Arizona Public Service - February RPAC Meeting Minutes

Date	Location	Start	Stop
2/14/2025	Virtual	9:00 a.m.	10:30 a.m.

MEETING OBJECTIVES

- Recap the November RPAC meeting and provide the status of previous action items.
- Provide an update on APS's 2024 ASRFP.
- Discuss E3's Southwest Resource Adequacy Study.
- Update members on recent developments related to APS's Western Market decision.
- Provide an outline of RPAC touchpoints for APS's 2026 IRP process.
- Forecast next steps and future RPAC engagement opportunities.

Attendees	Organization	Title/Role
Walter Clemence	Capital Power	Senior Advisor, US Regulatory
Gary Dirks	ASU	Senior Director, Global Futures Laboratory
Gwen Farnswoth	Western Resource Advocates	Deputy Director, State Advocacy
Ana Gorla	Sierra Club	Energy and Public Lands Coordinator
Robert Harlan	Onward Energy	Analyst
Aggie Hernandez	Leeward Energy	Manager, Transmission Market Analytics
Nicole Hill	Nature Conservancy	AZ Climate Program Director
Hunter Holman	Interwest Energy Alliance	Regulatory Attorney
Inwook Hwang	Leeward Energy	Manager, Transmission Network Analytics
Stephen Jennings	AARP	Associate State Director
Autumn Johnson	Tierra Strategy	CEO
Claire Michael	Wildfire	Director, Climate Equity
Anuja Oke	Western Resource Advocates	Consultant
Amanda Ormond	Western Grid Group	Director
Greg Patterson	AZ Competitive Power Alliance	Director
Lance Sollid	Leeward Energy	Senior Manager, Transmission Market Analytics
Kayla Teeple	Western Freedom	Policy Advisor
Katherine Urasky	National Renewable Solutions	Senior Origination Manager
Laura Wickham	SWEEP	Senior Arizona Associate
Scott Yaeger	Rockland Capital	Vice President, Power Marketing

Matt Lind | 1898 & Co./Director of Resource Planning | Welcome & Meeting Agenda

- No questions.

Derek Seaman | APS/Director, Resource Acquisition | ASRFP Update

Summary: Derek Seaman, Director of Resource Acquisition, began the meeting with an update on APS's 2024 ASRFP, released on February 5th. Derek shared that APS has received a robust response to its ASRFP, discussed the characteristics that APS is seeking in bids, and provided a timeline for the evaluation process and other steps leading to the negotiations stage. In addition, Derek explained that APS was monitoring the recent developments related to executive orders, tariffs, and AD/CVD investigations as they may impact the price of bids received and that APS was prepared to allow bidders to adjust bids, if doing so is deemed necessary in APS's discretion.

- No questions

Nick Schlag | E3, Partner | Southwest Resource Adequacy Study

Summary: Nick Schlag, Partner at E3, followed Derek's ASRFP update with an overview of the Southwest Resource Adequacy (SWRA) Study that E3 is performing with APS and other Southwestern utilities. Nick highlighted the findings from the 2021 study performed by E3 and explained the need for an updated examination, citing load growth, supply chain challenges, climate impacts and regional resource shortfalls as driving factors. Nick also provided detail on the two phases of the current study and their objectives.

- **Question – RPAC Member:** What is the difference between LOLE and LOLP, and how does ELCC relate to these metrics?
  - **Response – Nick Schlag**: LOLE, LOLP, and ELCC are all related to the type of modeling we are applying in the study, Loss of Load Probability (LOLP) modeling. This type of model typically involves stochastic hourly simulation with load profiles and resources to simulate a system over hundreds of years and combinations of conditions to derive a number of statistical measures of reliability of the system. You also might hear about other metrics, like Expected Unserved Energy (EUE). Each of these metrics represent a different output from the same type of model. ELCC is a fundamentally different type of metric, but it comes from the same model. Metrics like LOLE, LOLP, and EUE help describe the magnitude and duration of potential unserved energy events, and the likelihood of a reliability event given a portfolio of loads and resources. ELCC is the capacity value a resource can provide to a portfolio. ELCCs represent a technology specific measure of how a resource contributes to a portfolio relative to another. One of the complexities of ELCC is that it is a dynamic metric, and it changes as a function of penetration. The first MW of solar added to a system may have a much different ELCC than the thousandth MW added to the same system. As we've discussed previously, this can lead to a situation where the net peak shifts to the evening, when solar is no longer producing.
- **Question – RPAC Member**: Are LOLE and LOLP interchangeable, and is LOLE included in the LOLP analysis?
  - **Response – Nick Schlag**: If you hear someone talk about LOLE and LOLP modeling, it is likely that they are talking about the same type of modeling. If you look at a specific LOLE or LOLP metric, those are different metrics, but they are coming from the same model.
- **Question – RPAC Member**: Are we generally moving away from talking about metrics like LCOE, and focusing more on ELCC instead?
  - **Response – Nick Schlag**: These are very different metrics that measure different things. LCOE is a way of measuring the relative cost of different resources based on inputs like capital and operating costs. LCOE does not consider the value that resources provide to the grid. There are many types of value resources provide to the grid. ELCC is a way to measure the capacity value of different types of resources. Each of these metrics can measure the cost or value that different resources provide to the grid, but neither of them provides a holistic way of comparing all of the attributes of resources together.
- **Question – RPAC Member**: What is being done to sharpen the pencil on what load growth looks like, and what strategies do you recommend for utilities to avoid overbuilding?
  - **Response – Mike Eugenis**: We have a team here at APS that specializes in developing our load forecast. This forecast is informed by economics, development econometrics, as well as the

relationships with large customers that significantly impact the forecast. We meet with these customers regularly to better understand what their ramp and ultimate buildout are likely to be. As we see more growth driven by these data center customers, the industry is still changing. For example, as I'm sure many of you have seen on the news, Deepseek has recently reported remarkable performance increases. There is a well understood uncertainty associated with these loads moving forward. As we perform our forecasting, we build in this uncertainty, and we have benchmarked with industry peers, such as Dominion, to determine how we can more accurately estimate what is actually going to show up for these customers.

  - **Response - Nick Schlag**: Within the context of our Phase 2 assessment, we will be looking at utilities' forecasts, but also a range around that to understand the degree to which long-term low load growth forecast impacts the nature of regional resource needs. It is important to remember that the planning and procurement processes are inherently iterative. So, every cycle there is an opportunity to refine the load forecast based on the improved understanding of new customers coming onto the system. In the rapid growth of data centers that we are currently experiencing, there is uncertainty around how quickly these customers are coming onto different systems. Across various utilities we are working with, many load forecasts are being derated to account for the risk that these loads may not materialize. Analyzing sensitivities to understand the degree to which resource needs are driven by the load forecast is the strategy that I would consider best practice.
- **Question - RPAC Member**: At what point will APS require large customers to make a financial commitment, or implement another process, to encourage large customers to commit to their plans so that APS can produce more accurate load forecasts?
  - **Response - Mike Eugenis**: APS is committed to minimizing cost shift around these new customers, and there are several ways that we are exploring doing so.
- **Question - RPAC Member**: How detailed will the SWRA study load modeling be in terms of different customer type load shapes and flexible load? And what will the reliability impact of large loads be in concentrated areas?
  - **Response - Nick Schlag**: The development of load shapes is critical to understanding how loads and resources align when developing a model like this on the Southwest system. We are currently developing load shapes to account for the differences between the existing system's load and the load shapes of the high load factor customers that may be coming onto the system. This will impact the load shape five to ten years into the future, to the extent that a lot of the load growth is driven by those customers. In the 2021 Study, we started by modeling the loads and resources that the utilities provided to compare them side by side. From there, we evaluated the capacity value and impact of additional resources on the system. Looking at flexibility on the load side along with different utility scale or supply side resources will provide additional useful information within that aspect of the study.
- **Question - RPAC Member**: As the study goes out to 2050, will gas units converted to H2 be studied?
  - **Response - Nick Schlag**: In phase 2, we will be investigating the potential roles of different emerging technologies towards meeting the region's long-term needs - including hydrogen, other longer-duration storage options, and other technologies as relevant.
- **Comment - RPAC Member**: It is important to note that when modeling hydrogen delivery, supply and "green" energy fuel production infrastructure location and cost should not just be obscured in a fuel price assumption. Additionally, it is important that natural gas fuel availability is considered.
  - **Response - Nick Schlag**: These are all important considerations when thinking about the long-term future of the grid and we will be sure to keep those in mind as we proceed with our modeling.
- **Question - RPAC Member**: At a future RPAC meeting, Can APS address gas pipeline capacity constraints, and how the utilities are working together on this issue?
  - **Response - Mike Eugenis**: We will be sure to include that in a future RPAC agenda. As we have more information to share, we will be sure to keep the RPAC informed.
- **Question - RPAC Member**: At a future RPAC meeting, can APS share more information on how utilities plan to finance natural gas pipeline?
  - **Response - Mike Eugenis**: We will be sure to add that to our agenda as a topic to explore when we discuss our gas pipeline effort.

Kent Walter| APS/Director, Western Market Affairs| Western Markets Update

Summary: Kent Walter, Director of Western Market Affairs provided an update on the status of APS's decision to join SPP's Markets Plus day-ahead market. Kent highlighted the various RPAC touchpoints leading up to APS's Western Markets decision, provided a follow-up on action items requested by members during the November RPAC Meeting, and updated members on developments since the November RPAC Meeting. During his update on recent developments related to APS's Western Market decision, Kent shared that APS has signed the Phase 2 funding agreement.

- **Comment - RPAC Member**: I would like to see APS perform a capacity savings study.
- **Question - RPAC Member**: Will APS send an update to the RPAC on who signs on to the Phase 2 funding agreement, and whether it met the 200 TWh that you anticipated?
  - **Response - Kent Walter**: Yes, we would be happy to.
- **Question - RPAC Member**: Can you talk about what steps and investments are needed to bridge the gap between Phase 2 and Phase 3 of Markets Plus development?
  - **Response - Kent Walter**: The first step is to begin gathering requirements to develop a project plan associated with those. After that, it will be a matter of managing the change and integrating the technology. It will be a robust effort. In parallel with that, we will have meetings with our impacted customers. It will be important that we have a defined stakeholder process as we work towards developing other tariff changes for the open access transmission tariff.
- **Question - RPAC Member**: Has APS met with the wholesale customers about its market decision?
  - **Response - Kent Walter**: We plan to have those discussions in the future.
- **Question - RPAC Member**: When does APS plan to meet with wholesale customers about its market decision?
  - **Response - Kent Walter**: We will be meeting with customers with embedded load on February 24th, and we are still determining our stakeholder process for less impacted customers. We will do this consistent with the other entities leaning towards Markets Plus to ensure that we are aligned with the broader group that is moving towards implementation.
- **Question - RPAC Member**: Will that discussion be focused only on Markets Plus, or will APS discuss why it chose Markets Plus?
  - **Response - Kent Walter**: That discussion will be largely focused on Markets Plus.
- **Question - RPAC Member**: Will that discussion be public?
  - **Response - Kent Walter**: Meeting information will be available on our OASIS website for our wholesale customers, and directly impacted customers will receive direct invites.

Mike Eugenis| APS/Director, Resource Planning | 2023 IRP Workplan

Summary: Mike Eugenis, Director of Resource Planning, presented an outline of APS's plans for RPAC engagement throughout the 2026 IRP process, providing a timeline for when APS plans to make updates on specific items. Additionally, Mike gave a preview of the topics that APS plans to address in 2026 IRP, like resource price volatility and the integration of a new day-ahead market.

- **Question - RPAC Member**: When is the 2026 IRP due?
  - **Response - Mike Eugenis**: The 2026 IRP is due August 1, 2026.
- **Question - RPAC Member**: In the context of tariffs, can you talk about the level of price volatility in APS's 2024 ASRFP, and whether the volatility is concentrated in specific technologies relative to others?
  - **Response - Mike Eugenis**: All technologies have been impacted, but the degree to which they are impacted varies.
  - **Response - Derek Seaman**: Steel and aluminum tariffs that recently came out have a broad impact, and some technologies utilize more steel and aluminum than others. Additionally, the battery anode material investigation is broadly impacting the battery industry. We have also seen the continuation of supply chain delays. If the industry turns to domestic products or sourcing from countries less impacted by tariffs, it may drive up prices in those countries and could result in a wash. Ultimately, the impact varies on a case-by-case basis, and we are looking for bidders to apply thoughtful procurement strategies to mitigate these risks.

- **Question – RPAC Member**: Which sector are tariffs impacting the most?
  - **Response – Derek Seaman**: It is unclear which sector is being impacted the most at this time. Generally, some solar developers are finding ways to utilize panels from other countries to mitigate price increases. Batteries seem to show more variability, but domestic production lines are developing that might help reduce this uncertainty. In the gas industry, increased demand for turbines is extending lead times, and we expect for the steel and aluminum tariffs to impact turbines that are not made domestically. Wind projects may also be impacted by executive orders concerning federal lands and waters. It is difficult to say whether any industry is more impacted than others.
- **Question – RPAC Member**: Are the wind projects that APS has received bids for located in Arizona, or other states?
  - **Response – Derek Seaman**: We are seeing a mix of Arizona based projects as well as projects from other states, primarily New Mexico.
- **Question – RPAC Member**: Would APS bring Todd Komaromy to a future RPAC meeting to discuss APS's engagement related to federal policy and EEI's activity?
  - **Response – Mike Eugenis**: We will consider this as a potential agenda item for our next meeting.
- **Question – RPAC Member**: Does APS have any federal funding for projects or studies that is at risk?
  - **Response – Mike Eugenis**: APS has not encountered any situations where the lack of federal funding would require us to change paths on a project. Some of you may have seen the recent news release around the Arizona utilities pursuing nuclear power into the future and performing targeted analysis around related technologies. As part of this, we have applied for a DOE grant. While we are uncertain about the outcome of the DOE grant, we do not anticipate that the outcome of the grant will affect our pursuit of resource options that will provide reliability and affordability to our customers.
- **Question – RPAC Member**: Has APS received any federal awards that might be impacted by executive orders?
  - **Response – Mike Eugenis**: Developments are ongoing in this space, and we are happy to follow up with this group at a future meeting.
- **Comment – RPAC Member**: At a future RPAC meeting, I would appreciate a deeper dive into the context and timeline of APS's future nuclear plans.
- **Comment – RPAC Member**: At a future RPAC meeting, I would like to spend more time discussing gas pipeline capacity constraints, and how the utilities are working together on this issue.

Matt Lind | 1898 & Co./Director of Resource Planning | Next Steps & Closing Remarks

- **Question – RPAC Member**: As APS begins the 2026 IRP planning process, will the RPAC continue to meet every other month?
  - **Response – Mike Eugenis**: That is the current plan, yes.
- **Question – RPAC Member**: Is there a plan to meet on a monthly basis when APS begins its IRP load forecasting process?
  - **Response – Mike Eugenis**: APS is still developing a plan for RPAC meeting cadence. We may meet with the group every other month and utilize the entire meeting time or meet on a monthly basis with shorter meetings.
- **Question – RPAC Member**: Does APS plan to involve RPAC in load forecasting process leading up to the 2026 IRP?
  - **Response – Mike Eugenis**: APS plans to continue partnering with the RPAC to discuss load growth scenarios. This collaboration leading up to the 2023 IRP was beneficial, as it allowed individuals to better understand elements of the load forecast. However, the final product ultimately was not leveraged in the IRP. As we consider the load sensitivities that we are going to study, we are interested in the RPAC's feedback and discussion of low load forecast risks. We also want to ensure that we are respectful of the RPAC's time and that the work products we put together as a group are used in the IRP.