Session 2 -
RGGI Design, Markets and Reliability:
Issues Relating to Renewable and Distributed Resources

Setting: Several important aspects of the RGGI process turn on the practical realities of low-carbon, distributed electric power resources, which include renewable generation, end-use efficiency and demand response, and customer-based generation. Even without RGGI, these "non-conventional" resources are growing in importance as mainstream resource options to meet electric power needs. Meeting RGGI's goals highlights their importance: RGGI's ability to lower GHG emissions at acceptable cost while maintaining reliability will turn, in large measure, on how well these resources are deployed. Their impacts on system operations, reliability and power markets are thus crucial to RGGI program success, and the impacts of RGGI design on their development is equally important.

There are many important issues for interaction among these non-traditional resources, RGGI design, and RTO market rules and operations. While the time allowances at the workshop will likely not allow all of these issues to be addressed, this brief memo identifies a wide range of them for possible consideration at the workshop – and beyond.

Increasing renewable energy generation

Both regional baseline projections and RGGI cap scenarios include significant increases in renewable generation, much of which is expected to be wind power. What are the implications of this increase for RGGI design, system costs, regional power markets and system reliability?

- Are the RGGI cap scenarios' projections for development of new renewables realistic, considering costs, siting issues, etc.?
- How much intermittent wind power can the region and sub-regions absorb without degrading reliability or power quality? Are RGGI goals within these limits?
- As the level and type of renewables changes over time, how might this affect the regional mix of power generation, and how might this affect RGGI's goals?
- ISO market rules today penalize generators for deviations from day-ahead schedules and bids; should RGGI attempt to influence such rules so that wind resources might be subject to different performance requirements as fossil units?
- Given their inherent intermittency, wind generators can require much more transmission capacity at peak production than at most other hours. Current transmission rules do not account for this intermittency. Should RGGI attempt to influence them so that such rules don't inhibit the development of resources needed to meet RGGI goals?
- Landfill methane generation is a valuable form of GHG reduction as well as electric generation. Should RGGI treat these generators as zero emitters, as

positive emitters *requiring* credits, or negative emitters that will *receive* net credits?

- ❖ Where voluntary green power markets require a demonstration of net environmental improvement, can RGGI provide for retiring the necessary credits?
- ❖ Renewable generation is an important source of GHG reductions, but often at a price premium. Assuming that carbon credits are not auctioned, how can RGGI's design reveal the climate benefits of renewables, and improve their penetration, while lowering the premium that green purchasers will pay?

Increasing energy efficiency and demand response

Energy efficiency resources can offer a low-cost (even negative cost) means to achieve large GHG reductions for a given set of energy demands. Shorter-term demand response (or "load response") can improve reliability and lower high peak prices by reducing demand at critical points in time, but it typically does so without reducing overall consumption very much – that is, demand response can help to reduce some of RGGI's system impacts, without directly reducing GHGs.

- ❖ What is the realistic potential (as opposed to the technical potential) for enhanced energy efficiency and load response in the RGGI region?
- ❖ Should RGGI directly measure and value the GHG reductions associated with efficiency measures in some explicit way, through allowance set-asides, direct assignment to efficiency providers, or ?
- ❖ If increased deployment of energy efficiency is critical to RGGI success, what design elements could – and should – RGGI adopt that would support accelerated and sustained efficiency investments in the region? What power cost savings might result (through lower expenditures on power but also through efficiency's effect on lowering market clearing prices, at least in the short term), and how should these be taken into consideration in RGGI design decisions?
- ❖ Each ISO has policies designed to support Resource Adequacy on a forward-looking basis. Should RGGI encourage the ISOs to pay for capacity additions through end-use efficiency on the same terms as additions to generation?
- ❖ If demand-side investments can be targeted in ways that advance both RGGI carbon-reduction goals and ISO reliability goals (i.e., locating reductions in load pockets, to areas facing T&D reliability problems, etc.), how might (and should) RGGI design address this?

Customer-located generation: CHP and DG

Some observers envision a power system in the future in which customer-located generation (either combined-heat-and-power ("CHP") or stand-alone Distributed Generation ("DG")) provide an increasing percentage of total generation. However, these resources present a mix of pros and cons, both environmentally and economically. How might RGGI affect these resources under different RGGI designs, and how do they affect RGGI design elements?

- ❖ What reliability pros and cons do CHP and DG units present that RGGI should be aware of?

- What generator size threshold will RGGI adopt? If small-scale generators are exempt from the carbon cap, does this increase the potential for "leakage" due to new DG/CHP in the RGGI region?
- Could – or should - an exemption for small generators be crafted so as to promote only those that were especially efficient, and/or only those that do not present significant environmental harms?
- Would ISO and environmental tracking systems be adequate to track small generators in any case?
- Should in-region CHP be favored in RGGI design by giving offset credits for the increased societal efficiency and lower gas consumption associated with the combined system compared to the two stand-alone systems?
- Is expansion to cover industrial boilers the first logical extension of RGGI beyond the power sector? If so, is this a reason to bring CHP resources (including their thermal emissions) into RGGI as a first step in that extension?