How do RPS Requirements Impact the MISO Market?

WIEG Annual Meeting
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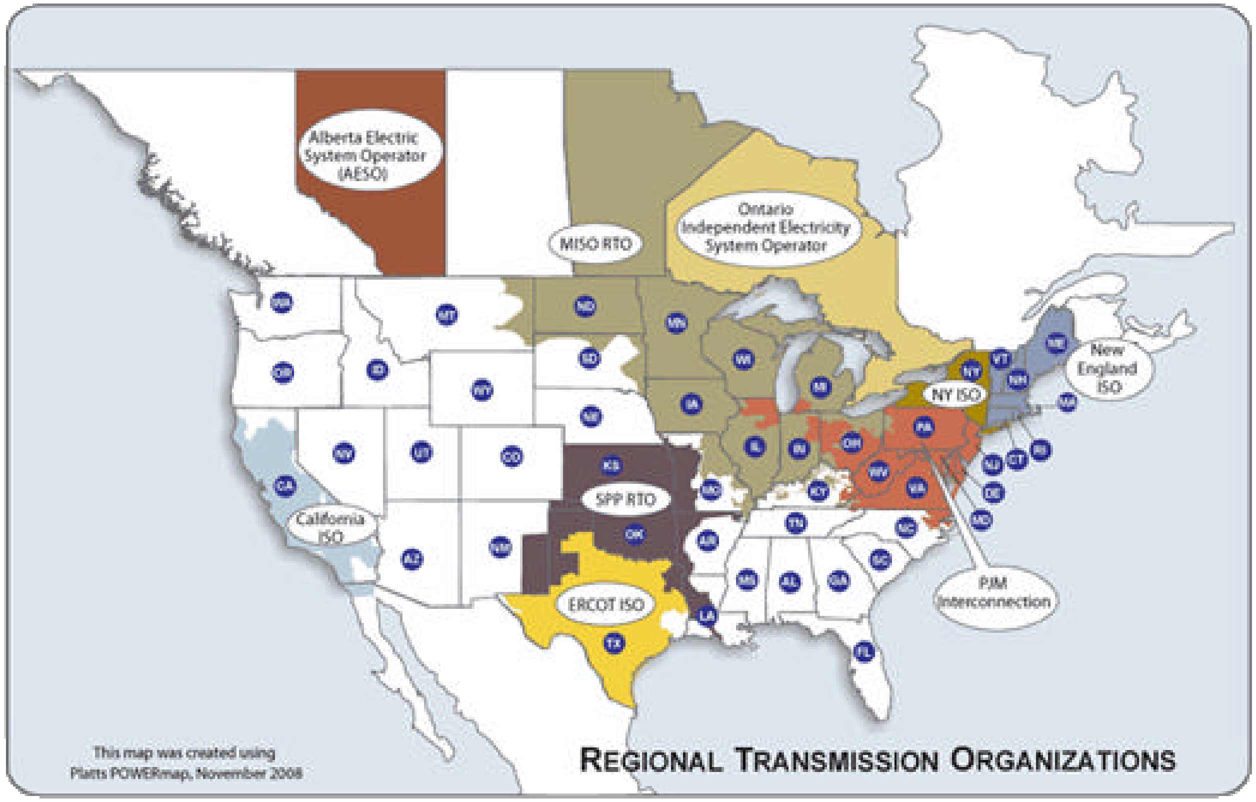
KM Energy Consulting, LLC

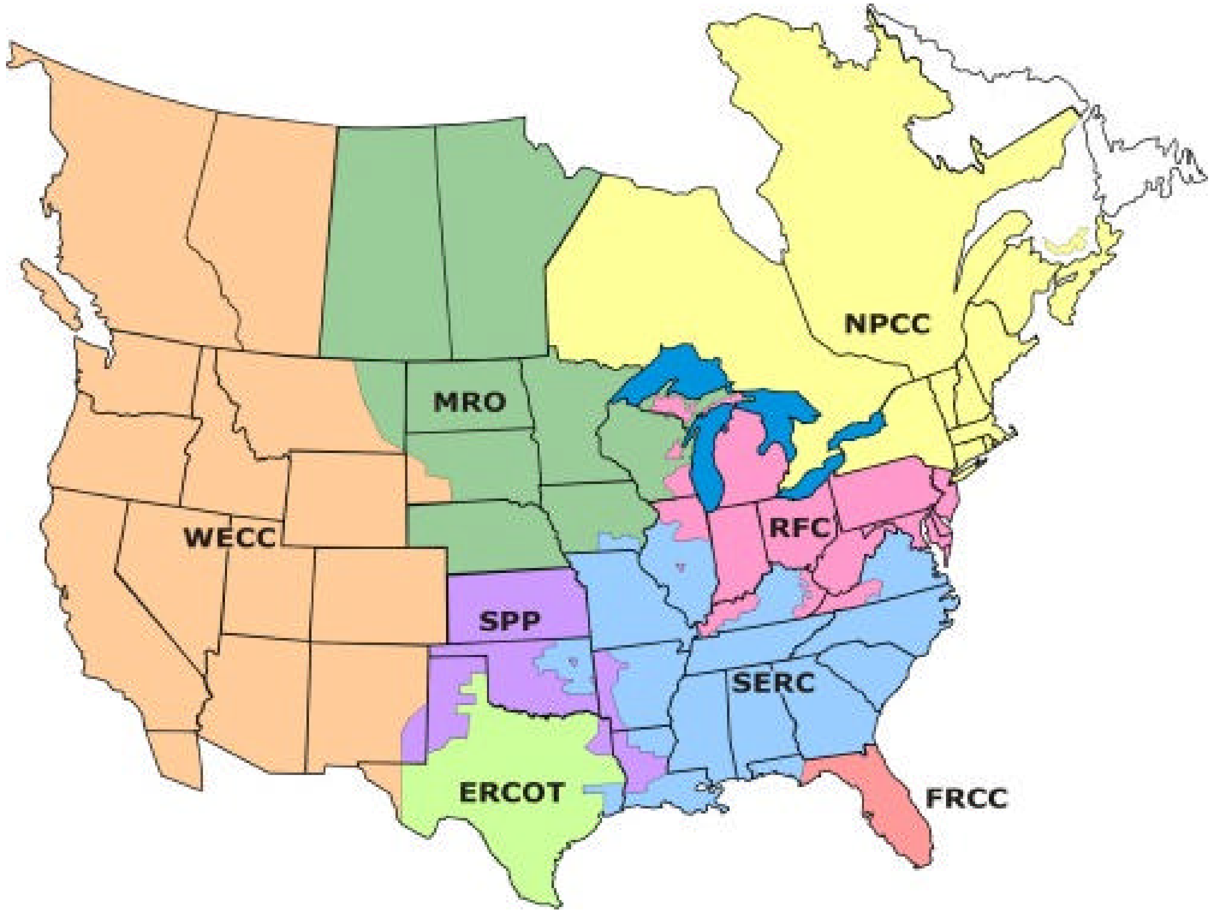
Protecting Your Bottom Line

Regional Transmission Organizations (RTOs/Independent System Operators (ISOs)



ISOs/RTOs formed as a result of FERC Orders & EPACT1992

Regional Reliability Councils



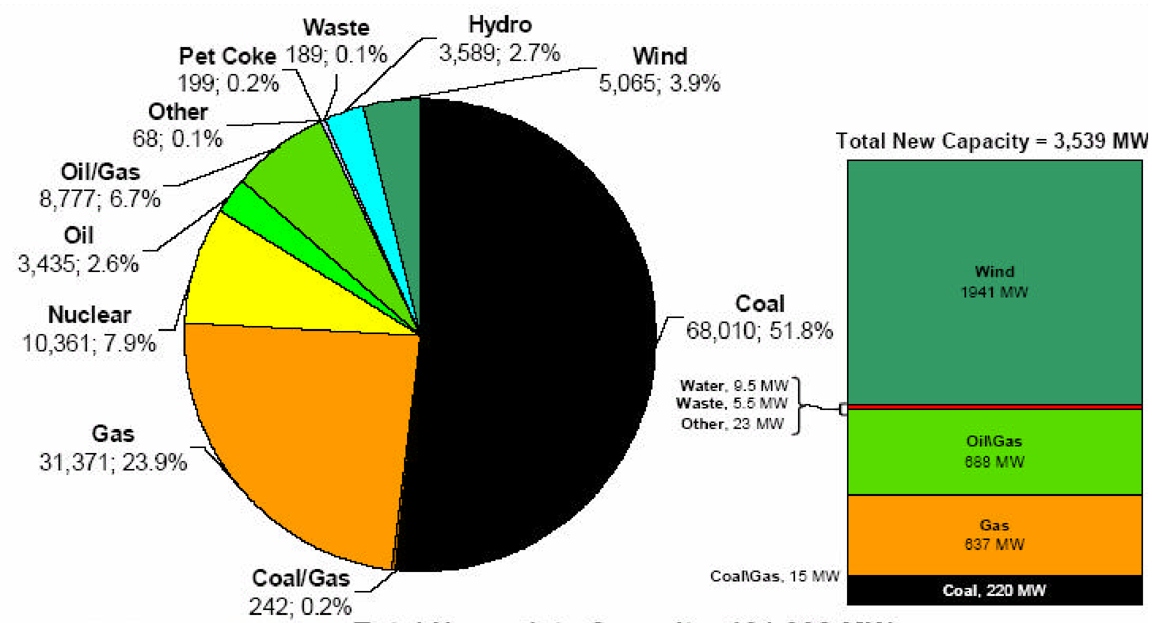
Mandatory Compliance of Reliability Standards

MISO

- Non Profit
- Spans 13 states and one Canadian province
- 131,000 MW of Generation Capacity
- Historic Peak load set on July 31, 2006 @ 116,030 MW
- $15 billion of transmission assets under MISO's functional control
- Participation is voluntary

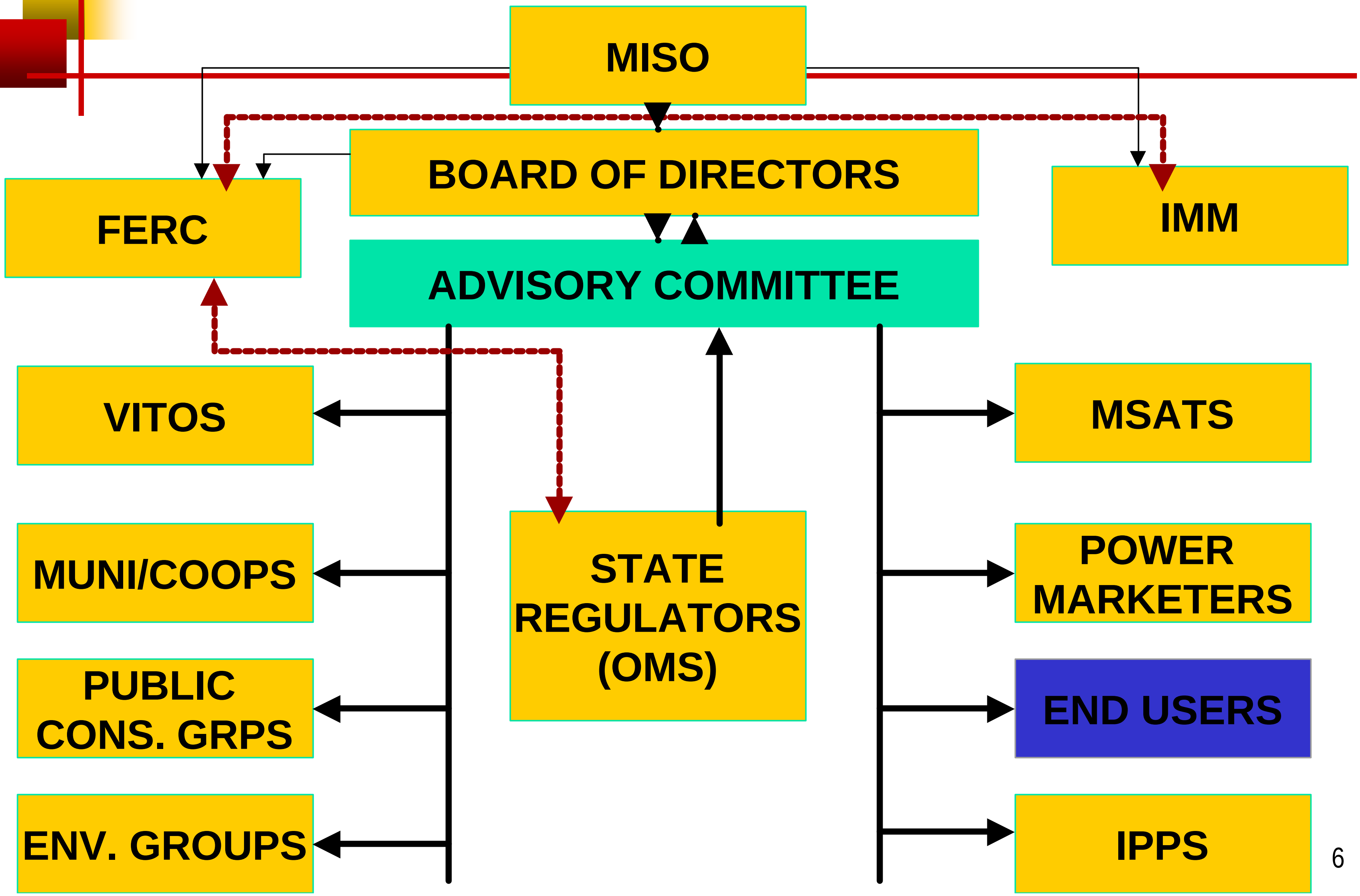
Source: MISO

MISO: 2009 Generation Capacity Breakdown



- 18% estimated reserve margin for this summer
- 100,000 MW of load;118,000 MW of dependable capacity
- Demand down by 3.2%
- MISO default reserve margin for this year:12.69% (accounting for diversity)

MISO SET- UP



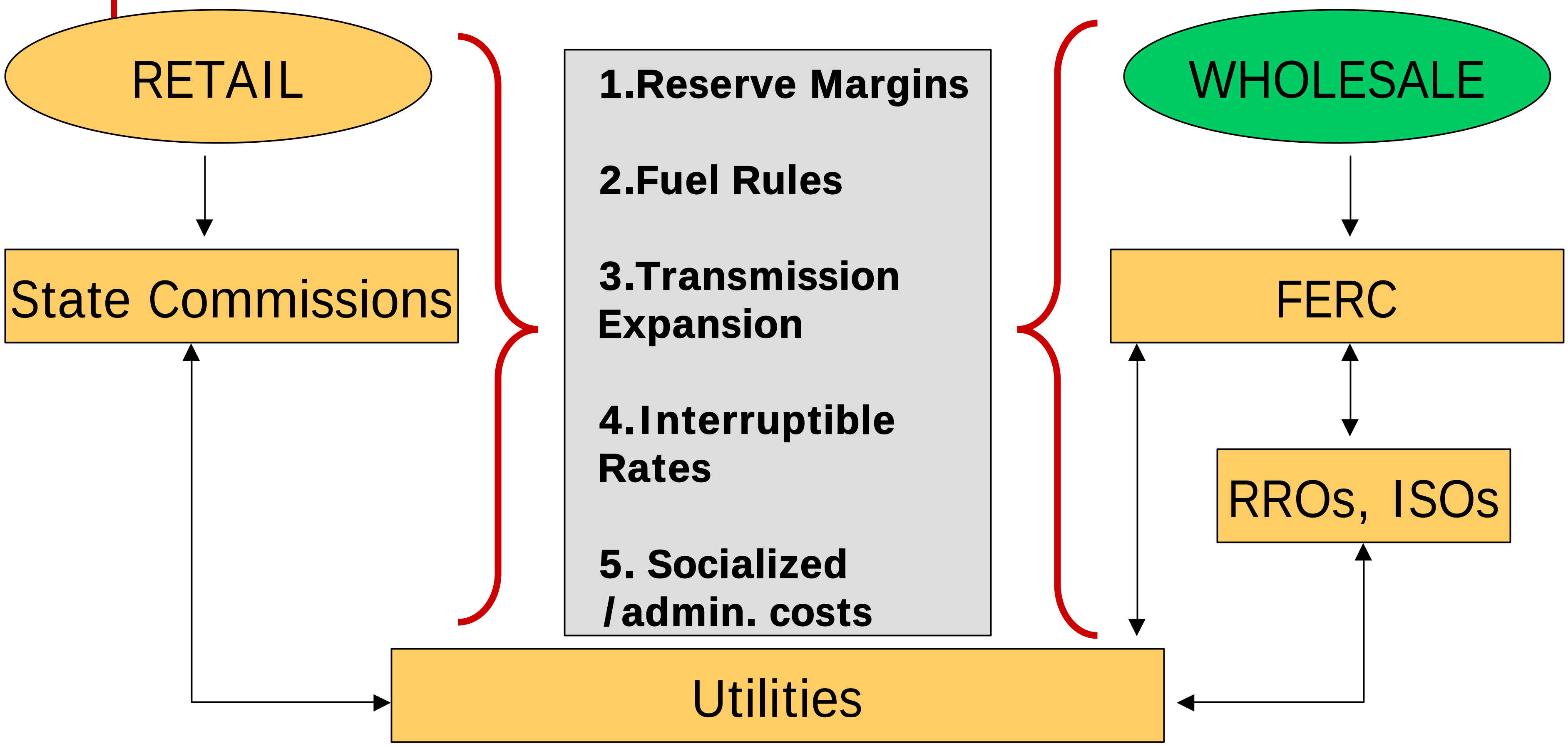
MISO
BOARD OF DIRECTORS
FERC
IMM
ADVISORY COMMITTEE
VITOS
MSATS
MUNI/COOPS
STATE REGULATORS (OMS)
POWER MARKETERS
PUBLIC CONS. GRPS
END USERS
ENV. GROUPS
IPPS

MISO Market

Facilitates

- Transmission Services
- Energy Markets (price transparency)
- Hedging for congestion through Financial Transmission Rights
- Regional Planning

Costs at Wholesale Level Impact Retail Rates



RRO= Regional Reliability Organizations
ISO = Independent System Operators

Objectives of WIEG Participation at MISO

- Cost avoidance – Influence MISO's market design/rules in order to help avoid cost impacts at retail level
- User friendly provisions and equitable compensation for demand response – Impact on legacy interruptible rates
- Effective competition – Market power/impact on energy prices
- Proper cost allocation – Demand vs. Energy
- Cost minimization – Socialization of costs associated with market operations, administration costs

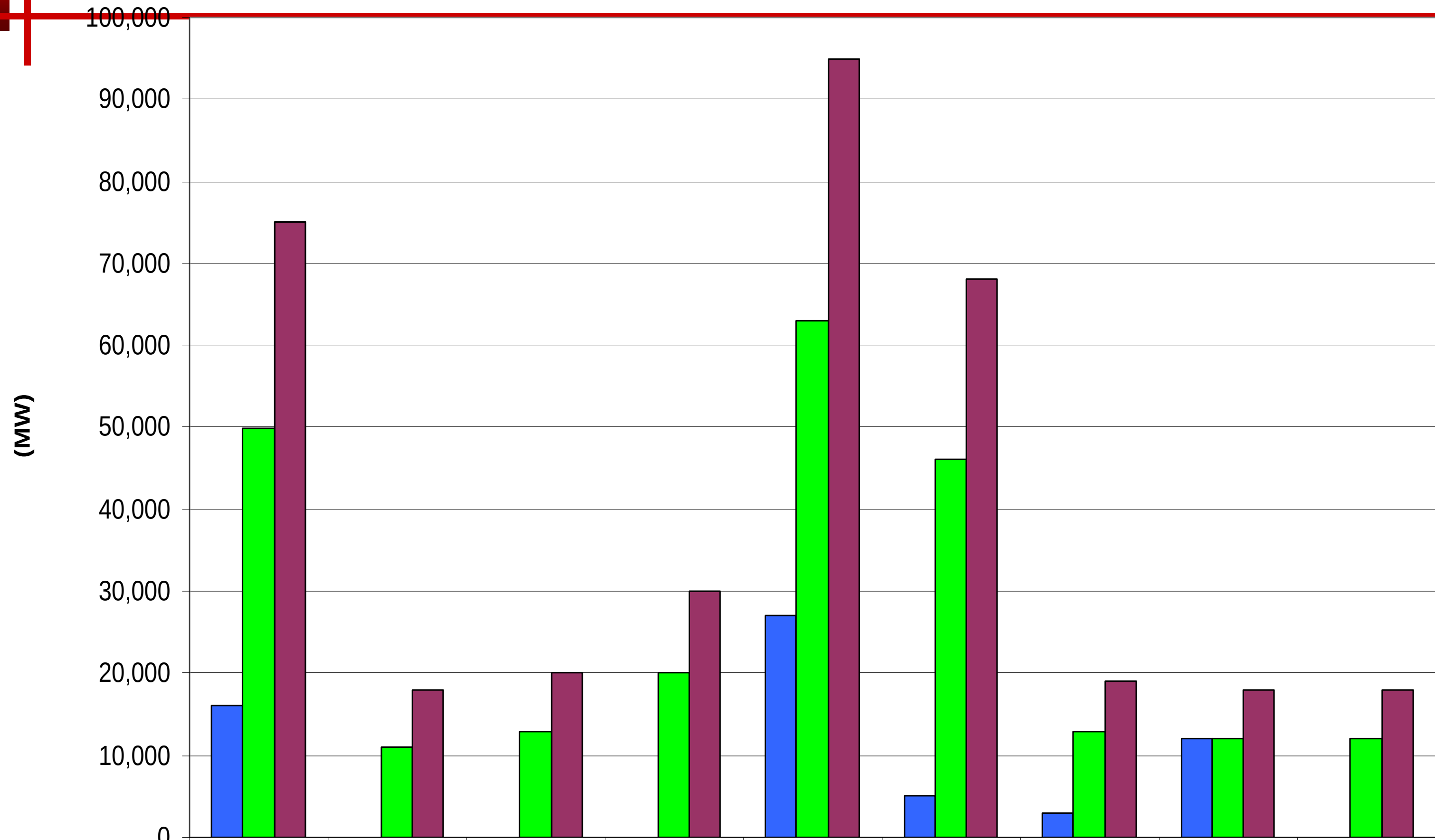
MISO: WIEG Priorities for 2009

- Programs/Market Rules regarding Demand Response
- Ancillary Services
- Long Term Resource Adequacy
- Transmission Expansion

MISO's Transmission Expansion Plan (MTEP)

- MTEP 2008
  - Appendix A: Approved Projects ($2.4 billion approved in October 2008)
  - Appendix B: Probable projects
  - Appendix C: Conceptual projects
- Conceptual/Study: Joint and Coordinated System Plan
  - Department Of Energy (DOE) Initiated

2008-2027 Study Period Incremental Regional Wind Requirements (Joint Coordinated System Plan Study)



	MISO&MRO	SPP	ENTERGY	TVA	PJM	SERC	NYISO	ISO-NE	IESO
Reference	16,000	0	0	0	27,000	5,000	3,000	12,000	0
20%	50,000	11,000	13,000	20,000	63,000	46,000	13,000	12,000	12,000
30%	75,000	18,000	20,000	30,000	95,000	68,000	19,000	18,000	18,000

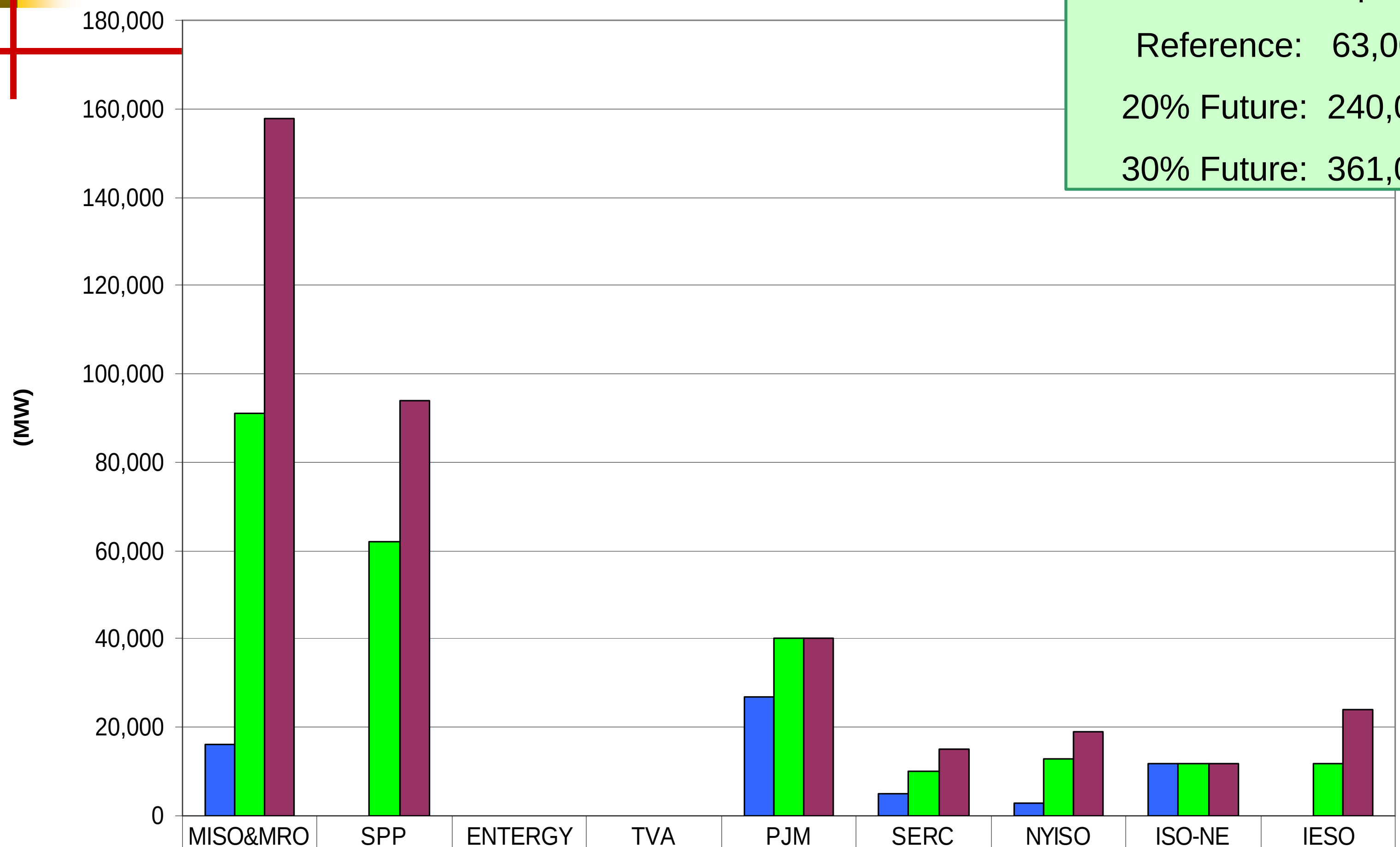
Redistribution of Incremental Wind Requirements Based On Wind Quality/Availability (JCSP Study)

2008-2027 Requirements

Reference: 63,000 MW

20% Future: 240,000 MW

30% Future: 361,000 MW



	MISO&MRO	SPP	ENTERGY	TVA	PJM	SERC	NYISO	ISO-NE	IESO
Reference	16,000	0	0	0	27,000	5,000	3,000	12,000	0
20%	91,000	62,000	0	0	40,000	10,000	13,000	12,000	12,000
30%	157,667	94,000	0	0	40,000	15,000	19,000	12,000	24,000

JCSP Cost Preliminary Estimates

Reference Case

- Transmission Costs: $50 Billion
- Generation Costs:$674 Billion

20% RPS Mandate

- Transmission Costs: $80 Billion
- Generation Costs:$1,050 Billion

RPS Requirements in Wisconsin

- RPS =10% by 2015
- Global warming task force recommendation to increase RPS to 25% by 2025
- According to the Strategic Energy Assessment, this equates to 400 MW of wind generation capacity each year between 2008-2025

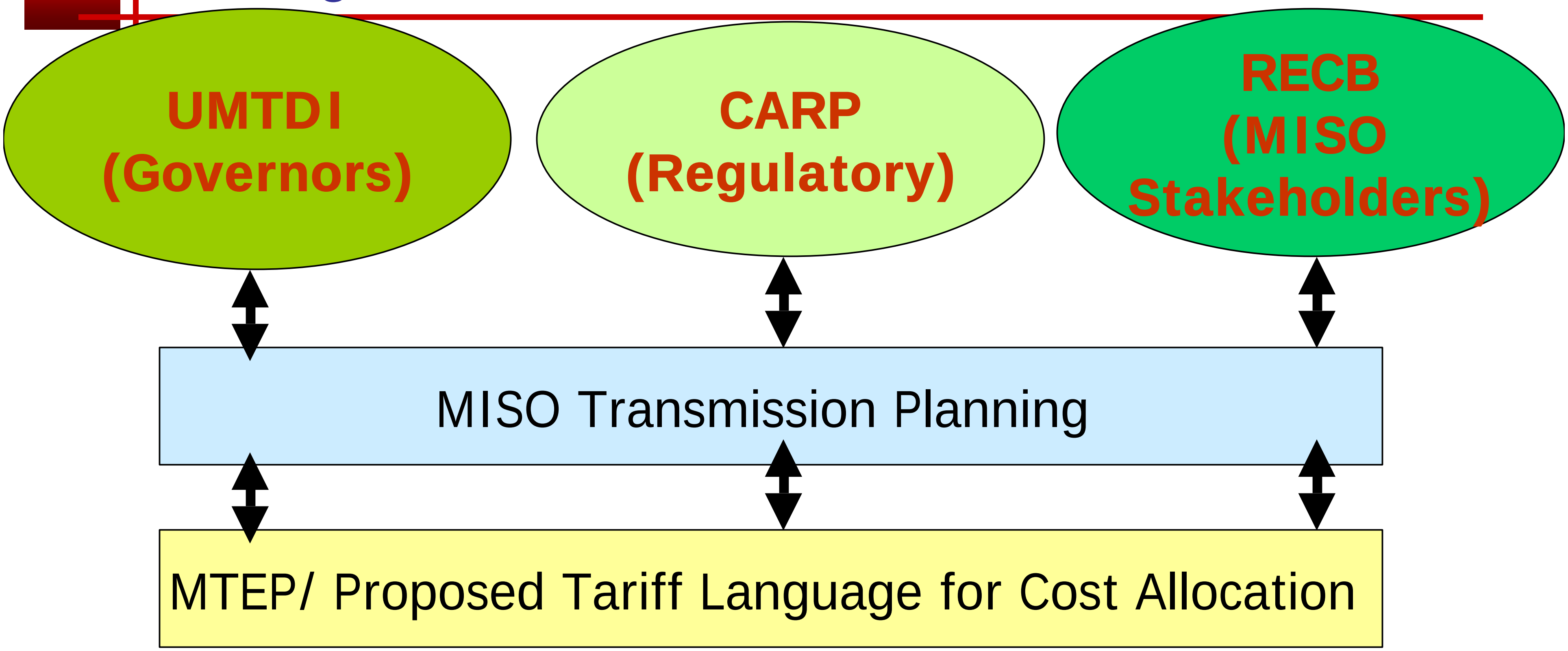
Planning Reserve Margins in Wisconsin

Line		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Line							*Forecasted Planning Values*				
Summer Peak Electric Demand (MW)											
				Last Full Year							
	Date of Peak Load			31-Jul							
	Date of Peak Load	9-Aug	31-Jul	1-Aug							
1	Peak Load Data & Forecast (non-coincident)	14,395	14,993	14,535	13,731	15,831	16,066	16,389	16,678	16,965	17,240
2	Direct Load Control Program	-37	-99	-88	-59	-170	-171	-176	-179	-184	-186
3	Interruptible Load	-315	-243	-164	-315	-669	-669	-690	-691	-698	-702
4	Capacity Sales Including Reserves	770	732	926	725	710	650	584	644	701	757
5	Capacity Purchases Including Reserves	-719	-725	-652	-603	-704	-571	-529	-560	-591	-622
6	Miscellaneous Demand Factors	-570	-553	-555	-553	-590	-592	-590	-590	-526	-527
7											
8	**Adjusted Electric Demand**	**13,624**	**14,106**	**14,002**	**12,926**	**14,407**	**14,712**	**14,988**	**15,301**	**15,667**	**15,960**
Electric Power Supply (MW)											
9	Owned Generating Capacity, Used For Wisconsin Load	12,356	12,781	12,831	11,855	12,914	13,287	13,928	14,584	14,828	15,431
10	Merchant Power Plant Capacity Under Contract, Used For Wisconsin Load	3,157	3,790	3,518	4,043	3,506	3,507	3,481	3,212	2,492	1,921
12	New Owned or Leased Capacity Additions	664	60	0	1,057	309	639	619	300	595	353
17	Net Purchases Without Reserves	543	577	284	260	254	260	295	327	256	256
18	Miscellaneous Supply Factors	-302	-214	-234	-290	-224	-236	-200	-289	-257	-240
19											
20	**Electric Power Supply**	**16,418**	**16,994**	**16,398**	**16,924**	**16,758**	**17,457**	**18,122**	**18,135**	**17,814**	**17,721**
Calculated Data											
21	Reserve Margin	21.4%	20.5%	17.1%							
22	Planning Reserve Margin				30.9%	16.3%	18.7%	20.9%	18.5%	14.4%	11.0%
Transmission Data											
25	Resources Utilizing PJM/WUMS-MISO Interface	925	990	940	830	585	585	585	385	85	85

Wind Integration Issues – What does Wind Generation Really Cost?

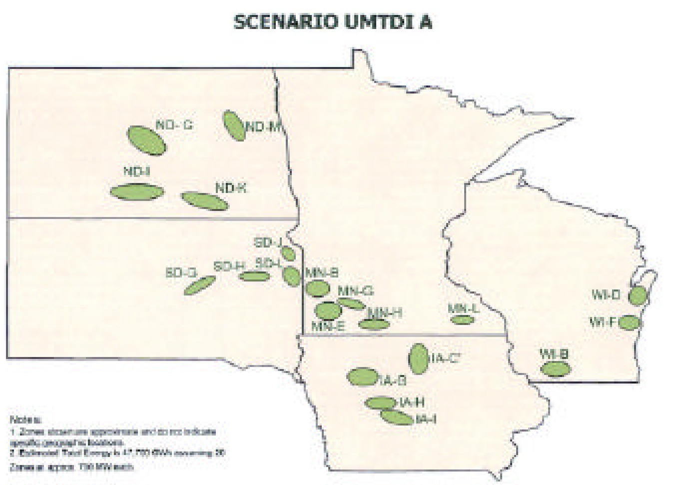
- Capital Costs - $2,320,000/MW
- Transmission Costs – Will depend on type of solution (will be in the billions of dollars)
  - RPS Requirements
  - 345KV or 765 KV
  - Distance
- Operational Issues (intermittent resource) – Backing down coal units, needs for additional ancillary services, uplift charges for out of merit order dispatch

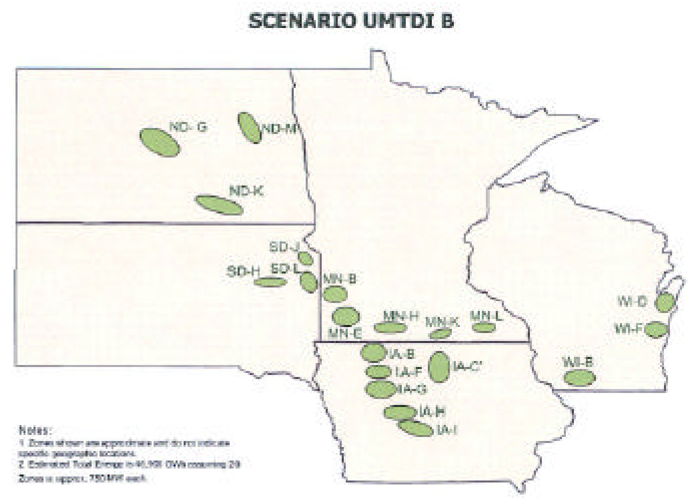
Current Initiatives Investigating Transmission Planning and Cost Allocation for Wind Integration



UMTDI= Upper Midwest Transmission Development Initiative
CARP= Cost Allocation & Regional Planning
RECB = Reliability Expansion Costs & Benefits

UMTDI Scenarios





- Existing RPS + 25% for WI
  - UMTDI = 15,000 MW
  - MISO = 25,000 MW
- 20% Federal Mandate
  - MISO = 45,000 MW

Current MISO Cost Allocation Policies

- Reliability Based Transmission Upgrades – Methodology results in localized allocation of costs with 20% socialization for lines 345 KV and above
- Economic Based Transmission Upgrades – Based on economics (production costs and energy prices) with 20% socialization for lines 345 KV and above
- Generator Interconnections – 345KV and above allocates 50% to generator, 40% to transmission owner, 10% socialized

Proposed Changes to Cost Allocation for Generation Interconnection – Phase I

- Expedited process to address Otter Tail Power’s cost allocation concerns
  - Otter Tail filed a letter of intent to exit MISO – Disproportionate share of cost burden without commensurate benefits
- “Band- Aid” Solution – 90% costs to generator and 10% socialized

Cost Allocation Challenges – Who Pays?

- UMTDI
  - First mover disadvantage?
  - Build to just satisfy UMTDI requirements or for export?
- From Wisconsin’s perspective
  - Is the UMTDI solution more cost effective than a Wisconsin specific solution?
  - Least cost imperative is critical