MISO – PJM Cross-Border Planning

July 24, 2014
MISO-PJM JCM

Planning Coordination Issues

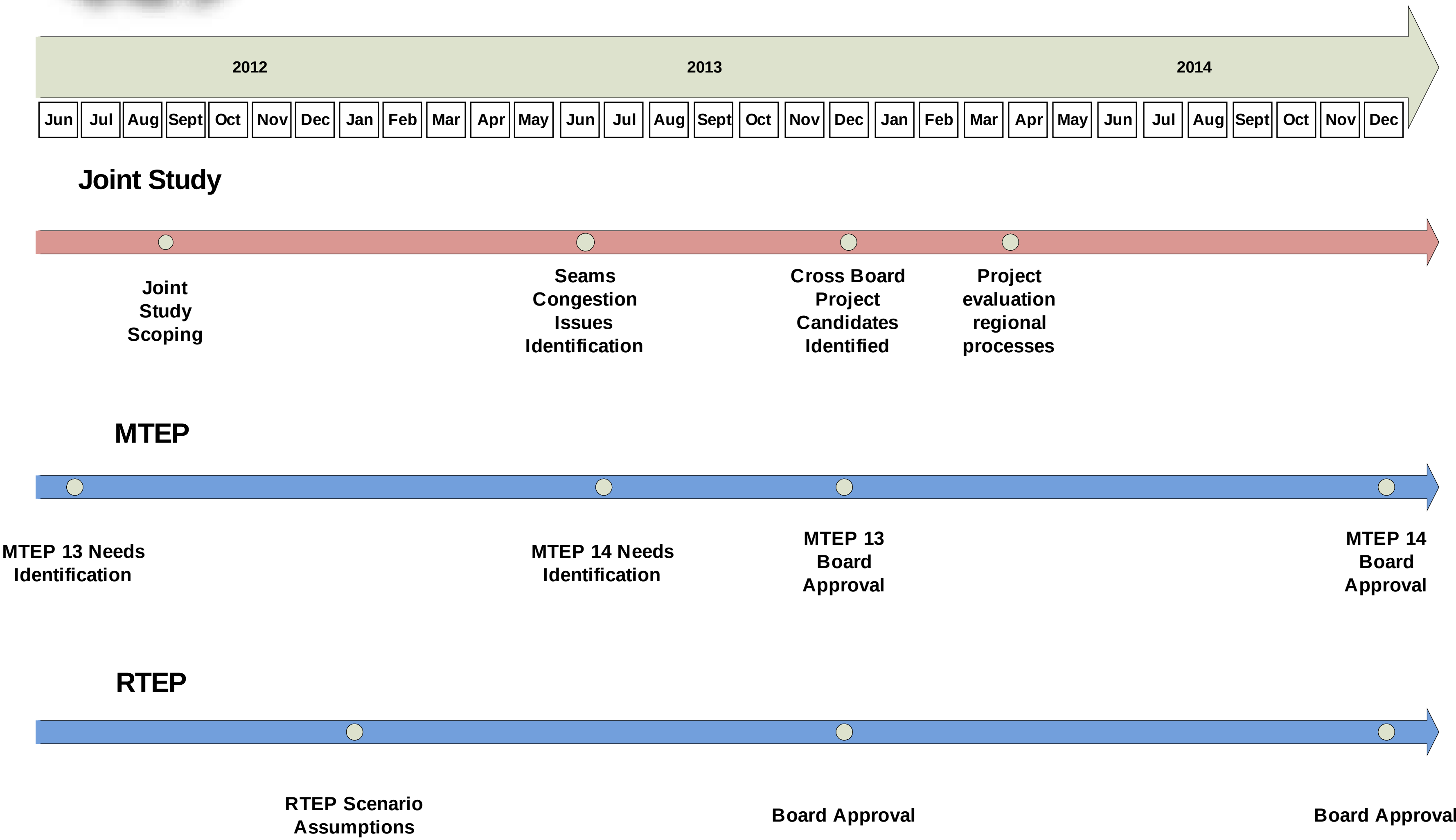
- **At a previous JCM meeting, several issues related to planning coordination were raised:**
  - Market Efficiency Planning criteria, thresholds, and process
  - Generation interconnection process
  - Generator deactivation/retirement process
  - General coordinated planning processes and procedures (models, assumptions, criteria)

Approach to Addressing Issues

- **Todays Discussion**
  - Discussion of process and metric issues associated with CBMEP study
  - Alignment of planning assumptions, timelines and models in general

- **Future JCM Discussions**
  - Generator deactivation / retirement coordination
  - Interconnection Process assessment of effective enhancements

Study Timeline



JOA - CBMEP Qualification

- **Cross Boarder Projects must meet the following Criteria:**
  - Evaluated as part of a Coordinated System Plan or joint study process
  - Meet the JOA benefit to cost ratio threshold 1.25
  - Benefit = 70% Adjusted Production Cost Savings + 30% Net Load Payment Savings
  - Minimum project cost of $20 million or greater
  - 10 year Net Present Value of benefits and cost, not to exceed 20 years from study year
  - Qualifies as an economic transmission enhancement or expansion under the terms of the PJM RTEP
  - Qualifies as a market efficiency project under the terms of Attachment FF of the MISO Tariff
  - Addresses one or more constraints for which at least one dispatchable generator in the adjacent market has a Generation to Load Distribution Factor (GLDF) of 5% or greater with respect to serving load in that adjacent market

JOA - CBMEP Qualification

- **MISO MEP must meet the following Criteria:**
  - Minimum project cost of $5 million or greater
  - Meet the benefit to cost ratio threshold 1.25
  - 20 year Net Present Value of benefits and cost, not to exceed 25 years from study year
  - 345 kV and above and lower voltage facilities of 100kV or above that collectively constitute less than 50% of the combined estimated project cost and without the project could not deliver sufficient benefit to meet the required benefit-to-cost ratio threshold
- **PJM MEP must meet the following Criteria:**
  - No Minimum project cost
  - Meet the benefit to cost ratio threshold 1.25
  - 15 year Net Present Value of benefits and cost
  - 100kV and above

Metrics – Benefit Calculation

- **Cross Border:**
  - 70% Adjusted Production Cost Savings (APCS) + 30% Net Load Payment Savings
- **MISO**
  - 100% Adjusted Production Cost Savings
- **PJM**
  - **Total Benefit = Energy Benefit + RPM Benefit**
  - **Regional Projects (Double Circuit 345kV and up)**
    - Energy Benefit = 50% Adjusted Production Cost savings + 50% change in Net Load Payment*
    - RPM Benefit = 50% change in Total System Capacity costs + 50% change in Net Capacity Payments**
  - **Lower Voltage Projects**
    - Energy Benefit = 100% change in net load payments*
    - RPM Benefit = 100% change in load capacity payments*

*only zones with decrease in net load payments
**only zones with decrease in net capacity payments

Summary - Metrics Differences

- A Cross Border Project must meet three sets of metrics:
  - JOA metrics
  - Qualify as an economic transmission enhancement or expansion under the terms of the PJM RTEP
  - Qualify as a market efficiency project under the terms of MISO's Attachment FF

	JOA	PJM	MISO
B/C	1.25	1.25	1.25
Metric	70% APC + 30% NLP	50% APC + 50% NLP*	100% APC
Cost Threshold	$20M	No Minimum	$5M
Benefit Years	10+ Year NPV**	15 Year NPV	20 Year NPV***
Voltage	> 100kV	> 100kV	>= 345kV****

* Lower voltage projects are allocated based on 100% NLP
** Not to exceed 20 years from study year
*** Not to exceed 25 years from study year
**** 345 kV and above and lower voltage facilities of 100kV or above that collectively constitute less than 50% of the combined estimated project cost

Metrics Comparison and Discussion

- **Changing the metrics will impact the benefit calculation and the overall B/C ratio tests**
- **How should we calculate the Benefit Metric?**
  - System Production Cost Savings – lower overall production costs benefit of the overall area under study
  - Adjustments to Production Cost Savings – account for the value of imports and exports
  - Load Payment Savings – captures the benefit of LMP reductions at load busses for specific transmission zones
  - Net Load Payment Savings – accounts for the value of FTRs in load payment savings
- **Thresholds**
  - Is the current $20M threshold too high or too low?
  - Is the voltage threshold too high or too low?

Next Steps – Estimated Timeline

- **September / October**
  - Conduct issues and RTEP/MTEP plan reviews
  - Metrics, models/coordination, retirements, outage coordination and interconnections
  - Conducted consistent with JOA process, with reports to JCM
- **January**
  - Present process issues and potential enhancements
- **March**
  - Solicit stakeholder feedback on proposals and discuss next steps
- **May - June**
  - Propose timeline to finalize and implement any potential changes

APPENDIX

Metrics – Cost Calculations

The JOA, MISO, and PJM Cost metrics are very similar

	JOA	PJM	MISO
Discount Rate	7.78% (50% MISO, 50% PJM)	7.7%	8.1%
Annual Charge Rate	16.25% (50% MISO, 50% PJM)	16.7%	15.8%

Metrics – Benefit Calculation

- **Adjusted Production Cost (APC)**
  - JOA
    - each RTO's production costs adjusted for interchange purchases and sales on an hourly basis.
      - If the RTO is selling interchange, multiply the interchange sales MW by the RTO's generation-weighted LMP and subtract this value from the RTO's production cost.
      - If the RTO is purchasing interchange, multiply the interchange purchase MW by the RTO's load-weighted LMP and add this value to the RTO's production cost.
  - PJM
    - Difference in estimated total annual fuel costs, variable O&M costs, and emissions costs of the dispatched resources in the PJM Region without and with the enhancement or expansion. Costs for purchases from outside of the PJM Region and sales to outside the PJM Region will be captured.
      - Purchases will be valued at the Load Weighted LMP
      - Sales will be valued at the Generation Weighted LMP
  - MISO
    - Difference in total production cost of the Resources in each Local Resource Zone adjusted for import costs and export revenues with and without the proposed Market Efficiency Project as part of the Transmission System.

Metrics – Benefit Calculation

- **Net Load Payments (NLP)**
  - JOA
    - The NLP benefit for each RTO represents each RTO's gross load payment minus the estimated value of congestion-hedging transmission rights in each RTO.
      - Multiply the LMP at each modeled load bus in the RTO by the load (in MW) at the bus, for each simulation hour (load LMP * load (in MW)). Subtract from that value the estimated value of congestion-hedging transmission rights for that hour.
      - RTO's congestion-hedging transmission rights shall be calculated by subtracting the RTO generation-weighted LMP from the RTO load-weighted LMP For each simulation hour. Then multiply this difference by the lower of the RTO's total generation MW level or the RTO's total load MW level.
  - PJM
    - Difference between the annual sum of the hourly estimated zonal load megawatts for each PJM transmission zone multiplied by the hourly estimated zonal Locational Marginal Price for each PJM transmission zone. Less the value of Transmission Rights for each PJM transmission zone without and with the economic-based enhancement or expansion.

Metrics – Benefit Calculation

- **Additional PJM Metrics**
  - Total System Capacity Cost
    - Difference between the sum of the megawatts that are estimated to be cleared in the Base Residual Auction under PJM's Reliability Pricing Model capacity construct times the prices that are estimated to be contained in the offers for each such cleared megawatt* without and with the economic-based enhancement or expansion.
  - Load Capacity Payment
    - Sum of the estimated zonal load megawatts in each PJM transmission zone times the estimated Final Zonal Capacity Prices** for capacity under the Reliability Pricing Model construct* without and with the economic-based enhancement or expansion.

* times the number of days in the study year
** payments paid by load in each transmission zone