TESLA
Forecasting Solutions

Arizona Duck Curve

● 0% ● 4% ● 8% ● 12% ● 16% ● 20%

Arizona Public Service's Day Ahead Trading Improved

Arizona Public Service (APS) understands the value of utilizing and comparing multiple load forecasts. This allows them to select the forecast most likely to outperform for the day.

About APS

APS is the largest electric utility in Arizona, United States. It is the principal subsidiary of the Investor-owned utility Pinnacle West Capital. With 6,500 MW of generating capacity, APS serves more than one million customers in 11 counties throughout most of the state.

Forecasting Challenges

With an average of more than 300 days of sunshine a year, there is no question that solar generation, both utility scale and rooftop PV, would comprise a large part of Arizona's generation mix. From APS's perspective, power generation from rooftop PV is essentially negative demand, contributing to the duck curve in APS's daily load profile. Significant challenges occur when cloudy weather limits the amount of energy generated by rooftop systems especially sudden storms during monsoon season.

"Inclement weather (cloud/rain/snow) in combination with the duck curve during shoulder months makes it extremely difficult to manage our resources. TESLA provides a strong baseline for APS to follow on inclement weather days that yields exceptional results when compared to other vendors."

— Danny Dayal, Senior. Business Analyst at APS.

aps

"TESLA yields exceptional results when compared to other vendors during inclement weather."

Danny Dayal
Senior Business Analyst at APS

Temperature Sensitivity

When monsoon weather hits during warm summer months in the southwest US, temperature can drop drastically, sometimes as much as 10-30° Fahrenheit (~5-17° Celsius) from one hour to the next. TESLA expanded their temperature sensitivity feature for APS, to allow for temperature forecast deviations larger than 7° F (~4° C) to approximate the effect of large unexpected temperature drops on power demand. APS can now see the effect of a -15° F (~-8° C) temperature deviation from the forecast, which will help them prepare for the possibility of large power demand drops in anticipation of extreme inclement weather days.

Forecast Vendor Selection

APS utilizes multiple load forecasting vendors and created a web application to assist Day Ahead Traders with forecast contrast and selection.

In the image below you can see that the APS web application displays both the Artificial Neural Network Short Term Load Forecast (ANNSTLF) and TESLA forecast for the trader to choose between. Based on the specific circumstances of that day, the application recommends the trader use the TESLA forecast.

Conclusion

It is useful for utilities to be able to compare forecasts for better trading decisions. By adding an energy forecast from TESLA, which has long been an industry leader in accuracy, users can feel more confident they are making the best trades. With a further rise in solar capacity expected over the coming years, it is becoming especially important to have accurate forecasts on inclement weather days, something that APS recognized early and addressed with their work with TESLA.

Benefits

- **Proven accuracy** during inclement weather days

- **Key information** to make commodity hedging decisions

- **Minimal overhead** to trial and implement

- **Easy integration** with existing systems

"TESLA provides a strong baseline for APS to follow on inclement weather days"

Fig 1 | APS Forecast Data Dashboard