

## Topic Session 3:

### RGGI Design, Markets and Reliability - Issues Relating to System Operations

The third discussion session of the RGGI Markets Workshop covers a number of RGGI design issues that are important from the perspective of electric system operations. These issues are tied to some critical attributes of electric systems, such as the need for adequate and available power supplies at all times and at all places as needed to meet demand requirements throughout the region. Fuel diversity among power supply sources is tied to those issues, because of the spreading of risk (of power plant outages, or loss of fuel supplies, etc.) and is therefore important to system operators.

#### Fuel Diversity

Over the past decade, virtually all of the recent additions to the electric mix in the Northeast region have been gas-fired, combined-cycle generating facilities. While such facilities emit lower greenhouse gas emissions than other fossil-fired generating plants, they still emit carbon. The region's reliance on such gas-fired facilities in the future will depend on many factors, including the price of gas, the price of gas relative to other fuels available for power generation, environmental compliance costs for power plants, and capital costs of alternative sources of power.

- ❖ What are the implications will RGGI design and the cost of compliance with RGGI policies have on fuel prices and fuel diversity issues going forward?
- ❖ Assuming that there are traditional restrictions on oil use at dual-fuel (gas/oil) generating units, what further restrictions will or could occur with respect to RGGI requirements? Will there be price impacts in situations where gas supply is scarce / expensive? (Units scheduled at minimum generation levels would result in higher emission rates, since these units are operating at less efficient levels, which can exacerbate supplier costs.)
- ❖ Will the ISOs need to implement measures to maintain fuel diversity?
- ❖ If a facility is economically insolvent but needed for reliability, how will the reliability must run contract be structured and who is responsible for the costs? If such a facility is in PJM, should all customers pay or only states that have supported the RGGI initiative?
- ❖ In their energy facility siting processes, should the states in the RGGI region permit only (or give advantage to) non-CO2 emitting resources to satisfy load growth?
  - Efficiency and conservation
  - Wind, solar and renewable biomass
  - Nuclear
  - CO2 issues in new fuel-delivery infrastructure (e.g., natural gas pipelines, LNG)

## Operational Flexibility

System operators want to have a set of power supply and delivery resources available to them that will enable them to operate nimbly and flexibly under constantly changing circumstances on the grid. Circumstances change not only routinely (as, for example, power demand increases relatively predictably over the course of each “normal” weekday) but also quite unexpectedly at certain times (e.g., during periods of sustainable abnormal weather in summer and winter peak seasons). For example, long periods of sustainable cold weather will put significant demand on gas-fired, combined cycle units, as the gas supplies will be in relatively short supply in the heating season. Environmental and other restrictions on the ability of any of these plants that have dual-fuel capability can impact the availability and flexibility of sources of supply. Also, circumstances can change quickly in certain regions when facilities (e.g., power plants and/or transmission lines) trip out of service. A combination of sustained bad weather, with higher-than-expected planned and unplanned power plant outages and higher-than-predicted demand can lead the system to have to invoke emergency operating conditions, which call upon all available generators to produce power, all demand resources to be called upon, and so forth.

For these variety of reasons, RGGI design needs to take into account the system-operators’ need to maintain reliability under all combinations of operating conditions.

- ❖ How will RGGI treat emissions of generating units under emergency operating conditions?
- ❖ How will the system operators need to account for overall RGGI allowance limits in dispatching units with reliability and economical – and now, environmental – objectives are met?
- ❖ How will RGGI design treat generating resources that are considered “must-run” for reliability purposes? Will such costs be allowed in the reliability contracts for these units? Will there – or should there – be any “set-asides” for such reliability-must-run units?

The system planners need to make sure that electric resources (some combination of power plants, transmission facilities and demand-side resources) are adequate in the future to meet demand and reserve requirements at all times, including during peak demand periods. To support that “resource adequacy” process, the ISOs and various transmission and power companies – and even state agencies – undergo resource planning exercises. What are the implications of RGGI design for these planning processes, and vice versa?

- ❖ Treatment of emissions during operational emergencies?
- ❖ Treatment of CO<sub>2</sub> emissions in transmission planning?
- ❖ Treatment of CO<sub>2</sub> emissions in state siting procedures for new infrastructure.