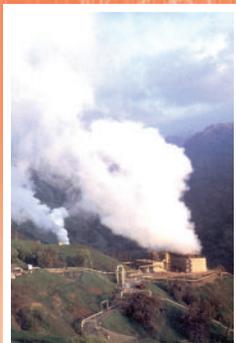
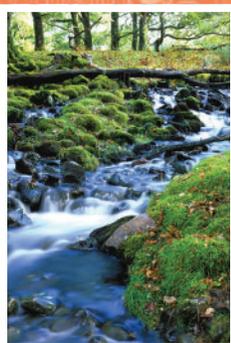


Supporting State Compliance With the EPA Clean Power Plan

Recommendations for Renewable Energy Certificate Tracking Systems



February 11, 2015

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Foreword

Most U.S. states encourage renewable energy development through state renewable portfolio standards and other renewable energy policies. In order to meet the emissions reductions targets in the Clean Power Plan (CPP), the U.S. EPA allows states to use these existing policy tools. A key challenge for state regulators seeking to comply with the CPP through their renewable energy programs will be tracking the results of those programs, which can occur inside and sometimes outside of state boundaries.

In this paper, the Center for Resource Solutions and the Regulatory Assistance Project have collaborated to describe how the existing functionality of the regional renewable energy tracking systems can be used by states to track renewable energy and support compliance with the CPP, as well as to identify enhancements that may be needed to support state policy and reporting requirements.

We hope that this paper will be helpful as you work through these issues.



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Executive Summary

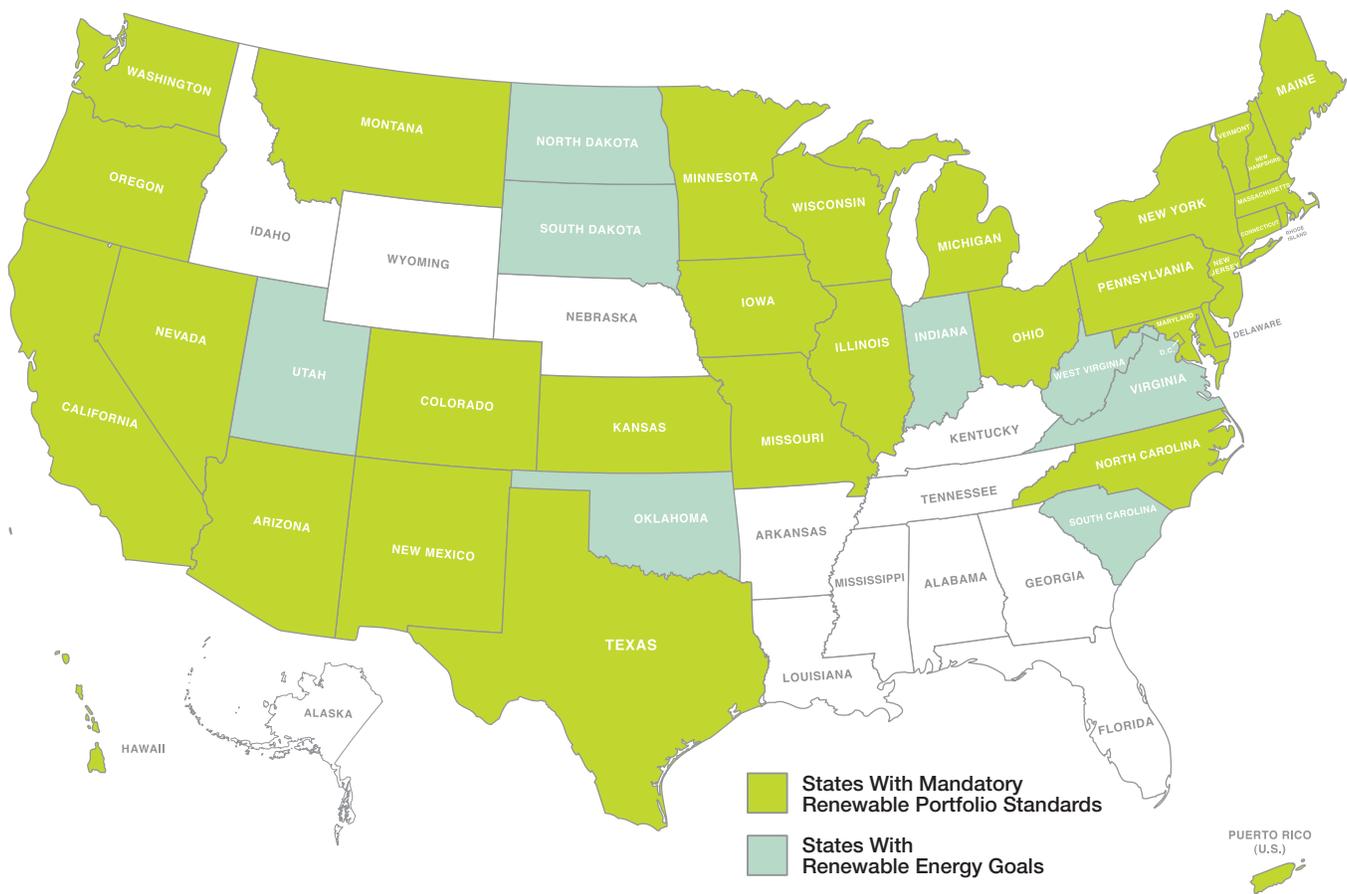
Renewable energy will provide an important pathway for states to comply with the EPA Clean Power Plan (CPP). The majority of states have renewable portfolio standards and other renewable energy policies in place. The existing network of regional Renewable Energy Certificate (REC) tracking systems is used by many of these states to verify compliance with their current programs, and, more broadly, is used by states, load serving entities (LSEs), and voluntary renewable energy market participants to document renewable energy ownership and use. These tracking systems can easily be adapted for state requirements for tracking renewable energy for CPP compliance. Existing functionality provides much of what states will need, including reporting functions that can document renewable energy generation and retirements by obligated entities. State reporting and tracking needs for the CPP may require

some enhancements to the existing functional and reporting capabilities of these systems, including expansion of the current options for inter-registry certificate transfers and expanded regulator access and reporting to document the renewable energy generation that results from state plans. Similar enhancements have already been adopted by some of the systems, and the flexible architecture of the underlying software will allow tracking systems to easily meet state needs as states finalize the renewable energy portions of their state plans.

Introduction

Renewable energy is a key component of state compliance pathways under the proposed EPA CPP. Recognizing that the majority of states already have well-established renewable portfolio standards (RPS) and other policies that support the development of new renewable energy

Figure 1. RPS In Place in the Majority of States



Source: Database of State Incentives for Renewables and Efficiency (DSIRE) available at http://dsireusa.org/documents/summarymaps/RPS_map.pdf.

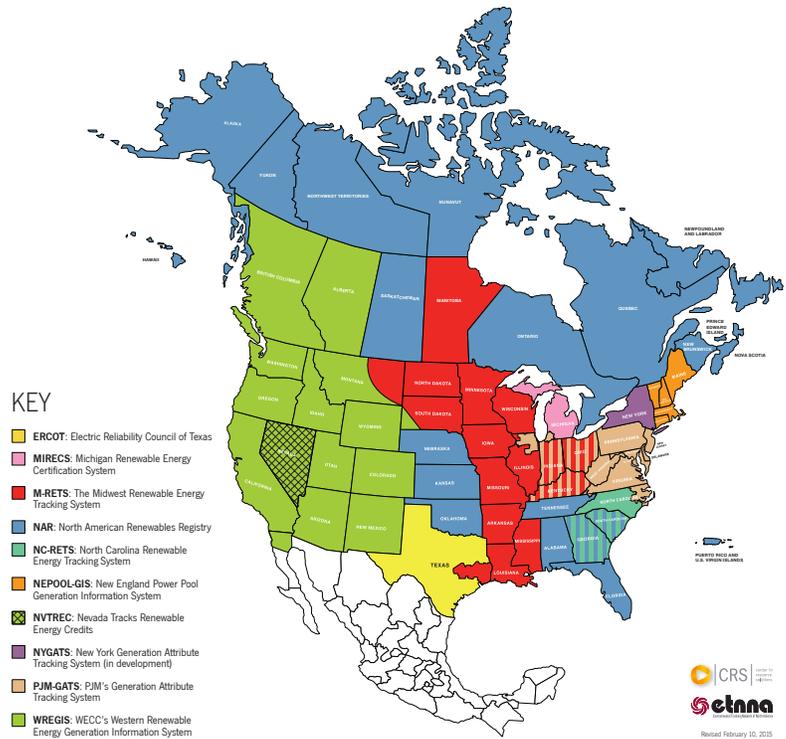
generation facilities, EPA proposed that states may meet the emissions reductions goals of the CPP by continuing existing programs in addition to developing new renewable energy policies.

Beginning with the launch of Texas's ERCOT tracking system in 2001, states and regional governmental bodies have created tracking systems for renewable energy (and in some parts of the country, all electricity generation) to support state and regional renewable energy goals, as well as power source disclosure and emission disclosure reporting requirements.^{1,2} Today, these regional systems, plus the privately operated North American Renewables Registry, provide coverage for generation across the U.S., and for interconnected electricity markets in portions of Canada and Northern Baja California, Mexico.

A critical element for states using renewable energy to meet the requirements in the CPP will be tracking and documenting renewable energy production that result from state action, and the associated emissions impacts. The existing tracking systems already have the capability to track ownership of renewable energy and its environmental attributes, and to produce reports that state regulators can use to demonstrate renewable energy generation resulting from state policies activities that support compliance with the CPP.

The CPP recognizes that some state policies already support renewable energy development outside a given state's boundaries, or may in the future.³ The CPP allows for renewable energy to be used towards compliance even in cases where that renewable energy generation is located outside of the state geographic borders, and across tracking system boundaries. In support of existing state policies that already allow out-of-state renewable energy generation to be used for in-state RPS compliance, the existing tracking systems have already started developing functionality to track transfers of certificates between tracking systems. This capability, in addition to the tracking and reporting functions already offered by the tracking systems, will be critical to their use by states for complying with the requirements of the CPP. States will have flexibility in how they develop their state plans to comply with the CPP, and the existing tracking systems have a flexible architecture that can be adapted to differing state policy requirements. In anticipation of

Figure 2. Renewable Energy Tracking Systems of North America



Source: Environmental Tracking Network of North America (ETNNA), available at <http://www.etnna.org/learn.html>. M-RETS territory indicated above effective April 2015.

Figure 3. Common REC Tracking System Data

Certificate Data	Static Data
Certificate Type	State or Province
Tracking System ID	Country
Project Type	NERC Region
Project Name	eGrid Sub-Region
Certificate Vintage	Commenced Operation Date
Certificate Serial Numbers	Fuel Type/Energy Source
Quantity of Certificates	Nameplate Capacity
Meter Data From:	Reporting Entity Type
Meter Data To:	Reporting Entity Contact Company or Organization
Name	Utility to Which Facility is Interconnected
Certificate Creation Date	Repowered Indicator (Y/N)
Utility to Which Project is Connected	Repowered Amount
	Repower Date (required if repowered indicator = Y)
	Qualified Facility (Y/N)
	State(s) RPS Eligibility

Source: Adapted from "REC Definitions and Tracking Mechanisms Used By State RPS Programs," by Jan Hamrin for the Clean Energy States Alliance, June 2014. Available at <http://bit.ly/1AW5xMF>.

these state requirements, this paper discusses how tracking systems can augment their current offerings to better suit the potential state reporting and verification requirements for CPP compliance with renewable energy.

Tracking Systems Are Compliance Tools For the Clean Power Plan

Tracking systems provide a reliable, secure, and data-driven tool for regulators to track compliance with state renewable energy policies and the CPP. All of the tracking systems in use in the U.S. track Renewable Energy Certificates (RECs) using common datasets, data quality criteria, and operating procedures.⁴ As such, they offer individual states, and multi-state regions that are jointly responding to the CPP, a common framework to track renewable energy activity within their state and also across borders. The flexible architecture of these systems allows them to easily add information to certificates, and also to produce reports for regulators that summarize generation activity using a variety of reporting categories, such as the geographic region where the generator is located, specific time periods of generation or REC use (retirement), end-users of the certificate (e.g. Load-Serving Entities [LSEs] in a particular state), and for specific types of generators (e.g., those eligible for a particular state's RPS).

Tracking systems are routinely used to track the environmental attributes of renewable energy generation.⁵ Some states use these systems to track emissions in the electricity sector, and use the certificate data to create reports on the emissions associated with electricity delivered by in-state LSEs.⁶ In addition, for states that allow out-of-state renewable energy generation for compliance with state renewable energy policies, tracking systems are routinely used to track certificate transfers from out-of-state generators to in-state LSEs and other users. In some jurisdictions, tracking systems are also used to track delivered renewable electricity across state borders.⁷

Tracking systems provide a ready-made platform for the administrative and verification processes states will need for tracking renewable energy for the CPP. Because these systems were designed to assist state regulators with monitoring and verifying compliance with state renewable energy policies, the systems all offer reporting features that provide needed data to state regulators, including, in some cases, restricted access to certain types of data and reporting that is needed by state

regulators but not publicly available. As state plans are developed, tracking system operators can adjust the functionality of the systems easily to accommodate state needs for enhanced reporting, and for inter-registry transfers.

Tracking Systems Track the Environmental, Non-Energy Benefits of Renewable Energy

Currently, all the systems but one (North Carolina's NC-RETS tracking system) ensure, consistent with applicable state laws and market participant requirements, that the non-energy, environmental benefits of renewable energy are not transacted outside of the certificate.⁸ Although the EPA has not yet finalized its guidance on how renewable energy can be used by states in reporting emissions, the draft regulation offers examples of calculation methods that adjust emission rates (pounds/MWh for rate-based reporting) using renewable energy generation. States using such reporting methods can easily rely on tracking system results to calculate the number of MWh to use for the renewable energy adjustments in calculating their emission rates for EPA.⁹ EPA offers states flexibility in reporting emissions and in how renewable energy is used to adjust or impact emissions from regulated Electric Generating Units (EGUs). Some states already

Figure 4. Cross-State RPS Compliance Options

States	Imports
3 States Allow No Imports	
2 States Allow Imports From	1 State
1 State Allows Imports From	2 States
2 States Allow Imports From	3 States
3 States Allow Imports From	4 States
1 State Allows Imports From	6 States
2 States Allow Imports From	7 States
1 State Allows Imports From	8 States
15 States Allow Imports From	9+ States

Source: Based on data from Holt, Ed. "Potential RPS Markets for Renewable Energy Generators." Clean Energy States Alliance. January 2014. <http://www.cesa.org/assets/2014-Files/Potential-RPS-Markets-Report-Holt-January-2014.pdf>.

use tracking systems to track emissions from all generation (including regulated EGUs and renewable energy generators). If states propose other reporting mechanisms that rely on tracking emissions (or emission reductions) associated with renewable energy generators, tracking systems can track the data that state regulators need to support emissions reporting associated with their state plans.

Cross-Boundary Renewable Energy Certificate Tracking

Tracking renewable energy certificates across state boundaries currently happens on a regular basis to meet the needs of RPS administrators and other REC market participants. For states using renewable energy to meet their CPP emission reduction targets, enhancements of these transfer capabilities, and the policies that enable them, will augment states' ability to use these systems to comply with the CPP. Current examples such as the interaction between M-RETS and the Michigan MIRECS system, as well as the European Energy Certificate System, provide examples of how these modifications may take effect on a wider basis.

It will be critical for states using renewable energy to comply with the CPP to be able to track bundled renewable electricity (electricity that includes RECs) and unbundled RECs exported from their state of generation, both for states where renewable energy policies accept generators outside of state borders, and for states in which such exporting generators operate. While most of the U.S. tracking systems have multi-state footprints, some states' renewable energy policies allow renewable generation from outside of the state's tracking system. For example, North Carolina allows renewable energy to be used for compliance with its RPS from outside of the footprint of the NC-RETS system. Such renewable energy policies with geographic boundaries that do not align with tracking system boundaries, and the possibility that more will develop in the future and be used in state plans, emphasize the need for effective tracking and transfer of RECs between systems.

Twenty-nine states and the District of Columbia currently have RPS policies. Of these, only three require all renewable generators

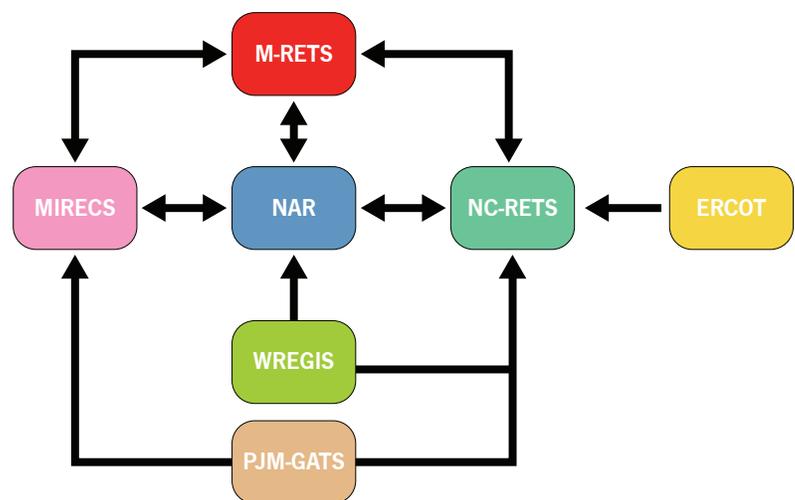
used for RPS compliance to be located inside the state boundaries. The overwhelming majority allow renewable energy from out-of-state generators to be used for RPS compliance. In addition, eight states have non-binding renewable energy goals, and five of the eight allow renewables from other states to be used in fulfilling their goals.¹⁰

To support RPS use of out-of-state renewables, many tracking systems have already taken steps to allow for import and export of RECs with neighboring systems. For example, M-RETS allows import of RECs from Michigan's MIRECS system. Every tracking system in the U.S. other than NEPOOL GIS and NVTREC is able to import to or export certificates from at least one other tracking system.¹¹ The graphic below illustrates all current tracking system linkages.

To suit the needs of CPP reporting, further linkages may be necessary. Continuing to develop such linkages could also benefit RPS and voluntary renewable energy markets, further improving tracking systems' use for avoiding double counting across all relevant renewable energy policies and markets.

Linkages and export/import functionality between tracking systems must be responsive to state policy design. An example of tracking system flexibility and policy accommodation can be seen in M-RETS' acceptance of imports from MIRECS, which issues tradable "incentive"

Figure 5. Available Inter-Registry REC Transfers



Source: North American Renewables Registry (<http://www.narecs.com>) and The Midwest Renewable Energy Tracking System (M-RETS; <http://www.mrets.org/resources/frequently-asked-questions/>). Data accessed 2/10/15.

certificates (effectively REC multipliers)¹² in addition to RECs for certain MWh of generation. M-RETS does not issue or recognize the incentive certificates, and defines a REC as all the environmental benefits of 1 MWh of renewable electricity generation. The M-RETS import protocol with MIRECS forces the retirement of the MIRECS REC and all associated incentive certificates, and creates a corresponding REC in M-RETS, thus preserving the full environmental value of the REC now in M-RETS and preventing trading and other use of the REC and incentive certificates in MIRECS. Such functionality creates certainty for M-RETS users that each REC is the only tradable instrument generated from each MWh of renewable energy generation imported from MIRECS, and for CPP purposes, supports cross-state and cross-tracking system boundaries transfers and prevents potential double counting of renewable energy attributes.

The European Energy Certificate System (EECS) for tracking Guarantee of Origin (GO) certificates from renewable electricity generation offers another example of how certificate tracking systems have developed mechanisms for certificate transfer. European countries participating in the EECS are able to transfer certificates between national tracking systems using a centralized hub model. Participating national systems are able to import and export certificates through a centralized hub, which provides the technical criteria and data requirements needed for tracking systems to connect to the hub and interact with each other.¹³ Using

a centralized hub with a single set of protocols and criteria for certificate transfer allows the European tracking system administrators to avoid the costs of developing unique interconnection rules between each possible pair of tracking systems. In the U.S., there are fewer total tracking systems than in the EU. Given this smaller number, state specific policy requirements such as those described in the previous paragraph, and the fact that many of the U.S. systems have already developed interconnections with each other, it would be more efficient and practical to build on the system of direct bilateral transfers that already exists.

Using Tracking System Functionality for CPP Compliance Reporting

Tracking systems already provide regulators and regulated LSEs with a variety of administrative features for reporting and tracking renewable energy that can be used for CPP purposes. These include administrative-level access for regulators, creation and review of customized data reporting, and options to denote that REC retirement was completed for a specific state policy or other program.

Regulators in many states have special administrative status through their tracking system accounts so that they can review REC retirements made for RPS compliance. In some

Figure 6. Example Tracking System 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

cases, this access allows regulators to review specific reports, communicate with tracking system users, accept or reject retirements, and view other detailed information. Depending on how compliance reports are created, state regulators with administrative access could view reports specifically created to show renewable energy retired for compliance with those state policies that are part of the state's CPP compliance plan. Additional reporting and administrative functionality could be added to meet states' needs.

Where there is not complete overlap between renewables that are eligible for a state's renewable energy policy and for the CPP (for example, some renewables eligible for the RPS⁴ are not included in the state's CPP plan), tracking system data reports can be designed to report data on only those MWh eligible for both programs (e.g. RECs can be tagged at retirement using a specific "retirement reason"). Such tools can be used by states to demonstrate the portion of their RPS retirements that can be allocated to CPP compliance.

The CPP allows the states significant flexibility in designing their state plans. To create reports with the required tracking system data, state regulators will need to work with tracking system administrators to identify reporting needs, including tracking system data fields, state policy REC retirement and eligibility rules, and other requirements of the state's CPP plan. For example, a state with an RPS that allows RECs from a neighboring state with mass-based reporting might have to design a compliance report that excludes the out-of-state RECs which were otherwise eligible for the RPS. Or, the state could instead mark all in-state generators that are eligible under the state's CPP plan, and create a report showing all REC retirements from CPP eligible facilities completed by LSE's within the state. The voluntary renewable energy market also uses tracking systems for compliance, making it easy to identify and exclude in-state generation that was used for voluntary retirement reasons and is therefore not eligible for state CPP compliance.

RECs traded across state borders and used for CPP compliance raise the potential for double counting if two states attempt to comply using the same MWh of renewable electricity generation. To avoid double counting, tracking system reports used to demonstrate CPP compliance

should be designed to report RECs *retired* for a specific state's renewable energy policy, and credit should only be given to the state where the retirement was used for compliance, not the state of generation (unless they are the same). In addition to fields noting the eligibility of specific generators for state CPP compliance, retirement reasons that specify the state of the applicable policy could ease the administrative burden of tracking which state can report renewable electricity generation toward CPP.

Double counting between states could arise if REC retirement is not the basis for CPP compliance. For example, State A could mark certain generators as CPP eligible (for example, all generators that are also eligible for the state's RPS) and then, regardless of where and for what reason the RECs from the generator are retired, attempt to report that generation for CPP

It is critical for the success of state plans involving renewable energy to be clear that REC retirement (not just generator eligibility) is needed for CPP compliance.

purposes. State B, in the same tracking system footprint, might also allow that same generation to count towards its CPP State Plan and its RPS. If an LSE in state B retires the RECs for state B's RPS, then only state B should include that generation in its CPP compliance reporting. It is critical for the success of state plans involving renewable energy to be clear that REC retirement (not just generator eligibility) is needed for CPP compliance. To prevent double counting, tracking system reports issued for CPP purposes to states should report each REC retirement to only one state (or group of states if there is regional cooperation).

There are existing state renewable energy policies that do not currently require REC issuance or retirement, such as incentive programs for

new distributed solar. Such policies can be used by states for CPP compliance, provided the generation from those facilities is registered in tracking systems, and the retirement reason is associated with the supporting state's CPP plan. By reporting and tracking renewable energy generation from such facilities in REC tracking systems, and using the tracking systems to create reports when those RECs are retired for the state's CPP Plan, states can assure that these facilities will not be counted by other states for CPP purposes, or for other uses (e.g., voluntary market renewable energy claims) that would result in double counting of the emissions reductions attributes of that generation.

Conclusions

Many implementation aspects of the CPP are still to be determined, including how states will be required to document emissions reductions from renewable energy in their plans. Despite this uncertainty, states already use and have access to renewable energy tracking systems that provide much of the core functionality and tracking and reporting needs that states will require if they use renewable energy to comply with the CPP.

Tracking renewable energy using data-driven, secure and reliable tracking systems will be key to supporting the validity of state emission reduction reporting under the CPP. Without their use, there is significant risk of double counting among states of emissions reductions resulting from renewable energy generation. Multiple state policies affect renewable energy development, and the flexibility to include out-of-state renewable energy in a state plan creates the real potential for two or more states to claim the same renewable energy generation for CPP compliance. Tracking systems also provide the tracking and reporting functionality that states will need to verify and document the impact of their renewable energy policies for the purposes of CPP compliance. The existing tracking systems offer states a tool that will allow states to easily authenticate renewable energy ownership to support compliance and avoid double counting. By including tracking systems in their state plans, states can ensure that their renewable energy policies will be effective in meeting their CPP goals.

To better prepare for CPP compliance needs, state regulators should begin to work with tracking system administrators to identify specific ways that tracking system data and reporting can be used to support state CPP plans. Key issues that tracking systems administrators should ensure meet state needs include:

- Augmenting the data that is collected during certificate retirement to support CPP reporting.
- Creating or modifying (as necessary) administrative access for state regulators in charge of CPP compliance.
- Expanding certificate import and export functionality to match state renewable energy policies supporting CPP compliance.
- Considering adding new certificate data and reporting functionality that will benefit multiple states and states participating in regional plans.

Renewable energy tracking systems were developed to address policy verification and compliance, and were designed to be flexible enough to integrate with other program needs, such as those related to CPP compliance. With the inter-state renewable energy tracking and regional cooperation between states that will occur as a result of the CPP, there is increased need for cooperation, communication and linkage between the existing systems. ●

Notes

1. For a chronology of the development of the regional electronic tracking systems, see <http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=3>.
2. Hamrin, Jan. "REC Definitions and Tracking Mechanisms Used by State RPS Programs." Clean Energy States Alliance. June 2014. www.cesa.org/assets/2014-Files/RECs-Attribute-Definitions-Hamrin-June-2014.pdf.
3. U.S. Environmental Protection Agency, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," Federal Register vol. 79, No. 117, June 18, 2014, Sec. VIII, F.6, p. 34922. "The EPA is proposing that, for renewable energy measures, consistent with existing state RPS policies, a state could take into account all of the CO2 emission reductions from renewable energy measures implemented by the state, whether they occur in the state or in other states. This proposed approach for RE acknowledges the existence of renewable energy certificates (REC) that allow for interstate trading of RE attributes and the fact that a given state's RPS requirements often allow for the use of qualifying RE located in another state to be used to comply with that state's RPS. The EPA is also seeking comment on how to avoid double counting emission reductions using this proposed approach."
4. See Hamrin, Table 4.
5. Heeter, Jenny. "Renewable Energy Certificate (REC) Tracking Systems: Costs & Verification Issues." Presentation. October 11, 2013. <http://www.nrel.gov/docs/fy14osti/60640.pdf>.
6. The NEPOOL GIS is used by multiple states to track electricity sector emissions from all generation facilities in the region.
7. For example, the NEPOOL GIS creates certificates for physical electricity deliveries into the NEPOOL region, and WREGIS has fields used to document NERC tag data required by California for certain classes of out-of-state renewable energy generation used for compliance with the state RPS program.
8. Heeter, Jenny. "Renewable Energy Certificate (REC) Tracking Systems: Costs & Verification Issues." Presentation. October 11, 2013. <http://www.nrel.gov/docs/fy14osti/60640.pdf>.
9. See David Farnsworth, "Navigating EPA's Clean Power Plan for Compliance With Renewable Energy" at <http://www.resource-solutions.org/publications> for a more detailed discussion of how emission reporting could be adjusted to reflect emissions reductions from renewable energy.
10. Based on data from Holt, Ed. "Potential RPS Markets for Renewable Energy Generators." Clean Energy States Alliance. January 2014. <http://www.cesa.org/assets/2014-Files/Potential-RPS-Markets-Report-Holt-January-2014.pdf>.
11. Although NEPOOL GIS does not allow certificate-only imports, it does allow certificates to be issued for out-of-region generators if electricity from those generators is physically imported into the NEPOOL region. See <http://www.narecs.com/resources/registries/> for a list of tracking systems allow REC-only export and import.
12. MIRECs has published procedures that allow exported RECs to correspond to one MWh of generation. These procedures require retiring extra RECs to compensate for any incentive RECs that were issued for a single MWh of generation. A full explanation of the procedures can be found here. Incentive RECs and Inter-registry Transfers, 05/02/2014, www.mirecs.org/wp.../4/.../Interregistry-Credit-Transfer-05022014.docx.
13. For more information on the AIB Hub, see http://www.aib-net.org/portal/page/portal/AIB_HOME/FACTS/EECS%20Registries/AIB_Hub.
14. For a more thorough discussion of inter-state renewable energy tracking and reporting between states using differing reporting methods (rate-based and mass-based), see "Navigating EPA's Clean Power Plan for Compliance With Renewable Energy" at <http://www.resource-solutions.org/publications>.



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