MISO Allocation Factors: State Level and MISO Local Resource Zone

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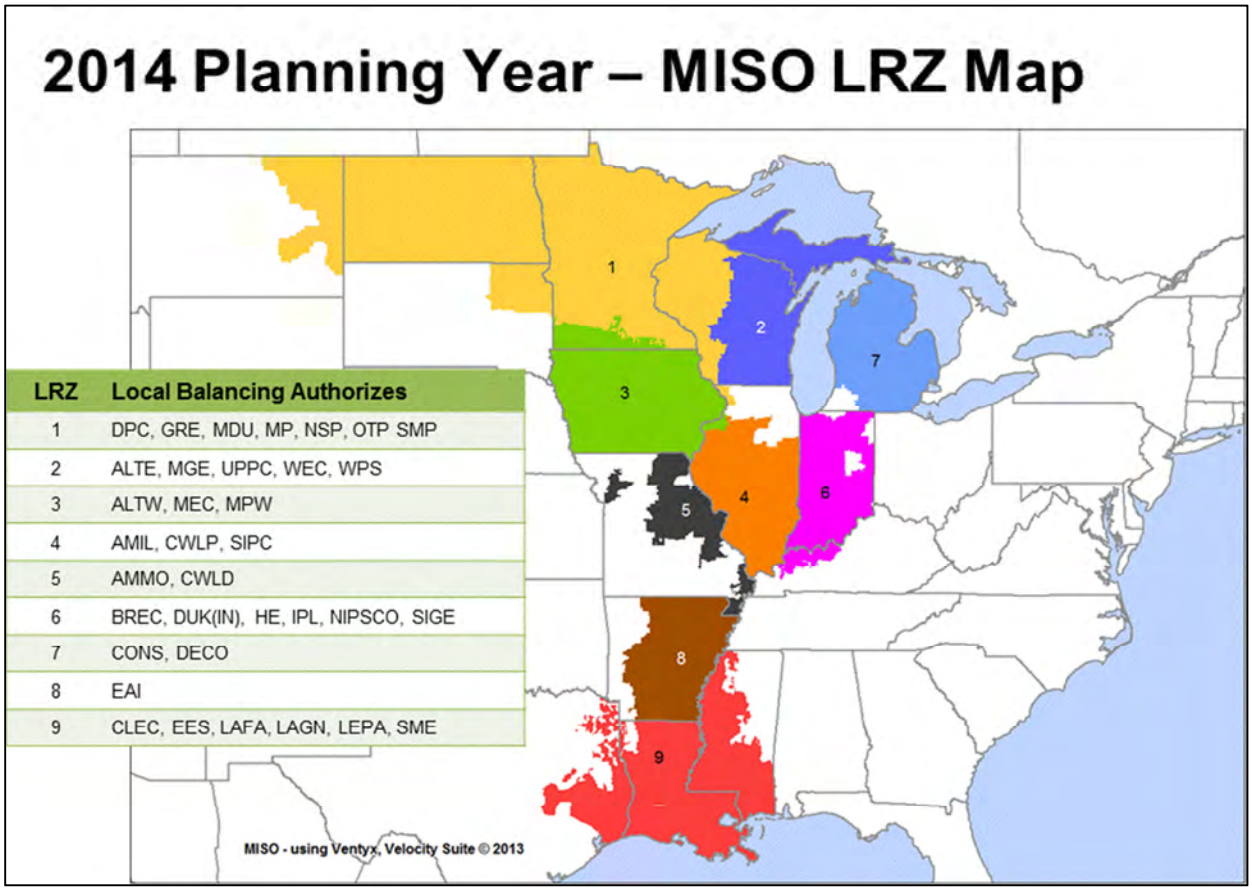
Introduction

Allocation factors will be used to develop annual electricity sales forecasts at the Midcontinent Independent System Operator's (MISO) local resource zone (LRZ) level from SUFG's state level econometric forecasts. The market shares of electricity sales were calculated from sales of local balancing authorities (LBAs) that are within the MISO market footprint. EIA's 861 historical annual electricity sales data for 2009 to 2012 were used to estimate the annual MISO load fraction at the state level. For most states, the MISO load fraction at either the state or the LRZ level showed the same pattern with less than 1% absolute change annually.

MISO Local Resource Zone

MISO's market footprint consists of a number of individual Local Balancing Authorities (LBAs) within MISO. MISO's market footprint covers all or parts of 15 states and is divided into 9 LRZs. Figure 1 displays MISO's market footprint at the LRZ level.

Figure 1: MISO LRZ Map



Source: MISO, 2014

For some LBAs, the name recorded in EIA's 861 database is somewhat different from the name listed in MISO's market footprint. Therefore, the utility name mapping in Table 2 was developed in order to capture all MISO sales from EIA's 861 database. This table was used to extract MISO electricity sales from EIA's 861 database and calculate allocation factors for each MISO LRZ. Sales from those utilities listed in Table 1 were considered MISO sales. For utilities that are not listed in this table but use MISO LBAs as their local balancing authority, their sales were considered as MISO sales.

Table 1: MISO Local Balancing Authorities, 2014

BA Acronym	Local Balancing Authority (MISO)	Local Utility /Balancing Authority (EIA)	LRZ
DPC	Dairy Land Power Cooperative	Dairyland Power Cooperative	1
GRE	Great River Energy	Great River Energy	1
MDU	Montana-Dakota Utilities	Montana-Dakota Utilities Co	1
MP	Minnesota Power	Minnesota Power Inc	1
NSP	Northern States Power (Xcel Energy)	Northern States Power Co	1
OTP	Otter Tail Power	Otter Tail Power Co	1
SMP	Southern Minnesota Municipal Association	Southern Minnesota Mun P Agny	1
ALTE	Alliant Energy – East[1]	Wisconsin Power & Light Co	2
MGE	Madison Gas & Electric	Madison Gas & Electric Co	2
UPPC	Upper Peninsula Power Company	Upper Peninsula Power Co	2
WEC	Wisconsin Electric Power Company	Wisconsin Electric Power Co	2
WPS	Wisconsin Public Service	Wisconsin Public Service Corp	2
ALTW	Alliant Energy - West[2]	Interstate Power and Light Co	3
MEC	MidAmerican Electric Company	MidAmerican Energy Co	3
MPW	Muscatine Power & Water	Board of Water Electric & Communications	3
AMIL	Ameren - Illinois	Ameren Illinois Company	4
CWLP	City Water Light & Power	City of Springfield - (IL)	4
SIPC	Southern Illinois Power Cooperative	Southern Illinois Power Coop	4
AMMO	Ameren - Missouri[3]	Union Electric Co - (MO)	5
CWLD	Columbia Water & Light District	City of Columbia - (MO)	5
BREC	Big Rivers Electric Cooperative	Big Rivers Electric Corp	6
DUK(IN)	Duke Energy - Indiana	Duke Energy Indiana Inc	6
HE	Hoosier Energy	Hoosier Energy R E C, Inc	6
IPL	Indianapolis Power & Light	Indianapolis Power & Light Co	6
NIPSCO	Northern Indiana Public Service Company	Northern Indiana Pub Serv Co	6
SIGE	Southern Indian Gas & Electric	Southern Indiana Gas & Elec Co	6
CONS	Consumers Energy	Consumers Energy	7
DECO	Detroit Edison (DTE Energy)	Detroit Edison (DTE Energy)	7
EAI	Entergy - Arkansas	Entergy Arkansas Inc	8
CLEC	Cleco	Cleco Power LLC	9
EES	Entergy - MS, LA, TX	Entergy Mississippi Inc	9
EES	Entergy - MS, LA, TX	Entergy Louisiana Inc	9
EES	Entergy - MS, LA, TX	Entergy Texas Inc.	9
LAFA	Lafayette Utilities	City of Lafayette	9
LAGN	Louisiana Generation (NRG)	Louisiana Generating, LLC	9
LEPA	Louisiana Energy & Power Authority	Louisiana Energy & Power Authority	9
SME	South Mississippi Electric Power Association	South Mississippi Electric Power Association	9

Source: MISO, 2014; Electric power sales, revenue, and energy efficiency 861 detailed data files, U.S. Energy Information Administration, summarized by SUFG

[1] It is listed as Wisconsin Power & Light Co in EIA 861 database. It is an Alliant Energy's subsidiary that provides services in southern and central Wisconsin.

[2] It is listed as Interstate Power and Light Co in EIA 861 database. It is an Alliant Energy's subsidiary and provides services in Iowa and southern Minnesota.

[3] Union Electric and CIPSCO, Inc merged to create Ameren Corporation in 1997. Source: www.ameren.com

The balancing authority listing in EIA-861 for a small number of utilities is either specified as "Other" or not provided. In these cases, the utility loads have not been included in the MISO loads at this time. A review of those utilities has been sought from people with local knowledge of those regions. The load fractions and resulting allocation factors will be adjusted appropriately if any of those utilities are identified as being within MISO.

MISO Load Fraction

Table *2* summarizes the historical MISO load fractions at the state level for 2009 to 2012. The category "MISO Sales" includes all electricity sales from either MISO utilities or utilities listing a MISO LBA as the local balancing authority. At the request of MISO staff and due to concerns over providing utility-specific information in states that only have a single MISO utility, the states of Indiana and Kentucky are combined (IN+KY). Similarly, North Dakota and Montana have been combined (ND+MT).

Table 2: MISO Load Fraction at State Level, 2012 (MWh)

State	MISO Sales	Non-MISO Sales	Total Sales	MISO State Level Load Fraction				
				2012	2011	2010	2009	Average
AR	31,247,070	15,612,497	46,859,567	66.7%	66.7%	66.8%	66.1%	66.6%
IA	42,507,754	3,201,346	45,709,100	93.0%	92.8%	92.7%	91.8%	92.6%
IL	48,655,718	94,884,286	143,540,004	33.9%	34.8%	34.5%	33.9%	34.3%
IN+KY	94,021,163	100,200,752	194,221,915	48.6%	48.3%	47.4%	47.2%	47.9%
LA	75,906,115	8,824,628	84,730,743	89.6%	88.7%	88.7%	88.7%	88.9%
MI	100,059,073	4,759,118	104,818,191	95.5%	95.4%	95.7%	94.5%	95.3%
MN	65,308,334	2,680,201	67,988,535	96.1%	96.1%	96.1%	96.1%	96.1%
MO	41,489,813	40,945,546	82,435,359	50.3%	49.5%	49.7%	48.9%	49.6%
MS	20,871,963	27,515,712	48,387,675	43.1%	43.6%	44.2%	43.9%	43.7%
ND+MT	9,510,284	19,070,055	28,580,339	33.3%	34.5%	34.4%	33.0%	33.8%
SD	3,073,575	8,660,635	11,734,210	26.2%	26.2%	27.0%	26.6%	26.5%
TX	24,821,670	340,282,461	365,104,131	6.8%	6.7%	6.7%	6.3%	6.6%
WI	68,646,131	173,959	68,820,090	99.7%	99.7%	99.7%	99.7%	99.7%

Source: Electric power sales, revenue, and energy efficiency 861 detailed data files, U.S. Energy Information Administration, calculated by SUFG.

Figure 2 illustrates the percentage of total electricity sales from MISO associated utilities at the state level for 2009 to 2012. The numbers above the bars represent the four-year average MISO load fraction at the state level. For most of the states, the MISO load fractions changed slowly during the period of 2009 to 2012, except for ND+MT. To understand the sharp drop in MISO's load fraction in ND+MT that occurred in 2012, SUFG researched EIA's Form 861 annual electricity sales and found the drop could be attributed to unusually high growth experienced during 2012 by 7 non-MISO utilities in the region where the development of the Bakken shale formation occurred as shown in Table 3. At the same time, MISO utilities in the remainder of ND+MT exhibited relatively normal growth which resulted in an overall drop in the MISO load fraction.

Figure 2: State-Level MISO Load Fraction, 2009 to 2012

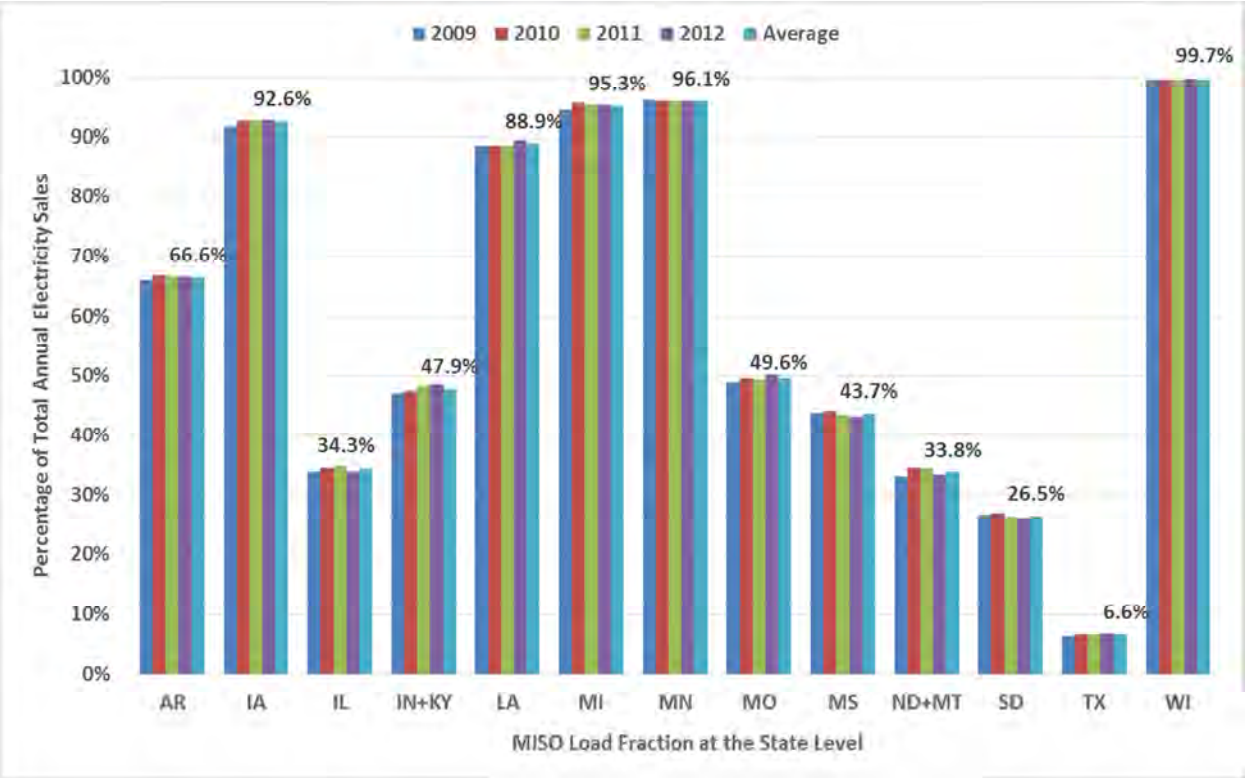


Table 3: Non-MISO Utilities in the Bakken Region Experienced Tremendous Growth in 2012 (MWh)

Utility Name	2012	2011	Annual Change%	Service Territory (County)
Burke-Divide Electric Coop Inc	116,170	85,504	36%	Burke, Divide, Mountrail, Renville, Ward, Williams
Lower Yellowstone R E A, Inc	31,658	20,611	54%	McKenzie, Williams
McKenzie Electric Coop Inc	867,976	512,506	69%	Billings, Dunn, Golden Valley, Mckenzie, Mercer
Mountrail-Williams Elec Coop	1,007,191	682,017	48%	Burke, Divide, McLean, Mountrail, Ward, Williams
Roughrider Electric Cooperativ	595,786	520,158	15%	Billings, Dunn, Golden Valley, Hettinger, Mercer, Oliver, Slope, Stark
Sheridan Electric Coop, Inc	7,848	5,848	34%	Divide, Williams
Slope Electric Coop Inc	411,736	360,021	14%	Adams, Bowman, Hettinger, Slope

Source: Electric power sales, revenue, and energy efficiency Form EIA-861 detailed data files, U.S. Energy Information Administration, summarized by SUFG

Table 4 shows the average percentage of annual electricity sales at the state level that was located in each MISO LRZ. Color scales were used to highlight those states with higher MISO load fraction. The darker the color shade is, the higher MISO load fraction is. A MISO LRZ may cover multiple states such as LRZ 1 and LRZ 9. The last row "Non-MISO" listed the average percentage of electricity sales from non-MISO utilities at the state level.

Table 4: MISO Load Fraction Formula at LRZ Level (Average Percentage of State-Level Electricity Sales from 2009 to 2012)

MISO LRZ	AR	IA[4]	IL	IN+KY	LA	MI[5]	MN	MO	MS	ND+MT	SD	TX	WI[6]
1		1.8%	0.0002%			0.1%	94.8%			33.7%	24.7%		14.8%
2						4.9%							84.9%
3		90.8%	1.4%				1.3%				1.8%		
4			32.9%										
5								49.6%					
6				47.8%									
7						90.2%							
8	66.6%												
9					88.9%				43.7%			6.6%	
Non-MISO	33.4%	7.4%	65.7%	52.1%	11.1%	4.7%	3.9%	50.4%	56.3%	66.2%	73.5%	93.4%	0.3%

Source: Electric power sales, revenue, and energy efficiency Form 861 detailed data files, U.S. Energy Information Administration, calculated by SUFG.

[4] Part of utilities in Iowa such as Heartland Power Coop, Hawkeye Tri-County EL Coop Inc. etc. used Dairy Land Power Cooperative as their balancing authority. Dairy Land Power Cooperative is a local balancing authority in MISO market footprint Zone 1. Therefore, electricity sales from those utilities are considered MISO sales in LRZ 1.

[5] Northern States Power Company provides electricity to customers in the Upper Peninsula of Michigan. As it is categorized as MISO LRZ 1 utility, its sales to Michigan are considered MISO sales in LRZ 1.

[6] Northern States Power Company and Dairy Land Power Cooperative provide electricity to customers in western Wisconsin. Therefore, their sales are considered MISO sales in LRZ 1.

Table 5 summarizes the state level percentage of MISO electricity sales for 2009 to 2012 and the four-year average by LRZs. For most states, the state level percentage of electricity sales from MISO utilities was quite stable during this period.

Table 5: State Level MISO Load Fraction by MISO LRZs, 2009 to 2012

MISO LRZ	State	State Level MISO Load Fraction				
		Average	2009	2010	2011	2012
1	IA	***1.8%***	1.8%	1.8%	1.8%	1.7%
	IL*	***0.0%***	0.0%	0.0%	0.0%	0.0%
	MI	***0.1%***	0.1%	0.1%	0.1%	0.1%
	MN	***94.8%***	94.8%	94.8%	94.9%	94.8%
	ND+MT	***33.7%***	32.9%	34.0%	34.5%	33.3%
	SD	***24.7%***	24.8%	25.1%	24.4%	24.4%
	WI	***14.8%***	15.0%	14.8%	15.1%	14.4%
2	MI	***4.9%***	4.3%	5.2%	5.3%	4.9%
	WI	***84.9%***	84.7%	85.0%	84.7%	85.3%
3	IA	***90.8%***	90.0%	90.9%	91.1%	91.3%
	IL	***1.4%***	1.4%	1.4%	1.4%	1.4%
	MN	***1.3%***	1.3%	1.3%	1.2%	1.2%
	SD	***1.8%***	1.8%	1.9%	1.8%	1.8%
4	IL	***32.9%***	32.5%	33.1%	33.3%	32.5%
5	MO	***49.6%***	48.8%	49.7%	49.5%	50.3%
7	MI	***90.2%***	90.1%	90.3%	90.0%	90.4%
8	AR	***66.6%***	66.1%	66.8%	66.7%	66.7%
6	IN+KY	***47.8%***	47.1%	47.4%	48.3%	48.4%
9	LA	***88.9%***	88.7%	88.7%	88.7%	89.6%
	MS	***43.7%***	43.9%	44.2%	43.6%	43.1%
	TX	***6.6%***	6.3%	6.7%	6.7%	6.8%

*Note: *The value is 0.0002%.*

Source: Electric power sales, revenue, and energy efficiency Form 861 detailed data files, U.S. Energy Information Administration, calculated by SUFG.

Figure 3 to
Figure 11 display MISO state level load fraction by LRZ from 2009 to 2012.

Figure 3: MISO State-Level Load Fractions at LRZ 1

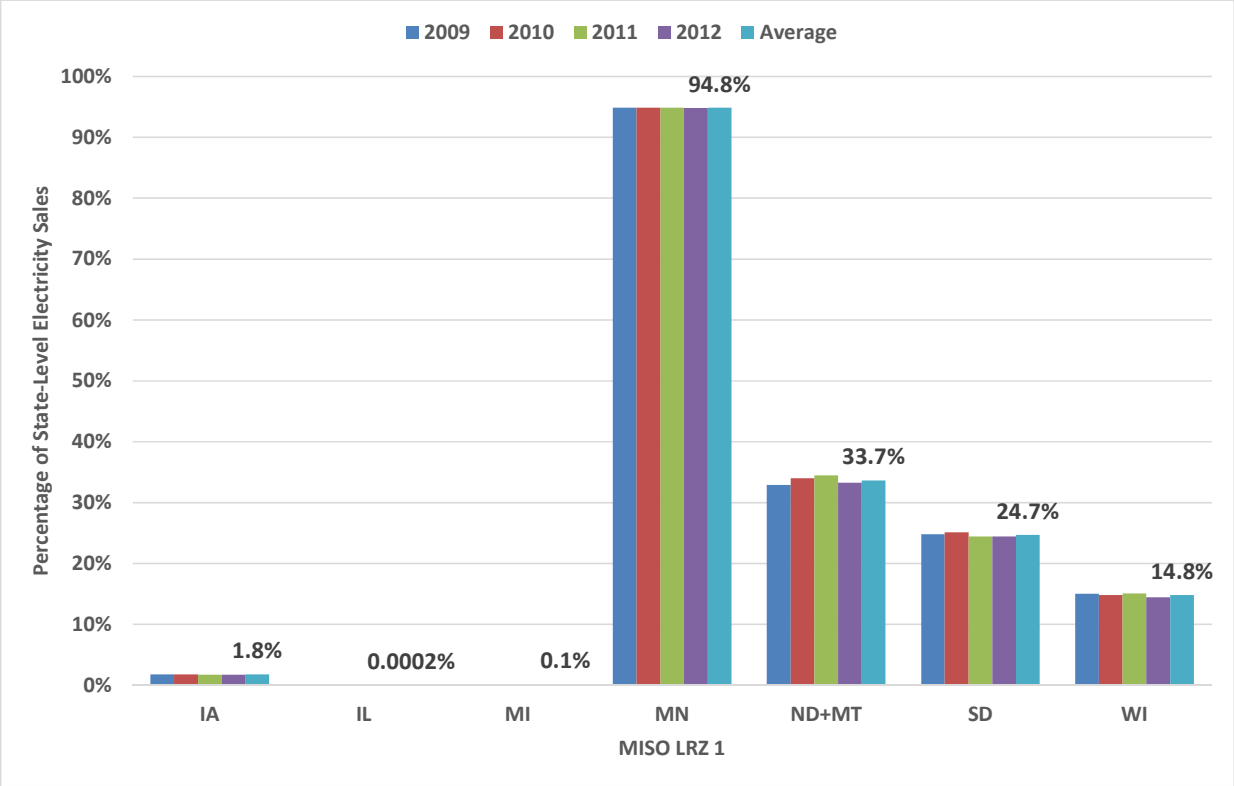


Figure 4: MISO State-Level Load Fractions at LRZ 2

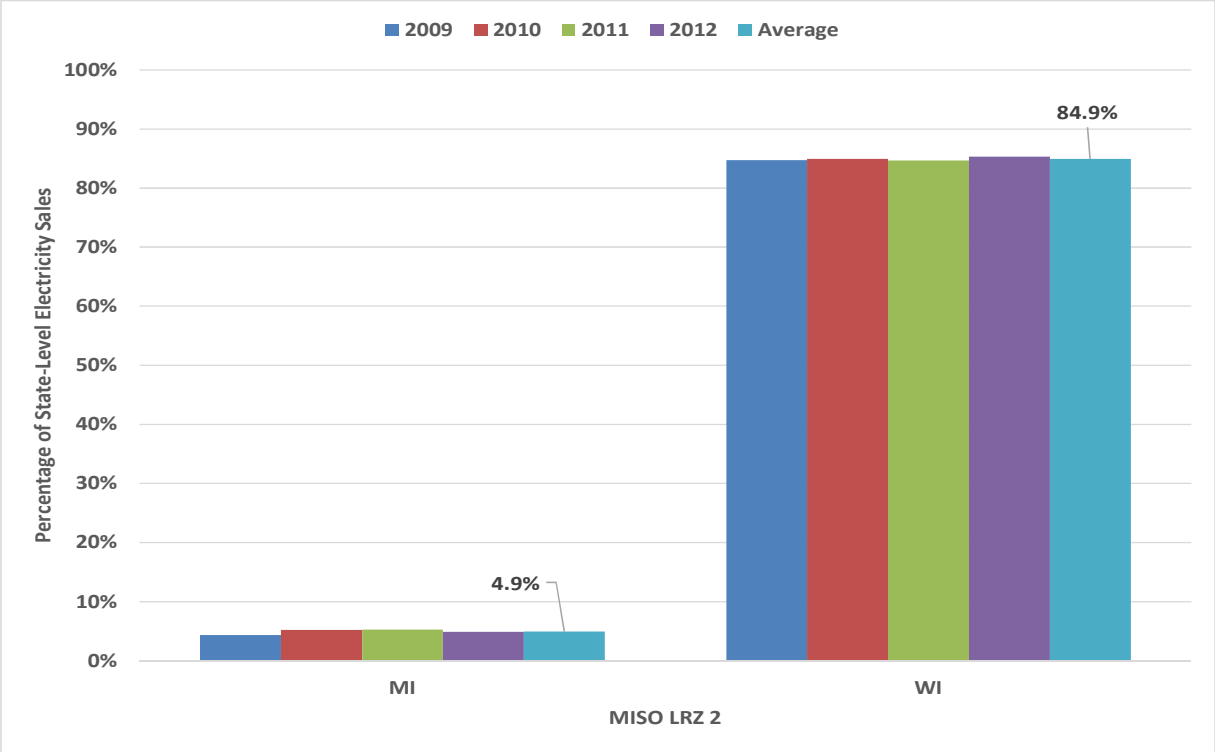


Figure 5: MISO State-Level Load Fractions at LRZ 3

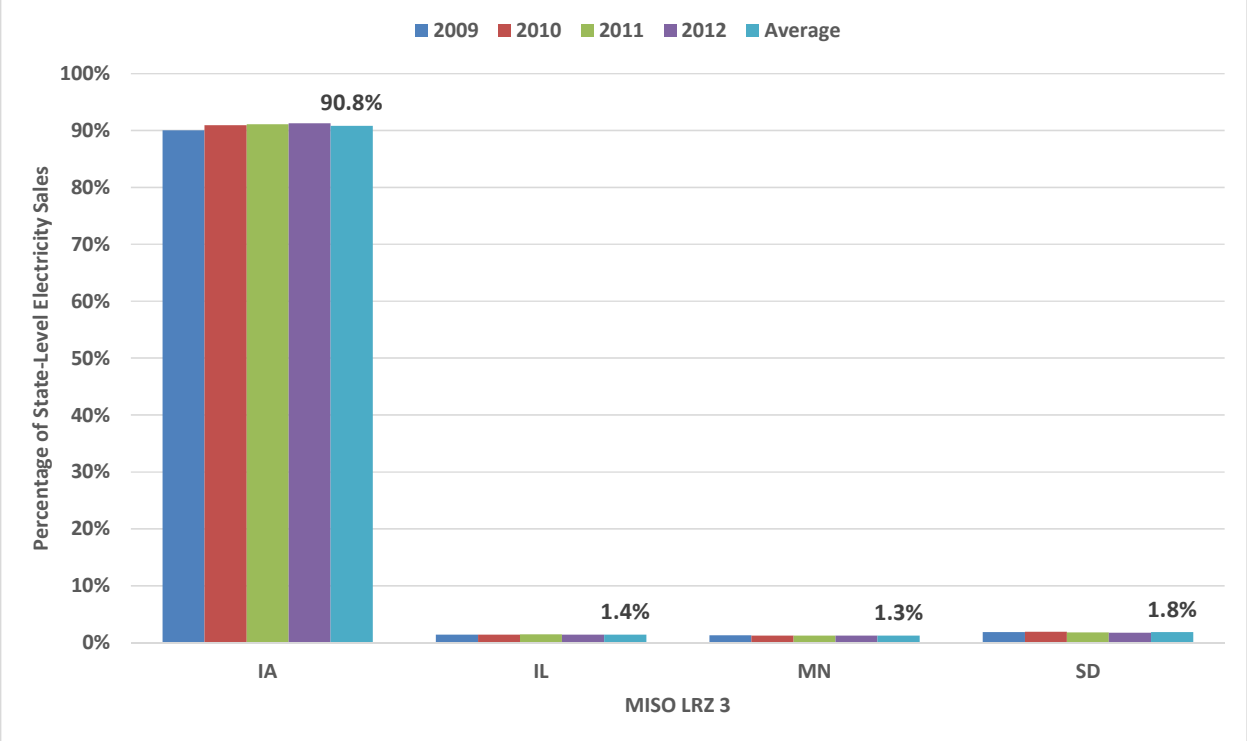


Figure 6: MISO State-Level Load Fractions at LRZ 4

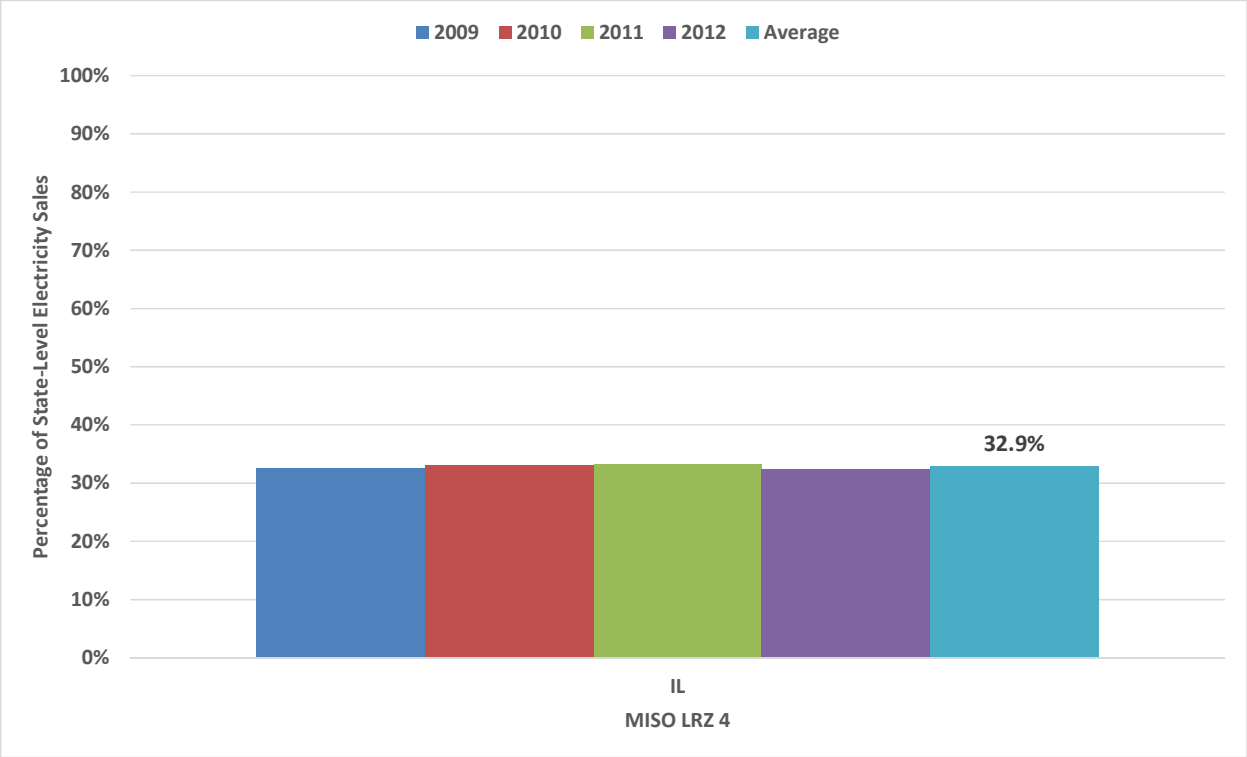


Figure 7: MISO State-Level Load Fractions at LRZ 5

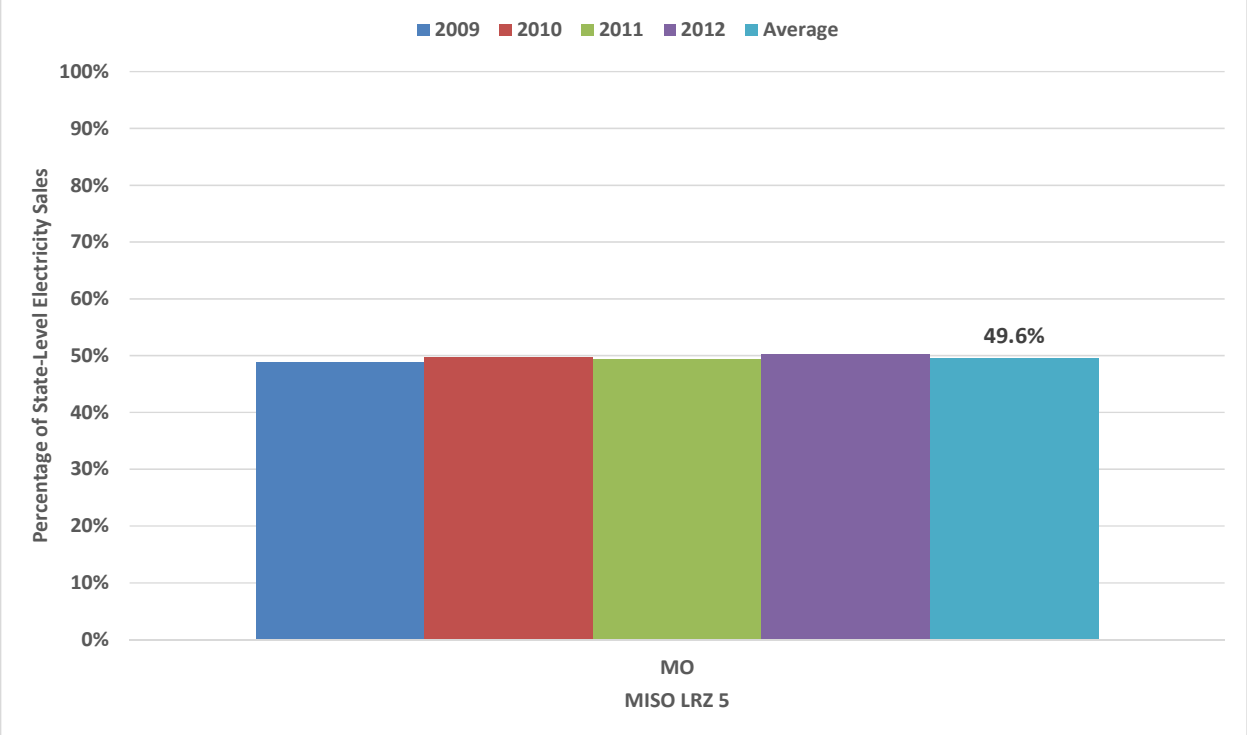


Figure 8: MISO State-Level Load Fractions at LRZ 6

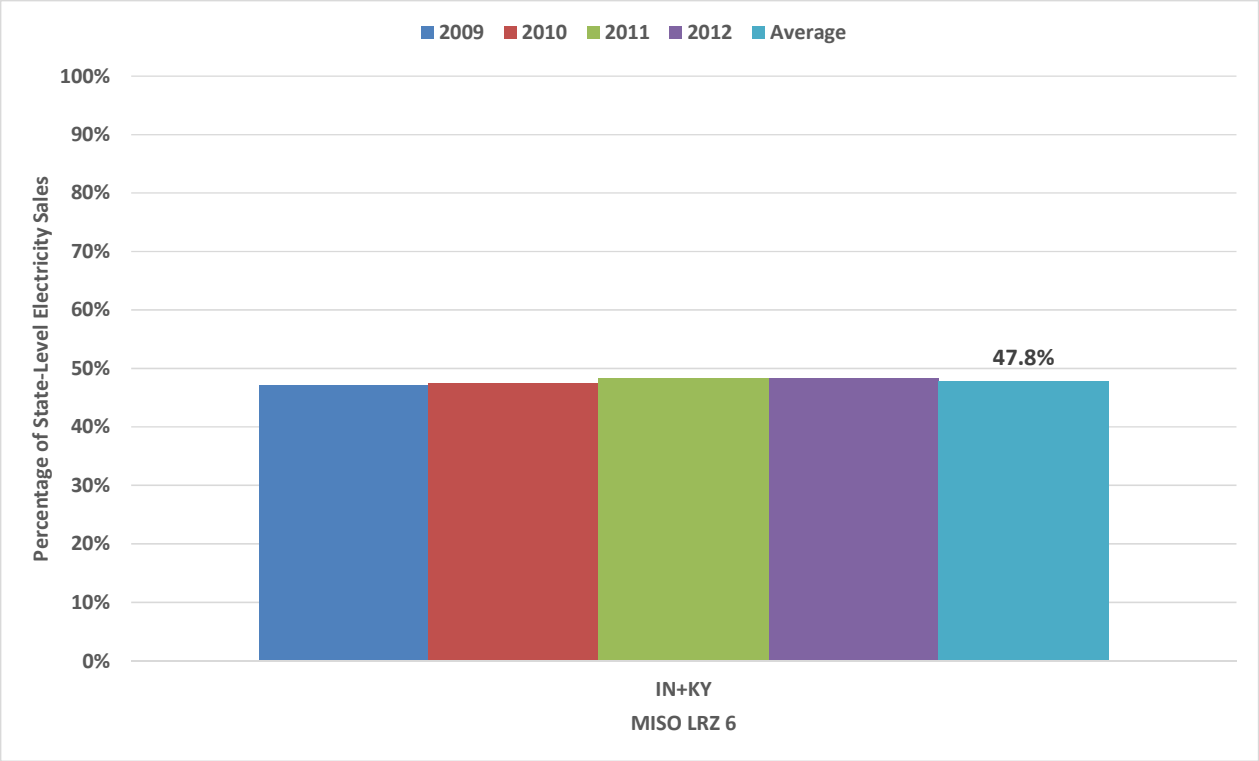

2009
2010
2011
2012
Average
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percentage of State-Level Electricity Sales
47.8%
IN+KY
MISO LRZ 6

Figure 9: MISO State-Level Load Fractions at LRZ 7

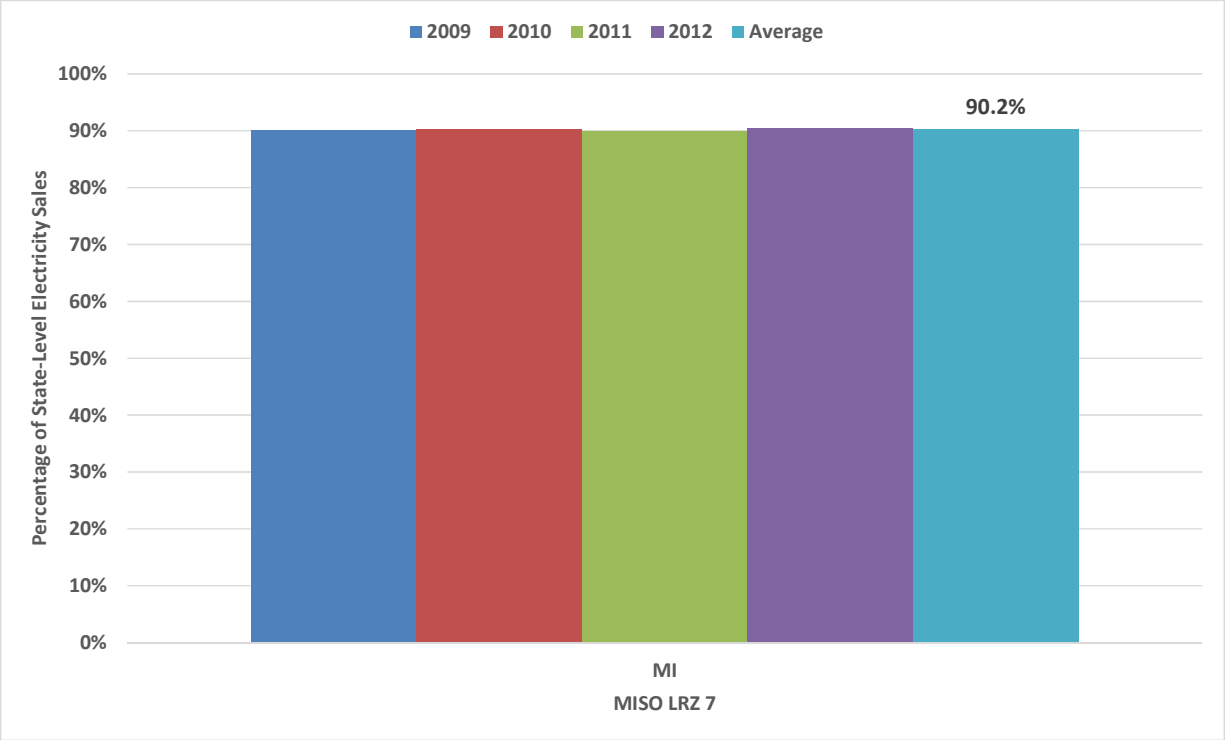


Figure 10: MISO State-Level Load Fractions at LRZ 8

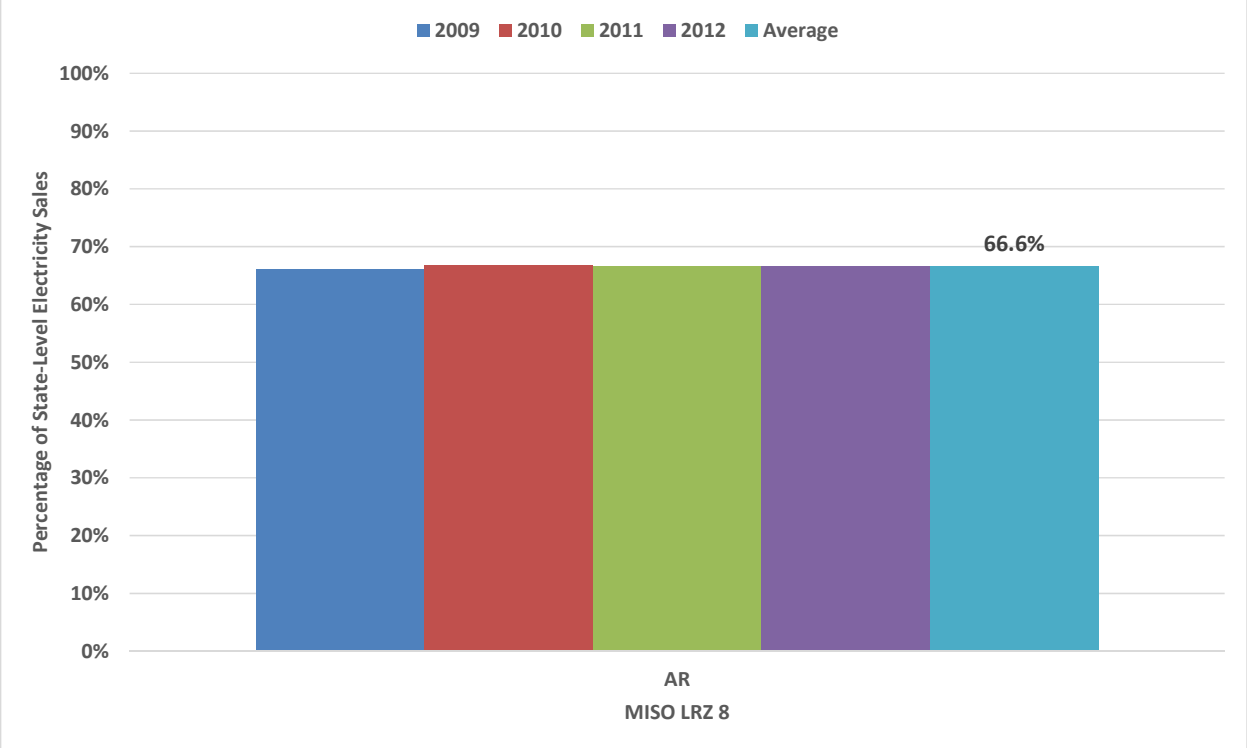
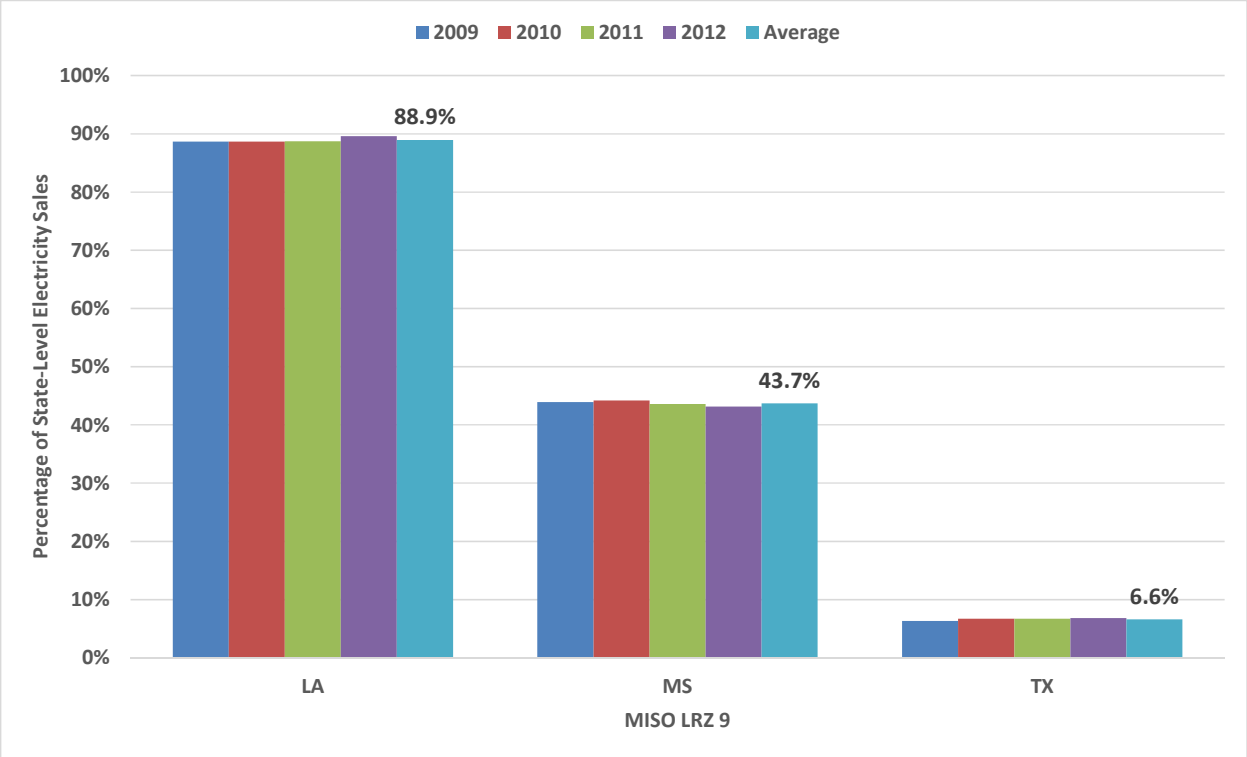


Figure 11: MISO State-Level Load Fractions at LRZ 9



MISO Allocation Factors

Figures 12 through 24 provide historical market shares for various states and the future allocation factors. In determining the future allocation factors, a number of elements were considered. This includes the stability of the historical market shares, any distinct upward or downward trend in the historical market shares, and information regarding expected growth for sub-state areas where those areas are particularly indicative of either the MISO or the non-MISO portion of the state (e.g., Chicago). In general future allocation factors are constant at either the average or most recent observed level, assumed to change going forward because of trends in the observed values, or assumed to change based on differences in expected growth for sub-state areas that are indicative of the MISO or non-MISO portion of the state.

Figure 12 shows the historical MISO market share in AR and its future allocation factors. The blue line represents the MISO market share in AR and the red line for the non-MISO share. The variation in the historical share is moderate (between 66.1% and 66.8%). Therefore, the allocation factor is held at the average of the historical values (66.6%).

Figure 12: MISO Allocation Factors—AR

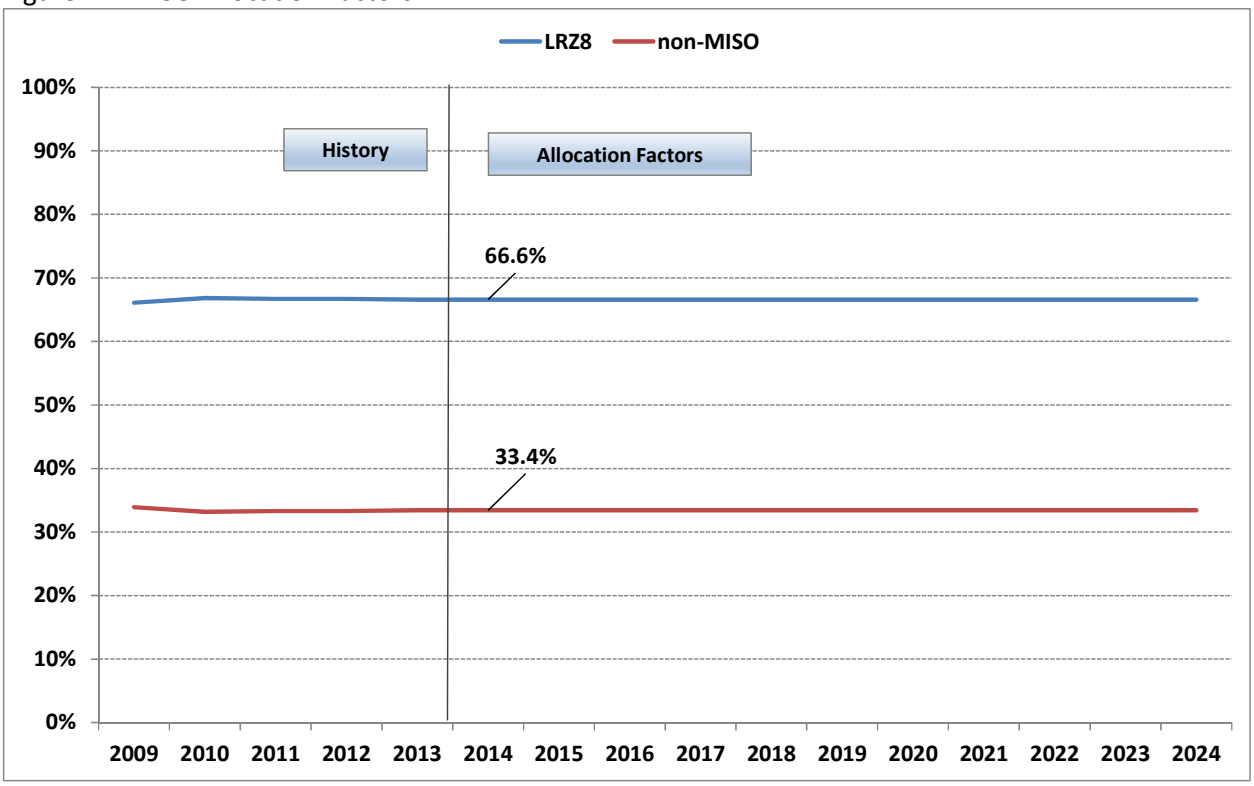


Figure 13 shows the historical MISO market share in IA and its future allocation factors. Historical values for LRZ 1 are all either 1.7% or 1.8%. The allocation factor is held at the average of the historical values (1.8%). For LRZ 3, the 2009 value (90.0%) is lower than the others, which have little variation. The allocation factor is held at the last observed value (91.3%).

Figure 13: MISO Allocation Factors—IA

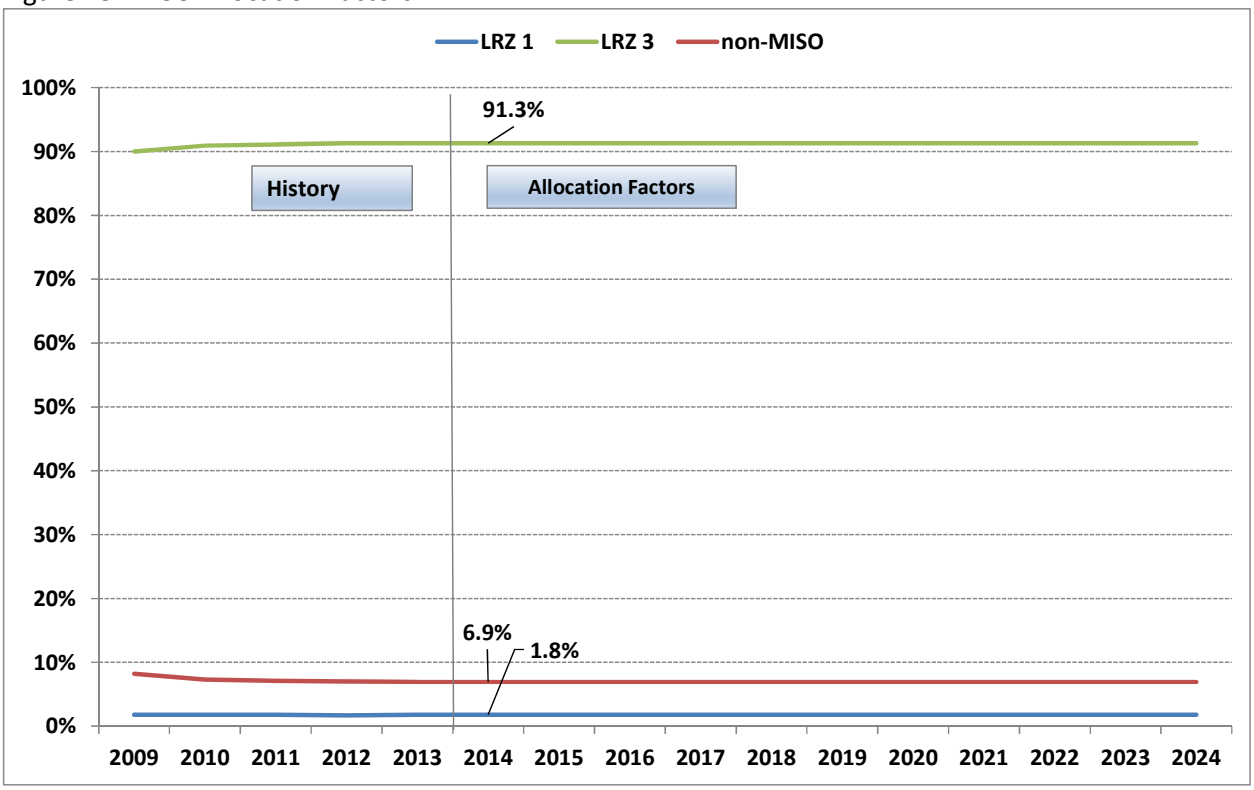


Figure 14 illustrates the historical MISO market share in IL and its future allocation factors. Based on the projections of the values for the model drivers for the state of Illinois and for the Chicago metropolitan statistical area, the non-MISO region is projected to grow slightly faster than the MISO region. The allocation factors for LRZ 1 (0.0002%) and LRZ 3 (1.4%) are held constant at their historical values. The allocation factor for LRZ 4 declines from 32.4% to 31.9% over the 10-year period to reflect the declining share of statewide sales in the MISO footprint.

Figure 14: MISO Allocation Factors—IL

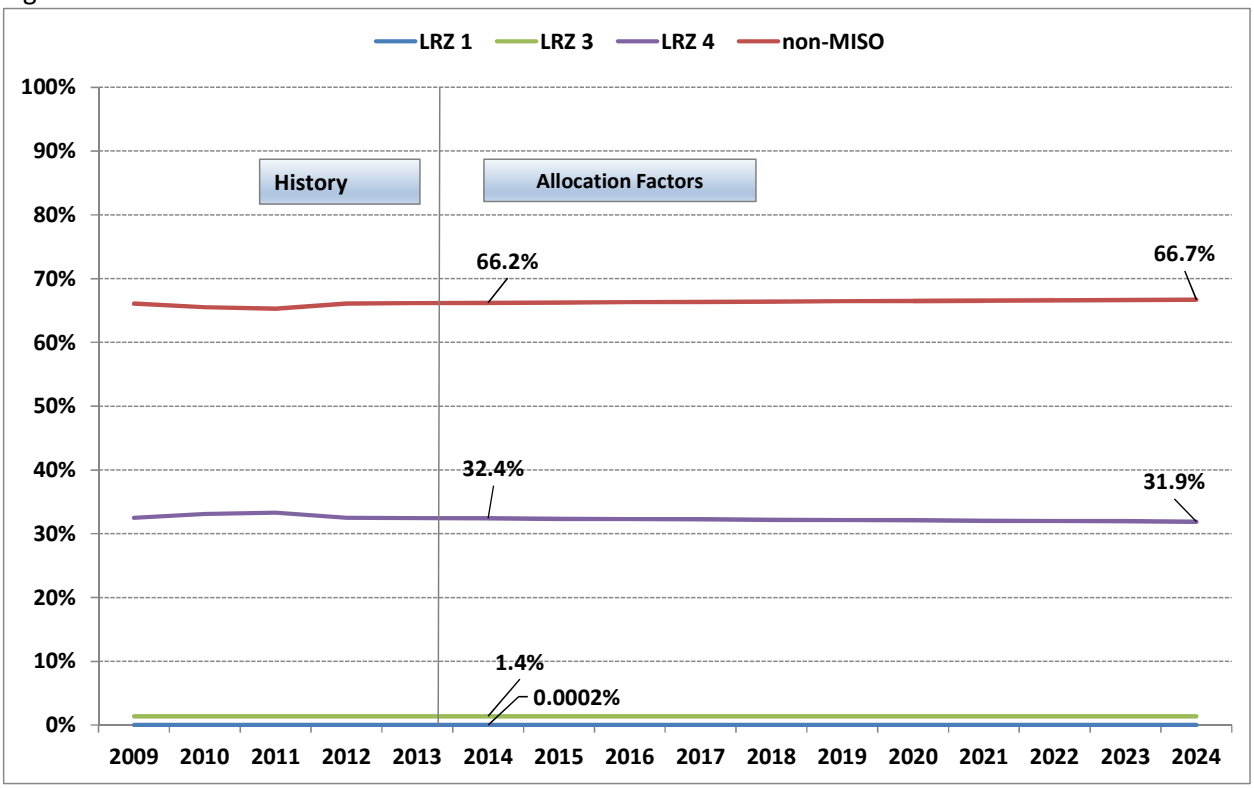


Figure 15 shows the combined historical MISO market share in IN and KY and its future allocation factors. The historical share in the MISO footprint has risen throughout the observations (from 47.1% to 48.4%). The allocation factor reflects that growth in the future, growing to 48.8% and then leveling off.

Figure 15: MISO Allocation Factors—IN+KY

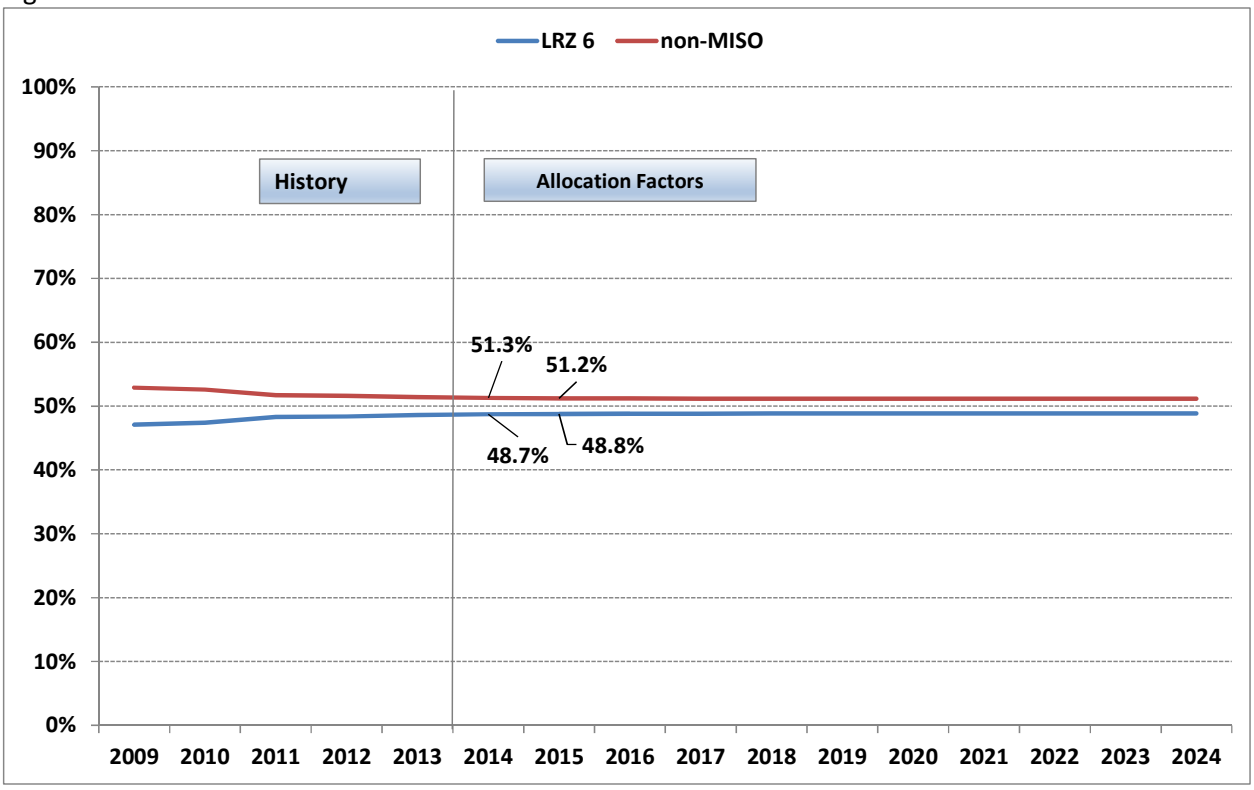


Figure 16 shows the historical MISO market share in LA and its future allocation factors. The historical shares have been consistent with a slight increase in 2012. The allocation factor is held at the average of the historical values (88.9%).

Figure 16: MISO Allocation Factors—LA

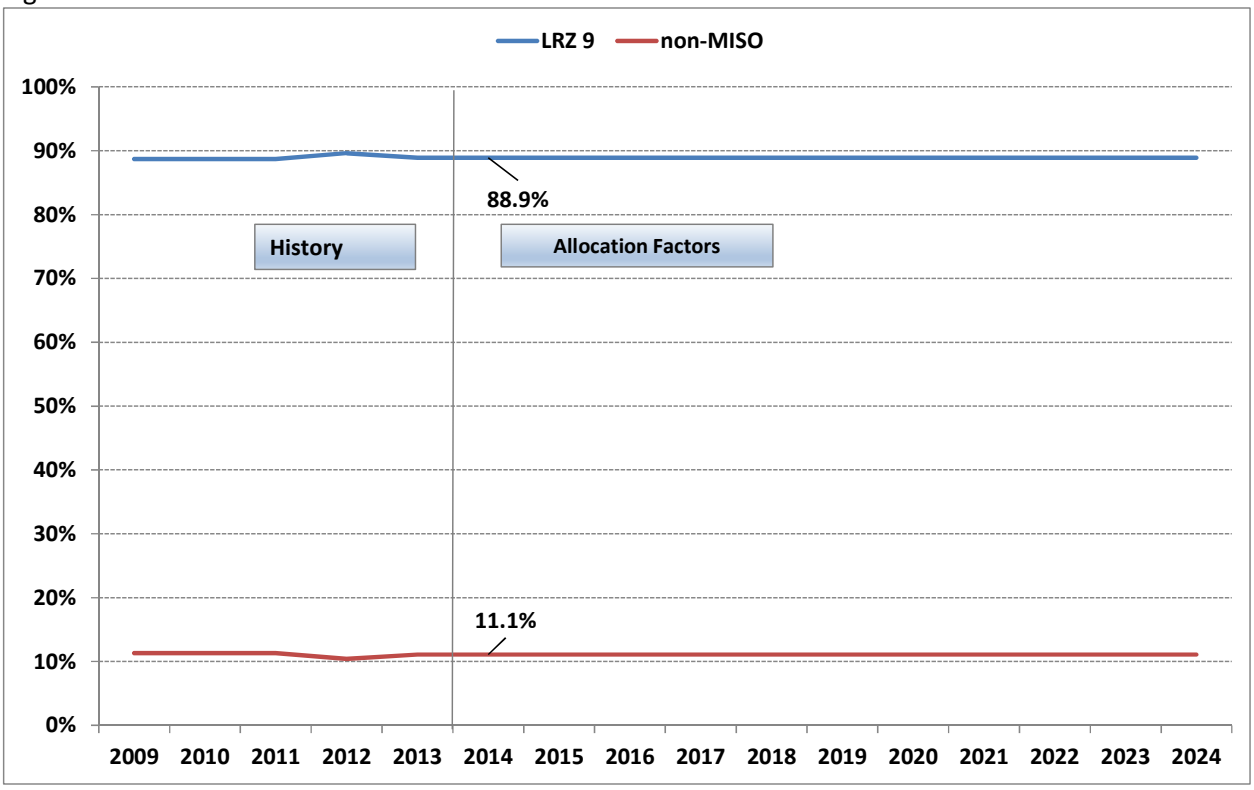


Figure 17 shows the historical MISO market share in MI and its future allocation factors. LRZ 1 has had a constant share (0.1%) and is held constant at that level. LRZ 2 has been consistent since a lower level in 2009 (4.3%). The allocation factor is held constant at the last historical observation (4.9%). The variation in LRZ 7 has been low (between 90.0% and 90.4%). The allocation factor is held at the average of the historical values (90.2%).

Figure 17: MISO Allocation Factors—MI

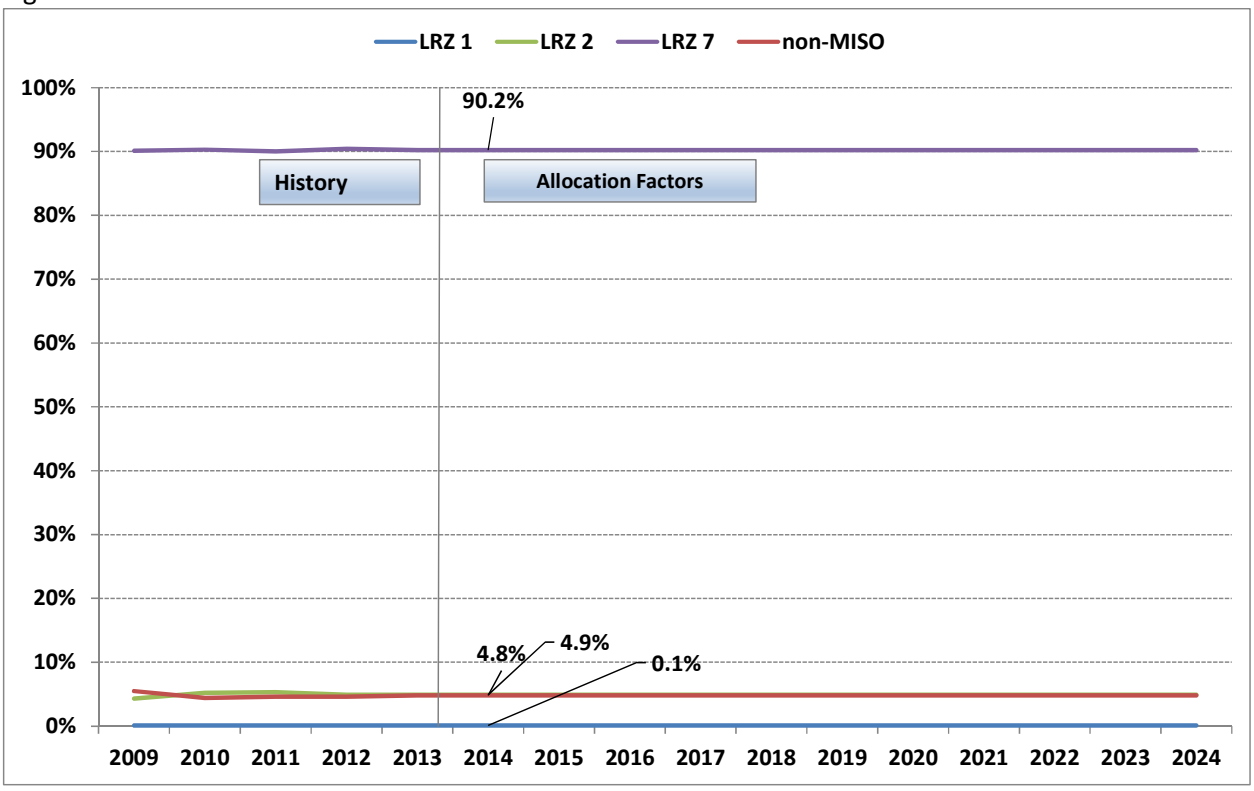


Figure 18 shows the historical MISO market share in MN and its future allocation factors. The variation in LRZ 1 has been very low (between 94.8% and 94.9%). The allocation factor is held at the average of the historical values (94.8%). The variation in LRZ 3 has also been low (between 1.2% and 1.3%). The allocation factor is held at the average of the historical values (1.3%).

Figure 18: MISO Allocation Factors—MN

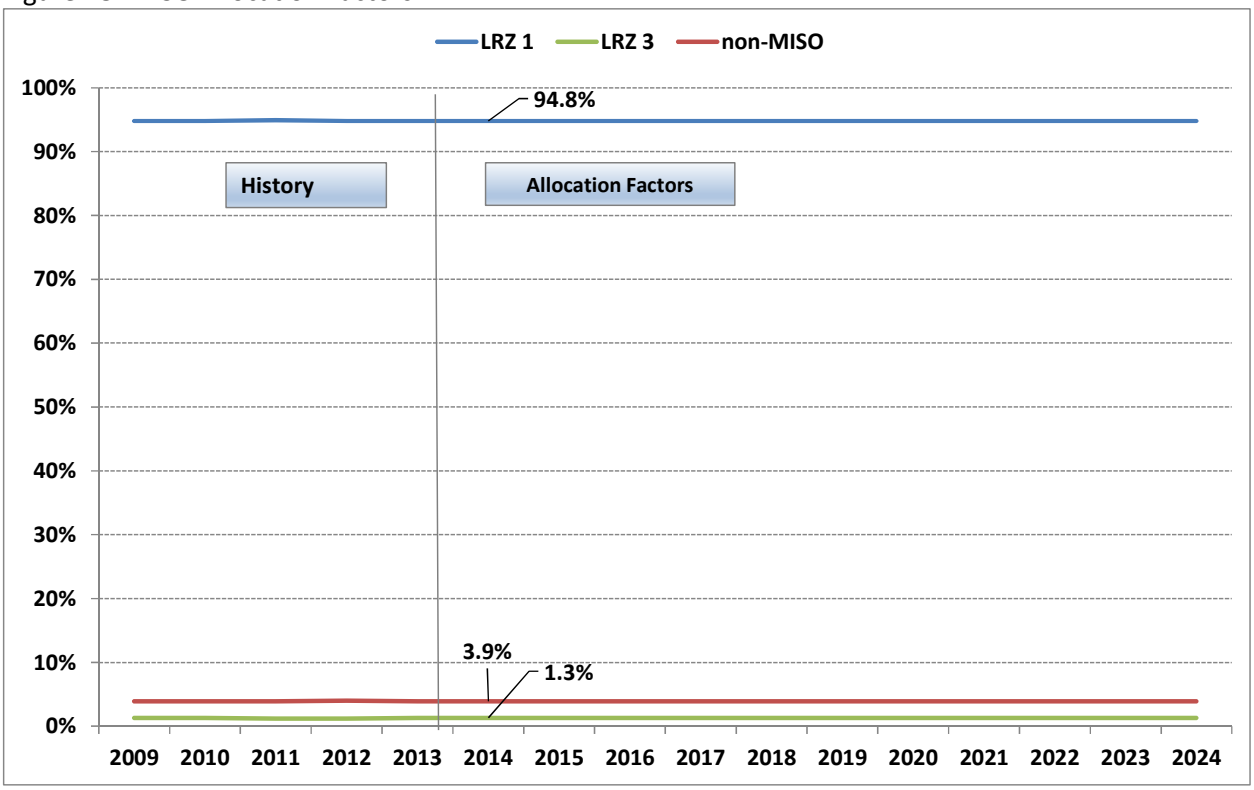


Figure 19 shows the historical MISO market share in MO and its future allocation factors. Based on the projections of the values for the model drivers for the state of Missouri and for the St. Louis metropolitan statistical area, the non-MISO region is projected to grow faster than the MISO region. The allocation factor for LRZ 5 declines from 50.3% to 49.3% over the 10-year period to reflect the declining share of statewide sales in the MISO footprint.

Figure 19: MISO Allocation Factors—MO

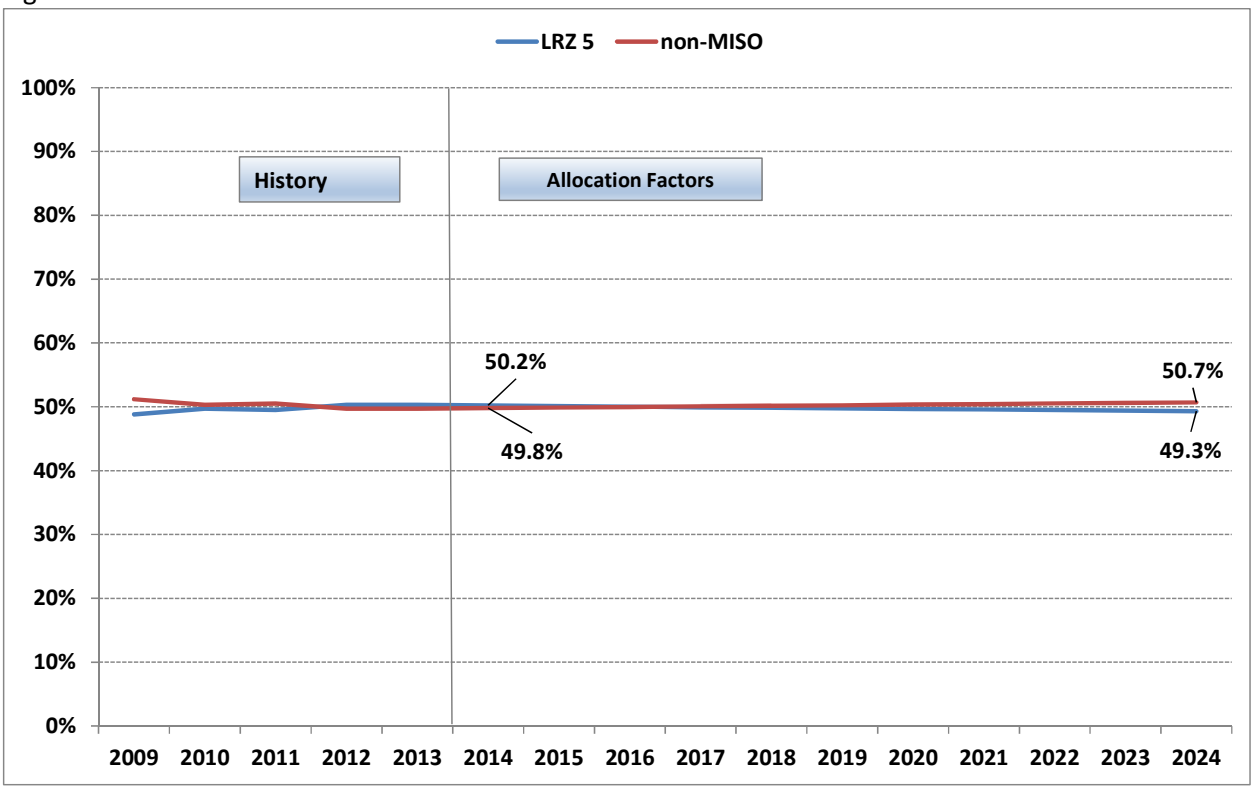


Figure 20 shows the historical MISO market share in MS and its future allocation factors. While there is some variation in the historical share (between 43.1% and 44.2%), there is no consistent pattern of growth or shrinkage. The allocation factor is held at the average of the historical values (43.7%).

Figure 20: MISO Allocation Factors—MS

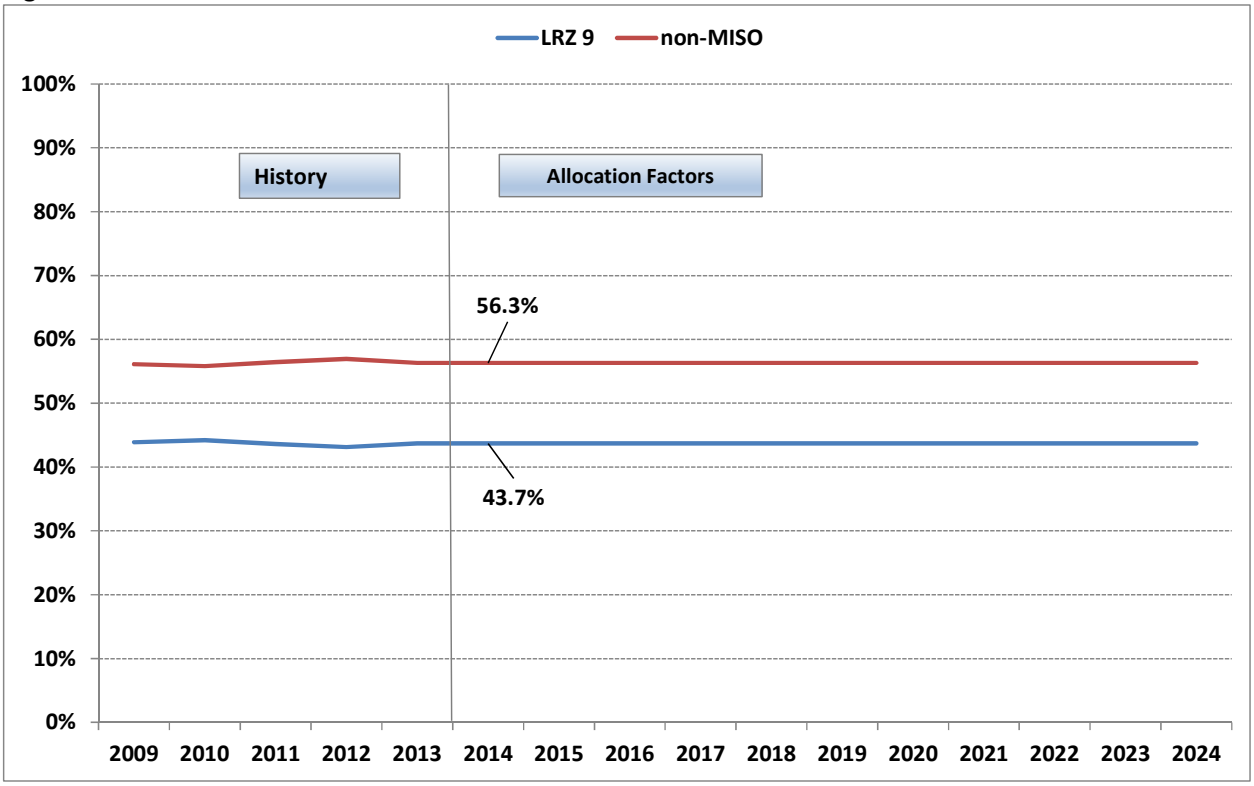


Figure 21 shows the combined historical MISO market share in ND and MT and its future allocation factors. The share of sales in LRZ 1 dropped significantly in 2012 (from 34.5% to 33.3%) due to very strong growth in non-MISO utilities in the Bakken region. While strong growth is expected to continue in that region, the extreme growth (in excess of 50% in one year for some) is not expected to continue indefinitely. The allocation factor for LRZ 1 drops from the 2012 level to 32.1% before leveling off.

Figure 21: MISO Allocation Factors—ND+MT

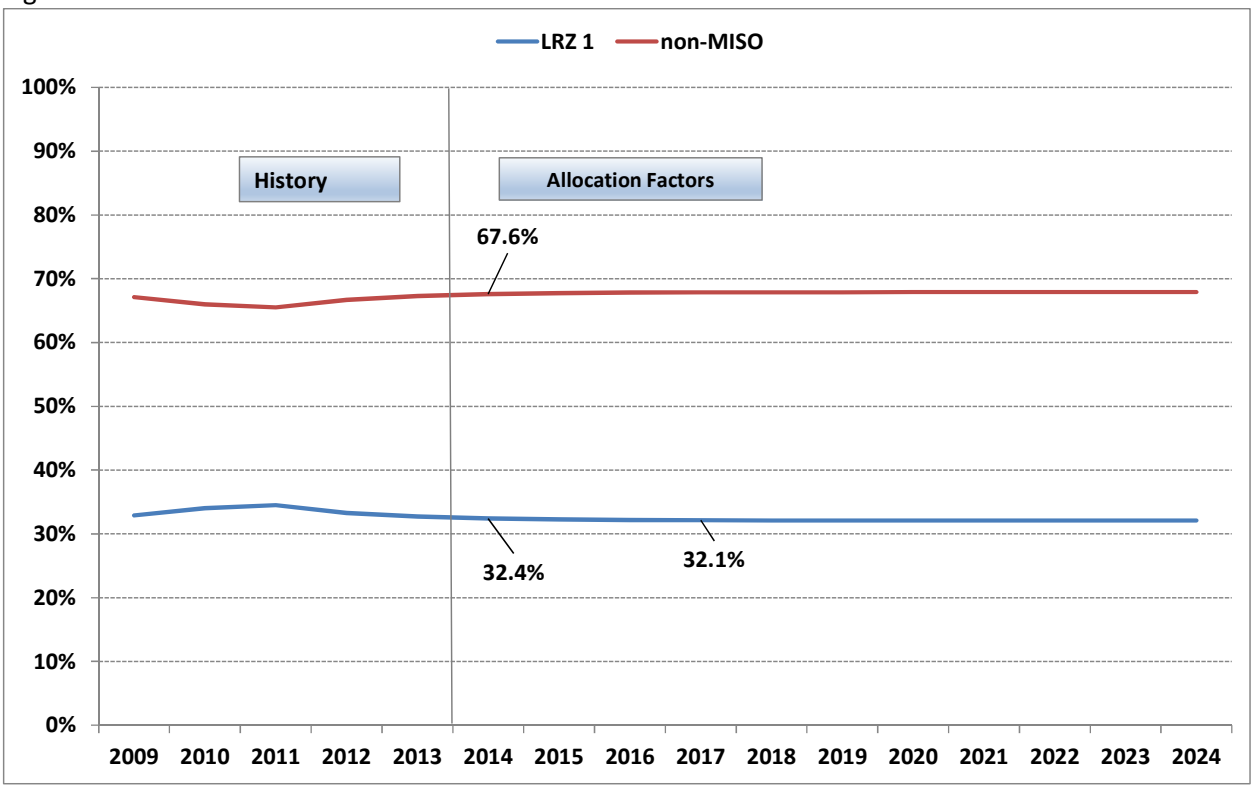


Figure 22 shows the historical MISO market share in SD and its future allocation factors. The variation in the historical share of LRZ 1 is moderate (between 24.4% and 25.1%). The allocation factor is held at the average of the historical values (24.7%). The variation in the historical share of LRZ 3 is low (between 1.8% and 1.9%). The allocation factor is held at the average of the historical values (1.8%).

Figure 22: MISO Allocation Factors—SD

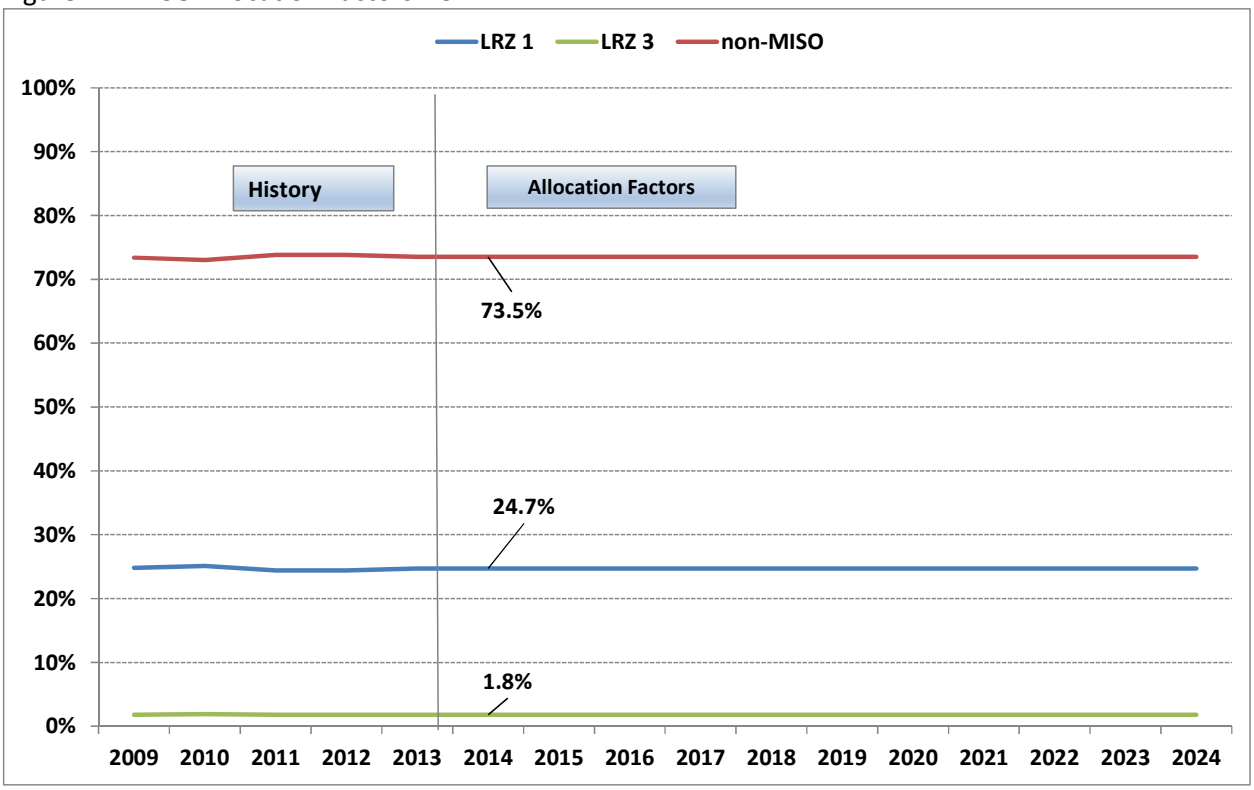


Figure 23 shows the historical MISO market share in TX and its future allocation factors. The variation has been very low (between 6.7% and 6.8%) since a lower level in 2009 (6.3%). The allocation factor is held constant at the last historical observation (6.8%).

Figure 23: MISO Allocation Factors—TX

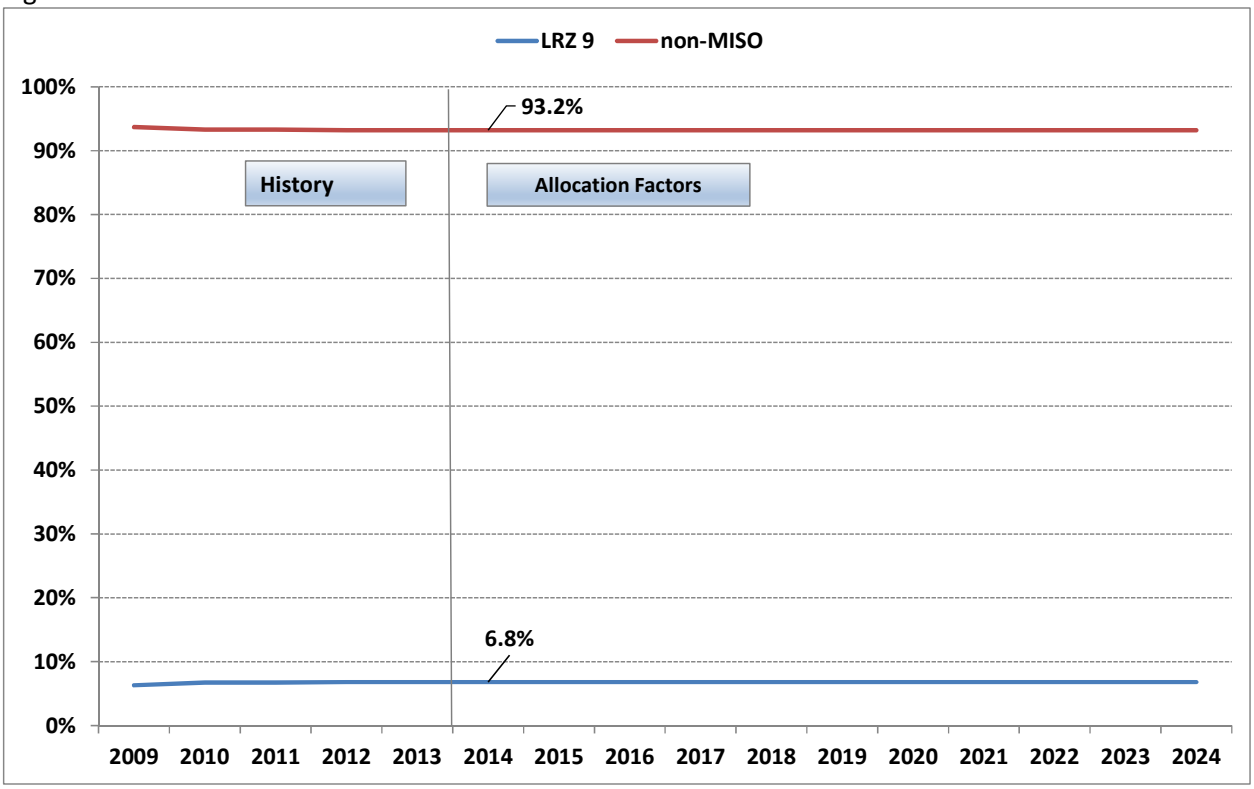


Figure 24 shows the historical MISO market share in WI and its future allocation factors. The variation in the historical share of LRZ 1 is moderate (between 14.4% and 15.1%). The allocation factor is held at the average of the historical values (14.8%). The variation in the historical share of LRZ 2 is also moderate (between 84.7% and 85.3%). The allocation factor is held at the average of the historical values (84.9%).

Figure 24: MISO Allocation Factors—WI