TO Questions Regarding 2008 State of the Market Report

1. Slides 42 and 43 contain net revenue analyses for combined cycle units and combustion turbines. Can you provide similar analyses for coal and nuclear units, for demand response, and for energy efficiency?

2. On slide 44, the report asserts, "Vernon/Greenwood is the only area of NYC where new CT investment might have been profitable in 2008." It goes on to say, "The estimated CONE for a new CT in NYC was $188/kW-year for the 2008/09 Capability Period," with that estimate having been taken from the ICAP demand curve reset study. However, that value of "CONE" was calculated using an amortization period that is much shorter than the forecasted 30-year life of the plant. A generator owner would consider revenues to be earned over the full 30-year lifespan of the plant, so it is not appropriate to use this version of CONE in this analysis. Instead, a CONE calculated using a full 30-year amortization period is appropriate. Would new CT investment have been profitable in 2008 in the areas of NYC that you analyzed, using CONE calculated over a 30-year amortization period? What about new CT investment in the locations outside NYC that you analyzed?

3. Can you confirm that the data presented on slides 49 and 50 reflect scheduled flows, rather than actual flows, across each interface? Also, could you confirm that net imports from HQ are actually highest in the winter and lowest in the summer, as slide 50 suggests? This seems counterintuitive.

4. Slides 52 through 56 discuss circuitous transactions around Lake Erie. However, they do not discuss the large increase in transactions being scheduled from Ontario to PJM through MISO. As we understand from your comments, about half of this energy actually flows through New York, so this is the cause of significant adverse parallel flows in New York. Can you prepare a written presentation on this issue, its impact on New York consumers, and potential procedures for alleviating this impact?

5. The graph on slide 58 shows the extent to which New York prices and prices calculated for adjoining control areas differ during unconstrained hours. Elsewhere, on slides 145-149, you describe top-of-hour pricing issues. How would omitting these intervals from the analysis on slide 58 affect your conclusions?

6. Could you provide more background on the simulations of optimal hourly scheduling on the New York-New England interface that are described in slide 64? Did they assume perfect foresight by each ISO? How frequently could inter-ISO schedules be changed? Can the data in slide 65 be updated to include 2008? When will a similar study for the New York – PJM interface, as requested at the May Management Committee meeting, be completed?

7. Slide 82 discusses convergence between day-ahead and real-time ancillary services prices. Slides 83 and 84 indicate that for eastern 10-minute non-spinning reserve and western 10-minute spinning reserve, when there are significant differences between day-ahead and real-time prices, day-ahead prices are usually lower than the real-time prices (with the exception of the 10-minute non-spinning reserves during summer afternoons). Does this pattern apply to other products in addition to the two illustrated? More generally, other than permitting virtual trading in OR and regulation markets, what can be done to produce convergence in cases when day-ahead prices exceed real-time prices?

8. Slide 86 asserts, "Suppliers in markets that are not workably competitive will have the greatest incentive to withhold at peak load levels when the market impact is the largest." However, this is not necessarily true, because the foregone margins resulting from withholding will also be higher at peak load levels. To see this, consider the following example:

   - In Hour 1, assume that by withholding 10 percent of its 1000 MW of generation, a generator owner can cause prices to increase from $100/MWh to $115/MWh, a $15/MWh increase.

   - In Hour 2, assume that by withholding 10 percent of its 1000 MW of generation, a generator owner can cause prices to increase from $200/MWh to $220/MWh, a $20/MWh increase.

   - For simplicity, assume operating costs for all generation are zero.

   - Then if the generator withholds in Hour 1, it realizes 900 MWh × $115/MWh = $103,500 in revenue, while if it does not withhold, it realizes 1000 MWh × $100/MWh = $100,000 in revenue, so it is better off in Hour 1 if it withholds.

   - If the generator withholds in Hour 2, it realizes 900 MWh × $220/MWh = $198,000 in revenue, while if it does not withhold, it realizes 1000 MWh × $200/MWh = $200,000 in revenue, so it is better off in Hour 2 if it does not withhold, despite the fact that its withholding had a larger impact on energy prices in Hour 2 than in Hour 1.

   Given that incentives to withhold may be higher at lower load levels, even if withholding has a larger effect on prices when load levels are higher, as this example has demonstrated, have you performed any analysis to determine whether incentives to withhold are actually higher at higher load levels? If so, can you share the results of that analysis with us? If not, how much reliance can be placed on the analysis in Slides 87-92 indicating that withholding is not occurring?

9. Slide 87 asserts that "the figure [on Slide 88] shows that long-term deratings and short-term deratings decline during the highest load conditions," and Slide 90 asserts, "These figures [on Slides 91 and 92] indicate that the output gap

decreases under the higher load conditions." However, that is not obvious from inspection of these figures, because there are so many data points on the figures that it is difficult to draw any conclusions from them. How strong was the correlation between load and derates, and between load and the output gap? How likely is it that this correlation was simply chance? What sort of correlations would you expect to observe in a competitive market, taking into account the example in the preceding question (which illustrates that incentives to withhold may, in some cases, be stronger at lower load levels). Can you make the data underlying the figure available to market participants?

10. Slide 100 recommends reconsideration of the requirement that steam units in NYC offer 10-minute spinning reserve at a price of zero. What is the basis for this recommendation? Can you provide data comparing day-ahead prices to real-time prices for eastern 10-minute spinning reserve?

11. Slide 106 states, "There have been substantial net virtual sales upstate and virtual purchases downstate during the past three years. This is consistent with the pattern of imports into downstate being higher in the day-ahead market than in the real-time market." Could you explain this further? Slide 102 states, "load has generally been over-scheduled in NYC and Long Island and under-scheduled in upstate NY." Consequently, one would expect the day-ahead price of energy to exceed the real-time price in NYC and Long Island, in which case the incentive on the margin is for virtual traders to schedule virtual supply, so that they can sell at the higher day-ahead price and cover their positions at the lower real-time price, which is inconsistent with the observation that there have been substantial net virtual purchases downstate. Similarly, one would expect the day-ahead price of energy to be less than the real-time price upstate, in which case the incentive on the margin is for virtual traders to schedule virtual load, so that they can buy at the lower day-ahead price and sell at the higher real-time price. That seems to be inconsistent with the observation that there have been substantial net virtual sales upstate.

12. Slide 110 states, "The Central-East Interface exhibited more frequent constraints in 2008, due to higher net imports from Hydro Quebec and increased clockwise loop flows around Lake Erie." However, this does not explain the growth in the frequency or value of real-time congestion on Central East from 2004 to 2007. What are the causes of this growth?

13. Similarly, what caused the large decreases in the frequency and value of real-time congestion on the UPNY-Con Ed interface in recent years?

14. Congestion into NYC is shown by the yellow bars in the figure on the right side of slide 112. What accounts for the decrease in congestion into NYC over the last several years?

15. The figure on slide 115 shows that the prices of TCCs in the capability period auctions for summer 2008 were considerably lower than the prices for those TCCs

in either the monthly auctions or the congestion payments made to the holder of those TCCs. Have you conducted any analysis to attempt to explain this difference? If so, what conclusions have you drawn? Is this phenomenon limited to summer 2008, or has it been going on for longer than that? If so, do you know why?

16. According to slide 117, 57 percent of day-ahead congestion rent shortfalls were not associated with specific outages and were accordingly socialized among the TOs. How does this compare to previous years? Do you have any information as to the causes of these shortfalls, and how much of the shortfall resulted from each of those causes? For example, how much was attributable to differences between parallel flow assumptions made in the DAM and parallel flow assumptions made when conducting the TCC auction (some of which may have been the result of adjusting the day-ahead assumptions to reflect the circuitous Lake Erie scheduling)? How much was attributable to transmission outages occurring outside the NYCA?

17. Slide 129 states, "Balancing congestion shortfalls result when external interface capability is reduced in real-time below the day-ahead scheduled level." It goes on to note that real-time offers can be as low as –$999.70/MWh, and recommends "that the current offer limit for real-time import transactions be adjusted from –$999.70/MWh to a level more consistent with the avoided costs of curtailing the import." Is there reason to believe that market power has been exercised in these cases? If so, is the ISO considering any actions other than changing the lower limit for real-time imports? Also, how would the ISO calculate the real-time offer that is "more consistent with the avoided costs of curtailing the import"?

18. Slide 133 states, "One factor that tends to reduce the efficiency of GT commitment is the use of simplified interface constraints in NYC load pockets rather than the more detailed model of transmission capability." Could you explain why RTC uses the simplified interface constraints? Is it possible to increase the amount of detail used in RTC's model?

19. Slide 145 describes one of the factors contributing to top-of-hour real-time price volatility as occurring "when pump storage units switch between consuming electricity and producing electricity." Isn't there usually a one-hour (or longer) gap between being in pump mode and being in generation mode? Therefore, are these actually occasions when these units switch between consuming electricity and being shut off, or between generating electricity and being shut off?

20. Have you attempted to estimate the net impact of top-of-hour real-time price volatility on the amounts paid by load? If so, what were the results?

21. Slides 157 through 161 explain how the hybrid pricing methodology caused some shortages of eastern 10-minute reserve not to be reflected in prices for the affected intervals. However, as slide 153 notes, there were also some intervals in which

shortage pricing occurred, even though there was not a shortage in those intervals. What is the explanation for this discrepancy?

22. Slides 179 and 180 highlight transmission constraints between Zones A-F and G-I and recommend consideration of a Southeast New York capacity zone. What is the basis for distinguishing the Hudson Valley from other transmission-constrained areas within the existing capacity regions, such as Staten Island and Astoria?

23. Would there be sufficient competition in a Southeast New York capacity zone?

24. If NYISO added a Southeast New York capacity zone, what procedure should the NYISO use to determine the capacity requirements for that zone and for the New York City and Long Island Localities that are nested within that zone? Might this procedure be similar to the Tan 45 method currently used to balance the ICAP requirement for the NYCA against ICAP requirements for the Localities? If so, would adding the Southeast New York capacity zone cause the Locality ICAP requirements to differ from those calculated using the current procedures, which do not include this extra step of balancing ICAP requirements for the Localities against ICAP requirements for Southeast New York? Given the potential that the addition of this zone, this could change the ICAP requirements for the Localities, would it make sense to create a new capacity zone only when there is a demonstrated need for such a zone (because sufficient generation would not be provided in the new zone without imposing such a requirement)?

25. Slide 179 states, "The [deliverability] test should be revised over time to correspond to a real potential set of contingencies. This would determine whether incremental capacity can respond to maintain the reliability of the system." Is this the proper role of a deliverability test? If you are referring to the impact that incremental capacity would have on loss of load expectation, wouldn't that be better ascertained when determining the required installed reserve margins?

26. Slide 180 states, "If the deliverability test determines that new units or imports are not deliverable due to a congested path, the definition of a new capacity zone is likely needed to distinguish between capacity on either side of the path." What if the deliverability test simply determines that *surplus* capacity cannot be delivered? At some quantity of capacity, a deliverability test will always fail, but it does not follow that there should be sufficient transmission to deliver an infinite amount of upstream capacity.

27. Slide 180 also states, "The capacity market will not send the signals necessary to build new capacity if it is needed in the congested area." Wouldn't developers of new capacity in the congested area avoid the need to pay for transmission upgrades needed for deliverability, while developers of new capacity outside the congested area would need to pay for such upgrades? Given that, what is the basis for your statement?

28. Slide 180 goes on to say, "Suppliers upstate and a large share of the potential capacity imports will be foreclosed from the market. This will raise capacity costs for New York consumers and reduce competition." Can you explain this conclusion? Wouldn't creating a new capacity zone also raise capacity costs for New York consumers (because they would be required to purchase more capacity in that zone than they would have been required to purchase in the absence of that requirement) and reduce competition (because resources in that zone would only have to compete with other resources in that zone)? Also, does this statement take into account the ability for suppliers to sell ICAP into other control areas, which would mitigate the impact on upstate suppliers that elect not to pay for the upgrades that are required in order for them to be deemed deliverable?

29. In addition, slide 180 states, "Suppliers that can provide capacity and reliability benefits to a large portion of the NYCA will not receive any revenue, which results in inefficient investment incentives." Given that the deliverability test is determining that capacity in excess of the ICAP requirement is not deliverable, how significant are those benefits?