2016 Stakeholder Workshop #1

January 18, 2016

2015 Independent Load Forecast Summary

Changes from 2014 Forecast

- Historical data correction for MISO South resulted in better peak demand calibration
- Correction in LSE assignments to LRZs had a small impact
- Multiple weather stations for state models appear to have minor impact
- Change in peak modeling plus additional year of historical data resulted in somewhat lower summer peaks and higher winter peaks

Changes from 2014 Forecast

- Low and high forecast bands are wider and more realistic
- Change in EE adjustment had a very large impact
  - Some LRZs had much smaller energy adjustments this year
  - Peak adjustments are larger overall, but the growth rates do not reflect that

LRZ Energy Forecast Comparison - CAGR

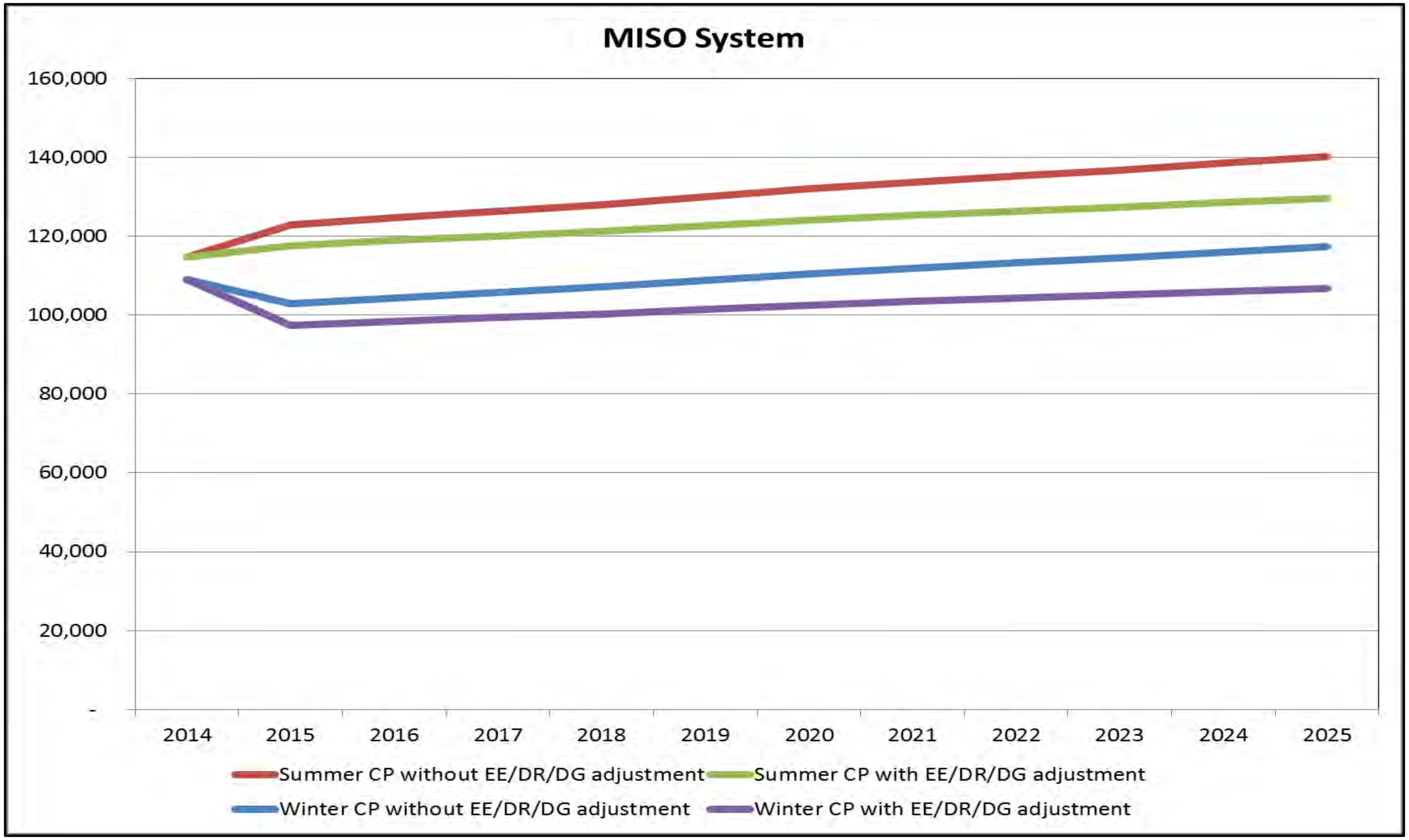
	Gross		Net		Adjustment	
LRZ	2014	2015	2014	2015	2014	2015
1	1.81	1.63	0.79	1.46	1.01	0.16
2	2.00	1.45	1.46	1.32	0.55	0.13
3	1.63	1.56	0.81	1.10	0.81	0.46
4	0.66	0.63	-0.41	0.27	1.07	0.35
5	0.75	0.97	0.00	0.57	0.76	0.40
6	1.25	1.18	1.26	0.96	-0.01	0.22
7	1.62	0.88	0.77	0.66	0.85	0.22
8	1.69	1.00	1.23	0.84	0.46	0.16
9	1.11	1.88	1.04	1.80	0.08	0.08
10		1.76		1.68		0.07

Red indicates 2015 CAGR is lower than 2014
Blue indicates 2015 CAGR is higher than 2014

DR Assumption

- All available DR was included in the adjustment, which reduces demand throughout the forecast period
  - This will not always be the case in reality because sometimes it will not be needed
  - Thus, the net peak forecast will be lower than actual if all DR is not called upon
- This is a common assumption when forecasting for resource needs

Peak Demands



Peak Adjustments

- The peak adjustments are larger this year (5.8-10.5 GW) than last year (2.4-9.6 GW)
- Growth rate comparisons become problematic
  - The 2015 forecast peak lies below the 2014 forecast but has a higher growth rate

MISO-level Results: CAGR

	Last year (2015-2024)	This year (2016-2025)
Gross Energy	1.42	1.33
Net Energy	0.87	1.13
Gross Summer Peak	1.42	1.30
Net Summer Peak	0.86	0.96
Gross Winter Peak	1.41	1.32
Net Winter Peak	0.86	0.91

Notes
CAGR – compound annual growth rate (%)
Gross – prior to adjustments for energy efficiency, demand response, and distributed generation
Net – after adjustments for energy efficiency, demand response, and distributed generation

90/10 Net Forecasts: CAGR

	Base	High	Low
Energy	1.12	1.56	0.58
Summer Peak	0.97	1.44	0.39
Winter Peak	0.91	1.40	0.31

2016 Modeling Efforts

Purpose

- Obtain feedback regarding potential areas of improvement/analysis in Year 3
- Last year, this process resulted in 4 focus areas
  - we intend to continue using the methodologies developed last year (e.g., multiple weather stations)
- Stakeholder input is very important at this stage

Potential Areas

- These are based on discussions over the past year and areas that were left over from a year ago
- 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

DSM Embedded in State Models

- Utility-sponsored programs that reduce energy usage or peak demand will have some impact on the econometric model formulation and may lead to double-counting within the EE/DR/DG adjustments
- We could attempt to quantify the amount
- Lack of data at the sub-annual level may limit the effectiveness

Louisiana Model

- Historically, industrial CHP has grown at double the rate of all retail sales and quadruple the rate of industrial retail sales
- This causes industrial output to be somewhat disconnected from retail sales

Louisiana

- In year 1, we were unable to get gross state product (GSP) as a driver, which resulted in a low forecast relative to what we know is happening
- In year 2, we were able to get GSP in the model, but the IHS Global Insight projections for GSP were low due to low natural gas prices affecting the drilling sector
  - thus, we used the manufacturing sector growth rate to better capture the growth in electricity using areas

Louisiana

- While this gave us a more realistic projection, there are still areas of concern
  - for instance, the high level of CHP in the history results in an elasticity for GSP that is on the low end

Louisiana Alternate Options

- Use sales + CHP as the dependent variable, then subtract off CHP from the forecast
- Use manufacturing GSP as the driver
  - BEA data has data breaks and is not usable
  - Could be done using IHS Global Insight historical data, but that goes against the idea of using publicly available sources

(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?
  - Indications are that the new loads are not planning to add CHP immediately

Manufacturing GSP

- BEA data has data breaks and is not usable
- Could be done using IHS Global Insight historical data, but that goes against the idea of using publicly available sources

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 Clean Power Plan 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 determine peak demand growth, but we lack the information necessary to do that

Coincidence Factors

- Winter peak coincidence factors were calculated using averages of observations
- Summer peak coincidence factors were provided by MISO in year 1; they were calculated in year 2
- 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