APS RPAC Meeting

03/01/2023

MEETING AGENDA

Welcome & Meeting Agenda
Matt Lind
1898 & Co.

Load Forecast Update
Ross Mohr
Manager, Energy & Revenue Forecasting

2022 RFP Update
Derek Seaman
Manager, Resource Acquisition

TPU Update
Todd Komaromy
Director, Resource Planning

Microgrid Primer
Judson Tillinghast
Manager, Strategic Projects

IRP Portfolios - RPAC Feedback
Matt Lind
1898 & Co.

Next Steps & Open Discussion
Matt Lind
1898 & Co.

Meeting Guidelines

- 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.
- We will keep a parking lot for items to be addressed at later meetings.
- 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.
- Consistent member attendance encouraged; identify proxy attendee for scheduling conflicts.
- Meetings and content are preliminary in nature, and prepared for RPAC discussion purposes. Litigating attorneys are not expected to participate.

Following Up

- Action Items from previous meetings:

- Ongoing Commitments:
  - Distribute meeting materials in a timely fashion (3 bd prior)
  - Transparency and dialogue

January Meeting Recap

- RPAC was formally introduced to APS President, Ted Geisler. Ted emphasized APS' continued dedication to achieving the goals of its Clean Energy Commitment.
- EPRI provided an update its on-going Climate Change Scenario Analysis.
- APS discussed the 2023 Load Forecast and how datacenters and large manufacturing customers are expected to be a major source of load growth.
- APS outlined the 2023 IRP timeline and highlighted critical milestones.

Load Forecast Update

2023 Load Forecast Update

Ross Mohr

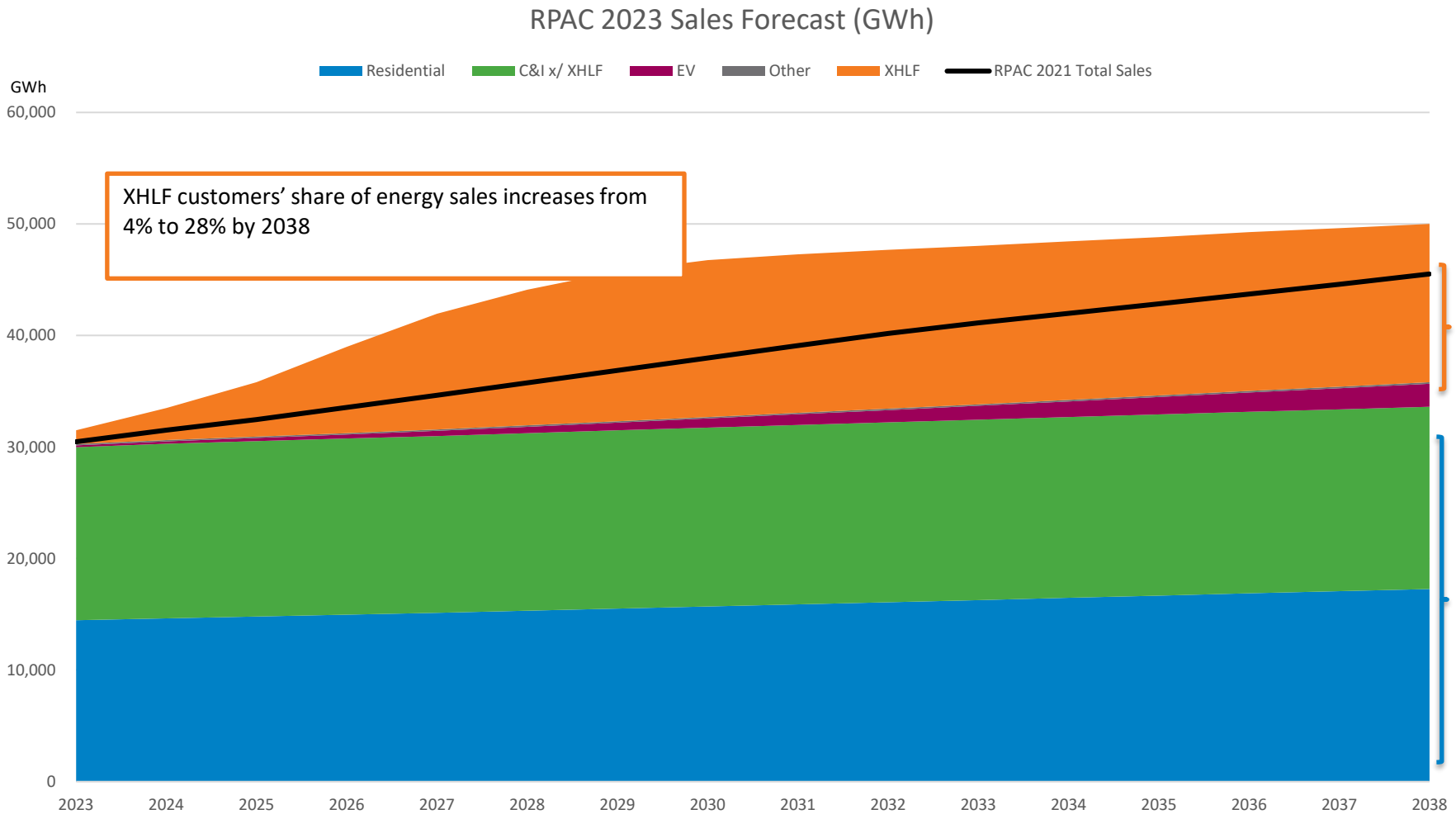
March 1, 2023

March 2023 Load Forecast Update Summary

- January RPAC presented XHLF with two scenarios
  - **Low XHLF** is comprised of existing datacenter customers and two announced Fabs of TSMC
  - **High XHLF** includes a probability-weighted forecast for all prospective datacenters and large manufacturing customers that are in various stages of study/funding/construction
  - Datacenters and large manufacturing customers' (XHLF) share of energy sales increases from 4% of sales to 16%-49% of sales from 2023 to 2038

- **March RPAC:** Datacenter and large manufacturing customers ("XHLF") are expected to be the major source of load growth, with energy sales increasing from 4% of sales to 28% of sales from 2023 to 2038
  - Modeled with probability-weighting as was the High XHLF scenario from January
  - XHLF forecast now closer to Low XHLF scenario due to lower probabilities and lower projected loads on some datacenter customers
  - No other changes to the forecast (including EV, DE, and EE/DR forecast updates in progress with Guidehouse)

Sales Forecast Update



Large projected load increase due to prospective datacenters and large manufacturing

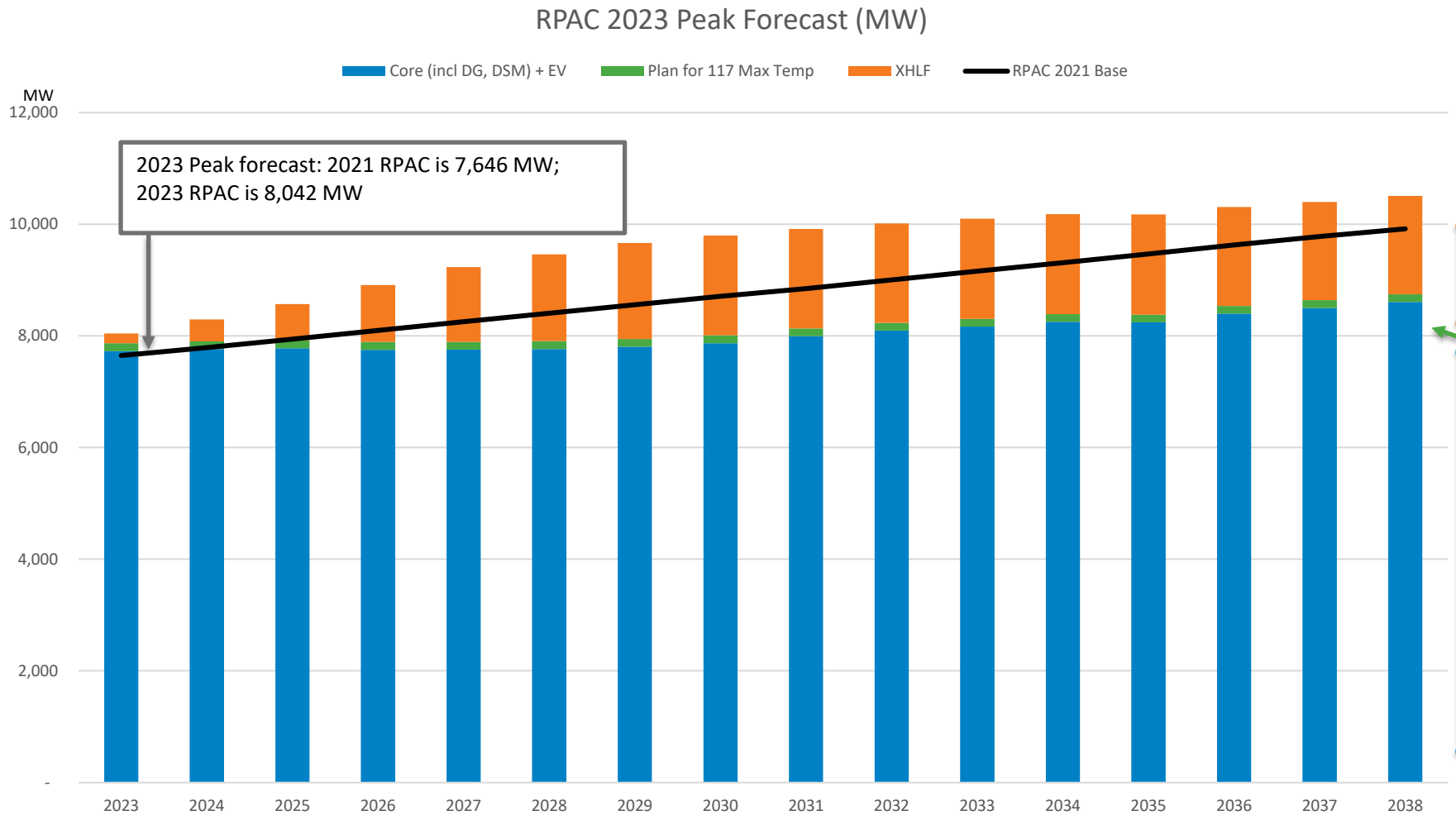
XHLF

- Now projected at more than twice the amount of sales growth vs the 2021 RPAC forecast for XHLF customers
- 2021 RPAC forecast had XHLF share of sales increasing to 15%

Slight net decrease among residential and C&I compared to 2021 RPAC forecast

Peak Forecast Update

Peak forecast increases to 10,506 MW vs 9,919 MW (RPAC 2021)



XHLF: Almost all peak growth compared to 2021 RPAC forecast is due to datacenters and large manufacturing

Planning for **max temps of 117 degrees adds 139 MW** to the peak forecast

Slight net decrease among residential, C&I, and EV compared to 2021 RPAC forecast

Load Forecast Growth Summary

- 2023 RPAC forecast shows slower "core" load growth due to changes in usage trends post-COVID and model improvements
- XHLF customers expected to be the major source of load growth; new probability-weighted forecast

Retail Sales CAGR		2023-2028	2028-2033	2033-2038	2023-2038	
RPAC 2021 Base Case	**Total Retail**	**3.2%**	**2.8%**	**2.0%**	**2.7%**	
	Total Retail x/ XHLF	1.9%	2.1%	2.1%	2.0%	
	Total Retail x/ XHLF, EV	1.7%	1.8%	1.7%	1.8%	"Core" growth
RPAC 2023	**Total Retail**	**7.0%**	**1.7%**	**0.8%**	**3.1%**	
	Total Retail x/ XHLF	1.1%	1.2%	1.1%	1.1%	
	Total Retail x/ XHLF, EV	0.8%	0.8%	0.7%	0.8%	"Core" growth

Peak CAGR	2023-2028	2028-2033	2033-2038	2023-2038
RPAC 2021 – Base Case	1.9%	1.7%	1.6%	**1.8%**
RPAC 2022 – Base Case	3.3%	1.3%	0.8%	**1.8%**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2022 ASRFP Update

2022 RFP Update

- Significant need for flexible and diverse resources to come online in 2025-2026

- Negotiations ongoing; expect to conclude late Q2 2023
  - Nearly 600MW executed (2025 COD)
  - Approximately 1600MW in active negotiations (2025 COD)
  - Pursuing 500-1000MW additional resources (2026 COD)

- Anticipate issuing next RFP late Q2/early Q3 2023
  - All Source approach
  - Resources to come online beginning in 2027 and beyond
  - Take lessons learned and build on successes of 2022 effort
  - Continued RPAC engagement


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Thermal Performance Upgrade (TPU)

Upgrade to West Phoenix Power Plant

- Improved efficiency - ~55 MW additional reliable, dispatchable generation capability
- In service by summer of 2024
- No noise increases, nor externally visible modifications
- Similar upgrades have occurred at APS's Redhawk facility and others around the state

Exploring options at existing generation sites for additional capacity

Discussion & Questions


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Microgrid Primer

APS MICROGRID PROPOSAL

CUSTOMER TO GRID SOLUTIONS

JUDSON TILLINGHAST | MANAGER, CUSTOMER TO GRID SOLUTIONS

TYPICAL CUSTOMER SOLUTION
EMERGENCY GENERATION

- **Tier 2 Diesel Generation**
  - Distributed throughout your facility
  - High capital expenditure
  - Only allowed to run during an outage
- **Maintenance**
  - Time consuming air permits, expensive fuel, complicated testing, repairs, etc.
- **Generation is not your core business**
  - Lack training, expertise, materials and vendor relationships

WHAT IS AN APS MICROGRID?

APS Partners with Customers

- Engines **always** prioritize emergency power
- Operates in **parallel with the grid,** not just during an outage

Cleaner Parallel Operation Creates Value

- APS installs **CLEANER GENERATION** instead of the customer installing **Tier 2** diesel engines
- Creates **value** for the **grid** in addition to the customer facility

Reduces Risk and Cost to Customers

- **APS owns and maintains generation**, even air permits, for the customer
- Backup solution **costs are lower** than less capable standby-only systems

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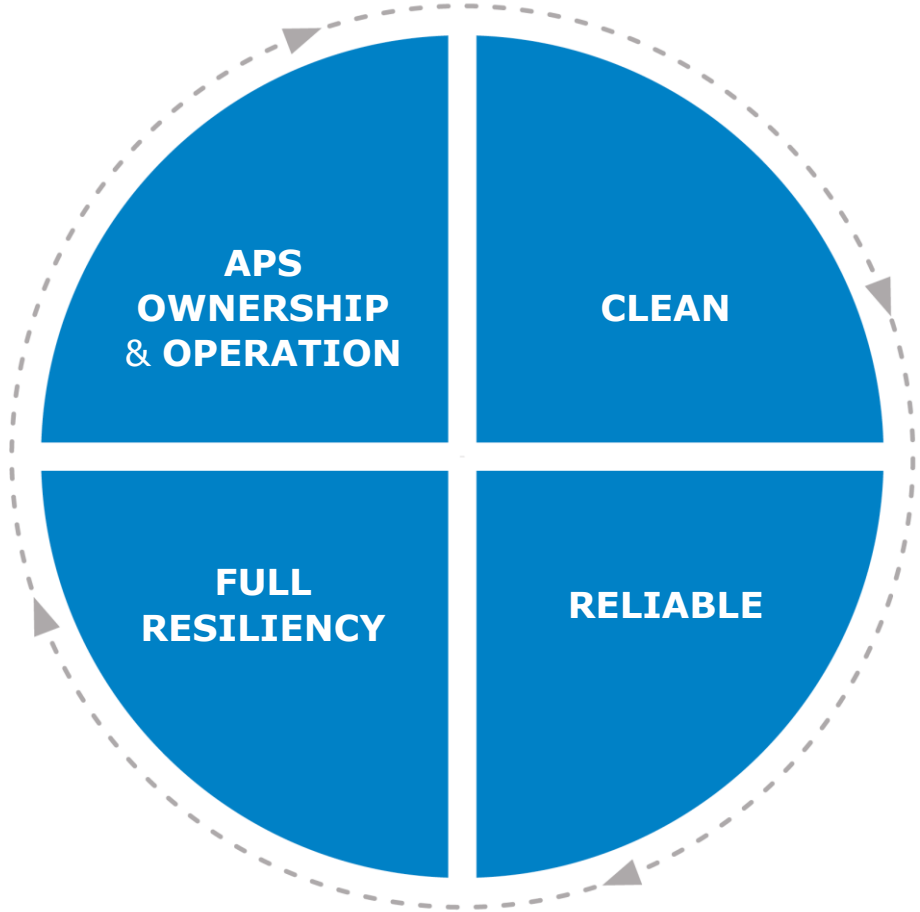
APS **MICROGRID PROJECTS**

NAME	INDUSTRY	SIZE
Marine Corp Air Station Yuma	Military	22 MW Tier 4F
Aligned	Data Center	11 MW Tier 4F
Phoenix City Wastewater	Municipal Water	6 MW Tier 4F
Preacher Canyon	APS (T&D Deferral)	2 MW Tier 4 Final
Young	APS (T&D Deferral)	2 MW Tier 4 Final

HOW DOES THE **PROCESS WORK?**

APS

- FINANCIAL CONTRIBUTION
- PROJECT IMPLEMENTATION
- ASSET ACQUISITION
- AIR PERMITS
- O & M FOR LIFE
- PERCENTAGE CAPITAL FOR THE PROJECT



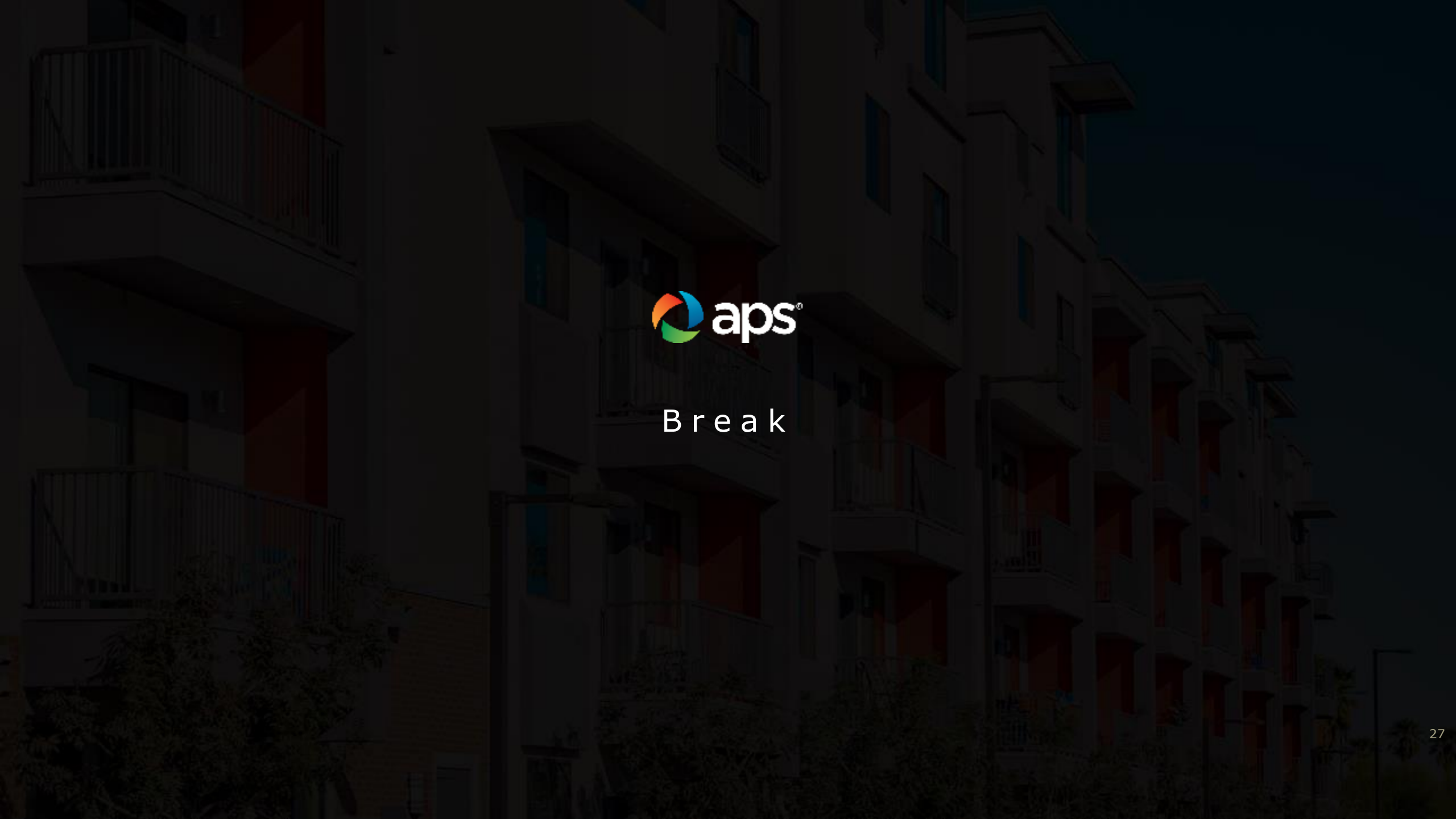
CUSTOMER

- FINANCIAL CONTRIBUTION
- SITE FOR THE MICROGRID
- PERCENTAGE CAPITAL FOR THE PROJECT

APS Microgrid Summary

- Clean:
  - Emissions reductions compared to Tier 2 diesel generation
- Affordable:
  - Cost share provides lower cost for participating customer and lower cost capacity for all APS customers
- Reliable:
  - Capacity and ancillary service benefits for all APS customers, not just the participating customer
- Customer Centric:
  - The customer can focus on their core business while APS provides resiliency as a service

Discussion & Questions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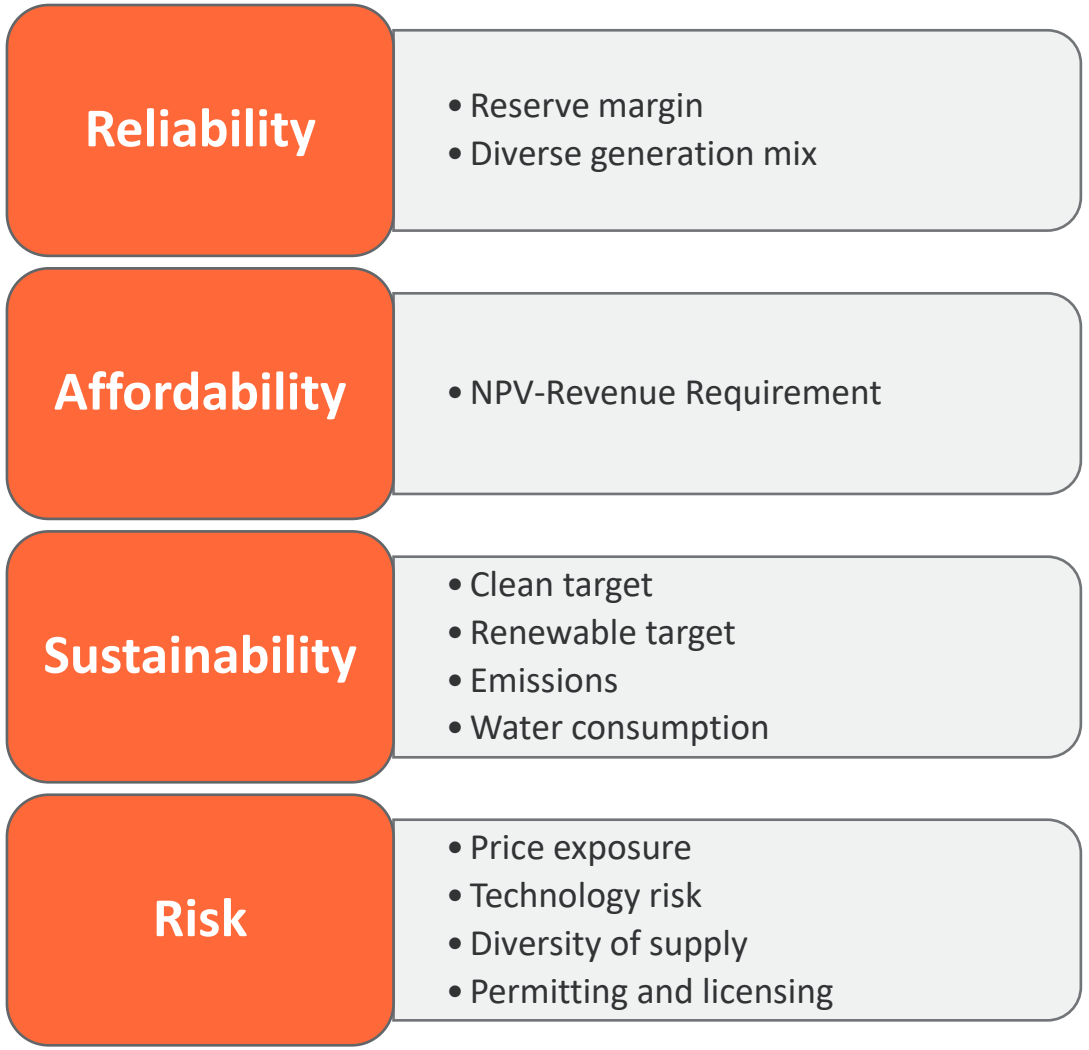
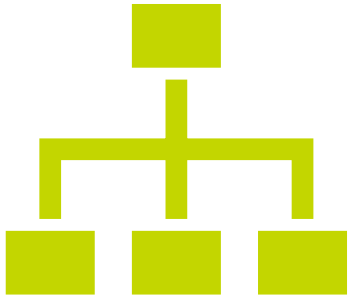
IRP Portfolios – RPAC Feedback

APS' 2023 IRP planning principles include reliability, affordability, and sustainability



APS evaluates portfolios across different future scenarios with varying assumptions



Portfolio – The entire set of resources over the planning period designed to meet customer demand for electricity. All portfolios represent paths that enable APS to deliver on its Clean Energy Commitment.

Scenario – The grouping together of a set of assumptions of key uncertain variables that could potentially all occur in tandem. Illustrates the potential impact to portfolios if multiple key variables are stressed in a plausible manner.

Each portfolio will have tradeoffs

Each portfolio's component tradeoffs will drive varying performance under varying Scenarios.

Risk factors that could influence portfolio cost

Quantitative Risk Factors

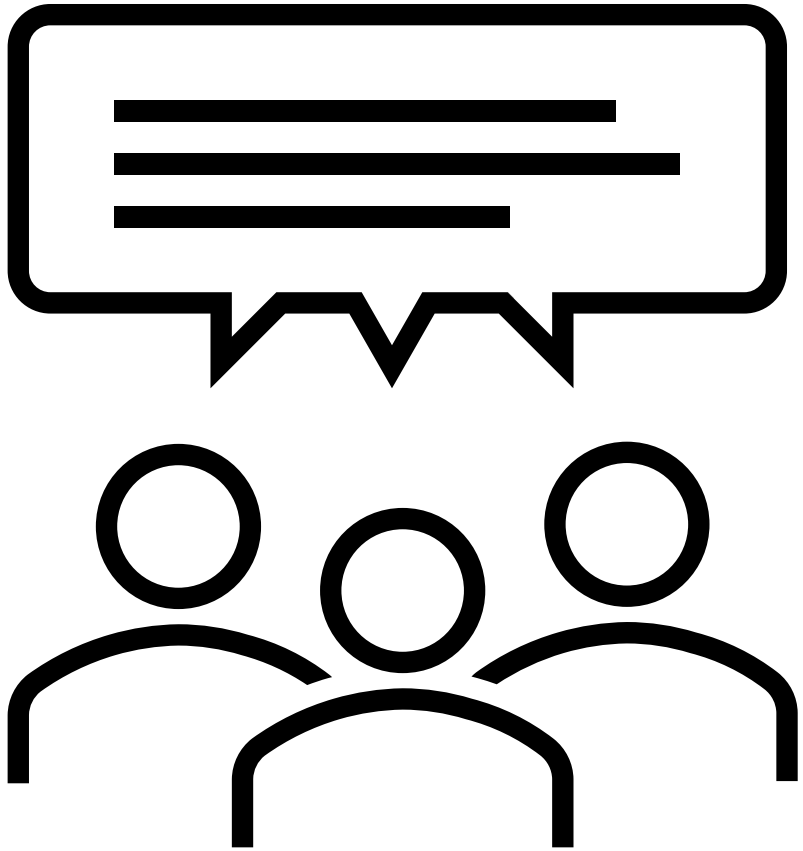
- Fuel Price
- Load
- CO_2 Price
- Capital Cost
- Intermittent Renewable Resource Profiles
- Plant Forced Outages

Qualitative Risk Factors

- Power Supply
- Market Volatility
- Siting and Permitting
- State and Federal Policy

RPAC Feedback

- Of the identified risk factors, which one is most important to you?
- Are there other variables that you would like to see quantitatively or qualitatively measured/varied?
- Are there portfolios characteristics that could emphasize performance tradeoffs?



Discussion & Questions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