

## Summary of Modeling WG Webinar

Monday, June 11, 1 PM ET

**Official/designated WG members in attendance:** Erin Hogan (Chair), Allan Myers, Brenda Harris, Craig Taborsky, Dennis Chastain, Herb Healy, Hisham Choueiki, Matt Schuerger, Michael Goggin, Paul McCurley, Stan Hadley, Tyler Ruthven, Wil Burns, and Diane Barney, Michael Wegner, and Marya White (for EISPC), Ralph Luciani and Bruce Tsuchida (CRA); John Buechler, Flora Flygt, and David Whiteley (for EIPC). Facilitator: Catherine Morris (Keystone).

***\*NOTE: To facilitate the rapid pace of the MWG meetings during June 2012, these summaries will focus on the action steps taken during the meeting and next steps resulting from the meeting. Details of modeling discussed will be captured in the matrix of inputs (see below) and the output framework drafts, to be updated regularly on the Phase II – MWG page online. Recordings of the webinars will also be posted.***

### Outstanding Questions from last MWG Webinar on Input Data

- ORNL (Stan Hadley) will work on curve for DR supply and provide update on Wed.
- CRA can and will include DR in commitment step, working as pseudo-generator. DR will be distributed over busses by load-ratio.
- CRA will consider variation of the DR pseudo-generator characteristics so that the DR is not dispatched too much or too little. One option may be to have seasonal variations.
- Some MWG members expressed preference for running Scenario 3's (BAU) production cost first.
- CRA has developed an example of the proposed wind curve stratification using MISO-W wind load shape and verbally shared the preliminary proposed allocation but it is still under internal review. Concerns were raised that geographical diversity may not be captured in this approach. CRA will provide the proposed allocation in writing for MWG consideration.
- In the meantime, ORNL (Stan Hadley) will reach out to NREL to consider options of developing wind shape curves from the 2006 EWITS data to reflect geographical diversity within a NEEM region. This may address concern with the approach of stratifying a NEEM region load shape. This alternative has very specific load shape information by unit site rather than disaggregated average load shapes, but both options are based on the 2006 EWITS data.

### Generation Characteristics, continued (see chart)

- Rated Capacity:
  - Need to specify seasonal rate for different capacities- summer typically lower than winter.
  - NEEM uses summer capacity, so adding in 8% for winter (for gas CTs and CCs) may solve this issue.
- Full load heat rates:
  - heat rates are a marginal step function, not average rate
  - NREL data provided by M. Goggin is average rate. S. Hadley will provide some analysis tomorrow to allow comparison.
- Spinning Reserves:
  - broken down by region using region-specific methods to determine requirements
  - reviewed and approved by PAs
- Emissions Prices:
  - Confirmation: Scenario 3, no price.
  - Scenario 1, NEEM-specified price.
  - Scenario 2, nonbinding price

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- Transmission Characteristics
  - Suggestion to use \$0 instead of \$1/MW as curtailment point for wind
  - MWG will need to set up a rough estimate of how much of the wind resources transmission to commit to the native NEEM region, and how much to assume will be exported (e.g. via DC lines, 3500 MW each). D. Whiteley warned that the DC lines to support the NEEM transfer limits. Discussion to continue on next call.

**ACTION ITEMS:**

- CRA: break down wind load shapes in MISO-W as an example region.
- Stan Hadley: DR price to be stratified into a schedule
- Next MWG call: **Wednesday, June 13, 3-4:30 PM EDT**

<b>EIPC MWG GE-MAPS Data Review, Draft after June 11, 2012 meeting</b>			
<b>Input</b>	<b>Phase 1 Assumptions</b>	<b>Phase 2 Recommendations</b>	<b>Comments</b>
<b>Load Characteristics</b>			
Hourly Load Profile	Load duration curve developed from 2006 Load Shape	Chronological hourly load based on 2006 Load Shape	
Peak Load	Each NEEM Region peak adjusted for coincidence factor	Peak load based on hourly load for MAPS area	NEEM adjustment necessary to capture variation in peak loads across time zones (Phase 1, excludes Phase 2)
Total Energy by Area	2030 Energy Aggregated by NEEM Region	2030 Energy Disaggregated proportionate to MAPS area	Follows similar methodology to exhibit phase 1
<b>Generation Characteristics</b>			
Generating Capacity	NEEM used single capacity rating ( Summer capacity rating for gas units)	generation in-service in 2030 consistent with power flow cases for each Scenario;	unit list posted on EIPC website
Capacity ratings		seasonal differences used for gas (CTs & CCs) ; 8% additional capacity for winter rating	CRA to confirm NEEM values

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Full load heat rates		Generation in-service in 2030 consistent with power flow cases for each Scenario	MG provided NREL data of avg heat rates which SH is converting to marginal rates for comparison; Can we use geographically-differentiated HRs?
Forced outage rates		NEEM	New units - AEO projections; existing units - CRA to check
Planned outage rates		NEEM	
Emission rates for existing units		NEEM	
Post-retrofit emissions rates		NEEM	
Variable O&M costs		NEEM	
Nuclear capacity ratings		NEEM	
Nuclear forced outage rates		NEEM	
Hydro Existing			MAPS model: Monthly energy target w/ Max Limit, Min Limit; Minimize Total Production Cost
Hydro, New			
Renewable Resource Plant Capacity		NEEM	
Renewable Resource Plant available energy		NEEM	
Wind generation capacity factors	Modeled Output: 8760 Curve Shape by NEEM Region <1000 MW [5 Shapes] >5000 MW < [20 Shapes]		Fixed Output 8760/unit; from NREL 2006 data (capacity factors)
Profile of hourly wind generation			CRA to provide an example of the distribution of wind in MISO with varying load shapes. Developed 20 groups of wind shapes within MISO_W; NREL data available at more granular level to allow distribution of wind load shapes to MAPS regions based on measure wind resources; Time may be determining factor on

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			approach taken
Demand Resource Variable Cost		Will treat DR as pseudo-generator in commitment process; use a step function on price; dispatch step will determine whether it actually runs; no prescribed limits to DR dispatch other than price	DR acts during real-time dispatch; load-weighted distribution to busses; price step function should be carefully designed to ensure that DR is not over-dispatched; can create seasonal price curves; could be a factor to consider as a sensitivity
Demand Resources in peak			
Spinning Reserves	NA	Section A-10 of input assumptions lists regional requirements; also made assumptions of thermal units' and hydro plants' spinning reserve provided by type (p. 6)	based on hourly load or MW levels and approved by PAs; does not include spinning reserves from nuclear or CTs
Standby Reserves		Not included directly in MAPS	
<b>Transmission Characteristics</b>			
Transmission		Transmission build for EIPC power flow model	200 kV and above
DC tie with WECC		NEEM	
DC tie with ERCOT		NEEM	
Tie with HQ		NEEM	
Tie with Maritimes		NEEM	
DC line impact on commitment by region			3500 MW each
Hurdle Rates		NEEM hurdle rates between regions in dispatch step in MAPS; commitment step - divide model into 10 commitment pools; inside pool set \$10 hurdle rate	Note: Each commitment pool commits units to meet load within the pool. Wind is based on specified schedule unless RTP drops below \$1; would \$0 LMP be

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		between NEEM regions	appropriate?
<b>Fuel Prices</b>			
Seasonal natural gas price	Summer/winter Shoulder	NEEM	Delivered gas prices as Phase 1
Distillate oil price	Annual	NEEM	
Coal price	Output from NEEM	NEEM	Assumed 2010 Dollars
<b>Emission Prices</b>			
NOx price		NEEM	
SO2 price		NEEM	
CO2 price		NEEM in Scenario 1	None in Scenario 3 or 2; CO2 = \$0