

“How can utilities transform their energy plans to advance clean energy?”

Plans of leading utilities as they navigate the energy transitions facing Colorado and the U.S.

Co-hosts: Colorado Energy Research Collaboratory & Payne Institute for Public Policy, Colorado School of Mines

Moderator: Morgan Bazilian, Director, Payne Institute, Professor of Public Policy, Colorado School of Mines

Panelists:

- Duane Highley, CEO, Tri-State
- Alyssa Clemsen Roberts, Chief Strategy Officer, Platte River Power Authority
- Bryan Hannegan, President/CEO, Holy Cross Energy

The May 4, 2020 webinar was a great success. There were 87 questions from viewers on that day and the speakers have tried to answer attendee questions. Please read this document for more information. Answers are in no particular order.

Answers prepared by Tri-State

About Tri-State and what it means to be a cooperative

Tri-State Generation and Transmission Association is a not-for-profit wholesale electric cooperative serving 46 members in four states. The majority of our members are rural electric cooperatives and public power districts, which in turn deliver power to over a million consumers across over 200,000 square miles of the West. Our mission is to provide our member systems a reliable, affordable and responsible supply of electricity in accordance with cooperative principles.

From democratic member control to members’ economic participation to concern for community, these principles set cooperatives apart by defining what we do and how we get it done. Our members convene monthly to move the business of our cooperative forward and make decisions about our priorities and goals. On our members’ behalf, we develop and plan for assets to ensure that reliable power is available whenever they need it, today and decades in the future. Our members contribute to these capital investments, and we return patronage capital to them. We do not have shareholders who pressure our business to increase profit for a few – we have members who govern our business to meet their shared needs and the needs of their communities.

Tri-State’s industry-leading energy transition

Our member-comprised board of directors set a goal for our cooperative in July 2019 to comply with all applicable environmental and renewable energy requirements while striving to reduce members’ rates, preserve electricity reliability and affordability, and maintain our financial strength. Tri-State’s industry-leading Responsible Energy Plan (REP) was developed to meet this goal, and is based on a vision for the future in which the benefits of an economy-wide energy transition – from cleaner air to economic opportunity to a greener grid – are shared with everyone. Our clean energy transition will expand renewable generation and reduce greenhouse gas emissions while ensuring reliable, affordable, responsible electricity for our member cooperatives and public power districts, and for the communities they serve.

Our Responsible Energy Plan outlines six commitments and goals, which we have already made considerable progress toward achieving. We are reducing emissions by eliminating 100% of emissions from our coal facilities in New Mexico by the end of 2020 and in Colorado by 2030. We’re increasing clean energy by bringing over 1,000 megawatts of wind and solar resources online by 2024 so half the energy our members use will come from renewables, with more to come. Our members have increased their contract flexibility to create more opportunities to develop local renewables and self-supply up to 50% of their power. We’re helping consumers save money and reduce emissions by extending the benefits of a clean grid, like through a \$2 million allocation for members to expand EV charging infrastructure and our support of the Beneficial Electrification League of Colorado and other state chapters.

As we implement this transition, we will do so without sacrificing our responsibility to our employees, our members, our communities, and our environment. This means that as our industry changes, we're committed to supporting employee and community transition and are working with impacted communities, employees and local, state, federal, and industry leaders to develop solutions for a truly just transition. And we know there's more to do as we look forward to our brighter vision for the future, so we're striving for 100% clean energy in Colorado by 2040, to maintain or reduce member rates as we implement the REP, and to promote participation in a Regional Transmission Organization (RTO) to efficiently and cost-effectively achieve a broader energy transition.

We are energized by the potential of this energy transition, even as we recognize and work to manage the challenges that remain. These include dedicated and meaningful support for transitioning coal-dependent communities so they are not left behind, treatment for cooperative debt and stranded assets so we can responsibly retire coal generation as we add renewables, participation in an RTO to secure electricity reliability and affordability as our industry transitions, and streamlined siting and permitting for necessary infrastructure so we can meet the time and cost expectations of the clean energy transition.

Making the REP a reality

As a cooperative, we often talk about how much we can accomplish when we work together. We believe we can achieve the bright goals and promises of our REP and an inclusive, cost-effective energy transition if we work together – with our members, with local leaders and thought leaders, with policymakers and regulators, with interest groups and individuals. We also believe that this 'all together' strategy applies to the technology that will make this transition possible. Renewable technology has improved dramatically in the past decade and is now cost-competitive with traditional generation technologies. This sort of innovation in alternative generation, storage, consumer-side products and programs, and other developments we don't even know about yet will all be necessary to achieve high-percentage or full transition to a clean grid.

Tri-State has a long history of research and development to push the frontiers of innovation in our industry, and we believe our generation portfolio in 15 years will include many innovations that, 15 years ago, were only entering the conversation about what can power the grid. For example, we were the first electric utility to join the Ammonia Energy Association, because we believe green ammonia can be an important energy carrier for meeting economy-wide decarbonization goals effectively in the rural and agricultural communities our members serve.

When we look ahead at our 'all together' strategy of the future, we see technologies like green ammonia playing a role. We see batteries playing a role. But to replace always-available resources like coal we need a lot of options for generation and load-shaping beyond ammonia and batteries, and solutions may include hydrogen, pumped-hydro, heat storage, gravity storage, energy efficiency, demand-side management, microgrids, EV incentives for charging and discharging, and more. Bringing any of these technologies to commercial viability at the scale necessary to integrate effectively with the grid will take additional investment and research. But we are excited about the suite of opportunities on the horizon, and will be actively reviewing these technologies in the coming decade as we approach the closure of our coal facilities.

The importance of RTOs in achieving a reliable and affordable clean grid

A robust Regional Transmission Organization (RTO) in the Rocky Mountain Region would make it possible to efficiently and cost-effectively integrate more renewables into the grid while preserving electricity reliability and affordability. Tri-State has always worked closely with neighboring transmission providers to plan and construct reliable transmission systems and, accordingly, has been exploring organized markets for years. In October 2015, Tri-State placed its Eastern Interconnection facilities in the Southwest Power Pool (SPP) RTO, which has resulted in a positive experience and cost savings. Tri-State was also one of several regional utilities that came together as the Mountain West Transmission Group (MWTG), which determined that an organized market would provide benefits to all participants. Unfortunately, Xcel Energy – one of the critical partners, given their footprint in the region – unexpectedly abandoned the group in 2018 as the MWTG was exploring participation in the SPP RTO, resulting in the delay of the effort.

Despite the disbanding of the MWTG, Tri-State and several other utilities remain interested in securing the benefits of an RTO, and Tri-State, Basin Electric Power Cooperative and the Western Area Power Administration continued to work with SPP. Throughout 2018, SPP worked to expand its Reliability Coordinator (RC) services in the West, which monitor and oversee regional transmission operations. The significant effort of establishing SPP as RC in the region was completed at the end of 2019.

As a next step, the same three energy providers joined SPP's Western Energy Imbalance Service (WEIS) market, which will launch in February 2021. This market will centrally dispatch energy from the participants throughout the region every five minutes, enhancing reliability and affordability of electricity delivery from utilities to consumers. It represents another step closer to a full RTO.

Tri-State has been consistently supportive of the transition to the SPP RC, establishing the WEIS market, and an effective transition into an RTO. We will continue to evaluate our options and work with other transmission owners, regulators and elected officials to encourage the formation of an RTO in the Rocky Mountain Region.

With an RTO, Tri-State and other electricity providers can secure electricity reliability and affordability while transitioning to a clean grid in a cost-effective and efficient manner.

Answers prepared by Platte River Power Authority

Q: What are the interim goals for PRPA to meet its goal of 100% renewables by 2030?

A: About 50% of our energy will come from noncarbon resources by 2021, from new wind and solar; we want to add another 150MW of solar by 2023, which will raise the percentage to 60+%. Our draft IRP outlines more significant moves to aggressively pursue our 100% goal.

Q: I commend a 2024 interim goal by Tri-State. How come PRPA doesn't have interim goals leading up to reaching the goal of 100% non carbon by 2030? How about 70% by 2023?

A: See above conversation about Platte River interim goals.

Q: Thank you Ms. Clemens, what does the pandemic mean for the future viability of renewable energy? I would think it would serve to increase the desirability of renewables. Yes? No?

A: The long-term viability of noncarbon resources shouldn't be changed by short-term events such as the current pandemic. Platte River's goals are aggressive and we are taking significant steps to achieve them.

Q: What's DER?

A: Distributed Energy Resources - this includes such things as the integration of rooftop solar, onsite energy storage, electric vehicles, a more dynamic distribution system, etc.

Q: Where do we find these P1, P2 and other options for PRPA's future?

A: Please visit our IRP microsite at www.prpa.org/irp. We have posted numerous studies and public meeting videos on that site for people to review.

Q: Thank you all for your time this afternoon. My question is: what do you think is the quickest reasonable timeline we could establish a western RTO? And what are the biggest obstacles to accelerating this timeline?

A: Platte River and its partners have committed to joining the Western Energy Imbalance Market by 2022. A full RTO will take longer to organize and implement.

Q: Have any of you seen large swings in the daily load profile due to businesses being shut down and more people working from home during COVID? If so, what operational challenges did you need to overcome?

A: Platte River has witnessed a decline in demand across our owner communities.

Q: For Alyssa--What do you see as the future of the Rawhide coal plant and what have been the hardest parts of developing a plan to get to high levels of renewable energy?

A: The future of Rawhide Unit 1 (coal) is being deliberated as part of our 2020 integrated resource plan (IRP). The issues moving toward a 100% noncarbon energy mix depend on adherence to our three pillars: reliable, financially sustainable and environmentally responsible energy and services.

Q: For all panelists: Can you speak to how your companies are planning for transportation and building electrification growth and how that impacts resource planning and investments?

A: Platte River: We've formed a distributed energy resources (DER) strategy team to map the future of EVs along with a variety of other distributed energy systems.

Q: Do you expect reaching these long term carbon reducing goals while maintaining or improving costs? Or is there an assumed increase in costs to reach the goals?

A: Platte River: We constantly look for the best way to move forward with noncarbon resource additions, to maintain system reliability and low cost.

Q: Are there any goals for increasing cross-border trade capacity between big utilities to increase flexibility and reliability until storage technologies become more viable?

A: Yes. See market questions above.

Q: All participants want a RTO/ISO for Colorado, but run into Xcel's disinterest. Is it possible to create an RTO that doesn't include Xcel? If not, any insight into how get Xcel to join an RTO?

A: Xcel Energy, Platte River, Colorado Springs Utilities and Black Hills agreed to join the Western Energy Imbalance Market, which is a good first step toward an RTO.

Q: Morgan: Hello! Great (and timely) panel. Large scale storage is key to ensuring dispatch ability of renewable energy. New technologies (vanadium flow, heat storage (e.g. salt), etc. are attracting attention. Some utilities are starting to act: Recently Southern California Edison has signed contracts for a combined 770 megawatts of grid battery projects and wants to switch them on by August 2021. Could your panelists share their views on the likely timing for construction of large storage systems and the technologies they anticipate might be used. Add on: how do they view very large storage vs distributed storage with smaller storage units?

A: Platte River will test both large transmission and distribution system battery systems, albeit on a smaller scale. Every system is different and we need to know how they perform in relation to our customer load patterns before we can commit to more. By then, battery costs could decline further.

Q: The latest monthly newsletter in Loveland says PRPA is only supplying 9% of its power from solar and wind. It's been widely reported it is more than 30% now. Why the discrepancy?

A: Approximately 30% of the energy we currently deliver to our owner communities comes from noncarbon resources: wind, hydro and solar. In 2021, that percentage will rise to 50%.

Q: Hello! Thank you for taking the time to answer our questions and present the great work your companies are exploring. A question for all of the presenters, what are your thoughts on using microorganisms from clean energy?

A: We will continually study technology development within the context of its relative value proposition to our customers.

Q: Given that PRPA (and others) is joining Western EIM and Tri-State seeks to join an expanded SPP, which regional ISO do you think is most appropriate for the Mountain West: CAISO or SPP?

A: This is an issue that will require further study. An initial study indicated to Platte River, Xcel Energy, Colorado Springs Utilities and Black Hills Energy that the WEIM provided better overall value.

Q: Why hasn't PRPA really committed to 100% RE by 2030 given the (4) recent IRP proposals & really no interim goal(s) for by ~2023?

A: Platte River's goal is to achieve a 100% noncarbon energy mix by 2030 in accordance with our Resource Diversification Policy, which you can find on our website.

Q: PRPA claims you can get to 90% "pretty easily" according to Alyssa Roberts. Why don't you just get there quicker then?

A: We will move toward our 100% noncarbon goal as rapidly as we can, respecting our three pillars: system reliability, financial sustainability and environmental responsibility.

Q: For any or all: There has been much mention of having a full blown RTO or TSO to get to the highest levels of renewables. But what is really needed beyond an energy imbalance market hour and day ahead markets? Does this really require the centralized planning that an RTO/TSO generally have?

A: An RTO provides many more services that an EIM does not, which can be highly valuable to a utility.

Answers prepared by Holy Cross Energy

Q: If time, discuss the residential/business rate projections thru 2050? Many residential solar PV companies are using 4% annual increases. Is this high or low or just right?

A: Steven, our Seventy70Thirty plan at Holy Cross includes a commitment to keep power supply costs at or below what they would have been otherwise.

Q: For Bryan--What are your thoughts about the new PUC Commissioner Megan Gilman who came from the Holy Cross Board? What special perspectives do you think she brings to her new position on the PUC?

A: Hi Leslie, we were sad to lose Megan as our Board Chair, but we think she will be a great addition to the PUC. She really understands the role that distributed resources, especially solar and grid-interactive buildings, can play in achieving our clean energy future.

General answers

Q: What is an RTO?

A: A Regional Transmission Organization - an independent body that runs a regional transmission grid comprised of individual lines owned by many utilities.

Q: For Duane Highly or other — How much would electricity to hydrogen to ammonia to its combustion cost per kWh produced today? At what roundtrip efficiency?

A: Ammonia's round trip efficiency might only be 60%+, so that would seem like a negative, but if utilities have massively overbuilt renewables, as I expect we collectively will, there will be lots of "free" energy available for long-term storage.

Q: What are the panelists' plans for microgrids within their networks?

A: Hi Piper, we have a number of local communities that we are working with on potential microgrid solutions for their energy resilience needs. It's a value-added service that costs a bit more for the consumer, but if we can use the microgrid assets on a "blue sky day" for the grid's benefit, we can help make up that difference.

Q: Rewarding electric car charging: how about Time of Day rates, eventually real-time electric rates.

A: PRPA and Holy Cross do have time-of-day rates, but a more dynamic rate design is going to be needed to get the full flexibility from those Distributed Energy Resources.