



Mass-based and Rate-based Comparison

December 21, 2015

Revision History

Date or Version Number	Author	Change Description	Comments
11/24/2015	Sam Ellis	Initial draft	
12/9/2015	Sam Ellis	Incorporated feedback from CPPTF, et al	
12/21/2015	Sam Ellis	Further feedback from CPPTF	

One of the goals of the Clean Power Plan Task Force of the Strategic Planning Committee (“CPPTF”) is to perform a qualitative assessment of rate-based and mass-based approaches. The CPPTF has had qualitative discussions on the relative advantages and disadvantages of mass-based and rate-based approaches (which are summarized below) and, in doing so, has concluded that the amount of flexibility afforded by compliance plans ultimately plays a larger role in regional reliability and cost effectiveness than whether a mass-based or rate-based approach is utilized.

Determining supply of allowances and credits

Using the proposed mass-based methodology, the total number of available allowances is known at the beginning of each compliance period. Because the supply of allowances is known in advance, there is arguably greater economic certainty that can be attached to trading of allowances, particularly in forward markets, which could facilitate greater market liquidity in the long-run.

Price-certainty related to allowances enhances market participants’ ability to understand production costs and formulate accurate market offers, which facilitates efficient market dispatch based on offers that reflect more definitive cost information.

Since the total allowances are pre-determined based on projections, one potential disadvantage of the mass-based approach is that states experiencing higher load growth than anticipated may find the mass-based caps more burdensome than rate-based compliance.

Under the proposed rate-based approach, certain types of resources generate emissions rate credits throughout the compliance period that can be applied to other resources in order to bring each resource’s overall emissions rate below a required target (pounds of CO₂ per MWh of output). Since the generation of credits is not known in advance, forward markets may be inflated to reflect additional risk premiums associated with the uncertainty of how many credits will be available in future periods. However, additional credits can be generated based on demand, and so there may be less long-term economic scarcity impact associated with a rate-based approach since the supply of credits is not fixed.

An additional complicating factor in the rate-based approach is that there is potential that credits submitted for compliance may not be valid, and the risk of its validity lies with the resource owner who submitted the credits to demonstrate compliance. The uncertainty, along with measures (such as third party verification services) that might be used to offset this risk, could increase the expense of compliance under a rate-based approach.

Monitoring, verification and tracking

The proposed mass-based approach is more similar to existing EPA compliance programs, such as ARP SO₂ trading program, NO_x Budget Trading Program, CAIR, and CSAPR. The EPA states that most generation resources already have the monitoring in place to track emissions against a mass-

based approach. Hence, compliance with a mass-based plan may be easier, and, therefore, arguably, measurement and verification under a mass-based plan may be less expensive.

Under a rate-based approach, new monitoring and tracking mechanisms might be necessary, resulting in more expense and effort than would be required under a mass-based approach. Also, the EPA states that any liability for the validity of an emissions rate credit is associated with the resource owner who submits the credit as part of its compliance, so trading credits may be more risky than trading allowances. Energy efficiency credits are more difficult to verify than credits generated from more direct methods, such as from renewable energy sources.

Issues with allocation

Under a mass-based approach, there are different ways allowances can be allocated to resource owners. The allocation plans ultimately lie with entities responsible for developing the compliance plans. Although SPP has no position on particular allocation methods, there are two issues that are worth noting in terms of their potential impact to SPP's functions that relate to the proposed benchmarks for allocations under the mass based FIP proposal and the treatment of infrequently used resources.

The first issue relates to the allocation method proposed in the federal plan. In its proposed mass-based plan, the EPA proposes to allocate allowances to resource owners based on historical generation (MWh) levels. Alternative approaches could also be considered, such as an allocation based on the emissions rates of the individual resources. Differing approaches will result in different costs between owners of resources with higher and lower levels of carbon emissions. These different costs have the potential to alter regional dispatch of the units.

Second, the EPA also plans to consider resources that haven't produced energy for a period of time to be retired, and the allowances associated with those generation resources that are considered retired will be reallocated. This provides resource owners with the incentive to keep potentially inefficient resources from retirement in order to retain the allowances associated with them and, as a result, may undermine market efficiency in the long run.

States may propose allocation methods of allowances, either as part of a federal plan or as part of a state plan. The process for each state's determination of the best method of allocation could become contentious.

In a rate-based plan, resources are assigned a target emissions rate and can meet that rate either by reducing CO₂ emissions or applying rate credits to bring its overall rate below the assigned target. Hence, the rate-based approach avoids much of the allocation contention that the mass-based approach could entail. Some resources, such as certain coal plants, will have to procure credits generated from other resources to comply since they cannot lower their emissions rate below their assigned cap.

Leakage under mass-based plans

Under rate-based plans, the EPA has no concerns about shifting generation to resources not subject to the requirements of 111(d), known as “leakage”. Under a mass-based plan, however, the EPA has concerns with incentives to shift energy production to generation not subject to the requirements of 111(d). The EPA requires states to address such leakage in their plans, and they have proposed establishing a set-aside in the federal plan to reduce incentives for leakages to occur. Based on interactions with states and various stakeholders, leakage is one of the more contentious concepts in the mass-based plan, with some asserting that the EPA has no authority to require mitigation of potential leakage.

The way in which leakages are addressed may have an impact on the supply (and, as a result, cost) of allowances. In some cases, it may be possible to demonstrate that leakage would not occur under a state plan, to the extent that a state’s integrated resource planning processes are informative and dependable. The EPA has encouraged states to expand their compliance plans to include resources not subject to 111(d) as a way to demonstrate leakage would not occur, which would lead to more restrictive output for a larger portion of resources, which decreases supply of allowances overall.

Reliability Implications

As discussed earlier, the mass-based portion of the federal plan proposes reallocating allowances (eventually) for retired resources. This provides some incentive for resource owners to keep inefficient resources available at some minimum level in order to provide credits. Over time, the fleet of resources, particularly in certain constrained areas, may become less responsive and, therefore, less effective in helping resolve reliability issues.

Although both approaches provide incentives to construct renewables, the proposed federal rate-based plan allows newer low-carbon resources (such as renewables) to generate rate credits while existing ones cannot. Thus, rate-based plans may have more incentive to add renewables than mass-based plans since, under a mass-based plan, any low-carbon resource generation contributes toward reducing the number of allowances required, when it replaces higher CO₂ generation. Since most renewables in SPP’s system are not synchronized generation, the challenges with associated planning and reliability coordination will increase as asynchronous generation is added to the system.