A Mechanism to Adjust Mass-Based CO_2 Goals for Changes in Load Growth Under the Clean Power Plan

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NORTHBRIDGE

CONTEXT — Facilitating CO_2 Mass Goals

- Under the Clean Power Plan (CPP) as proposed in June 2014, states may comply by adopting either a CO_2 emission rate goal (expressed in lbs of CO_2/MWh) or a mass goal (expressed in tons of CO_2 per year).
- Since the CPP proposal was released, many stakeholders have discussed their concerns with CO_2 rate goals, the advantages of mass goals* and how EPA could facilitate states' choice of mass goals.
- In response to state and other stakeholder requests for guidance regarding how the CPP's proposed emission rate goals could be translated into mass goals, EPA issued a Technical Support Document (TSD) in November 2014 describing two illustrative translation methodologies.
- Importantly, the methodology for existing and new fossil sources relies in part on a forecast of state load growth over time.**

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* The problems with rate goals include their administrative complexity, higher compliance costs and risk of unintended adverse impacts on electric markets and emissions, while the advantages of mass goals include their familiarity, the opportunity to allocate allowances for public purposes and their consistency with likely long term carbon policies.

** U.S. EPA, "Technical Support Document: Translation of the Clean Power Plan Emission Rate-Based CO2 Goals to Mass-Based Equivalents," at 6-8 (Nov. 2014), *available at*: http://www2.epa.gov/sites/production/files/2014-11/documents/20141106tsd-rate-to-mass.pdf. For other examples of methodologies incorporating load growth expectations into mass goals, see the December 1, 2014 NorthBridge Group whitepaper "Translating Emission Rate Goals to Mass Goals Under the Clean Power Plan."

- This has raised two concerns:
  - Actual load growth may differ from the growth forecasts used to translate rate goals into mass goals.
  - More generally, some parties – especially those located in states and regions with relatively high load growth expectations – have questioned whether mass goals might constrain states' economic growth over time.
- By providing a methodology by which mass goals are adjusted to reflect actual load growth, EPA could address these concerns, facilitate states' choice of mass goals and protect the environmental integrity of the CPP.***
- Accordingly, these materials recommend a mechanism to adjust mass goals for the difference between forecasted and actual levels of state electric load. The proposed mechanism also accounts for experience with energy efficiency so as not to create disincentives energy efficiency investments.

*** The concept of adjusting mass goals over time was raised in comments filed with EPA by a group of 16 prominent economists (Borenstein, Bushnell, Davis, Fowlie, Goulder, Holland, Hughes, Greenstone, Knittel, Kolstad, Kothen, Stavins, Wara, Wolak and Wolfram), as well as by the Sierra Club and Calpine. More recently it has been raised by the Bipartisan Policy Center and Great Plains Institute in its report titled "Choosing a Policy Pathway for State 111(d) Plans to Meet State Objectives," Franz Litz and Jennifer Macedonia, April 2015.

TRUE UP MECHANISM — Process & Timing

A load growth true up mechanism could work as follows.

- As part of its State Plan filing, a state electing to comply using a mass goal that would be adjusted over time would:
  - Establish a "baseline" mass goal for each CPP compliance period (note these materials assume that such mass goals would cover both existing and new sources)
  - Commit to using a methodology and process, prescribed by EPA and uniform across states, for adjusting the baseline mass goal in future years.
- During the CPP compliance period, the true up could be performed annually or periodically (for instance, every second or third year).
- Any adjustments to the baseline goals would be prospective. For example, for a one year true-up period, an adjustment determined in 2022 based on 2021 data would modify the 2023 baseline goal.
- The last adjustment, which would modify the final 2030 mass goal, would be done at the end of the interim compliance period.

TRUE UP MECHANISM — Tonnage Adjustment

The baseline mass goal, established in the State Plan, would be adjusted during the compliance period as follows:

- Tonnage Adjustment to a State's Baseline Mass Goal:
  - CO_2 Tonnage adjustment = (actual state electric load minus "benchmark" state electric load) times the state emission rate
  - Example: (130 TWh actual load – 125 TWh benchmark load) * 1000 lbs/MWh = 2.5 million ton CO_2 increase in the mass goal
- Benchmark Load:
  - The benchmark load would be the business-as-usual (that is, without the CPP) electric load forecast used in the rate to mass goal translation methodology less the energy efficiency (EE) reductions realized under the CPP.
  - The EE adjustment is necessary to isolate the effect of economic activity on electric load and avoid deterring or penalizing states for successful EE programs.
  - The following slide outlines two ways to calculate the benchmark load.
- The emission rate would be the same as in the rate to mass goal translation methodology in the state plan.
- The tonnage adjustment to the baseline mass goal could increase or decrease the baseline goal.

This true up process should result in an adjusted mass goal consistent with the baseline goal had it been calculated using what turned out to be actual load growth.

TRUE UP MECHANISM — Benchmark Load

Two options for calculating the benchmark load without creating disincentives for EE programs are shown below.

1. Benchmark = Load forecast without the CPP less actual as-measured EE savings
   - This would be the most rigorous approach as it would reflect the impact of both EE program design and performance on actual future electric loads

Examples of Alternative State Plans and EE Outcomes	Load Data In State Plan			Load and EE Calculations in True Up					
	Estimated Future Year Generation without CPP (TWh)	Estimated Future Year EE Savings with CPP (TWh)	Estimated Future Year Generation with CPP (TWh)	Actual As-Measured EE Savings Achieved (TWh)	Load Benchmark for True Up (TWh)	Load Growth Outcomes			
						High Load		Low Load	
						Actual Load (TWh)	Load Adjustment (TWh)	Actual Load (TWh)	Load Adjustment (TWh)
	1	2	3	4	5	6	7	8	9
	input	input	1 - 2	input	1 - 4	input	6 - 5	input	8 - 5
State Plan includes EE; EE Performs as Expected	135	10	125	10	125	130	+5	120	-5
State Plan does not include EE Programs	135	0	135	0	135	140	+5	130	-5
State Plan includes EE; EE Program Under Performs	135	10	125	5	130	135	+5	125	-5
State Plan includes EE; EE Program Over Performs	135	10	125	15	120	125	+5	115	-5

2. Benchmark = Load forecast without the CPP less EE savings estimated in state plan
   - This would reflect the impact of EE program design but not performance.
   - In the table above, column 2 rather than column 4 would be used to determine the benchmark.