

SIMPLIFYING ENERGY EFFICIENCY FOR STATES



Utilizing and Incentivizing Energy Efficiency-Related Greenhouse Gas
Reductions under the Clean Power Plan's Mass-Based Approach

January 15, 2016

Overview

- 1 How States Can Incorporate Energy Efficiency
- 2 Illustrating the Tragedy of the Commons in a Mass-Based System
- 3 Allowance Allocation Options in a Mass-based system (Option 1)
- 4 Allowance Allocation Options in a Mass-based system (Option 2)
- 5 Recommended Next Steps

How States Can Incorporate Energy Efficiency

1

States look up the total GHG reductions from registered energy efficiency projects in their state using the national registry

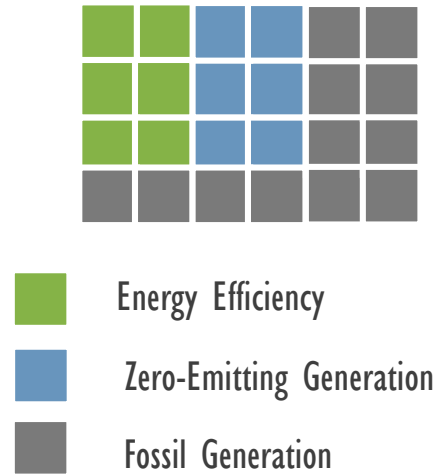
Energy Efficiency Projects

Project	MWh Saved	Tons CO ₂ reduced
A	3	2
B	6	4

6 Tons of CO₂ saved

2

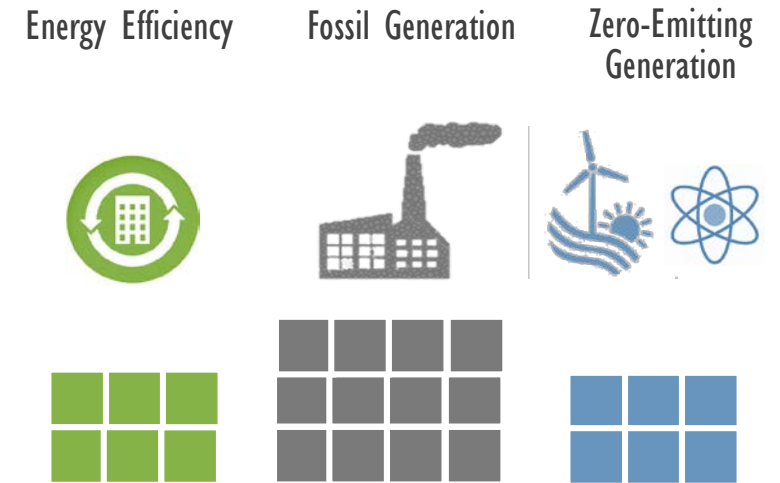
The state designates allowances equal to the avoided tons of GHG to efficiency projects



6 allowances for EE

3

The state distributes allowances



Effective Credit Mechanism

Illustrating the Tragedy of the Commons in a Mass-Based System

Suppose a regulated EGU receives 750,000 allowances

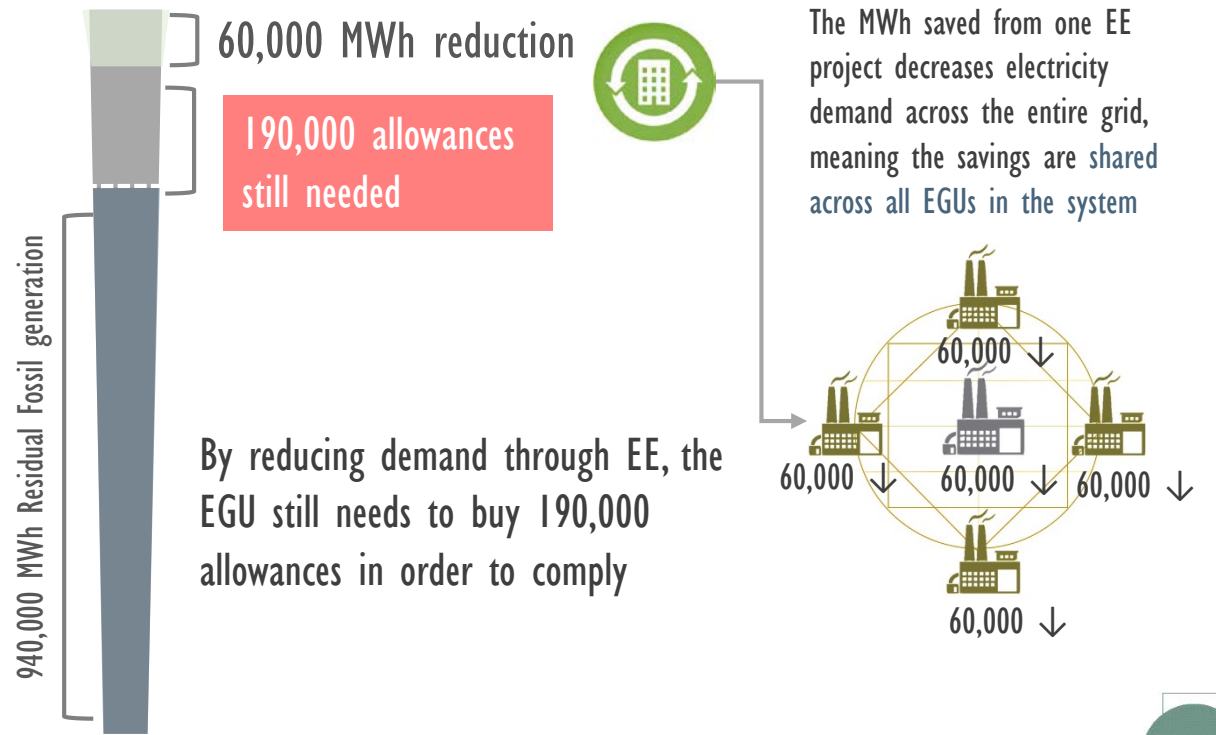
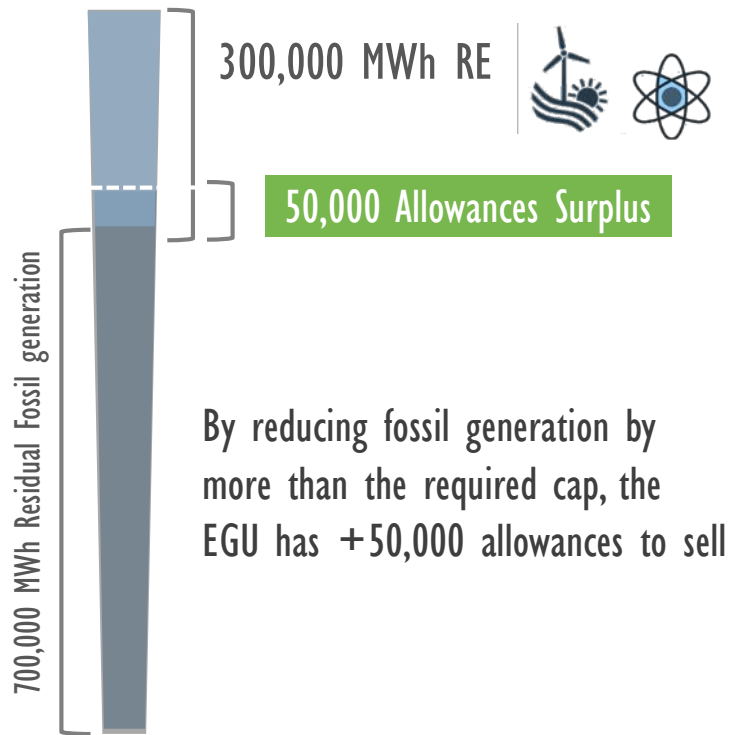
SCENARIO PARAMETERS



2 Potential Compliance Scenarios

- ① EGU Switches 300,000 MWh to zero-emitting sources
- ② EGU Reduces 300,000 MWh electricity demand through EE

Without adequate credit for GHG reductions, EE will be excluded as a compliance option despite being a proven, low-cost means of reducing CO₂



Allowance Allocation Options in a Mass-based system

OPTION 1 – DIRECT ALLOCATION PROCESS (IN LIEU OF SET-ASIDES)

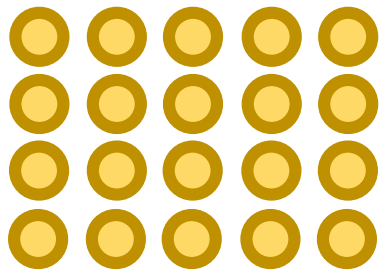
States allocate allowances to projects according to the registered tons of GHG reductions since the prior allocation



Distribution Process Based on Prior Year Savings

Allocating allowances to registered Cleantech projects that generated savings in the previous year guarantees that only projects with verified electricity savings receive allowances

ALLOCATION FORMULA



Total Allowances Available

For allocation by a state in an allocation period



Tons of GHGs reduced by EE and RE

Since the state's prior allocation by appropriately verified and registered projects



Total Allowances Remaining

Remaining allowances available for allocation by a state
Option 2 describes how to allocate remaining allowances on an output basis to EGUs

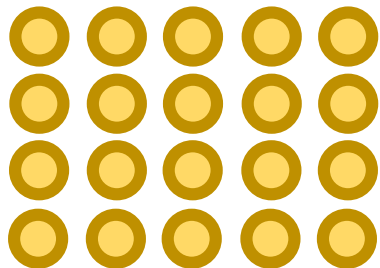
Allowance Allocation Options in a Mass-based system

OPTION 2 – OUTPUT-BASED ALLOCATION APPROACH

1 States calculate allowance rate for EE, RE, and new nuclear (as in Option 1)

2 States calculate allowances for GHG reductions from EE, RE, and new nuclear registered since the prior allocation (as in Option 1)

3 Calculate Total Available Allowances Remaining for EGUs (as in Option 1)



Total Allowances Available

For allocation by a state in an allocation period



Tons of GHGs reduced by EE, RE, and New Nuclear

Since the state's prior allocation by appropriately verified and registered projects



Total Allowances Remaining

For allocation by a state to EGUs

4 Calculate Number of Allowances for Fossil EGUs weighted to provide greater incentive for less-emitting generation

- Natural gas units will receive more allowances per ton of CO₂ emitted than coal units because they are more efficient and less carbon intensive

Allowance Allocation Options in a Mass-based system

OPTION 2 – OUTPUT-BASED ALLOCATION APPROACH

States allocate allowances based on a resource's contribution to the grid; lower-emitting sources rewarded with allowances in greater proportion to higher-emitting ones

STATE ILLUSTRATION EXAMPLE

1 Calculate allowance rate for EE, RE, and NUC

$$\left(\frac{\text{Avg. State Fossil Rate in Lbs/MWh}}{\text{Lbs per ton}} \right) = \left(\frac{1,500}{2,000} \right) = 0.75 \text{ Allowances per MWh}$$

2 Calculate allowances for EE, RE, and NUC

$$0.75 \text{ Allowances per MWh} * 50,000,000 \text{ MWh} = 37,500,000 \text{ Allowances to EE, RE, Nuc}$$

3 Calculate Total Available Allowances Remaining

$$TAAR = 66,000,000 \text{ (cap tons)} - 37,500,000 \text{ (RE, EE, Nuc)} = 28,500,000 \text{ Total Avail. Allowances Remaining}$$

4 Calculate # of allowances for Fossil EGUs

$$EGU \text{ Allowances} = \left(\frac{(28,500,000) * 1,500}{2,250} \right) * 45,000,000 = 11,400,000 \text{ allowances for coal}$$

$$EGU \text{ Allowances} = \left(\frac{(28,500,000) * 1,500}{1,000} \right) * 30,000,000 = 17,100,000 \text{ allowances for NGCC}$$

Assume Mass-based cap of 66,000,000 tons of CO₂

Source Category	Generation or Savings (MWh)	Emissions Rate (lbs. CO ₂ /MWh)	CO ₂ emitted (tons CO ₂)
COAL	40,000,000	2,250	45,000,000
NGCC	60,000,000	1,000	30,000,000
EE, RE, NUC	50,000,000	0	0
Avg. Fossil Emission Rate (lbs. CO ₂ /MWh)		1,500	

An output-based allocation approach is the most direct, simple means of creating a market incentive to decarbonize the generation and use of electricity

$$\left(\frac{\left(\frac{TAAR}{\text{State fossil tons}} \right) * \text{Avg. Fossil Emission Rate}}{\text{emissions rate of fossil EGU}} \right) * \text{Tons emitted by EGU}$$

Allowance Allocation Scenarios in a Mass-based system

OUTPUT-BASED VS. HISTORICAL EMISSIONS

Allocation Scenarios

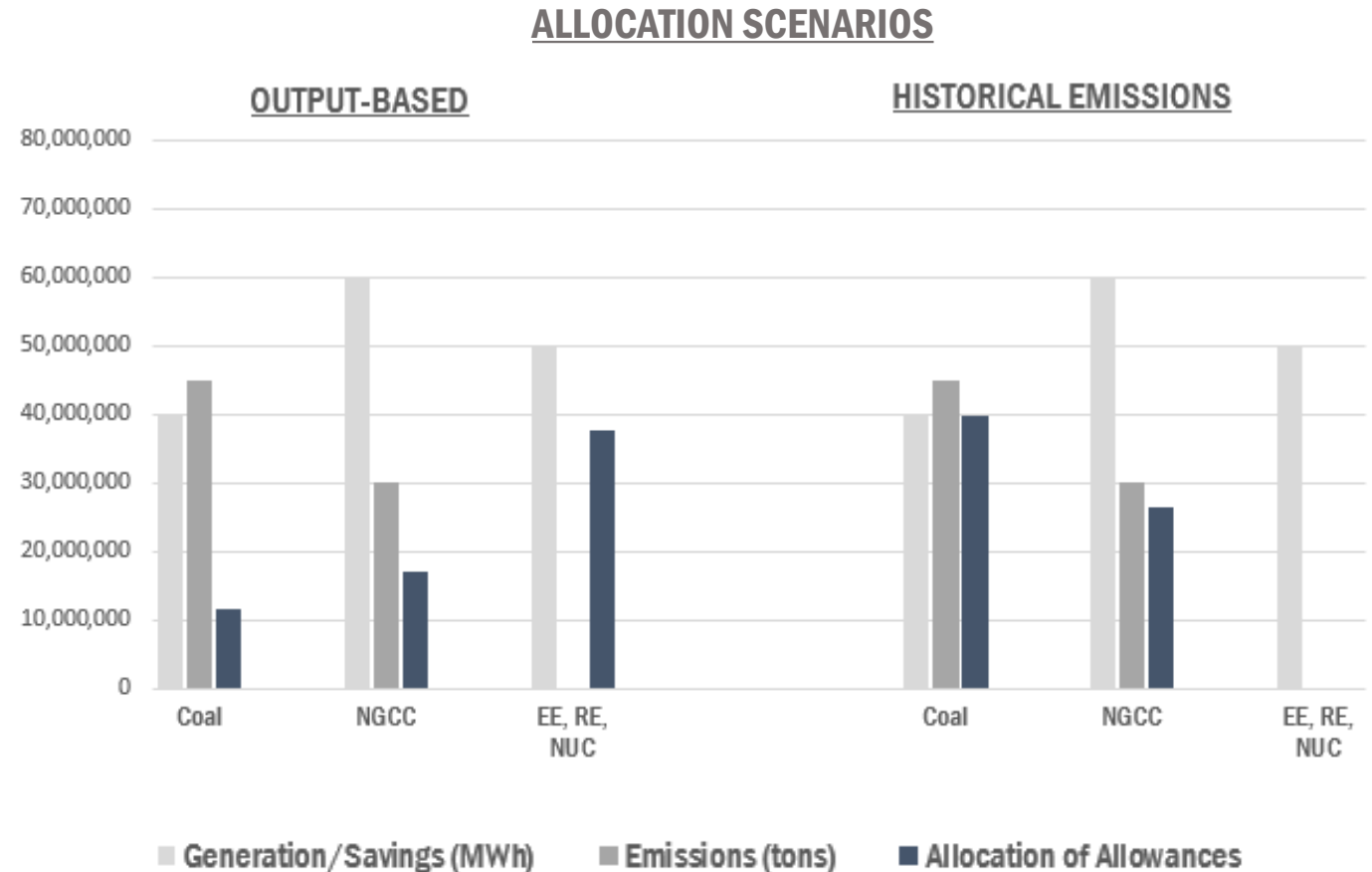
OUTPUT-BASED

How an allocation would occur in the state illustration shown on slide 7 that implements the output-based allocation approach in Option 2

HISTORICAL EMISSIONS

How an allocation would occur in the state illustration shown on slide 7 that implements an allocation where allowances are given to fossil EGUs in proportion to their historical emissions.

This output-based allocation approach incentivizes and rewards investment in cleaner sources with allowances that can be used to reduce the cost of compliance with the CPP



Recommended Next Steps

FOR EPA

- Include an allowance allocation process (from options provided) in the final Model State Plans and supporting materials.
- Dedicate appropriate staff and financial resources to the implementation of an energy efficiency project registry.
- Develop necessary guidance for states describing a process for allocating allowances with the purpose of incentivizing and recognizing the CO₂ emission reduction contributions from energy efficiency projects and programs.
- Support states during CPP implementation plan development to enable the creation of clear and simple allocation procedures that will enable monetization of CO₂ emission reductions from energy efficiency projects.

FOR STATES

- Include an allowance allocation process in mass-based state plans to enable the monetization of CO₂ reductions from energy efficiency projects.
- Recognize one or more EPA-accredited energy efficiency project registries to reduce state administrative costs to implement the CPP.



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