Independent Load Forecast Update

MISO Planning Advisory Committee

November 11, 2015

Change from Draft Version

- The revised EE/DR/DG adjustments had very little impact at the system-wide level (e.g., net summer peak CAGR* changed from 0.98 to 0.97)
- The only significant change at the LRZ level was in LRZ 7
  - net energy CAGR changed from 0.75 to 0.66

* CAGR- compound annual growth rate (%)

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

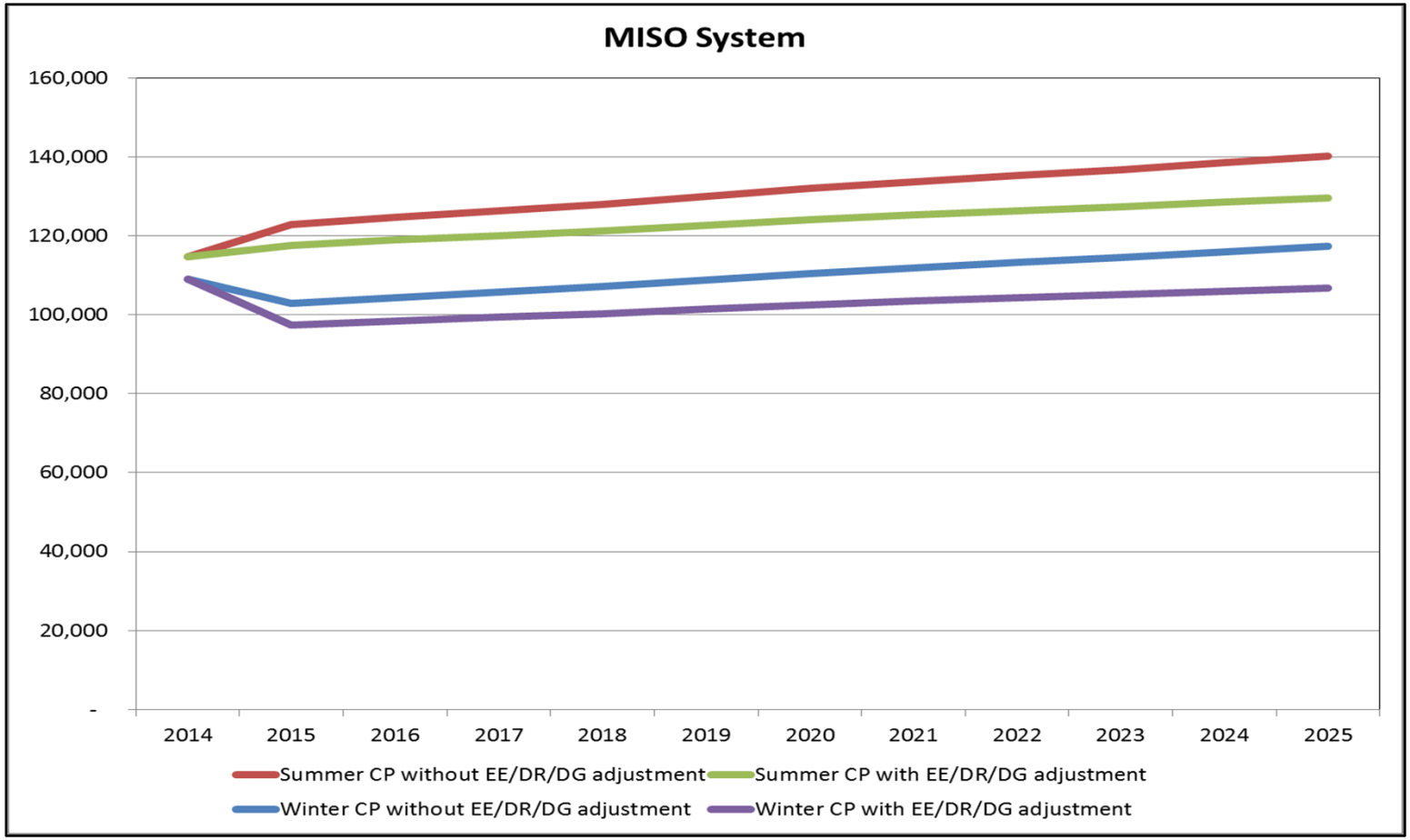
LRZ Energy Forecast Comparison - CAGR

LRZ	2014 Gross	2015 Gross	2014 Net	2015 Net	2014 Adj.	2015 Adj.
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

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
EE/DR/DG adjustments are expected to be revised prior to being finalized

90/10 Net Forecasts: CAGR

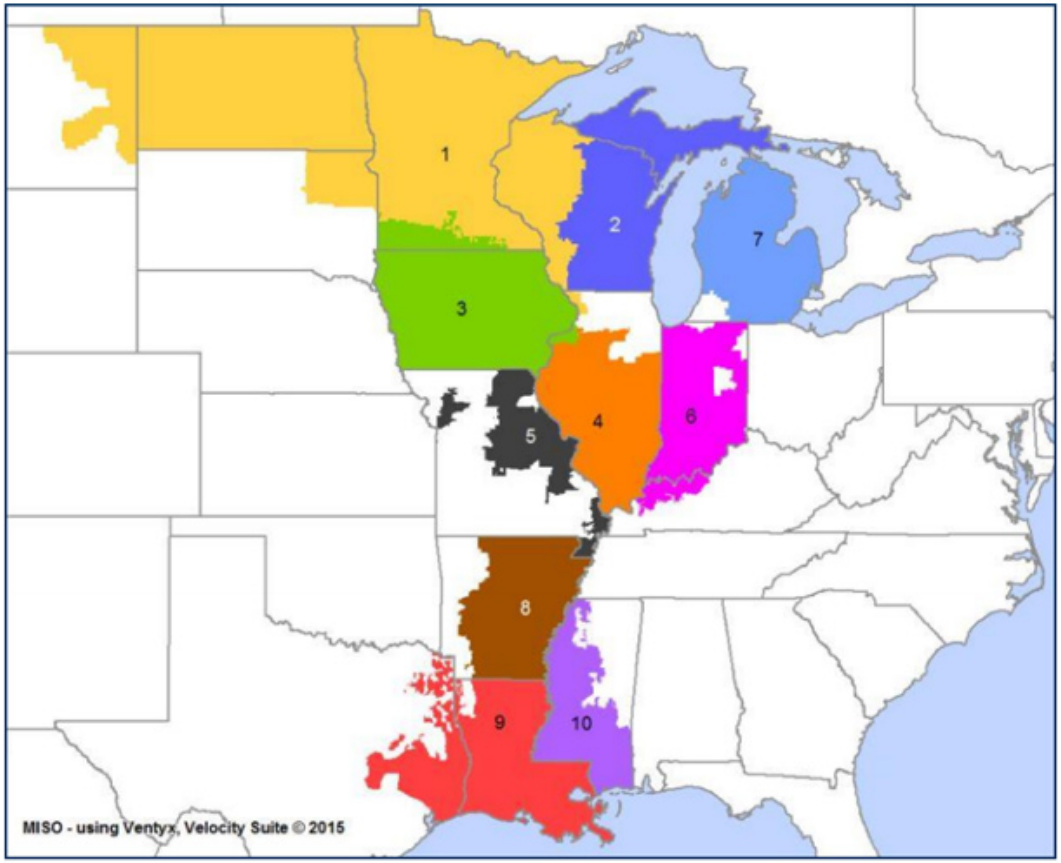
	Base	High	Low
Energy	1.12	1.56	0.58
Summer Peak	0.97	1.44	0.39
Winter Peak	0.91	1.40	0.31

Stakeholder Comments

- Is there potential for double counting of energy efficiency programs in the approach?
  - Past EE programs affect the state econometric model formulations, so some level of EE is "assumed" by the models
  - The EE/DR/DG adjustment would then double count
- This is likely true to some unknown degree
- SUFG is only aware of the amount that has been called on within the market (essentially, nothing)
- We will probably try to estimate the impact of this in the future

Lessons Learned

- The map is approximate
  - LRZ 1 in MI
  - LRZ 3 in SD
  - LRZ 8 in MO, OK, TN, & TX



Lessons Learned

- Make sure your comparisons are apples to apples
  - Are transmission and/or distribution losses included?
  - Has it been adjusted for EE and DR?

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