MFR a-3. A narrative description of the EDC’s methodologies for calculating the design day load.

Historical data including billing units, daily firm usage, and heating degree days (HDDs) were gathered separately for each pool. Each variable used in the forecasting model is tested for statistical significance to determine whether it should be included in the model or not. There are many input variables, but only those variables that improve the forecast accuracy are used in each pool. For each day, a usage per billing (UPBU) unit was calculated by dividing the day's usage by the billing units on the system for that pool during the core winter period (December – February).

* Bend points at 3 HDD increments were calculated by subtracting the day's HDDs from the bend point. If the result was negative, then the result was reset to zero. The bend point represents a potential change in customer consumption behavior as temperatures get colder, either up or down. Bend points are dependent on HDDs and will vary across the 9 pools.
* For some pools, a December variable was added to all days that fall in that month to better account for lower average usage in this month.
* Holiday flags were created for major holidays and some surrounding days where lower usage is known to occur. Weekday flags were also created for each day of the week using 7 variables. For example, the Friday constant (FriConst) variable is set to ‘1’ if the data point fell on a Friday and ‘0’ if it did not. Usage on holidays and weekends is often lower, and these flags help the model adjust for that reduction.
* The 7-day rolling average temperature and 7-day rolling average HDDs variables were created to detect if extended cold spells produce higher load levels.
* The average wind speed variable was used because homes cool quicker with cold air blowing across and through its envelope.
* Yearly trend variables were constructed to capture a steady increase or decrease in baseload consumption from year to year. A gas year variable for each of the 5 gas years in the historical data was constructed to capture baseload changes, such as the addition of large firm customer. This variable also can capture baseload losses, such as when a firm customer becomes interruptible or chooses to not be an AGL customer any longer.

The Company is always seeking ways to improve accuracy in its forecasts. Smaller pools’ loads are noticeably impacted by the operational decisions of large customers, such as in Valdosta. Whether those decisions are for plant repairs, upgrades, or other, their sudden change in behavior substantially reduces or increases their gas needs. Understanding when and how long these changes appeared to impact their usage helped the Company improve the regression models. A ‘Low Usage Days’ flag was helpful in capturing temporary usage reduction. A ‘Lost Customer’ flag was used to tell the model that a large customer ended service and to predict a lower expected usage from that point forward.

For all pools, the dataset used for the Design Day forecasting included the core winter months (December-February) for December 2020 through February 2025. Outliers were only excluded due to operational changes/failures within the dataset range. These points were removed only sparingly, and almost all data points were treated as actual loads that should be considered in the forecasting.

After the variables have been defined, the data is loaded into Business Forecast System, Inc.'s regression analysis tool, Forecast Pro 100 version 12.0.1.32. A least-squares dynamic regression was used to produce a set of equations that attempt to describe customer usage in relationship to outside temperature along with the other variables described above.

The results from the regression analysis describe the behaviors of the mix of customers currently on the system. To understand what the existing mix of customers might use on a design day, the pool’s design day HDDs are used along with assumptions for each of the variables from the final regressions to calculate an average UPBU. Assuming the customer mix stays approximately the same in the future, a future load expectation is calculated by multiplying the design day UPBU by a billing unit forecast. This is the billing unit load which is representative of existing customers’ usage. It is the first of 2 layers, or components, to the design day forecast.

The second layer, or component, of the design day forecast is designed to capture load additions of customers with characteristics that far exceed the average system UPBU. On average, customers in this layer consume 100 Dth per day to 8,000 Dth per day or more. The load forecast for this layer is created using 2 data sources. The first is actual prospective customers gathered from AGL’s business development team. This team is responsible for interacting with potential customers about adding or reducing firm load at existing locations and/or brand-new locations. Through their interactions, they can determine the likelihood of the prospective customers, develop an understanding of the customers’ gas needs, and often know when the customers will need start-of-service. This is a good data source for very near-term (1 month to 18 months out) commercial and industrial load changes.

Though there are exceptions, most businesses do not inquire about gas service longer than 1-2 years prior to service starting. This causes a problem when trying to forecast gas needs of the extended future. For medium to long-term forecast of large customer needs, the marketing team provided a longer-term forecast based on historical additions by pool. Recognizing the offsetting impact of losing large customers in the future, the Company also obtained an attrition forecast for this category of customers. Subtracting the attrition forecast from the load additions provided a net load additions forecast. Finally, blending the short-term and long-term forecasts produced a final large load additions forecast by year.

Adding the billing unit load as well as large commercial and industrial customer changes all contributed to producing the final Design Day forecast projected for the upcoming 3 years.