Arizona's Cooperatives Summer Preparedness Report to the Arizona Corporation Commission

Presented by Arizona G&T Cooperatives

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Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

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Who are the Arizona G&T Cooperatives?

- Arizona Electric Power Cooperative, Inc. (AEPCO) is the not-for-profit Generation and Transmission Owner & Provider for 3 All Requirements Member (ARM) and 3 Partial Requirements Member (PRM) Distribution Cooperatives.

- AEPCO and its Members serve a large geographical area—12 counties, numerous cities, and 8 tribes – 160,000 meters and 350,000 Member-consumers.

- AEPCO and Southwest Transmission Cooperative, Inc. (SWTC) merged into a single entity in 2016. Arizona Generation and Transmission Cooperatives (AzGT) refers to the collective of AEPCO's generation transmission functions, as well as Sierra Southwest Cooperative Services, Inc. (Sierra).

Distribution Cooperatives Represented by AZGT

- G&T ***All*** Requirement Members:

Anza Electric Cooperative, Inc.

A Touchstone Energy® Cooperative

Anza, California

GRAHAM COUNTY ELECTRIC CO-OP
PIMA, ARIZ.

A Touchstone Energy® Cooperative

Pima, Arizona

D V E C

Duncan Valley Electric Cooperative, Inc.

A Touchstone Energy® Cooperative

Duncan, Arizona

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Distribution Cooperatives Represented by AZGT (Cont.)

- G&T ***Partial*** Requirement Members:

Sulphur Springs Valley Electric Cooperative, Inc.
A Touchstone Energy® Cooperative

Sierra Vista & Wilcox, Arizona

MOHAVE electric cooperative
A Touchstone Energy® Cooperative

Bullhead City, Arizona

TRICO
AN ENERGY COOPERATIVE

Marana, Arizona

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Other AZ Cooperatives Included in AZGT's Report

NAVOPACHE ELECTRIC COOPERATIVE

Lakeside, Arizona

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AZGT Member Cooperatives' Service Territories

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Resource Providers' Services

- G&T Cooperatives
  - All Requirements Members receive all resource-related scheduling, trading and ancillary services under their All Requirements contracts.
  - PRMs need to contract for such services from G&T or third party providers.
    - For the summer of 2019, all PRMs will reside in the AzGT subsystem of Western Balancing Area with AEPCO as their Scheduling & Trading Agent.
  - NEC receives all necessary resource-related services from Tucson Electric Power (TEP) and is in the TEP Balancing Area.

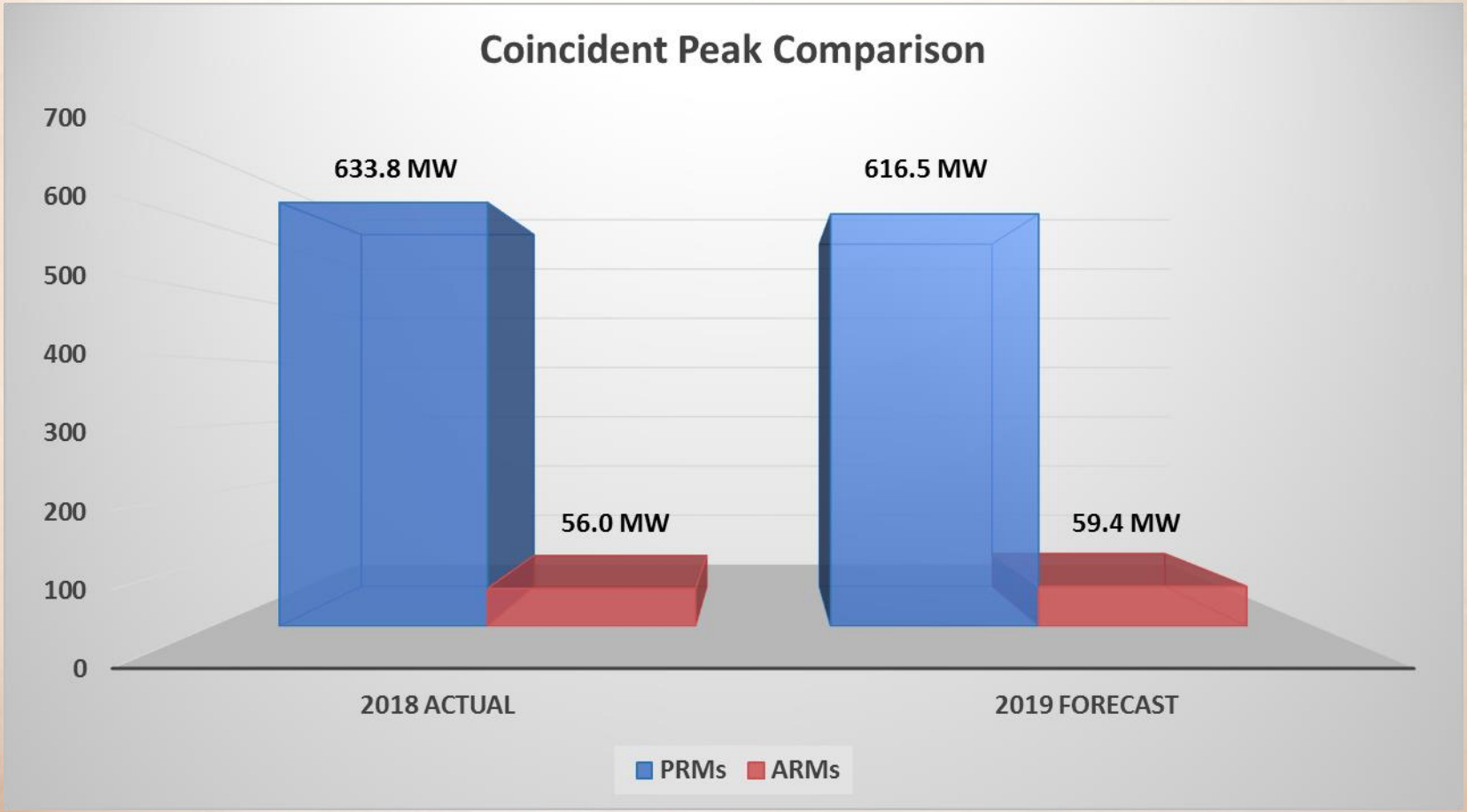
Peak Demand Summary

AEPCO has secured sufficient resources to meet the coincident peak demand for its ARMs and its allocated capacity obligation to each of its PRMs.

- Summer peak demand for AEPCO's ARMs for 2019 is projected to be 59.4 MW, in comparison with 2018's actual peak of 56.0 MW.
- Summer peak demand for AEPCO's PRMs for 2019 is projected to be 616.5 MW, in comparison with 2018's actual peak of 633.8 MW.
- PRMs supplement their Allocated Capacity (AC) in AEPCO resources in order to satisfy their summer peak load requirements. Additional resources and firm purchased power transactions are scheduled to fully meet PRM peak load requirements.

NEC's projected summer peak load of 75 MW will be met by its 8 MW of federal hydroelectric capacity and the balance will be supplied by TEP as firm energy from TEP resources.

2019 Peak Forecast vs. 2018 Actual



Loads represented are as seen by AEPCO at the transmission meter, and implicitly include resources behind that meter.

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AZGT Resource Portfolio - 2019

AEPCO Owned/Contracted Resources* (Net Available Capacity - MW)	
Apache Coal Generation	175
Apache Natural Gas Generation	383
Hydroelectric Purchase Capacity	33
Other Power Purchase Agreements	15
Apache Solar	17
Total:	623 MW

*Excludes MW designated for losses and contingency reserves, as well as renewables located behind the transmission meter or contracted to an outside entity. Chart includes only resources/renewables owned or contracted by AzGT that serve its distribution cooperative membership.

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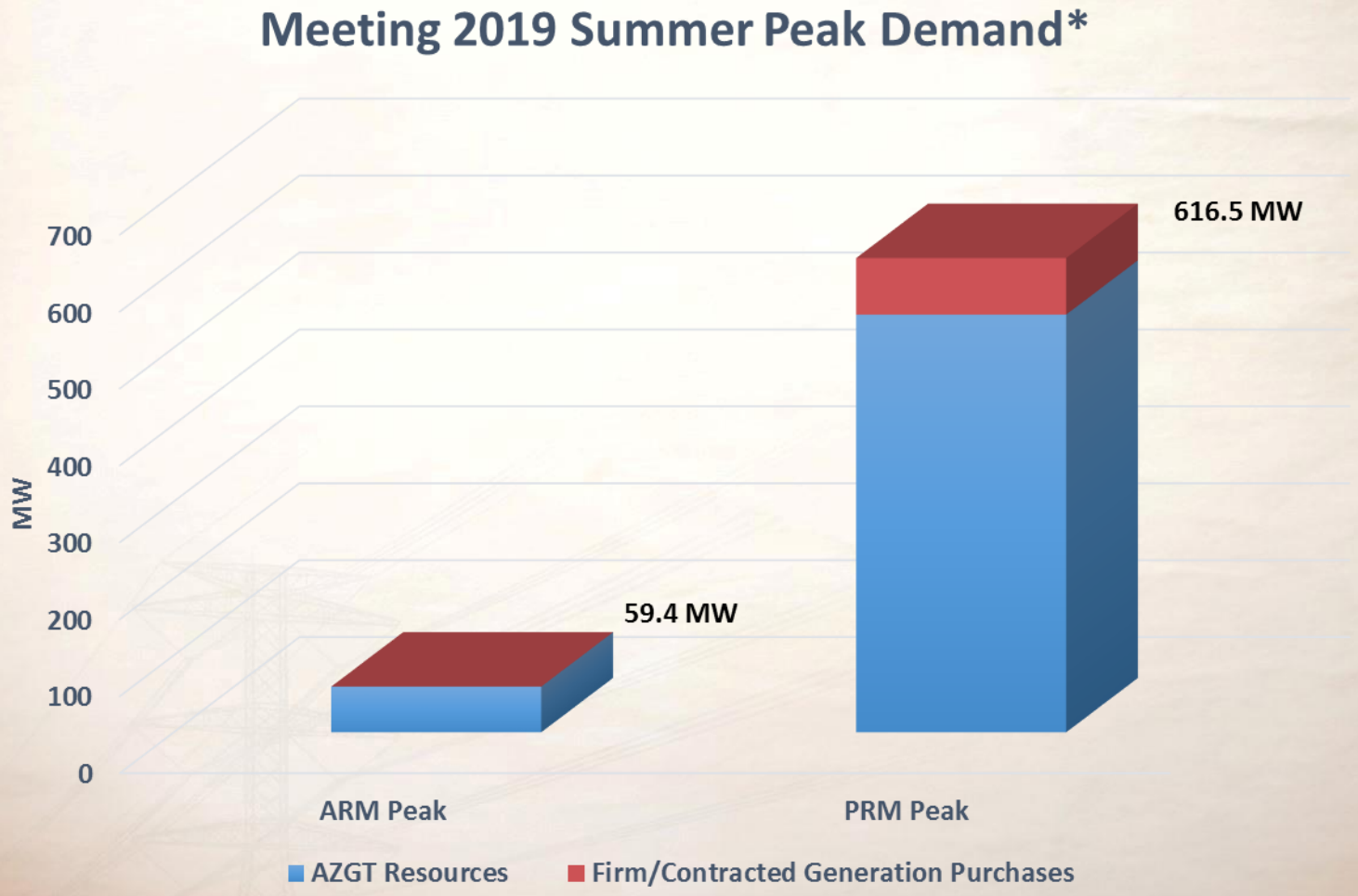
Summer 2019 Demand Forecast



*Represents possible capacity mix for peak load service under normal operating conditions. Reported demand is as seen by AzGT, and is net of distribution cooperative solar, which is behind the transmission meter.

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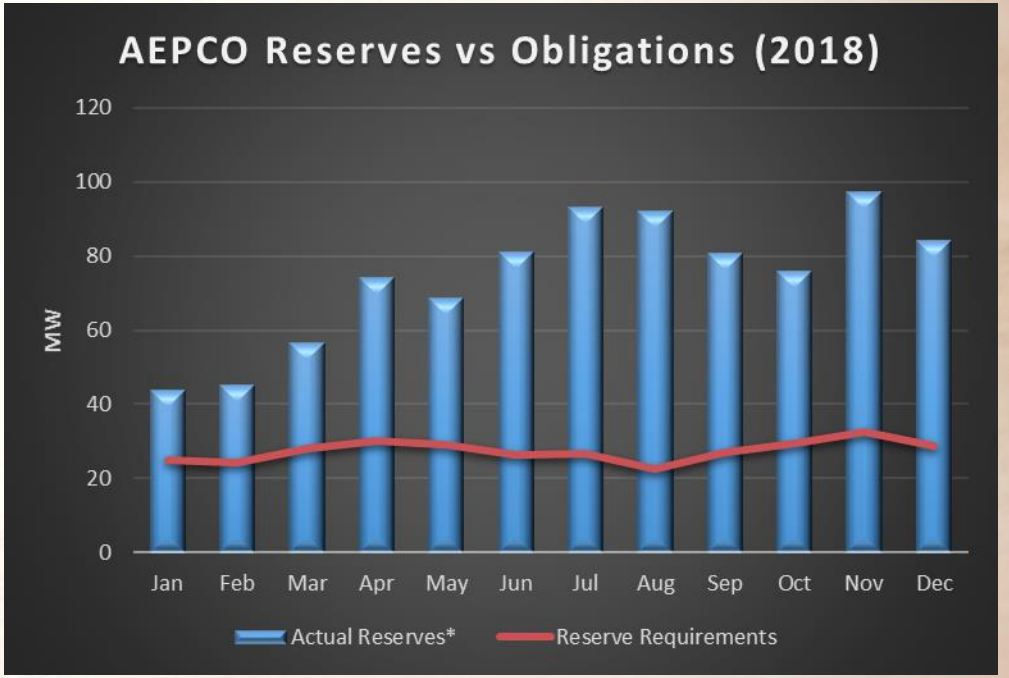
AZGT Reserves

- The Cooperative maintains an annually updated plan in case of the loss of its single largest hazard under peak load conditions.
  - For immediate response, AEPCO continues membership in the Southwest Reserve Sharing Group (SRSG).
  - For the event of an extended outage, AEPCO maintains:
    - Additional generation capacity used for operating reserves under normal conditions.
    - Transmission capacity to cover the largest unit outage.
    - Additional arrangements with transmission counterparties for emergency market access.



- These arrangements are sufficient to respond to forced generation outages or other potential service disruptions.

AZGT Fuel Summary

- Coal
  - Guidelines are in place to maintain adequate fuel supply for full-load, prolonged operation.
  - Coal inventory is currently and is expected to be at adequate levels per Cooperative guidelines.
  - Coal supply and rail transportation contracts are in place to meet full requirements.
- Natural Gas
  - AEPCO has contracted with the El Paso Natural Gas pipeline for firm gas transportation to supply its Apache Station units.
  - Transportation has been secured for anticipated hourly peak usage and daily burn requirements.

AZGT Generation Preparedness

- Regular Unit Maintenance & Testing
  - Large steam units have a regular maintenance cycle of both major and minor overhauls, and are monitored on an ongoing basis for any operational irregularity.
  - Peaking gas units have been recently tested to ensure startup capability and readiness for operational and reserve obligations.
- Major Maintenance Activities
  - In Spring and Fall of 2017, Apache Steam Units 2 and 3 each underwent a major overhaul to install low-NOx retrofits, as well as a complete inspection and maintenance of the steam cycles.
  - In 2018, all gas turbines at Apache were thoroughly inspected to ensure readiness for critical operation.
    - In 2018, Gas Turbine 4 underwent a high-pressure turbine maintenance.
    - In May of 2019, Gas Turbine 3 is scheduled to complete a major overhaul.

AZGT Transmission Overview

- 841 Miles of Transmission Line*
- 33 Substations

- Transmission service agreements in place to meet all members load requirements:

Direct Load Service	Market Purchasing
WAPA	SRP
APS	EPE
SCE	
TEP	

- Backup and Contingency Agreements
  - APS
  - TEP

*Figures include lines and substations/switchyards with either full or partial ownership by AzGT.

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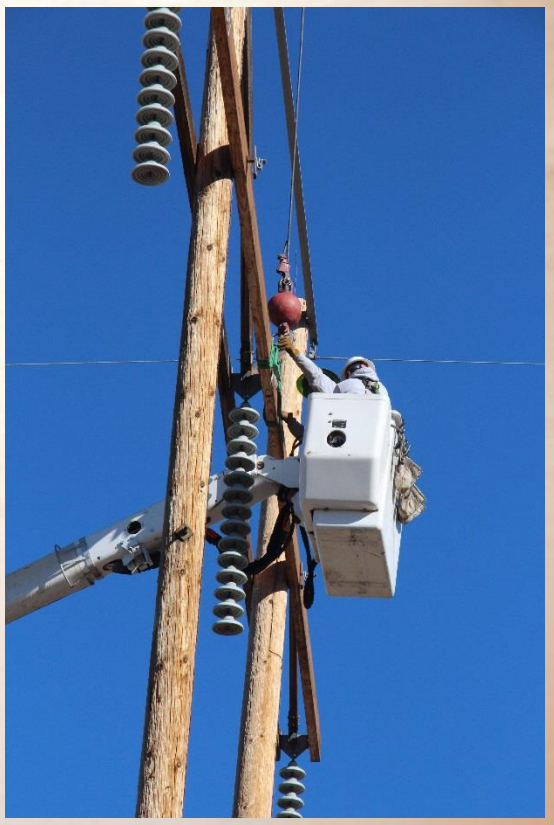
AZGT Transmission System Summer Preparation

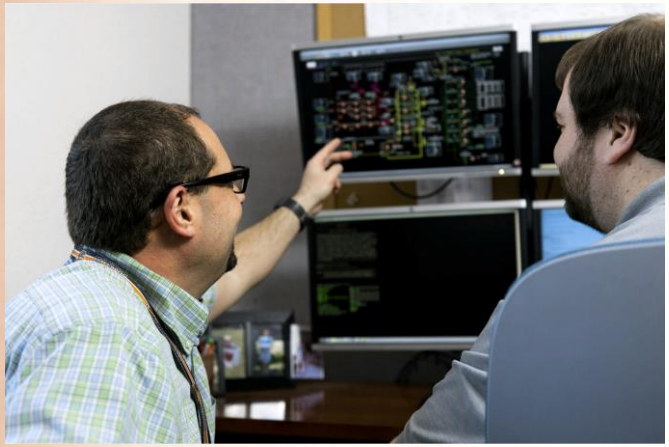
- Transmission and substation maintenance and assessment activities include:
  - Scheduled preventative maintenance prior to summer loads
    - All power circuit breakers are tested on an annual basis to ensure functioning.
    - Transformer setting adjusted for optimal voltage levels.
    - Every substation is serviced every 90 days in conjunction with a preventative maintenance schedule.
  - Focused infrastructure inspection and vegetation management activities
    - Inspection of all transmission lines performed biannually with focus on opportunities for predictive maintenance.
    - In Winter and Spring, special attention is given to high vegetation areas to avoid contact with transmission infrastructure.
    - Periodic replacement of older wood poles with steel transmission structures.
    - In 2016, AEPCO completed a five year transmission wood pole inspection program, testing wood pole strength and durability. AEPCO has completed the replacement of all rejected poles identified.
  - Partnership amongst Cooperatives and other utilities
    - Sharing of replacement transmission inventory for summer storm damage.
    - Participation in joint-planning and reliability working groups.



Recent AZGT Transmission System Upgrades

Upgrade/Improvement	Substation	System Benefit
Backup Power Connections	Hilltop Round Valley Bagdad Valencia	Power Outage Mitigation
Breaker, Relay, and Network Upgrades	Romney Kartchner Round Valley Apache	System & Fault Reliability
New Transformer Installations	Greenlee Thornydale Romney	System Reliability and Capacity Upgrade
Communication Upgrades	Three Points Avra Valley Riviera Davis Dam	Grid Intelligence & Control

AZGT Operational Preparedness



- Throughout 2017 - 2019, AEPCO participated in the Reliability Assurance Initiative, a joint WECC/NERC project to assess and improve reliability areas across the Western Interconnection.
- Updated G&T Joint Generation Contingency Reserve Plan for outage of largest generator.
- In addition to annual black-start training and tests of backup control infrastructure, AEPCO submits emergency operating plans to its Reliability Coordinator (RC), working with neighboring Balancing Authority (BA) Area entities.

Continuous Operational Improvements

2017
- Added Real-Time Contingency Analysis (RTCA) to EMS System.

2018
- WECC Audit of operations/control practices completed.
- Enhancement of fault analysis system.

2019
- Transition to new Energy Management System (EMS).
- Installed enhanced graphical interface and mapboard for situational awareness of network state and functionality.

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Transition of Reliability Coordinator

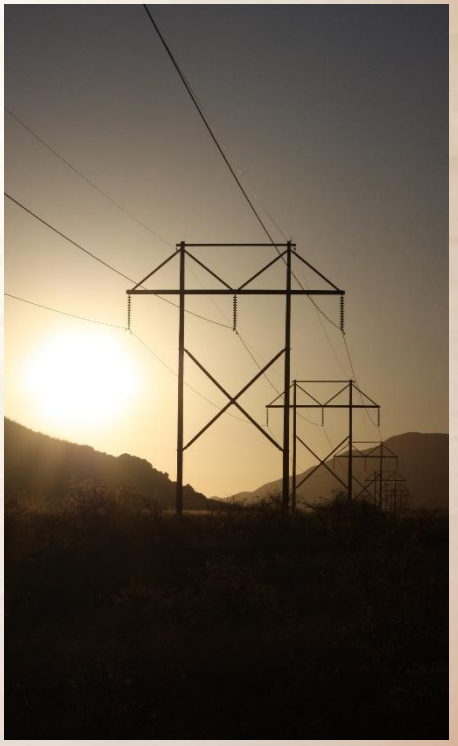
- AEPCO currently provides Transmission Operator services in both Arizona and California.

- As of 2018, AEPCO received all Reliability Coordinator services from Peak RC. Peak RC announced last year that it will wind down its operations in 2019.

- As a result of Peak RC's shutdown, AEPCO is in the process of transitioning Reliability Coordinator services from Peak RC to California Independent System Operator Corp. (CAISO) for its California footprint (3rd Quarter) and Southwest Power Pool (SPP) for Arizona (4th Quarter).

Summary of 2019 Summer Preparedness

- Existing resources, supplemented by firm purchases, will be sufficient to meet forecasted demand and energy needs.
- Fuel supply and transmission are in place to meet AEPCO's peak obligation.
- Operationally, AEPCO is well prepared and contingency plans and more than adequate reserves are in place for emergencies.
- Transmission system is well-maintained and ready to serve the load of ARM and PRM Members.



Questions?