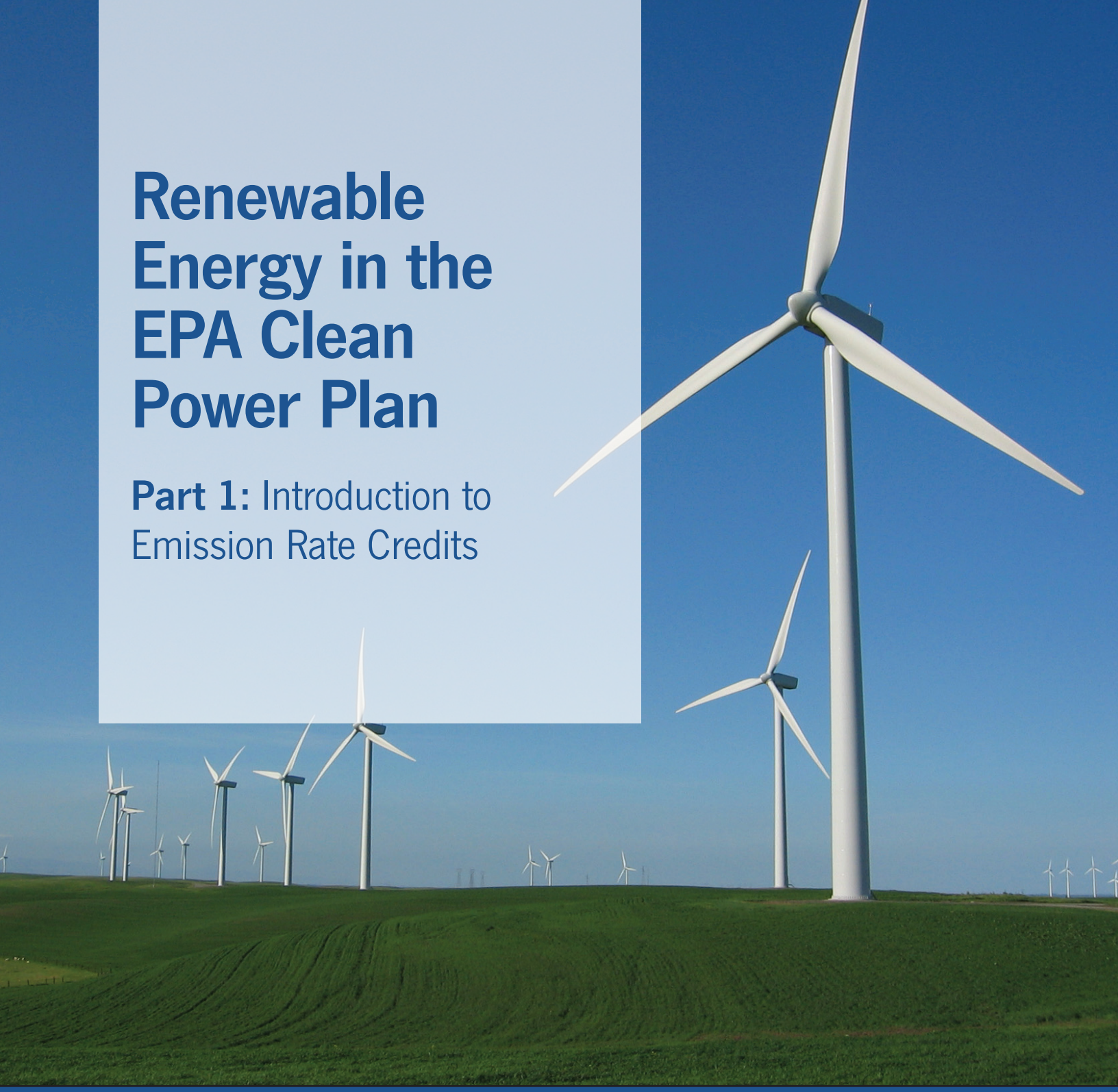
Renewable Energy in the EPA Clean Power Plan

Part 1: Introduction to Emission Rate Credits



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Todd Jones
Senior Manager,
Policy and Climate Change Programs
Center for Resource Solutions

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Background

The U.S. Environmental Protection Agency (EPA) released the final Clean Power Plan (CPP) on August 3, 2015. The CPP gives states a choice of adopting a "rate-based" or a "mass-based" carbon dioxide (CO_2) emissions target for existing electric power plants. A rate-based target is established in pounds of CO_2 per megawatt-hour (lbs of CO_2/MWh) and a mass-based target in tons of CO_2 per year.

Measures and activities like renewable energy (RE) and energy efficiency reduce mass CO_2 emissions at regulated fossil plants (electric generating units or "affected EGUs") by replacing that generation either with zero- or low-emitting generation or a reduction in electricity demand (i.e. avoiding the need for the generation altogether). These measures are automatically accounted for in mass-based compliance, which relies exclusively on reported stack emissions of regulated plants. However, RE and energy efficiency, along with other measures that substitute low- or zero-emitting generation or energy savings for fossil power generation, will not affect the emissions rate of fossil plants. States using rate-based targets and compliance must perform an explicit adjustment to their rates to reflect these measures and activities.[1]

The EPA has created a new instrument called an Emission Rate Credit (ERC) to use for this adjustment. ERCs will be used to track and account for emissions reductions that can be used to adjust a rate in states with rate-based plans.

What Is an ERC?

An ERC is a compliance-only and CPP-only instrument that is tied to[2] and authorized under[3] a rate-based state plan. ERCs are denominated in whole MWh.[4] ERCs are not a RE-only instrument and can be issued to other generation and non-generation activities as well[5] (see the section below on ERC Issuance). The final CPP provides several definitions, including:

> "ERCs [represent] the emissions-reducing effects of specific activities;"[6]
>
> "[ERCs are] instruments representing the ability of incremental electricity generated by [natural gas combined cycle] NGCC[/RE] units to cause emission reductions at affected steam[/affected] EGUs, as distinct from the incremental electricity itself;"[7]
>
> "ERCs [are] a tradable compliance unit representing one MWh of electric generation (or reduced electricity use) with zero associated CO_2 emissions;"[8]
>
> "These [ERC] MWh are added to the denominator of an affected EGU's reported CO_2 emission rate, resulting in a lower adjusted CO_2 emission rate;"[9] and
>
> "The EPA defines an ERC in the emission guidelines as a tradable compliance instrument that represents a zero-emission MWh (for the purposes of meeting the emission guidelines) from a qualifying measure that may be used to adjust the reported CO_2 emission rate of an affected EGU subject to a rate-based emission standard in an approved state plan under CAA section 111(d)."[10]

An ERC is also identified as representing an "environmental attribute."[11]

ERCs are to be used only by an affected EGU in demonstrating compliance with a rate-based target in an approved state plan.[12] For each submitted ERC, one MWh is added to the denominator of the rate,[13] as shown below:

$$CO_2 emission\ rate = \frac{\sum M_{CO2}}{\sum MWh_{op} + \sum MWh_{ERC}}$$

> "Where:
>
> CO_2 emission rate = An affected EGU's calculated CO_2 emission rate that will be used to determine compliance with the applicable CO_2 emission standard.
>
> MCO_2 = Measured CO_2 mass in units of pounds (lbs) summed over the compliance period for an affected EGU.
>
> MWh_{op} = Total net energy output over the compliance period for an affected EGU in units of MWh.
>
> MWh_{ERC} = ERC replacement generation for an affected EGU in units of MWh (ERCs are denominated in whole integers as specified in paragraph (d) of this section)." [13]

There appears to be no voluntary or other purpose or claim associated with acquiring and retiring an ERC, other than perhaps keeping a MWh from being used for compliance, which may be valuable to customers purchasing

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RE to achieve "regulatory surplus" (which is discussed further in Part 2).

The final rule requires that all adjustments to rates be "based on quantified and verified MWh from qualifying zero-emitting and low-emitting resources."[15] ERCs are the required form of such MWhs, and, according to the EPA, the only acceptable mechanism for making such an adjustment, as well as the only acceptable instrument used to track and trade such MWh under the CPP.

Finally, the EPA is clear that ERCs are separate from any other instruments that may be issued for a MWh of energy generation or energy savings from a qualifying measure, and which may be issued for use in meeting other regulatory requirements, such as state Renewable Portfolio Standard (RPS), or for use in voluntary markets (e.g. renewable energy certificates [RECs]).[16] The EPA acknowledges that ERCs may be issued based on the same data and verification requirements used by existing REC tracking systems for issuance of RECs.

ERC Issuance

ERCs are issued by the administering state regulatory body to 1) affected EGUs that emit below a specified CO_2 emission rate ("reference rate") and 2) "qualifying measures" that provide substitute generation for affected EGUs or avoid the need for generation from affected EGUs.[17] Qualifying measures include RE, demand-side energy efficiency, and other measures such as demand side management, transmission and distribution measures, energy storage, water system efficiency, combined heat and power, waste heat power measures, and incremental nuclear generation.[18] The state regulatory body (or its "agent") issues ERCs to the tracking system account of the provider of the approved program or project (see the section below on ERC Tracking).[19]

Regulated fossil fuel plants (affected EGUs) can generate ERCs where the reported emissions rate of the plant is lower than the specified reference rate. The reference rate can either be a single rate-based standard that applies to all affected EGUs in the state or a rate-based standard for the specific type or subcategory of EGU, e.g. a fossil fuel-fired electric utility steam generating unit or a stationary combustion turbine, if the state plan was set up that way.[20] In the case that a state uses separate rate-based standards for subcategories of EGUs (e.g. coal and natural gas), then NGCC plants can also generate ERCs for expected incremental generation that substitutes for generation from affected coal plants.[21] The accounting for this would be consistent with the EPA's application of "building block 2" in calculating rate-based targets, which is based on use of incremental generation from affected stationary combustion turbines to replace generation from affected steam generating units.[22] Importantly, "the EPA is requiring that a NGCC unit is not able to use ERCs generated by it or any other NGCC unit's building block 2 incremental generation."[23]

For qualifying measures, ERCs are only issued for generation or savings produced on or after January 1, 2022, to a qualifying measure installed after 2012.[24] There are also early action ERCs under the Clean Energy Incentive Program (CEIP) for reductions between 2020 and 2021.[25]

Apart from the eligibility date, the EPA sets other minimum requirements for measures used to adjust rates, including demonstration that measures substitute for grid generation; geographic eligibility requirements; and requirements specific to RE, demand side management, energy storage, transmission and distribution measures, water system efficiency, nuclear, combined heat and power, and waste heat power measures.[26] Requirements for RE include that generation is properly quantified and verified and specific eligibility requirements for post-2012 increases in capacity ("capacity uprates"), hydropower, biomass, and waste-to-energy.[27]

For RE and energy efficiency, measures installed after 2012 are considered eligible—that is, incremental—although only the generation and savings that they produce in 2022 and after can be used to adjust a rate.[28] This includes all generation from RE facilities built after 2012 as well as the generation associated with capacity uprates at RE facilities built in 2012 or before.[29] The final rule does not restrict ERC issuance to specific renewable technology types. It defines RE as "electric generating technologies using RE resources, such as wind, solar, geothermal, hydropower, biomass, and wave and tidal power."[30]

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The EPA requires that all ERC projects register and be validated with a rate-based state or its agent.[31] It also requires independent verification of all ERCs and monitoring in accordance with an Evaluation, Measurement and Verification (EM&V) plan that is included in the state plan. The EM&V plan must document how all MWh saved and generated from eligible measures will be quantified and verified.[32] The project or provider of the measure must submit monitoring and verification (M&V) reports to the state documenting the results of the project, quantified in actual MWh savings or generation according to the EM&V plan, but always on a retrospective (ex-post) basis[33] and verified by an accredited independent verifier.[34] The frequency of verification will be determined by the state, though the EPA recommends annual reporting. States can specify different reporting periods for different ERC types (e.g. RE, energy efficiency, etc.). State plans must also set qualifications for verifiers.[36]

The EPA does not specify the timing of ERC issuance relative to generation, energy savings, or avoided generation at the qualifying measure, other than that issuance must be ex-post—occuring after verification has been completed. Ostensibly, the timing of ERC issuance could vary by state and/or tracking system.

ERC Issuance for Out-of-State Measures

ERCs can be issued for out-of-state qualifying measures. ERCs and ERC measures must be tied to an approved rate-based state plan, but these measures may occur inside or outside the state.[37] The state that issues the ERC is the state to which the ERC provider applies for issuance, which could be the rate-based state in which the qualifying measure is located or a different rate-based state. According to the EPA, an ERC provider (qualifying measure) is free to apply for ERC issuance in any rate-based state that will accept its application, without needing the permission of the state in which it is located and regardless of the trading relationship between the state in which the provider is located and the state to which the provider applies for ERC issuance, if any. An exception may be where the Public Utilities Commission (PUC) or another state agency regulates the ERC-provider (e.g. the PUC regulates a renewable energy generator owner because, for example, it is a utility-owned and operated facility in a regulated state). In this case, the state, through that agency, may be able to restrict or regulate where the providers apply for ERCs. Otherwise, ERC providers are free to choose their state.

States may restrict ERC issuance beyond the minimum ERC eligibility qualifications in the final rule. In this case, according to the EPA, any ERC providers that do not meet a particular state's criteria may apply for ERC issuance in other states where they meet the issuance criteria.

The EPA has also confirmed that all of the ERCs issued to a qualifying measure must be issued by one state—i.e. no issuance is permitted in different states for different portions of the generation, energy savings, or avoided generation at a particular qualifying measure.

Once ERCs are issued by a state, trading and use of those ERCs is circumscribed by that issuing state in accordance with the trading relationships it establishes with other states (see the section below on ERC Trading). In other words, a state may determine in which state or states the ERCs that it issues may be traded and therefore into which states the provider can sell its ERCs.

ERCs cannot be issued for qualifying measures located in a mass-based state, except for renewable energy generation where the energy is delivered to meet load in a rate-based state (which does not necessarily need to be the state where the ERC is used).[38] The corresponding burden of proof rests with the rate-based state and the EPA gives states flexibility regarding the nature of this demonstration (which is discussed further in the section on Double Counting below).[39]

ERCs can be issued for qualifying measures located in a state with no emission reduction obligations (e.g. Vermont), provided they are connected to the contiguous U.S. grid and meet the other requirements for eligibility (installed after 2012; EM&V standards; etc.).[40] As with RE located in a mass-based state, to issue ERCs from RE in these areas, it must be demonstrated that the generation was delivered to the grid to meet electricity load in a state with a rate-based plan.[41] Non-contiguous states and territories (e.g. Alaska, Hawaii, Guam, and Puerto Rico) may not be providers of ERCs to

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the contiguous U.S. states.[42] Regarding international ERCs, the EPA says it will work with states interested in allowing the use of ERCs from RE located outside of the U.S. Again, all eligibility criteria for ERC issuance must be met, the country generating the ERCs must be connected to the U.S. grid, and there must be a power purchase agreement or other contract for delivery of the power with an entity in the U.S.[43]

ERC Tracking

ERCs must be tracked from issuance to submission for compliance in an EPA-administered or EPA-approved tracking system.[44] The EPA does not require any particular geographic scope for tracking systems, leaving open the possibility of single-state tracking systems, multi-state regional tracking systems, or a national tracking system.[45] In the case of multiple single-state or regional tracking systems, nationwide ERC trading would require that tracking systems be "interoperable."[46]

ERC tracking systems must ensure the exclusive ownership, transfer, and retirement of ERCs such that each ERC may be traced back to the program or project for which it was issued and is only used once by an affected EGU for compliance. The EPA says that this can be achieved by using unique identifiers (e.g. serial numbers), which are required for each issued ERC, and specific requirements for tracking system account holders, ERC issuance, ERC transfers among accounts, and compliance true-up for affected EGUs.[47] Tracking systems also must provide transparent, electronic, public access to information about program and project eligibility applications, including EM&V plans, M&V reports, and regulatory approvals.[48] The EPA is exploring its options for supporting the development and/or administration of tracking systems, and will be producing an "initial scoping assessment" of tracking system support needs and functionality.[49]

The EPA clearly articulates the possible use of existing tracking systems to track ERCs:

> "For energy generating resources, including RE resources, states may leverage the programs and infrastructure they have in place for achievement of their RPS and take advantage of registries in place for the issuance and tracking of RECs. Many existing REC tracking systems already include well-established safeguards, documentation requirements, and procedures for registry operations that could be adapted to serve similar functions in relation to the final emission guidelines. For example, a key element of RPS compliance in many states that parallels the final rule's requirements is that each generating unit must be uniquely identified and recorded in a specified registry to avoid the double counting of credits at the time of issuance and retirement. In addition, the existing reports and documentation from tracking systems may, together with eligible independent third party verification reports, serve as the substantive basis for eligibility applications, EM&V plans and M&V reports for the issuance of ERCs to energy generating resources for affected EGUs to meet their obligations under the final rule. With respect to actual monitoring requirements, many existing REC registries include provisions for the monitoring of MWh of generation that would be appropriate to meet state plan requirements pursuant to the final rule, such as requirements to use a revenue quality meter."[50]

ERC Trading

With regard to ERC trading, there are no vintage restrictions on trading or use for compliance. There is unlimited banking for ERCs—that is, ERCs may be applied in the year of issuance or any future year.[51]

The EPA does not set geographic restrictions on ERC trading. ERCs are interstate tradable. The EPA recognizes that generation attribute transactions need not be constrained by any geographic limits that may exist for physical electricity and capacity transactions.[52] The final rule not only allows for national ERC trading regardless of interconnection boundaries, it includes options to facilitate states' "very extensive reliance" on trading.[53] As noted earlier, there are restrictions on ERC issuance based on geography (e.g. ERCs cannot be issued in Hawaii and Alaska because they are not connected to the contiguous U.S. grid).

ERC trading is limited to rate-based states, and, ERCs may only be traded between rate-based states that have either adopted the same subcategorized emission rates for affected EGUs, or alternatively adopted a single weighted average emissions rate for the group of trading states.[54]

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Finally, states may choose to restrict/define the boundaries of ERC trading according to three different rate-based trading approaches.

1. A plan that is "ready-for-interstate-trading" means that there is no formal agreement required between "trading-ready" states.
2. A plan that includes specified bilateral or multilateral linkages means that there is a formal agreement between states.
3. A plan that provides for joint ERC issuance "among states with materially consistent regulations" includes a shared tracking system and coordinated review of ERC issuance.[55]

Under the first "trading-ready" approach, state plans contain common features necessary for EGUs to trade without the need for formal arrangements between states and/or designating the individual states by name from which ERCs may be accepted.[56] These plans would explicitly indicate that ERCs issued in other states may be used for compliance in that state and identify the tracking system(s) used for compliance.[57]

As such, states define the boundaries of the market for ERCs that they issue—the geographic scope of their trading. According to the EPA, trading can only happen in the context of a regulatory market established by states. The trading status or relationships of a state—either "trading-ready" and therefore trading with all other trading-ready states or having entered into specific multi-state trading agreements—will define the market into which a state's ERCs will enter.

In short, where states choose state-specific or multi-state weighted average emission rates or where they constrain issuance and trading of ERCs, this may result in distinct ERC markets, as opposed to a single national market.

Secondary trading of ERCs will also depend on the issuing state's trading agreements. According to the EPA, a state cannot be at once trading-ready and also have a bilateral trading relationship with another state for a certain set of ERCs. For example, if two states have a formal agreement to trade ERCs (bilateral linkage), the state that receives the ERCs cannot then trade those ERCs to another trading-ready state that does not have a formal agreement with the state that issued the ERCs. However, states are allowed to submit multiple multi-state plans for non-overlapping parts of the state, and in so doing split a portion of the state into one multi-state plan and another portion into a separate plan.

Beyond these major areas of guidance regarding the details of trading, qualifications for account holders, account and trading privileges for different account holder classifications (e.g. position limits, if any), rules for wholesale and secondary market transactions, etc. are left up to the states and the tracking system(s).

Oversight

States must "periodically review the administration of their rate-based emission trading programs" and submit the results to the EPA as part of required progress reporting on the implementation of their state plans.[58] The results of the review must also be made publicly available.

States are also encouraged to include requirements for third-party certification of the skills of workers that install different qualifying measures, including demand-side energy efficiency and RE projects, as well as those performing the EM&V of demand-side energy efficiency and RE performance.[59] The EPA provides examples of entities that could provide such certifications, including the Department of Energy or the U.S. Department of Labor.[60]

Double Counting

In and among rate-based states, the EPA generally relies on the ERC instrument and requirements around ERC eligibility, EM&V, issuance and tracking to prevent double counting of reductions.[61] There is no trading between rate- and mass-based states.[62]

Additionally, state plans will be reviewed by the EPA for the inclusion of requirements that prevent "duplicative" ERC-generating measures and double issuance of ERCs. This includes requirements that documentation is submitted only once for each ERC program or project, and to only one state program.[63] State and/or tracking system requirements must also ensure that only one ERC is issued for each verified MWh.[64] For qualifying measures that reduce

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generation at affected EGUs, ERCs can only be issued to the activity reducing generation (e.g. the RE facility or demand-side energy efficiency activity), not to the EGU where the generation is reduced.

The EPA refers to double counting of reductions from RE between mass-based and rate-based states as "foregone reductions." It says that expected CO_2 emission reduction actions in the rate-based state are foregone as a result of counting MWh that resulted in CO_2 emission reductions in a mass-based state.[65] There is no explicit "double counting" of emissions reductions since both rate- and mass-based states are counting unique stack emissions, and zero-emissions MWh from RE can reduce the mass and lower compliance costs but play no direct role in mass-based compliance. Foregone reductions are minimized through restrictions on the ability of rate-based states to claim emissions reductions from RE and energy efficiency located in mass-based states.[66]

Still, it seems that some foregone reductions may be possible under the Clean Power Plan. For example, if a RE generator (or other ERC-eligible activity) is located in a rate-based state and displaces emissions in a neighboring mass-based state, or in both the rate-based state and a neighboring mass-based state, the mass-based state will automatically count those reductions and the rate-based state may also use the full emissions reductions value of the ERC to adjust its rate. This scenario will need to be resolved during the development and approval of state plans.

The amount of foregone reductions would also depend on how the EPA's exception for ERC issuance from RE in a mass-based state is demonstrated and enforced. The EPA says that "delivery with the intent to meet load" can be demonstrated through, for example, the provision of a power delivery contract or power purchase agreement in which an entity in the rate-based state contracts for the supply of the MWhs in question. The EPA is providing flexibility to states regarding the nature of the demonstration.[67] Where emissions are nevertheless displaced in the mass-based state in this scenario, then there would be foregone reductions in the rate-based state where ERCs are counted from that generation. The significance of these foregone reductions will depend on the amount of supply coming from mass-based states under this exception.

ERCs and Offsets

Though they are used to lower an emissions rate based on avoided emissions at affected EGUs, ERCs are not carbon offsets. Carbon offsets can include emissions reductions outside of the electricity grid/power sector; and they must meet different verification criteria, including "additionality." Carbon offsets cannot be used for 111(d) compliance. ●

Notes

1. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. Final Rule (hereafter, "CPP"), Prepublication Version, 8/3/2015. See Sections VIII.K and VIII.L, p.1211-2 and p.1302-2, respectively.
2. Ibid. p.1223
3. Ibid. p.363
4. Ibid. p.1264, p.1489
5. Ibid. p.432
6. Ibid. p.316
7. Ibid. p.432
8. Ibid. p.889
9. Ibid. p.1211
10. Ibid. p.1278
11. Ibid. p.240, p.373-375
12. Ibid. p.1278
13. Ibid. p.889
14. Ibid. p.1489
15. Ibid. p.1211
16. Ibid. p.1279. Also see Part 2.
17. Ibid. p.889
18. Ibid. p.1209, p.1211, p.1260-1
19. Ibid. p.1273
20. Ibid. p.1263-4
21. Ibid. p.1264-7
22. Ibid. p.1266-7. EPA provides an accounting method in the proposed model rule for a rate-based emission trading program, which it says could be an approvable approach by the states.
23. Ibid. p.1265
24. Ibid. p.1218, p.1492

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25. Ibid. p.1276. Early action ERCs also can only be issued for qualifying measures installed after 2012.
26. In Section VIII.K.1.a.2.a-c of the CPP. See p.1217 of Prepublication Version, 8/3/2015.
27. See Section VIII.K.1.a.3 of the CPP, p.1232-5 of Prepublication Version, 8/3/2015.
28. CPP, Prepublication Version, 8/3/2015, p.1218
29. Ibid. p.1232
30. Ibid. p.1232
31. Ibid. p.1268-9
32. Ibid. p.1270-1, p.1282
33. Ibid. p.1286
34. Ibid. p.1273
35. Ibid. p.1273
36. Ibid. p.1271
37. Ibid. p.1223
38. Ibid. p.1225, 1227, 1308
39. Ibid. p.1227
40. Ibid. p.1229
41. Ibid. p.1229
42. Ibid. p.1230
43. Ibid. p.1230-1
44. Ibid. p.877, 1490
45. Ibid. p.1275
46. Ibid. p.1291
47. Ibid. p.1274-5
48. Ibid. p.1272
49. Ibid. p.877, 918, 1275
50. Ibid. p.1286-7
51. Ibid. p.1219, 1276
52. Ibid. p.408
53. Ibid. p.408
54. Ibid. p.1291-2, 1301
55. Ibid. p.1293-5
56. Ibid. p.854, 1294
57. Ibid. p.1291
58. Ibid. p.1280
59. Ibid. p.1289-90
60. Ibid. p.1290
61. Ibid. p.1303
62. Ibid. p.1301
63. Ibid. p.1272, 1302
64. Ibid. p.1273
65. Ibid. p.1307
66. Ibid. p.1306-7
67. Ibid. p.1308

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CRS
center for
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solutions

1012 Torney Ave. 2nd Floor
San Francisco, CA 94109
www.resource-solutions.org
415-561-2100

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