado and beyond

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No to renewable goals in Pueblo – what else might be going on?

by Allen Best

In pruning the mission of its energy advisory commission, the Pueblo City Council on Jan. 13 left no doubt that the city intends to move in a different direction. But what direction exactly?

The council on Dec. 23 rescinded a resolution from 2017 that posited a goal of 100% renewable energy by 2035. The reasoning for that action was murky, at best, and this latest action similarly was justified with a paucity of explanation.

Could this be related to the Black Hills rate case?

The high costs of electricity were cited during the meeting with the suggestion those prices are tied at the hips with renewable energy. In December, Joseph Pereira, deputy director of the Office of Utility Consumer Advocate, told Big Pivots that renewable energy has nothing to do with the rates charged by Black Hills Energy, the investor-owned electrical utility that distributes electricity to Pueblo.

Black Hills Energy already has among the highest electrical rates in Colorado — tops, according to a survey by the Colorado Association of Municipal Utilities from January 2024, although a July survey by the same organization showed Black Hills rates to be surpassed by several others. Pueblo is among the lower-income cities, with 62.3% of Colorado's average per capita person income.

The utility in July submitted a proposal to the Colorado Public Utilities Commission to raise rates another 18%. Black Hills in November knocked that proposal back to 13.8%. That remains far more than what intervenors in the PUC proceeding think can be justified. The PUC commissioners have taken testimony but not have scheduled a deliberation.

Might Pueblo want to bail from its franchise agreement with Black Hills? Such municipalization efforts are talked about frequently but, as a 2019 study concluded, rarely succeed and only then in mostly small markets.

Boulder and Pueblo, at polar ends of the affluence spectrum along Colorado's Front Range, have both entertained municipalization proposals in recent years. Pueblo came first, in the spring of 2020, and the proposal was defeated by a margin of 76% to 24%.

In Boulder later that same year, the margin was far more narrow, with 53.3% voting to stay with Xcel Energy.

Pueblo's franchise agreement runs through 2030 but includes a potential off-ramp in 2025. The city has appropriated $300,000 for the update of a study done in 2019. The cost of the election itself in November has been estimated at $100,000.

At the council's meeting Monday evening, council members first heard from an individual who declared his disappointment to the retraction of the 100% renewables goal. Pueblo, said David Cockrell, had been the first jurisdiction in Colorado to make the commitment, demonstrating "that even a working-class community like Pueblo can take responsibility to address the climate crisis."

Later, when the ordinance to strip the mission of the energy commission of any mention of renewables came up, several members of the commission testified that it was the wrong thing to do.

Among them was Jodie Hendershott, a new member of the commission.

"Rather than reverting to the status quo of many years ago, as this ordinance suggests, we can work together to develop an adaptive strategy that allows for flexibility based on data, budget, advances in technology, and a collaborative effort between the energy advisory commission, the mayor and the council," she said.

Hendershott also suggested that it was wrong to disband the commission as currently constituted because of the perceived failures of Black Hills Energy.

"Dissatisfaction with Black Hills as a utility provider and an on-going discussion of municipalization is not a relevant reason to change the city's vision or purpose of the Energy Advisory Commission, and you deprive yourself of the valuable resource that maintaining the input of this commission represents."

Another commission member, Mike Wakefield, who teaches at Colorado State University in Pueblo, said that he used the commission in his teaching about entrepreneurship and economic development. The students, he said, "understood that the mission of 100% renewable energy was really a stretch goal and not something that was in concrete that had to be achieved by a certain time."

Wakefield also urged the council to modify the commission as necessary, but not start from scratch.

The commission helped steer the city toward more renewable energy, including the adoption of geothermal for heating and cooling at several fire stations. There is an incremental higher cost that is far outweighed with reduced operating costs over the life of the structures.

The commission will start from scratch. The plan is to let the mayor, Heather Graham, appoint members at her discretion.

Before that vote was taken, though, they heard the arguments of Councilor Dennis Flores, who had also opposed rescinding the renewable goal.

"If anything, you should call this the Commission on Conservation of Energy, That's what you've created here by making these changes. (The existing commission) is light years ahead of that," said Flores.

The commission's recent work has included looking into battery storage, data

centers, even nuclear," he added. "There's not full agreement there, but at least we have people that will give us information that's valid, that's important for us to understand."

Flores also suggested that Pueblo may be sending the wrong message to businesses thinking of locating there.

"There may be lost opportunities of businesses that say, 'Hey, we've already committed going down that road. If this city is going to take a different path, maybe we don't want to locate our business in Pueblo.'"

Roger Gomez, another council member, responded that Pueblo has a growing sector called the "energy impoverished." He seemed to be referring to renewable energy when he spoke about "having to choose between eating and turning on their lights, but it's reality." Gomez credited the energy commission members with having good hearts, but "realistically, the timing is just not there."

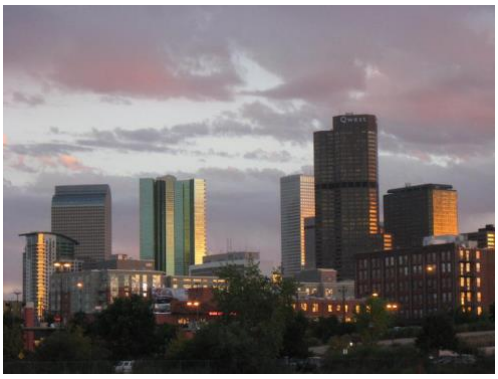
Will the existing members reapply? One of them, Laura Getts, said she would.

"It has all been deeply disappointing but I would reapply as there is still a lot of work to be done, and commissions can be more influential than most alternatives, barring running for council."

Tom Corlett, on the other hand, has no interest in applying to be on the new commission. "No renewables, no Tom. It's as simple as that," he said.

As for the municipalization, Flores said in a post-meeting interview that while he stoutly opposed the council's action, he also disagrees with pursuing municipalization. Such efforts almost never succeed, he pointed out.

If Boulder, with its much greater affluence cannot make it happen, the effort in Pueblo will almost certainly be doomed to defeat.



And in Denver, a postponed deadline for buildings larger than 25,000 sq. ft.

Denver's effort to reform how its larger buildings use energy ran into resistance a couple of years ago, and now the city, through its "Energize Denver" program, has postponed a deadline for large building owners to comply.

The Denver Gazette reported that Energize Denver has moved its target for compliance from 2025 to 2026 and eliminated a 2027 compliance. A 2030 final compliance target, although still in effect, will be flexible.

In Colorado Springs, the Gazette — a sister publication to the Denver Gazette — snickered in triumph

"Denver City Hall's dogma-driven response to the oft-promised climate 'crisis' includes a gut punch to the city's commercial property owners," said the Gazette editorial page. It called the Energize Denver agenda "absurdly costly and unworkable."

The schedule was too aggressive and the standards unrealistic by compelling "conversion to unproven and likely inadequate heat-pump technology(that was) never intended to warm large buildings in Colorado's climate."

Nuclear bill this year has sponsors from both political parties

by Allen Best

Nuclear has returned to the table at the Colorado Capitol, this time with bipartisan legislative support.

HB25-1040, titled "Adding Nuclear Energy as a Clean Energy Resource," would allow retail utilities to meet their 2050 clean energy targets by using nuclear energy. Colorado law currently excludes nuclear energy.

The statutory definition of clean energy also determines which energy projects are eligible for clean energy project financing at the county and city and county levels.

A similar bill was introduced in the 2024 legislative session by Sen. Larry Liston, a Republican from El Paso County. It failed to get out of its first committee on a party-line vote.

Liston is also a prime sponsor of this new bill and this time he is joined by another Republican, Ty Winter, who is from the Trinidad area. They are joined by Rep. Alex Valdez, a Democrat from Denver who has a history in the solar industry, and Sen. Dylan Roberts, who represents much of northwestern Colorado.

The bill says that Colorado's peak electrical demand has been projected to double in the next five years, and Colorado's current path to eliminating greenhouse gas emissions include only wind, solar, and battery storage. (In fact, it also includes geothermal and pumped-storage hydro).

The bill cites the large volumes of energy produced by nuclear for the large geographic footprint. It also insists that small modular nuclear reactors can replace coal power plants while maintaining the number of jobs in the communities in which the coal power plants are located. It says that designs will be available of the new small modular reactors to be ready for large-scale deployment by the 2030s.

Interviews were requested with two of the bill sponsors, but phone calls were not returned.

Nuclear bills in some form or fashion have been introduced in the Colorado Legislature for the past several years. All but one failed to move forward. Tellingly, the Colorado Greenhouse Gas Pollution Reduction Roadmap 2.0 that was issued in February 2024 fails to mention nuclear once in the 161 pages.

In this, Colorado appears to be in a minority. The Associated Press in a survey of all 50 states found that about two-thirds saw nuclear, in one fashion or another, as helping take the place of fossil fuels.

The U.S. government under the Biden administration also considers nuclear energy a source of clean energy, and so do some states. The Department of Energy notes that nuclear energy has supplied 20% of the nation's electricity since the 1990s. It provides power in 28 states.

Xcel Energy has two nuclear power plants in Minnesota, where it has its corporate headquarters. There, Minnesota state law deems nuclear a clean energy.

In Colorado, Xcel has also said overtly that it sees nuclear energy possibly being in play somewhere between 2030 and 2050. A task force organized by Xcel in Pueblo came to the conclusion that a nuclear power plant would best provide benefits to Pueblo County once Comanche Generating Station closes in 2030.

Xcel's Just Transition electric resource plan describes nuclear as an advanced technology that could be viable by around 2037. Geothermal falls under the same heading. These resources are needed to maintain reliability while meeting emissions-reduction goals, Xcel said.

Nuclear waste repository?

Meanwhile, in northwest Colorado, a movement is underway to become home to a nuclear waste repository. The Association Governments of Northwest Colorado, a small economic development group representing six counties, thinks that one of the counties could be a good place.

Matt Solomon, a former Eagle Town Council member, has been making the rounds in meeting with public officials to talk about the idea, reports KUNC.

The work of Solomon and others is being financed, at least in part, by federal grants.

The Grand Junction Sentinel reported that the Northwest Colorado Energy Initiative, the program under the auspices of the six-county group, received two $75,000 grants. The most recent grant comes from Energy Communities Alliance, a nonprofit organization of local governments and nuclear communities adjacent to or affected by U.S. Department of Energy activities. It will provide development of a multi-state stakeholder map that is guided by the U.S. Department of Energy's Energy Transition Playbook.

Among those supporters of looking into the idea of a waste repository is State Sen. Dylan Roberts. "I appreciate and understand the concerns about health and safety, but it does seem that in today's modern world, here in 2024-2025, that there are ways to very easily secure this waste and ensure that community safety is protected," he told KUNC.

Energy storage firm in Longmont adding 314 jobs with state aid

Aided by nearly $6 million in state incentives, Stored Energy Systems has announced it will expand its operation in Longmont and create 314 new jobs with average annual wages of $97,493, which is 109% of the average annual wage in Boulder.

The company, which goes by its acronym, SENS, provides non-stop direct current power for critical infrastructure. The company was founded in 1972 in the Silicon Valley by Herb Kaewert, a graduate of MIT who already has formed a battery company that was ultimately sold.

In 1991, to accommodate the needs for expansion, he and a son, Bill, moved the company to Longmont. Since then, the company has expanded more than tenfold, according to the SENS website.

The Colorado Economic Development Commission approved up to $4.6 million in performance-based job growth incentive tax credits over an eight-year period and up to $397,313 in performance-based incentive over a five-year period. These incentives are contingent upon SENS meeting net job creation and salary requirements.

Lots of storage in Colorado

The energy storage story in Longmont is part of a major expansion of energy storagework and business expansions along the Front Range of Colorado.

In Pueblo, **Xcel Energy** has partnered with **Form Energy** to develop and commercialize **iron-air storage**. The batteries will allow Xcel Energy to store renewable energy such as solar and wind when it is being produced and then later distribute the energy during periods of lower production.

While most existing battery technologies provide fewer than eight hours of energy storage, Form Energy's iron-air batteries could deliver electricity for 100 hours.

In December, Denver-based start-up **Peak Energy** announced it was planning a new battery cell engineering center in Broomfield. The venture hopes to advance **sodium-ion** battery systems. The company hopes to scale domestic battery cell manufacturing by 2027.

In October, Louisville-based **Solid Power** announced a production plant in Thornton for a new type of battery for use in electric vehicles. The expansion was accelerated with aid of $50 million in federal aid authorized under the Infrastructure Investment and Jobs Act of 2021. The company secured another $60 million in funding from other sources.

Most unusual – some think it's wacky — was the December unveiling of battery on wheels, a concept called **SunTrain**. The idea with SunTrain within the context of Colorado is to ferry solar energy from Pueblo to certain industrial users in metropolitan Denver via batteries loaded on trains.

Xcel wants to work with the company, and Xcel has lent its credibility to the project. And Gov Jared Polis in 2024 wrote a letter of support on behalf of a federal grant.

In his letter, Polis neatly laid out the problem: "Recent analysis from the Colorado Energy Office shows that the lowest cost pathway to serve electricity load in Colorado by 2040 requires quintupling solar deployment and tripling wind energy, which is a pathway also aligned with my goal of achieving 100% clean energy for Colorado by 2040.

"While we have made good progress in recent years, Colorado's electric transmission system still does not have enough capacity to serve the current or projected generation from renewable resources, leading to curtailments, high electricity costs, and increased pollution. Unfortunately building a new transmission line in the U.S. requires an average of 10 years and can run up to 20 years."

Christopher Smith, the founder and president of SunTrain, explains the concept in Eaton during December. ***Photo/Allen Best***

New natural gas lines are a problem. Will these solutions be a model for Colorado?

by Allen Best

Xcel Energy has a problem in some of the mountain communities where it sells natural gas. It's part of a much broader problem across Colorado.

The specific problem Xcel has to solve in a strip of communities from Leadville to Grand Lake is how to meet the needs of existing and new customers dependent on natural gas without spending money on assets that will be stranded.

Colorado, after all, has goals for achieving net-zero emissions in its economy by 2050. Installing natural gas pipelines into new homes that are expected to last for 70 years doesn't fit into this 25-year timeline.

Xcel calls its proposed solution the Mountain Energy Project. The company doesn't see one single solution to this conundrum. Rather, it sees several ideas that it places under the heading of hybrid.

In a filing with the Public Utilities Commission on Jan. 16, the company says the single biggest solution it had hoped might work would be electricity replacing gas. It sells both gas and electric in these areas.

Electrification remains a major part of the plan, and it would require beefing up the electrical infrastructure: Four feeder upgrades at Leadville and one at Dillon, along with transformer and substation upgrades at Breckenridge. Some of this was needed anyway, but not the Breckenridge project. Total cost of these various projects comes in at $28 million.

Here's a new acronym that you will see often: NPA (non-pipeline alternatives)

Electrification is just one of what geeks who track Colorado's big pivot in energy called NPAs, or non-pipeline alternatives. Xcel says it is the largest portfolio of NPA solutions that it is aware of in the United States.

"The company approached the issue from multiple angles," says Grace Jones, the

company's manager of gas strategic planning, in a PUC filing.

Under this hybrid approach, Xcel also sees a installing long-term modular liquified natural gas at Breckenridge and compressed natural gas at Keystone as alternatives to traditional gas infrastructure.

It calculates the total cost at $155 million for the 33,500 customers. It is not clear, however, what the cost of installing natural gas infrastructure in a business-as-usual case would be.

Xcel estimates 150% fewer greenhouse gas emissions for this proposal compared to just installing more natural gas infrastructure.

The most immediate problem is that the number of customers in Eagle, Grand, Lake, and Summit counties grew 8% from 2019 through 2023. Xcel expects this 1.7% annual growth to continue until at least 2033.

But a related problem is as demand for natural gas dwindles, insufficient pressure at the tail end of the natural gas system can prove inadequate to needs of some customers.

As this Mountain Energy project illustrates, the transition away from natural gas in Colorado won't be solved easily. To comply with several state laws of the last few years, Xcel — with 1.5 million gas customers and 1.7 million electric customers, by far the most of any utility in Colorado — is trying to figure out how to comply with the state's goals while still making money. In places where it provides both gas and electricity, that is far easier than in those places where it provides one or the other but not both.

One element is the law requiring gas utilities to gradually reduce their emissions through what is called clean-heat planning. Xcel was the first, although it is now being followed by Black Hills, Atmos, and Colorado Natural Gas.

Some programs, however, were specifically designed for Xcel. And this proposed solution, if provoked by a problem might be a solution in other parts of Colorado, says Robert Kenney, president of Xcel Energy Colorado.

"The main idea of a non-pipeline alternative portfolio is straightforward – instead of expanding and upgrading traditional natural gas pipeline systems, we will invest in alternative projects to avoid or defer investment in natural gas infrastructure, while fulfilling our obligation to serve new and existing customers as communities grow," he said in a press release.

Kenney pointed to a number of other tools proposed in the Mountain Energy Project that will enhance reliability and affordability while supporting communities and customers' desire for carbon-free energy.

In the announcement, Kenney went on to say that the Mountain Energy Project, if approved, "will provide valuable insight into how to effectively plan to achieve emissions reductions on the larger natural gas system serving our 1.5 million natural gas customers statewide.".

Representatives of two environmental advocacy groups deeply grounded in Colorado's energy transition expressed cautious support.

"We look forward to reviewing the project in detail and making the most of this opportunity," said Mike Henchen, a principal at RMI.

Justin Brant, from the Southwest Energy Efficiency Project, also expressed guarded support pending an examination of all the details. "Non-pipeline alternative projects will be essential to meeting the state's greenhouse gas emissions targets and reducing energy costs for Coloradans, while also improving public health and saving customers money," he said.

Xcel expects a decision from the PUC by the end of 2025.

Colorado in 2024: fourth warmest year on record

by Allen Best

It was another warm year in Colorado, part of a theme. Russ Schumacher, the state climatologist, reports 2024 was the 4th warmest on record, 3 degrees warmer than the 20th century average when temperatures across the state were averaged for the year.

Eight of the 10 warmest years in Colorado's recorded history have been since 2012.

From his base in Akron, 115 miles northeast of Denver, Joel Schneekloth observed temperatures that fit in with this trend.

"We really had warm days but even warmer nights," reported Schneekloth, who is a regional water specialist with the Colorado Water Institute. "But we didn't have a string of 100 degree days like we had in 2012 and 2002.We had 100 just once or twice this year."

To be clear, it can still get cold in Colorado. This is not quite up to Lake Wobegon standards, where all the children are above average. But all the action has been on the high side of the thermometer — or on the lack of cold. That was particularly true in December.

The Colorado Climate Center reported 120 new all-time high temperatures along with 25 tied records. Nights, as Schneekloth noted, were also warm. There were 129 records for the high minimum temperature.

On the flip side, it had two all-time cold temperatures.

Notable was the warmth of December. "It was very warm across Colorado, or perhaps more accurately, there was a distinct lack of cold," Schumacher wrote.

"It really was the lack of any real cold in December that led to the record-breaking temperatures for the month," he told Big Pivots.

"Highs in the low 70s aren't especially remarkable in December, but many stations set records for the warmest low temperature for December.

"For example, at Sedgwick, the lowest temperature in December was 11F – the previous warmest low temperature for December was 9F. This is true at numerous stations in northeastern Colorado. Fort Collins only got down to 15 in December. The previous record was 12 Akron only got to 10; the previous record was 8."

At many stations, the second or third warmest low for December was just the previous year (2023), a December with a similar lack of cold.

Precipitation, on the other hand, was above average statewide but not abnormally so, 35th wettest in records across the past 130 years. The story of rain and snow, however, was not uniform. The southern San Luis Valley had its wettest calendar year on record. Lands north of Fort Collins and Greeley, along the Wyoming border, were much drier than average.

records tied and broken

	High Max	Low Max	High Min	Low Min	Precip	Snow
Daily	25/**120**	3/**18**	50/**129**	0/**2**	14/**38**	0/**10**
Monthly	0/**0**	0/**0**	2/**0**	0/**0**	0/**1**	0/**0**
All-time	0/**0**	0/**0**	0/**0**	0/**0**	0/**0**	0/**0**

Tied/**Broken**, from NOAA National Centers for Environmental Information

Colorado says it leads the nation in lessening emissions from oil and gas

by Allen Best

In December, the Colorado Air Quality Control Commission adopted new rules that address greenhouse gas emissions from engines, turbines, and heaters used in the midstream component of oil and gas operations.

The practical effect of the new rule — described by the state as nation-leading – will be largely to replace use of gasoline and oil with use of electricity. United Power and Xcel Energy both submitted letters of support in the review by the commission and can be expected to provide much of the new electricity.

Midstream activities in the oil and gas industry operations include the processing, storing, transporting, and marketing of oil, natural gas, and natural gas liquids. Such mid-stream activities can be found along many county roads in the Wattenberg field between Denver and Greeley. Weld County has the most midstream operations followed by Garfield, Rio Blanco, and then 17 other counties statewide.

Under the new rule, midstream facilities must begin taking steps to reduce gas emissions from combustion fuel equipment by Feb. 14, 2025. They have a 2030 deadline to meet greenhouse gas emissions limits for both the overall sector and for each individual company.

An economic impact analysis conducted for the commission found that 66% of the reduced emissions can be accomplished through electrification of the operations. Another 28% can be achieved through idling and shutting down and adjusting operation of the mid-stream equipment. The remaining 11% will be achieved through retrofits and efficiency improvements.

Brighton-based United Power, the state's largest electrical cooperative in terms of the amount of electrical demand it satisfies, said it supports the rules but cautioned that electrification projects anticipated by the rule will require "careful and lengthy coordination efforts."

United also said the oil and gas sector makes up approximately 40% of its load, i.e. the electrical demand.

Xcel Energy testified in a pre-hearing filing that overall it strongly supports beneficial electrification of the midstream operations while also encouraging sufficient flexibilities.

The Colorado Oil and Gas Association pushed back in a September 2024 filing:

"This rule as drafted is unworkable for the midstream sector of the oil and natural gas industry. For many companies this is not technically or economically feasible, it relies heavily on utility power which is outside of the purview of the regulated entity. It also relies heavily on grid power availability and reliability for compliance, which may in some instances be currently unknown or uncertain. For many companies shutting down facilities may be the only option to comply with the rule, this results in revenue lost, stranded assets and a disruption in gas delivery in many parts of the State."

After the two-day hearing, an announcement by the Colorado Department of Public Health heralded the rule as first of its kind in the nation.

"Colorado is proud to take this bold, nation-leading step to address climate change and reduce air pollution," said Michael Ogletree, director of the air pollution division, in a prepared statement issued in December.

"This new rule is another milestone in Colorado's ambitious goal of achieving net-zero emission by 2050. We are especially proud that it prioritizes protections for communities disproportionately impacted by pollution."

The rule requires midstream facilities that operate in disproportionately impacted communities to prioritize reductions of onsite greenhouse gas emissions.

Starting in 2025, the air quality division will publish an annual report on midstream emission to track the state's progress toward the 2030 reduction goal.

For more information, visit the division's web page on the rulemaking.

EVs and plug-in hybrids constitute 31.5% of all new-car sales during Q4

During the fourth quarter of 2024, electric vehicles and plug-in hybrids constituted 31.5% of all new car sales in Colorado, according to the Colorado Automobile Dealers Association.

As of mid-January, according to Atlas Public Policy, Colorado had 169,117 EVs and plug-in hybrids on the road. Colorado has a goal of 940,000 EVS by 2030.

Pueblo gets $11.5 million for 260 EV charging ports

Pueblo is getting $11.5 million in federal grants for installation of 260 EV charging ports near low- and moderate-income neighborhoods.

Pueblo has plenty of low- and moderate-income neighborhoods. It also has a new city administration that in December requested that the city scrap the resolution adopted in 2017 that called for 100% renewable energy by 2035. The ostensible reason given by the mayor was a dislike of the EV fleet for vehicles.

The grant was among 11 announced by the U.S. Department of Transportation totaling $112 million. The money is coming from the Bipartisan Infrastructure Law.

Denver, Greeley, and Commerce City are also getting transportation grants. The single biggest grant will go to southeastern Colorado, where 12 individual passing lanes are to be created between Pueblo and the Kansas state lane. Total aid: $40 million.

The Roaring Fork Transportation Authority is to get a little over $1 million to help create a new alignment for the VelociRFTA Bus Rapid Transit lane through Glenwood Springs to I-70.

See the full list of grants here.

Colorado will need up to $8.7 billion in transmission during the next 20 years

by Allen Best

A new study identifies a minimum $4.5 billion in necessary transmission investment in the next 10 to 20 years in Colorado. Beyond that?

There's some guesswork involved, but another $4.2 billion might also be needed as Colorado stretches to eliminate emissions associated with its electricity even as demand surges from data centers, buildings and vehicle electrification. Plus, there's continued population growth and economic expansion.

The study was commissioned by the Colorado Electric Transmission Authority, an independent political subdivision of the state created by state legislators in 2022. They endowed CETA with crucial powers to build transmission that individual utilities might not build themselves but which could be important to achieve the state's goals.

> Where will CETA use its unusual revenue-bond authority? That is yet to be decided.

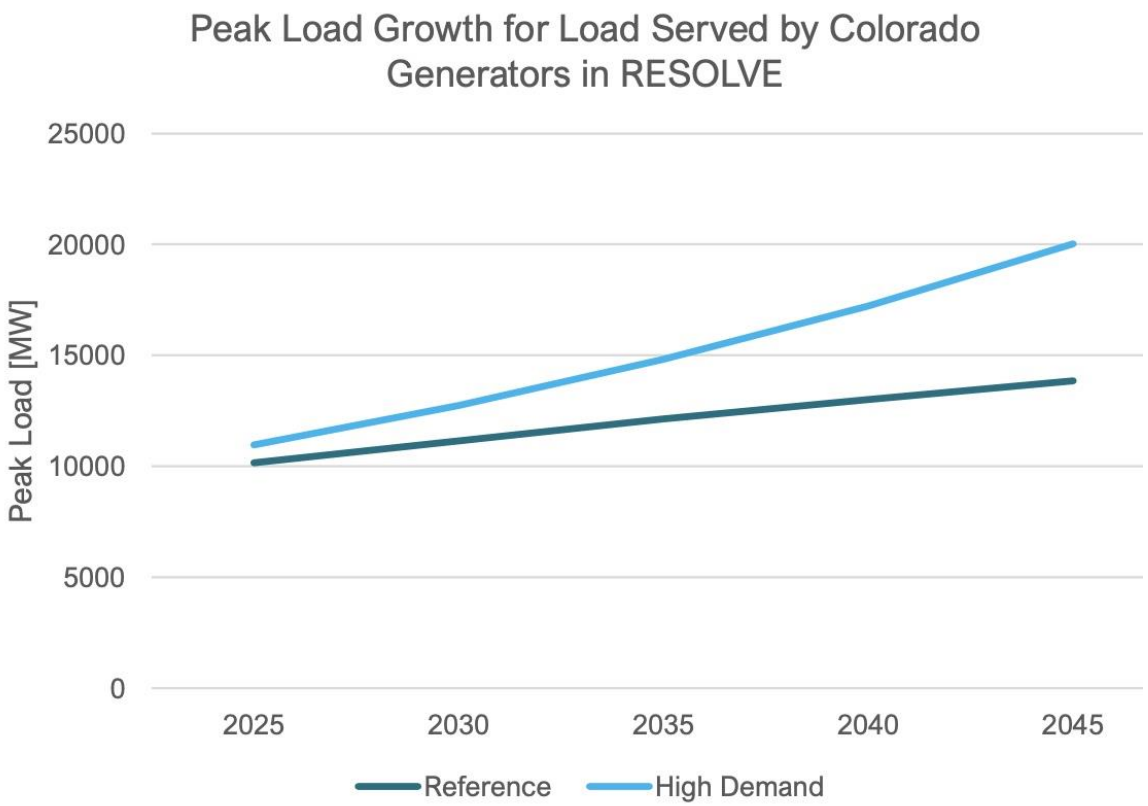
CETA can issue low-interest revenue bonds. This can be done for projects in which CETA has partners. Such bonds would ultimately lower costs to consumers.

Where will CETA use that power to best advantage for Colorado? CETA hopes to identify three to five candidate projects by the end of 2025 or early 2026, according to Maury Galbraith, the chief executive. He told Big Pivots that CETA is probably a year or two away from doing detailed studies.

First, however, CETA directors need to select guidelines for evaluating which projects to choose. That will require additional legal and financial expertise that will cost more than what is available from the state's $500,000 annual appropriation. Galbraith says he hopes to secure a federal grant or perhaps tap private philanthropy to move the planning forward rapidly. Otherwise, this next step may take a couple of years.

As for this new study, it was ordered by legislators in 2023. Kathleen Staks, the chair of the CETA board of directors, told the combined House and Senate energy committees on Jan. 16 that the law, SB23-016, required the study to address whether and how the expanded capacity will support the forecasted demand for electricity in

20-Year Colorado Demand Forecast



Colorado, reduce emissions, and improve access to organized wholesale markets.

Keegan Moyer, the principle of Energy Strategies, the consultant hired to do the year-long study that was conducted in 2024, further simplified the mission to one of identifying long-term gaps in the state's transmission needs.

Utilities already have much new transmission underway or planned for the next decade. Most prominently, Xcel expects to wrap up its new 550-mile semi-loop around eastern Colorado, called the Colorado Power Pathway, by 2027. It is protected to comes in at a cost of $1.7 to $2 billion. Xcel and other utilities have proposals for other lines.

The study found lesser problem areas looking out to 2035 that need to be addressed. Those problem areas are in the San Luis Valley, southeastern Colorado, and northeastern Colorado.

The study's greater value was looking out 20 years. The consultants created two projections of peak demand for electricity to 2045. The lower-demand forecast, called business as usual, forecasts that peak electrical demand, which is now 10 gigawatts, will grow to 14 gigawatts. On the high end, peak demand could double to 20 gigawatts.

Demand growth represents a "significant uncertainty when it comes to grid planning," Moyer told legislators. And where new generation will be placed is another significant uncertainty, he said.

Galbraith, in an interview with Big Pivots prior to the legislative hearing, said the most likely growth in demand will lie somewhere between these extremes.

In this longer time horizon, inefficiencies of the existing system grow, requiring more investment.

Moyer told legislators that 80% of needs on line miles could be addressed on existing transmission corridors, by repurposing and upgrading capacity with aid of new technology.

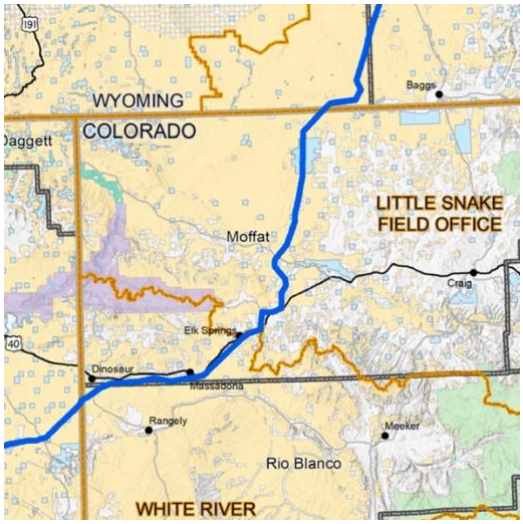
That will still leave about 550 miles of new "greenfield" transmission lines in Colorado by 2045. For reference, driving from Raton Pass at the New Mexico border to the Wyoming border north of Fort Collins is about 300 miles. For those who travel I-70 across Colorado, it's 450 miles.

The study is focused on Colorado but does consider the possibility of transmission connections beyond the state borders.

Colorado has struggled for much of the last 20 years to create cohesive transmission planning. Some of those involved still speak about the efforts with exasperation.

Galbraith said this represents the first statewide study to examine total needs of all utilities. In its 20-year time horizon, it also looks further into the future than anything previously. And third, it provides a different approach to a traditional chicken-and-egg problem in transmission studies, namely which comes first, the generation or the transmission planning.

"We had Energy Strategies focus on what new generation capacity would be needed over the next 20 years and really detail it down to the substation level," Galbraith said. The strategy used in the



The Gateway South transmission line would snake its way across northwest Colorado.

study, he added, represents a "plausible generation buildout in the state."

Transmission often takes long planning horizons. The general figure used is 10 years. Xcel's Colorado Power Pathway will come in below that. It was proposed in 2021 and will be completed in 2027, according to Xcel's current projections.

The Anschutz Company's TransWest Express transmission line to export wind-generated electricity from southern Wyoming, in contrast, took 17 years from first conception to beginning of construction. It's a much more involved affair, though. The 600-kV direct-current line is to stretch 728 miles from its origin near Rawlins, Wyo., to markets in the Phoenix, Las Vegas and Los Angeles areas. It will nick the northwest corner of Colorado

Gateway South, a 416-mile transmission line also being built to deliver wind power from Wyoming to more westerly markets, will also cross northwest Colorado, as shown in the map above.

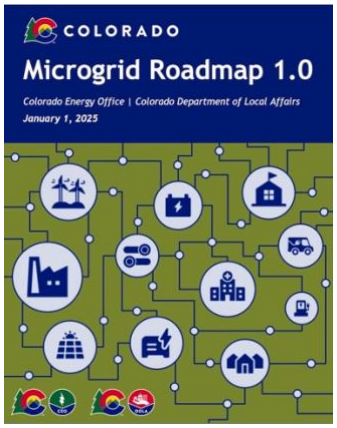
Might CETA use its authority to deliver a link into that network? Yes, said Galbraith, it is a candidate, possibly among the short list of potential projects defined by CETA by the end of July.

Microgrid Roadmap finished as ordered by legislators in ‘22

by Allen Best

Aspen and Antonito have little in common other than they are both in Colorado’s mountains — and both are likely to be impacted by the warming, more erratic climate.

Aspen, of course, has dozens of billionaires. Over the holidays, Jeff Bezos was reportedly on the verge of a private marriage to Lauren Sanchez with a $600 million extravagance. The potential marriage and its excesses were covered around the world, including by the Times of India. As for the marriage? It seems not to have happened.



Antonito? It’s located a few miles from New Mexico in the San Luis Valley. It has no resident or part-time billionaires.

They may share an interest in microgrids. Aspen certainly does. The town nearly lost power as a result of the Lake Christine Wildfire in 2018. Since then, Holy Cross Energy has been working on a microgrid — although the first one is likely to be too small for more than the barest of critical functions.

See: Microgrids and electric cul-de-sacs, Big Pivots, Aug. 19, 2024.

State legislators in 2022 ordered that state agencies create a roadmap for what local utilities and others need to be thinking about. That report, the Microgrid Roadmap, was released in late December.

The roadmap defines and evaluates different types of microgrids, criteria to identify priority projects, and recommends key policies to facilitate microgrid deployment in Colorado.

Will Toor, executive director of the Colorado Energy Office, describes microgrids as a useful tool for helping achieve Colorado’s climate-induced energy transition goals.

“Reliable access to clean electricity is a must as communities electrify buildings and cars. This roadmap offers a long-term strategy for the role of microgrids in supporting energy resilience across Colorado (and) helping Coloradans, especially in rural and underserved areas, keep their lights on, vehicles, charged, and homes warm.”

The roadmap identifies a broad swath of southern Colorado from Las Animas, along the Arkansas River, to Cortez, as being more vulnerable to power outages, including longer-duration events, or greater vulnerability to community members.

Several other areas — Lake and Grand counties in the central mountains, and Mesa County and two counties of northwestern Colorado – are similarly vulnerable, based on the same criteria.

The roadmap also reports strategies for addressing costs, interconnection standards, and legal considerations, which are among the main challenges for implementation of microgrids in Colorado.

Microgrids exchange power with a traditional utility grid while also receiving power from local electricity sources. They can be fueled with fossil fuels – and indeed, most of them that now exist do have oil-fueled generators. They are commonly associated with hospitals.

Colorado, of course, wants to create microgrids using renewable energy.

Using state and federal grid resilience funding,state Department of Local Affairs

offers the Microgrids for Community Resilience Grant program to support microgrid planning and implementation. To date, DOLA has funded 25 planning and construction projects, totaling about $17.7 million (including local match) to ensure local energy resilience.

United Power, serving 113,000 members on metropolitan Denver's northern side, mentions in its roadmap the need to embrace microgrids as part of a more decentralized electrical grid.

"This grid modernization also ensures increased resiliency through the integration of hyper-local energy generation, microgrids and adaptive measures."

Threat of wildfire cited in announcement of three microgrids in northern New Mexico

In New Mexico, Kit Carson Electric has announced plans for investment of $23 million in three new microgrids in its service territory around Taos.

Luis Reyes. the chief executive, cited the risk of wildlife.

"The lack of precipitation and unforeseen extreme weather events in our service area leave our members vulnerable to serious wildfire threats," he said.

"Should we face broad power grid outages caused by extreme events, we will be able to tap into these new microgrid locally stored power resources."

In case of power disruptions – such as wildfire effectively shutting down transmission, the stored electricity in the batteries can be tapped to serve critical demands for up to 5.5 hours.

All three locations will get lithium-ion batteries:

• Taos Ski Valley, with a capacity of 18 megawatt hours.

• Penasco, with 13.5 megawatt-hours; and

• El Rio West, with 6.75 megawatt-hours.

Of the $23 million, $14.5 is coming from the Department of Energy and $7.7 from cost-sharing as part of a broad effort to enhance U.S. power grid resilience.

And Kit Carson awarded $231 million for green hydrogen and solar

Kit Carson Electric has been awarded $231 million in New Era funds for its green hydrogen and solar project amid the former molybdenum mining operations at Questa, north of Taos.

Kit Carson plans new solar generation that will be used to create green hydrogen from repurposed wastewater at the mine site. The hydrogen can then be converted to electricity as needed. The project will have a potential of 104 megawatts of energy for 16 hours.

Leaders of Kit Carson heralded the award. Bobby Ortega, the chair of the board of directors, described it as "among the most significant milestones in the coop's history." This grant, he said, "will bring to fruition the first green hydrogen project of this type in the nation done by an electric cooperative."

Luis Reyes Jr., the chief executive, said the project will be a "game-changer for Kit Carson, insuring a reliable power supply even during challenging conditions and allowing first-responders and the community of access to life-saving power during emergencies such as wildfires or extreme natural disasters."

La Plata Electric primes the pump of electrification

Newly installed as the chief executive of La Plata Electric, Chris Hansen has dived into the carrot bin to incentivize electrification.

The Durango-based electrical cooperative has created or increased three financial incentives, all of them under a new umbrella given the name Resolve to Electrify.

Battery storage rebates up to $3,000

Members can receive up to $2,000 in rebates for home battery systems. An additional $1,000 is available for systems in interconnection limited zones.

State and federal incentives also exist. The federal government allows tax credits of up to 30% of the cost of a battery system. Colorado also offers a tax credit.

Home battery energy storage systems costs vary based on capacity and brand. Installation often is an added cost.

La Plata says that 10 to 20 kWh batteries range in cost from $10,000 installed while those exceeding 20 kWh generally cost more than $20,000 installed.

"Our rebate program is designed to help offset upfront costs by approximately 10%, although the exact savings depend on the specific brand and the associated installation costs."

Energy storage can save a homeowner or business operator money over time because the energy that is stored typically will be at lower cost. It can avert the need to use electricity on the ground during times of high demand, such as hot summer evenings.

EV rebates up to $500

La Plata has increased the rebate for installation of Level 2 home chargers, formerly $125, to $500.

Through the cooperative's time-of-use rate programs, members can reduce their costs of charging the car or truck by shifting use to lower-rate periods. This also helps reduce strain on the grid – and makes it easier to integrate renewable energy at higher levels. Hansen has said he believes La Plata can achieve 97% renewable generation by 2035.

All-electric buildings

La Plata has expanded its rebates for members transiting to all-electric heating and cooling, including water heating and appliances.

Members building all-electric homes or completing a full electric remodel conversion can receive a $500 bonus. This is on top of existing rebates for heat pumps, electric heat-pump water heaters, induction cooktops, smart thermostats, and more.

"This is a true example of community power in action," said Hansen in the announcement. "As a cooperative, we're all in this together. By working collectively, we can reduce energy costs and accelerate the adoption of innovative energy technologies. Every member's participation strengthened our community and moves us closer to a sustainable, resilient energy future."

Fewer panels but more juice with Spanish Peaks in the distance

by Allen Best

Tri-State Generation and Transmission Association continues its investment in solar generation, in part because of dramatically more enticing economics since its first major installation in 2010.

The latest installation, the 140-megawatt Spanish Peaks Solar, lies in southern Colorado, northeast of Trinidad, and has a handsome view of the namesake twin peaks in the Sangre de Cristo Range. They are also known as Huajatolla, the name assigned by the Comanche who once inhabited that area.

The new Spanish Peaks solar project began commercial operations the day after Christmas 2024.

Deriva Energy developed the project after acquiring it from JUWI Inc. in 2024. This is Deriva Energy's sixth utility-scale renewable project in Colorado.

Tri-State is adding 595 megawatts of solar resources during 2024 and 2025. It is also adding solar capacity at Axial Basin, at the site of the ColoWyo Mine between Craig and Meeker, and another solar project in Dolores County. Both will be owned directly by Tri-State, a first, instead of the generation being secured through power-purchase agreements.

This newest project has been supported by the federal government's $2.5 billion award in low-cost financing to Tri-State through the New ERA (Empowering Rural America) program. The funding has 18 components, this being just one.

Tri-State, once heavily invested in coal, closed its lone coal plant in New Mexico in

2019 and plans to be gone from coal in Colorado by 2028.

Tri-State expects to be at 50% renewable energy by late 2025, according to Duane Highley, the chief executive.

One measure of the improved economics of solar can be found in two projects in New Mexico developed for Tri-State. The first project, Cimarron, was commissioned in 2010 and required 500,000 panels for 30 megawatts of capacity. A solar installation of 200 megawatts at Escalante, the former coal plant, used the same number of solar panels, according to Lee Boughey, the vice president of communications at Tri-State.

Construction of these solar projects seems to have not suffered inordinately from supply chain problems, said Boughey. He said Tri-State is not immune to cost and availability pressure. "It is constantly part of our planning," he said.

New transmission line

Tri-State also expects completion of its 230-kilovolt transmission line in eastern Colorado between Burlington and Lamar in January. Construction started in February 2024.

Coupled with other upgrades, the new line will accommodate more than 700 megawatts of potential new generating capacity.

It will also improve reliability in the Lamar area and reduce or eliminate generation curtailment, especially around Tri-State's Burlington and Lamar substations.

Duane Highley: Move as fast as you can

Supply chains are lengthening, said Duane Highley, chief executive of Tri-State Generation and Transmission Association.

A gas turbine order now might not be delivered until 2030 or 2031, he said.

"We're going to need some gas in the mix to make it all happen even as we build massive amounts of renewables. So I'd say just move as fast as you can."

A virtual gathering of utility executives, journalists and others on Jan. 15 was focused on resource adequacy. It was organized by the U.S. Energy Association.

Would the utilities favor an executive order by the new president ordering that remaining coal plants be kept in service?

No, said Highley. It's a matter of cost.

"You can't afford to continue to run a plant that's built for base loads when it's running in more of a peaking mode. So, in some instances, we would still seek a plant retirement. We wouldn't really welcome an executive order saying you can't retire it if it is an economic issue for our members."

Highley also mentioned the coming cold weather in Colorado and other states where its member cooperatives are located. During Winter Storm Uri during four mostly windless days in February 2021, Tri-State resorted to burning oil.

Tri-State will be at 50% renewables by the end of 2025, he said, and 89% decarbonization in its Colorado operations by 2030.

"As we rely more and more on intermittent resources, we have to make sure that we're not counting on them during extreme weather. So we have to make sure we keep other dispatchable resources in the mix," he said.

"We're politically agnostic. No, wind and solar aren't Democrat or Republican, and fossil fuels aren't Republican or Democrat. It's all about reliability and affordability."

Highley also mentioned the need for demand response.

"While we're building the steel on the ground as fast as we can and securitizing that, making sure we have reliable generation is a big part of the answer and is also making sure that we've exhausted our opportunities for demand response," he said.

"There's a lot of opportunity to create a virtual power plant, working with our customers, those that have controllable loads, and aggregating those, taking them to markets on an aggregate basis, and using that to mitigate not only high prices, but also to provide critical capacity at peak times."

United Power says it leads as a distributed system operator

United Power, Colorado's largest electrical cooperative in terms of the electricity it distributes, made its break from Tri-State G&T on May 1, 2024. It seems to be on its feet with no reason to look over its shoulder.

But where is United going?

Hyper-localization was the phrase introduced in 2024 by its chief executive, Mark Gabriel, as the cooperative put into operation several major battery storage installations in its service territory on the northern side of metropolitan Denver.

That hyper-localization can also be understood in terms of the 12,600 roof-top solar installations among its 113,000 members.

In its annual report issued in early January, United also discussed the concept of a distribution system operator (DSO). If perhaps elementary to some readers of Big Pivots, to others it might be a nice explanation of where we've been and where we're headed as we try to reinvent electricity – and all of energy, for that matter.

United Power's service territory includes much of the Wattenberg oil and gas field, the principal reason that Colorado ranks fourth in oil and eighth in natural gas extraction among the 50 states. Many energy-requiring tasks in this place of energy production, however, are being converted to electricity.

Here is how United explained what it described as an industry-leading effort:

"The flow of energy only used to move in one direction, but this model is quickly changing. Technology, like EVs and distributed generation such as solar photovoltaic systems and batteries, are changing the way cooperative members use electricity and interact with the local grid.

"United Power has developed a DSO Action Plan to ensure it can deliver a reliable and efficient flow of electricity within its distribution network by maintaining critical infrastructure, such as substations, transformers, and power lines to ensure safety and reliability, and managing the integration of DERs (distributed energy resources), like solar panels and battery storage, while facilitating connections for new members and opportunities for independent energy generators.

"The DSO model also drives grid modernization by analyzing data from smart devices and sensors to enable a smarter, more flexible system to support technologies like EVs and demand response tools. This grid modernization also ensures increased resiliency through the integration

A coal-seam fire has been burning underneath Marshall Mesa, in southern Boulder County, for about a century. No evidence of it in this photo from late December.

of hyper-local energy generation, microgrids, and other adaptive measures.

"Essentially, the transition to a DSO will ensure that United Power members, who are increasingly becoming both consumers and producers of energy, have a reliable electrical distribution network that maximizes the transfer and use of electricity from DERs to their homes, businesses, and industries."

Ah, and to think that just a decade ago, the world of electrical cooperatives seemed to be a backwater. Now, the electrical cooperatives may be providing the most interesting innovations in Colorado.

Easier to get EV chargers in multifamily housing

Colorado it now allowing for property developers, managers and contractors seeking state grants to install EV charging stations to apply once for multiple locations.

The applications are due no later than Feb. 14. Eligible projects include multifamily housing, work places, tourist destinations and community charging. The standard grants are for up to $250,000, with up to six level-2 charging ports per application. More information here.