An aerial photograph of a large dam situated in a deep, rugged canyon. The canyon walls are composed of layered, reddish-brown rock. A river flows through the canyon, curving around the dam. The sky is clear and blue. The text "SRP Native Load Calculation & ATC" is overlaid in large white letters across the center of the image.

SRP Native Load Calculation & ATC

November 19, 2021

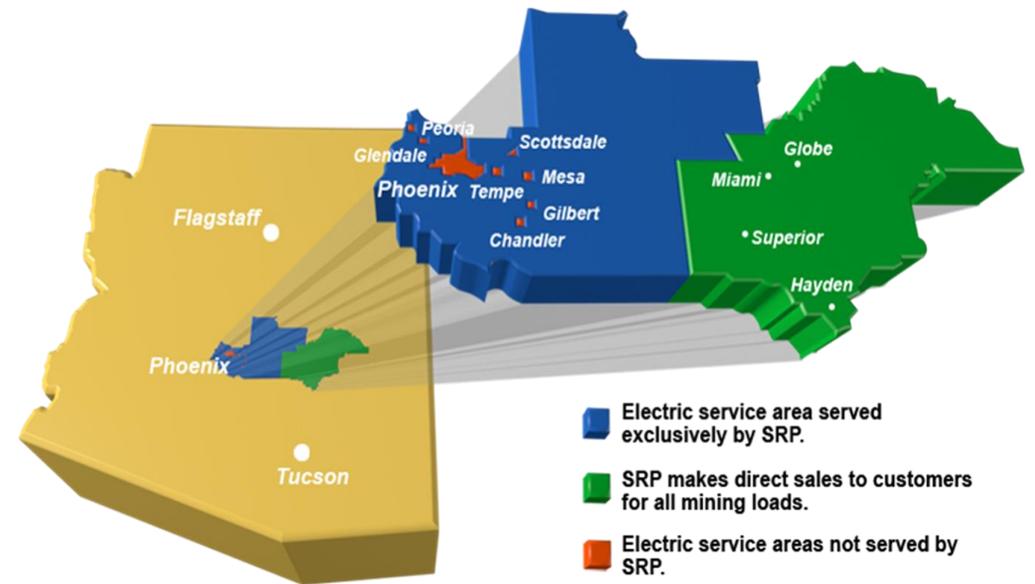
Introduction to SRP

Salt River Project Agricultural Improvement and Power District is a political subdivision of the State of Arizona

- Formed in 1937
- Operates SRP's vertically integrated power system
- Governed by elected board and council
- Serves approximately one million power customers

SRP is also a water provider (Salt River Valley Water Users' Association)

Electric Service Area



Topics and Presenters

- Load Forecasts
- Calculating Existing Transmission Commitments (ETC) for Native Load/Network Load
- Calculation of Available Transfer Capability (ATC) across different time horizons
- Publicly Posted Information
- Accounting for Uncertainty



Harry Sauthoff, Manager, Forecasting



Emily Tozier, Resource Analyst, Operations Planning



Heidi Stoltz, Senior Transmission Scheduler, Scheduling and Reliability Services

Description of ETC assumptions across long-term and short term horizons

- Do the assumptions change/vary?
 - ETC assumptions do not change/vary
 - Long-term reservations remain constant
 - Scheduling varies
- Type of load forecasts utilized across different horizons
 - Long-term
 - Short-term

Long-Term Forecast: Key Drivers

- Economy/Population Outlook
- Economic Development
- SRP Customer Programs
- Electric Vehicles
- Rooftop Solar
- Customer-Owned Batteries
- Weather



Long-Term Forecast: Strong Economic Growth Ahead

Maricopa is the #1 fastest growing county in the U.S.

Phoenix is one of only two major cities to have recovered 100% of jobs lost during the pandemic

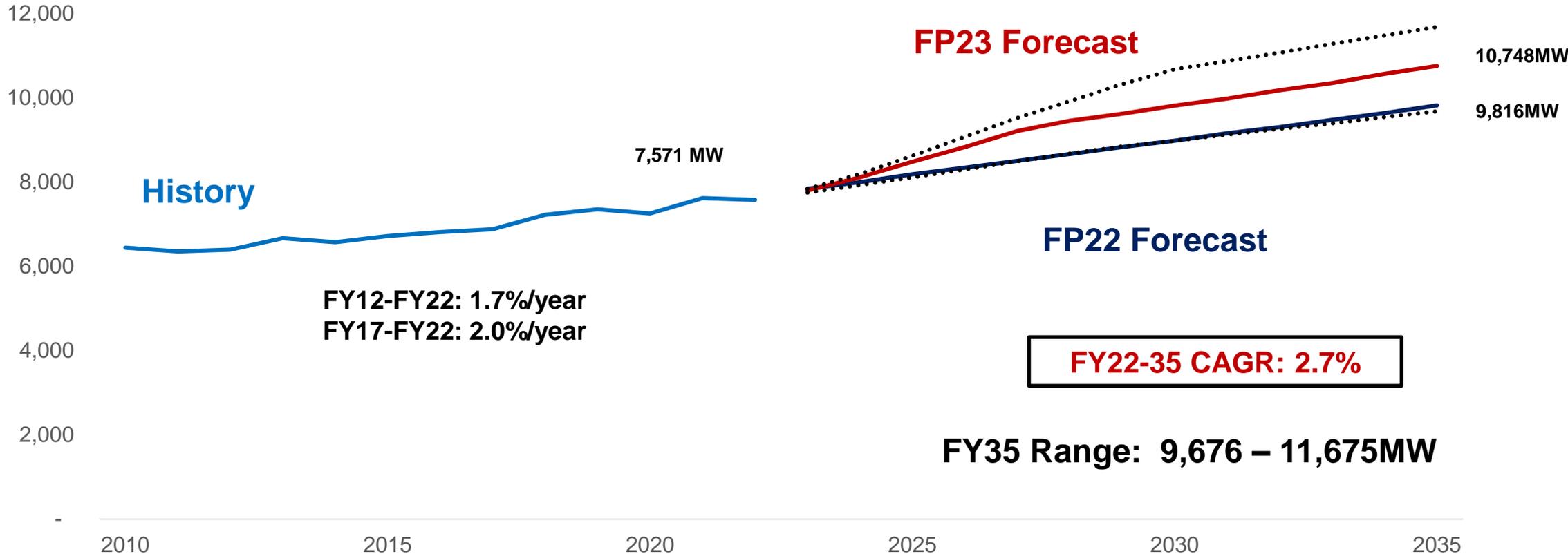
The Southwest is becoming America's advanced manufacturing hub

Housing permits are at the highest since mid-2000's: Over 100 every day



Long-Term Forecast: FP23 Forecast

Peak Demand (MW)



Short-Term Forecasts

- SRP's Short-Term Trading group (Day-Ahead) runs load forecasts for each trading day
 - Run loads two times per day – morning and afternoon
 - Use two load forecast models and three weather providers (one is SRP in-house meteorology group)
 - Day-Ahead Traders determine which forecast to use depending on conditions
- Forecasts are weather-driven
 - Temperature and humidity inputs
 - Very accurate when temperatures are consistent
 - Often large spread between low and high each day within SRP service territory
 - Biggest errors are related to storms
 - 1 degree in the summer equates to approximately 150 MW – 4 degrees makes the difference in needing a power plant

Description of load and generation assumptions in calculating ETC for native load/network load

- For generation assumptions – how do you determine the appropriate generation assumptions, including assumptions about level of imports serving load?
 - Load and Resource Plan (30 years)
 - 13-month Transmission Plan considers usage of various transmission paths
 - Economic dispatch order
 - Planned outages
- SRP uses MOD-029 rated path methodology
 - Total Transfer Capability (TTC) is established for each path
 - Re-establish TTC when there is a significant change
 - Commitments are subtracted from TTC

Calculation of ATC across different time horizons

- How do you calculate firm v. non-firm ATC

- SRP OASIS calculates SRP Firm ATC (“ATC_F”) in accordance with R7 of MOD-029-2a for all time horizons.

$$ATC_F = TTC - ETC_F - TRM + Postbacks_F + Counterflows_F$$

- SRP OASIS calculates SRP Non-Firm ATC (“ATC_{NF}”) in accordance with R8 of MOD-029-2a for all time horizons.

$$ATC_{NF} = TTC - ETC_F - ETC_{NF} - TRM_U + Postbacks_{NF} + Counterflows_{NF}$$

Calculation of ATC across different time horizons

- What type of margins do you account for (TRM, CBM)
 - Transmission Reliability Margin (TRM) – SRP sets aside transmission as TRM under the following categories:
 - Southwest Reserve Sharing Group (SRSG)
 - Replacement Power
 - Plant Start-Up and auxiliary load
- Across what time horizons is ATC/ETC calculated?
 - Hourly, Daily, Weekly, Monthly, and Yearly up to 13 months

How do you account for uncertainty related to native load/network load service?

- SRP does not account for forecast error, generation dispatch, or system topology uncertainty within ETC or as part of TRM
- Based on same-day and real-time operator assessment, SRP sometimes carries reserves for load forecast error generation dispatch, and system topology uncertainty
- SRP accounts for generator outage related imports associated with reserve sharing group emergency assistance in response to sudden unit trips
- Transmission does not change unless there is a need to buy additional transmission

thank you!