National Center for Environmental Conflict Resolution
Udall Foundation

Summary Report: Drought & Energy Dialogues

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WESTERN AREA POWER ADMINISTRATION
IN PARTNERSHIP WITH THE BUREAU OF RECLAMATION

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1.0 Opening Remarks

The National Center for Environmental Conflict Resolution (National Center) facilitated the Drought and Energy Dialogue Session meetings for the Department of Energy's (DOE) Western Area Power Administration (WAPA) and the Department of Interior's (DOI) Bureau of Reclamation (Reclamation) in person in Phoenix, Arizona on November 2nd, and Lakewood, Colorado on November 9th. Seth Cohen (National Center) provided an overview of the Agenda (see Appendix A) and led introductions (see Appendix B for a list of meeting participants). During the introductions, many attendees shared what they hoped to get out of the sessions[1]. Customer objectives, included:

- learn more about nexus between water and power
- leave with a big picture understanding of the state of the drought
- network with other customers
- discuss alternative renewable energy sources
- better understand Tribal contributions
- learn more about energy side of issues (including hydro generation)
- understand what possible options exit to maintain rates and supply
- gain clarity on possible long-term solutions
- understand how Reclamation and WAPA can effectively work together to set expectations
- preserve valuable resources and come up with collective solutions
- understand and share perspectives across the power customer base, as one united basin hear/learn new perspectives.

A diversity of opinions and perspectives were welcomed and encouraged throughout both sessions.

1.1 Welcome from WAPA

Administrator and Chief Executive Officer, Tracey LeBeau, thanked everyone for talking the time to gather in-person for this important topic. She described these dialogue sessions as an opportunity to explore ideas and engage in informal dialogue around short and long-term power issues in this era of drought for the Colorado River Basin.

The current hydrology situation quickly escalated in 2021 and the agency has had to act fast and plan for how WAPA will respond to current and predicted conditions. WAPA has dealt with drought before, but not to this extent. WAPA can look back to how they worked with drought challenges in the past, but new technology has emerged. With respect to Glen Canyon, Rodney Bailey, Senior Vice President, and Colorado River Storage Project Manager, has worked collaboratively with Colorado River Storage Project (CRSP) customers to get short term rates into place. Now, the agency wants to identify long term ideas and approaches for dealing with impacts of the drought. WAPA's intent is to start these "Drought and Energy Dialogue Sessions" with CRSP and Desert Southwest (DSW) customers and see if this model of engagement can be successful for problem-solving in other WAPA service areas.[2]

[1]Fewer customers attended the Lakewood session and as a result, all discussion occurred as one-group in plenary style. Power customers had the opportunity to share what they hoped to get out of the discussions.

[2] Administrator LeBeau had worked with the National Center on other initiatives and felt it would be beneficial to have them provide neutral third-party facilitation to allow the agencies to focus on engaging in dialogue. WAPA partnered with the National Center to conduct a Situation Assessment of critical customer issues for the dialogue

Administrator LeBeau hopes these dialogues will give the agencies a good sense of the breadth and depth of power customer's concerns and help to guide WAPA and Reclamation on how to best focus their efforts to address hydropower and transmission challenges. Administrator LeBeau noted that she had the opportunity to sit down with Senate energy staff and they are very supportive of this "dialogue engagement" initiative. The results of this meeting will be reported out to Hill staff by WAPA leadership.

1.2 Welcome from DOE

David Turk, Deputy Secretary of the DOE spoke to the power customers via a pre-recorded video. He shared that DOE looks forward to learning what ideas emerge from these sessions, and he noted some potential opportunities with the large amount of national funding allocated for infrastructure projects.

2.0 Discussion Overview

The National Center presented the preliminary results from a Situation Assessment they conducted this Fall with approximately 25 diverse customers from within the CRSP and DSW regions. The assessment aimed to get a cross-section of experiences, priorities, and concerns that would help to identify current customer priorities and concerns. The Dialogue Session discussion topics that follow were informed by the core themes the customers spoke to during the assessment interviews. WAPA and the National Center agreed to circulate the presentation for customer use (see Appendix C).

2.1 Agency Remarks: Western Area Power Administration

At the Dialogue Session in Phoenix Jack Murray, Regional Manager for DSW, provided some opening remarks on behalf of WAPA and spoke to some of the drought realities on the Lower Colorado River Basin. Rodney built on Jack's remarks and spoke to what is going on in the Upper Colorado River Basin. Jack and Rodney started working for WAPA 20 plus years ago when there was an excess of power generation. Today the agency finds itself in a very different situation.

Below are some current realities and challenges for the Upper and Lower Colorado River Basins:

- In fiscal year 2023, WAPA forecasts shortfalls in hydrology that will drive them to purchase 12% or 165 GWh of their energy on the open market. That amounts to 22 million dollars to fulfil statutory requirement under contracts. The cost for Reclamation to operate dams is about 17 million.
    - It now costs more to purchase power for the project than to operate it, and that's only with 12% purchases.
- In the Lower Colorado River Basin, Hoover is "run of the river." The customer is allocated whatever comes out of the generating units. Therefore, when there is less generation, the per unit cost increases and customers can replace lost power on their own.
- There is a 20% reduction in power because of the hydrology situation. While WAPA manages to flatline out costs, the agency is trying to find sources to keep costs down. However, rates have still increased by 24% because less units are being reproduced.
- Considering replacement power purchases, lost renewable energy certificates, resource adequacy, greenhouse gas impacts for California customers, and lost ancillary services, WAPA is forecasting the drought will cost Hoover power customers $939 million over the next 9 years.

sessions. Bureau of Reclamation's Commissioner, Camile Touton, also believed supported the approach and key personnel from Reclamation have partnered with WAPA in this effort.

- For fiscal year 2022 the Salt Lake City Area integrated projects provided about 65% of allocations (with similar projections for 2023). To provide 100% of allocations, WAPA would need to make approximately $162 million in purchase power. That is not sustainable, and it also puts a heavy strain on the reliability of the grid.
- Last year the Colorado River Storage Project implemented an emergency rate. Under this plan, they deliver what they generate[3].

Jack and Rodney lamented that that about three years has passed since they have been able to gather as a group like this for an in-person engagement. They were happy to see that the meeting attendees represented the geographic diversity of the basin. The idea behind the Drought and Energy Dialogue Sessions only works if everyone is willing to engage. WAPA wants to have this dialogue to understand what is important to customers.

2.2 Agency Remarks: Bureau of Reclamation

Katrina Grantz, Deputy Regional Director of the Upper Colorado River Basin, provided opening remarks on behalf of Reclamation at the November 2nd session and Nick Williams, Power Manager, and David Arend, Deputy Regional Director for the Lower Colorado River Basin, spoke at the November 9th session. April 2022 is the lowest they have seen Lake Powel since the late 1960s. Energy generation is the lowest it has been since 1965 (when the resource first came online). In Spring 2023, Reclamation expects to see a reservoir level 5-10 feet lower than what we saw this year. They reviewed the key actions Reclamation has taken to combat drought and shared some exciting opportunities. These included:

- Receiving funding from the Bipartisan Infrastructure Law and the Inflation Reduction Act.
    - Greater water conservation will benefit hydropower users.
    - They continue to protect critical allocations in Lake Powell and Lake Mead so hydropower can be generated.
- Coordinating closely with WAPA and ad-hoc Work Groups to focus on drought and related climate impact (ex: the Upper Colorado River Basin participates in ad-hoc work groups focused on drought set up by Power Customers).
- Deciding to keep 480,000-acre feet in Lake Powell to protect Glen Canyon Dam's minimum power pool and through Drought Response Operating Agreement, an additional 661 kaf (161kaf in '21 and 500kaf in '22) will also be added to Lake Powell).
- Reducing their budgets primarily by rescheduling projects to try to lessen the rate impact.

Reclamation acknowledges there could be some short-term reductions in energy because less water will flow through the Turbines, but it should help to avoid a catastrophic crash in their Energy production (MWh) and likely stabilize and maybe even increase Capacity (MW). Reclamation considers the power component in every decision it makes on basin issues. They are doing everything possible to prevent the reservoirs from reaching dead pool.

[3]WAPA recognizes that just because power customers aren't getting more energy from the agencies, it doesn't mean they don't need that energy. Either the agencies purchase replacement power on the market on behalf of the customers or customers replace that energy themselves. WAPA sets rates through the Federal regulation process and contracts memorialize how that power is delivered.

Reclamation acknowledged the importance of working together across the larger region and treating the upper and lower basin as one united basin. Reclamation is thinking about these issues and working to find creative and collaborative solutions from the local level to the Washington, D.C. level. Climate change has shown everyone that we will likely have less water than we have experienced in the past.

Reclamation knows there is a desire for better forecasting for hydropower production, but there are so many variables that this is very challenging. What they can do, for now, is run a range of scenarios and strategize how they would operate under different conditions. It is important for customers to have a base level understanding of the hydrology and recognize the legal structure of how decisions are made. Reclamation shares how much water will be delivered in its reports. If Reclamation continues to supply water as written in the Colorado River Compact, there will not be sufficient water for the multiple needs of the basin.[4]

2.3 Discussion Framework

The November 2nd and November 9th discussions were organized around five central themes: (i) assets; (ii) products/services; (iii) funding and rates; (iv) education and communication; and (v) and general ideas and concerns. Discussion of these topics often over-lapped due to the interconnected nature of key topics. Several sub-themes are highlighted in the summary below, including transmission, replacement power, alternative energy, generation, impact to agriculture sector, and impact to Native Nations. For brevity, we have combined similar comments and distilled requests or personal anecdotes into bullet points that convey recommendations, questions, and concerns. We have removed attribution to the comments and questions to maintain the anonymity of the contributing customers.

3.0 Discussion Topic: Assets

The first discussion topic focused on the challenges of maintaining agency assets, such as the facilities at Hoover and Glen Canyon Dam. Reclamation and WAPA shared that there will be a requirement to maintain critical infrastructure and systems during years of less generation and/or no generation. WAPA and Reclamation asked customers to share how this work should be prioritized and what should be considered. The Customers expressed a variety of concerns, priorities, and potential actions for consideration:

- Extraordinary maintenance is required on Hoover Dam.
- Agencies should discuss strategic maintenance and prioritization with customers.
- Customers would like to see agencies prioritize capital investments that enable long-term benefits.
- There is interest in understanding what must be done to keep infrastructure from falling into disrepair.
    - Customers would like to see another supporting funding source for maintaining assets - other than just raising rates.
- Customers are concerned that Federal hydropower allocations are reducing but fixed costs remain unchanged.

[4] There are a lot of different water interests and demands and some decisions are beyond Reclamation's control. The supplemental Environmental Impact Statement is a placeholder until the 2026 guidelines are established.

    - Given that power customers are funding environmental programs, can agencies explore studies/efforts that benefit hydropower generation or strike a better balance between environmental and hydropower needs?
- There is an interest in exploring solutions now (regarding operations & maintenance costs) so in the future customers are not forced to pay for something they are not receiving value from.
    - Agency personnel shared that while hydropower customers paid for the Hoover dam visitor center, the profits from this center helped pay down their power rates.
    - Is there an option to use Federal funding to replace current technology with new technology so electricity can be generated at lower water levels?
        - Not sustainable to pass big infrastructure investment onto the customer. Outside capital investments are needed long term.
        - What investments are made in the infrastructure depends on who is paying for them.
    - Can agencies consider conducting a risk assessment on current infrastructure?
- Mixed opinions on "mothballing hydro plants." Might be good to preserve in case water returns.
    - Ensure any furloughed facilities can be "resurrected" in future years.
    - Agency representative shared they think mothballing assets is premature.

3.1 Transmission

WAPA requested customer ideas on how to best manage/allocate its transmission assets and available capacity. Customers shared the following:

- Important to maintain the functionality of the transmission system.
- Consider cost allocation tradeoffs between transmission and generation.
    - Stranded cost of generation is moving to the cost of transmission.
- Transmission should be reserved for WAPA customers first.
- If the dams aren't replacing power, customers want to maintain access to the transmission system.
- The drought has driven up power rates, causing some customers to "off stream" somewhere else. This will come with some serious financial hardships.
    - Drought is making it harder for customers to move power and transmission.
- Underutilized transmission results in non-optimal generation.
- There is "clogging" of the transmission system for some Utah customers, what are possible solutions?
- WAPA should be more proactive in dealing with Federal Energy Regulatory Commission (FERC), in part to help stop volatility and limit price hikes and resolve transmission queue challenges.
- Options to get the best value from transmission; (i) market it at the highest possible price; (ii) find replacement resources and use transmission to deliver that resource; and (iii) bring replacement in from west and utilize transmission from takers in the East.
- For CRSP customers, WAPA can make transmission available at the customer's request[5].
- Recommendation to aggregate carbon free resources and continue to use existing transmission system. The larger the scale the easier to opt-in.

[5] This is due in part to the decreased hydropower delivery.

- Request for specific short- and long-term planning on WAPA transmission usage and energy solutions.
    - Short-term: solar + battery, wide head turbine optimization, and replacement power
    - Long-term: nuclear, pump storage, bypass resource shuffling, other low hydropower generation, and cooperative exchange of hydro, thermals, and renewables between customers and states.
- Transmission will be more expensive if it's not on WAPA system. Interest in alternative energy project that would still use WAPA's transmission system.
- Displacement agreements may help to ease transmission constraints.
- Request that agencies conduct a transmission study and look for opportunities.
- It's hard for utilities to develop projects if they don't know where WAPA transmission lines are.
    - The agencies might be more interested in people who are already building projects than sharing the transmission information.
        - An Agency representative inquired about investigating the interconnection request in the queue. A customer shared that people in the queue are not Tribes, or other customers, but most likely are independent power producers.
        - A customer who represents Tribes stated that Tribes will want to develop the projects that are on their own Tribal land, but generally Tribes are not interested in open leases. Most Tribal nations have small loads, so it's a wholesale exchange. This doesn't have to go through interconnection process.
- Is there data on transmission utilization rates?
    - Response: Projections are complicated, but the agencies do have data on transmission usage.
- Interest in taking advantage of transmission through a PPA scenario.
- Can a customer buy someone else's wind or solar energy and use the WAPA transmission system?
    - Response: That is an option, but WAPA is nervous about oversubscribing, that's the balance they are trying to strike.
- Is WAPA looking into Western Energy imbalance market (WEIM)?
    - Response: WAPA is exploring SPP. Benefits from joining SPP allows us to find power in other parts and benefits outweigh the costs.
- Joining Regional Transmission Organizations (RTOs) expands the transmission system, and for some customers that increases the value of their relationship with WAPA.

4.0 Discussion Topic: Products/Services

WAPA and Reclamation asked customers to share ideas on replacement power, new power or transmission services, or changes to existing services, that the agencies might consider during an extended drought. Customers expressed a variety of concerns, priorities, and potential actions for consideration:

- Protect resource adequacy[6].
- Borrow best projects from one region and apply to others.

[6] WAPA is already heavily involved in the Western Resource Adequacy Program, which is a resource adequacy sharing group.

- Augment water in basin.
    - One customer suggested cloud seeding as a potential consideration for improving drought conditions in the basin.
        - There was discussion that it is hard to prove the effectiveness of this practice, one customer has been exploring this option with mixed success.
- The agencies may consider exploring projects that capture excess water and desalinize brackish or salt water.
- Develop the ancillary services market.
- There were suggestions that WAPA and customers optimize energy efficiency (ex: customers who have more flexibility with their resources could make decisions that help the larger community, and a robust rate structure could incentivize charging electric vehicles overnight).
    - Relieve restrictions on output of units.
    - Hoover is more flexible; can they get more generation out in summer months?
    - Can the lake level at Mojave be reevaluated to see if it can generate more during summer?
    - There is potential to conserve energy if laws and regulations could be tweaked. Currently there is no incentive for power customers to engage in energy efficiency. If WAPA enforced those requirements, and have utilities create conservation programs, this could be very impactful.
        - Can WAPA work with Bonneville Power Administration (BPA) to learn more about their study? Explore possibility of enforcing energy efficiency requirements and have utilities create conservation programs.
        - A participant shared that Tribes have huge energy efficiency block grants.
- A customer found it find it helpful that CAISO and nearby utilities are transparent with their data. There were big calls for utilities to conserve energy; we could see our conservation was contributing to staying online.
- There will need to be energy audits --Everything from commercial to residential--can agencies develop program and utilize funds?
- Consider a “sleeve arrangement”
- Reclamation shared that there are constraints on WAPA’s actions due to times of the day when there is no water flowing. When water is flowing, the agency has more flexibility but there are still sideboards on what the agencies can do.
- Agencies are in the process of developing a Request for Proposals (RFP) to explore what other power sources are out there that can help get through the drought.

4.1 Replacement Power

- Encourage the exploration of hydropower coupled with other renewable resources (solar, wind, gas, and thermal). [7]
    - Solar energy + battery + hydropower seems to be a promising option.
    - A customer shared that they are representing an entity that is building a large wind project with transmission lines. They addressed the other customers and encouraged them to consider changing how they are generating energy and mixing it with another resource. They could “backfill it” with hydro generated from the dams that you can use

[7] Congressional action would be needed for WAPA to expand its mission and explore new projects.

like a battery. The customer noted the intermittent nature of wind and the opportunity to support that with hydro.
    - Reclamation staff shared that they have a certain limited amount of water to move and work with WAPA to move that water within a 24-hour period. Water levels and hydropower availability is nothing like it was in the early 1980s, for example, when they could easily generate power based on demand. This may be on obstacle to "backfilling" with hydropower.
- Joint projects do not necessarily need to be co-located. Regional diversity can allow wind to complement solar when needed (or vice versa). Resources can be mixed. One participant shared they are using old coals lines for wind transportation.
- Replacement generation could use some of the existing infrastructure to provide power.
- Expand CRSP "replacement power committee" to other Colorado River Basin customers (presumably smaller entities) interested in exploring alternative energy projects with the agencies.
    - Alignment needed between Reclamation, Congress, and constituents, and Native Nations.
- Determine how much replacement power is needed and when. This will help customers "come to the table" with ideas and proposed solutions.
    - Can agencies aggregate data from customers on hydropower replacement to better inform a discussion about resource disparity.
- Integrate small, new hydropower (Ex: in-line).
- Translate hypothetical impact to customer if outside developer helped build new generation:
    - How could WAPA be a "partial partner"?
    - What role could a state agency play?
- How would adding additional resources impact rates?
- WAPA can identify Bureau Land Management (BLM) land or other opportunities and help customers come together for a larger contract (which may have more value than a smaller project).
    - There is no one central organization aggregating those needs. WAPA understands the regional nuisances.
    - Whatever is looked at - must be reliable and dispatchable.
- Storage capacity is a big priority.
- Aggregating contracts would leverage scalability.
    - Smaller projects still have value in their own right.
- Recommendation to form a joint action committee that could work with WAPA to develop a project and streamline the process (ex: circumvent the contract complexities & supply chain challenges).
- WAPA staff shared that this discussion on alternative ideas is useful for agencies because their first reaction is to give "but....no" answers to many of these ideas. Agencies and customers hope to get past the tendency to dismiss what seems unlikely by thinking outside the box. The agencies want to explore how they can have more flexibility, which includes exploring how to change the structures to make change happen.

5.0 Discussion Topic: Funding and Rates

Funding and rates issues were raised throughout the day. The dialogue sessions also provided some dedicated time to discuss ideas and concerns. Agency staff asked customers for their input on how operations might be funded during an extended drought. Participants and agency staff also discussed rates impacts to identify what is critical in the event of prolonged drought (e.g., predictability? stability?)

5.1 Rates

- There has been some discussion between customers about walking away from the contracts as they are becoming very expensive. One customer shared they are not willing to pay more than $83/megawatt.
- Hydropower is now more expensive than solar and wind. Some customers have green energy goals, and the price hikes are making it harder to meet those goals.
    - It's painful for small utilities.
    - Rate increased force utility to raise rates to their end users.
    - Small, rapid rate increases wreak havoc on customer's budgets. Predictability helps customers plan and manage their budgets.
    - Several Arizona power customers have had to implement three rate increases in last three months.
- WAPA shared that there are off-ramps during the agreement if the cost becomes prohibitive for customers.
- If some utilities are forced to buy on the market for a 6-month period, they would go out of business.
- Some Irrigation customers are close to walking away from their contracts and other customers may soon follow suit.
- Opportunity for further alignment/coordination on how customers set up their rates.
- CRSP transmission rate appear artificially low because of the denominator used. There is a preference to use the Sustainable Hydropower (SHP) as the rate denominator.
- Unbundle rates for CRSP and DSW.

5.2 Funding

- WAPA has no subsidies for replacement power options
- Funding considerations differ from region to region within WAPA. DSW can take advances from customers. CRSP customers don't do that. Advances could be used fund operations.
- Request to explore low interest loans from any source to help lower cost on customers.
- Appreciate WAPA helping with renewable energy certificate program.
- External funding sources should be explored to help support power customers. If customers don't seek this money out to support the agencies, then no one will.
- Reimbursable funding over many years or non-reimbursable drought funding is needed.
- Really having to look carefully at how useful contracts are; there are other alternatives that may be more flexible or cost efficient.
- Can Reclamation use some of their new funding to support hydropower customers directly?
    - Response: Reclamation shared that there are two pieces of bill funding. One is on the WaterSMART program and the other side is aging infrastructure.

    - Explore if there are opportunities for new Reclamation funding channeled into hydropower opportunities.
- Billions of dollars and thousands of jobs being created but not as many assigned to hydropower specific issues.
- Agency representative suggested trying to untangle the decision-making process for how funding is decided, and more clearly determine and communicate who is "driving the bus" on decision making processes related to funding.
- Some customers raised the suggestion to that the Federal government revisit "supplementing irrigation projects." If everyone had to actually pay for the price of water, it would reduce their usage.
- Customer expressed concern that the funding avenues explored are reimbursable and suggesting exploring non-reimbursable funding avenues.
    - WAPA noted that in the current state, anything non-reimbursable comes out of basin fund. If they wanted an additional funding pool, there would have to be appropriated additional funding, so it doesn't impact the basin fund.
- Can agencies provide data and conduct studies to help customers make claim to Congress as to why they need non-reimbursable funding to help mitigate the drought and support WAPA's transmission system? The data should project out future expected drought conditions and illustrate what is the right amount of funding needed and why? (May consider how to make up for 35% revenue loss?)
    - Can agencies prepare a sample budget for a situation where there is no hydropower?
        - Customers can then use that budget to make a pitch to Congress for non-reimbursable.
- There was a request for customer power replacement costs to be incorporated into WAPA's statistics on power replacement costs to paint a more realistic picture of much supplemental energy is being purchased.
- The importance of reliability-- Dispatchable resources are key to reliability.
    - Customers also value stability and consistency.
- Recommendation to create an annual equipment replacement fund or a onetime expense fund. The one-time fund might support bigger purchases turbines that can generate power at lower water levels.
- Use emergency funding to buy down capital costs of projects. (Hoover already has one of these.)
- Some uncertainty around feasibility of bank stabilization program — could be worth exploring "banking" summer power.
- Can customers be provided a credit option in the form of an interest rate?
- Need to discover efficiencies in water releases across the whole basin[8].
- WAPA must maintain the asset because the hope is that someday there will be water again. A minimum funding level should be identified.
- Could we shift in charging for the actual water? (Not just for the costs of delivery, etc.). Right now, power payments cover a share of what water users can't pay.
- Power Purchase Agreement (PPA)s—what could that look like from the perspective of a power customer?

[8] Old decrees govern the movement of water, so WAPA & Reclamation can't really fine tune releases.

- Understand whether customers really could move their use to non-peak hours?
    - High value placed on summer peaking.
    - Customers would use fewer peak hours if they were priced separately.
    - WAPA should consider developing a varying price mechanism that reflects the tradeoffs of production during peak times.
    - Establish two or three different rates, including a "needle peak" during the time of day that solar drops off
- Explore seasonal pricing: contracts are split and have differences prices based on summer versus winter.
- Explore if funding opportunities through DOE
- If two states want to conduct a study, could MOA2 funds be used to pay for a study?[9]
    - Response: MOIA2 funds belong to states, if states wanted to come together, they could pay for a study. Those funds are to do water projects, so Reclamation would need to determine if funds could be spent that way. MOIA2 funds are spent on water type upgrades.

6.0 Discussion Topic: Education and Communication

Throughout the dialogues the agencies were interested in in learning how all parties (agencies and customers) can better communicate drought-related impacts to hydropower and share information with one another, with their constituents, and with policymakers at the state and national levels.

- Request for stronger coordination between Federal government agencies.
- Current drought situation is a "slow emergency"—how can the worst-case scenario be effectively communicated to the public?
    - Customers understand that forecasting is very difficult and that predictions cannot be guaranteed, but believe if various partners work together, they can come up with an educated guess.
    - We have a slow-moving crisis, not a whole lot of momentum to do radical thinking. We are not communicating to our stakeholders as if we are in crisis mode.
    - Can the customers come together and ask for Congressional support with short term and long-term solutions?
- Bridge the disconnect that exists between water and power. There is lack of understanding by many of the nexus between them[10]
- Share information with customers of all size (ensure smaller entities receive information directly from agency personnel).
- Request for Reclamation to produce analytical graphics that shows hydropower projections.
    - Customers would like to see more forecasting information (even if not optimistic).
- Conduct assessment on drought impact analysis for all the WAPA projects not just the DSW region.

[9] Upper Colorado River Basin Fund Memorandum of Agreement 2 (MOA2) or sometimes called CRSP MOA2, which is funded from power revenues.

[10] This concerned was raised multiple times throughout the group's discussion.

- The customer would like the agencies to understand the importance of grid reliability and the potential impacts it can have on a community when grid reliability is compromised.
- Recognize the impacts of the water supply and quality on rural communities and Native Nations.
- Request to develop some type of education document teaching the importance of reliability/dispatchable generation to congressional leadership, state leadership, and the average customer. This document should speak to grid collapse and what it takes to bring energy back on.
- Is it possible to report out the minimum lake levels and power expectations and restructure allocations based on the current realities?
    - This could lead to push back from priority use customers.
    - The states need to hear and understand the constrained water limitations.
        - There could be better communication to states. (Ex: to save the dams we will have to do "x" more than we have done in the past.)
- Emergency information needs to continue to be provided to states.
- Municipalities need clear message on what WAPA and Reclamation need; clear talking points to lobby and convey these points to decision makers
- Power is very expensive, the cost of everything is going up. Inflation is very important, and building materials are needed need to develop these assets.
- Agency representative shared it would be good stop making assumptions about what customers will accept and encouraged customers to stop making assumptions about what agencies can't do.
- There should be more ongoing conversations (via phone or in-person).
    - That's what the Energy Planning and Management Program is supposed to be; it should be an opportunity to talk about goals.
        - There is a feeling among some customers that the agencies are not reading their Integrated Resource Plans since they do not get feedback on them.
- If WAPA is doing that much purchasing for their customers, why not develop a project that would fill those loads?
    - Response: WAPA staff are spread thin, and it takes a lot of time to work with a developer. WAPA will need new authorities and legislation to see this through. Some customers have pushed back against this idea and don't want to be forced to pay higher prices if water comes back. WAPA is trying to facilitate this discussion as much as they can.
    - Consider creating a smaller sub-group to communicate out to the public. Agency needs to create sense of urgency; might get some different ideas and thought processes.
    - There are patchwork groups, but communication is lacking outside the "family."
- WAPA shared that part of the reason we had this dialogue session because communication is happening in siloed bits.
- WAPA customers have a lot of sway in Washington, and they should be making their voices heard on these issues.

7.0 General Discussion (Customer Experiences)

WAPA and Reclamation asked the customers to share what they are experiencing that the agencies may not see, or understand, about how the drought is impacting them and their respective communities or customers. Customers expressed a variety of concerns, priorities, and potential actions for consideration around key topics, including generation, renewables, impacts to agriculture, and impacts to Tribal Nations. The discussions also provided an opportunity for Q&A on key issues like operations and maintenance issues for Hoover and Glen Canyon dams.

7.1 Alternative Energy/Renewables

- Customers seek more clarity on the Federal government's focus on renewables and carbon free resources.
- Customer requested more flexibility on renewable energy credits.
- Communities will face rolling blackouts—this is an energy crisis. All alternative resources should be examined for their potential.
- Customers should have the choice to opt in or out of alternative energy projects. Those who opt out should have no financial obligation to contribute.
- Modular nuclear - permitting still seems to be quite a hurdle.
- "Old, big" hydropower does not count as carbon pollution-free electricity; therefore, it could not be purchased to help the Federal government meet their renewable energy goals.
    - Can WAPA and Reclamation communicate on this matter with Federal colleagues?

7.2 Generation

- Zero generation shouldn't even be a possibility for the two lower dams.
- Do the agencies have contingency plans for smaller municipalities if lakes reach dead pool?
- If Hoover Dam "goes to zero," can customers walk away from their contracts?
- How does the administrative process of managing lake levels dovetail with the supplemental Environmental Impact Statement for December 2007 record of decision entitled "Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead"
    - Response: Both agencies are working closely together on this.
    - Request for agencies to continue to work together and share information as it becomes available.
- This customer was specifically interested in Hoover and wondered if Reclamation would be able to project further out than 5 years. Is there a plan to conduct a cost benefit analysis for replacing turbines? If in next year they head into "level 3" potential shortage, what would be the impact?
    - Response: It's hard to come up with long term projections. Ten years ago, they would not have predicted the system would be in this situation today. The projections Reclamation develops assume or describe a certain outcome if the agency did not take any further action. The further out they project, the worse the future looks. However, the agencies have actions they plan to take to help avoid their projections from becoming reality.

    - They have five low head turbines in use now. The agency did a cost benefit analysis when lake was higher to see if more turbines were needed. Reclamation is now conducting a study to examine if the results would be different as lake levels go down.
    - Reclamation is doing what they can to prevent the lakes from reaching minimum power pool and noted that they are asking several Colorado River Basin states to help with water reductions. The Secretary of Interior has the authority to make decisions on water level and needs and can make cuts if the states do not.
    - Agency staff shared that Yuma, Arizona, is sort of a good proxy for the agencies in making short term projections. If it rains in Yuma, they will take less water, allowing agencies to stop releases.
    - Generation is based on water demands (not market demand). There is some wiggle room because they can ramp up generation from those sources in an emergency power situation. This helps power customers because they are getting the benefit from this excess energy induced by the emergency situation playing out elsewhere.
    - If the power prices are high, then they won't generate power.
- Have any calculations been done to quantify the loss of generation at Hoover?
    - Response: WAPA conducted a study and looked at replacement power cost, it came out to roughly $900 million.
    - Hoover's capacity is down by about 35% from full capacity and every half foot change Reclamation recalculates what their capacity is.
    - The lower the water levels go; the wall of the dam becomes steeper and closer. The impacts are amplified because of the dam shape. (Agency staff provided the analogy that the dam is similarly shaped to a martini glass)
- Within the system everything is a question of tradeoffs—what is the preference from a hydropower standpoint?
    - Response: Power is generated based on allocated water orders (deliveries based on the Colorado River Compact). If the lake lowers and generates power at a lower amount, then there is potential damage to turbines (and the process is less efficient). It is advantageous to keep the lake levels propped up.

7.3 Impacts to agriculture sector

- Buying farmers out as an effort to increase lake elevations for generation needs. Lower Basin provides funding for Upper Basin.
    - There is some concern that the lack of water will directly impact the national fruit and vegetable supply since the country relies on states with warmer climates (such as Arizona) to grow crops year-round.
- Losing hydropower has impacts on the agricultural sector:
    - More farmland lays fallow.
    - Power needs increase because more water is needed to pump groundwater.
    - Community is also doubly hit by higher prices of labor, chemicals, fertilizer, etc.[11].
- Urban sprawl has increased power demand.

[11] Commodity prices and inflation were brought up multiple times and put additional financial burdens on power customers.

- In addition to increased population, some communities want to develop industry, which will only further increase the demand for energy.

- Reclamation shared that a current short term drought fix is encouraging farmers to leave their fields fallow to help raise lake levels. There could be some sort of a long-term component to this where costs are shared. However, the reality is it will be hard to "conserve our way out of the crisis."

7.4 Impacts to Native Nations

- A representative from the Navajo Nation's tribal utility encouraged the agencies to look at the Colorado River Basin system as whole rather than by Upper and Lower Colorado River Basin. Both regions play an integral part in driving economies. The Navajo Nation has had some of its rights recognized, but all water rights have not yet been realized. As the Navajo Nation starts securing its rights, the region will see the impacts of that.
  - There are roughly 14,00 families (approximately 40,000 people) living on the Navajo Nation with no access to power or water. This utility's main objective is to provide services to those families. They received some new funding to help make this happen, but the utility is concerned because the supply of hydropower is decreasing. The current drought conditions will only exacerbate their ability to serve this population.
- A customer shared that Tribal impacts are felt more through revenue loss rather than water loss (due to Tribal water rights).
  - One representative shared they have seen a 50% reduction in revenue just last year.
- Agencies should seek to strengthen their communication efforts with Native American communities to increase understanding of benefits crediting arrangements.
  - Tribal benefits have been decreasing.
  - Each case is unique.
  - An agency representative shared that staffing is a challenge right now, but Tribal contracting is of high importance.
- Opportunity for Federal agencies and Tribes to work together as the Federal government needs clean energy and Native Nations need an energy buyer. The price of power would be lower than what you purchase on the market. Through tax credits customers can more affordably build renewables. If they build renewable energy projects on Tribal lands, there are more associated benefits.
- Can agencies suspend power allocations to Tribes if it would be mutually beneficial to both parties?
  - Response: WAPA personnel shared that benefit-crediting agreements are set to expire shortly, and they will need to start the process to re-negotiate the terms.

7.5 Miscellaneous Issues

- Calling the current situation, a "drought," implies the hydrology situation is temporary. There needs to be a *new plan*. WAPA should discuss what needs to change within its statutory authorities. (Example of a starting point could be a 5-year strategic operations plan)
- There are tough decisions ahead about how to spread drought impacts between states and manage different priorities.
  - Concerned about the possibility of "water wars"; there is need for water orders.

- Important to remember the diverse range of power customers in the basin (different % of hydropower and needs).
    - Many customers want a diverse portfolio and as many utilities transition away from greenhouse gasses, hydropower becomes more important.
- A lot of fossil fuel plants were taken offline, and prices have increased on the market because of the limited supply of available power. Customers are competing with WAPA for the same energy on the market.
- A customer shared that the drought has led to a 300% price increase on retail load.
- There was recognition of the importance of hydropower in emergency situations (black start capability)
- A customer expressed that when California has emergencies, it calls upon Glen Canyon Dam.
    - The customer was frustrated because they feel they too desperately needed water, and while they were compensated financially, they need the water more than the money.
- A customer suggested that depending on what 2026 operations look like, there is an opportunity to decouple operations from water management to provide a true, clean accounting of water. This could give Reclamation a lot more flexibility to generate the best they can with the water they have. They can use accounting to do this versus wet water so operations can drive those instead of water.

8.0 Final Reflections and Next Steps

Customers:

- Agencies and customers alike need to seek out federal funding. Both groups have not banded together collectively to do this yet.
- There will not be 100% consensus on developing new projects, but there is a huge opportunity for Native American contractors to develop projects
    - The Federal borrowing rate is lower than funding the customer could access.
    - Agencies and power customers should work together and take advantage of these diverse opportunities.
- There are no fast solutions, and the drought needs to be taken seriously by all. For some, this is not just a drought – it must be viewed and communicated as ongoing changes to the climate in the region.
- The customers want the agencies to provide a picture of the worst-case scenario so they can figure out how they will replace the power.
- Are the agencies working on a comprehensive water management plan? What is the long-term solution?
    - Response: Yes, Reclamation is working on this collaboratively with communities, States, and Tribes. There is a supply and demand imbalance, and it is challenging to elect where to make cuts, when, and by how much.
- Over the years the agencies have gotten better at collaborating with their power customers.
- Recommendation that this “Drought and Energy Dialogue Session” should be an annual occurrence.
- The sessions were productive and positive.

Reclamation:

Reclamation shared that The U.S. Department of Energy, Department of the Interior Bureau of Reclamation, and the Department of the Army through the U.S. Army Corps of Engineers are all part of a hydropower Memorandum of Understanding. Through that MOU they can work with national labs to conduct funded research. They have done a lot of work on renewable portfolio. The renewable energy credits are based on narrow, new, generation base demo pump rates, and capacity increases. We think all generations should be renewable credits; but they haven't gotten that traction. The Federal government is finishing up a hydro pump storage project, that will help to see what is happening outside the system and how that should or could be a more valuable resource for the grid. We can work together with customers to figure out the scope of that study and see modeling of Western grid.

There is funding(resources) available to:

- Conduct more studies through the MOU agreement.
- Provide Tribal technical assistance.
- Possibly get Reclamation public affairs personnel involved in the water-energy nexus conversations.

WAPA

Administrator LeBeau seeks to have further conversation on what to do if there is no generation for an extended period and the implication of that on operations and maintenance. WAPA has been asked to defer maintenance and projects, but leadership is nervous as it's unclear at what point deferring these repairs will cause problems.

There is a tightening supply of available resources. Administrator LeBeau appreciated the point raised earlier about the Federal borrowing rate and will try to work to explore that idea further. WAPA can investigate which utilities would be more impactful to its maintenance resources. Occasionally WAPA gets a very specific question from the Office of Management and Budget, but they have not looked at if the agency had to triage—what would be the impacts of that, etc.

Administrator LeBeau suggested that she start an education campaign and make sure everyone is aligned. The customers and agencies need to talk with more frequency and periodize this topic. These conversations help WAPA better understand the issues customers face. Administrator LeBeau hopes that power customers leave these sessions with a unity in effort and mission.

Appendix A: Agenda

Time	Topic
Meeting starts at 9:00 am	Welcome Agenda Review Introductions
	Discussion Topics Overview ➢ Approach: Plenary
	Discussion Topic 1: General-What the agencies need to understand about current drought impacts on customers ➢ Approach: Breakout groups
	➢ Discussion Topic 2: Assets (Hydro Generation; Transmission System considerations) Approach: Breakout groups
	Group report outs and large group discussion from Topics 1&2 ➢ Approach: Plenary
12:00-1:15	Lunch
	Discussion Topic 3: Products/Services (Power and Transmission; Replacement Power considerations) ➢ Approach: Breakout groups
	Discussion Topic 4: Funding consideration and Rates impacts ➢ Approach: Breakout groups
	Group report outs and large group discussion from Topics 3&4 ➢ Approach: Plenary
	Discussion Topic 5: Communication and Coordination ➢ Approach: Plenary
This session and the meeting adjourn at 4:00 pm	Final Reflections and Next Steps ➢ Approach: Plenary
4:00-4:30	Informal networking (optional)

* Phoenix meeting had breakout group and plenary discussions and plenary. The Lakewood Meeting stayed in plenary, discussing all topics as one group (due to a smaller number of participants).

Appendix B: Meeting Participants

November 2nd, Phoenix:

- Adam Arellano, WAPA
- Amy Mignella, Hopi Tribes
- Anthony D'Aquila, City of Burbank
- Brent Osiek, WAPA
- Ben Olbrich, LACDPU
- Bret Fleck, City of Peoria
- Brian Yerges, ED3
- Brian Young, CAWCD
- Charles Cowan, YCWUA
- Christina Mudd, Exeter Associates
- Daniel Herder, Clark Hill
- Darrin Francom, CAWCD
- Gail Bates, CRC
- Jennifer Jack, SPRMIC
- John Jontry, MWD
- Jordy Fuentes, APA
- Katrina Grantz, Reclamation
- Ken Saline, KR Saline
- Kevin Garlick, UMPA
- Layne Burningham, UMPA
- Len Schilling, Reclamation
- Leslie James, CREDA
- Max Spiker, Reclamation
- Michael Curtis, Counsel with Arizona Municipal Power, HoHokam IDD, Wickenburg, Marana, Gilbert, and Avra Valley IDD
- Mike Peterson, WAPA
- Richard Torres, City of Azusa
- Richard Wiliamson, SLRIWA
- Rodney Bailey, WAPA
- Rosemary Henry, WMPA
- Sheri Faraq, SRP
- Sherly Sweeney, Clark Hill
- Srinivasa Venigalla, NTUA
- Stefan Walston, City of Gilbert
- Tim Hamilton, IID
- Tina Ko, WAPA
- Tracey LeBeau, WAPA
- Yu Wang, MWD

Facilitation Team (National Center):

- Elyse Magen,
- Monique Mullenaux
- Seth Cohen
- Stephanie Kavanaugh

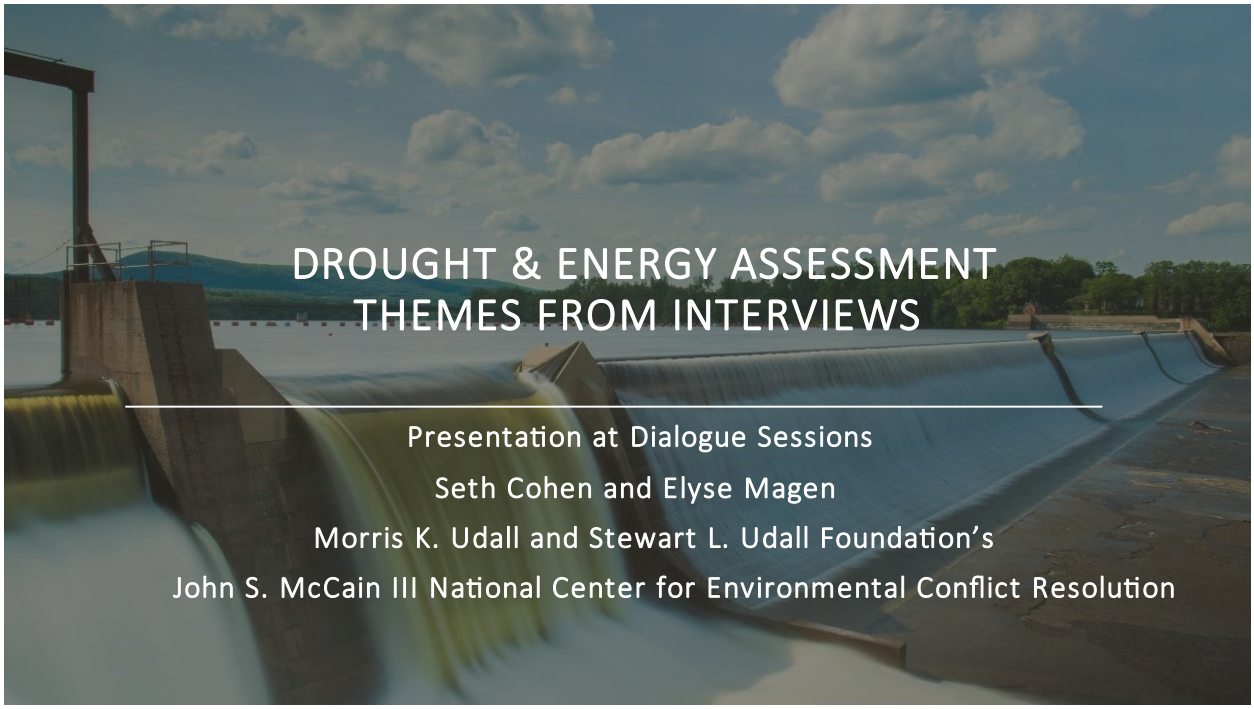
November 9th, Lakewood:

- Adam Arellano, WAPA
- Bart Leeflang, CUWD
- Brent Osiek, WAPA
- Carol Ballentine, PRPA
- Christina Noftsker, NMISC
- Christopher Hildred, CORE Electric COOP
- Chuck Files, Reclamation
- David Arend, Reclamation
- David Fitzegerald, AEPCO
- Glenn Stieger, NTUA
- Heather Banks, PRPA
- Jack Murray, WAPA
- Jason Norlen, Heber Light & Power
- Kait Son Lai, LADWP
- Margie Schaff, Native Energy Resources Counsel
- Max Spiker, Reclamation
- Monica Opderbeck, Pattern Energy Group
- Nick Williams, Reclamation
- Rick Rigel, ARPA
- Rodney Bailey, Reclamation
- Scott Lund, WAPA
- Trevor Updegraff, WAPA
- Tracey LeBeau, WAPA

Facilitation Team (National Center):

- Elyse Magen
- Seth Cohen

Appendix C: Situation Assessment PowerPoint (DRAFT FINDINDS)



TYPES OF CUSTOMERS INTERVIEWED

27 Total:

- COOPs (4)
- Priority Use Power Customers (2)
- Municipalities (10)
- State agencies (2)
- Trade Groups (4)
- Tribal Utilities (2)
- Tribal Nations (1)
- Water Districts (2)

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CLEAN, FIRM, AND RELIABLE ENERGY SOURCE

- Customers value how flexible hydropower is, and the key role it has played in grid stability
- Hydropower is so important because of the capacity associated with it.
- Some entities expressed that they have set clean energy goals (in part fueled by their customer base) and Hydropower is an excellent energy source for utilities to have in their portfolios.
- As hydropower diminishes, some worry about relying on power sources that generate green house gasses

TRANSMISSION NEEDS:

- Customers place high value on WAPA's transmission system and transmission rights
- As Federal hydropower decreases, many WAPA customers remain concerned about their access to transmission space guaranteed in their contracts.
- Some questions raised are:
  - What the most effective way to allocate transmission is if there is no hydropower
  - What other resources could be transmitted to replace lost hydropower?
  - How could that work (contractually)?
  - Is it possible for WAPA to expand transmission capacity?

REPLACEMENT POWER

- Customers place a high value on the fact that WAPA offers to buy replacement power on market (helps smaller utilities)
- Other customers with less dependency on Federal resources prefer to purchase directly from market
- Important to continue to consult customers before buying power.
- Mixed views on joining RTOs like SPP; some feel that should be further explored, while others have strong concerns

DEVELOPING NEW PROJECTS

- Many customers interviewed expressed an interest in seeing the agencies explore alternative energy sources
  - solar, wind, pump storage projects, de -salinization, and nuclear energy were discussed as options.
  - Customers also are interested in WAPA exploring batteries for energy storage
    - but some think the technology for adequate battery storage is years away.
- Others felt they, or other entities, were more equipped than the Federal agencies to develop such projects.
- Some interviewees said they would like the option to choose whether to participate in any future energy project or not (i.e., be charged or not).
  - Contracts might need to be renegotiated.

CONCERNS ABOUT COSTS

- Customers are nervous about the need for firm power and the high price of other energy sources
- Hydropower helps balance the market.*"When you take hydropower off the market, the market responds with less efficient energy and energy prices becomes prohibitively expensive."*
- It will be challenging for the agricultural sector to grow crops if power becomes too expensive.
- Some of the entities interviewed serve some of the most vulnerable populations, so they place a high value on affordable energy.

FUNDING FOR THE FUTURE?

- Clarity needed on the legal authorities the agencies have to explore different financial avenues to help offset the cost of hydropower and pursue alternative energy projects.
- There was a request for a more comprehensive plan on how to get emergency non-reimbursable funding.
- Interest in having WAPA explore a rate stabilization fund
- Can any funding from the Bipartisan Infrastructure Bill be used to support hydropower customers?

COMMUNICATION:

- How can we (agency and customers) communicate the dire state of the drought and its impacts on hydropower generation and distribution in a way that leads to change.
- Interest in an agency led communication strategy with messaging for policymakers and the populations/stakeholders who are served by WAPA and its customers.
- WAPA and Reclamation should continue to work closely on these all these issue. Praise for WAPA engagement on the drought
  - Many wished there had been earlier engagement regarding dropping water levels, but they appreciate the current proactive approach.
  - Appreciation for communication and transparency with customers through CRSP, DSW, & CREDA meetings
  - Some smaller entities often represented by Trade Groups, Coops, Municipal entities, and Tribes would prefer the agencies communicate more with them directly.

GROUND RULES FOR DIALOGUE

- Listen carefully and with respect
- Speak honestly and with respect
- Let everyone contribute
- Try not to repeat what has already been said
- Acknowledge Different Perspectives
- Look for common ground
- Think creatively
- Take risks
- Keep a sense of humor
- Honor the process
- But be flexible
- Silence your devices☺

•Adapted from Lucy Moore & Associates

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