

Session 5

Status Update
Assessment of ICT/RTO Options and Issues

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Overview

Assessment of ICT/RTO Options and Issues

- **Possible Outcomes of Entergy RTO/ICT Decision**

- **Implications of Entergy RTO/ICT Decision on Customers**

- **Plan for Assessing RTO/ICT Options**

Possible Outcomes of Entergy RTO/ICT Decision

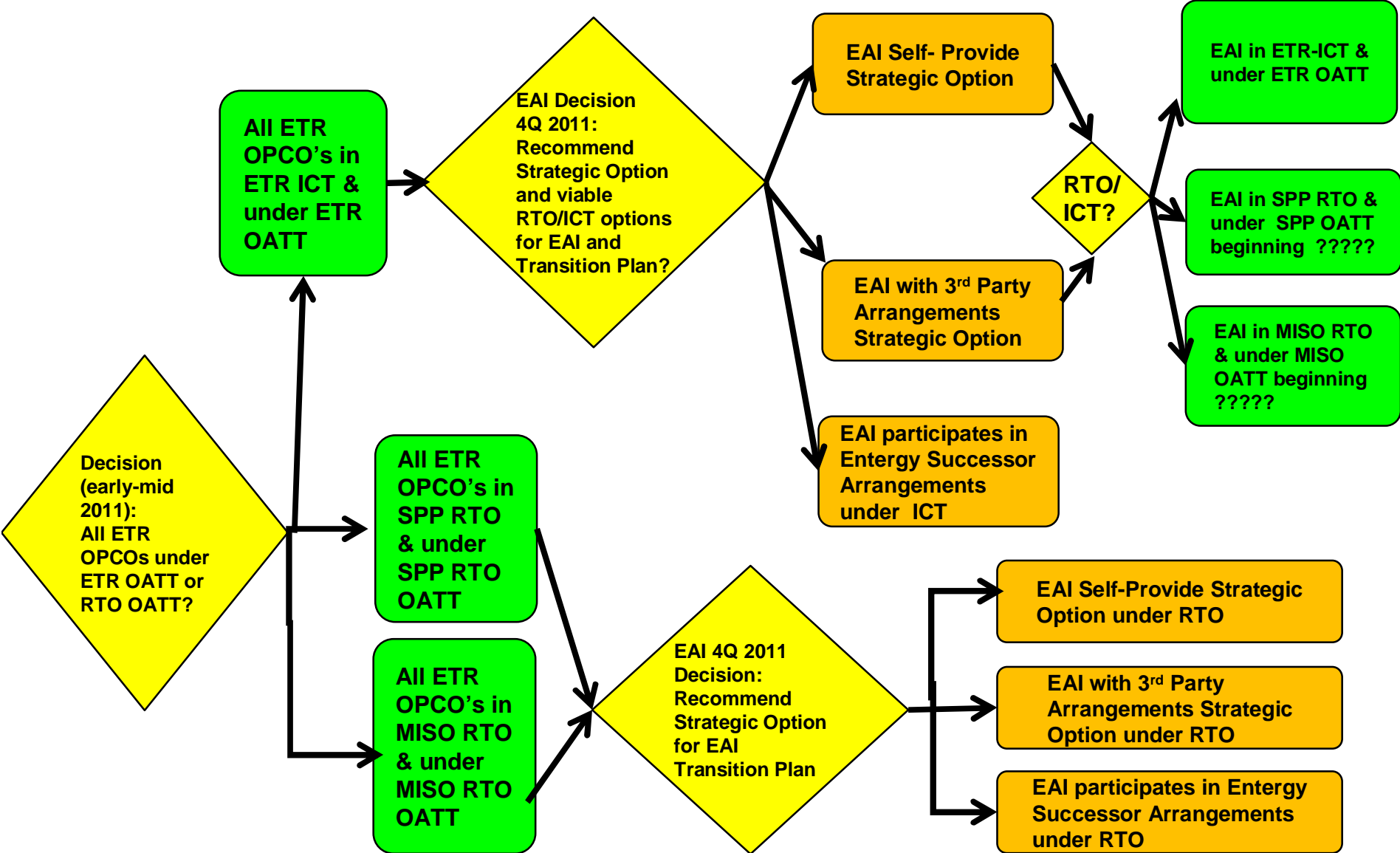
Assessment of ICT/RTO Options and Issues

- **ICT (ETR OATT)**
 - Status Quo for EAI and Arkansas entities served from EAI transmission system
 - Decisions regarding ICT enhancements and FERC extension of ICT arrangement expected in 4Q 2010 –early 2011
 - Does not operate a “Day 1” or “Day 2” market

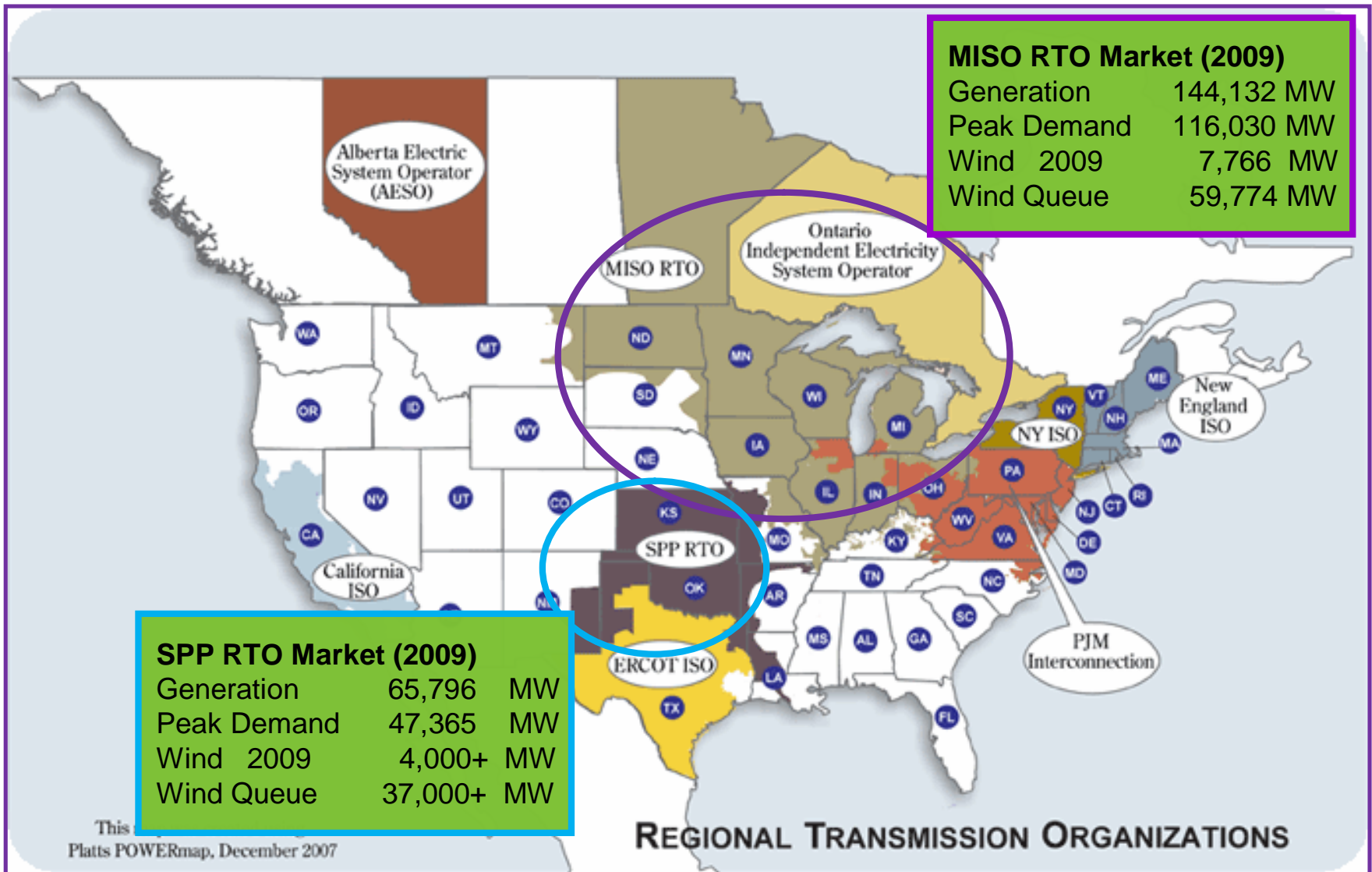
- **MISO RTO (MISO OATT)**
 - Operates an established Day 2 market with established protocols and FERC approvals
 - Currently operates a consolidated Balancing Authority

- **SPP RTO (SPO OATT)**
 - Currently operates a voluntary current-day, energy-only market (EIS) to re-dispatch on-line generation for economy purposes and congestion management
 - Does not currently operate a consolidated Balancing Authority
 - Developing protocols and plans for a future Day 2 market

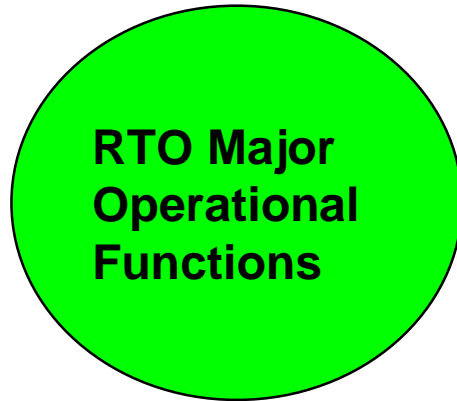
Overview of Possible Outcomes That Must Be Considered for EAI's Transition Plan



Geographic Region for RTO Options



RTOs Provide 4 Major Operational Functions Through Various Provisions of their OATT and Other Programs



Independent Real-time and Near-term System Operation of Existing Transmission System

Operation of Wholesale Markets

Plan Transmission Expansions, Determine Long-term Transmission Service, and Allocate Costs for Transmission

Provide/Participate in Multi-party Regional Coordination Agreements

Implications of Entergy RTO/ICT Decision on Customers

Assessment of ICT/RTO Options and Issues

- **The Entergy RTO/ICT Decision could impact the following key aspects of EAI's future operations**
 - **The transmission revenue requirements paid by EAI customers for transmission to serve their load**
 - **Transmission service provisions (OATT) regarding delivery of generation to serve load and the price for firm delivery**
 - **The operation of EAI's generation and the process that will be used to commit and dispatch resources to serve EAI's retail and wholesale customers**
 - **The cost of purchased power and economy energy for EAI's customers**
 - **The planning requirements and sources of generation used for providing reliable operations and ancillary services**

Implications of ICT/RTO Decision on Customers

Assessment of ICT/RTO Options and Issues

- **The Entergy RTO/ICT Decision will affect the manner in which the Transition Plan evaluates these issues**
 - **If all of the Entergy Op. Cos. decide to join an RTO, EAI will not face an RTO/ICT choice for its First Day operations**
 - **If all of the Entergy Op. Cos. decide to implement a modified ICT, then EAI will have to make a decision about RTO v. ICT for First Day operations**

Implications of ICT/RTO Decision on Customers

Assessment of ICT/RTO Options and Issues

- **Assuming EAI must make such a decision for First Day operations, there are many complex issues that will require EAI and others to understand the impacts on their customers**
 - **Issues impact customers of EAI and other Arkansas utilities (AECC, Cities, AEP-SW, etc.)**
 - **Issues also impact merchant generators and entities outside of Arkansas**
 - **There are two RTO options (SPP RTO and MISO RTO) that should be assessed – each has unique features and risks**
 - **Impacts of a change are significant and regional – will require extensive discussion and FERC and State regulatory approvals to implement**

Plan for Assessing ICT/RTO Options

Assessment of ICT/RTO Options and Issues

- **A decision regarding the ICT/RTO choice is not on EAI's critical path for the Transition Plan for First Day Operations (2013-2014)**
- **EAI's Baseline Scenario Plan for First Day operations does not require a decision in the near term or implementation by December 2013**
 - **EAI can operate under either an ICT or RTO**
 - **Transition to an RTO could occur (if warranted) at a later date (e.g., in the 2014-2017 period)**
 - **ICT/RTO issues and decisions involve multiple parties**
 - **ICT/RTO issues for First Day operations may not be resolved by 4Q 2011 or after**
- **EAI will have a provisioning plan alternative for critical First Day functions that does not rely on the schedule of decisions, approvals, or implementation of RTO features**

Plan for Assessing ICT/RTO Options

Assessment of ICT/RTO Options and Issues

- **EAI's Transition Plan for 2013-2023 will have the flexibility to adapt at the appropriate time to the ultimate outcome of the Entergy RTO/ICT Decision**
- **EAI will monitor discussions and studies of the ICT/RTO issues and options**
- **EAI will conduct its own assessments of the SPP RTO and MISO RTO options 2010-early 2011 period**
- **EAI will finalize the Transition Plan recommendation by 4Q 2011 reflecting the current state of the ICT/RTO options**

Factors Influencing the Outcome of the ICT/RTO Decision That Will Occur During 2010-2011

- **Decisions and Actions by SPP RTO members**
 - **Protocols and Methods Finalization**
 - **Cost and Implementation Schedule for Future Market – Actual Progress**
 - **Business Practices and Methods**
 - **Transmission Expansion**
 - **Cost Allocation**
- **Decisions regarding ICT enhancements and extension**
- **Outcomes of FERC decisions regarding RTO methods and litigation**
- **Results and analysis of FERC and APSC/SPP Studies of Participation in SPP RTO (Charles River Associates CBA Modeling Studies)**
- **Analysis and decision regarding all Entergy OPCOs participating in an RTO**
- **EAI assessment of SPP RTO and MISO RTO options to be conducted in 2010-2011**

FERC and APSC/SPP 2010 Studies RTO Participation Cost Benefit Analysis (CBA)

- **Studies conducted by Charles River Associates**
- **SPP-Entergy CBA**
 - **Considers impact of all Entergy OPCOs joining the SPP RTO**
 - **Scheduled for completion in late September 2010 – will not determine Entergy OPCO specific impacts**
 - **Entergy analysis required to determine Entergy OPCO impact for state regulatory review**
 - **Additional addendum studies requested – but can not delay completion of FERC study – include participation in MISO scenario**
 - **Studies and analysis of results expected to continue into early 2011**
- **SPP-EAI CBA**
 - **Considers impact of EAI joining SPP RTO without other Entergy OPCOs**
 - **Study beginning in July – scheduled for completion in late October 2010**
 - **Additional addendum studies requested – but can not delay completion of SPP-Entergy CBA and SPP-EAI CBA**

SPP RTO Decision and Implementation Schedule for Future Markets Milestones

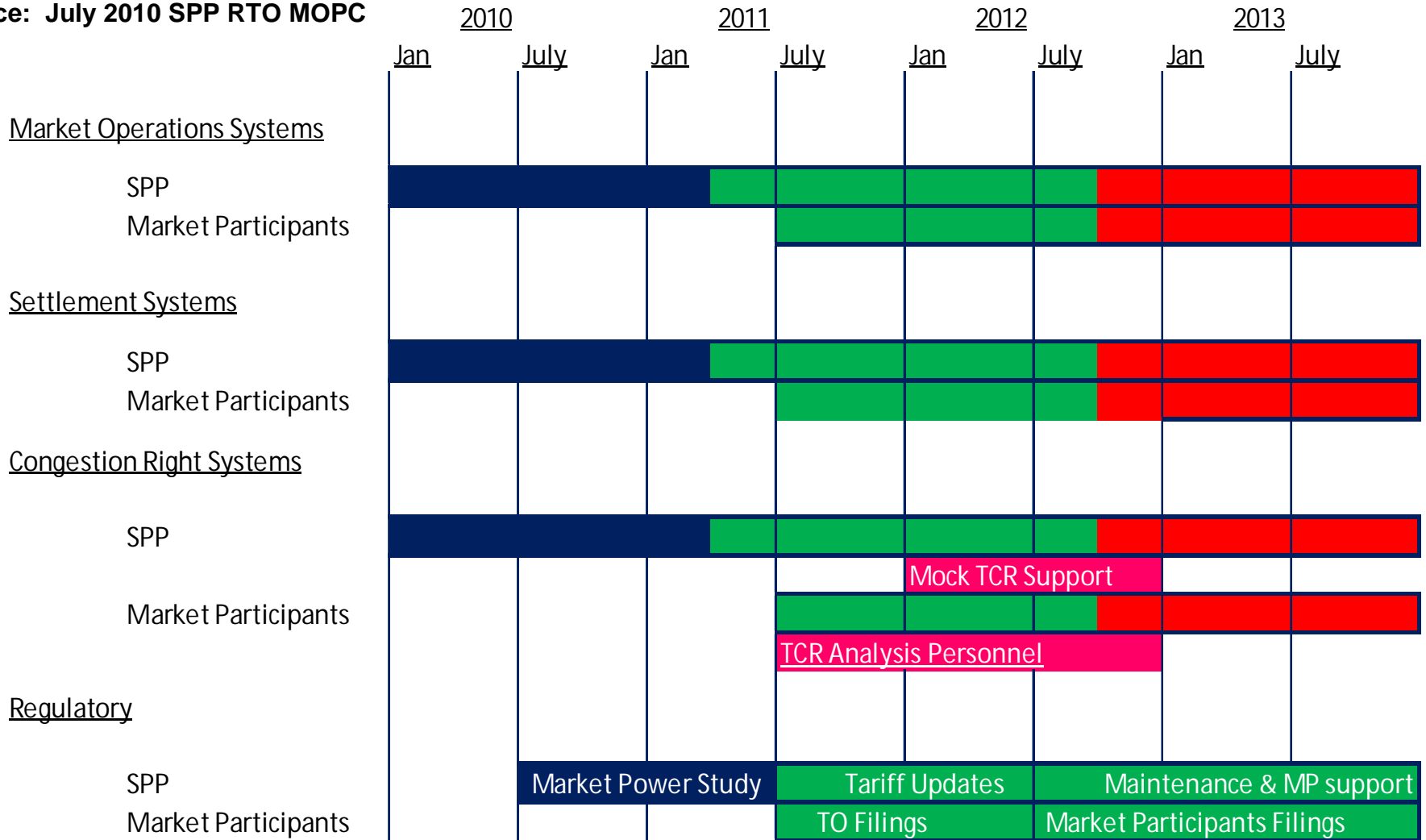
Upcoming Key Milestone	Estimated Completion Date
MWG Finalize Core Protocols	June 2010
MWG Checkpoint with MOPC	July 2010
MWG Finalize Non-Core Protocols	July 2010
MWG Finalize Protocols	September 2010
MOPC Approval of Protocols	October 2010
BoD Approval of Implementation Budget	January 2011
Software Requirements Complete	April 2011

Source: July 2010 SPP RTO MOPC Meeting

Note: milestone dates assume that no new major projects divert SPP resources from the Future Markets effort

SPP RTO Implementation and Regulatory Schedule - Future Markets Project Roadmap

Source: July 2010 SPP RTO MOPC



SPP RTO Future Markets Regulatory Timeline and Filings



Future Markets Regulatory Considerations

- SPP will conduct a market power study – 2011
- Some TOs will need to file with FERC to get permission to sell into SPP's new markets at market-based rates – Q3-2011-Q1-2012
- SPP will update tariffs and seek FERC approval (tariff and go-live date) – Q1 2012
- Market Participants will need to file in their retail jurisdictions (usually state commissions) to seek permission to participate in SPP's new markets – Q1 2012 to go-live

SPP RTO – Operational Support and Implementation Requirements for Market Participants (MP)

Market Participant Focus

Market Operations

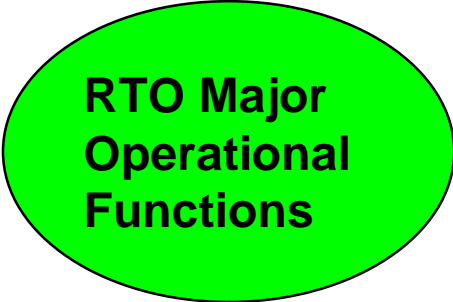
- **Day-Ahead and Real-Time Decisional Data Required:**
 - Three-Part Offers (Energy, Start Up, No Load)
 - Operating Reserve Offers (4 products)
 - Virtual Offers/Bids (Financial)
 - Demand Bids (DA Market only)
 - Resource Status (Commitment and Dispatch)
 - Resource Offer Parameters (Section 4.2.1.1-FM Protocols)
- **Staffing to support DA Market & RTBM**
- **MP vendor development lead time is 1 year prior to delivery to MPs**

Plan for Assessing ICT/RTO Options

Assessment of ICT/RTO Options and Issues

- **EAI will assess RTO using the same overall framework and decision criteria that will be used in the overall Transition Plan**
 - **EAI customer impact focus over 2013-2023 period**
 - **Assessment will consider impacts on EAI customer:**
 - » **Revenue requirements**
 - » **Reliability**
 - » **Exposure to risks and uncertainties**
 - **Complexity and implementation risks for First Day operations will be considered**
 - **Will assess exposure to litigation and re-allocation of costs**
 - **Distinguish between known and projected costs/impacts**
 - **Identify near-term vs. longer term costs/benefits/risks**

The Assessment of the SPP RTO and MISO RTO Will Consider the Impacts on EAI Customers in Each Area of Operations



**RTO Major
Operational
Functions**

Independent Real-time and Near-term System Operation of Existing Transmission System (assuming Day 2 market exits)

- Manage short-term transmission service
- Manage congestion (redispatch)
- Reliability functions – “real time operations”

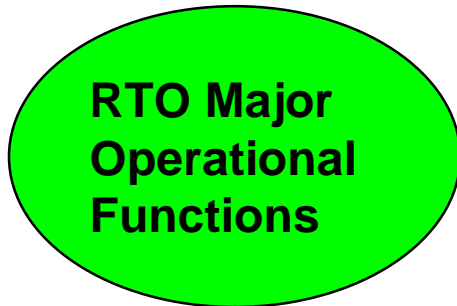
Operation of Wholesale Markets

- Conduct auctions and determine prices for various generation and transmission products
- Determine generating unit operations through economic dispatch and “unit commitment decisions (for Day Ahead Markets)
- Determine LMP cost to serve load and pay generation at various “nodes”
- Manage financial settlement systems

Plan Transmission Expansions , Determine Long-term Transmission Service, and Allocate Costs for Transmission

Provide/Participate in Multi-party Regional Coordination Agreements

The Assessment of both the SPP RTO and MISO RTO Will Consider the Impacts on EAI Customers in Each Area of Operations



Independent Real-time and Near-term System Operation of Existing Transmission System

Operation of Wholesale Markets

Plan Transmission Expansions, Determine Long-term Transmission Service, and Allocate Costs for Transmission

- Determine reliability upgrade projects for transmission
- Determine availability of and grant long-term transmission service
- Conduct studies for other “economic/policy driven” transmission expansion projects
- Define and administer cost allocation methods for transmission cost support and expansion projects

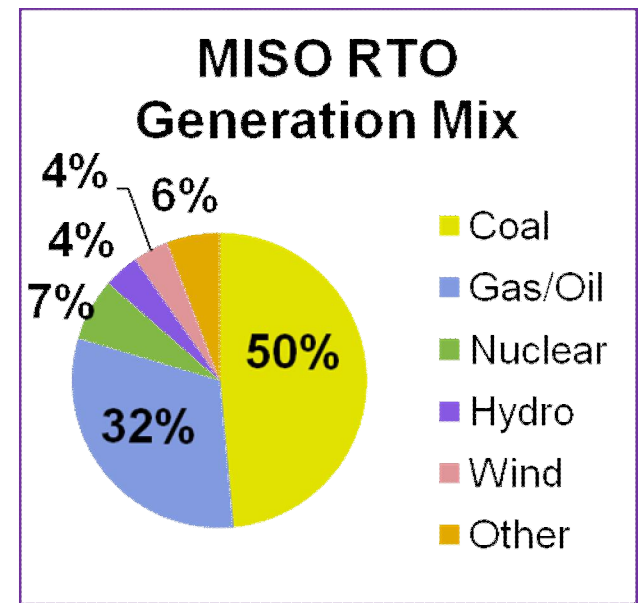
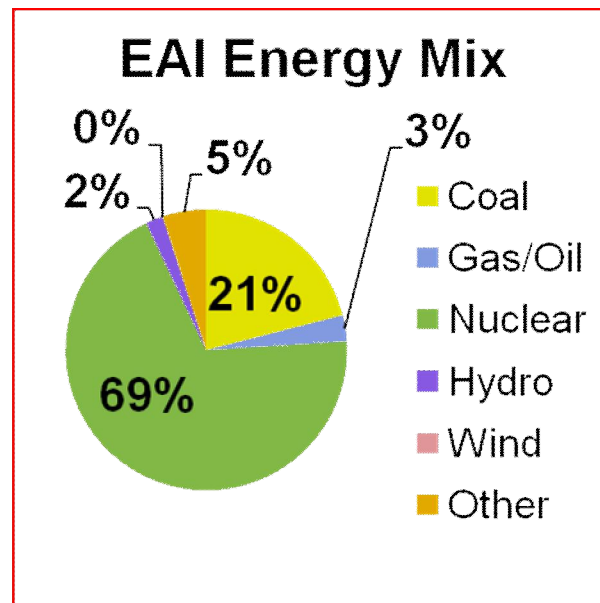
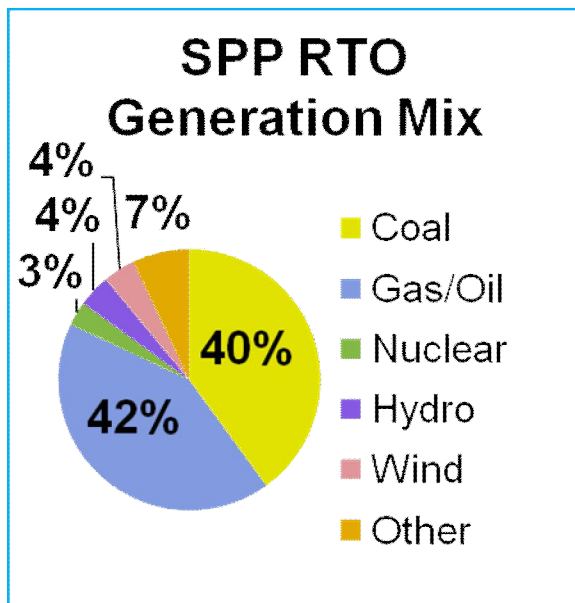
Provide/Participate in Multi-party Regional Coordination Agreements

- Operate Consolidated Balancing Authority to reduce amount of “regulation reserve generation” (unloaded generation) achieved through load diversity of larger system
- Operate Operational Reserve Sharing program to reduce amount of “operating and contingency reserves” (unloaded generation) required

Comparison of RTOs – Market Features

Feature	MISO RTO	SPP RTO
Consolidated Balancing Authority Available	Yes	Planned Late 2013
Operates Energy Market – Economic Dispatch	Yes	Yes
Operates Day Ahead Unit Commitment Market	Yes	Planned Late 2013
Operates Capacity Market	No	No

RTO 2009 Generation Mix and EAI 2009 Energy Mix



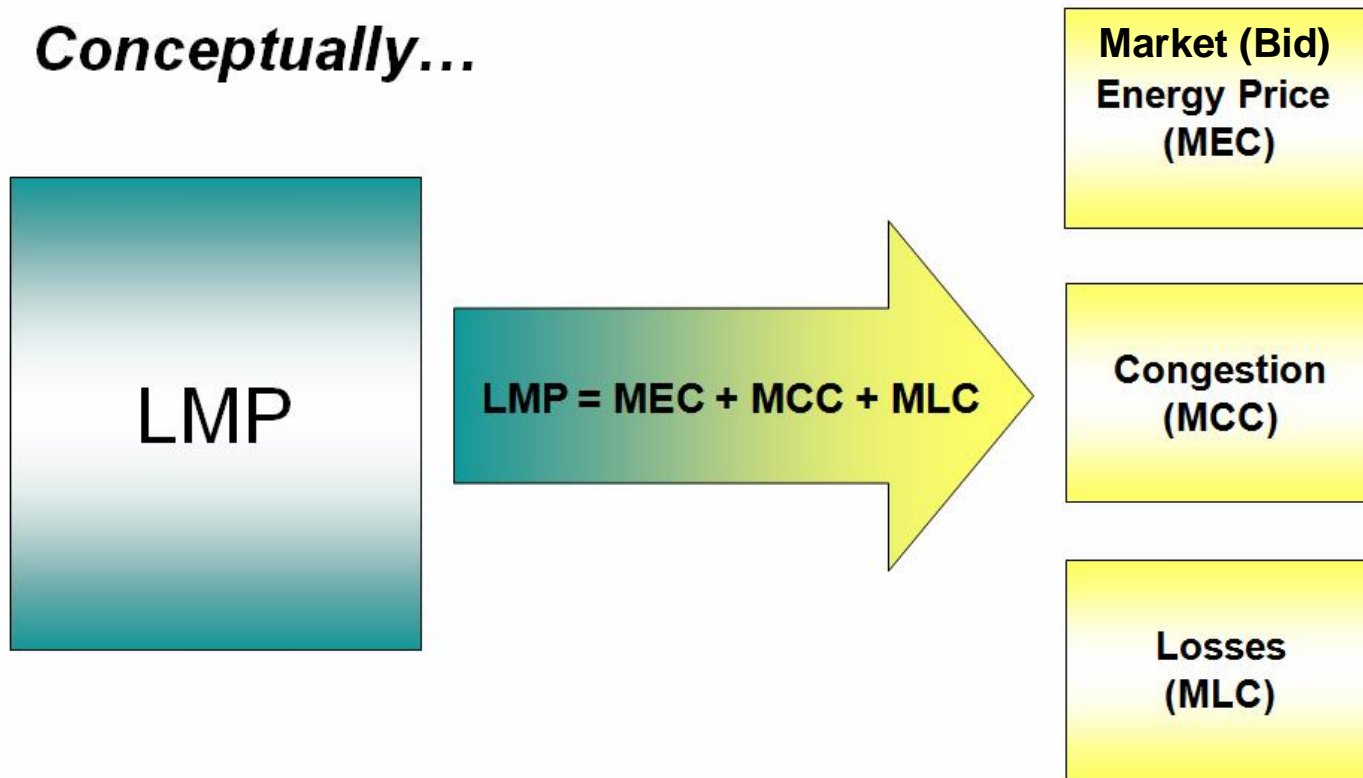
RTO Markets are Based on LMP Prices

- **What is Locational Marginal Price (LMP)?**
 - **LMP is a method of calculating the marginal price for energy, including congestion and losses, at all points on the grid**
 - **$LMP = \text{Energy} + \text{Congestion} + \text{Losses}$**
 - **Note LMP “Energy” component reflects a “bid price” that can be above costs (*i.e.*, recover fixed generation investment)**
- **Marginal pricing is the idea that the market price of any commodity should be the cost of the next unit of that commodity (the one that balances supply and demand) to market**
- **The factors that could cause or contribute to these components need to be considered as well as the how these will impact EAI and its customers**

Transition to RTOs Requires Understanding the Components of LMP Prices and What Costs and Risks Are Assumed by Customers

LMP Components

Conceptually...



LMP Key Concepts

- **LMPs (Locational Marginal Prices)**
 - **Load pays LMP at its node – Generators receive LMP at node**
 - **At a particular node, LMPs are the same whether you are buying or selling into the market**
 - **Can be impacted by “offer prices (bids)” made into both Energy and Operating Reserve markets**
 - **Offer prices can recover more than variable costs (i.e. include fixed cost recovery)**
 - **Hourly LMPs are posted for the Day-Ahead Market**
 - **5 Minute and time-weighted hourly LMPs are posted for each node for the Real-Time Market**
 - **Congestion and Loss factors cause LMPs to differ by time and location. In an unconstrained system with no losses or congestion, all LMPs would be equal**

Comparison of RTO 2009 Average Market LMP Prices

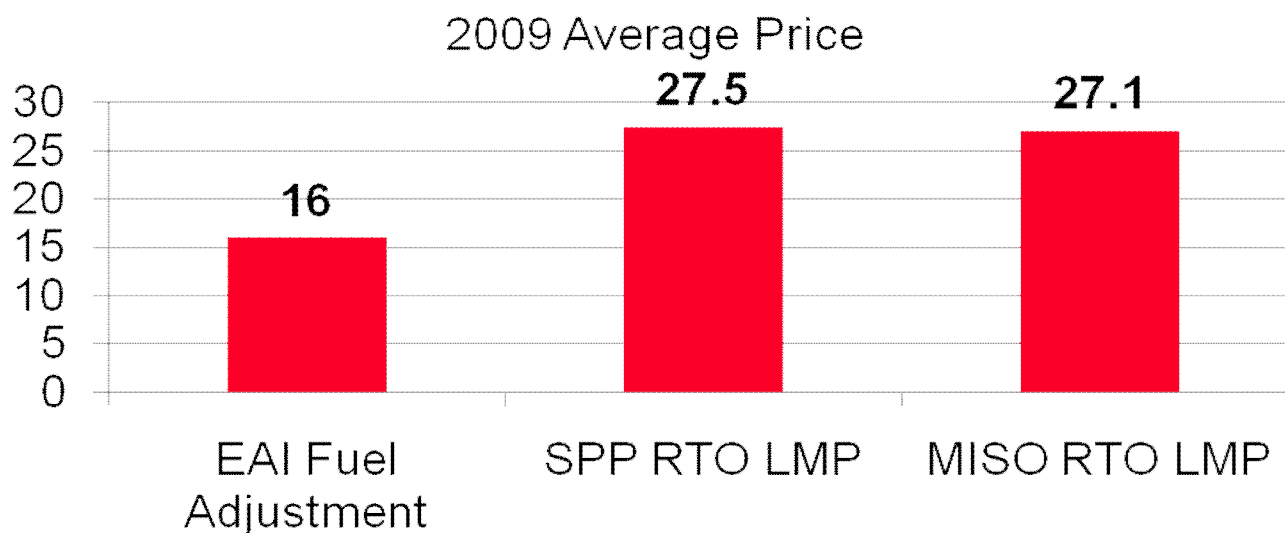


Table II.4 Electricity Prices Compared with Neighboring Regions

Region	Average Price			Average On-Peak Price			Average Off-Peak Price		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
SPP	\$49.18	\$53.21	\$27.50	\$58.30	\$66.16	\$32.11	\$41.25	\$41.89	\$23.47
MISO	\$47.37	\$48.08	\$27.11	\$63.37	\$64.86	\$34.15	\$33.45	\$33.34	\$20.92
ERCOT	\$53.00	\$65.64	\$30.19	\$60.74	\$80.88	\$35.25	\$46.26	\$52.31	\$25.74

 SOURCE: SPP DSS and MISO website at http://www.midwestmarket.org/home/Market%20Reports/?type=rt_lmp&list=month
 and ERCOT website at <http://www.ercot.com/mktinfo/services/bal/index.html>

Note: Retail revenue requirements are not based on LMP alone and will reflect the economics of EAI's owned generation

Overview of Generation Supply Roles in RTO Day Ahead Markets

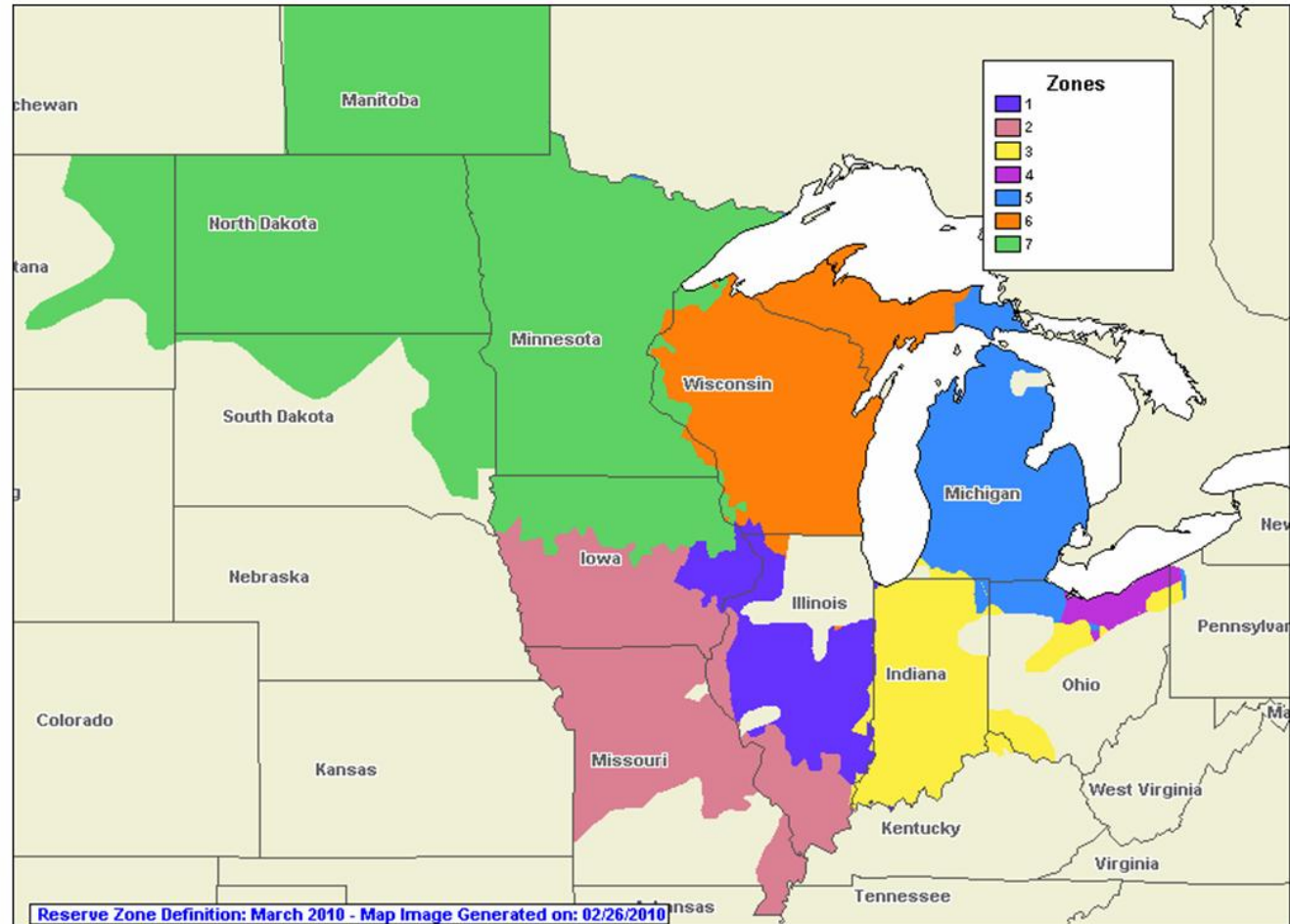
Day-Ahead and Real-Time Energy and Operating Reserve Markets have Four Generation Products

- **Energy**
 - Commodity based on demand bids and resource offers submitted in Day-Ahead Market and offers and system demand in Real-Time Market
- **Regulating Reserve**
 - Allows the system operator to physically balance supply and demand on real-time basis
- **Spinning Reserve**
 - Provides energy to meet demand in the event of an unexpected loss of a generation or transmission resource
- **Supplemental Reserve**
 - Same as Spinning Reserve, but can be from online or offline Resources

Zones Within an RTO Impact Unit Decisions Regarding Generation Commitment for Operating Reserves and Reliability Issues

- MISO currently has 7 operating reserve zones
- SPP Future market zones have not yet been determined
- Operating zone implications for Arkansas area operation within an RTO need to be assessed

MISO Reserve Zones

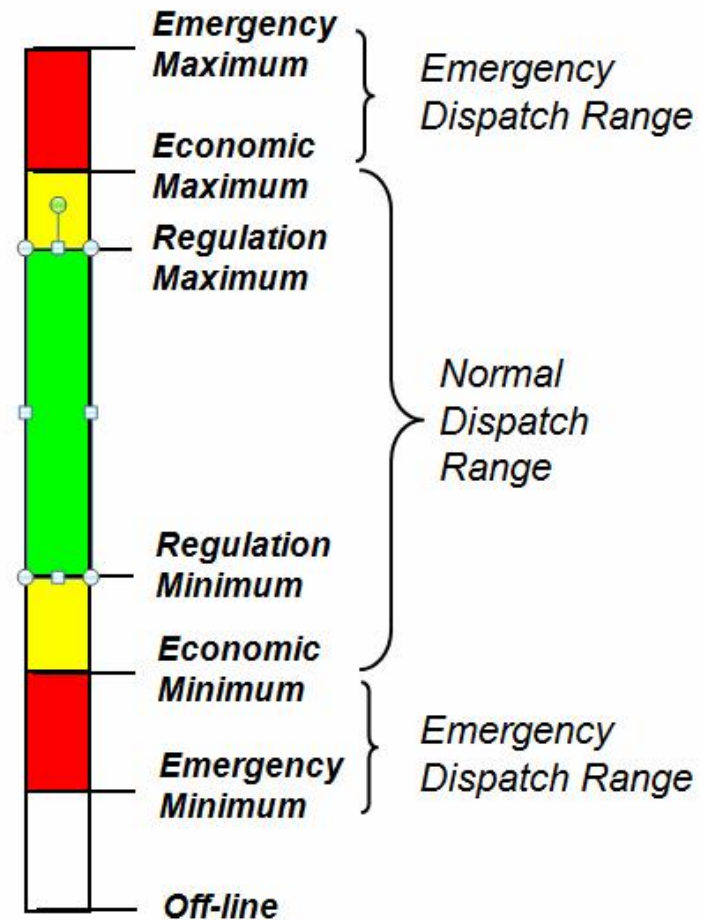


Daily Decisions Must Be Made Regarding How to Use and “Bid” the Available Capacity of a Generating Unit to Meet Various Supply Roles

- Unit Dispatch Limits

- Emergency
- Economic
- Regulation

- Offline Resource



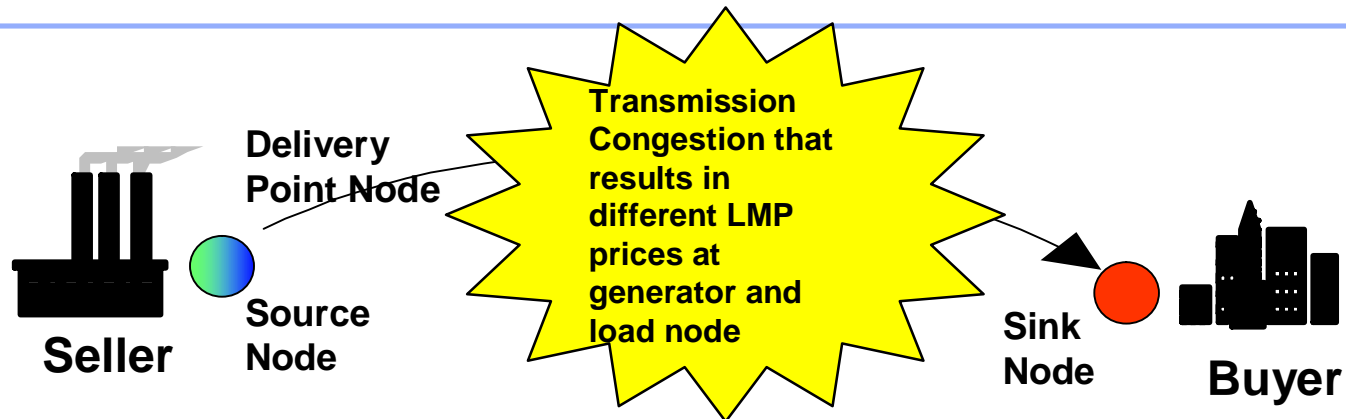
RTO Participation Will Have an Impact on the Cost of Transmission and the Risks Associated with Transmission Service and Congestion

- **Under a RTO, the transmission rates for load in Arkansas will pay a zonal transmission rate that includes:**
 - EAI's current net investment in Arkansas transmission facilities (about \$1 Billion)
 - An allocated share of an RTO's regional transmission investment located outside of Arkansas for:
 - » Previously approved RTO regional projects
 - » Potential transmission expansions, such as wind build out or other expansions justified under RTO's planning processes
- **Under a RTO, the costs and risks associated with serving load from remotely located generation changes – from contract path and schedules to LMP pricing and financially settled congestion rights method**
 - RTO's conduct annual Financial Transmission Rights allocation and auction process
 - Firm transmission service customer allocated financial rights for certain source and delivery nodes
 - Operating decisions required for annual and monthly Transmission Rights Auctions

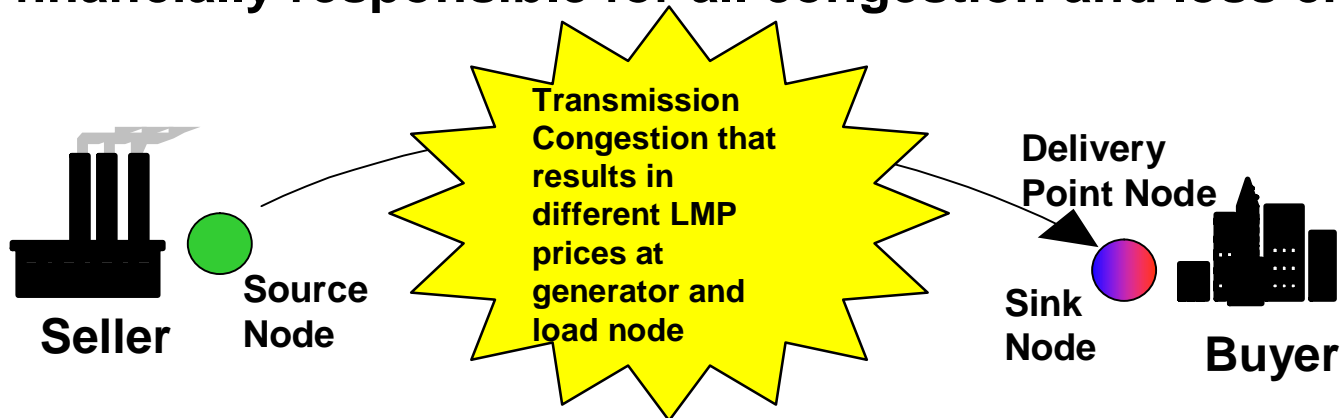
Comparison of RTOs – Business Practices – Cost Allocation Method for Out-of-State Regional Transmission

Feature	MISO RTO	SPP RTO
FERC Approval for Methodology for Cost Allocation of Major Transmission	New method to be filed at FERC July 2010	New Highway/Byway Method – FERC accepted filing June 2010
Cost Allocation for Major Transmission Investments	“RTO “System Benefit” projects allocated on load ratio share	345 KV & above allocated 2/3 to entire SPP region (load ratio share)
EAI Approximate Load Ratio Share (EAI only in RTO)	4%??	9%??
Currently Approved Investment Qualifying for Regional Allocation	TBD	TBD
Potential Transmission Expansion Qualifying for Regional Allocation	TBD	TBD

Financial Risks of Congestion in RTO Markets

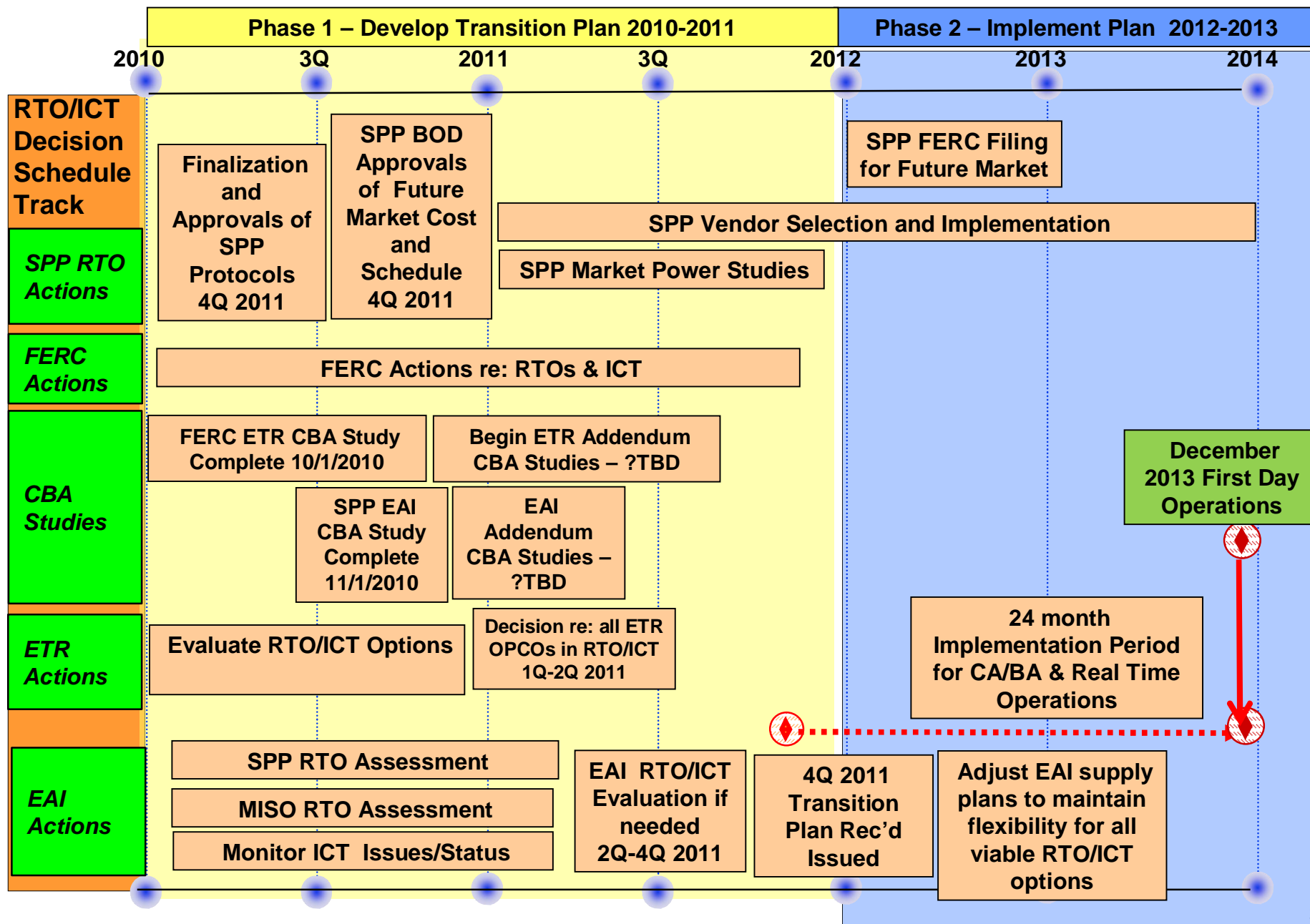


- The **Source** and **Delivery Point** nodes could be the same, making the Buyer financially responsible for all congestion and loss charges



- If the **Sink** and **Delivery Point** nodes are the same, the Seller is financially responsible for all congestion and loss charges

RTO/ICT Decisions Schedule Track



Summary

Assessment of ICT/RTO Options and Issues

- **EAI's Transition Plan will be prepared to adapt to possible outcomes of the Entergy RTO/ICT Decision**
- **The Entergy RTO/ICT Decision is complex and will be influenced by many factors outside of EAI's control**
- **Participation in an RTO is not required for EAI's First Day operations - Transition Plan development will consider alternative timing for possible transition to RTO**
- **EAI will assess the RTO options considering impacts on EAI customer's costs, reliability, and exposure to risk**
- **EAI will monitor ICT/RTO developments and assess RTO options in 2010-2011 – will provide updates in future technical conferences**