Throughout my tenure as Administrator and CEO, WAPA has focused on becoming a data-driven organization to manage the $5.6 billion asset base entrusted to us. We clearly defined this focus in Strategic Roadmap 2024 with the critical Pathway of Business, Operational and Organizational Excellence.

The extensive size of our enterprise—encompassing more than 117,000 structures, 322 substations, 291 transformers, 661 buildings and 487 communication sites across 1.3 million square miles—requires thoughtful, responsible and informed investment to allocate limited people and dollars where they are needed most.

Since 2013, we have overhauled, expanded and created programs and tools designed to collect, compare and analyze the resources and information available to us. We developed a focused asset management effort to build on the data foundations within WAPA, such as the reliability-centered maintenance program, a cadre of project management professionals and unparalleled field knowledge retained by the best maintenance employees in the business.

The Asset Planning and Management Program transformed an age-based evaluation of WAPA’s physical equipment into a multi-factor assessment that accounts for risk, asset health, probability and consequences of failure and redundancy at a component level. We continue to add new asset classes to our program every year with the intent of being able to provide the same level of objective analytic data for every physical asset.

Over time, asset management has become the cornerstone of our maintenance and investment strategies. AM data began to be incorporated into the revamped 10-year capital plans in 2014, providing an objective view of system health and needs that require investment. Thanks in large part to this new asset information and collaboration with customers, we anticipate investing $1.3 billion in our system over the next 10 years to maintain our consistently high levels of reliability.

Lifecycle management was added to our business practices in 2018 to secure the full value of our capital investments. Considering an asset’s total lifecycle, including its design, acquisition and installation, as well as its annual operations and maintenance and disposal costs, provides opportunities to maximize the cost-effectiveness and total value of our infrastructure and information technology investments beyond the purchase price.

In 2019, we added “Data as a Strategic Asset” to the refreshed Tactical Action Plan to enhance our ability to translate raw data on our strategic assets into usable information for decision making and performance metrics.
Thanks to these advancements, we have been better able to evaluate our physical and IT equipment and identify a measured, stable plan to reinvest in our assets over time.

We are now poised to take the next step in becoming a premier data-driven organization. In the coming year, we will undertake a Workload Management Initiative to pair our equipment data with our staffing and organizational priorities.

There are a finite number of hours, people and funds available at any given time. The regional 10-year capital plans provide an overview of necessary investments into our system, but cannot currently identify the human resources needed to complete those projects within expected timeframes and does not account for routine maintenance work or work for others that we also perform every year.

This year, the Workload Management Initiative will focus on documenting operations and maintenance projects to establish a baseline level of work, particularly for craft employees. The baseline assessment is designed to be a holistic cross-craft review to gain common and consistent understanding of annual workloads. The cross-functional team at WAPA will then evaluate how and where work can be prioritized, planned and streamlined to accommodate long-term capital projects.

Although this initiative began with the craft, we anticipate it will also integrate other critical functions that support a healthy, reliable grid, including Lands, Environment, Procurement and Design and Engineering, among others.

Armed with the people side of the workload management equation, we can better match our resources with business needs, improve communication and transparency around our projects and more efficiently and effectively complete the many pressing projects before us.

As we embark on this year, we continue to fix our gaze toward the energy frontier and the many demands it will place on our people, operations, customers and resources. Our theme this year, especially appropriate after a tumultuous 2020, is "Balance." We will seek balance between system and customer needs and available resources; between resilience and reliability; and between today and our many possible tomorrows.

Through our many balancing acts, we remain committed to our customers, our mission and our new vision: “Empowering communities, securing a resilient energy future.”

Sincerely,
APA operates a distributed business model with various functions spread throughout its 15-state, 1.4-million-square-mile territory. Located in Lakewood, Colorado, WAPA's Headquarters serves many diverse customers, including Congress, Native American power customers, public power utilities, other government agencies and WAPA’s regional and field offices.
HQ is home base for WAPA’s administrator and CEO, the General Counsel and the organization’s Economic Impact and Diversity, Public Affairs, Power Operations, Finance, Safety, Physical Security, Asset Management and Information Technology offices.

Within these functions, WAPA accomplishes the “behind-the-scenes” work to fulfill the needs of around 700 firm electric service utility customers, who then provide electricity to more than 40 million people throughout the West. This work includes:

- Representing WAPA in Washington, D.C.
- Conducting public meetings.
- Developing publications such as the annual report.
- Managing finances and WAPA’s annual budget.
- Focusing support on WAPA-wide employee safety and system security.
- Designing and maintaining power systems facilities.
- Emergency management.
- Overseeing and continuously improving North American Electric Reliability Corporation compliance activities.
- Supporting renewable resources and environmental protection.
- Providing helicopter services to all WAPA service areas and supervising unmanned aerial system integration.
- Supporting the power marketing community.

Asset Management is evolving to become a long-term effort that provides data-validated insights as well as data. AM analytics are providing a platform for analysis in areas such as data strategy, physical security, budgeting, workforce planning and vegetation management. For example, the newly formed Total Capital Committee will use AM data to consistently prioritize and execute capital projects across WAPA’s footprint.

The transition from tabular data to a more visual presentation will encourage the acceptance and application of AM reports by other WAPA business units. Working in partnership with Information Technology, AM is shifting its reporting format from Excel spreadsheets to Power BI. This software system integrates data sources into an interactive visual format. The pilot collaboration is expected to make three new reports available WAPA-wide in 2021. These reports will be easier to comprehend and incorporate into WAPA business decisions, furthering the Tactical Action Plan milestone of Data as a Strategic Asset.

The visual analyses will also make transmission line inspection data more shareable with regional maintenance organizations, leading to more informed decisions on transmission line replacement and maintenance. This supports WAPA’s Maintenance Managers Council’s transition to a more strategic, long-term focus on systematic transmission line investments.

In support of WAPA’s workload planning initiative, AM is enabling the use of resource-loaded schedules for construction project management. Resource-loaded schedules show project duration by individual activity duration along with individual crew estimates. The program is also providing historical Operations and Maintenance data to support
more accurate forecasting of craft worker availability. Visualized schedules will clarify interrelated resource needs for construction projects, enabling WAPA to use full-time employees and execute its budget more effectively.

Bringing new asset classes into the management portfolio will continue to be a core part of the program. Analyses on the four asset classes added in 2020 will become available in fiscal year 2021. Basic data on cranes and circuit breakers under 100-kilovolts has been collected and equipment use studies are ready to move forward. Reporting on load tap changers and transformer bushings is expected to begin in the fourth quarter.

In FY 2021, Engineering and Design continues to apply technology widely used in the industry to optimize the efficiency and accuracy of substation and transmission line designs. Engineers are expanding the use of computer-aided tools to move toward designing in a 3D world rather than 2D. They will begin implementing commercial software for building designs, which create sections and elevations that are interconnected; if a user makes a change in one view, the other views are automatically updated.

The base building is drawn using 3D objects to create walls, floors, roofs, structure, windows, doors and other objects as needed. Other commercial software will allow engineers to take a virtual tour of a substation using data from WAPA's 3D scanner. From imported photographs and laser scans, programs can measure critical parameters such as the top of concrete elevations, the diameter of a rigid bus and phase-to-phase spacing. These technologies will aid engineers in their quest to continuously improve their designs.

Engineering and Design will also use its newly acquired hardware for the Digital Control System laboratory, located at HQ. The package includes WAPA's standard vertical switchboard, line protection, two bays of breaker control and breaker simulators. It provides an opportunity for WAPA engineering and craft personnel to program, operate and troubleshoot current and future DCS-standard designs in a laboratory environment. It also serves as a test bed for control logic, line protection relay settings, breaker failure schemes and fiber optic communications.

Anticipated hands-on training opportunities include automation controller, port server and annunciator programming; power circuit breaker control relay logic and LCD/touchscreen programming; Human Machine Interface screen development; and fault playback and event reconstruction.

WAPA recently hired its first Human Performance and Just Culture Program Manager, allowing the organization to roll out the program. The Human Performance and Just Culture Program will describe processes and activities that constitute the program for WAPA, such as identifying, documenting, tracking, reviewing and correcting the causes of human performance events.

The program will describe the roles and responsibilities of those involved in initiating HP event reviews, reviewing those events and ultimately resolving concerns identified.

A WAPA-wide organizational cultural survey will be sent to employees to identify already established processes, assess WAPA's current culture and identify areas to improve. Senior leaders and employees will receive training on Human Performance Improvement and Just Culture, incident training, coaching and observation training.

The program will promote excellence in Human Performance through behaviors that support safe and reliable operations. Establishing a strong reporting culture is instrumental for the program's success.

WAPA's North American Electric Reliability Corporation Reliability Compliance program is looking to further standardize and automate key compliance processes for both the program itself and the programs being monitored.

In 2021, WAPA facilitated a mock audit for the Rocky Mountain region, including invitations to its customers, to practice for upcoming Western Electricity Coordinating Council and Midwest Reliability Organization audits. Sierra Nevada and RM will have WECC audits in May and August, respectively.

The NERC Reliability Compliance program will continue to actively participate in several industry groups such as the North American Transmission Forum, WECC and NERC to exchange and build knowledge and implement best practices for a host of upcoming new standards, such as supply-chain security and cloud technologies.

Additionally, the program is involved in internal WAPA projects for facilities ratings, records management, new IT systems, markets and information protection.

WAPA's Electric Power Training Center is redesigning the structure of training programs in collaboration with partners and customers to be based more significantly on training data analytics. This includes potentially moving toward a blended learning approach and incorporating a variety of distance-learning options, including virtual instructor-led training and eLearning. The EPTC follows up knowledge-based training with hands-on training in order to support and reinforce learning.

Additionally, the EPTC will continue to collaborate with WAPA and its federal hydropower partners, the Army Corps of Engineers and the Bureau of Reclamation in identifying required training needs. This is essential in deciding how to best meet those needs, whether through developing and delivering necessary training internally or securing vendor training at a cost savings through collaboration.
The Colorado River Storage Project Management Center markets clean, reliable hydropower from 15 powerplants under a single rate known as the Salt Lake City Area/Integrated Projects. These generating resources produced an average of 5,367 gigawatt-hours annually over the past 10 years for CRSP MC’s 132 preference and project-use customers.

The Glen Canyon Dam is the largest powerplant, generating 74% of SLCA/IP energy. Transmission facilities in Arizona, New Mexico, Colorado, Utah and Wyoming deliver SLCA/IP hydropower to its preference and project-use customers. CRSP MC owns 2,316.25 miles of transmission lines and 42 transformers.

In the area of power marketing, CRSP MC worked hard in its move toward joining the new Western Energy Imbalance Service offered by Southwest Power Pool. In addition to managing the transition into the WEIS market, the Energy Marketing and Management Office continued to efficiently and professionally manage and coordinate several diverse systems for both CRSP and the Loveland Area Projects, with approximately $270 million of annual power marketing activity being executed and delivered across 10 states.

The Rates team worked tirelessly to collaborate with and gather input from CRSP customers and other stakeholders to establish a new firm electric service rate as well as new transmission and ancillary service rates. These rates became effective Oct. 1, 2020. The firm power rate was slightly lowered from 29.42 mills per kilowatt-hour to a composite rate 27.45 mills/kWh.

Staff members continued reaching out to customers who have not yet signed the 2025 SLCA/IP power contracts. The contracts extend customers’ services under the current marketing plan through 2057 and will provide long-term assurance and stability for customers receiving SLCA/IP hydropower.

CRSP MC’s tribal outreach continues to strive to find and provide additional benefits to 53 Native American tribal customers. CRSP MC staff met with many tribal leaders,
utilities and regional associations. Since the SLCA/IP allocations were awarded in 2004, two tribal utilities have been established and another begins service early this year. Several other tribes are considering establishing their own utilities.

In 2021, CRSP MC will continue reaching out to tribal leaders to strengthen its working relationships, even with the limitations created by the COVID-19 pandemic.

Maintaining infrastructure in partnership with other WAPA regions and the Bureau of Reclamation is a high priority for CRSP MC. In 2020, replacements were completed on the Island Lakes communication building, Flaming Gorge switchyard equipment, Montrose warehouse and machine shop, a reactor at Hayden Substation, Glen Canyon communication tower and breakers at the Glen Canyon switchyard.

Construction will continue or be completed in 2021 on:
- Glen Canyon-to-Shiprock 60-megavolt-ampere-reactive, 230-kilovolt reactor project.
- Glen Canyon Warehouse workspace for WAPA and Reclamation staff.
- Shiprock 115-kV and 345-kV breakers.
- Various microwave system upgrades in Arizona.

Environment staff from CRSP MC is proud to be playing a role in the recovery of endangered fish species in the Colorado River through participation in the Upper Colorado River Endangered Fish Recovery Program and the Glen Canyon Dam Adaptive Management Program.

In 2020, the U.S. Fish and Wildlife Service issued a proposed rule to downlist the federally protected humpback chub from endangered to threatened status due to their increasing populations and is working on a proposal to downlist the razorback sucker.

Downlistings are the result of successful conservation efforts between the FWS and other organizations, including WAPA, to protect these unique fish populations and their habitats. Changing the fishes’ status from endangered to threatened should allow more flexibility in the hydropower facility operations in the Colorado River drainage basin. The FWS’ efforts to downlist and revise their recovery plans will continue in 2021.

In the Upper Colorado River Basin, Environment employees are conducting a hydropower analysis on an Endangered Species Recovery Program Report that recommends flow and temperature experiments in the Green River below Flaming Gorge Dam.

Biologists are collaborating with Reclamation and the FWS Endangered Fish Recovery Program Office to analyze how experimental flow recommendations influence hydropower resources. Experimental flow releases being evaluated include spring peak water releases timed to match larval razorback sucker abundance and enhancing backwater rearing habitat inundation; spike flows in late spring or early summer to disrupt smallmouth bass spawning; and elevated base summer flows to support spawning and rearing habitat for juvenile Colorado pikeminnow.

Additionally, the biologists help coordinate and conduct biannual trout surveys for the popular sport fishery below
Flaming Gorge Dam. The trout survey helps determine the population status as it relates to dam operations and environmental conditions. This work has shown that trout populations are strong, and winter double peaking has been beneficial to trout populations.

Environment employees are assisting the Grand Canyon Monitoring and Research Center with studies evaluating the effects of Glen Canyon Dam operations on downstream resources. One such study, the bug-flow experiment, evaluated how changes in water releases affect the insect population that supplies food for the rainbow trout below the dam.

Researchers hypothesized that fluctuating river levels cause insect eggs to dry out and die, reducing the primary food source for native fish. The bug-flow experiment tested to see if adjusting the daily release patterns at Glen Canyon Dam can increase the diversity and production of aquatic insects without significantly affecting the hydropower resource. Due to the impacts of COVID-19, which limited biologists’ abilities to travel to the river, another bug-flow experiment has been proposed for 2021 by scientists at the GCMRC.

Water releases may also directly affect the reproduction and growth of rainbow trout, so CRSP MC has teamed up with Reclamation and the GCMRC to research trout-management flows.

The strategy is intended to enhance the trout fishery below Glen Canyon Dam while reducing conflicts between rainbow trout and native fish. Using releases to control the trout population could potentially enhance hydropower value, a side benefit of trout management flows of particular interest to WAPA.
Desert Southwest markets hydroelectric power to about 100 municipalities, cooperatives, Native American tribes, federal and state agencies and irrigation districts in Arizona, California and Nevada from powerplants operated at Hoover, Parker and Davis dams. DSW maintains 67 substations, 2,689 miles of transmission lines ranging from 34.5-kilovolts to 500-kV and 80 communication sites to provide safe, secure, reliable and affordable energy and transmission services to its customers and communities.

In 2020, DSW completed tens of thousands of hours of critical maintenance work and completed several significant construction projects, such as the energization of the Parker-Davis Project’s Longtin Substation and the interconnection of a significant wind generator to the Intertie’s Mead Substation.

DSW has numerous projects planned for 2021 that will ensure the continued reliability of the transmission system.

The Bouse Upgrade Project proposes redirecting the Parker-Davis Project’s Parker-to-Liberty No. 2 230-kV transmission line using a new double-circuit line. The line will require 15 miles of new structures to pass through the Bouse Substation and return. This will allow for 161-kV power to be supplied to the Head Gate Rock Substation using existing rights of way and transmission lines south of the Parker Strip area. This project will eliminate the need for the transmission lines currently crossing the Parker Strip and Colorado River into California. It will also significantly increase reliability by replacing aging infrastructure and
position WAPA and its customers for future load growth in the area.

The Townsite Solar Project consists of 180 megawatts of photovoltaic generation and will interconnect to WAPA’s system via a single-circuit generation tie line. The project includes multiple banks of photovoltaic cells at approximately 45.5 MW aggregate generation per bank. Two generator step-up transformers convert from 34.5-kV to 230-kV for transmission to Mead Substation. Upgrades at Mead Substation will consist of two 230-kV 90-kiloampere circuit breakers, four 230-kV disconnect switches, instrument transformers, foundations and take-off structures and relay protection.

In 2020, Tucson Electric Power acquired the rights to a portion of the Southline Project. This portion, now named the Vail-Tortolita Project, was previously designated as the first phase of the Southline Project. It will rebuild approximately 62 miles of a Parker-Davis Project transmission line near Tucson, Arizona. The transmission line will be rebuilt as a double-circuit 230-kV line with WAPA and TEP each owning and operating a single circuit. WAPA’s circuit will be operated at 115-kV, the current voltage for the Parker-Davis Project transmission system in the area. TEP is pursuing permitting for the rebuild and is working with DSW on project development agreements.

GridLiance recently built the Sloan Canyon Substation and new 230-kV transmission line to interconnect to Mead Substation. Upgrades will be required at Mead Substation to support the interconnection’s 3,000-amp rating. In 2021, WAPA will remove a 1,600-amp wave trap, replace structures and install current transformers, jumpers and protection and communication relays to complete the project.

In addition to large construction projects, DSW will also purchase and equip a maintenance building in Yuma, Arizona, to position crews closer to important transmission assets, continue wood pole replacements on Parker-Davis Project’s Blythe-to-Knob 161-kV transmission line, replace breakers and relays and install communications upgrades throughout its transmission system.
Rocky Mountain serves around 120 preference customers with Loveland Area Projects allocations in Colorado, Wyoming, Nebraska and Kansas. It sells more than 2.8 million megawatt-hours of power generated at 20 hydroelectric plants in the Loveland Area Projects, through both the Fryingpan-Arkansas Project and the Pick-Sloan Missouri Basin Program—Western Division. RM reliably delivers federal and nonfederal power through 3,366 miles of transmission lines and 84 substations.

As the hydrology of the river systems fluctuates, Power Marketing staff provides stability in navigating the ebb and flow of hydropower while keeping costs low. WAPA decreased the composite LAP rate by 12% in 2017 and 14% in 2018. WAPA held the LAP rate flat again for 2021, marking 12 consecutive years with a flat or decreasing rate.

In September 2019, RM and the Western Area Colorado-Missouri Balancing Authority signed the Western Joint Dispatch Agreement to become a market participant of the Southwest Power Pool Western Energy Imbalance Service. Throughout 2020, WAPA prepared its operations and processes for this new environment. WAPA finalized its Open Access Transmission Tariff modifications, updated Business Practices, established modified transmission and ancillary formula rates, executed standardized Balancing Authority Services Agreement Contracts, developed Settlements processes and procedures and continued working with the Bureau of Reclamation to install generation metering on
Reclamation hydropower generators. This work throughout 2020 paid off, as WEIS successfully went live Feb. 1.

WAPA successfully placed a pilot program in service for a customer to provide resources to cover a portion of its requirements for regulation service. The pilot has so far been successful and is providing the Western Area Colorado-Missouri Balancing Authority with greater flexibility and through resource diversity in provision of its regulation service. The success of this pilot program may result in extending it to additional customers in the future.

During 2020, Power Operations, supporting the Colorado River Storage Project Management Center, Desert Southwest and Rocky Mountain, worked to improve real-time transmission efficiency through its real-time Total-Transfer-Capacity project. This project offered a software solution that has provided customers with up to 30% more transmission capacity in real time on constrained elements within its transmission system.

Phase 1 was focused on the Western Electricity Coordinating Council-defined paths in the Western Interconnection. Phase 2, planned for this year, looks to expand it further to those constrained elements outside of the WECC Path Rating Process.

During this time, Operations had to shift from in-person training to remote training due to the COVID-19 pandemic, spurring the development of a first-of-its-kind remote switchman training program. This continued to ensure the safe and reliable operation of the bulk electric system.

Operations has also been working in support of the DSW Market Study. This includes providing large amounts of data, meeting with customers to discuss future opportunities, studying internal operations to better prepare for markets and ensuring that WAPA and its customers are aligned on the path forward.

On Dec. 8, 2020, Administrator and CEO Mark A. Gabriel signed the Record of Decision for Reauthorization of Permits, Maintenance and Vegetation Management on Western Area Power Administration Transmission Lines on National Forest System Lands, Colorado, Nebraska and Utah (DOE/EIS-0442).

The signing concludes and formalizes the National Environmental Policy Act process on a multiyear Environmental Impact Statement between WAPA and the U.S. Forest Service. The proposed action encompasses approximately 273 miles of transmission line rights of way on USFS land in Colorado, Nebraska and Utah.

Under the selected alternative, WAPA and the USFS will develop new and update existing operation and maintenance plans for the authorization of right-of-way maintenance activities, including access road improvements, structure replacements and integrated vegetation management.

Now through fiscal year 2022, RM will replace its Mitel Voice over Internet Protocol system with a new Cisco VoIP system. The region budgeted for this replacement several years ago when the Department of Energy informed WAPA that Cisco would be the new standard for such systems. Replacement of the RM system follows similar replacements done in UGP, and RM will consult UGP to discuss lessons learned.

In 2020, RM used asset data, subject matter expert input and power system planning information to revise the regional Capital Investment Plan, detailing the work and priorities for the next 15 years. This year, RM will continue communicating the importance of these projects to customers in order to acquire additional funding as required. RM will also work to identify resource constraints associated with these projects, as well as methods to mitigate any risks.

The major projects RM plans to address this year include:

- Dave Johnston Tap-to-Sidney Substation 115-kilovolt line reconductor: Replace 213 miles of conductor to correct separating conductor issues. This will mitigate safety concerns and ensure reliability. Construction will begin in March and be completed by the end of October.

- Estes-to-Flatiron and Estes-to-Lyons 115-kV rebuild: A rebuild and consolidation of two 14-mile 115-kV lines to one double-circuit line. This will increase reliability and reduce maintenance costs. It will also improve and increase the communications reliability and capacity for WAPA and others sharing the fiber-optic line. Construction will begin in the third quarter of FY 2021 with an in-service expectation of the first quarter of FY 2023.
Sierra Nevada markets hydroelectric power generated from the Bureau of Reclamation’s Central Valley Project to 83 preference power customers in California, including municipal public power utilities, irrigation districts, Native American tribes, rural electric cooperatives and federal and state entities.

The CVP federal transmission system is owned, operated and maintained safely and reliably by SN and consists of 25 substations, 21 transformers and 1,363 miles of transmission line. SN is also the operating agent for the 350-mile California-Oregon Transmission Project, one of the three lines forming the California-Oregon Intertie.

In 2021, SN staff will continue to work with Reclamation and SN’s customers on issues related to the future of CVP hydropower due to changing market conditions in California.

One of the significant issues is the CVP Improvement Act true-up process. In 2020, Reclamation worked with CVP stakeholders on the Business Practice Guidelines for CVPIA Receipts, Program Accounting, Cost Allocation and Cost Recovery. The document is undergoing a federal interagency review before it can be finalized. Reclamation has committed to working with project stakeholders to address their concerns.

Additionally, in 2020, a federal court ruled in favor of power customers regarding applying “proportionality” to power customers’ annual CVPIA assessment. Reclamation is now directed to limit this assessment based on the power customers’ 10-year rolling average of CV PI repayment. This will result in approximately a $10 million average reduction in power customers’ annual CVPIA assessment. The new methodology was applied for 2021.

Another issue on which SN continues to work with Reclamation is the CVP Cost Allocation Study. On Jan. 14, 2020, the CVP Final Cost Allocation Study was posted to Reclamation’s website. The results showed a decrease to the total capital cost obligation for commercial power of about $32 million. SN reduced the 2020 power revenue requirement, or PRR, by $10 million as a midyear adjustment in April and plans to adjust the PRR by $10 million each year until the full $32 million adjustment has been applied.

In 2020, SN also worked with Reclamation to calculate an adjustment to Interest on Investment, or IOI, to reflect the reduced interest expense due to the lower CVP capital cost obligation for power. The preliminary estimated IOI adjustment is approximately $141 million.

SN plans to adjust interest expense on the PRR by $14 to $15 million per year, beginning in 2023, after the $32 million adjustment to power customers’ CVP capital cost obligation has been fully applied to the PRR. SN will coordinate with Reclamation on the IOI adjustment methodology to ensure it is sound and the period for the historical adjustment is appropriate.

On Sept. 15, 2020, the Pacific Gas & Electric Company filed with the Federal Energy Regulatory Commission proposed rate changes and revisions to certain non-rate terms and conditions of its Wholesale Distribution Tariff Service Agreement with WAPA.

In its filing, PG&E states that its WDT revenue requirement has risen from $2.7 billion to $4.4 billion. As a result, PG&E is proposing that utilities interconnect only at the primary
level. PG&E proposes to bill certain WAPA customers that do not have demand meters based on demand, eliminate “Reserved Capacity,” introduce “Contract Demand” and include Ratcheted Contract Demand and Ratcheted Period.

WAPA filed an Intervention and Protest Oct. 6, 2020, requesting the maximum rate suspension of five months to attempt to settle and/or litigate the matter. WAPA is working with several other intervenors to develop a Partial Settlement for Interim Rates proposal.

In September 2019, SN and a few other members of the Balancing Authority of Northern California began the process necessary to join the California Independent System Operator’s Western Energy Imbalance Market on March 25, 2021. The EIM is expected to be a net positive benefit to SN’s PRR by the end of fiscal year 2022, with capital repayment completed in FY 2026. In January 2021, SN successfully initiated parallel operations with CAISO, achieving the last critical milestone before cutover.

In October 2020, Operations worked to finalize and file tariff revisions to the WAPA-wide Open Access Transmission Tariff to incorporate provisions for SN’s participation in the EIM under the Balancing Authority of Northern California EIM entity. The OATT revisions were filed with an effective date of Dec. 1, 2020, with the EIM-related provisions applicable during SN’s participation in EIM. In 2021, Operations will supplement the OATT provisions by developing business practices outlining implementation aspects of its EIM participation. Operations will work with regional staff and customer groups to evolve transmission loss settlements for the CVP and California-Oregon Transmission Project from physical to financial settlement coincident with going live with the EIM.

SN will continue working with Reclamation in its pursuit of construction funding for the San Luis Transmission Project, a proposed 230-kV transmission line that will deliver Reclamation-generated hydropower to move water deliveries to agricultural and water users. SN will continue project coordination with other entities within the project corridor, including several solar developers and a large reservoir project. SN is also partnering with the City of Roseville in its 230/60-kV Transformer Addition Project at its Fiddyment Substation by providing project management coordination, specification review, commissioning support and design of the protection and controls systems.

SN’s partnership with the Department of Energy’s Lawrence Livermore National Laboratory to provide new 115-kV service for LLNL’s project to modernize its Exascale Computing Facility is continuing. SN continues to work with LLNL’s contractor in the design, construction support and commissioning of the new 115-kV transmission line and 115/13.8-kV substation. Project completion is scheduled for December.

SN completed the National Environmental Policy Act process, including Environmental Assessment and Finding of No Significant Impact, for the proposed Beale Air Force Base Interconnection Project. The project includes a 230-kV transmission line and 230/60-kV substation that will provide Beale Air Force Base with access to reliable energy sources and help bolster security and resilience.
Upper Great Plains markets more than 9 million megawatt-hours generated at eight dams and powerplants in the Pick-Sloan Missouri Basin Program—Eastern Division to around 340 power customers in Montana, North Dakota, South Dakota, Nebraska, Iowa and Minnesota.

UGP delivers enough hydropower to serve more than 3 million households through 129 substations with 118 transformers and across 7,922 miles of federal transmission lines in its 378,000-square-mile service territory.

In 2020, eight significant construction projects were completed, 21 projects were in progress and 14 were in the planning stages.

Infrastructure projects completed in 2020 include:

- Brookings Substation, Stage 09: Replacement of the 115-kilovolt main and transfer yard with a breaker-and-a-half yard and a new control building.
- Eagle Butte transformer replacement: Replacement of the 115/69-kV transformer KY1A.
- Fargo 115-kV panels / station service: Upgrade of the 115-kV control panels and a new station service.
- Huron transformer KY1A replacement: Replacement of the failed 115/69-kV (42 megavolt amperes) transformer KY1A with a new 60 MVA transformer purchased by East River Electric Power Cooperative.
- Miles City 2-to-Baker 230-kV river erosion: Removal of structure that was threatened by the Powder River and replacement of two adjacent structures with taller steel structures to span the bend in the river.
Mount Vernon Stage 05: Replacement of the 115/69-kV transformer, the majority of the 115-kV equipment and the station service.

Sulphur Stage 01: Addition of the 115-kV Sulphur Switchyard on the Newell-to-Maurine 115-kV line, providing an interconnection point for the new Willow Creek Wind 103.5-megawatt wind farm in Butte County, South Dakota.

Towner Stage 02: Installation of a new 115-kV breaker bay at the Towner Substation for a new Central Power Electric interconnection.

East River has requested a total of five new 115-kV bay additions at Carpenter, Brookings, Flandreau and Summit. Along with the bay additions, East River will construct two 115-kV substations on WAPA transmission line facilities. The additions are intended to improve East River system reliability and support future load growth.

Moving forward, UGP has three significant projects supporting renewable generation interconnection requests for a total of 528 MW of capacity. These are located at the New Underwood Substation and two new switching stations: one on the Fort Thompson-to-Huron 230-kV line and the other on the Oahe-to-Fort Thompson 230-kV line.

Creston-Maryville 161-kV reconductor: Reconductoring with a larger conductor, replacement of eight structures with dead-end structures and necessary maintenance replacements of entire structures or crossarms.

Devils Lake Stage 06: Replacement of the 115-kV main and transfer yard within a new yard expansion. Project also includes replacement of the 115/41.8-kV transformer, a bank of 41.8-kV shunt capacitors, the control building, control panels and communication equipment. A second 115-kV capacitor bank will also be added.

Killdeer-to-Charlie Creek 115-kV rebuild: Replacement of the transmission line within the existing right of way with larger conductor and taller structures.

Martin Stage 07: Replacement of the 115/69-kV transformer, the majority of the 115-kV equipment and the station service.
Summarizing 2020 hydrology conditions

Editor’s note: The following report summarizes data from WAPA’s Hydropower Conditions webpage for straight power purchase costs, which are based solely upon hydrology, actual hydropower generation and related generation shortages. Readers may review all data by visiting wapa.gov, Power Marketing, Hydropower Conditions.

One of the biggest challenges for hydropower is water variability due to intermittent drought and flooding. By definition, hydropower needs water to generate electricity. Without it, WAPA must buy power on the open market from other sources to meet contractual obligations to its customers. This is referred to as purchased power.

In an ideal year, snowpack around the West is average or above average, yielding snowmelt runoff to recharge reservoirs behind the dams and powerplants that provide the power WAPA markets. Federal dam owners such as the Bureau of Reclamation, the Army Corps of Engineers and the International Boundary and Water Commission move water to federal hydroelectric powerplants.

WAPA markets the subsequent power generated to around 700 preference customers. Its customers, in turn, sell that power to more than 40 million Americans.

Water around WAPA in 2020

WAPA’s actual generation was 100.3% of average in water year 2020, for a total generation of 26,985 gigawatt-hours. For the same period, total purchased power was 2,124 GWh with actual purchase power expenses of $65,959,195 equating to $31.06 per megawatt-hour.

The Colorado River Storage Project Management Center projected most probable purchase power expenses for water year 2020 to be $14,195,307. Actual purchase power expenses were $16,259,069. The cost per MWh was $28.63.

Lake Powell ended the water year with an elevation of 3,596 feet, which is about 104 feet below the maximum reservoir level and 106 feet above the minimum generation level. The storage volume for Lake Powell was 11.4 million acre-feet at the end of September, or about 46% of capacity. Drought conditions persist in the Upper Colorado River Basin with below-average annual inflow forecasted.
for Lake Powell again in water year 2021. Currently 9.0 MAF is the forecasted annual release for WY 2021, but it could be reduced as low as 8.23 MAF.

Desert Southwest’s hydrology is mostly dependent on the Colorado River Basin snowpack and precipitation above Lake Powell. Precipitation was 36% of average at the end of September. The region’s most probable projected purchase power expenses were $21,308,920. Actual purchase power expenses were higher at $22,548,678, with a cost per MWh of $54.00. Lake Mead ended the water year with an elevation of 1,083 feet, about 136 feet below the full storage level and 133 feet above the minimum generation level. Lake Mead’s elevation peaked at 1,099 feet in March.

In Rocky Mountain, at the end of September, reservoir inflows were 66% of average and storage was 107% of average. The projected purchase power expenses were $10,116,670, but actual purchase power expenses were higher at $14,480,376. The cost per MWh was $32.37.

Sierra Nevada ended the water year with 97% of the 15-year average reservoir storage for Trinity, 91% for Shasta, 92% for Folsom and 112% percent for New Melones. Accumulated inflow for the same date was 39% of the 15-year average for Trinity, 63% for Shasta, 57% for Folsom and 60% for New Melones. The region began water year 2019 with a most probable projection of purchase power of $3,130,909 but ended with an actual expense of $7,662,135. The cost per MWh was $15.39.

Much of the Upper Great Plains service area is experiencing moderate drought conditions and small areas in South Dakota and Montana are experiencing extreme drought. The Missouri River basin ended the water year with runoff of 24,400 MAF, or 105% of average. System storage is 57.8 MAF. About 89% of the designated flood control storage is available to store runoff from mountain snowmelt and spring and summer rainfall events. The region’s most probable projection for purchase power was $8,715,786. Actual purchase power expenses were significantly lower at $5,008,937. The cost per MWh was $25.97.

**Anticipating water year 2021**

The Seasonal Drought Outlook provided by the National Weather Service’s Climate Prediction Center in November 2020 predicted persistent drought throughout most of the western United States. Significant drought development is also predicted in states such as Texas, Oklahoma, Kansas and areas of Southern California.

The predictions also show drought conditions improving in the northwest and northeast. Drought development is anticipated in the southeast.

The NWS emphasized that its predictions are made in accordance with large-scale trends, which are based on “subjectively derived probabilities guided by short-and long-range statistical and dynamical forecasts.” They emphasize caution and regular checking of updated drought predictions.

**For more information…**

Visit the National Weather Service’s Climate Prediction Center at [cpc.ncep.noaa.gov](http://cpc.ncep.noaa.gov)