Arizona Public Service - April RPAC Meeting Minutes

Date	Location	Start	Stop
4/9/2025	Virtual	9:00 a.m.	11:30 a.m.

MEETING OBJECTIVES

- Recap the February RPAC Meeting and provide the status of previous action items.
- Provide a Federal Regulatory update and address recent comments about the Cholla Power Plant.
- Share an update on the evaluation stage of APS's 2024 ASRFP.
- Preview the Summer Preparedness presentation that APS will deliver at the ACC on April 24th.
- Update members on APS's activity in the recently opened ACC Natural Gas Docket.
- Discuss the ACC's recently opened Future Nuclear Docket and APS's recent press release regarding future nuclear development in Arizona.
- Provide an outline of RPAC touchpoints for APS's 2026 IRP process.
- Forecast next steps and future RPAC engagement opportunities.

Attendees	Organization	Title/Role
Poonum Agrawal	Invenergy	Senior Manager, Regulatory Affairs
Ramon Alatorre	SWEEP	Senior Manager, Utility Program
Lindsay Ashby	Avangrid	Business Development
Sandy Bahr	Sierra Club	Director, Grand Canyon Chapter
Leif Bang	Scout Clean Energy	Director, New Project Development
Alex Blake	Innergex	Senior Manager, Development
Kate Bowman	Vote Solar	Regulatory Director
Tennison Brady Steen	Plus Power	Project Development Associate
Diane E. Brown	Arizona PIRG	Executive Director
Paul Burman	Invenergy	Director of Renewable Development
Walter Clemence	Capital Power	Senior Advisor, US Regulatory
Maxwell Cohen	Orsted	Manager, Growth
Seamus P. Crowley	Holland & Hart	Associate
Gary Dirks	ASU	Senior Director, Global Futures Laboratory
Shirley Fontanié	EDF Renewables	Rotational Program Associate
Robert Gardener	AES Corporation	Senior Manager, Development
Kevin Gillies	Innergex	Development Associate
Robert Harlan	Onward Energy	Analyst
Sohini Hathiramani	Cypress Creek Renewables	Project Developer

Aggie Hernandez	Leeward Energy	Manager, Transmission Market Analytics
Hunter Holman	Interwest Energy Alliance	Regulatory Attorney
Jennifer Jachym	Plus Power	Manager, Origination
Stephen Jennings	AARP	Associate State Director
Autumn Johnson	Tierra Strategy	CEO
Trupti Kalbag	AES Clean Energy	Vice President, Origination
Kelsey Knoche	EDF Renewables	Sr. Development Manager
Nitin Luhar	Mitsubishi	Consultant
Kelsey Mass	Aypa Power	Senior Origination Analyst
Bryan Martin	Aypa Power	Strategic Development Associate
Christian Martinez	Clearway Energy Group	Manager, Origination
Rachel McMahon	EDF Renewables	Director, Regulatory and Legislative affairs
Claire Michael	Wildfire	Director, Climate Equity
Jack Moe	AES Clean Energy	Manager, Origination
Katherine Morell	Plus Power	Power Marketing Manager
Gabe Murtaugh	Hydrostor	Director, Markets and Technology
Nicholas Navarro	Plus Power	Origination Consultant
Amanda Ormond	Western Grid Group	Director
Greg Patterson	AZ Competitive Power Alliance	Director
Lindsey Ransom	Leeward Energy	Senior Manager, Transmission Market Analytics
Alex Routhier	Western Freedom	Policy Advisor
Andrew Sharer	Avantus	Vice President, Origination
Jason Smith	VP, Onshore Transmission	Vice President, Onshore Transmission
Julie Thompson	Hydrostor	Vice President, Origination
Katherine Urasky	National Renewable Solutions	Senior Origination Manager
Nick Walden	Transalta	Business Analyst
Laura Wickham	SWEEP	Senior Arizona Associate
Katy Wilson	Transalta	Director, Origination
Patric Woolsey	Sierra Club	Senior Arizona Associate
Scott Yaeger	Rockland Capital	Vice President, Power Marketing
Isabelle Zolligner	Invenergy	Sr. Development Analyst

Mike Eugenis | APS/Director, Resource Planning | Welcome & Meeting Agenda

Summary: Mike Eugenis began the meeting with an overview of the agenda and guidelines, a recap of the February RPAC Meeting, and a status update on action items from previous meetings, including an update on APS's Federal Regulatory engagement and a statement regarding the Cholla Power Plant.

- **Question – RPAC Member:** Can you talk about HB 2774 and how the potential to bypass the Certificate of Environmental Compatibility (CEC) process may impact APS's plans to build nuclear resources into the future?
  - **Response – Mike Eugenis:** APS abides by all regulations as they exist today. As we look at new resource types, we are interested in the potential for new nuclear power, but there is nothing to share as it relates to the CEC process for new nuclear resources.
- **Question – RPAC Member:** Is there any coal left on site at APS's Cholla Power Plant?
  - **Response – Mike Eugenis:** APS has ceased operations at the Cholla Power Plant, and there are a number of hurdles that would be associated with continuing operations at that site.
- **Question – RPAC Member:** Has APS changed its strategy around its clean energy commitment?
  - **Response – Mike Eugenis:** APS's planning principles related to our resource mix into the future have not changed. Reliability for our customers is our highest priority, at the least cost for our customers. We have seen high levels of clean and renewable procurement over the last couple of years. 93% of the total procurement from the 2023 ASRFP consisted of clean resources, and we balance that with firm resources to support.

Vivian Vo | APS/Power Origination Consultant, Resource Acquisition | ASRFP Update

Summary: Vivian Vo provided an update on APS's 2024 All-Source RFP. Vivian shared that APS received 243 bids in its 2024 ASRFP and provided a breakdown of the number of bids received for each resource type and each transaction structure. Vivian closed her presentation with an expected timeline for the remaining steps of the 2024 ASRFP.

- **Question – RPAC Member:** Are all of the thermal proposals APS has received in the 2024 ASRFP natural gas proposals? Are they combined cycle or combustion turbines?
  - **Response – Vivian Vo:** The thermal proposals APS has received include a combination of combined cycle and combustion turbines.
- **Question – RPAC Member:** Did APS call for proposals for repurposing the Cholla Power Plant in the 2023 ASRFP, or the 2024 ASRFP? What is the status of that opportunity?
  - **Response – Vivian Vo:** That opportunity was highlighted in the 2023 ASRFP. We did not move forward with the proposals that were submitted for that opportunity during the 2023 ASRFP.
- **Question – RPAC Member:** Are proposals to repurpose the Cholla Power Plant part of the 2024 ASRFP?
  - **Response – Vivian Vo:** Proposals that want to utilize Cholla are not excluded from submission. We just did not highlight the unique opportunity like we did in the 2023 ASRFP.
- **Question – RPAC Member:** How is APS approaching new nuclear resources in the ASRFP process? Will there be a nuclear specific RFP, or could APS go outside of the ASRFP process?
  - **Response – Mike Eugenis:** The 2024 ASRFP is the first time APS has called out future opportunities beyond a defined range of years. While we have a focus period of 2028 through 2030, there is another part of this ASRFP that looks at resources that may go into service beyond 2030. The ASRFP process is important to us in terms understanding the market. There is a lot of opportunity into the future for these technologies as they mature and cost curves come down, and we look forward to seeing cost competitive bids for those resources. If those resources do not become cost competitive, we would not procure them on behalf of our customers.
- **Question – RPAC Member:** Did APS receive any thermal proposals that were not CC or CT resources as a part of the 2024 ASRFP?
  - **Response – Mike Eugenis:** No. Outside of combined cycle and combustion turbine bids, there were no thermal proposals with any fuel source associated with them.

- **Question – RPAC Member:** How is APS making sure that it is not minimizing the role that energy efficiency resources can play in its resource portfolio?
  - **Response – Vivian Vo**: APS carefully crafted the 2024 ASRFP to be inclusive to all resource types. Our Customer to Grid Solutions team actively encourages participation in this space.
  - **Response – Mike Eugenis**: Energy efficiency and other customer-sided resources are an important part of our plan for maintaining resource adequacy and affordability for customers into the future.
- **Question – RPAC Member:** Does APS anticipate changes to the criteria used in its ASRFPs?
  - **Response – Vivian Vo**: We do not plan to change the criteria for the 2024 ASRFP, but we welcome feedback to incorporate into future ASRFPs.
- **Question – RPAC Member:** How is APS addressing current tariff implications on project costs and the uncertainty around that for pricing? Will APS require bidders to submit their tariff assumptions along with their pricing to level set drivers for price changes?
  - **Response – Vivian Vo**: The regulatory environment as it relates to tariffs is volatile, and APS is not alone in this regard. Most bidders incorporated base tariff assumptions into their proposed prices as a part of their risk mitigation. There has been continued communication between APS and respondents in the case of price updates, but for most of the received proposals, bidders included their base tariff assumptions in their proposals. We plan to address potential additional tariffs through shortlist presentations and the best and final offer stage of the ASRFP process.
- **Comment – RPAC Member:** I hope APS continues to engage the RPAC on changes to the ASRFP criteria moving forward, this makes for the best stakeholder process in the state.
- **Question – RPAC Member:** How is APS maintaining its carbon reduction goals through the ASRFP process?
  - **Response – Mike Eugenis**: The primary goal of our resource planning process is to identify the portfolio of projects that maintains reliability at the least cost for customers. We saw a tremendous number of clean and renewables in the 2023 ASRFP. The magnitude of procurement that we've done in that space is indicative of the important role that renewables are going to play in the least cost portfolio into the future. We anticipate that there will also be a need for additional natural gas resources to maintain reliability. The exact percentages for our carbon reduction goal will be dependent on the specific bids received through ASRFPs and the changing landscape of our load.
- **Question – RPAC Member:** Is APS looking at geothermal resources in the 2024 ASRFP?
  - **Response – Vivian Vo**: We did not receive any proposals for geothermal resources in the 2024 ASRFP.
- **Question – RPAC Member:** Does APS see more geothermal resources on the horizon?
  - **Response – Mike Eugenis**: A recent article from the DOE discusses advanced geothermal with a price target below $50/MWh as a base load resource. If that were to come into fruition, it would be an exciting opportunity for customers, but we have not seen this in a commercial space. We look forward to more development in this space.

Tim Rusert | APS/Director, Power Supply Services | ACC Summer Preparedness

Summary: Following Vivian's ASRFP Update, Tim Rusert shared a preview of the Summer Preparedness presentation that he will provide at the ACC on April 24th. Tim highlighted APS's resource changes going into Summer 2025, including an additional 884 MW of solar plus storage hybrid resources, 675 MW of standalone storage, an additional 175 MW of uprates at existing natural gas sites, and retirement of 380 MW of coal powered resources.

- **Comment – RPAC Member:** With the high levels of anticipated load growth, APS should lean into demand response resources.
  - **Response – Tim Rusert**: Demand response resources are an important part of APS's resource portfolio that we rely on, similar to the other resources shown on Slide 14.
- **Question – RPAC Member:** How do you think the capacity mix chart table on Slide 14 might look different from an energy perspective with MWh instead of MWs.

- Response - Tim Rusert: We do not have an energy mix view of the table on hand, but we would be happy to follow up with more information. (See Appendix)
- **Question - RPAC Member**: Why is the on-peak value for energy storage resources only about half of their nameplate value?
  - Response - Tim Rusert: 4-hour batteries cover just over half of our critical risk hours, so they are assigned a lower effective load carrying capability (ELCC).
- **Question - RPAC Member**: Are all of APS's energy storage resources 4-hour batteries?
  - Response - Tim Rusert: APS has 4-hour and 3-hour batteries online. The Energy Storage total in the capacity mix table on Slide 14 represents only 4-hour batteries, while our 3-hour batteries are represented in the solar + storage resource total.

Mike Eugenis| APS/Director, Resource Planning | ACC Natural Gas Docket No. G-00000A-25-0029

Summary: Mike shared an update on APS's recent activity in the Natural Gas Infrastructure and Storage docket opened by Vice Chairman Myers on February 10. Mike addressed the comments APS and others have filed to the docket, highlighted the factors driving the need for exploring additional natural gas transport, and shared that APS plans to continue collaborating with stakeholders on the topic in potential workshops.

- **Question - RPAC Member**: Can you talk about APS's negotiations with natural gas pipeline companies?
  - Response - Mike Eugenis: APS is currently evaluating opportunities from natural gas pipeline companies. Due to the sensitive nature of the negotiations, there is no more that we can share.
- **Question - RPAC Member**: Would the pipeline expansions being discussed be capable of transporting hydrogen?
  - Response - Mike Eugenis: There are a variety of available options, and that is a possibility moving forward.
- **Question - RPAC Member**: Can you provide more detail on when we can expect for the natural gas pipeline constraints mentioned during E3's September RPAC presentation relative to when we may see pipeline expansion?
  - Response - Mike Eugenis: We are beginning to see the constraints mentioned by E3 develop throughout the West already. There has been an expectation that California's natural gas usage will reduce into the future, and that there could be more availability for Arizona to claim natural gas previously slated for California, but we are not currently seeing that. While APS has natural gas supply to support all of the natural gas resources procured in the 2023 ASRFP, we anticipate that future natural gas resources will need additional supply moving forward.
- **Question - RPAC Member**: What would be the financial arrangement for APS to pay for the additional infrastructure? Does APS plan to invest in the infrastructure itself?
  - Response - Mike Eugenis: APS does not currently own or develop natural gas pipelines.
- **Comment - RPAC Member**: It is important that APS considers the pipelines' ability to transport hydrogen as it evaluates opportunities.
- **Question - RPAC Member**: What is the expected timeline for natural gas pipeline buildout?
  - Response - Mike Eugenis: We have heard various timelines associated with the construction of natural gas facilities and there are many factors that could impact those timelines. Looking at natural gas buildout in the United States over the past couple of decades, you will see varying construction times depending on the specific challenges faced by each project.
- **Question - RPAC Member**: What would an expedited timeline for natural gas pipeline development look like?
  - Response - Mike Eugenis: That would be highly dependent on the length of the pipeline. It would be a multi-year process.
- **Question - RPAC Member**: As APS looks to procure natural gas pipelines, is it considering opportunities for hydrogen blending?

- Response - Mike Eugenis: APS is considering the possibility of hydrogen blending into the future. Optionality for future resources is important to APS, as developments surrounding different technology types are uncertain.
- Question - RPAC Member: Who would build the pipelines?
  - Response - Mike Eugenis: There are a number of pipeline developers in the West. More information on those developers is accessible online.

Brad Berles| APS/Director, Palo Verde Water Strategy | ACC Future Nuclear Docket No. E-00000A-25-0026

Summary: Brad Berles shared an update on the recently opened ACC docket for future nuclear development in Arizona and APS's press release regarding the potential for new nuclear generation in Arizona. Brad discussed APS's current Department of Energy (DOE) grant application for future nuclear projects, APS's collaboration with other Arizona utilities, and some of the emerging nuclear technologies.

- Question - RPAC Member: Is the DOE grant application only for small modular reactors (SMRs)?
  - Response - Brad Berles: The DOE grant application is intended for SMR Gen-3 plus evaluations. However, the site selection and permitting processes allow for a wide breadth of applicability to both SMRs and large frame reactors. This gives APS the opportunity to pursue technologies beyond only SMRs.
- Question - RPAC Member: Is Holtec's SMR 300 the only SMR technology shown on Slide 22?
  - Response - Brad Berles: Holtec calls their SMR the SMR 300, which is why SMR is shown in the title. GE-Hitachi, NuScale, and Westinghouse all have SMRs as well.
- Question - RPAC Member: Can you explain the difference between the terms new nuclear and advanced nuclear?
  - Response - Brad Berles: New nuclear and future nuclear refer to additional nuclear generation that would potentially be deployed in Arizona. Advanced nuclear refers to Gen IV reactors and non-light water reactors.
- Question - RPAC Member: Are the technologies shown in the first row through the fifth row on Slide 22 all SMRs?
  - Response - Brad Berles: The first five technologies shown on Slide 22 are all considered to be in the SMR space.
- Question - RPAC Member: Are any of the technologies shown on Slide 22 salt-based reactors?
  - Response - Brad Berles: The TerraPower's H Reactor in Wyoming is a salt-based reactor. There are other salt and liquid metal reactor companies out there, and there is a lot of activity in the reactor space with many new advanced reactor companies emerging.
- Question - RPAC Member: Are SMRs a new technology, or have they been deployed on navy ships for decades?
  - Response - Brad Berles: From a commercial perspective, NuScale is the only SMR that has undergone the NRC design process, and there are two operational SMRs in the world. Reactor designs for naval applications are different from the commercial fleet in terms of fuel and capacity.
- Question - RPAC Member: Given current geopolitics, how is APS evaluating risk for different fuel sources for nuclear resources?
  - Response - Brad Berles: A number of countries are currently engaged in uranium enrichment. This is an important issue for APS and for the industry. We will consider the economics and reliability of different fuel supplies as we go through the evaluation process.
- Question - RPAC Member: Is high-assay low-enriched uranium (HALEU) only enriched in Russia? Would APS eliminate any candidate projects that use HALEU enriched uranium from consideration?

- Response – Brad Berles: There are a number of ongoing efforts to broaden where HALEU can be produced worldwide, including here in the United States. APS will consider all options as we evaluate different technologies, and this will be a factor in our consideration.

- **Question – RPAC Member**: How is APS ensuring that any future nuclear project that could eventually be considered will be on budget and on schedule?
  - Response – Brad Berles: At this point, APS is looking at a high-level evaluation of the various technologies, potential siting, and economic modeling. We are still in the very early stages, as mentioned in APS's recent press release regarding future nuclear development. If this progresses into a project, we will apply all necessary contingencies that we would put into ensuring that any large project is successful.
  - Response – Mike Eugenis: APS is currently investigating existing technologies to better understand what is under development. As Vivian mentioned earlier, APS did not receive any bids for nuclear projects in the 2024 ASRFP, which speaks to the cost challenges associated with nuclear technologies today. APS is focused on cost effectiveness and will be looking for the cost curve for new technologies to come down before investing in them. This is an industry-wide issue for utilities, as many are hesitant to invest in these projects that have such high levels of risk associated with the cost overruns that you describe. I am hopeful that, as we look to the future energy needs of large businesses, private companies will make some of these investments. Larger companies may be able to drive down costs through investing in more mature supply chains and workforces.
- **Question – RPAC Member**: Can you talk more about the levels of water usage for newer nuclear technologies?
  - Response – Brad Berles: As we've looked at SMRs, an individual SMR uses less water than a large reactor, which is expected from a MW generation perspective. There is also potential for air cooling condenser technology into the future, and there is ongoing research to explore other cooling mediums that could help reduce the water footprint. Additionally, some of the advanced reactors shown on Slide 22 have the potential for improved thermal efficiency.
- **Question – RPAC Member**: Could uranium ever be sourced in Arizona?
  - Response – Brad Berles: APS does not source any uranium from Arizona, and I don't believe there is any intent to change that position.
- **Question – RPAC Member**: How does APS plan to incorporate its exploration of advanced nuclear technologies into its 2026 Integrated Resource Plan (IRP)?
  - Response – Mike Eugenis: Future nuclear developments will be an input in the 2026 IRP process. To inform ourselves on what this technology will look like into the future, we are exploring the different options in this space. We utilize a range of industry data to develop resource costs for the IRP, with the NREL annual technology baseline (ATB) being the primary source for many of those costs into the future. The IRP will show the optimal resources based on this information but, ultimately, the bids we receive in our ASRFPs will determine what APS procures. We will continue to pursue ASRFPs into the future, and it is unlikely that nuclear procurement will occur outside of the ASRFP process.
- **Question – RPAC Member**: Can you talk more about APS's expected outcome from the DOE application process?
  - Response – Brad Berles: We are in the process of revising our application to meet the requirements of the revised grant. The new administration made changes to the FOA, and we are working to identify any of those changes and implement them into our previously submitted application. We expect to make our revised application by the April 23rd deadline. In terms of next steps, the application will undergo a review process. Applicants that make it through the initial selection could go to Washington, D.C. to present their proposals. Then there is a final selection process, and selected applicants enter negotiations on terms surrounding the grant, which can lead to a range of outcomes - from accepting the grant and implementing it to not getting the grant due to the conditions around the grant. It is difficult to speculate what this may look like by the end of the process, but we expect more updates in this space in the coming months.

- **Question – RPAC Member**: Are the technologies listed on Slide 22 incorporated into the NREL ATB?
  - **Response – Mike Eugenis**: Costs associated with building these technologies are not entirely known because of the ongoing development in this space. NREL performs their own sampling of the market, and using NREL cost data provides an unbiased, public source of data.
  - **Response – Brad Berles**: Many developers are in the development and design phases of their advanced reactors and are still refining their cost projections. As they continue to refine their plans for constructions, these projections remain uncertain.
- **Question – RPAC Member**: Can you talk on the market readiness of the technologies shown on Slide 22?
  - **Response – Brad Berles**: The technologies shown on Slide 22 are in various states. For example, GE-Hitachi technology was just issued a construction license, while advanced reactors are further out, and many still need to go through testing. Advanced reactors are expected to trail light water SMRs by a number or years. Fusion, as you noted, is expected to be 20 years out. There has been a lot of progress in the last couple of years, and there are various technologies, but there is nothing imminent at this point.
- **Question – RPAC Member**: Is APS dedicating most of its time to investigating nuclear technologies?
  - **Response – Mike Eugenis**: APS maintains an all-of-the-above strategy as we explore emerging technologies. While we are more experienced with nuclear plants because we have been operating Palo Verde for decades, we are actively investigating other technologies. Long duration storage and geothermal are both technologies we are closely monitoring. A diverse set of resources will be needed into the future, and each resource type is important to ensuring reliability at the lowest cost to customers.

Mike Eugenis| APS/Director, Resource Planning | 2026 IRP Workplan

Summary: Mike Eugenis closed out the meeting with an overview of APS's 2026 IRP workplan and plans for stakeholder engagement throughout the process. Mike provided a similar update during the February RPAC meeting. This time, he provided additional detail on topics requested by members.

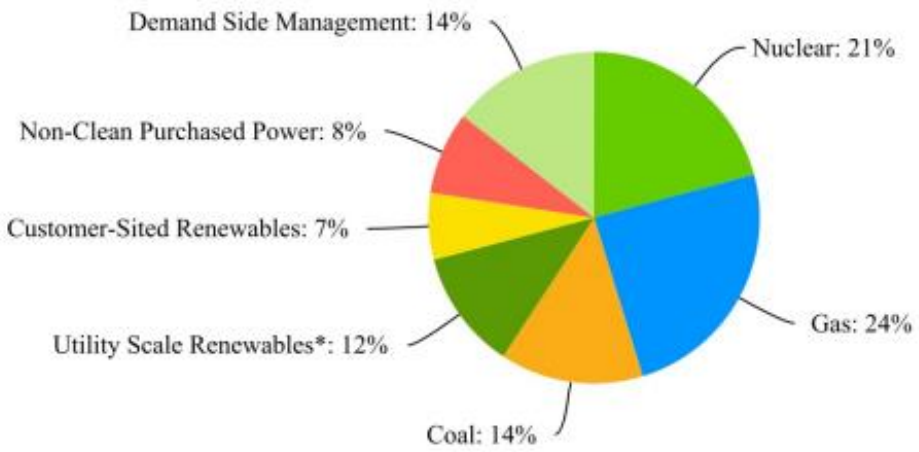
- **Question – RPAC Member**: When will APS finalize its resource ELCCs?
  - **Response – Mike Eugenis**: That is part of the resource adequacy study work that we are currently performing with PowerGEM. We will look to share information from that study during the next RPAC meeting.
- **Comment – RPAC Member**: I would like to hear more about the long-term transmission line docket at a future RPAC meeting.
- **Question – RPAC Member**: Will the RPAC meet on a monthly basis in 2025?
  - **Response – Mike Eugenis**: We plan on keeping the upcoming June meeting date, but we could move to a monthly meeting frequency as soon as Q3 2025. We want to ensure that we continue to use RPAC meeting times effectively.
- **Question – RPAC Member**: Does APS have any updates on ACC Staff's recommended order regarding stakeholder model access?
  - **Response – Mike Eugenis**: We will work with our Regulatory team to resolve ambiguity in this space. APS has been evaluating modeling tools to support the 2026 IRP and is focused on selecting a tool that allows external consultants to perform study work. RPAC participation and the ability to facilitate third-party analysis is also important in our consideration. We will provide an update on this at a future RPAC meeting.

Reece Taylor | APS/Analyst, Resource Planning | Next Steps & Closing Remarks

- No Questions

Appendix

APS 2024 Energy Mix (%):



*Utility Scale Renewables include energy from biogas, biomass, geothermal, solar, and wind.