

Meeting Objectives

- Recap December RPAC meeting and provide status of previous action items.
- Discuss the need for an RFP over an RFI and develop a schedule for the issuance of an RFP by April.
- Provide a near-term supply update and discuss considerations for resource procurement in the West.

Meeting Subject: January RPAC Meeting

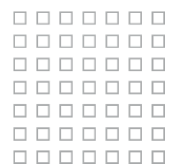
Meeting Date: 01/20/2021

Start Time: 09:00am

End Time: 12:00pm

Location: Virtual

| Attendees | Organization | Title/Role |
|--------------------|----------------------------|--|
| Jeffrey Burke | APS | Director of Resource Planning |
| Justin Joiner | APS | Vice President of Resource Management |
| Jessica Hankins | APS | RPAC Lead/Liaison |
| Gregory Bernosky | APS | Director of Corporate Strategy |
| Todd Komaromy | APS | Manager of State Reg. Compliance |
| Mike Eugenis | APS | Supervisor, Resource Planning |
| Yessica Del Rincon | APS | Communications Consultant |
| Jill Freret | APS | Director of Resource Acquisition |
| Scott Henry | APS | IT Support Specialist |
| Tayla Simmons | APS | Real Time Marketing & Trading Supervisor |
| Lakshmi Alagappan | E3 | Director |
| Nick Schlag | E3 | Partner |
| Matt Lind | E98 | Director of Resource Planning |
| Debashis Bose | E98 | Project Management |
| Chase Kilty | E98 | Consultant |
| Sandy Bahr | Sierra Club | Chapter Director |
| Louisa Eberle | Sierra Club | Attorney |
| Autumn Johnson | Western Resource Advocates | AZ Gov. Affairs Manager |
| Gary Dirks | ASU | Director |
| John Cordes | UPC Solar | VP of Utility Development |
| Nicole Hill | Nature Conservancy | AZ Thrives Program Lead |
| Nitin Luhar | Mitsubishi Power | Regional Director |
| Devi Glick | Synapse Energy Economics | Principal Associate |
| Rikki Seguin | Interwest Energy Alliance | Executive Director |
| Teresa Brown | PG&E | Operating Clerk |
| Alex Routhier | Western Resource Advocates | Sr. Clean Energy Policy Analyst |





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| Attendees | Organization | Title/Role |
|--------------------------|------------------------------|--------------------------------|
| Blan Holman | Pine Gate Renewables | VP of Regulatory Affairs |
| Caryn Potter | SW Energy Efficiency Project | Utility Program Manager |
| Daniel Schwiebert | Policy Advisor | Arizona Corporation Commission |

Matt Lind (E98/Director of Resource Planning) – Introduction/December RPAC Recap/2022 RPAC Expectations

- **Slide 3 – December RPAC Meeting Recap**
 - 1898 & Co. and E3 will be involved with RPAC to facilitate and provide expertise to meetings and allow APS to be primarily focused on interacting with RPAC members and responding to their questions and feedback.
 - APS highlighted challenges that the industry is facing, primarily in the west, and identified historical events where APS relied on the short-term market to meet reliability needs. The trends illustrate APS’ needs to plan for resource needs in the short-term.
 - Load forecast was completed and letter to ACC was made available to RPAC members to provide feedback by Monday, January 24th.
- **Slide 4 – RPAC Welcome to 2022**
 - Executed on December action item to make RPAC meeting materials available to the public. There is a five-day lag between the materials being ready to post and being available on the APS website so meeting material will still be made available by email three business days before RPAC meetings.
 - APS will continue to be committed to providing transparency and dialogue around future resource decisions.
 - Participation has been active and is encouraged to continue to be active to continue having productive and constructive RPAC meetings.
- **Slide 5 – Meeting Guidelines**
 - Guidelines haven’t necessarily changed from previous meetings and engagement will continue to be critical. There will be time allotted to end of each agenda item for discussion on the topic.
 - Certain topics that will require more explanation will be kept in a “parking lot” to be addressed at later meetings in a timely manner.
 - End of RPAC meetings will be reserved for a broader discussion on any feedback that RPAC members may have.
 - Meeting minutes will be kept and shared for each meeting and RPAC members are encouraged to provide feedback to modify and add to the minutes with the intent that they will be used to monitor and provide updates on action items. Meeting materials are preliminary in nature and provided for discussion purposes. Litigating attorneys are not expected to participate.
- **Slide 7 – What to Expect**
 - January meeting is focused on planning updates, resource procurement mechanisms, and discussing moving forward with an RFP in comparison to an RFI.
 - February will be focused more on the E3 Southwest Resource Adequacy study and the issuance of a draft RFP for RPAC member feedback.
 - March meeting will provide a forum for RPAC member feedback on the draft RFP with a target to release the RFP in April.
 - April meeting will go over bid evaluation process and other follow-up items related to the issuance of the RFP.



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- High level results of the RFP as well as the next steps will be discussed and shared with RPAC members to the extent possible.

Justin Joiner (APS/Vice President of Resource Management) – Near Term Supply Update

- **Slide 10 – A rapidly evolving landscape creates risk and opportunities**
 - Current drivers of current and near-term resource needs include:
 - Increased load from commercial and industrial customers.
 - Tight markets in WECC and CAISO and a lack of counterparties to purchases from. What was once 60 or so counterparties is now realistically down to five or six.
 - Existing resource retirements of Cholla and Four Corners.
 - Extreme weather events are becoming a trend rather than an anomaly.
 - Resource needs will be updated at the conclusion of the 2020 RFP as remaining contracts under negotiation are expected to be completed by first quarter of 2022.
 - There is anywhere from a two- to five-year lead time for new resource additions and the focus needs to shift towards procurement for 2025 and 2026.
 - Future resource needs further out into the future will be evaluated in next IRP process.
- **Slide 11 – 2020 All Source RFP Update**
 - To date, APS has signed 810 MW of new renewables and storage.
 - 450 MW of solar and 360 MW of storage have been added as well as an extension of the Arlington Combined Cycle unit through 2031 at a reduced monthly capacity payment.
 - In addition to signed projects, APS still has a need for 1200 MW for renewables and 1000 MW of storage that is being negotiated with a significant amount and is expected to be signed by the end of the first quarter.
 - Details of the additional contracts will be shared with the RPAC at the appropriate time to avoid any corporate sensitivities.
- **Slide 12 – Typical All-Source Timeline**
 - Timeline is focused on a 2025 and 2026 completion
 - Construction timeline is dependent on resource type and technology and can vary from one to five years not including any supply chain disruptions that are outside of APS control.
 - APS will do its best to ensure the most expedient and direct process, but some timing constraints are outside of APS control. There is not ample time for an RFI, and there is a need and prudence for an RFP over an RFI.
- **Slide 13 – APS Resource Needs and RFP Approach**
 - It is time to act now for 2025 and 2026 resource needs.
 - RPAC will be directly involved with RFP construction and evaluation process. RFP improvement and discussion will not end after this issuance, but rather continue through to future RFPs and RPAC and stakeholder discussions. RPAC will help determine key attributes to evaluate bids with and will be involved after bids are received as APS will discuss high level results in a manner that does not impact confidentiality.
- **Slide 14 – Discussion & Questions**
 - Question: Are the resources you are looking for to be in commercial operation between 2024 and 2026?



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- Response – Justin Joiner: We are already going through the final stages of 2024. The focus of the RFP would be for the 2025 and 2026 timeline.
- Question: Is the RFP issuance targeted for early April?
- Response – Justin Joiner: We want to work out the timeline with the RPAC but the sooner the better based on timeline and resource needs.
- Question: The RFI process would delay the timeline by a year or so?
- Response - Justin Joiner: The timeline would be delayed by a minimum of six months, but it could be up to a year. APS views the RFI as a duplicity of an RFP that would add time without value.
- Question: Can you elaborate further on how the RPAC will provide feedback on project concepts before the RFP is executed?
- Response – Justin Joiner: The details for RPAC participation will be further finalized after this meeting. It is easy to look at price and if it was that simplistic it could be done on our own. We need qualitative factors and attributes to evaluate along with price. Risk mitigants, customer protection, commission date certainty, and more must be considered and we want RPAC feedback on what metrics should be included. Attributes such as capacity accreditation and others must be weighted and scored, and we need to develop an approach to evaluate different technology types. We are going to be issuing a lot of RFPs overtime. Although we only have a month or so for this one, we will continue to refine for future RFPs.
- Comment: The ability for RPAC members to provide a more detailed response on the language of the RFP in terms of resource selection should be included.
- Question: What does PVS stand for and why were non-wires alternatives not included in the timeline range for different technologies?
- Response – Justin Joiner: PVS is solar + storage. The timeline slide is illustrative to get an idea, but the RFP will be all-source. Demand side will be key to that, and we look forward to proposals that include that. I would say that the timelines are best case scenario based on current construction and supply chain timelines. They represent utility scale mostly. We will show a draft of the RFP at the March RPAC meeting that will drive a lot of discussion on how the RFP is written and we can also work outside of the RPAC meetings. The April timeline is key for a safe landing spot.
- Comment: I want to ensure that all technology is considered.
- Response – Justin Joiner: Absolutely.
- Question: One of the reasons you do RFI is to get information or to uncover options that might otherwise not come to light. How much have you signaled this RFP is coming? Are you having conversations within the supply base so that you may get atypical players with interesting solutions?
- Response – Justin Joiner: I would say it is very well known what our needs are and we have discussed with bids that were not selected in previous RFPs that another RFP will be coming without specifying a date. We indicated that it would be an all-source RFP for anything that meets need and is consistent with RFP principles. We are going to allow ample time for bids to be put together and proposed. It will be designed to be a forum that attracts a wide range of bidders and allows a robust process.
- Question: Demand side management (“DSM”) comes up a lot and is a good thing to do. Have you done an analysis on the scale of DSM opportunity? Do we have any sense at all of the scale of DSM offering?



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- Response – Justin Joiner: Jeff would know more on a specific number, but the RFP would be a way to gauge what is available in the market. We are constantly speaking about the importance of DSM and we are seeing that number grow but the RFP bids will illustrate what is there in the market.
- Response – Jeffrey Burke: We have done industry studies and continue to define and develop them as we continue to do RFPs. We want to make sure that we include the universe of what is possible and evaluate against what is economically feasible. From a higher level, I would say there is a few 100 MW of demand response potential and from an energy perspective I suspect GWs are available, but we must see what it is really offsetting. Is it offsetting energy in higher priced periods? We are going to bring DSM personnel to future RPAC meetings for more discussion.
- Question: So it won't be a major factor in changing the energy gap that APS has?
- Response – Justin Joiner: We have to see how it develops and plays out. It is significant compared to where it was a few years ago but it is not the majority.
- Response – Jeffrey Burke: Those were mostly near-term numbers, but opportunities continue to present themselves. Ability to control thermostats is getting cheaper. Technology will continue to develop, and the number is not static. There is clearly more and we want to continue to evaluate as the technology develops and presents more opportunities as load shape and other factors also continue to change.
- Question: Is your clean commitment part of your IRP principles? I was surprised that wasn't listed as part of your qualitative analysis.
- Response – Justin Joiner: Absolutely. The projects have to be consistent with the clean commitment. If resources are not consistent it will limit the ability to consider certain projects. We are 100% committed to the clean energy commitment. Sustainability, reliability, and affordability must all be considered.
- Question: Did APS say that it is planning to seek pre-approval from the ACC for all future resource investments?
- Response – Justin Joiner: We are committed to offering what we are seeing early and often. We want to have a transparent process with the Commission and not go in at the midnight hour to get commission approval. I will have to let regulatory speak more on that in the future. It needs to be a collaborative and thoughtful process.
- Comment: In regard to DSM, I would echo that it is incredibly important that it is first and foremost priority. Obviously, it is best from the rate payer needs perspective. I think APS diminishes it and doesn't show it is a critical pillar. I am increasingly concerned by hydrogen included as a consideration as a technology. I want a conversation and want to move from resources that are costly and have carbon impact and that won't fill a huge bulk of the gap. Lastly on the RFP, I am wondering to what degree there can be more conversation on what APS is seeking from the RFP and how that language is written to encourage more diverse resource consideration.
- Response – Justin Joiner: APS will present the draft of the RFP before the March RPAC meeting and wants to have a good dialogue around the language of the RFP. In regards to hydrogen, I want to make it clear that it is an all-source RFP that encourages all types of submissions. We want everyone to participate so we can see what is available now and how it relates to our clean energy commitment and IRP principles. I want to see all types of projects and share those projects with RPAC members to get feedback.
- Comment: What is written in the RFP will make a huge impact on what is bid. We want to really see the commitment to allow RPAC to put suggestions on RFP language so that the process is more widely open.



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- Response – Justin Joiner: We want it to be all-sources, we have a GW type of need and we are open to any and all technologies to help APS. We welcome and look forward to the RPAC comments to ensure it is a transparent and open RFP.
- Comment: Agree about the hydrogen component and would like the technology to be more thoroughly vetted than the 2020 RFP.
- Question: Do we have a sense for the specific size of the RFP?
- Response: Jeffrey Burke: We will true it up over the next coming weeks as it depends on how contracts are finalized from previous RFPs. It will be a pretty large number with the Cholla retirement and load growth expectations. It'll be several hundred MWs but might not be a GW but it is dependent on what is bid and we will take all bids into consideration. We will have a number for the RPAC in the future and an updated forecast once contracts are finalized.
- Question: Are you anticipating location requirements near Cholla?
- Response – Jeffrey Burke: We definitely look at location. We want to make sure that we cover all of our bases and see what is competitive in all areas. We have included a map with our RFP previously to identify areas that could be favorable.
- Question: I am sensing there is still confusion with ACC approval of resources. Will you go to ACC with each resource?
- Response – Justin Joiner: The timeline for the ACC approval was to include an open dialogue for transparency as well as time for filing for prudency determination. I am trying to be as realistic with the timeframes as possible. Really to make clear that we can't issue this RFP in the second half of this year and be setup for success in 2025.
- Comment: I think it is great but with all the delays you can end up with stale bids. I don't know if we can help with that, but we want to avoid that.
- Response – Justin Joiner: We have negotiations overlaid with multiple processes to allow for those type of delays. Obviously things can change and we have to have backup plans that we will propose as well. We want to have time to negotiate, and we don't want things to go stale.
- Question: Can you elaborate on the RFP issuance you are scheduling for March 1st? Will we be reviewing the RFP before it is noticed in the April RPAC meeting?
- Response – Justin Joiner: No, we are talking about an April issuance. A draft RFP will be discussed during the March RPAC meeting before the final issuance. Meet first, discuss, then issue.
- Question: My understanding is that ACC prudency has not been a part of the process in previous years. I am wondering where that change is coming from and what the thinking is for adding that in before construction starts?
- Response – Justin Joiner: I wanted to make clear I am not suggesting pre-approval, I am expressing that we are willing to sharing information with commission staff as soon as possible to be transparent. I know I am using that word often but that is what I want to emphasize. It is something that we are wanting to do to be responsive to the commission.
- Question: Generally, when you are seeking a prudency decision, that is essentially a pre-approval. Is that what you are really wanting here?
- Response – Justin Joiner: Prudency determination is a contingency of our contracts saying that at this time it is prudent for a project. I wanted to layout a timeframe for dialogue with the commission and have time for our typical filing. It is not just a one- or two-month process. In a perfect world, I would like to present projects early and often. Our regulatory group would be able to speak to the matter better than I am.



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- Question: I am struggling because I feel this is usually coming from a rate case and it is different from other states. Are you all envisioning this as a more CPCN approval process?
- Response – Justin Joiner: I am more use to the CPCN process, but I am not suggesting that at this time. I am just suggesting that it is a thought out and open process that makes sure there aren't any suggestions that become stale or come as a surprise.
- Question: You have mentioned the Cholla and Four Corner retirements. Are you required to model pre 2031 retirement scenarios as part of the RFP?
- Response – Justin Joiner: Anything before the 2031 date would accelerate the need for new resources. It doesn't change the discussion but would shift the timeline of the need.
- Response – Jeffrey Burke: It would push things sooner. Based on the outcome of the rate case we have to evaluate earlier retirements in the upcoming IRP.
- Question: Can we summarize what the task may be that you are looking for from the RPAC?
- Response – Justin Joiner: I want to crystalize it. We want feedback and engagement throughout the process. Because of the timing needs I think it is prudent we issue sooner rather than later and then the engagement will continue as we share RFP results and then things shift towards the IRP. I want the engagement to continue over time so that we are constantly improving our process. It will be a cycle and there will be different items and different things we focus on, but RPAC needs to be focused on 2025-2026 right now and how we can get the RFP out and stay true to our IRP principles and clean energy commitments.

Lakshmi Alagappan (E3/Director) – Timing Considerations for Procurement

- **Slide 17 – RFI & RFP Definitions**
 - RFI is a solicitation to developers to provide information on potential generation resources with the intent on gaining market intelligence.
 - RFP is a solicitation to developers to provide competitive bids to fill a specific procurement need.
- **Slide 18 – Key Differences between an RFI and RFP**
 - Key differences include timeline, reliability of pricing information, and requirements of participation.
 - An RFI paired with an RFP could take up to 21 months and could not have a contract executed for up to two years.
 - RFP requires bidders to make binding pricing decisions while an RFI has no guarantee that a utility can procure resources as prices that are provided as market intelligence.
 - RFP requires more stringent requirements to ensure validity of bidders.
- **Slide 19 – New Resource Development**
 - The next five to ten years will be the most active in the history of the region in terms of resource additions.
 - Amount of storage projected to be added will be orders of magnitude larger than what has been developed to date.
- **Slide 20 – Procurement in the West**
 - Utilities and entities across the west are already taking action.
 - Large amount of capacity expected to be procured indicates increased competition and that there might be limited opportunities to enter contracts with existing resources.
 - Demand for new projects could lead to upstream supply chain issues.
- **Slide 21 – Supply Chain Disruption**



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- Upstream supply chain dynamics are already being felt with need for raw materials including lithium and others that are critical for battery storage and renewables.
- Factors are increasing the prices of raw materials and experts are uncertain if supply will keep up with growing demand.
- **Slide 22 – Current RFP Schedules**
 - There are numerous active RFPs focused on resource procurement that can come online between 2024 and 2026.
 - Emphasizes the need for APS to move quickly on RFP for 2025 and 2026 target dates and indicates that APS will be in the market the same time as many other entities in the west.
- **Slide 23 – Discussion**
 - Question: The US isn't the only player looking to change their energy mix. Lithium, Nickel, Cobalt, and solar resources are globally traded commodities. What is the bigger global picture?
 - Response – Lakshmi Alagappan: There are some significant global trends that are raising demand for raw materials. There are attempts to shift battery chemistries to reduce demand for lithium-ion and bring some manufacturing closer to the US to avoid global constraints. If we continue with current chemistries, we will continue to see rising prices. If we are able to change chemistry in 2-4 years, we may be able to avoid a big mid-2020s constraint.
 - Question: What about supply of solar panels?
 - Response – Lakshmi Alagappan: Major supply chain issues in the past few months. Continue to see constraints under current conditions.
 - Response – Matt Lind: Battery chemistries are shifting in the industry. There have also been significant challenges with solar and Lakshmi covered that well.
 - Question: There has been a rise in battery recycling programs. Have you seen any trends that are pairing programs with full lifecycle battery recycling for second life?
 - Response – Lakshmi Alagappan: I have heard of the second life programs, but I have not worked on any myself.
 - Response – Matt Lind: Not extensively aware but it will be evolving more as batteries and their applications proliferate to other sectors of the economy.
 - Comment: Even with the tight supply chain, when utilities contract with developers for battery storage and solar, it doesn't necessarily mean they will meet their required date and we are seeing that with battery storage and not by just a few months but by six months to a year.
 - Response – Justin Joiner: Uncertainty with supply chain impacts the timeline of the negotiations as well so just wanted to reiterate the importance of timing.
 - Question: What do you have for Plan B if we get down the road and these very serious supply chain issues hit when we need power online?
 - Response – Justin Joiner: We are the ones thinking about that daily. That is the purpose of the all-source RFP looking at everything in the generation mix. I don't want to preclude any resource. The more we have to look at and the greater the diversification the better. Some of our Plan B options in the past have been looking at the short-term market that is drying up. We are also looking at joining a more robust market, but everyone is going to be facing these problems. This is one of the reasons we extended Arlington to ensure reliability with the retirements of Cholla and Four Corners. I wish I had a perfect answer here. I think this emphasizes the fact that we need to move fast with our decisions here. I don't think it would be prudent to wait a couple months before the summer to do something about resource needs.



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- Comment: Thank you for your comments on a robust market, Justin, as a partial but not complete solution to this concern. We view a regional wholesale market as an important tool to assist with this “plan b” issue.
- Response – Justin Joiner: There is also a need for a diversity in the production of resources as well that will have a ripple effect through the industry. There is going to be a lot of competition for resources as indicated by the content that Lakshmi presented.
- Comment: The sooner we get into the queue the better off we are going to be.
- Response – Justin Joiner: I totally agree.

Jeffrey Burke (APS/Director of Resource Planning) – RPAC Going Forward

- Slide 25 – RPAC Going Forward
 - APS wants to say thank you to all RPAC members that have been with us along the way. APS knows we are asking for a lot of your time.
 - APS asks that RPAC members try to attend every meeting going forward and communicates if they are unable to attend for any reason.
 - RPAC was designed to pull diverse interests and thoughts from the group, and we want to make sure everyone is able to attend. The intent is to get the RPAC group down to one member per group going forward so that everyone gets an equal opportunity to participate and be heard/
- Slide 26 – APS Commitment to RPAC
 - APS has a lot of needs and will be facing challenges and we want to hear from everyone so that there are no surprises moving forward.
 - Materials will continue to be shared before RPAC meetings and there will be a collaborative discussion throughout the process. APS is available to answer questions outside of RPAC meetings.
 - APS is here and ready to respond.

Matt Lind (E98/Director of Resource Planning) – Open Discussion and Next Steps

- Slide 27 – Open Discussion
 - Comment – Matt Lind: I am not hearing a lot of resistance over the RFP being the right direction moving forward. I sense some consensus that this is agreed upon considering schedule, supply chain issues, and other factors. I would like to open the rest of the discussion up to the broader group.
 - Comment: I want to applaud the urgency because some other states have decarbonization goals but when you do the math, they must get started and started soon and they haven't. Appreciate the sense of urgency and appreciate you sharing it with us.
 - Comment – Justin Joiner: The main point of today's meeting is the RFP concept and I feel support from this group, and I think we have that answer. I have been able to connect with probably half of the RPAC members, but I plan to send out emails to have meetings and get to know each RPAC member individually. Today's meeting has flowed the way we have wanted it to in regards to robust dialogue and diversity of opinion and thought. We don't want to have meeting fatigue and we want to have open dialogue and questions throughout the meeting. The participation was appreciated, and we want feedback on how to make improvements to our process. E3 and 1898 operate independently and have reputations of having unbiased views of the world that I want shared here and I really want their insights. Thank you all for your time. We will be sending the RFP draft to you all and looking for a great dialogue next month. We will keep



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working with a sense of urgency but won't do anything sloppy. The process will be best through diversity of thought and doing things as a collective.

- Comment - Matt Lind: Great meeting and we look to continue that. All the material within this deck will be posted. We will continue to post materials going forward. We will also be providing the minutes going forward. Please email the RPAC email with comments and questions on how we are addressing action items. The intent is to move forward and share the RFP issued document with the RPAC members. Discuss what the need is going to be for the RFP, what resource types can address those needs, cost characteristics, what will we evaluate, how will we evaluate. We will talk about this during the February RPAC meeting and shortly after will share the RFP for review and provide feedback in March meeting. The hope is to target an issuance in the April timeframe. At a point in the future, we will summarize bids and aggregate and share information that is not confidential to show how bids look and stack up against each other. Today was a great sign of member engagement moving forward and we appreciate all that you do to make these RPAC meetings collaborative.

New Action Items