

LOUISVILLE GAS AND ELECTRIC COMPANY/KENTUCKY UTILITIES COMPANY  
("LG&E/KU")  
LONG-TERM LOAD FORECAST METHODOLOGY

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The LG&E/KU Sales Analysis and Forecasting Group produces the Long Term Load Forecast (meaning the forecast for (i) the peak for each of the next 360 months) for LG&E/KU, which includes the load forecast for KU (including KU's retail customers, KU's wholesale municipal customers and Old Dominion Power), LG&E, and Owensboro Municipal Utilities ("OMU"). The LG&E/KU OASIS only publishes the peak load forecast for each month for the next 18-36 months.

The LG&E/KU Long Term Load Forecast methodology is based on econometric modeling of energy sales by customer class, but also incorporates specific intelligence on the prospective energy requirements of the utility's largest customers. Econometric modeling captures the (observed) statistical relationship between energy consumption – the dependent variable – and one or more independent explanatory variables such as the number of households or the level of economic activity in the service territory. Forecasts of electricity sales are then derived from a projection of the independent variable(s).

This widely-accepted approach can readily accommodate the influences of national, regional and local (service territory) drivers of utility sales. This approach may be applied to forecast customer numbers, energy sales, or use-per-customer. The statistical relationships will vary depending upon the jurisdiction being modeled and the class of service. For LG&E, only one jurisdiction is modeled, Kentucky-retail. The KU energy forecast identifies three separate jurisdictional groups: Kentucky-retail, Virginia-retail, and wholesale sales (to 12 municipally-

owned utilities in Kentucky). The OMU peak demand forecast is provided separately by OMU. Within the LG&E and KU jurisdictions, the forecast typically distinguishes several classes of customers including residential, commercial, and industrial.

The econometric models used to produce the forecast passed two critical tests. First, the explanatory variables of the models were theoretically appropriate and have been widely used in electric utility forecasting. Second, inclusion of those explanatory variables produced statistically-significant results that led to an intuitively reasonable forecast. In other words, the models were proven theoretically and empirically robust to explain the behavior of the LG&E/KU customer and sales data.

Sales to several of LG&E/KU's largest customers are forecast based on information obtained through direct discussions with these customers. These regular communications allow LG&E/KU to directly adjust sales expectations given the first-hand knowledge of the production outlook for these companies.

The modeling of residential sales also incorporates elements of end-use forecasting – covering base load, heating and cooling components of sales – which recognize expectations with regard to appliance saturation trends, efficiencies, and price or income effects.

Once complete, the energy forecasts for the LG&E and KU service territories are converted from a billed to calendar basis and adjusted for company uses and losses. The resulting estimate of monthly energy requirements is then associated with a typical load profile and load factor to generate annual, seasonal, and monthly peak demand forecasts. The LG&E/KU Long Term Load forecast is completed by adding the coincident peak demand forecast for OMU to the peak demand forecast for the LG&E and KU service territories.

Data inputs to the forecasting process for LG&E and KU service territories come from a variety of external and internal sources. The national outlook for U.S Gross Domestic Product, industrial production and consumer prices are key macro-level variables that establish the broad market environment within which LG&E/KU operate. Local influences include trends in population, household formation, employment, personal income, and cost of service provision (the 'price' of electricity). National, regional and state level macroeconomic and demographic forecast data are provided by reputable economic forecasting consultants (Global Insight).

Weather data for each service territory is provided by the National Climatic Data Center (NCDC), a branch of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. A coal production forecast is obtained from Hill & Associates for use in modeling KU mine power tariff sales. Itron provides regional databases with information from the Energy Information Administration (EIA) that support the modeling of appliance saturation and efficiency trends and customer choice. The retail electric price forecast and load profile/load factor data for both utilities are determined internally.

As mentioned previously, sales to several large customers for LG&E/KU are forecast based on information provided by these customers to LG&E/KU. Historical sales data for these customers and for the respective class forecasts are obtained via extracts from LG&E/KU's Customer Information Systems (CIS). Figure 1 illustrates the external and internal data sources used to drive the LG&E/KU forecasts.

**Figure 1 – Data Inputs to KU & LG&E Customer, Sales, and Demand Forecasts**

