Emission Portfolio Standards

I. Introduction

The Northeast states are developing a regional initiative (known as the Regional Greenhouse Gas Initiative, or RGGI) with the goal of reducing carbon dioxide (CO_2) emissions from the electricity sector. States participating in the RGGI process are currently discussing the architecture of a program to reduce CO_2 emissions utilizing a traditional cap-and-trade approach (i.e., based on allowance allocations to electric generators). However, there are significant issues associated with this implementation method including negative economic impacts on affected electric generating companies, and possible degradation of CO_2 reductions given the likely increases in power imports into the region (otherwise known as leakage).

This document contains a discussion of an alternative policy implementation mechanism for an emissions cap-and-trade program called an *emission portfolio standard or EPS*. An EPS would subject the distribution or wires company, otherwise known as the load serving entity (or LSE), to an output-based performance standard (using lbs CO_2/MWh as the metric). Under an EPS, the LSE could demonstrate compliance with the performance standard by any combination of approaches including balancing its supply portfolio to meet the target level, trading certificates that are created within the power market and trading project-based emission reductions (or carbon offsets) created in other sectors.

In addition to addressing the concern of economic and environmental impacts of a traditionally implemented cap-and-trade program, an EPS also has the following benefits:

- alignment with the regional electricity markets,
- more cost-effective program administration, and
- increased market demand for low/zero emitting and renewable technologies.

II. Implications of a Traditional Cap-and-Trade Approach

All emissions cap-and-trade systems establish an emission tonnage cap for a specified group of sources. Traditionally, the administering agency authorizes a tradable currency, usually referred to as an allowance, in an amount equal to the cap. Source compliance with the cap requires that each source hold an amount of allowances that is at least equal to the source's actual emissions during the compliance period. Allowances are distributed to affected sources according to one of several possible methodologies. For instance, allowances could be distributed to affected sources based on historic activity levels of each affected source. Allocation methodologies built on historic activity levels (i.e., heat input) have been used for several cap-and-trade programs in the U.S. including the Acid Rain Program and OTC NOx Budget Program.

Historically, cap-and-trade programs applied to the electricity sector have cost-effectively reduced emissions because of the geographic scope, comprehensive coverage of electric generating sources, availability of cost-effective end-of-pipe emission control

technologies and reasonable emission trading rules. Lacking any of these elements, it is likely that a regional CO_2 cap-and-trade program would result in four undesirable outcomes:

1. competitive disadvantages for affected electric generators in the region versus electric generators outside the region,
2. increased power imports from outside the affected region,
3. increased greenhouse gas (GHG) and air pollution emissions in upwind states which would reduce the environmental benefit of RGGI, and
4. an allocation process that will likely be very contentious.

Each one of these undesirable outcomes is discussed below.

Competitive Disadvantages

In the new electricity markets, electric generating companies sell power into the electricity grid and transmission and distribution companies (wires companies) move and deliver the electricity in a competitive market. In this market, generating companies are trying to minimize their operating costs in order to compete, and as a result, most costs of doing business (including environmental regulations) are passed onto customers. Those generating companies that can offer the least expensive electricity will be most competitive in the power markets. A traditional cap-and-trade approach to RGGI will likely increase costs for electric generators in the region in relation to generators outside the RGGI region, including those in adjacent power pools. This introduces a competitive disadvantage for RGGI affected companies.

Increases in Power Imports

Due to the operational characteristics of multi-state power pools, power sold in any given power pool can originate from both inside and outside the pool. As such, electric generating companies not only compete with other companies in the region in which they operate, but also compete with electric generators outside the region.

Recent modeling of a traditional cap-and-trade program for the RGGI states, completed for the Connecticut Climate Change Stakeholder Process, indicates that it is likely that such a policy would result in significant increases in imported power into the region.[1]

The Connecticut modeling illustrates that if a constraint on CO_2 emissions is imposed on electric generating sources in the RGGI states, generators outside the region could gain considerable market share above "business-as-usual" levels.[2] According to the Connecticut modeling results:

[1] Similar to any modeling exercise, the results of the CT modeling are a product of the assumptions that went into the model. For more information on the assumptions, see www.ccap.org and click on Connecticut.

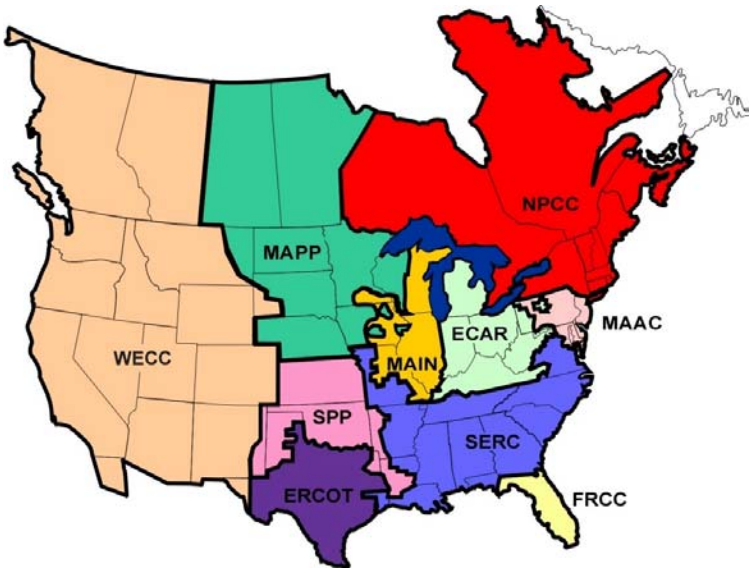
[2] The regional cap-and-trade program modeled by CT was for a 10 state region (excluding Maryland) with the CO_2 caps as follows – 1990 emission levels in 2010, 5% below 1990 emission levels in 2015 and 10% below 1990 emission levels in 2020.

Leakage from the 10-state region occurs in 2010 and after. Net power imports to the 10-state region increase (relative to Reference Case levels) by 26,280 GWh in 2010 and 22,241 GWh in 2015. In 2020, in the Reference Case, the region is a net power exporter. In the policy case, however, it becomes a net importer in 2020, at which time imports total 22,811 GWh.[3]

Emissions Leakage (Increases)

As noted above, generating facilities outside the RGGI region will gain a competitive advantage over those under RGGI jurisdiction due to different regulatory obligations. RGGI will likely increase costs for affected sources, therefore increasing the price the generating facilities are bidding into the market versus those electric generating sources operating outside the cap-and-trade program.

Electric generating sources outside the RGGI states operate under less stringent air pollutant regulations, are therefore higher emitting facilities and have cheaper power production costs. While the RGGI region's average CO_2 emission rates are relatively low, the CO_2 emission rates in power pools west of the RGGI region have higher CO_2 emission rates (see below).



Control Region	Average Annual CO_2 Emission Rate (Fossil Only) 2000	Average Annual CO_2 Emission Rate (Total Energy) 2000
NPCC	1,638	941
MAAC	1,913	1,098
ECAR	2,108	1,913
SERC	2,008	1,345

Source: EPA's eGRID2002 Version 2.01 Location (Operator)-Based NERC Region File (Year 2000 Data).

[3] Based on comparisons between the Reference Case and Combo Case modeling results. See http://www.ccap.org for modeling results.

Unless policy mechanisms are implemented to address this discrepancy, CO_2 emissions are likely to increase outside RGGI states as demand for imported power increases. This so-called emissions leakage could significantly undermine RGGI's success.

In its modeling of a "RGGI-type program", the Connecticut results cited above indicate that the emission reduction benefit attributed to the regional CO_2 cap-and-trade program would be reduced by over 50 percent in 2010 and over 70 percent in 2020 due to the increases in emissions from the increase in power imports.

Allocation Process

Under a cap-and-trade approach implemented with the allocation of emissions allowances to electric generators, there are inevitably winners and losers. Which companies end up on either side of the equation is often determined by how allowances are allocated (e.g., based on heat input or output, fossil fuel only, or total energy). This, in turn, greatly impacts the competitive positions of generating technologies, fuels, and, ultimately, affected companies. As a result, determination of the allocation approach and the final allocations to the affected sources is the most time-consuming and contentious processes of designing a traditional cap-and-trade program.

III. Introduction to the Concept of an EPS

An EPS is an implementation mechanism for a cap-and-trade program that applies an output-based standard (lbs CO_2/MWh) to the portfolios of electric generation resources used to provide retail electricity to customers. Compliance with an EPS is the responsibility of retail electricity suppliers (load serving entities or LSEs), not the electric generating companies. The EPS would require that the seller of electricity (who may or may not own power plants) ensure that the average emission rates of all the generation sources used to meet its customers' electricity needs not exceed specific output-based performance standards. Similar to the approach used in meeting an RPS, LSEs could comply with the standard through the purchase and sale of certificates traded through a generation tracking system.

Output Based Performance Standard

A cap-and-trade program implemented with an EPS would be based on an output-based performance standard that is updated over time. Increasingly, regulators are utilizing output-based approaches to reduce emissions because of their many benefits including incentivizing energy efficiency, clean/zero emitting and renewable technologies, and the fuel neutral nature of the approach.

An EPS could simply be developed as follows:

1) identify an aggregate, tonnage emission reduction goal for affected sources in a given geographical region;
2) identify the projected aggregate electricity demand during the target time period;
3) divide the tonnage goal by the projected aggregate electricity demand, resulting in a standard expressed in lb CO_2/MWh; and
4) update the EPS over time to ensure emissions are being reduced.

Demonstrating Compliance with an EPS

Depending on its implementation, an EPS can be designed to provide retail electricity suppliers with up to three options to meet emissions portfolio requirements. They are:

- securing supply contracts with the appropriate fuel mix,
- trading carbon certificates and
- trading carbon offsets.

First, LSEs can create a portfolio at or below EPS-mandated emissions rates through their power purchases. They can balance carbon-intensive supply with lower-carbon resources. This creates a direct incentive to pursue energy efficiency programs along with zero carbon technologies such solar and wind.

Similar to an RPS, LSEs could also demonstrate compliance with an EPS through a certificate-based trading system. For example, retail suppliers required to demonstrate compliance with an EPS whose actual portfolio emission rate exceeded the EPS could purchase tradable certificates from retail suppliers whose rate was lower than the standard. This is similar to the ability of retail suppliers to purchase renewable energy certificates for compliance with RPS requirements.

Additionally LSEs could also purchase project-based emission reductions from outside the system (otherwise known as carbon offsets). In the case of an EPS, the LSE would be responsible for purchasing carbon offsets for compliance purposes based on the difference in emissions between the EPS rate and the rate it operated at. Depending on the carbon offset implementation rules and criteria, emission reduction projects could originate in the industrial and manufacturing sectors, the agriculture, forestry, waste management sectors and the transportation sector.

State Authority to Implement an EPS

Legislatures in three northeast states (Connecticut, Massachusetts, and New Jersey) have given their respective state environmental agencies authority to establish some form of an emission performance standard for retail electricity suppliers, although the authority granted is constrained as discussed below. Because of the authority granted to these states, Northeast States for Coordinated Air Use Management (NESCAUM) has developed a model rule guidance document for northeast states to use as a template to design their EPS rules.

Connecticut

The Connecticut electric restructuring law authorizes the Department of Environmental Protection (DEP) to establish uniform performance standards for electricity generation facilities supplying power to customers in Connecticut. The legislation declares that the performance standards should be based on fuel used for generation of electricity and targeted at emissions of NOx, SOx, CO_2, CO and mercury emitted per megawatt hour of electricity produced. However, the Connecticut DEP may only establish such an EPS if three of the states participating in the Ozone Transport Commission (OTC), with a total population of at least 27 million, adopt similar standards. This population trigger means that New York would have to be one of the three states.

Connecticut has issued a draft rule for public comment - R.C.S.A. Section 22a-174-34, Emission Performance Standards. That proposed rule contains an EPS of 1,100 lbs CO_2/MWh.

Massachusetts

The Massachusetts electricity restructuring law authorizes the DEP, together with the Attorney General and Department of Telecommunications and Energy, to adopt and implement uniform generation performance standards of emissions per unit of electrical output on a portfolio basis for any pollutant determined by the DEP to be of concern to public health and produced in quantity by electric generation facilities. The legislation states that DEP must have the performance standards in place for at least one pollutant on, but not before, May 1, 2003.

New Jersey

The New Jersey electric restructuring law authorizes the Board of Public Utilities to implement an EPS for all retail electric suppliers if two or more states in the Pennsylvania, New Jersey, Maryland (PJM) control area representing at least 40% of electric usage adopt an EPS. An EPS would require each retail supplier to ensure that the weighted average of all generation resources used to meet its customer load in New Jersey meet specific standards with respect to emissions of NOx, SO2 and CO2.

NESCAUM Model Rule

The NESCAUM EPS Model Rule identifies and recommends output-based emission standards for five pollutants (NOx, SO_2, CO_2, mercury and CO). The level of the EPS stipulated in the Model Rule was not designed to achieve specific emission reduction goals but rather to reflect the status of the NEPOOL region in terms of average emission rates at the time of the report (1999) in order to prevent any backsliding. The purpose of the model rule is to "augment environmental regulations applicable to individual generating facilities in order to prevent disparities in such regulations from creating a competitive advantage for high emitting electric generators." The model rule would require each retail electricity supplier to meet the standards shown in Table 1 below on the basis of a weighted average.[4]

Table 1: NESCAUM Model EPS Rule

Pollutant	EPS (lbs/MWh)
NO_x	1.0
SO_2	4.0
CO_2	1,100
Mercury	Actual emission rate
CO	Reserved

[4] To view the NESCAUM Model EPS Rule see http://www.nescaum.org/workgroups/energy.html

IV. How an EPS Would Address Key Concerns

As noted above, a traditional cap-and-trade approach to RGGI would result in four undesirable outcomes:

- competitive disadvantages for affected sources;
- increased power imports into the region;
- emissions leakage (increased GHG and air pollution emissions) resulting from the increase in power imports, and
- an allocation process that will likely be very contentious.

While the EPS approach deviates from the traditional, allowance-based approaches utilized to date to reduce emissions from the electricity sector, the implementation of an EPS on retail suppliers could provide an attractive alternative. The most attractive aspects of an EPS include its potential to:

1. create a level playing field by reducing emissions associated with serving retail electricity demand in the Northeast;

2. address the issue of power imports and the associated emissions leakage;

3. directly encourage increased energy efficiency, and low/zero emitting and renewable technologies,

4. reduce implementation burden by leveraging existing generation information tracking systems, and

5. avoid an allocation process.

An EPS Creates a Level Playing Field

An EPS is key to ensuring that affected electric generators are not placed at a competitive disadvantage with other companies that operate in the same power pool (and adjacent ones) who are not subject to the regional GHG program. This is will depend on the final geographical extent of the capped region.

As the PJM Power Pool delivers on its plans to expand westward (including parts of West Virginia, Tennessee, Ohio, Indiana, and Illinois) generators will be facing increasing competition and a level playing field will become that much more important. Competitive equality among all electricity generators, with compliance costs reflected in market prices will avoid distortions in the market while insuring that reductions are achieved at least cost.

An EPS Addresses Power Imports and Emission Leakage

The application of an EPS to retail suppliers provides regulators with the ability to limit the environmental impacts of meeting retail electricity demand, regardless of the location and type of generation resources employed by retailers to meet that demand. Any power that is imported into the Northeast to serve retail demand would likely be covered by the

EPS and therefore would minimize or eliminate an increase in higher emitting imports and, as a result, emissions leakage.

An EPS Directly Encourages Energy Efficiency, Low/Zero Emitting and Renewable Technologies

An EPS would likely create additional demand for generating resources that are less carbon intensive such as combined cycle natural gas, and renewable technologies. In addition, an EPS would likely encourage additional investments in energy efficiency at electric generating facilities. An EPS would create a market signal for the cost of carbon that would impact both the electric generators that supply power to the Northeast and those that want to sell power into the region.

An EPS Can Be Implemented with Existing Infrastructure

Electricity tracking infrastructure currently operating and under development in the Northeast could be leveraged to implement an EPS in the region. Currently, retail suppliers must comply with renewable portfolio standards on a state-by-state basis and use tradable renewable energy certificates for compliance purposes. The same information currently tracked for compliance with these programs and for associated "environmental disclosure" requirements could be leveraged to implement an EPS program.

The New England Power Pool (NEPOOL) has adopted a system for tracking the environmental characteristics of the electricity delivered to customers in New England. The PJM Power pool is also currently developing a system similar to NEPOOL's, and New York is also considering development of such a system.

The NEPOOL system is called the New England Generation Information System, or NEPOOL GIS. The GIS is an on-line accounting system that tracks the environmental characteristics of every MWh of electricity generated in or imported into NEPOOL. The system tracks all types of electricity, including renewable, fossil, and nuclear, by assigning an electronic certificate to every megawatt-hour of electricity delivered to the grid.

The PJM system is called the generator attribute tracking system (GATS). GATS is a database that is able to track the electric generation by MWH or smaller increment, and its ownership from the point of generation through any number of wholesale transactions, the end retail supplier, and finally and its to end user. While the PJM GATs details are, as yet, not finalized, linkages with the NEPOOL GIS are being explored.

An EPS Avoids an Allocation Process

Given the differences in electric generating sector CO_2 emissions profiles between the RGGI states, a traditional cap-and-trade program based on allowance allocations to affected sources would result in large reductions in some states and fewer (even possibly increases) in others. Depending on the allowance allocation methodology and baseline, companies may obtain a larger or smaller allocation. Because these allocations have a have direct financial implications for these companies, they will lobby to obtain the

largest allocation possible. As a result, the allocation process will likely be the most contentious aspect of the program design. An EPS could avoid this contentious issue by removing the allocations from the equation entirely resulting in a far more politically viable implementation process.