



Meeting Notes

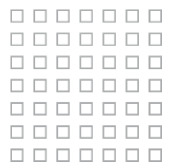
DRAFT – For Discussion Purposes Only

Meeting Objectives

- Discuss conclusion and final steps of the load forecasting process
- Highlight current conditions, market dynamics, and resource adequacy trends in the West and how the current state impacts APS’ planning needs
- Introduce the 1898 & Co. and E3 teams and update RPAC on changes to the RPAC meeting structure and RPAC vision moving into 2022

Meeting Subject: December RPAC Meeting
 Meeting Date: 12/14/2021
 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
David Peterson	APS	Corporate Strategy Advisor
Kristie Cocco	APS	General Manager of Reg. Affairs & Compliance
Ross Mohr	APS	Manager, Eng/Revenue Analysis
Nick Schlag	E3	Director
Lakshmi Alagappan	E3	Partner
Adrian Au	E3	Consultant
Matt Lind	E98	Director of Resource Planning
Debashis Bose	E98	Project Management
Chase Kilty	E98	Consultant
Sandy Bahr	Sierra Club	
Louisa Eberle	Sierra Club	Attorney
Autumn Johnson		
Gary Dirks	ASU	Director
John Cordes		
Nicole Hill	Nature Conservancy	AZ Thrives Program Lead
Nitin Luhar	Mitsubishi Power	Regional Director
Devi Glick		





Justin Joiner (APS/Vice President of Resource Management) –Introduction/Current Conditions/Summer Review/Market Dynamics

- **Slide 2 – Agenda/Introduction**
 - The primary focus of the redefined RPAC is to provide an open, transparent process with no pre-conceived notions.
- **Slide 4 – New Dilemmas for resource adequacy in the West**
 - Arizona is experiencing real load growth in the area that is already taking place with developments like the TSM manufacturing facility.
 - There are planned firm retirements and renewable storage additions happening in Arizona and other western states.
 - Changing weather conditions and increased risk of drought further stress resource adequacy needs in the region.
- **Slide 5 – Increased renewable penetration is reshaping resource adequacy needs in the West**
 - An increase in renewable resources shifts planning need to net-peak hours when solar output drops off.
 - An example of the need for net-peak planning was highlighted by the 2020 CAISO load shedding events and increasing renewable penetration increases the potential for increase in frequency of these type of events.
- **Slide 6 – APS depended on short-term market to meet obligations**
 - Short-term purchases were relied on to meet load in 2020 and 2021.
 - Capacity shortfalls are not only a reliability risk, but also a cost risk.
 - July 9th was an additional date where the electric grid was stressed across WECC, and imports would have been difficult to rely on.
 - APS was one unit away from having a reliability issue on 7/30/2020 and 6/18/2021.
 - APS is actively monitoring and exploring western market initiatives and their benefits including:
 - CAISO Extended Day-Ahead Market
 - Western Market Exploratory Groups
 - Western Resource Adequacy Program
 - SPP Markets Plus Initiative
 - Western markets initiative is more long-term focus, but APS will have to focus on short-term planning as well to meet requirements.
- **Slide 7 – A rapidly evolving landscape creates risk and opportunities**
 - Recent headlines and announcements were specifically called out to highlight trends and developments in the Southwest including:
 - California rates are 2x Arizona
 - Regulatory concerns over renewable overbuild
 - Reliance on energy storage to meet future resource adequacy
 - High EV growth
 - Question: Where will all the water come from? This is not sustainable. It feels like APS is setting us up for bad news. Where is the headline for the climate crisis?
 - Response – Justin Joiner: We were not setting the RPAC up for bad news, we are noticing a potential for success and wanted to call that out. We want this to be a process where RPAC members can fully engage and be heard. 1898 and



APS RPAC December Meeting

E3 are going to help us facilitate this forum so we can direct our attention towards observing and understanding RPAC members feedback and taking action. The intent is to be fully transparent.

- Question: Most of the context of the letter from the commissioner was fossil based and not just specific to renewables. Does APS intend to respond to the letter from the commissioner? I also wanted to clarify our goals here, are we trying to influence the 2023 action plan or modify the 2020 action plan.
- Response – Justin Joiner: Regarding your second question, I think both will be influenced, the intent is to be very transparent about what we're doing and if the topics addressed in this meeting result in modifications to actions plans, then great. In terms of the letter response, APS must be responsive to the chairperson of our commission. We are still working with our regulatory and legal teams to determine the nature of a response.
- Comment: I appreciate the sentiment you are expressing to make this forum into a broad, interactive conversation and welcome the intent to bring issues of reliability, affordability, and energy justice into the conversation alongside climate.
- Question: Sounds like APS has been short on capacity in recent years. Now that we know what the peaks are during extreme conditions, can we figure out what the exact capacity needs are and add solar plus batteries to meet that need plus any reserve margin since it is cheaper than coal and gas.
- Response – Justin Joiner: Yes, that is possible, and everything is on the table to meet reliability needs. I want to note that we talked about the letter from the commissioner on renewable overbuild that, I would say, is a headwind to creating more renewables. We have an eyes wide open approach in terms of adding additional renewable resources and we do have many renewables coming online in our plan. Adding more renewables on top of that would be something valuable for discussion.
- Comment: California procurement additions are going to include a very small amount of natural gas expansions. Sierra Club has issued a report that a renewable energy plus storage portfolio would be more reliable than gas moving forward. We are facing a climate crisis and understand reliability concerns but do not see the two options as mutually exclusive.
- Response - Justin Joiner: California is doing a phenomenal job; they are on the forefront of renewables. I did though want to note that they have extended license agreements on fossil and nuclear resources that I would not have seen possible a few years ago. I want to ensure that we do not create a reliance on imports or create a resource adequacy risk in the future.
- Comment: All of this context is helpful as we move ahead. We would like to see ambitious targets for renewable energy. I also want to understand the barriers and challenges for APS achieving goals - maybe RPAC members can help be part of the broader solution for APS - whether it is how regional markets work or supporting incentives for innovation at APS. We are in this together.
- Response – Justin Joiner: We have our clean energy commitments and if there are ways that we can expand upon them moving forward then that is something that should be considered. We are fully investing in this RPAC, and we want this process to be collaborative and fruitful. The recent rate case and letter from the commissioner are examples that regulatory challenges do exist. APS does not want to enter a poor agreement financially and wants to ensure prudent decision making going forward.
- Comment: I understand that APS is regulated by the ACC, but you need three votes and many of these issues have been one off comments by a single commissioner.



APS RPAC December Meeting

- Response – Justin Joiner: That is noted but APS wants to be transparent that they are responding to the concerns of their commissioners. I hear you completely, and I believe we took the correct action on Solana. We will continue to make our case, and we understand that there certainly is a risk there.

Matt Lind (1898 & Co./Director of Resource Planning and Market Assessments) – 1898 & Co. Introduction

- Slide 9 to 11 – Introduction to 1898 & Co capabilities and experience

Nick Schlag (E3/Director) – E3 Introduction

- Slide 12 to 13 – Introduction to E3 capabilities and experience

Jeffrey Burke (APS/Director of Resource Planning) – Load Forecast Conclusion

- Slide 15 – RPAC Load Forecast Selection Results
 - Highlighted big levers incorporated in load forecast and indicated which scenarios were included for demand side management, distributed generation, electric vehicle adoption, economic development, and extreme weather.
- Slide 16 – Peak Growth Comparison to APS Base Forecast
 - RPAC peak forecasts reflect different levels of DSM.
 - EV forecast impacts reflected in growth in period 2030 and beyond.
- Slide 17 – Energy Growth Comparison to APS Base Forecast
 - Energy forecast differences not as significant compared to peak demand.
 - High distributed generation reduces energy growth over all years.
 - High EV forecasts increase energy growth over all years.
- Slide 18 – RPAC Load Forecast Next Steps
 - APS to send load forecast to ACC.
 - Letter to ACC will provide an overview of the process used to develop the load forecasts and highlight that the forecasts are not representative of a particular individual's perspective.
 - Question – Autumn Johnson: Will we be repicking scenarios in a year or just re-running those scenarios with updated data?
 - Response – Jeffrey Burke: There will be some updates, but they will be higher level and we do not intend to go into as much detail during future updates. The load forecast exercise was intended to give RPAC insights into the load forecasting process and then lead into next steps of the resource plan. We will not be able to go into the IRP with a year-old forecast, so it will need to be refreshed in the fall. The refresh will not go into in the same level of detail as this exercise.
 - Comment: I did not realize that there was going to be a difference between the RPAC forecasts and the APS forecast.
 - Response – Jeffrey Burke: APS does not go into an IRP with one forecast. This was more of an exercise to get feedback from the RPAC to understand which assumptions are high priority. APS will be evaluating multiple forecasts in the IRP analysis.
 - Question: What is RPAC going to be focused on next in the near term?



APS RPAC December Meeting

- Response – Jeffrey Burke: The focus will be on how we select resources going forward and how we evaluate the next IRP. Near-term and long-term planning are both a part of the IRP process. We will move forward with the current energy rules.
- Question: Depending on the energy rules, does APS plan on changing the RPAC or are we committed to the RPAC moving forward?
- Response – Jeffrey Burke: APS will be keeping the RPAC together moving forward. APS wants RPAC feedback and wants the RPAC's support moving forward.
- Question: The ACC provided recommendations that may impact the 2020 IRPs submitted by Arizona utilities. These could impact the 2023 IRPs, for example, evaluating the existing resources and their current states.
- Response – Jeffrey Burke: APS does not have a crystal ball yet, but APS did respond to that specific filing. Sub-hourly modeling was one aspect of the filing that was found to be challenging. There is a lot of effort and uncertainty that goes into sub-hourly modeling over an extended time period. We will keep the RPAC up to date with any changes resulting from that filing.

Justin Joiner (APS/Vice President of Resource Management) – RPAC Focus and Commitments Moving Forward

- Slide 20 and 21 – RPAC Focus and Commitments and Next Steps
 - A main focus of the meetings is to be transparent, collaborative, and productive. There will be monthly meetings that accommodate RPAC members' schedules.
 - 1898 and E3 will become the main facilitators of the dialogue during the RPAC meetings and provide supplemental analysis where it is beneficial.
 - RPAC focus centered around the APS promise of a sustainable energy future for Arizona that is clean, reliable, and affordable.
 - RPAC meeting material will be available to the public.
 - The intent is to not get hung up by technical jargon or details that will slow down the process. APS wants to be visionaries and to be inclusive of all possible technologies that will align with the APS promise.
 - The current process to get new resources is lengthy. Implementing an RFI, RFP, then evaluating bids with an independent monitor, and then finally performing outreach to developers can be a four-to-five-month process. The negotiation phase with developers can then take another five or six months, leading to a year-long process.
 - APS is interested in opportunities to take out steps that do not add value, such as an RFI, to speed up the process and enable the addition of new resources within a shorter timeline.
 - Question: I am hung up on the word "refocus", what is going to change?
 - Response – Justin Joiner: It is not necessarily clear in the energy rules to call for steps of immediate action. We want future RPAC meetings to be mediated by 1898 and to include analysis performed by E3 to ensure that the process is transparent and collaborative.
 - Comment: While not your responsibility solely to address adversely impacted communities in this energy journey, APS leadership and stewardship is essential. This group would be a great forum for ensuring that the larger AZ community considers and addresses the needs of disadvantaged populations. An addition to our focus.



APS RPAC December Meeting

- Response – Justin Joiner: That point of view may not be fully represented on this RPAC call and we may need to add a representative of that mindset to future RPAC calls. These communities need to be represented so that we can address their needs in all that we present to regulating bodies.
- Comment: I am worried about the severity of the load forecast increase especially if APS is already having capacity shortfalls.
- Response – Justin Joiner: It is not an inconsequential amount of load increase, but it wouldn't be as much of a concern if the issues were specific to Arizona and there was more of an ability to rely on neighbors. The current system conditions require considerations about how APS would operate as an island due to the risks associated with depending on imports. The main concern would be that in May the RPAC decides that nothing needs to be done.
- Question: When will the load forecast be filed?
- Response – Jeffrey Burke: In the next two or three weeks assuming there are no major questions or concerns. The timeline is less certain with the holidays approaching.
- Question: Is there anything that RPAC should expect to hear on the 2020 IRP at this week's open meeting?
- Response – Jeffrey Burke: We have read it, processed it, and are concerned about the sub-hourly modeling but that is most of our feedback. Any other surprise to RPAC members would be associated with amendments or questions answered live that APS is not expecting.
- Question: When will E3s study be shown?
- Response – Justin Joiner/Nick Schlag: The intent is to introduce and talk about the study in the January and February RPAC meetings. The focus is on resource adequacy in Arizona and New Mexico.
- Closing remarks of the RPAC meeting reemphasized the intent of the RPAC meetings to be transparent, collaborative, and productive.

New Action Items

- APS - Complete and send letter to ACC on load forecast and determine if the letter will be shared with the RPAC beforehand for questions and comments.