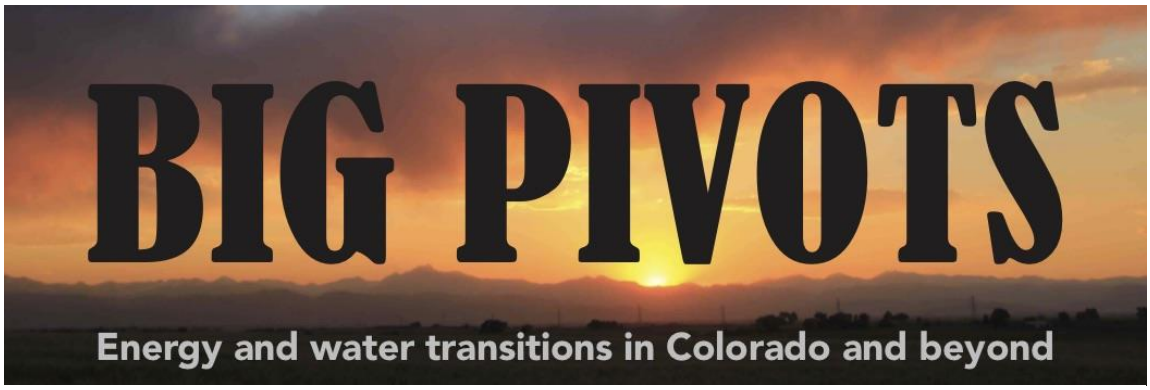


Issue No. 12 June 8, 2020
https://mountaintownnews.net

Windy enough in Dust Bowl land, but no place for the power to go

by Allen Best

In Walsh, a town of 500 people in southeastern Colorado, eagles are the mascot for the high school's six-man football team. That's appropriate. This is a land of wind, strong and steady. Wind an eagle might like.

And wind that could generate massive amounts of electricity—if only high-voltage transmission existed that could convey it to demand centers along the Front Range and other locations across Colorado.

Fred Hefley has been waiting for a long time for those transmission lines to arrive. He and his wife, Kay Lynn, live in Walsh.

The Hefleys grow corn irrigated with water from the underlying Ogallala aquifer and dryland sorghum and wheat on their 6,000 acres southeast of Walsh. From their farm it's a short drive to Kansas. It's not much farther to Oklahoma, crossing one branch of the Santa Fe Trail, the most direct branch, along the way.

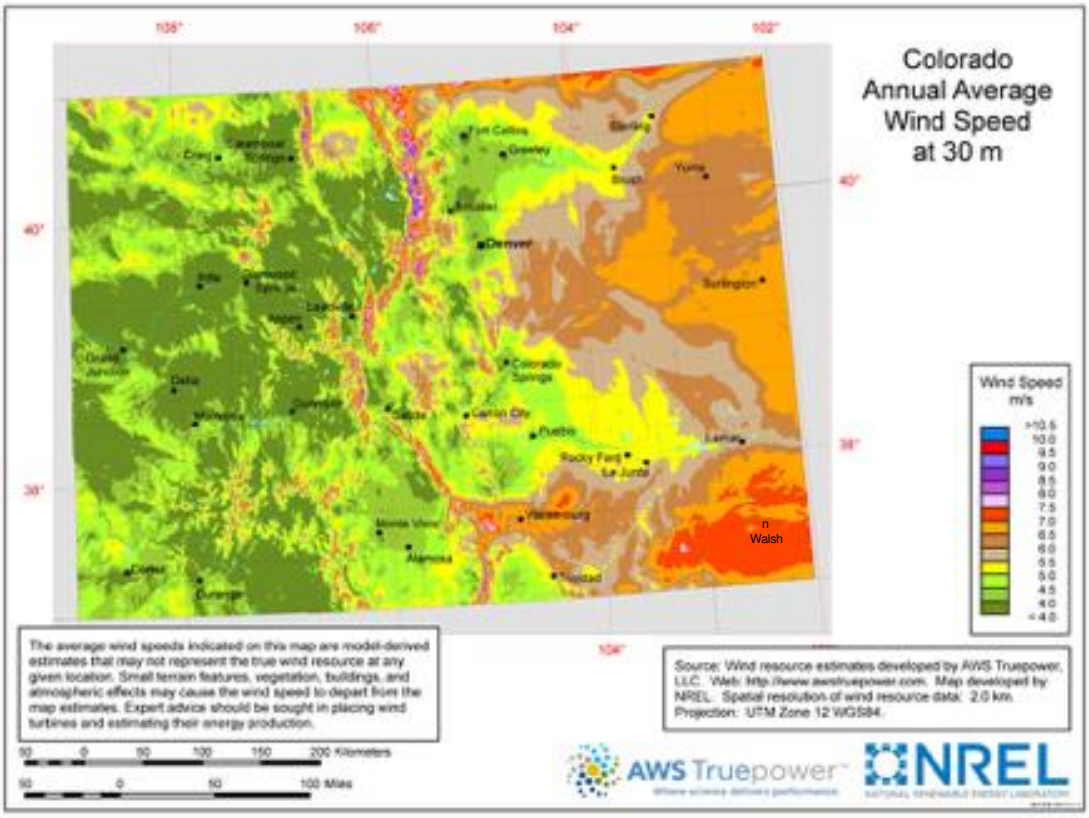
The most direct route from Walsh to Denver is four and a half hours by U.S. 287. It's a highway busy with trucks ferrying freight from the port at Houston to the nation's midsection. The Hefleys and many of their neighbors in Baca County would also like to ship electrons to Denver.

Colorado Green got the Hefleys and their neighbors excited. The wind farm, Colorado's first, was the nation's fifth largest when production from the 108 turbines began in 2003. It's located halfway between Springfield and Lamar. Wind developers were also checking out Baca County. Iberdrola, one of the companies, put up five towers, to test the steadiness and velocity of the wind. Hefley says representatives ranked the wind resource as second best in the country.

A major wind developer leased 42,000 acres of farms and pastures.

Maps from the National Renewable Energy Laboratory show Colorado's southeastern corner as a blob of red for annual average wind speeds at 30 meters. At 80 meters above ground, the blob broadens, and turns purple.

Nate Blair, manager of the distribution system and storage analysis group at NREL, used a tool called wind prospector to examine the wind potential for Baca County. Crunching the numbers using several common-sense assumptions, he came up with 15 gigawatts of potential wind from Baca County.



"Now, much of that might not be able to be built based on towns, roads, private land ownership, etc., so a smaller number is more viable," he told Big Pivots by e-mail.

The 15 gigawatts of potential in Baca County compares with Colorado's total summer 16,017 megawatts generating capacity as of 2017 from all of its coal plants, gas plants, wind farms, and other energy sources. That's 16.017 gigawatts. In other words, wind-generated electricity from Baca County alone nearly could equal the current annual peak demand in Colorado.

But it's a renewable energy stranded by absence of transmission. The developer who had leased the 42,000 acres let the agreements lapse in 2012.

Now, there's renewed hope in Baca County. A wind developer is poking around again. There's talk about a larger capacity 345-kilowatt line between Lamar and Burlington, along the state's eastern edge. And in the background of all utility planning are the targets identified by a 2019 Colorado law for decarbonization of the state's economy, first 50% by 2030 and then 90% by mid-century. As Colorado drives toward those long-reach goals, it must develop far more renewable energy. It's not enough to replace retiring coal plants. New appetites for electricity will be created by electrification of transportation and replacement of natural gas in heating of buildings.

That would seem to put the state's best wind resources in one of its least populated sections within closer reach of urban markets.

Until last week, there was also a proposed law that sought to nudge utilities into building transmission into renewables-rich zones of Colorado.

SB 20-190 proposed to make Colorado's carbon reduction goals the center of transmission planning by directing the

The grocery store in Walsh. ***Photo/Allen Best***

Colorado Public Utilities Commission to approve utilities' applications to build new transmission if the PUC found the new facilities would assist the utilities in meeting the clean energy goals.

"This is trying to solve the chicken-and-egg problem of transmission that has plagued Colorado for years," says Mark Detsky, an attorney for the Colorado Independent Energy Association, in an interview in March, soon after the bill had been introduced.

"Baca County is the poster child for having amazing wind resources but no transmission," adds Detsky. "The idea (of the law) is that this would allow the best bids, the best projects to drive transmission decisions."

Just how much more electricity will be needed remains unclear. Black Hills Energy, Tri-State Generation and Transmission, and Xcel Energy all must submit plans that estimate generation needs as electrification use grows for transportation and for heating of buildings.

Xcel Energy supplies more than 60% of electricity in Colorado, followed by Tri-State and Black Hills. Municipal providers such as Platte River Power Authority and Colorado Springs Utilities are exempt from regulation.

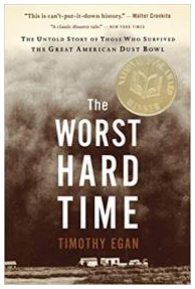
Without mentioning Baca County, the bill proposed to shift "the state away from inefficient, radial transmission development" to one that interconnects renewable resources. Existing transmission generally radiates from fossil fuel plants.

To this end, SB 20-190 would have required the PUC to "complete a review of existing and potential additional energy resource zones for renewable resources

generation development areas within Colorado." It proposed to also give the PUC authority to merge the planning by different utilities, to couple transmission planning with resource planning in a more wholistic fashion.

One possible result: more dense concentrations of development of renewables, say 500 megawatts of new wind and solar generation in one broad cluster enabled by new transmission as opposed to, say five clusters of 100 megawatts across eastern Colorado.

Wind was Baca County's curse in the 1930s. It was within the epicenter of the Dust Bowl. When Timothy Egan came through Denver in early 2007 to promote his book "The Worst Hard Time," he told me that southeastern Colorado provided him among his best material.



Hefley moved to Walsh in 1971 after graduating from high school in Texas. The community by then had recovered from the Dust Bowl and even boomed growing broom corn. It had two cafes and an 11-boy football team. It was, relatively speaking, thriving.

Enrollment at Walsh High School has declined since then. Seven boys turned out for the 6-man football team last fall. Farm sizes have grown in the last 50 years, and mechanization requires fewer people. The cafes have closed, and the grocery store was saved by creation of a community cooperative. There's still a liquor store, too. Like many of the small towns in the nation's mid-section, Walsh has been hollowing out.

Wind and solar development offer some potential for new vigor. Property taxes on wind and solar farms could augment income benefiting school districts and rural hospitals. Landowners get lease payments. A non-profit, Baca Green Energy, was formed in 2003, and at one time it had 30 members. Only one of the landowners polled didn't want to see turbines.

Baca County faces many challenges to economic development of its wind and solar resources posed by its location.

Hefley identifies another problem. Tri-State Generation and Transmission, which provides power to the local electrical cooperative in Baca County that powers his center-pivot sprinklers, was slow to develop renewable generation. Instead, it was content to keep operating its coal plants, especially at Craig, at the opposite corner of the state.

"They owned coal mines," says Hefley. "They weren't too excited about wind energy in southeastern Colorado."

Tri-State, however, has shifted course, pulled by the low prices of renewables and pushed by legislative mandates in Colorado and New Mexico. Even before that switch, though, it had been studying new transmission to relieve reliability and congestion issues in eastern Colorado. The first iteration was a conceptual line, 225-kilovolts in capacity, from Lamar to the Front Range.

"While not designed specifically to accommodate substantial amounts of new generation, it was expected to allow for some," reports Mark Stutz, a spokesman for Tri-State.

Tri-State cancelled that idea in late May. A key reason, said Stutz, was Colorado's new carbon reduction goals. A bigger line would accommodate likely addition of new renewable sources from Eastern Colorado as necessary to accommodate the state-mandated decarbonization goals.

"In light of the recent legislation on greenhouse gas emissions, it is clear that this project may not be adequate to meet the now substantial injection needs in eastern Colorado," he explained.

Tri-State now has started looking into a 345-kV transmission line from Lamar to the Burlington area, where it is building a major wind farm at Cheyenne Ridge. The planning

Erection of wind towers at Colorado Green, located between Lamar and Springfield, motivated Fred Hefley and his wife, Kay Lynn, in developing wind potential in Baca County. ***Photo/Allen Best***

remains contingent upon the plans for the rest of the system surrounding Lamar-Burlington, says Stutz.

Future efforts to develop wind projects in Baca County will be under the umbrella of this current study.

In March, soon after he introduced SB20-190, State Sen. Chris Hansen, D-Denver, described the bill as one that would solve a number of chicken-and-egg problems around Colorado. It would, he said, open up several billion dollars' worth of investment opportunity for developers of renewable energy.

Detsky, the attorney who helped shape the bill, said resource-rich but transmission-poor areas can be found across southern Colorado, including the San Luis Valley, and on the Western Slope, too.

Colorado tried to solve the same problem in 2007. A law passed that year, SB 100, also required utilities to identify "energy resource" zones, but for many reasons the law has failed to stimulate development of the best resources, said Detsky.

Hansen's bill delivered pressure for development of transmissions to renewable integration in southeastern Colorado and elsewhere.

The bill he introduced in March also had broader ambitions yet, as reflected in its subtitle: "Concerning Incentives for the Development of an Electric Grid that Fully Accommodates Increased Production from Zero-Carbon Generation Resources."

To this end, Hansen's bill sought to push Colorado's utilities into participating or forming a regional transmission organization, or RTO, as exists elsewhere in the country. Colorado utilities are just now forming energy imbalance markets. Those markets might be likened to bicycles as compared to the auto of an RTO in terms of their power. Many have said that an RTO will be crucial for the deep decarbonization goals. But an RTO would reduce the autonomy of the individual utilities.

The result could have benefited utilities across Colorado, including those on the Western Slope, which have plentiful sunshine but not so much wind.

More broadly yet, Hansen's bill set out to help begin laying out the electrical grid of the future. The grid that evolved in the 20th century was built around centralized generation from coal-fired power plants. This new grid will look somewhat different. But on June 3, Hansen told members of a Senate committee that he had been unable to achieve agreement on key provisions and asked that the bill be postponed indefinitely. It's dead for this covid-disrupted session.

Later, in an interview, he explained that both Xcel Energy and electrical workers had opposed it. The latter, he said, he believes mistakenly concluded the bill would cause transmission jobs to suffer. As for Xcel, he said he believed that the utility wanted to preserve its monopoly in creating transmission within its service territory.

In a statement, Xcel confirmed that it had opposed the bill. The company said the bill would have impacted how it reached its goals of reducing carbon emissions from its power supply 80% by 2030 as compared to 2005 levels.

"As drafted, the proposal would have added unnecessary costs to our customers at a time when many of our customers are suffering financially due to the COVID-19 pandemic as well as reduced the opportunity for labor to be completed by in-state trades and businesses," the statement said.

Xcel also said Hansen's bill "would have created a burdensome, expensive process that would have slowed the development to transmission that is critical to achieving Colorado's carbon reduction goal." The utility said sweeping reform of laws governing transmission development "at this time is unwarranted."

Hansen said he intends to return with the basic idea of reforming transmission development in Colorado in January. He had hoped to pass it this year, to influence the generation and transmission planning by Xcel, Tri-State, and Black Hills Energy, but development of those electric resource plans takes several years. He believes it can still have value next year.

Meanwhile, in Walsh, the Hefleys await rain for their wheat in yet another drought cycle. Unless it rains, they may have little wheat to deliver to market. Most assuredly, they have no electrons to sell.

Wind in Colorado & several nearby states

Installed wind capacity	**MW**
Colorado	3,762
Wyoming	1,589
New Mexico	1,952
Utah	391
Kansas	6,128
Texas	29,407

State ranking for installed capacity	
Colorado	8th
Wyoming	18th
New Mexico	16th
Utah	27th
Kansas	4th
Texas	1st

Share of in-state energy production	
Colorado	19.2%
Wyoming	9.8%
New Mexico	19.4%
Utah	2.0%
Kansas	41.4%
Texas	15.9%

Equivalent US homes power	
Colorado	1,002,400
Wyoming	370,800
New Mexico	629,400
Utah	74,200
Kansas	1,972,600
Texas	7,745,800

Source: Statistics for 2019, American Wind Energy Association State Facts Sheets

Xcel Energy looks west, and Tri-State looks east – but will the twain ever join?

by Allen Best

Like the Continental Divide that splits Colorado waters into those flowing toward the Atlantic and the Pacific oceans, the state's electrical utilities have decided to go either east or west to take advantage of new or growing energy markets. But will this new seam in energy imbalance markets remain as utilities seek even greater benefits of a regional transmission organization?

The questions percolated in filings submitted by 25 organizations to the Colorado Public Utilities Commission late last year. The comments were a response to a legislative mandate for the commission to study how markets could aid the state in achieving its goals of deeply decarbonizing electrical and other sectors of the economy.

But the ultimate answer of what electricity markets look like in Colorado will also depend upon what lawmakers in California decide. But first some explaining.

Most of the nation's electrical utilities long ago began sharing resources, some nearly a century ago. Colorado utilities and those in Western states more generally have remained fragmented but eventually began to pool resources in the event of supply disruptions.

In 2014, the Public Service Co., a subsidiary of Xcel Energy, Colorado's largest electrical utility, created a joint dispatch agreement with Platte River Power Authority and Black Hills Energy. All three serve primarily the heavily populated Front Range urban corridor. The agreement makes Xcel the balancing authority, aligning supplies with demands.

This story was originally posted on March 23 by Energy News Network.

An energy imbalance market, or EIM, can offer even greater advantages as it draws upon a broader geographic area with diverse resources and 5-minute-ahead scheduling.

In December, Xcel and its partners, now including Colorado Springs Utilities, announced they will join the California Independent System Operator, or CAISO, Western EIM. CAISO began offering those services to utilities beyond California in November 2014 and estimates it has saved its members $861.79 million as of February 2020. When the Colorado utilities join in April 2022, CAISO expects to provide energy imbalance services to meet 77% of demand, also called load, in 14 Western states.

Utilities have also emphasized the importance of enlarged markets in cleaning their power generation. “This is a key component needed to help meet our long-term goal for a non-carbon energy future,” said Jason Frisbie, chief executive of Platte River Power Authority.

While Xcel looks west, Tri-State Generation and Transmission and the Western Area Power Administration have looked east. WAPA delivers hydroelectricity generated by federal dams in the Colorado and Missouri River basins and has an important transmission network. Tri-State serves 18 electric cooperatives in Colorado and 25 more in New Mexico, Wyoming and Nebraska.

In September they announced they would join a new energy imbalance market being assembled by the Southwest Power Pool. The Arkansas-based organization has achieved “incredible integration of wind” into energy supplies of member utilities in the Great Plains, said Paul Suskie, executive vice president of regulatory policy and general counsel, at a recent conference. Its existing operations have been in the Eastern grid, whereas Colorado and other mountain states lie in the Western interconnection.

David J. Hurlbut, author of “Creative Destruction and the Electric Utility of the Future,” said about 5% of the energy on the grid goes to balancing. This sharing also allows the neighboring utilities to find the least-cost resources, typically wind and solar.

“It’s cheaper and easier to integrate higher penetrations of wind but also solar if you do it over a broader geographic area,” he said.

Energy imbalance markets were slower to be formed in the Rocky Mountain states than in other parts of the country because of the abundance of what used to be lower-cost coal, said Steve Beuning, vice president of power supply and programs for Holy Cross Energy, an electrical cooperative that serves the Vail and Aspen areas.

“When you have low costs, the urgency in forming a regional market isn’t quite as great,” Beuning said. “What has changed in the West is that even resources that we used to think of as low cost — for example, coal plants — are now getting beat by the next generation of renewable resources that are

A late-summer thunderstorm gets ready to blast in southeastern Colorado. *Photo/Allen Best*

now available. We are seeing changing generation patterns with the retirement of coal and the need to address the variability of these new resources in a more cost-effective way."

Colorado has dozens of independent municipal utilities and electrical cooperatives that will be woven into these new markets in some way. Holy Cross, for example, gets 9 megawatts of electrical generation from the federal dams, including Glen Canyon. It also buys electricity from Xcel, uses Xcel's transmission lines, and co-owns a coal-fired power plant, Comanche 3, with Xcel and another electrical cooperative.

An informal organization called the Mountain West Transmission Group for several years studied potential market constructs. In 2017, the Southwest Power Pool looked likely. Then Xcel abruptly withdrew in April 2018. Absent the region's biggest utility, further discussions fizzled. Even so, most analysts saw further market integrations in Colorado as inevitable.

Jennifer Gardner, senior staff attorney for Western Resource Advocates, favors a westward-tilt to Colorado because she believes the California-spawned imbalance market will produce lower costs and more rapid decarbonization for Xcel and the other Front Range utilities. But even Tri-State's move is better than no move. "I will be happy to take this bifurcated scenario over the business-as-usual operations," she said.

A Brattle Group study issued in January estimates that Xcel and its partners will realize annual savings of $1.98 million a year by joining the imbalance market to the west. Benefits to the four utilities would grow to $17.34 million a year if all the utilities in Colorado and some adjoining areas were to join that same imbalance market. This is in stark comparison with the $1.62 million in savings if these same utilities — including Tri-State and the Western Area Power Administration — joined the Southwest Power Pool's new imbalance market. Xcel and its partners commissioned the study.

Tri-State is committed to only the Southwest Power Pool's imbalance market for

only three years, by which time it will have made back its investment, said Duane Highley, the chief executive. “Regardless of whether it was the right imbalance market, Tri-State wanted to get something going, and we didn’t see anybody moving forward,” he said in a January interview. If, after three years, the California-created imbalance looks like a better fit, he said, it can do so, as it will by then have made back its investment.

The two imbalance markets will leave what some call a seam across the state. “I would challenge you to find anybody that can say anything good about a market seam,” said Ron Lehr, a former chairman of the Colorado Public Utilities Commission now participating in the Western Grid Group, a group formed to advance the integration of renewables. He cites the challenges of transmission.

“If you were to start fresh, you would have an entirely different grid than what we have. But we have the grid we have, so we have to use it,” Lehr said. He compared transmission across lines owned by various entities to that of wind merchants sailing the Rhine River nearly a millennium ago, extorted along the way repeatedly by medieval barons in castles. Today, the transmission costs are called pancaking, as each utility charges a rate for use of its transmission. The most important transmission for this evolving market will be that of the Western Area Power Administration, he said.

The question facing Colorado is the value of having two different markets. “I would say it’s a negative value,” he says. “It’s a sign of irrationality.”

If they so far disagree about their market choices, Tri-State and Xcel agree that the state should not tell them what to do. The Sierra Club and Sustainable FERC Project see it completely opposite. Western Resource Advocates, the Natural Resources Defense Council, and others agree that the utilities commission has authority but counsel that public interests may be “best served by influencing (rather than ordering) these market participation decisions.” They cite examples from Nevada and New Mexico.

Benefits of an energy imbalance market pale compared to those of a regional transmission organization, or RTO. If CAISO might seem the obvious foundation for a West-wide RTO, one major problem remains. Governing board members must be approved by California legislators, and they rejected two attempts by the administration of former California Gov. Jerry Brown to create an independent board. Until that happens, utilities in Colorado and elsewhere will remain hesitant.

Peter Colussy, manager of regional affairs for CAISO, conceded the political challenge in a session at the Solar Power & Energy Storage Mountain West conference in Denver recently. He called the governance issue a “big hurdle.”

Margaret Miller, director of regulatory affairs and market development at Avangrid Renewables, said joint transmission planning across a larger market region will be needed, but it need not be done with one giant RTO. “We can have two in the West. We are still going to see benefits from that.”

Take it slow, advises Beuning of Holy Cross Energy, and be sure to build up staff expertise sufficient for such an undertaking. “Don’t underestimate the challenge of these small steps,” he said.

But these small steps, all agree, will be necessary on the way to an RTO and deeper integration of renewables, “You cannot do it without an RTO and a day-ahead energy market,” Southwest Power Pool’s Suskie said.