

Summary of Modeling WG Meeting September 20, 2012, Detroit, MI

Official/designated WG members in attendance or on phone: Doug Gotham, Ezra Hausman, Bob Fagan, Bob Pauley, Michael Goggin, Michael Wegner, Ryan Kind, Samir Succar, Randell Johnson, Tyler Ruthven, Wil Burns; Ralph Luciani and Bruce Tsuchida (CRA), Stan Hadley (ORNL); Dave Whiteley (EIPC).
Facilitator: Catherine Morris (Keystone).

SSC members attending: Ryan Kind (EU), Stu Nachmius (TO/TDU), Tim Noeldner (PP/TDU), Maryam Sharif (PP/TDU), Rob Sinclair (CA), Roy Thilly (chair)

- **Review of remaining fixes needed for Scenarios 1 and 3** – Ralph Luciani & Bruce Tsuchida, CRA
 - Slides 6 and 7 of CRA's [presentation](#) for the September 20-21 SSC meeting presentation lists the fixes that will be made in the next modeling runs for Scenarios 1 and 3. Fixes found in Scenario 3 have already been incorporated in the first run of Scen. 1.
 - None of these fixes are expected to have much of an impact on the results.
 - In Scenario 1 specifically, there have been a variety of challenges given the high levels of wind. Fixes include:
 - NEISO hydro unit that shouldn't be there
 - SOCO terminal upgrade
 - SOCO hydro unit – pump storage
 - RGGI price
 - NY zone J&K constraints
 - PJM to-E to NY DC cable
 - MAPP hydro
 - IESO generating units
 - SC to SOCO transmission
 - GRE DC line
 - Biomass pricing
 - Any additional suggested fixes should be sent to CRA by September 23.

- **Review of Outstanding Questions on Production Cost Modeling Results for Scenario 1**
 - Flow gates in NE are not showing up in S1
 - From CRA's reading, the flow gates in question do not exist and were no longer relevant for this scenario
 - Wind curtailment in MISO-W, Nebraska and SPP
 - Because S3 involved so much wind (see slide 5 of CRA presentation) and a low load, there was significant amount of wind curtailment in certain regions. Curtailment begins when the spot price falls below \$1.10/MWH. Originally the trigger for curtailment was \$0.10/MWH but it had to be raised to prevent nuclear units from cycling off for short periods of time.
 - Steps were taken to relax spinning requirements in order to get the model to solve, but even with the relaxation of those constraints, wind was curtailed significantly in MISO-W, Nebraska, SPP-N, IESO and Entergy. Note that SPP-S has a lot of wind but very little curtailment. Indicates that wind is able to move to Entergy, is lower cost and therefore may be the cause of Entergy's wind curtailment.
 - The model solved much more easily in the summer (peak) months which indicates that the low load in off-peak periods contributed significantly to the wind curtailment.

yield a great deal of useful information that couldn't already be extrapolated from the initial results.

- DR does not appear to be causing the wind curtailment previously discussed.
 - If a sensitivity involving higher levels of DR is of interest, it may be better to approach it by increasing peak load rather than by changing the price curve.
2. Improved wind performance (higher capacity factor and/or lower cost of wind in low wind regions)
 - This possible sensitivity would be an effort to model new wind turbine technologies, such as low wind speed turbines which could encourage higher wind builds in low-wind regions.
 - This sensitivity was viewed as useful but not as high of a priority as dealing with the wind curtailment.
 3. Wind build in Canada
 - The wind, solar and nuclear units have been adjusted so this is no longer needed as a sensitivity.
 4. CO2 price variation in S1
 - CO2 emitters are largely gone in S1. Decreasing the CO2 price could result in higher dispatch of natural gas in S1.
 - CO2 prices are added to fuel costs, therefore changing the CO2 price will have the same effect as changing fossil fuel prices.
 - Adjusting both fuel costs and CO2 prices could be interesting but it would be unclear which variable was the driver.
 - This sensitivity was characterized as low-priority.
 5. Adjust fuel (natural gas) costs
 - This could involve both downward and upward adjustments of natural gas prices, and could apply to both S1 and S3.
 - NG price in 2030 was \$6.50/MMBTU in 2010 dollars.
 - It was suggested that both high and low NG prices be tested if this sensitivity is selected.
 6. Enhanced thermal generation system flexibility
 - This sensitivity could be used to reflect technologies with better load following capabilities, such as new combined cycle generation. Could be reflected in increased ramp rates and better partial load heat rates.
 7. Increase capacity limits of DC line ties (S1)
 - This sensitivity could cause problems on the underlying AC system; reducing capacity might be easier than increasing it and could still tell you something about the role of the transmission system in curtailment of wind.
 8. Eliminate commitment pools in S1
 - CRA explained that they would be unable to get the model to solve in the commitment pools were eliminated.
 - Stakeholders may consider a narrower range or different range of allowable inter-pool commitment, which could result in more MISO generators available to export into PJM in dispatch phase. (See p. 6 of CRA assumptions on current range.)
 9. Generation and transmission mismatch
 - This proposed sensitivity would be difficult to capture, since major changes to the transmission system can't be made at this stage.
 - This was characterized as a low-priority sensitivity.
 10. Wind curtailment (this may entail multiple approaches and/or sensitivity runs)

- Possibilities for exploring the wind curtailment issue might include dropping spinning requirements; increasing or lowering the S1 load by 5% or so; reducing wind in high curtailment areas; or making region-specific adjustments to the spinning reserves.
- CRA and MWG members will continue to examine the data to try to determine the best sensitivities to deal with this issue.
- MWG would like more information before deciding what sensitivities might be useful

11. Hurdle rates

- Hurdle rates were adjusted in Phase I but didn't make much of a difference in the resource build.
 - Hurdle rate adjustments could have a bigger impact on S3 on the actual flows between regions than in S1 (since S1 would involve actual physical limitations to the flows).
- See slides 17 and 18 of the MWG's [presentation](#) to the SSC for a summary of the MWG's discussion on sensitivities.

- **Next Steps**

- CRA will try to distribute the S2 results late next week with the fixes incorporated.
- The next MWG call will be held Monday, October 1.