Renewable Energy in the EPA Clean Power Plan

Part 2: Interactions With and Impacts on RECs and Renewable Energy Markets

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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 in pounds of CO_2 per megawatt-hour (lbs of CO_2/MWh) and a mass-based target is 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 (which avoids 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. This new instrument enters a landscape of existing renewable energy markets, which operate on the basis of a different instrument, the Renewable Energy Certificate (REC). In Part 1, we explained what the CPP says about ERCs. In Part 2, we explore how the creation and trading of ERCs may affect REC markets.

How do ERCs interact with RECs and RE markets?

Only time will tell how ERCs and REC-based RE markets actually interact. It will largely depend on how states set up their CPP state plans and specify (if at all) the relationship between REC and ERC ownership. There are, however, at least 6 things that we can say, based solely on the final rule.

1. ERCs are RECs are distinct instruments:

> "The EPA also notes that non-ERC certificates may be issued by states and other bodies for MWh of energy generation and energy savings that are used to meet other state regulatory requirements, such as state RPS and EERS, or by individuals to make environmental or other claims in voluntary markets. [...] An ERC is issued separately from any other instruments that may be issued for a MWh of energy generation or energy savings from a qualifying measure. Such other instruments may be issued for use in meeting other regulatory requirements (e.g., such as state renewable portfolio standard [RPS] and energy efficiency resource standard [EERS] requirements) or for use in voluntary markets. An ERC may be issued based on the same data and verification requirements used by existing REC and EEC tracking systems for issuance of RECs and EECs."[2]

It is therefore possible to have a REC and an ERC issued from the same MWh of RE generation and sold/traded separately.[3]

RECs and ERCs are distinct and not interchangeable. RECs cannot be used for CPP compliance in rate-based states in place of ERCs nor can a state define a REC as an ERC for the purposes of CPP compliance.[4] RECs can still be used for RPS compliance and are the standard mechanism for tracking and trading renewable energy for end-use consumption (see No. 2 for further discussion). To the extent that an RPS may be included in a mass-based state measures plan (see No. 5 for further discussion), compliance RECs may be indirectly involved in 111(d) compliance in these states. Nonetheless, compliance in a mass-based state is determined only by measuring stack emissions, not by counting RECs.

2. ERCs cannot be used for "Scope 2" greenhouse gas (GHG) emissions[5] accounting or to demonstrate the use/delivery of a MWh of energy with an emissions factor of zero.

While ERCs are referred to as "zero-emission MWhs" throughout the rule,[6] this shorthand description does not refer to a MWh with an emissions factor of zero (see Part 1 for the definition of an ERC). ERCs may be issued to

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generation without an emissions factor of zero and indeed to non-generation activities. The CPP does not indicate that an ERC includes the GHG emissions factor attribute of renewable generation, nor is it intended to deliver RE to states or customers. As such, ERCs cannot be used for Scope 2 accounting or to demonstrate use or delivery of electricity with zero emissions. Furthermore, the ERC owner is reporting its generation, not its consumption, which further indicates that there can be no Scope 2 claim. An ERC as a "zero-emission MWh" refers to its effect on the rate of emitting generation units: "the emissions-reducing effects of specific activities."[7] It is a zero-emissions MWh that can only be applied to the denominator of a rate for the purposes of compliance with the CPP. This also means that when purchasing electricity from an affected EGU that purchases ERCs, the customer would use the actual, unadjusted emissions rate of that EGU (without ERC purchases by the affected EGU) to calculate Scope 2 emissions. RECs are the only instrument that can be used for RE usage and delivery claims, and the only instrument that conveys the GHG emissions factor of renewable generation to grid customers (for Scope 2 reporting) in the U.S.

3. ERCs will determine the location and use of avoided grid emissions from RE for CPP compliance.

In addition to the GHG emissions factor, which can be used for Scope 2 calculations and for claims about receiving carbon-free power, REC purchasers can claim that the generation of their electricity displaced or avoided the need for an equivalent MWh from emitting power plants on the grid ("avoided grid emissions").[8] The avoided grid emissions benefit in a REC, quantified as the emissions displaced by the renewable generation, is conceptually similar to that which is embodied by (or traded as) the ERC—the emissions effect of renewable energy generation. Though this attribute is not used to reduce a REC-owner's footprint, this nevertheless has raised concerns about REC disaggregation and double claims where ERCs are issued from RE.

According to the formula for calculating the adjusted emissions rate of an affected EGU, an ERC has the equivalent effect of 1 MWh of emissions-free generation at the affected EGU. That is, an EGU that owns an ERC is able to report a reduced emissions rate as if that EGU had produced an extra MWh of emissions-free power. Since ERCs are transacted between RE generators and affected EGUs, it may be logical to think of the ERC as transferring the emissions rate of the RE generator to the EGU: the EGU that owns an ERC is able to report a reduced emissions rate as if the generation that actually occurs at the RE plant had occurred at that EGU, with an emissions factor of zero. But since ERCs are not only generated by activities that generate power, but rather by activities that avoid generation at affected generating units—including zero-emitting power generation, and also energy efficiency, transmission and distribution measures, demand-side management, etc.—we know that ERCs do not convey the emissions factor of zero-emitting generation.

As shown in Figure 1, RE generation (1) (like other ERC-qualifying measures) avoids emissions in the region where it is located by displacing (or, in the case of energy efficiency, avoiding the need for) generation at nearby emitting generators (2). However, in order to report that avoided generation and emissions reductions for CPP compliance in a rate-based state, the nearby emitting generator (2) would need the corresponding ERC to adjust its rate. Instead, the ERC has been transferred to an out-of-state affected EGU (3), which is able to use the ERC to adjust its rate for CPP compliance.

According to the EPA, an ERC does not represent a discrete emissions reduction and there is no expressed "avoided emissions attribute" attached to an ERC—it is simply a zero-emissions MWh added to the denominator of a rate for compliance. However, the ERC owner reports a reduced emissions rate on the basis of the avoided grid emissions that result from RE and other qualifying measures. The calculations performed for ERCs (adding zero-emissions MWh to the denominator of a rate) simply estimate that effect, even though they do not quantify actual avoided emissions. Therefore an ERC effectively determines the location and use of avoided grid emissions from RE and other qualifying measures for CPP compliance. Trading an ERC transfers the ability to report a reduced rate for compliance on the basis of avoided emissions. Interstate ERC trading (Figure 1) means that if we took an individual

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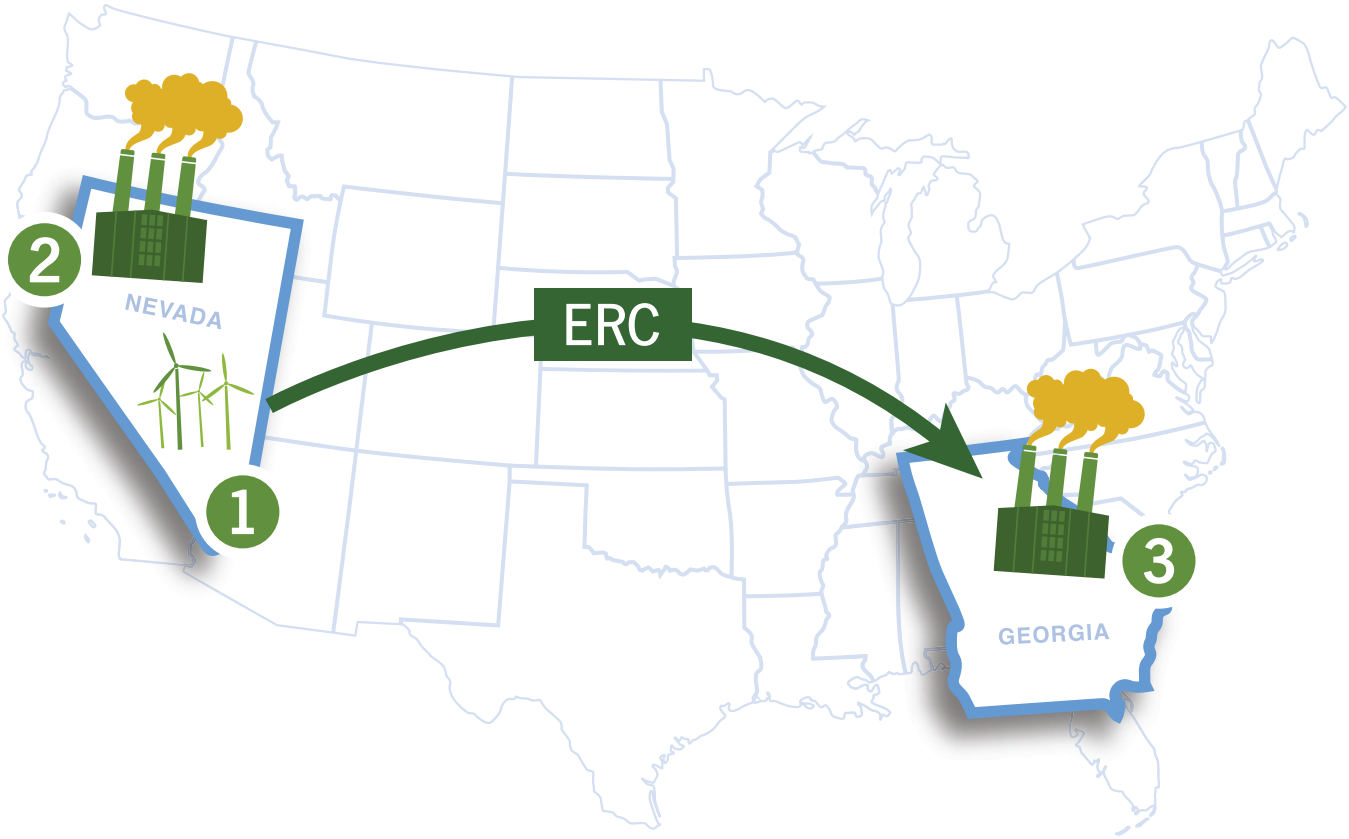
state's adjusted rate and multiplied it by the combined output of the EGUs in that state, the total tons will not equal the actual tons emitted. But if we performed the same calculation for the aggregate of all rate-based states, the total tons emitted will be the correct number.

In other words, an ERC owner is effectively reporting that the avoided emissions caused by that MWh of RE occurred at their EGU for the purposes of compliance. The REC owner may still be able to claim that their RE generation avoids these emissions, which simply get used for compliance by ERC owner. In this case, the REC claim is to avoided emissions as a benefit of RE consumption ("I use/deliver RE generation that avoids X emissions"). The ERC claim is a compliance claim to the avoided emissions for reporting generation ("the X avoided emissions from that RE generation occurred on my behalf for CPP compliance"). Both can be made simultaneously, and it does not necessarily require a change to the claim made by the REC owner (except that the avoided emissions are no longer surplus to regulation, which is discussed in No. 6 below). This is true because the CPP does not allocate or deliver RE or its attributes to specific customers for consumption claims. If the REC and ERC end up in different states, then the RPS or voluntary REC purchaser

Figure 1. Interstate ERC Trading Between Rate-Based States



1. Renewable Energy Generator
Reduces fossil generation and mass emissions (avoiding emissions) at affected EGUs. Issued ERCs.

2. Affected EGU
Actual location where fossil generation and mass emissions are reduced (location of avoided emissions). Emissions rate is unaffected by reduction of generation and mass emissions.

3. Affected EGU
Purchases ERC from Renewable Energy Generator (1). Uses ERC to reduce emissions rate for compliance based on the avoided emissions occurring at affected EGUs (2).

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cannot claim that their generation avoids emissions in the state in which the REC is used.

When RE is located in a mass-based state, the avoided emissions attribute in the REC equals zero because of the cap on total emissions (in which case a "set-aside" mechanism, also discussed in General Guidance for States below, can be used to restore the emission-reducing effect of renewable energy and the avoided grid emissions value for the REC owner).

4. Any right to the ERC that is conveyed with REC ownership will be determined by the states.

> "[S]tates may want to assess, when developing their state plan, how such existing instruments may interact with ERCs. For example, a state may want to assess how issuance of ERCs pursuant to a state plan may interact with compliance with a state RPS by entities affected under relevant state RPS regulations or PUC orders. The interaction of other instruments and ERCs may also impact existing or future arrangements in the private marketplace. Actions taken by states, separate from the design of their state plan, could address a number of these potential interactions. For example, state RPS regulations that specify a REC for a MWh of RE generation, and the attributes related to that MWh, may or may not explicitly or implicitly recognize that the holder of the REC is also entitled to the issuance of an ERC for a MWh of electricity generation from the eligible RE resource. This could impact existing and future RE power purchase agreements or REC purchase agreements. Such interactions among existing instruments and ERCs could also impact how marketing claims are made in the voluntary RE market. How a state might choose to address these potential interactions will depend on a number of factors, including the utility regulatory structure in the state, existing statutory and regulatory requirements for state RPS, and existing RE power purchase agreements and REC contracts."[9]

States with RPSs may find that there is good reason to require that ERCs accompany RECs used for compliance with the RPS, or that the RPS otherwise maintains its unique effect on grid emissions, depending on state regulations and the intent of the RPS. Where the RPS is (at least partially) intended to reduce GHG emissions from the power sector, where the REC is defined (by the state or tracking system) explicitly to include avoided emissions, or where state regulations require that generation used for the RPS not be counted toward any other policy or regulation, states may consider changing the rules of the RPS to specify that RECs and ERCs (if issued) be bundled for RPS compliance.

5. RPSs can only be included in mass-based state plans using the state measures approach.

RPSs can only be included in a mass-based state plan that chooses the "state measures" approach, which means the plan includes non-federally enforceable measures implemented by the state that result in the affected EGUs meeting their targets.[10] The EPA specifically mentions an RPS as an example of a measure that could be included in a plan taking a state measures approach.[11] In this case it is not considered "duplicative" to include an RPS in a state plan.[12] In a mass-based state, compliance must be determined based on stack emissions alone, and an RPS represents a policy measure intended to achieve lower stack emissions.

RPSs cannot be included or used for compliance as part of a rate-based plan.[13] For rate-based states, ERCs must be issued for eligible renewable generation in order to adjust the rate for renewable energy. Where the rate-based state also has an RPS or chooses to implement an RPS, then the same generation used for the RPS can also be used for ERC issuance. States with an RPS could choose to require ERC retirement along with REC retirement for RPS compliance (see General Guidance for States [p. 5]), or the RPS and CPP could represent entirely separate policies and markets.

Consequently, it is not technically possible to have double counting between RECs and ERCs. ERCs are intended for CPP compliance only and RECs cannot be used for CPP compliance.

6. Perhaps the largest impact of the CPP on RE markets is the loss of "regulatory surplus" for GHG emissions reductions in RE markets, particularly voluntary RE markets,

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where ERCs are issued and used for CPP compliance.

Thousands of businesses and organizations along with millions of individuals across the country purchase green power in the U.S. voluntary renewable energy market.[14] These individuals and organizations, including over 1,300 that participate in the EPA's Green Power Partnership, voluntarily use billions of kilowatt-hours of renewable energy annually.[15] Many do this as part of their commitment to reduce their greenhouse gas footprint. These commitments to renewable energy, and avoided greenhouse gas emissions on the grid, go beyond that which is attributed to state or federal policy. Where RE sold into the voluntary market is included in 111(d) compliance—meaning it gets issued an ERC for use in a rate-based state or is located in a mass-based state without a set-aside of allowances for voluntary RE—these voluntary actions to purchase and develop RE will no longer be going beyond what is required by law for GHG emissions from affected EGUs. That is, the actions of voluntary purchasers will no longer qualify as "regulatory surplus" with regard to GHG emissions reductions from regulated fossil plants because the avoided emissions are no longer surplus to regulation since they get factored into the reductions that a state reports to EPA. In this scenario, these purchases will now be supporting state compliance, making it easier for regulated fossil units to comply by increasing the supply of ERCs and/or reducing mass emissions, and may reduce the overall impetus to take action. Existing voluntary markets for RE value regulatory surplus for GHG emissions, and without it, demand in this market could suffer—impacting its effectiveness as a climate change solution for participating companies and individuals.

Remaining Questions for RE Markets

Many of the biggest remaining questions for RPS and voluntary RE markets—markets that deliver RE to customers and drive demand for RE—surround the potential loss of regulatory surplus for GHG emissions reductions (see No. 6 above). There can be no doubt these markets have had a significant impact for decades on the development of renewable energy and created GHG emissions reductions in the power sector. What will be their post-2020 role, given the rise of carbon markets under the CPP and the fact that many RPSs are set to meet their targets in 2020? What case can be made for pursuing these markets now and in the future? One answer is that RE has value far beyond its impact on GHG emissions, voluntary markets will nevertheless contribute to reducing the costs of CPP compliance, and all policies intended to support the rapid and massive expansion of RE will still be necessary to achieve that outcome. Maintaining a robust voluntary market will require addressing the following questions, which we introduce here to feed the broader discussion.

- What benefits will RPS and voluntary RE markets deliver post-CPP?
- What impact will RPS and voluntary RE markets have on RE development post-CPP?
- How should/must RPS and voluntary RE markets evolve in order deliver claims and impacts valued by voluntary market participants?
- Can existing RPS and voluntary RE market structures succeed at scale with or without these changes? Will there be enough supply and demand to sustain them in the new landscape of state CPP compliance?
- How will this future growth and continued impact and relevance depend on whether the RE is located in a mass- or rate-based state?

General Guidance for States

Over time, in cooperation with our partners, CRS will provide states with more detailed options and specific policy level solutions to maximize the impact of their RE policies and programs within the CPP ecosystem. In the near term, however, there are several objectives states should consider:

States should design their 111(d) state plans to support and enhance—not undercut—existing RE policies and markets in order to motivate more individuals, businesses, and organizations to invest in clean energy with their private funds. State plans should be designed so that these voluntary actions and other existing RE policies and programs deliver incremental emissions reductions—and not simply reduce the costs of CPP compliance.

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Rate-based states can set requirements around ERC issuance, trading, and use that support multiple goals, e.g. development and use of in-state RE, voluntary market growth, and CPP compliance. For example, keeping ERCs and RECs bundled together (or preventing the issuance of ERCs for RE serving other programs or markets) will ensure that each policy and purchase (accounted for in either RECs or ERCs or both) makes a real difference. In mass-based states, reducing the level of the emissions cap or lowering the budget (by retiring allowances) to account for voluntary renewable energy transactions will ensure that these transactions maintain regulatory surplus. Such an approach has already been taken by both California[16] and the Regional Greenhouse Gas Initiative.[17]

There may be other situations in which existing markets can be leveraged to facilitate or accelerate CPP compliance and increase the development of RE, and/or facilitate cooperation and reduce political barriers. Envisioning creative relationships between RECs and ERCs and driving forward innovative policy solutions can help new and existing markets adapt and maximize their impact. ●

Notes

1. *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. Final Rule* (hereafter, "Clean Power Plan"), Prepublication Version, 8/3/2015. See Sections VIII.K and VIII.L, p.1211-2 and p.1302-2, respectively.
2. Ibid. p.1278-9
3. Ibid. p.976, 989
4. Ibid. p.748, 1278-9
5. Defined by the World Resources Institute (WRI) as GHG emissions from purchased electricity, steam, heat, and cooling for the purposes of corporate GHG emissions accounting. See Sotos, M. (2015) *GHG Protocol Scope 2 Guidance: An Amendment to the GHG Protocol Corporate Standard*. World Resources Institute. Available online: http://www.wri.org/sites/default/files/Scope_2_Guidance_Final.pdf.
6. See CPP, Prepublication Version, 8/3/2015, p.1275, 1278, for example.
7. Ibid. p.316
8. Jones, T. et al. (2015) The Legal Basis of Renewable Energy Certificates. Center for Resource Solutions. Available online at: http://www.resource-solutions.org/pub_pdfs/The%20Legal%20Basis%20for%20RECs.pdf.

   Also see U.S. Environmental Protection Agency (EPA). (2008) *Renewable Energy Certificates*.

   Also see Bird, L. and J. Sumner (2011). *Using Renewable Energy Purchases to Achieve Institutional Carbon Goals: A Review of Current Practices and Considerations*. National Renewable Energy Laboratory. NREL/TP-6A20-49938: 35. Available online at: http://www.nrel.gov/docs/fy11osti/49938.pdf.

   Also see Environmental Tracking Network of North America (ETNNA). (2010) *The Intersection between Carbon, RECs, and Tracking: Accounting and Tracking the Carbon Attributes of Renewable Energy*. Available online at: http://etnna.org/images/PDFs/Intersection%20btwn%20Carbon%20RECs%20and%20Tracking.pdf.
9. CPP, Prepublication Version, 8/3/2015, p.1279-80
10. Ibid. p.851
11. Ibid. p.898
12. Ibid. p.976, 989
13. Ibid. p.852, 899, 900
14. Heeter, J. et al. (November 2014). *Status and Trends in the U.S. Voluntary Green Power Market (2013 Data)*. National Renewable Energy Laboratory (NREL). Technical Report NREL/TP-6A20-63052. Available at: http://www.nrel.gov/docs/fy15osti/63052.pdf.
15. For more information about the importance and impact of voluntary green power purchasing, visit http://www.epa.gov/greenpower/. Also see NREL's market analysis at http://www.nrel.gov/analysis/market_green_power.html.
16. See title 17, CCR, sections 95831(b)(6) and 95841.1. Available online at: http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_082014.pdf.
17. RGGI Model Rule. Revised on December 23, 2013, Originally issued on February 7, 2013. Pg. 44-47. Available online at: http://www.rggi.org/docs/ProgramReview/_FinalProgramReviewMaterials/Model_Rule_FINAL.pdf.

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