



APS RPAC Meeting

7/23/2024



MEETING AGENDA



Welcome & Meeting Agenda
Matt Lind
1898 & Co.



Break



APS Update
Todd Komaromy
APS



Redhawk CEC Application
Mike Eugenis
APS



APS IRP Stakeholder Workshop
Akhil Mandadi
APS



Next Steps & Closing Remarks
Matt Lind
1898 & Co.



ASRFP Update
Derek Seaman
APS

Meeting Guidelines



Member Engagement

RPAC Member engagement is critical. Clarifying questions are welcome at any time. There will be discussion time allotted to each presentation/agenda item, as well as at the end of each meeting.



Action Items

We will keep a parking lot for items to be addressed at later meetings.



Meeting Minutes

Meeting minutes will be posted to the public website along with pending questions and items needing follow up. We will monitor and address questions in a timely fashion.



Preliminary Content

Meetings and content are preliminary in nature and prepared for RPAC discussion purposes. Litigating attorneys are not expected to participate.



May Meeting Recap

- APS provided an overview of the System Reliability Benefit (SRB) mechanism and a preview of its stakeholder process.
- APS discussed the goals of the Corporate Sustainability Survey shared with members prior to the May RPAC meeting.
- E3 provided an update on the status of the hydrogen industry.
- Mitsubishi shared an OEM perspective on the hydrogen industry.
- APS updated members on the progress of its Response to Stakeholder Comments.



Following Up

- Action Items from Previous Meetings: N/A
- Ongoing Commitments:
 - Distribute meeting materials in a timely fashion (3 business days prior)
 - Transparency and dialogue





APS Update

Todd Komaromy, APS



IRP Stakeholder Workshop

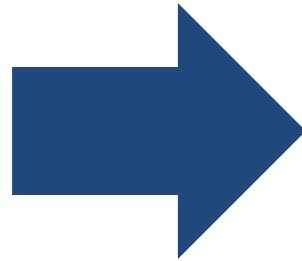
Akhil Mandadi, APS



Significant Changes in the 2023 Integrated Resource Plan (IRP)

2020 IRP

1. Traditional Installed Capacity (ICAP) treatment for Resource Adequacy
2. Existing renewable energy credits
3. RPAC not formed
4. Conventional modeling practices
5. Limited infrastructure constraints

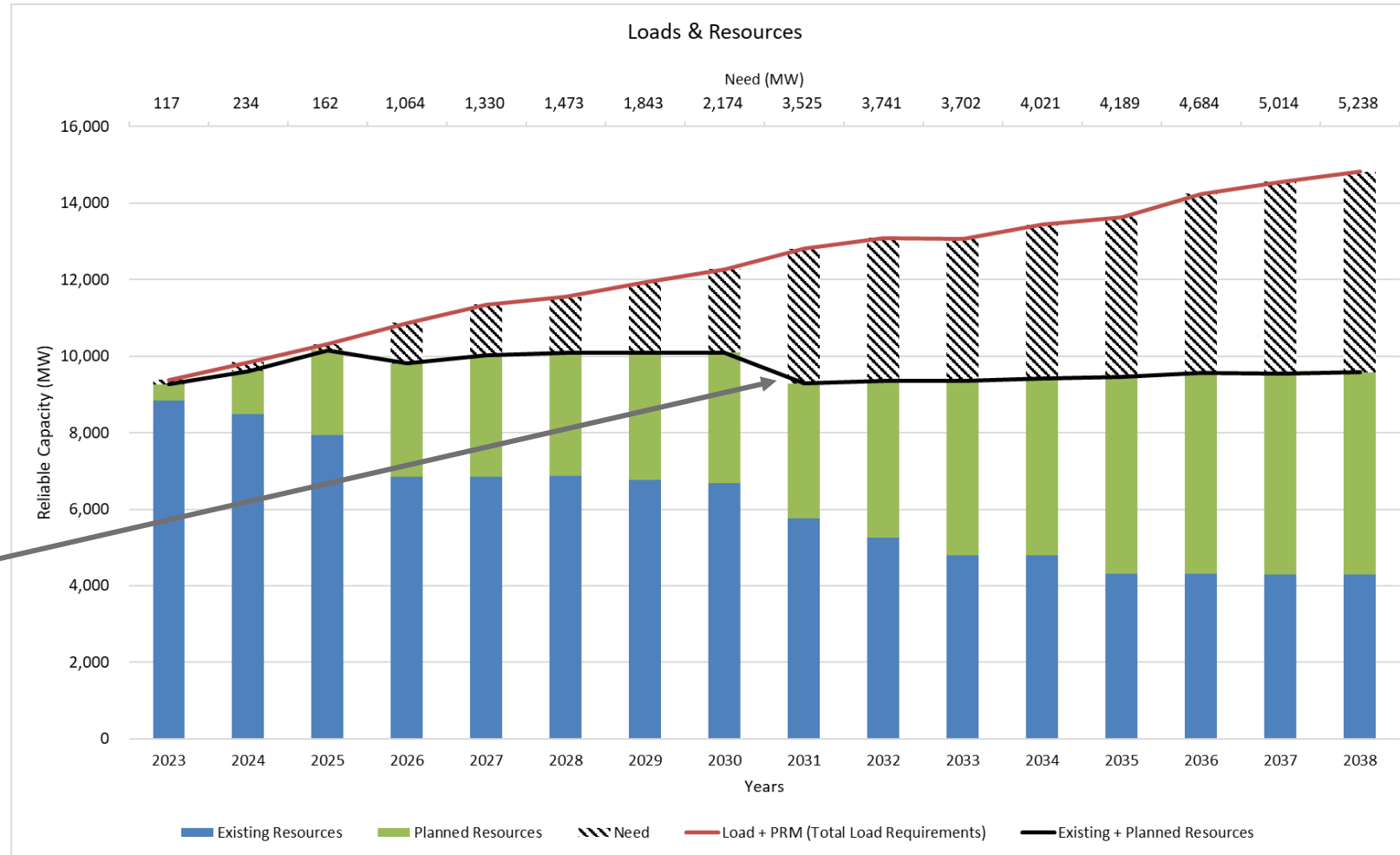


2023 IRP

1. Implementation of Perfect Capacity (PCAP) treatment for Resource Adequacy
2. 2022 Inflation Reduction Act (IRA) electrification & tax credit extensions
3. RPAC Stakeholder collaboration
4. Utilization of Capacity Expansion modeling
5. Natural gas transport & transmission capabilities modeled



2023 IRP Reference Case – Annual Capacity Need



Increase in need due to Four Corners Coal exit

Note: The values are cumulative.





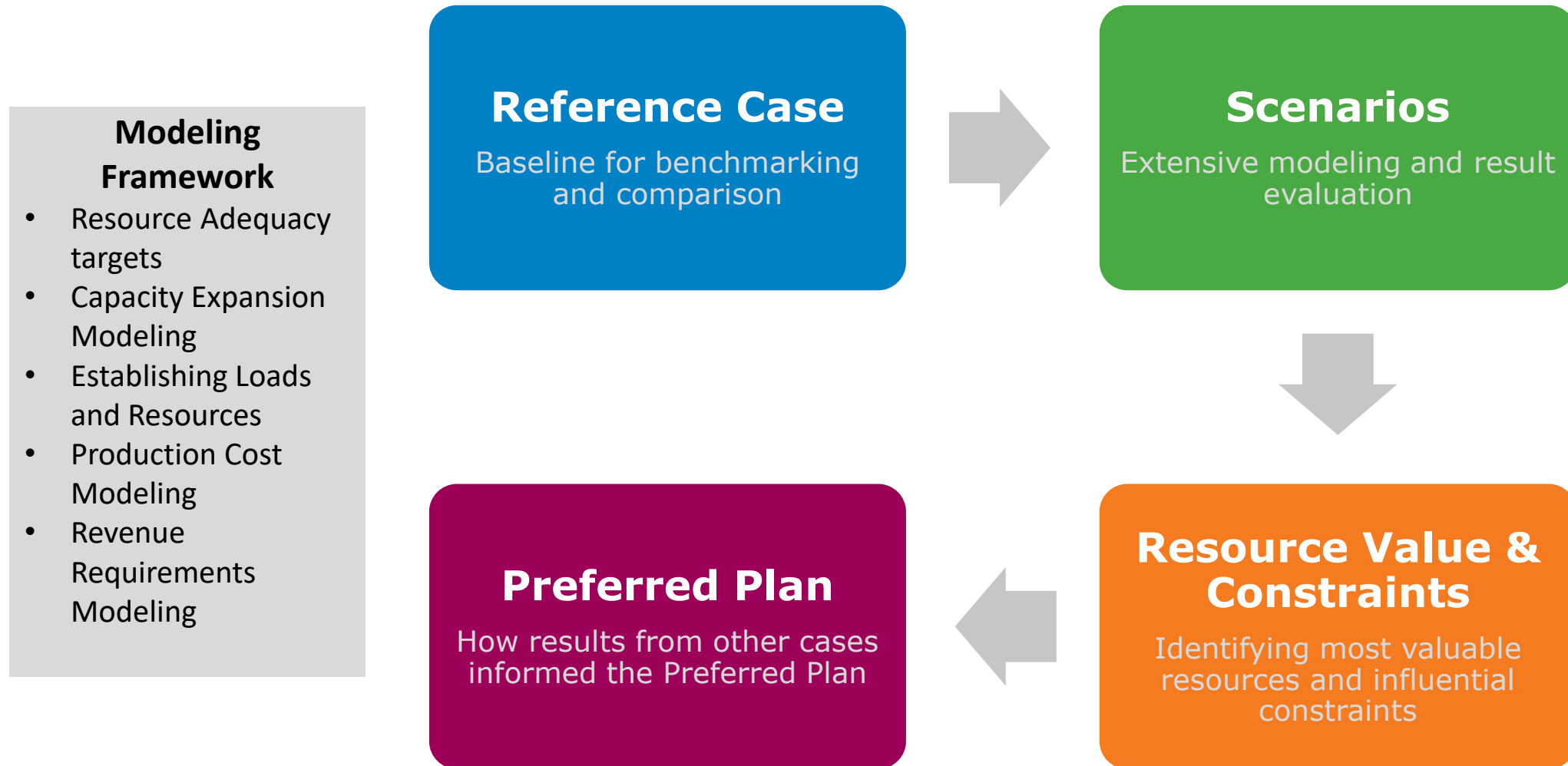
2023 IRP Portfolios Studied

Scenario Overview	Objective of Each Case
1. Reference Case (Baseline Scenario)	Benchmarking
2. Four Corners Coal Exit Scenarios*	Reliability and cost impacts
3. Technology Neutral Scenario*	Impact of emission reduction goals or renewable/carbon emission standards
4. Low & High Renewable Capital Costs/ High Demand-Side Technology*/ High Gas Price Scenario	Robustness assessment of portfolios
5. Low & High Load Scenarios*	Identifying high-value resources
6. Preferred Plan Scenario	Incorporating key learnings from all other scenarios

*Represents portfolios required by the Arizona Corporation Commission



2023 IRP Portfolio Analysis Process

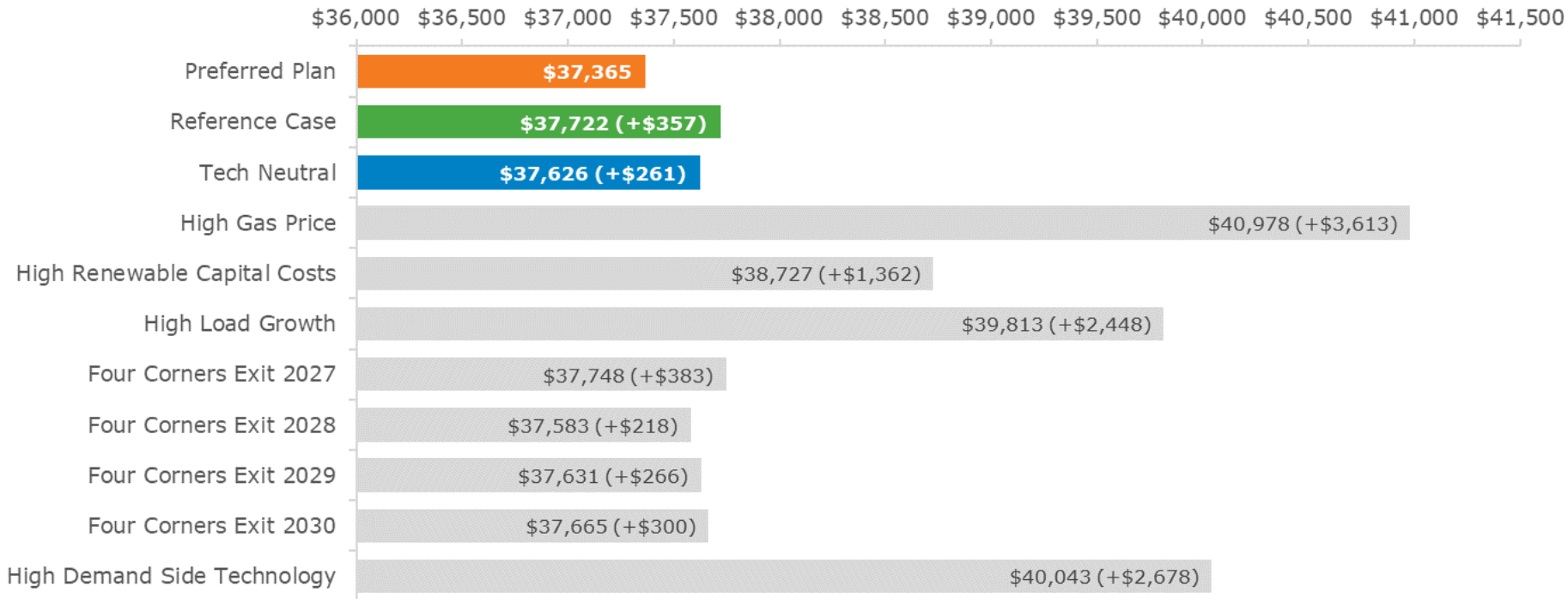




APS Preferred Plan: Portfolio Analysis Outcome

Maintains reliability for APS customers at least cost through investment in a diverse portfolio of resources.

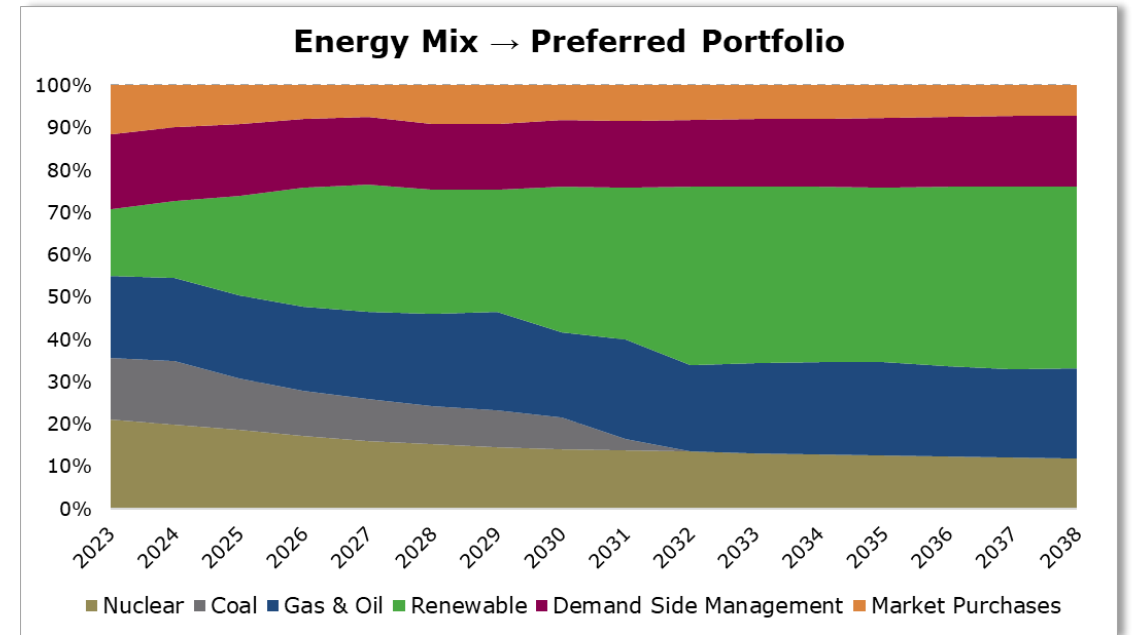
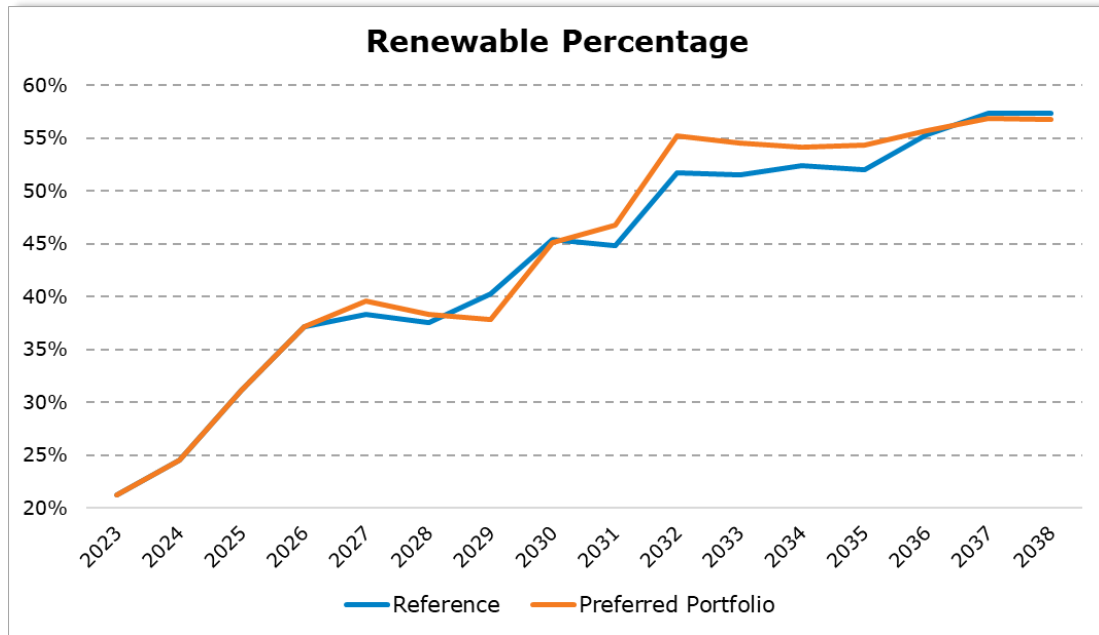
Present Value Revenue Requirement (\$ millions)



- ✓ Least Cost
- ✓ Reliable
- ✓ Balanced Resource Portfolio
- ✓ Dependable technologies



APS Preferred Plan Energy Mix



Renewable resources an important part of least cost balanced portfolio.



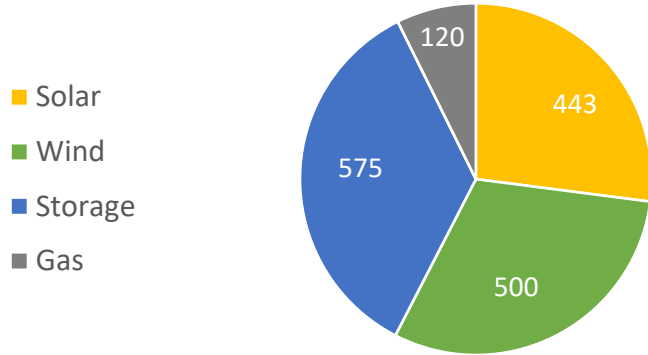


ASRFP Update

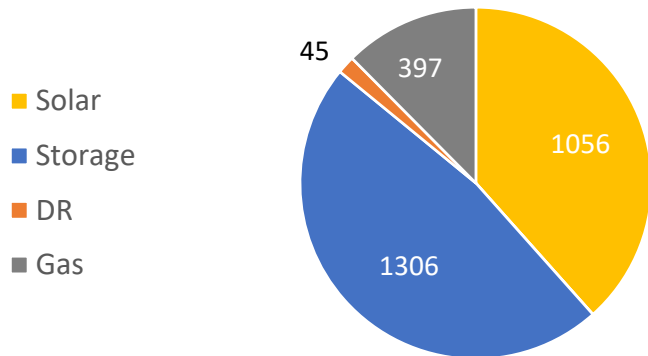
Derek Seaman, APS

2023 ASRFP – Anticipated Resources (2026-2028)

2023 ASRFP Signed Projects



2023 ASRFP Projects in Negotiation



Recently Signed Projects

- Ironwood – 168 MW Solar
- Agave – 150 MW Battery
- Sundance – 91 MW CT
- 150 MW Battery
- 30 MW Combined Cycle Uprate
- 275 MW PVS
- 500 MW Wind

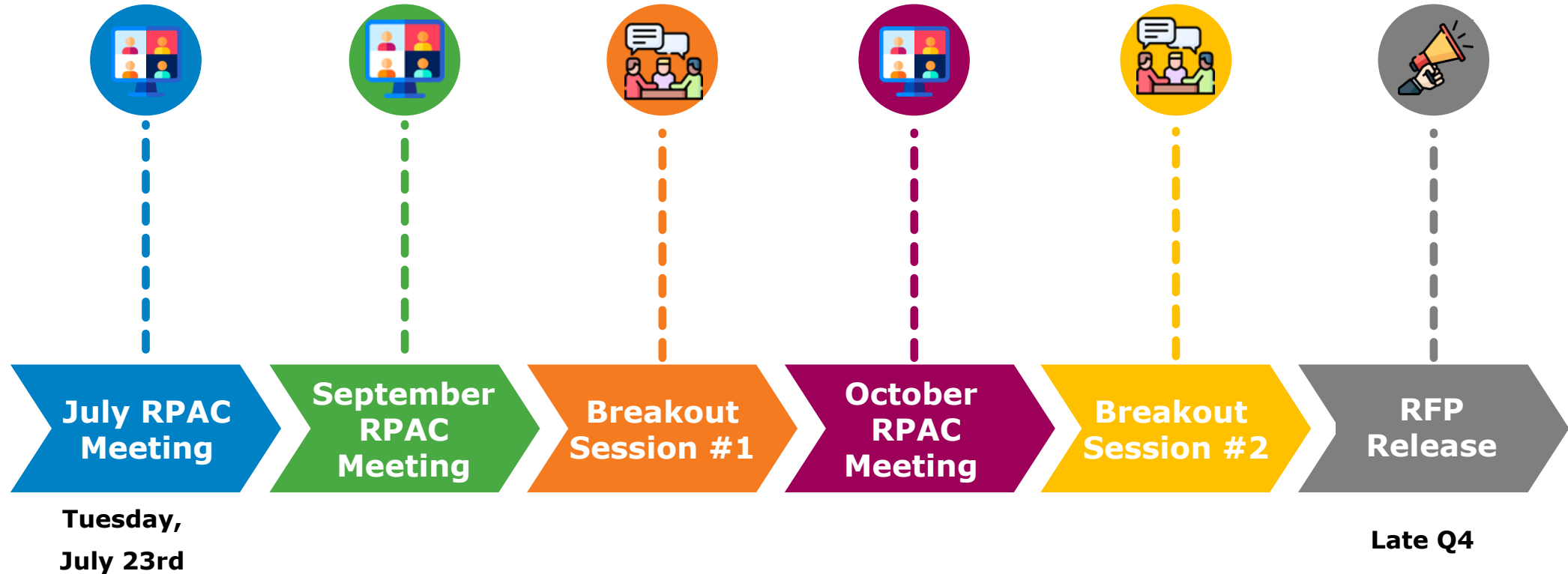
Will seek SRB recovery

2023 ASRFP by the Numbers

- Sought 4,387 MWs of Resources and 1,999 MWs of renewables.
- Expected 2026 Resources
 - 3,123 MWs
 - 1,553 MWs - renewable energy
- 2028 negotiations underway



2024 All Source RFP Timeline



2024 ASRFP - Current Plan

- Will focus on long term needs
 - Targeting in excess of 1,000 MW of on peak resources
 - Target years of 2028 and beyond with equal emphasis on longer lead time projects
 - Long term needs are driven by broad economic growth and planned resource retirements
- Evaluation Process
 - Review bids for minimum participation criteria
 - Screen bids using cost and non-cost criteria to create shortlist
 - Shortlist best and final offers are requested
 - Portfolio Analysis
 - Resources compete head-to-head
 - Projects are ranked based on performance
 - Negotiations





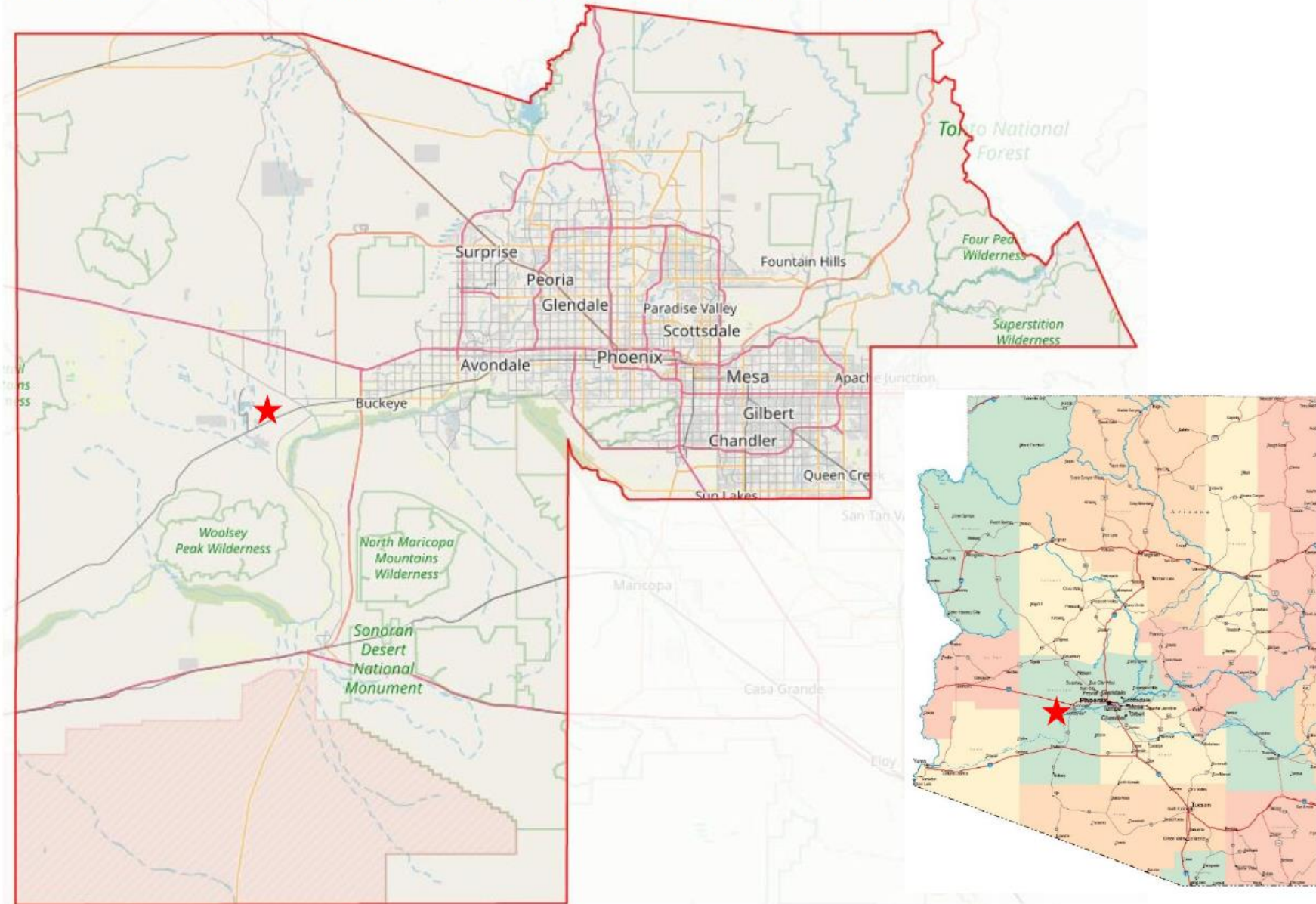
Redhawk CEC Application

Mike Eugenis, APS

- APS is evaluating the opportunity to build eight new 49.6MW simple cycle (natural gas fired) power generation units adjacent to the existing units. (397MW new generation)
- LM6000 turbines are derived from the core of the CF6-80C2 engine, which is General Electric Company's high-thrust, high-efficiency aircraft engine
 - 10-minute fast start flexibility
 - Quick starting capability allows for greater reliance on renewables without impacting reliability
- LM6000 units will be equipped with emission control systems, SCR/CO catalysts.
- Scope includes supporting infrastructure (electric, water, instrument air, emission systems, etc.) to facilitate operation of new units.

Redhawk Power Plant Location

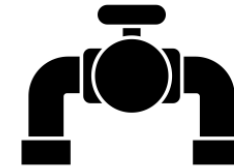
FIGURE 2-2. Location of the Redhawk Power Plant in Arizona and Maricopa County.



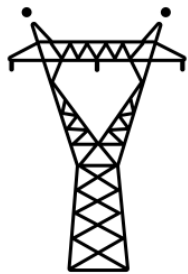
Advantages to Redhawk



Existing Site



Redundant Gas
Pipeline

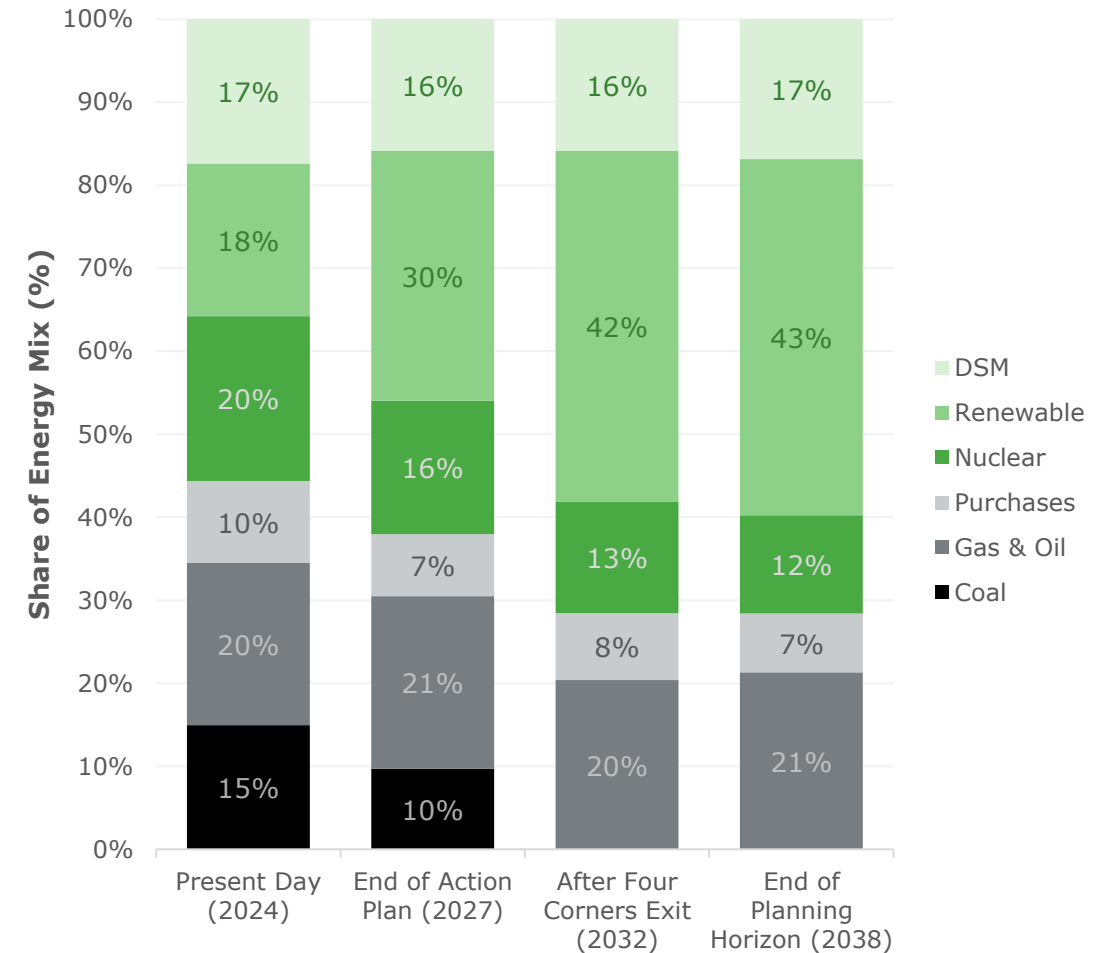
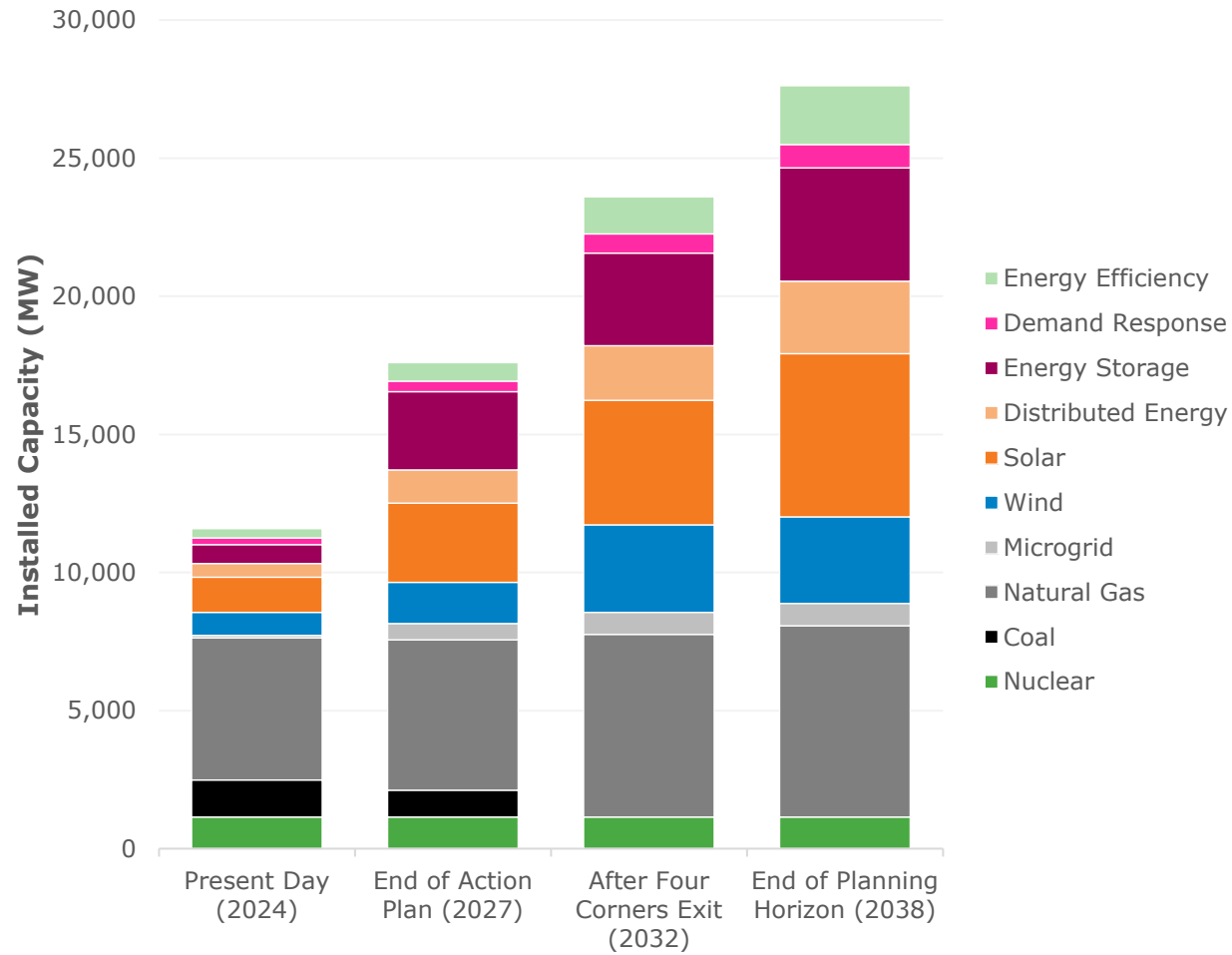


Transmission
Infrastructure



Existing Water Rights

APS Resource & Energy Mix



Source: 2023 IRP Pgs: 6 & 82

NERC Long Term Reliability Assessment

Changing Resource Mix and Reliability Implications

Wind, solar PV, and hybrid generation are projected to be the primary additions to the resource mix over the 10-year assessment period; this leads the continued energy transition as older thermal generators retire. Maintaining a reliable BPS throughout the transition requires unwavering attention to ensure the resource mix satisfies capacity, energy, and essential reliability service (ERS) needs under designed conditions. It will also require significant planning and development of the interconnected transmission system to have a deliverable electricity supply from new resources to changing types of loads and the ability to withstand system contingencies.

Conclusions and Recommendations

The energy and capacity risks identified in this 2023 LTRA underscore the need for reliability to be a top priority for energy policymakers, regulators, and industry. Growing the reliable BPS will involve doing the following four things, numbered only for identification:

1. **Add new resources with needed reliability attributes and make existing resources more dependable.** As BPS resources grow to meet rising demand and the resource mix changes, IBR performance issues as well as generator and fuel vulnerabilities to extreme temperatures must be addressed to have a reliable electricity supply:
 - New wind and solar PV resources use inverters to convert their output power onto the grid, and the vast majority of resource inverters are susceptible to tripping or power disruption during normal grid fault conditions; this makes the future grid less reliable when more resources are inverter-based.
 - Natural-gas-fired generators are essential for meeting demand; they are dispatchable at any hour and provide a consistent rated output under a wide range of conditions. However, sufficient natural gas fuel supplies cannot be assured without better reliability measures and the effective coordination between the operators and planners of both electricity and natural gas infrastructures.

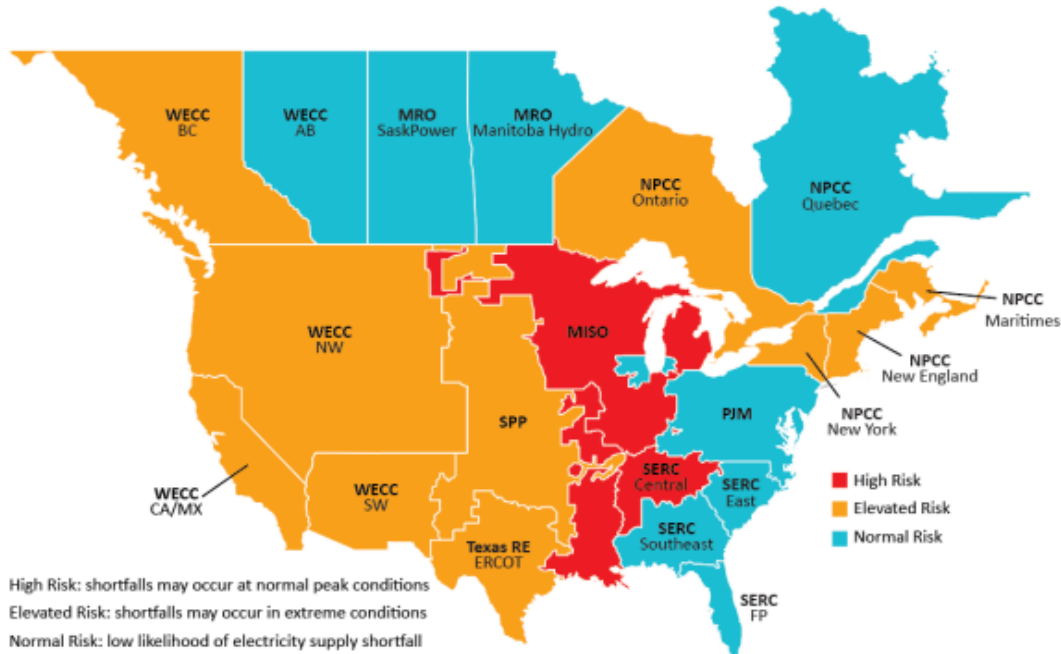


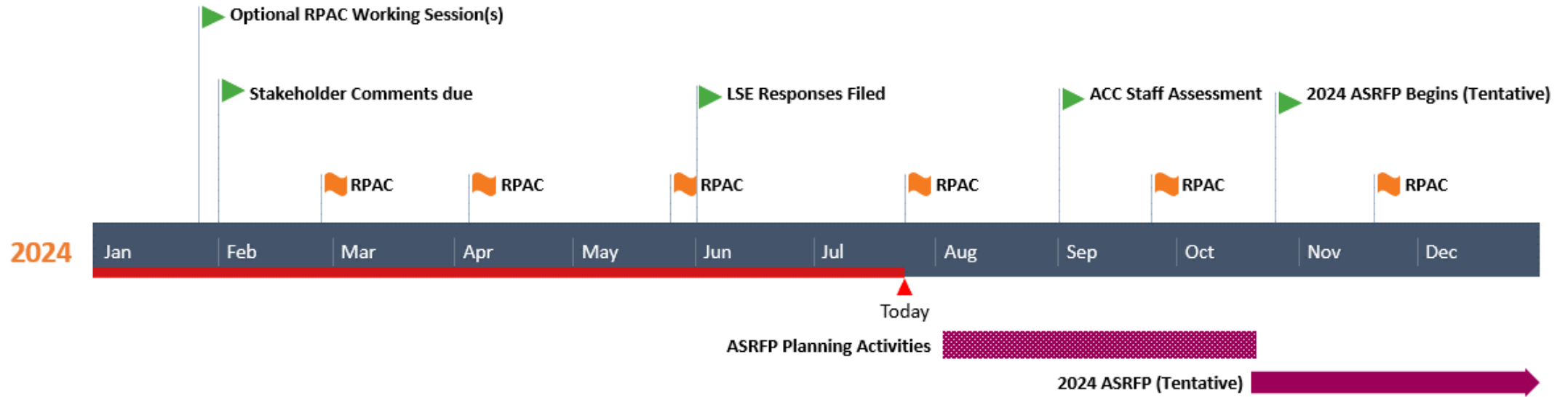
Figure 1: Risk Area Summary 2024–2028⁸



Next Steps & Closing Remarks

Matt Lind, 1898 & Co.

Forward Plans and Meetings



Key Milestones

September RPAC Meeting: 9/25/2024
Time: 9:00am

Redhawk CEC filed: 7/8/2024
Redhawk Line Siting Hearing: 8/19/2024

