Tracking Renewable Energy for the U.S. EPA's Clean Power Plan

Guidelines for States to Use Existing REC Tracking Systems to Comply with 111(d)

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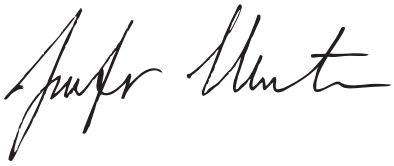
Foreword

Existing renewable energy certificate (REC) tracking systems hold promise as an enabler of 111(d) compliance with renewable resources such as solar and wind generation. REC tracking systems, together with state policies designed to increase the production and use of renewable electricity, will provide one key to helping states reduce the carbon intensity of their power sector.

Many states already rely on tracking systems to serve as a transparent means of establishing and tracking ownership of renewable energy. When used according to basic protocols, these systems can support the ability of every state to comply with federal carbon standards.

State regulators are key. They have broad authority to develop the policies and requirements that are needed to tap the full potential of existing REC tracking systems to support state compliance with the U.S. Environmental Protection Agency's Clean Energy Program.



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Executive Summary

Renewable energy is one of the four main building blocks outlined in the EPA's *Clean Power Plan*, and states are likely to rely upon the production of renewable energy as a part of their efforts to control carbon in the electric sector. Air and energy regulators should understand that the existing tools currently used in the renewable energy markets ensure that renewable energy is metered, tracked, and accounted for in robust tracking systems across North America, and that with the help of these systems, renewable energy can increase the ability of states to cost-effectively meet their carbon goals.

Our key observations include:

- State production of renewable energy promises to be a significant compliance option for power sector carbon standards.
- The production of renewable energy in the U.S. is tracked by the megawatt-hour (MWh) through existing tracking systems that have been developed to be transparent and ensure a robust method for establishing legal REC ownership and supporting regulatory compliance.
- Existing tracking systems were developed out of stakeholder processes with the help of air and energy regulators, regional transmission operators, generation owners, and utilities. States can rely on these systems to support the use of renewable energy for power sector carbon policy compliance.
- Using existing REC tracking systems and tracking protocols can ensure the proper accounting for renewable energy generation, and increase the likelihood of cost-effectively achieving emission-reduction goals under 111(d) Plans.

Introduction

With the issuance of the EPA's June 2, 2014 *Clean Power Plan*, a carbon policy for existing fossil-fired electric generation, many states are exploring the development of compliance plans to enable them to meet EPA requirements in the most flexible manner and at the lowest cost.[1] Program flexibility should allow states and municipalities to look beyond traditional smokestack-by-smokestack compliance solutions and use a variety of measures—including greater deployment of renewable energy—to meet carbon-reduction targets.

In 2009, the National Association of Regulatory Utility Commissioners (NARUC) Task Force on Climate Policy recognized the benefits of addressing power sector carbon emissions by relying on clean energy policies, including renewable energy investment: "For decades, the goals of State clean energy investment have been consistent with initiatives that only now are being explicitly described as 'carbon policies'."[2]

In this paper we explore one aspect of this approach—specifically, how renewable energy is currently accounted for and tracked by states that might want to make their renewable energy investments part of their federal carbon compliance strategies. Before exploring that topic, we briefly introduce the federal program and the potential role for renewable energy.

How Section 111(d) Works

Section 111 of the Clean Air Act (Act) establishes mechanisms for controlling emissions of air pollutants from stationary sources. Section 111(b) provides authority for EPA to promote New Source Performance Standards (NSPS), which apply only to new and modified sources. Once these standards for new sources are finalized, Section 111(d) calls for regulation of existing sources.[3]

Section 111(d), the statute under which EPA is proceeding in setting its guidelines, provides for a two-step federal/state process the U.S. Supreme Court summarizes as: "EPA issues emissions guidelines; in compliance with those guidelines and subject to federal oversight, the States then issue performance standards for stationary sources within their jurisdiction."[4]

Step One—EPA's Role

Although referred to as "guidelines," in this process the EPA establishes binding requirements, including emissions targets, that states must address when they develop "111(d) Plans" to regulate the existing sources in their jurisdictions. EPA's guidelines must reflect "the application of the *best system of emission reduction*... that has been adequately demonstrated..."[5] and must also take into consideration the cost of achieving reductions, any non-air quality

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health and environmental impacts, and energy requirements.

EPA's proposed guidelines assign each state with its own interim and final emissions goals for its existing power plants. The goals are set out as emissions rates, i.e. as pounds of CO_2 per MWh of net generation. EPA also provides states with the choice of converting their emissions goals into a mass-based standard that limits total emissions.[6]

EPA defines the "best system of emission reduction" as comprising four categories of measures, which it calls "building blocks."[7] They are designed to reduce:

- The carbon intensity of generation at individual affected generation units through heat rate improvements.
- The emissions of the most carbon-intensive affected generating units in the amount that results from substituting generation at those units with generation from less carbon-intensive affected units (including natural gas combined cycle units that are under construction).
- The emissions of affected units in the amount that results from substituting generation at those units with expanded low- or zero-carbon generation.
- The emissions from affected units in the amount that results from the use of demand-side energy efficiency.[8]

Step Two—The Role of States

As the second part of this federal/state process, states are required to issue performance standards for complying with EPA's Guidelines. States do this through the development of "111(d) Plans," in a procedure similar to the development of State Implementation Plans (SIPs) outlined in section 110 of the Act.[9] The statutory language provides states with significant leeway in meeting the requirements of EPA's Guidelines by employing the SIP model, which lists a broad array of policy mechanisms, including the open-ended "other control measures, means, or techniques."[10]

Where Does Renewable Energy Fit In?

In its *Clean Power Plan*, EPA suggests levels of renewable energy generation that states would need to meet reduction targets.[11] Renewable resources could be a significant means of compliance under EPA's Program, since they are generally carbon free, and their inclusion affords states a broader range of compliance resources.[12] When compared with fossil-fuel generation sources, renewable resources also provide non-air quality health, environmental, and energy benefits, including avoided fuel and water use.

While in the past, air regulation has generally focused on solutions at individual generation plants, like fuel switching or the installation of pollution control technologies, EPA's *Clean Power Plan* takes a more flexible approach by allowing states to take advantage of generation resources that displace more carbon-intensive alternatives. States that want to rely on renewable energy as a compliance resource will need to account for the energy that renewable energy projects produce, and will need to be able to ensure that the accounting is sufficiently robust to support a regulatory program.

Existing Tools: Renewable Energy Certificates and Tracking Systems

Renewable energy has been tracked and traded for nearly 20 years in the United States, and during this time, integrated electronic tracking systems and standardized approaches to trading and establishing ownership of renewable energy have been developed. Using renewable energy as part of 111(d) compliance strategies will be made possible by the continued use of existing tools in renewable electricity markets to assure regulators that these resources are actually producing electricity and that it is being counted correctly.

In order to determine how renewable energy should be accounted for in a state's 111(d) Plan, it is important to understand the existing policies and rules governing the use and claims made about renewable energy production. The use of this existing infrastructure can provide essential support for the inclusion of renewable

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energy as a compliance component of 111(d) Plans.

Renewable Energy Certificates: Defining the Environmental Benefits of Clean Energy Generation

The REC is the basis upon which ownership rights to renewable electricity are documented and traded across the United States. A REC is created when one MWh of renewable electricity is generated, and the REC represents the environmental attributes or the "renewableness" of that MWh of energy.[13]

The precise content of a REC is typically defined by state law, but usually includes all ownership rights to the attributes of renewable electricity generation, including the carbon-free emissions profile of the generation.[14] Under Kansas law, for example, a REC that is used towards the state renewable energy requirement is defined as "a certificate representing the attributes associated with one megawatt-hour (MWh) of energy generated by a renewable energy resource that is located in Kansas or serves ratepayers in the state."[15] By assigning a unique serial number to each MWh of renewable electricity generation, the tracking systems have the capability to ensure that each REC is used (or "retired") only once.[16]

A REC can be sold separately from the underlying electrical energy. Thus, as shown in Figure 1, one MWh of wind generation becomes a REC, (a tradable MWh of wind attribute) and one MWh of energy.

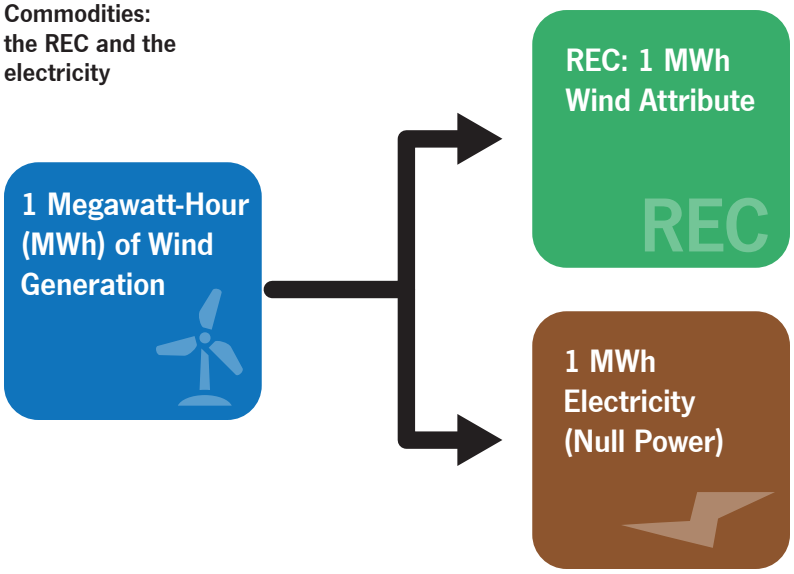
When a REC is sold separately from the underlying MWh of electricity, that remaining MWh is called "null power" and is no longer considered renewable.[17] Null power is described by the EPA in the *Clean Power Plan Proposed Rule: State Plan Considerations* Technical Support Document: "Once the RECs are separated from the power generated, the power has no attributes associated with it and is considered generic or 'null' power."[18] If it is represented as renewable—while the REC is used or sold elsewhere—that is a "misrepresentation," often simply referred to as "double counting," and must be guarded against, as it can result in two states taking credit for the same unit of renewable generation. In its *Clean Power Plan*, the EPA states that it:

> [R]ecognizes the complexity of accounting for interstate effects associated with measures in a state plan in a consistent manner, to allow states to take into account the CO_2 emission reductions resulting from these programs while minimizing the likelihood of double counting.[19]

The use of RECs began in the 1990s as a means of accounting for energy procurement obligations like renewable portfolio standards (RPS), or power-source disclosure programs where load serving entities were required to inform their customers about the sources of electricity relied on to provide service.[20] REC trading is a commonplace occurrence in electric markets today; more than half the U.S. states currently have RPSs.[21] Federal and state agencies, regional electricity transmission authorities, non-governmental organizations, trade associations, and electricity market participants recognize and rely on RECs to convey the environmental attributes of renewable electricity generation, including the legal right to claim delivery and usage of renewable energy.[22]

RECs are also used around the country to track renewable energy acquisition and use in voluntary markets, which exist in all states.[23] Individuals or companies that voluntarily purchase renewable energy, and load-serving entities that are required to do so, need a way to demonstrate that they have purchased a

Figure 1. Two Commodities: the REC and the electricity



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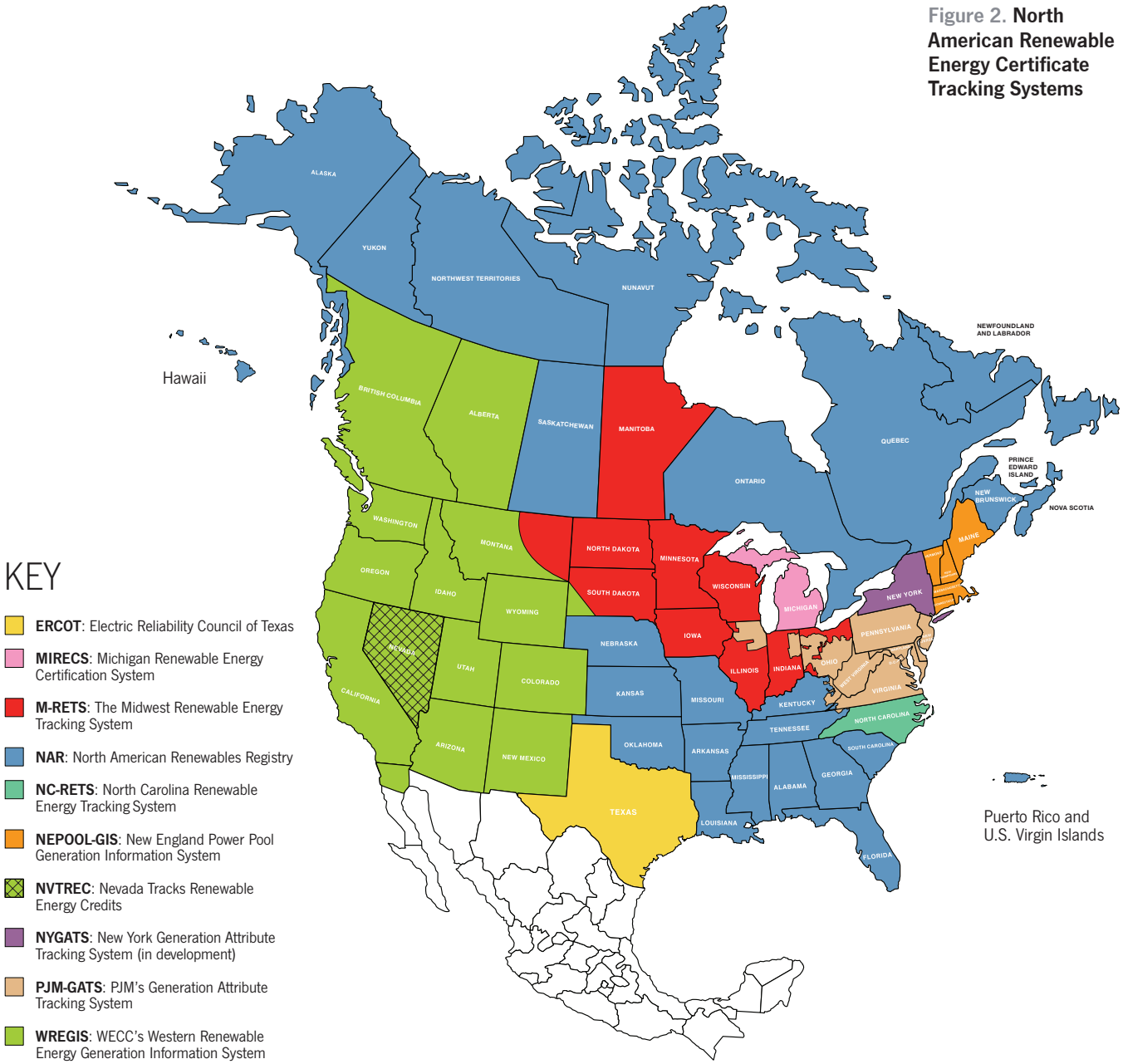
MWh of renewable energy and that they, and no one else, have the ownership rights to it. The same basic rules and definitions exist in the voluntary market as those found in RPS markets and disclosure programs: RECs and tracking systems are the basis for tracking and demonstrating ownership.[24] Whether a utility customer is using renewable energy as a result of its utility company's regulatory obligation, or as a result of the customer's voluntary purchase, each renewable MWh must be delivered and claimed only once.

Tracking Systems: a Reliable and Convenient Tool for State Regulators

Renewable energy certificate tracking systems are regional electronic databases that provide a platform for producing, managing, and retiring RECs, and also for ensuring that each REC is counted only once. There are ten regional REC tracking systems in operation in the U.S., as shown in Figure 2. These systems provide a valuable service to state regulators and to market participants. Retail electric companies and regulators use these systems to demonstrate compliance with state policies like an RPS.

Figure 2. North American Renewable Energy Certificate Tracking Systems



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Other renewable energy market participants rely on these systems for quality assurance. The tracking systems are intended to serve the needs of states and market participants and can be modified to suit the needs of regulators.

Tracking systems are essentially databases and, in a simplistic sense, work like checking accounts (*see Figures 3 and 4*).[25] Account holders can view and use the RECs currently in their accounts and transfer RECs to other account holders, but they are unable to view RECs in another user's account. Generators can register in their regional tracking system and have REC accounts. Retail electricity companies and other would-be purchasers have accounts as well. For each MWh of electricity produced, a certificate is issued and deposited into a generator's account. When the generator sells the REC, it is transferred from the generator's account into a buyer's account. The REC exists in only one account at a time. Given the manner in which these tracking systems operate, it is possible to substantiate a claim about REC ownership and ensure proper accounting through the relevant tracking system.

As illustrated in Figure 4, the EPA describes tracking systems:

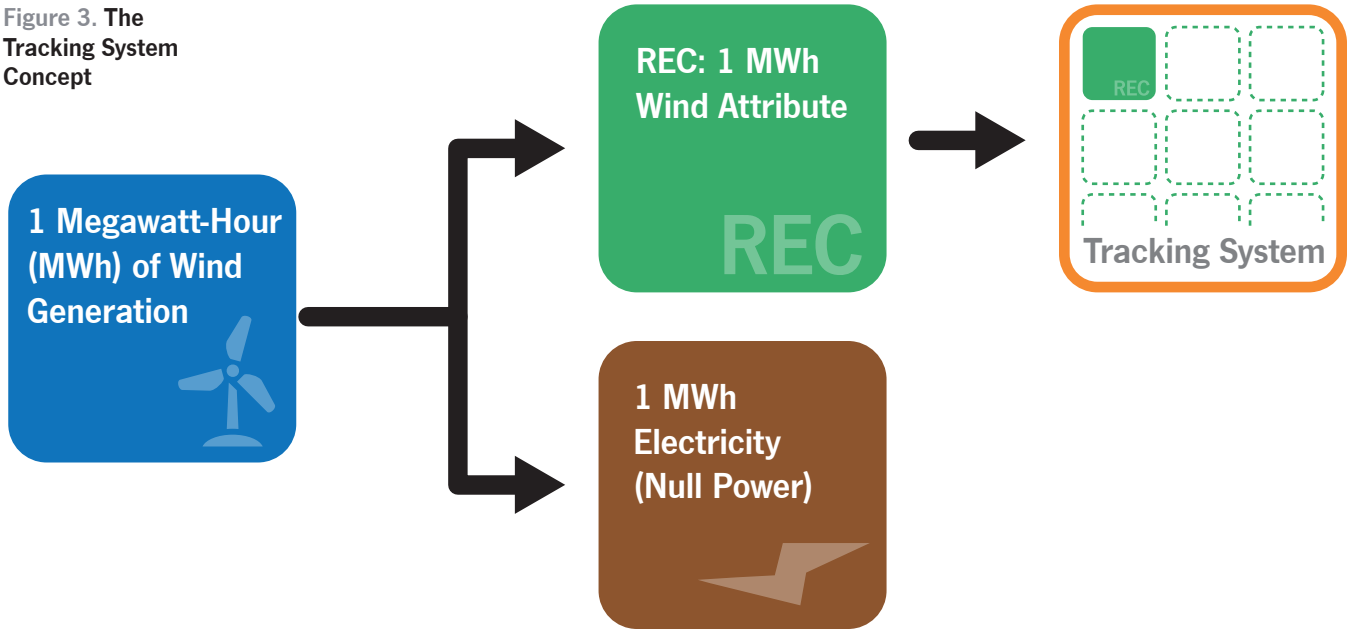
> The most common form of tracking system for RPS compliance is a regional or state REC tracking system or registry. These systems track RECs for both the compliance and voluntary markets. RECs are typically provided with a unique identification number and may be certified by a third-party verifier. Annual compliance reports containing REC data typically include the number of RECs the utility or load-serving entity procured and retired, what renewable energy generators supplied the RECs, and how much the utility spent on procuring the RECs.[26]

Each REC has its own serial number, and contains various descriptive "certificate fields." Certificate fields include information such as plant name, month and year of generation, generation unit location, and program eligibility, e.g. for Connecticut, Oregon, and New Jersey Renewable Portfolio Standards. *(See Figure 4, Sample Tracking System Retirement Report.)*

Renewable Energy Tracking Systems and RECs

A major concern in renewable energy markets, whether related to a RPS, voluntary purchases or disclosure, is the correct representation of renewable attribute ownership. While tracking systems are designed to help policy makers avoid double counting, it is possible for state policies to create circumstances where misrepresentation can occur. The following discussion illustrates this briefly in order to ensure that state officials understand the potential for these problems, and avoid putting their use of renewable energy for 111(d) compliance purposes at risk.[27]

Figure 3. The Tracking System Concept



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The examples that follow are intended to illustrate appropriate accounting for renewable energy, and also the potential for misrepresentation or double counting. RECs associated with the use of renewable energy for program-compliance purposes are retired in each of these examples. Because these RECs are tracked and retired appropriately, they can be used or sold to other buyers who can be confident that the purchased RECs have not already been used.

Examples

Example 1: In-State REC Transfers

- Tracking system used
- RECs retired
- No double counting

Load-serving entities ("LSEs") from State A are using RECs produced by in-state renewable electricity generators to comply with renewable energy requirements. These RECs are tracked in a tracking system from generator accounts to LSE accounts to facilitate accurate accounting of the RECs. LSEs retire RECs in the tracking system, and the LSE uses the retired REC to support voluntary claims or compliance obligations, and the RECs are not used again.

If generators or LSEs do not follow these protocols for transferring and retiring RECs, this would create a risk of confusing ownership of the RECs and the potential for the RECs to be double-counted.

Example 2: Out-Of-State REC Transfers From a State With an Energy-Based Requirement

- Tracking system used
- RECs retired
- No double counting

In this example, generators in State A have excess RECs that they can sell to LSEs in State B. These RECs are accounted for and their movement tracked in a tracking system to facilitate accurate accounting and transfer of the RECs to State B LSE accounts, where they are retired.

If the generators or the LSEs in either state do not follow this protocol for transferring and retiring RECs, there is a risk of unsubstantiated renewable energy claims being made. This could result in double-counting of the environmental attributes and failure to meet policy goals.

Figure 4. Sample Tracking System Retirement Report

Account Holder	Sub-Account	Retirement Types	Facility ID	Generating Facility	Fuel Type	Vintage Year/ Month	Certificate Serial Numbers	Quantity	State X Eligible	State Y Eligible	State Z Eligible	Green-e Energy Eligible
ACME	State X Renewable Energy Compliance	RPS	E9823	Slainte Wind Project - Dartmouth Ridge	Wind	11/2013	108-FR-12-3654-65987-1 to 98654	98,654	Yes	No	Yes	Yes
ACME	State X Renewable Energy Compliance	RPS	E9823	Slainte Wind Project - Dartmouth Ridge	Wind	11/2013	365-EW-36-4527-45871-1 to 87457	87,457	Yes	No	Yes	Yes
ACME	State X Renewable Energy Compliance	RPS	R2165	Kiba Solar - Blackrock Solar Energy Project	Solar	10/2013	656-GF-36-4712-56471-1 to 200	200	Yes	No	Yes	Yes
ACME	State X Renewable Energy Compliance	RPS	H9032	Fork Union County - Damascus Renewable Energy Center	Biomass	11/2013	659-LA-85-2198-34985-1 to 69832	69,832	Yes	No	Yes	Yes
ACME	State X Renewable Energy Compliance	RPS	J8723	Sol Solutions - Ridgefield Solar Farm	Solar	9/2013	879-AQ-14-3654-45698-1 to 20	20	Yes	No	Yes	Yes

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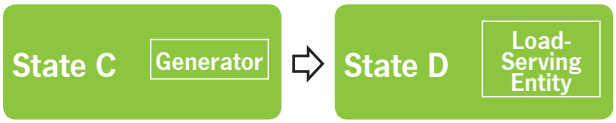
Example 3: Out-Of-State REC Transfers From a State With a Capacity-Based Requirement



- Tracking system used
- RECs retired
- No double counting

In this example, State C has a "capacity-based" renewable energy requirement that generators can meet by simply claiming the installed capacity to the state regulator. In lieu of being included in the capacity-based reporting in State C, State C generators have the opportunity to sell RECs associated with the electricity generated by the renewable capacity to LSEs in State D. If State C generators sell RECs to entities in State D, then State C generators affect their ability to use their renewable capacity for State C compliance reporting. To ensure there is no double counting, State C shouldn't include capacity associated with the RECs bought by State D LSEs toward their 111(d) Plan. If a generator were to report renewable capacity for compliance with State C's renewable requirement and sell the RECs from that capacity to State D, it would result in double counting of renewable attributes.

The ability to make renewable energy claims moves with the RECs that State C generators have sold. Furthermore, if State C generators do not follow this protocol, the purchasing LSE in State D cannot be assured of the quality of the RECs purchased from State D, as it is not clear whether or not they have already been used.

Attempting to use renewable resources for 111(d) compliance without relying on a tracking system and established tracking protocols could result in confusion and the failure to achieve intended regulatory outcomes. The use of REC tracking systems can help ensure that renewable energy production is accounted for in a transparent way and that states avoid misrepresenting their energy production and jeopardizing their 111(d) compliance.

Conclusion

As states consider their compliance options for power sector carbon standards, they will be able to use the production of renewable energy as a part of their efforts to control carbon in the electric sector. Tools and processes—in the form of REC tracking systems—already exist and are in widespread use to support development and implementation of State 111(d) Plans. These systems are flexible, were developed with the help of stakeholder input, are familiar to generators and load-serving entities, and would be unnecessarily costly to replicate. Using existing REC tracking systems can ensure the proper accounting for renewable energy generation, and increase the likelihood of cost-effectively achieving emission reductions goals under 111(d) plans.

Endnotes

1. U.S. Environmental Protection Agency, *EPA Proposes First Guidelines to Cut Carbon Pollution from Existing Power Plants/Clean Power Plan is flexible proposal to ensure a healthier environment, spur innovation and strengthen the economy*, Subheading to *News Releases to Headquarters*, http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceeac8525735900400c27/5bb6d20668b9a18485257ceb00490c98!OpenDocument (last visited Jun. 6, 2014).
2. National Association of Regulatory Utility Commissioner, *Climate Issue Brief #4, State Clean Energy Policies: the Foundation for an Electric Sector Cap-and-Trade Program* (July 2009), *available at* http://www.naruc.org/Publications/ClimateIssueBrief4_Jul2009.pdf (this was NARUC's predecessor to its current *Task Force of Environmental Regulation and Generation).*
3. *See Standard of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units*, 79 Fed. Reg. 1430 (Jan. 8, 2014) (hereinafter *Proposed Guidelines*); *see also, EPA Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units*, 77 Fed. Reg. 22,392, 22,394 (March 27, 2012).
4. Am. Elec. Power Co. v. Conn., 131 S. Ct. 2527, 2537-38 (2011).
5. 40 C.F.R. § 60.22, 60.23 (2009) (Emphasis added).
6. U.S. Environmental Protection Agency, *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units* 493-494 (Jun. 2, 2014), http://www2.epa.gov/sites/production/files/2014-05/

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documents/20140602proposal-cleanpowerplan.pdf; *see also* U.S. Environmental Protection. Agency, *EPA Proposes First Guidelines to Cut Carbon Pollution from Existing Power Plants*, *Subheading to Carbon Pollution Standards*, *available at* http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule (last visited Jun. 6, 2014).

7. 40 C.F.R. § 60.22, 60.23 (2009)

8. *Proposed Guidelines*, *supra* n. 2, at 113.

9. Clean Air Act, 42 U.S.C.A. § 7410(a)(2)(A).

10. Although states are afforded significant flexibility under Section 110, they are also bound by certain limits in this process. For example, SIPs must be "no less stringent" than EPA's emissions guideline.

11. *Proposed Guidelines, supra* n. 3, at 353.

12. The National Renewable Energy Laboratory (NREL) and others have demonstrated how renewable energy can effectively reduce emissions. *See* National Renewable Energy Laboratory, *Western Wind and Solar Integration Study* 130 (Sept., 2013), *available at* http://www.nrel.gov/electricity/transmission/western_wind.html; *see also* PJM Interconnection, *Renewable Integration Study* 6 (Feb. 28, 2014), *available at* http://www.pjm.com/~/media/committees-groups/committees/mic/20140303/20140303-pris-executive-summary.ashx; *see also* U.S. Department of Energy, *SunShot Vision Study* (Feb. 2012), *available at* http://www1.eere.energy.gov/solar/pdfs/47927_chapter7.pdf; *see also* National Renewable Energy Laboratory, *Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges* 493-94 (January 2005), *available at* http://apps3.eere.energy.gov/greenpower/resources/pdfs/37388.pdf.

13. National Renewable Energy Laboratory, *Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges* 19, 55 (2005), *available at* http://apps3.eere.energy.gov/greenpower/resources/pdfs/37388.pdf.

14. Although a REC may be eligible under multiple state RPSs, no REC can be used more than once for compliance. U.S. Environmental Protection Agency, *Mandatory Markets*, Subheading to *Voluntary and Mandatory Markets*, http://www.epa.gov/greenpower/gpmarket/markets.htm (last visited May 30, 2014).

15. Kan. Admin. Regs. § 82-17-1 (2013), *available at* http://www.kssos.org/other/Final_2013_KAR_Supplement.pdf.

16. Environmental Tracking Network of North America, *Learn About Renewable Energy Certificates (RECs)*, http://www.etnna.org/learn.html#certificates (last visited May 30, 2014).

17. National Renewable Energy Laboratory, *supra* n. 14, at 51.

18. U.S. Environmental Protection Agency, Office of Air & Radiation, *Clean Power Plan Proposed Rule: State Plan Considerations Technical Support Document*, 62-63 (June 2014) available at http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-state-plan-considerations.

19. *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units* at 493-494.

20. National Renewable Energy Laboratory, *supra* n.14, *at 7.*

21. J. Heeter et al., *A Survey of State-Level Cost and Benefit Estimates of Renewable Portfolio Standards* iv (May 2014), *available at* http://emp.lbl.gov/sites/all/files/lbnl-6589e.pdf. States define which types of electricity generation (e.g. by location and technology type) are eligible for compliance with state policies, and typically require regulated entities to acquire and retire RECs from eligible generation sources. *See, e.g.* State of Iowa, Department of Commerce Utilities, *Order Approving Facilities and Associated Capacities, Adopting Requirements for M-RETS Participation, and Requiring Report* (2007), *available at* http://www.state.ia.us/government/com/util/docs/orders/2007/1121_aep071.pdf.

22. U.S. Department of Energy, *Guide to Green Purchasing Power* 10 (March 2010), *available at http://www.epa.gov/greenpower/documents/purchasing_guide_for_web.pdf*.

23. J. Heeter & T. Nicholas, *Status and Trends in the U.S. Voluntary Green Power Market 6 (2012 Data), available at* http://www.nrel.gov/analysis/market_green_power.html.

24. *Id.* at 25.

25. Environmental Tracking Network of North America, *Learn about Tracking Systems,* http://www.etnna.org/learn.html#certificates (last visited May 30, 2014).

26. U.S. Environmental Protection Agency, Office of Air & Radiation, *Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79* (June 2014), available at http://www2.epa.gov/sites/production/files/2014-05/documents/20140602tsd-state-plan-considerations.pdf.

27. *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units*, *supra* n. 6.

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