2015 Independent Load Forecast – Workshop #1

January 22, 2015

Purpose

- Obtain feedback regarding potential areas of improvement/analysis in Year 2
- It is not our intention to simply repeat the Year 1 process with new data
- Stakeholder input is very important at this stage

Potential Areas

- We have come up with a number of things that we could look at in Year 2 based on discussions over the past year
- These are only intended to be a starting point
- If you have an idea for something you want us to look into, let us know

Multiple Weather Stations

- In the state econometric models we tried to select a single weather station that was indicative of the state's weather for annual CDD and HDD
- Suggestions were made that we use multiple weather stations
- Annual CDD and HDD data for multiple weather stations within a state may be highly correlated, resulting in multicollinearity

Correlations

Correlation with Houston

	CDD	HDD
San Antonio	0.68	0.89
Dallas	0.77	0.90

Correlation with Indianapolis

	CDD	HDD
South Bend	0.83	0.85
Evansville	0.87	0.93

EE/DR/DG

- In Year 1, we based our EE adjustments on state requirements
- This year, Applied Energy Group is doing a study of EE/DR/DG
- We hope to be able to utilize their work as the basis for the Year 2 adjustments

Louisiana CHP

- Despite expected robust economic growth, the Louisiana econometric model projected modest retail sales growth (0.47% CAGR)
- This occurred because most of the growth in industrial output in Louisiana has resulted in increased self-generation instead of increased retail sales

Louisiana CHP

- Historically, industrial CHP has grown at double the rate of all retail sales and quadruple the rate of industrial retail sales
- Thus, industrial output is disconnected from retail sales (we were unable to produce a model formulation that used GSP as a driver)

Louisiana CHP

- If we use sales + CHP as our dependent variable, we were able to produce a model that uses GSP as a driver
  - this model has not been vetted by stakeholders
- This model produces a CAGR of 1.70%, which is more in line with what might be expected

(Sales+CHP)-CHP?

- In theory, one could produce separate models that would project sales+CHP and just CHP and the difference would be sales
- But how does one project CHP in a non-arbitrary fashion?

Forecasts using Alternate Assumptions

- If there is interest, we could examine the impact of alternative assumptions on the forecast
  - e.g., if compliance with the EPA's 111(d) rule results in higher prices and/or changed economic growth, what would the effect be on the load forecast?

Sector-specific Forecasts

- The use of public data sources precludes the development of sector-specific (residential, commercial, industrial) forecasts
  - there is not enough possible drivers with public historical data sources
- Thus, this would force us to move away from public sources to proprietary sources

IHS Global Insight Data

- IHS Global Insight provides historical data for a number of potential drivers
- Residential – households, housing starts, disposable income, etc.
- Commercial – non-manufacturing employment/GSP, etc.
- Industrial – manufacturing GSP, etc.

Sector-specific Forecasts

- This would be a significant effort
  - 45 econometric models vs. 15
- Usefulness may be limited
  - Ideally, the differences between growth in the sectors can be used to drive peak demand growth, but we lack the information necessary to do that

Confidence Intervals

- Year 1 confidence intervals were based on the statistical bands associated with the state econometric models
- The applicability of those bands depends on the degree of correlation of the errors between state models
- We are looking into a seemingly unrelated regression (SUR) formulation

Confidence Intervals

- These do not capture uncertainty surrounding the macroeconomic projections
- IHS Global Insight can provide optimistic/pessimistic macroeconomic projections but they do not assign probabilities to these
  - These would cost extra

Peak Conversions

- LRZ level energy to peak conversions (winter and summer) were based on a linear relationship between temperature and load for the 10 highest load hours for the season for the 4 years for which we had data
- We could look into a more sophisticated regression using additional data points

Coincidence Factors

- Summer peak coincidence factors were provided by MISO
- Winter peak coincidence factors were calculated using averages of observations
- While data is a limiting factor, we could look into near-peak coincidence and/or weather conditions at time of peak to see if it provides value

Additional Statistical Issues

- Multicollinearity
- Non-stationarity