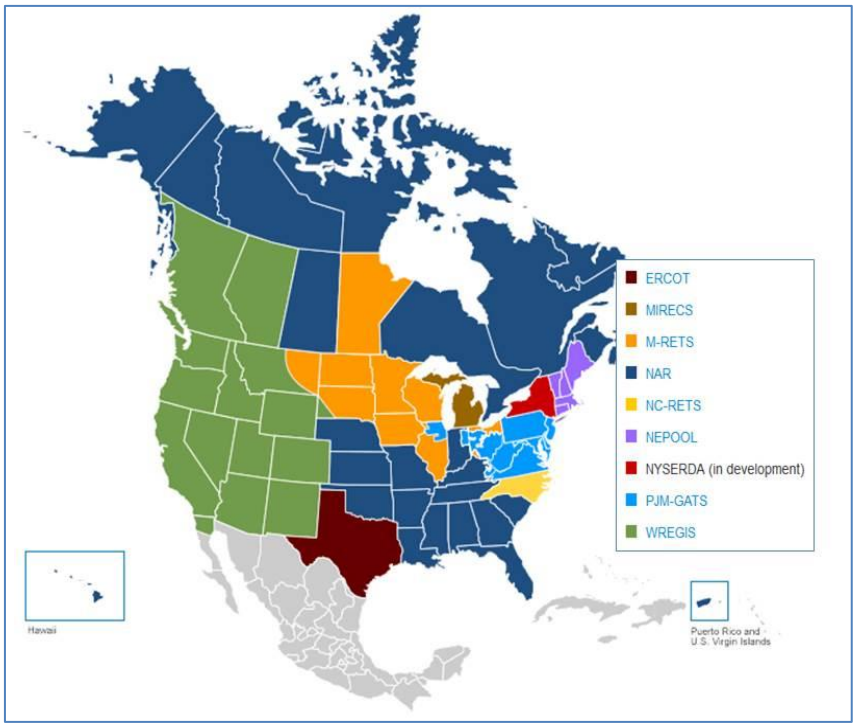
October 2014

# APX Research

## Using Tracking Systems with the Implementation of Section 111(d) State Plans

This summer, the US Environmental Protection Agency released its proposed rule under the Clean Air Act to reduce CO2 emissions from existing electric generating resources. When the rules become final, the EPA will mandate that state agencies implement policies to meet $CO_2$ reduction targets. As states begin to understand how the new requirements fit within existing renewable portfolio standard (RPS) programs (already implemented across 29 states, Puerto Rico and the District of Columbia) and existing carbon cap-and-trade programs implemented in the Northeast and California, states need to consider what tools they have available to track power sector emissions, reductions and compliance. This analysis outlines the current tracking system features available today in all 50 states and how they can support specific state policies.

**Figure 1: US Tracking Systems**




## INSIDE THIS ISSUE:



## KEY TAKEAWAYS:

- Section 111(d) implementation will require tracking of power attributes
- The current registry infrastructure can support tracking attributes from all power sources.
- Matching physical power paths and emission attributes may be required.
- Renewable Portfolio Standards and the voluntary green energy market can exist side-by-side with Section 111(d) implementation.
- Protocols and project workflows to support tracking of Energy Efficiency Credits is already implemented and utilized by some tracking systems.

## REGISTRIES:

| | Launched | Tracks All Generation? |
|---|---|---|
| ERCOT | 2001 | No |
| NEPOOL GIS | 2002 | Yes |
| PJM-GATS | 2005 | Yes |
| WREGIS | 2007 | No |
| M-RETS | 2007 | No |
| NAR | 2009 | No |
| MIRECS | 2009 | No |
| NC RETS | 2010 | No |

# 1. Energy and Attribute Tracking

The proposed rule aims for a thirty percent reduction target in absolute emissions by 2030 compared to 2005 levels, and outlines a flexible set of approaches and building blocks that states may use to meet these targets. Common among the majority of the various approaches is that these plans will require close tracking of energy and emission attributes from power generation as well as the interstate transfers of the physical power and associated environmental attributes.

Today, tracking systems are available across all States and Territories of the United States, enabling the electronic registry infrastructure to support compliance and voluntary markets for renewable energy and energy efficiency. The combined elements of tracking power generation attributes, associated emission rates, and physical power delivery provide the foundational elements needed to implement Section 111(d) State Implementation Plans. The key elements provided by tracking systems include:

- Tracking emission attributes for every MWh generated
- Calculating average and residual emission rates
- Tracking Energy Efficiency savings
- Calculating and tracking emission reductions from renewable energy and energy efficiency
- Tagging emissions attributes from power source to sink
- Tracking inter-state power transactions
- Inter-registry Import and Exports
- Support carbon allowance adjustment for voluntary green power market
- Public Reports provide transparency

## TRACKING EMISSION ATTRIBUTES FOR EVERY MWH GENERATED

Currently, two of the eight tracking systems, NEPOOL GIS and PJM-GATS, track all generation resources in order to support power disclosure programs and to provide system emission rates of various pollutants, including $CO_2$, to state regulators. In these registries, a certificate representing the power attributes is issued for every megawatthour (MWh) generated in the region, as well as for every MWh imported into the region. Power attributes include the source of the generation, the fuel/technology type, the emission rates for specific pollutants (such as $CO_2$), the time of generation (vintage), additional information required by regulators, and the tracking of each MWh of electricity generated. The emission rates associated with each MWh generated are based on the specific generating units' reporting to the US EPA. For imported generation certificates, the emission attributes are either based on the specific out-of-region generating unit or the system emissions rate for the region in which the power was generated.

Certificates can be transferred from one party to another to aid in calculating power disclosure for a specific load serving entity. One of the core principles of an all generation system is that there is a match between supply (certificates issued for every MWh generated/imported in the region) and load (every MWh of sales in the region), thus enabling a complete allocation of attributes across market participants. The ability to track the allocation of emission attributes within a power region and imports into a power region from neighboring regions are critical elements to support State Implementation Plans under Section 111(d).

## CALCULATING AVERAGE AND RESIDUAL EMISSION RATES

By tracking all generation and combining it with the emissions attributes of the generation, NEPOOL GIS and PJM-GATS can automatically calculate residual and system emission rates. The residual system mix is calculated by taking the average emission rate for all unclaimed certificates. This is the rate that is then applied to load that has not been matched to certificates to provide disclosure on the emission rates and generation sources for a specific utility. Power that is not associated with a specific certificate is often termed 'null power' (or undifferentiated), but in a region with all generation tracking, it will be given the attributes of the residual mix. In this way, the residual mix can support state efforts if Section 111(d) compliance is placed upon the Electric Distributing Utility (EDU) by creating emission rates that can be applied to null power.

## TRACKING ENERGY EFFICIENCY SAVINGS

NEPOOL GIS, NAR, and NC-RETS track energy savings from energy efficiency projects. The tracking can be based on individual project sites or based on aggregate programs administered by utilities or energy efficiency aggregators. The Energy Efficiency Certificates include the attributes (i.e. location, type, time, etc.) needed to help determine the emission reductions they produced. It is likely that demand side reductions will be a central part of state implementation plans. There are several direct and indirect ways they can be incorporated and the registry can support this based on the specific state or regional policy implemented.

## CALCULATING AND TRACKING EMISSION REDUCTIONS FROM RENEWABLE ENERGY AND ENERGY EFFICIENCY

Various agencies and non-profits have at times developed emission reduction calculations for renewable energy and energy efficiency. In the North American Renewables Registry (NAR), these calculations have been implemented based on methodologies developed by the US EPA Climate Leaders program and the Center for Resource Solutions. The calculation is based on the characteristics of a specific renewable generator (i.e. location, fuel type, etc.), enabling an automatic calculation of the reductions which are then tracked on the certificate. Similar functionality can be applied for states that choose to set up a program for recognizing the emissions reductions from renewable energy and energy efficiency. The state would choose the methodology but the tracking system could apply it based on key attributes, including potentially time-of-day generation.

## TAGGING EMISSION ATTRIBUTES FROM POWER SOURCE TO SINK

In NEPOOL GIS, capturing imported power attributes is possible by associating them to the specific generating unit. The importer is required to demonstrate that on an hourly basis renewable generation and import schedules match. In WREGIS, RECs can be matched with e-Tags to demonstrate delivery paths into CAISO. The matching of RECs and physical power delivery will be a central component to enable policies that address the emission effects of power transactions across state borders and power regions.

## TRACKING INTER-STATE POWER TRANSACTIONS

The majority of power regions do not align with state borders and several states are part of more than one power region. In addition, States within a power region may choose different ways to address emissions from the power sector. For example, the states of Maryland, Delaware, and the District of Columbia are part of the PJM Interconnection while also participating in the Regional Greenhouse Gas Initiative (RGGI) whose other members are in New York and New England. This necessitates the ability to track the source and sink of power transactions within a power region. This is not necessarily done today, but can be implemented in and tracked in the registries.

## INTER-REGISTRY IMPORT AND EXPORTS

Since some state RPS programs recognize renewable energy generated in other states beyond their tracking systems, imports and exports of credits across RPS registries are required. Several tracking systems have implemented the ability to import (MIRECS, M-RETS, NAR and NC-RETS) and export (MIRECS, M-RETS, NAR, NC- RETS, PJM-GATS, and WREGIS) certificates from one tracking system to another. The current linkages support millions of RECs exports and imports and additional links are currently being added. This process can also support the inter-registry transfers of certificates not eligible for RPS polices and the associated emission attributes.

## SUPPORT CARBON ALLOWANCE ADJUSTMENT FOR VOLUNTARY GREEN POWER MARKET

The NEPOOL GIS supports the annual true-up process implemented in RGGI to reduce the volume of auctioned GHG allowances based on voluntary purchases of green power in the region. This rule was instituted by RGGI in order to preserve the voluntary green power market while instituting the cap-and-trade allowance market for power generators. A similar process for California's cap-and-trade market is supported by WREGIS.

## PUBLIC REPORTS PROVIDE TRANSPARENCY

Registries provide several public reports that are automatically updated based on registry activity. This includes up-to-date information on the residual, system and import mix for the region providing transparency to regulators, market participants, and the public.

**Table 1: Registry Features and Section 111(d).**

| Registry Feature | Supports |
|---|---|
| Tracking emissions attributes for every MWh generated | Allocation of emission liabilities for purchased power |
| Calculation of average and residual system emission rates | Allocation of emission liabilities for purchased power<br>Applying emission attributes to power imports and exports |
| Tracking Energy Efficiency savings | The inclusion of energy efficiency certificates in tradable markets |
| Calculating and tracking emission reductions from renewable energy and energy efficiency | The inclusion of energy efficiency and renewable energy to adjust emission rates |
| Tagging emission attributes from source to sink | Interaction with other regional power markets and the attribution of emission characteristics to power imports and exports |
| Tracking inter-state power transactions | The ability to set-up a state market that does not align with regional power market borders |
| Inter-registry Import and Exports | Guarantees that attributes are not double-counted between regions |
| Support carbon allowance adjustment based on voluntary green power | Enables allowance adjustments whether for green power markets or RPS compliance results |
| Public Reports | Provides transparency to all stakeholders |

# 2. State Approaches and Options

The US EPA outlines four building blocks that states can use to meet the reduction requirements: (1) increase the efficiency of existing fossil fuel power plants, (2) convert to less carbon-intensive fuels, (3) expand the use of renewable and zero-emitting power sources, and (4) demand reduction via energy conservation and efficiency measures. It is not an exclusive list, as States are free to use additional strategies such as new construction of low-emitting generating units, high-emitting generating unit retirements, combined heat and power storage, etc.

In support of the proposed rule, the US EPA prepared a detailed review of the state compliance options in the State Plan Considerations Technical Support Document (TSD). The EPA differentiates between a Simple approach, in which all reductions are achieved by the Electric Generating Units (EGUs), and a Portfolio approach, which in addition to emission reductions from EGUs, can include measures for the Electric Distributing Utilities (EDUs).

Further variants of each model include whether the emission reduction goal will be based on total emissions from each EGU (Mass-based) or based on the emission rate (Rate-based), and whether States prefer to join or establish a regional effort rather than each state determining their own set of rules. Moreover, the Portfolio approach can vary based on the identity of the compliance entity (EGU, the EDU, or a combination of the two), and whether the goal will be a state- or utility-driven approach.

In order to evaluate the interaction between tracking systems and the various approaches, we have outlined six different approaches that States may utilize. This is not meant to be an exclusive list, but an illustration of a selection of the various pathways available to states and their connection to tracking systems.

### *Scenario #1: Simple*
### *EGU Allowance Trading – No RE or EE reductions*

A state with no RPS policy in place sets up an allowance trading system for EGUs to purchase the needed allowances. The amount of allowances will gradually decline to meet the 2020 and 2030 targets for the specific state. To the extent the State (or Region) uses this approach, it will likely cause double-counting of emission attributes (reductions and emissions) from neighboring states (regions) unless all power is generated and consumed in-state. An all-generation tracking system could be utilized to track attributes associated with interstate (inter-region) transactions. If RECs are sold for voluntary market purposes (in-state or out-of-state), a Voluntary Renewable Energy Set-Aside mechanism can be instituted which would require the use of a REC tracking system.

### *Scenario #2: Simple*
### *EGU Emission Rate – Reductions from RE and EE*

In this scenario, EGU's are faced with a limit on $CO_2$ emissions per MWh generated. If the EGU cannot reduce relative emissions below the limit, they have the option to acquire emission reductions achieved by renewable energy and/or energy efficiency activities. The reductions will be applied to the EGU's emission rate either by reducing the numerator (i.e. assigning an emission reduction value to EE/RE that can be deducted from the EGU's emission) or the denominator (by adding MWh's to the denominator with no corresponding increase in emission, i.e. the numerator).

The EPA is soliciting comments on which approach would be preferable but in terms of the mechanics of the calculation either could be supported by a tracking system. The specific rules for what kind of activities are eligible and the methodology for calculating the reductions will have to be developed by the State. As with Scenario #1, double-counting of attributes could be an issue unless all power is generated and consumed within the State (region). The voluntary market

could be included using the Voluntary Renewable Energy Set-Aside option.

### *Scenario #3: Portfolio*
### *EGU Allowance Trading – EDU Renewable Portfolio Standard*

Portfolio approaches give States the flexibility to include measures, in addition to a specific rate reduction or trading system for EGU's. Such an example would be an RPS (and/or an Energy Efficiency Portfolio Standard – EEPS), which would provide a portion of the reduction in emissions from the power sector. Essentially, a calculation will be made on the carbon emission savings that the RPS will produce and this, in combination with the reductions caused by the policies implemented for the EGU's, will achieve the required savings for the State. In this case, there could be two separately traded markets. One for RECs (in the existing REC tracking system) and one for allowances (added to existing REC tracking system or in separate system) but no overlap or integration between the two markets. As with Scenarios #1 and #2, this option could cause a double-counting issue for the emissions associated with power imported to or exported out of the state (region). The voluntary market could be included using the Voluntary Renewable Energy Set-Aside option. This approach is essentially what RGGI has used on a regional basis. RGGI is currently evaluating how to best handle import and exports of power to RGGI states.

### *Scenario #4: Portfolio*
### *EGU Emission Rate – RPS and Reductions from RE & EE*

This approach is similar to Scenario #2, but with the addition that RECs (and EECs) can be used for either an RPS (EEPS) or to reduce the emission rate for EGU's (as outlined in Scenario #2). RECs (EECs) used by EGUs to meet their rate-based limit would not be eligible for any RPS mandate, so there would be no double-counting between the two mandates. The same interstate issues apply to this scenario as with the previous scenarios.

### *Scenario #5: Portfolio*
### *EDU – No RPS*

This Portfolio option places compliance on the EDU (i.e. the load serving entities) instead of the EGU. It would require the use of an all-generation tracking system and a definition of the regional boundary from which the EDUs can source attributes and/or a matching process between attribute certificates and power flows. There would be no trading of allowances, but only of power attribute certificates (including from renewable energy facilities). Any certificates that are not claimed would be used to calculate a residual mix, which would be applied to any MWh of power sold by an EDU that does not have a corresponding attribute certificate. If neighboring states (regions) implement the same system of relying on power attributes, there would be no double-counting issues for interstate (inter-region) transfers.

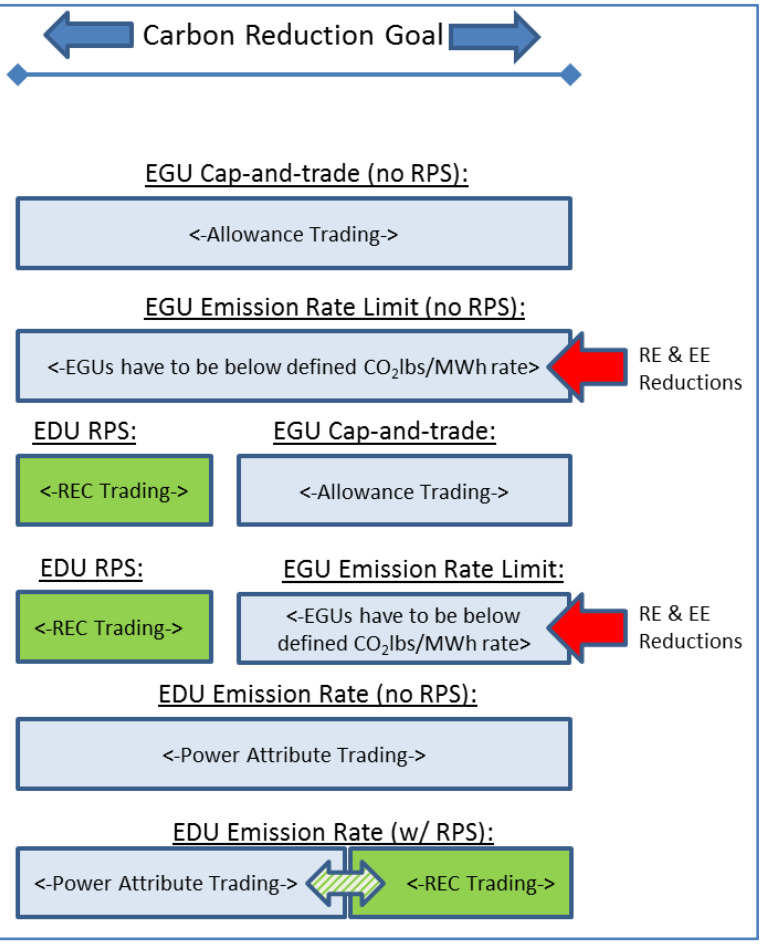
*Note*: This scenario would also accommodate the voluntary renewable energy market, as RECs retired for voluntary purposes would not be eligible to be counted by EDUs.

### *Scenario #6: Portfolio*
### *EDU – With RPS*

This approach is similar to Scenario #5, but with an RPS in place for the state (region). The fundamental structure of the market would be the same, as RECs used for the RPS would contribute to lower emission rates for EDUs and the voluntary market could exist without double counting of attributes. RECs could also be acquired by EDU's that may not be susceptible to the RPS, but would use the RECs to reduce their emission rate. The six scenarios discussed above are summarized in Figure 2 on the next page.

**Figure 2: 111(d) Scenarios:**

| # | Approach | Carbon Compliance on: | REC (&EEC) CO2 Attribute | RPS | Trading Unit |
|---|---|---|---|---|---|
| 1 | Simple | EGU | n/a | No | Tons (Mass-based) |
| 2 | Simple | EGU | Avoidance (negative) value or 0 Emissions | No | Tons/MWh (Rate-based) |
| 3 | Portfolio | EGU | 0 Emissions | Yes | RECs & Tons (Mass-based) |
| 4 | Portfolio | EGU | Avoidance (negative) value or 0 Emissions | Yes | Tons/MWh (Rate-based) |
| 5 | Portfolio | EDU | 0 Emissions | No | MWh Attributes (Rate-based) |
| 6 | Portfolio | EDU | 0 Emissions | Yes | MWh Attributes (Rate-based) |




# 3. Indirect Emission Reductions

Several of the presented scenarios allow for the inclusion of the indirect emission reductions resulting from the application of energy efficiency measures, renewable energy power generation, and renewable and/or energy efficiency portfolio standards (RPS/EERS). There are two different methods for a State to account for the indirect emission reductions originating from renewable and energy efficiency:

1) The emission limits (whether mass- or rate-based) for EGUs can be adjusted based on the deployment of quantified and verified demand-side end-use energy efficiency savings and renewable energy generation, or as a result of in-state RPS/EERS enactment and the expected reductions from this policy. These adjustments are facilitated by the state program administrator, and will be based on a calculation of avoided MWh generation (rate-based plans) or avoided CO2 emissions (mass-based plans). This is the case for Scenarios 3, 4 and 6 as illustrated in Figure 1.

2) Alternatively, renewable energy and energy efficiency savings can be directly included in a tradable emission system. This is the case in Scenarios 2 and 4. Calculations of the specific emission reduction from one REC or the complete RPS policy can be based upon information contained within the existing tracking systems and in certain cases can calculated automatically for each specific compliance period.

### TRANSFERRING CERTIFICATES ACROSS TRACKING SYSTEMS:

More than 10 million RECS have been transferred from one registry to another using the import-export functionality developed and launched in 2010. The Michigan Renewable Energy Certification System (MIRECS), the Midwest Renewable Energy Tracking System (M-RETS), the North American Renewables Registry (NAR), and the North Carolina Renewable Energy Tracking System (NC-RETS) all accept imports and exports of certificates. The following registries allow for the export of certificates Midwest Renewable Energy Tracking System (M-RETS), PJM Generation Attribute Tracking System (PJM-GATS) and the Western Renewable Energy Generation Information System (WREGIS).

# 4. Interstate Trading

Most US power markets are regionally structured and power flows freely across state borders. This dynamic adds to the complexity of State implementation plan designs focused on reducing emissions from existing power plants. Even a regional approach will not eliminate the structural issue, as regions pursuing a common program may not follow the regional power pools (for example, RGGI), and power is often transmitted from one region to another. These factors contribute to EPA's guidance that a *cooperative accounting agreement* will need to be agreed upon between states if power attributes are crossing state lines. To this end, States essentially have three options to address and solve this issue: state boundaries, import adjustments, and certificate tracking and liability allocation.

## A. STATE BOUNDARY

One option is to set the boundary for emissions covered by the State implementation at the state border; the State can then choose to not account for attributes of imported power. In short, because the liability (i.e. emissions) is only set for power generation facilities in the State, the power attributes (whether from fossil sources with emissions, i.e. coal or natural gas, or from renewable sources without emissions, i.e. wind or solar) from out-of-state facilities will not be appended into the implementation plan. There are significant issues with following such an approach, as it could conflict with neighboring states implementation plans and provide an a unfair advantage to power resources from out-of-state facilities if the generator or importer does not have to compensate for the associated emissions.

## B. IMPORT ADJUSTMENTS

A second option utilized by the carbon compliance program in California contains rules assigning imported power as specified or unspecified, dependent on the contractual history, delivery path and geographic source of generation, in an attempt to curb resource shuffling and system gaming. Questions include who the compliance entity is, what emission rates are assigned to imported power, and how to avoid leakage of emissions' liabilities. The emission liability can be placed on the power importer (i.e. California's 'First Jurisdictional Deliverer approach) or it could be assigned to the entity (i.e. the EDU), which ultimately sells the power to its customers in the state.

The more complex issues surround how to attribute emissions to imported power, and what emission rates to utilize. In general, there will be three different kinds of power import types: (a) the import of resource specific power from emitting generating resources, (b) the import of resource specific power from non-emitting resources, and (c) the import of non-differentiated system power. For each of these power imports types, tracking systems can assist by calculating and attributing the emission rates according to the state implementation plan.

Currently, the matching of physical power and RECs is only done for transactions across power regions (i.e. into CAISO, from NYISO to NEPOOL, etc.), but not for transactions incurring within a power region. However, there may be ways to take advantage of the vast but complex information that exists on power and power transactions within power regions in order to match it up with tracking attribute systems, if required by state implementation plans.

### *Imports of Resource Specific Power from Non-emitting Units*

In order to attribute zero emissions to imports from resource-specific non-emitting sources, if allowed under the State Implementation Plans, the compliance entity will need to hold the certificates (i.e. RECs) associated with the resource. This is the case within the markets where a REC has been defined as including the $CO_2$ emission attributes, which include the majority of markets. This approach is currently utilized by California and supported by all registries. The same procedures for e-Tag matching apply for inter-power region transactions while additional tools would be needed for intra-region power region transactions across state borders.

### *Imports of Non-differentiated System (Null) Power*

Import regulations must include a method of tracking $CO_2$ emissions from exporting EGUs while also incorporating in-state EDU emission obligation enforcement. Mechanisms such as NERC e-Tags provide an administrative tool that allows tracking systems to identify and monitor actual generation and associated generation attributes, which can be used subsequently to track $CO_2$ emissions. Because many EDUs purchase system power from the wholesale spot market, a residual mix (for the state/region where the power is generated) will be assigned to the undifferentiated power imports. This provides a simple, standardized framework for emission accounting attribution. With this structure focused on accuracy and transparency, tracking systems can provide state regulators, utility distributers, EGUs, and wholesale marketers, with the necessary information for emission attribute accounting.

*Resource Specific Imports from Emitting Units*

Imports from specific Electric Generating Unit emitting sources will be assigned the emission attribute based on their existing reporting to the EPA, which will be tracked on each certificate. This is similar to the process currently enabled in NEPOOL GIS. The certificate can also be matched with information on the physical power path (via NERC e-Tags), a practice similar to what is currently implemented in WREGIS to support California's Cap-and-Trade program.

Each state or regional program will decide the policy for attributing emission rates for non-differentiated resources, which are imports of power from an unknown source and therefore, with unknown emission attributes. The approach used by the NEPOOL GIS is to calculate a residual mix, which represents the average emission attributes for non-claimed resources.

## C. CERTIFICATE TRACKING AND LIABILITY ALLOCATION

The third option states can utilize is to require that all retail power sales by utilities have to be matched with an attribute certificate from the tracking system(s) operating in the state. While this would not necessarily reflect the power physically consumed in the state, it would represent the attributes from the power grid the State takes part in, and if all states in the power region have GHG requirements based on certificate attributes, all emission will be allocated and accounted for.

The issue of leakage is related to the fear that incentives for zero or low-emitting resources in a region with a carbon constraint will lead to imports of those resources from a non-carbon constrained region. While this will seemingly 'reduce' the emission footprint of the carbon constrained region, it will not lead to any actual emission reductions, as the emission liabilities are not accounted for in the exporting region. Assuming that all States will be required to implement a plan for emissions reductions according to Section 111(d), leakage should become less of an issue, although this does depend on the compatibility of various plans and cooperative accounting agreements.

If the governing principle is that emission liabilities and emission reductions (including zero emission facilities) are sourced from the same state or regional boundary, double-counting issues should be avoided, provided that the same approach is used between States where the power flows across the borders. The existence of tracking systems monitoring emission attributes for all generation will make the potential evaluation and solution much easier to implement.

**Table 2: Interstate Trading Solutions**

| Option | Advantages | Disadvantages |
|---|---|---|
| Structure regional programs that correspond to power region boundaries | Simplifies accounting and power market transactions | Not necessarily a feasible option for most states as they are participating in more than one region |
| Rely on GHG restrictions being implemented equally across States | Does not reflect physical power flows which could contribute to other issues | States could implement rules on varying timetables providing unequal market conditions |
| Track intra-region transactions and match with attributes | Most accurate accounting as the attributes reflect the physical transactions | Requires work to better understand and compute intra-region power flows |
| Rely on all generation tracking for emissions liabilities and performance | If all states within a power region follow this approach all emission liabilities will be accounted for | Some states participate in more than one power region |

# 5. Cooperative Accounting Agreement

Based on the reasons outlined previously, a cooperative accounting agreement between states may turn out to be the preferred approach. Under the Section 111(d) rule, multiple treatment approaches have been illuminated that govern the complexities of interstate emission effects. These approaches include the following claims: (a) state may claim in-state $CO_2$ emissions mitigation impact, (b) state may claim $CO_2$ emission reductions regardless of location, regional demonstration of emission reduction, regional credit market, and (c) multi-state cooperative accounting. However, these designated approaches may be consolidated and merged into a methodology that simplifies the accounting scheme of interstate linkages.

The utilization of a cooperative accounting agreement among state jurisdictions would prove beneficial, especially when a mixture of rate-based and mass-based state implementation plans within a shared grid system apply a market-based tradable credit market approach to their emissions goals. Additionally, the conceptual elements of a multi-state cooperative accounting system provide a platform whereby multiple states develop mutual arrangements relating to avoided $CO_2$ emissions distribution from EGUs as outlined by specified state implementation plans. Essentially, this strategy effectively extricates interstate double-counting issues by integrating an established bookkeeping formula that tracks transactional activity similar to debit and credit ledgers. In short, an avoided $CO_2$ emissions credit within a designated out-of-state jurisdiction will be accompanied by a simultaneous avoided $CO_2$ emissions debit within the in-state jurisdiction of focus. Furthermore, cooperative agreements assume regional collaboration within grid regions while permitting states to institute policy measures and ascribe interstate effects at their discretion. The information contained and tracked in the various tracking systems could prove helpful to states as they implement the cooperative account procedures.

It is worth noting that the import-export process that has been set up by tracking systems to facilitate transfers of certificates from one system to another includes the critical information for every certificate (such as emission attributes, location, vintage, etc.) needed to support any cooperative accounting agreement between states.

# 6. Summary

The implementation of Section 111(d) will force states to determine how to fit the State Implementation Plans with existing RPS, cap-and-trade programs, regional power markets, regulation of the electricity sector, and existing markets for power attribute certificates. Every State in the United States (with the possible exception of Hawaii) is currently involved in markets where power attributes (primarily RECs, but also zero emission attributes from large hydro and nuclear facilities) are traded across states and regions whether for RPS, voluntary markets, or other purposes, including efforts to reduce greenhouse gas footprints. There is a risk that if this is not acknowledged by the US EPA and states in their implementation plans, legal conflicts and delays will hinder implementation as parties begin disputing attribute ownership in light of Section 111(d). Section 111(d) policy suggests a conglomeration of options available for compliance. Consequently, whether a jurisdiction implements a particular emissions reduction program will largely depend on the utility regulatory structure, electric grid configuration, pre-existing compliance policies, economic benefits, and neighboring state plans' strategies. Ultimately, utilizing and enhancing the existing tracking infrastructure for power attributes could ease implementation significantly.

# About APX

APX Environmental Markets is proud to have worked side by side with our clients in giving birth to many of the critical environmental markets in existence today.

• We have been an integral part of every US REC market since their initial inception in California in the late nineties.

• We launched the world's first Renewable Energy Credit Registry in 2001 in support of the Texas Renewable Energy Credit Trading Program.

• Since then, we have built seven additional REC registries supporting every renewable energy market and compliance program in the United States.

• In 2008 we developed the first voluntary carbon registry infrastructure and today we support the major US and international voluntary carbon credit programs, including Offset Project Registries (OPR) approved by the California Air Resources Board.

• Our unique Software-as-a-Service solutions coupled with our team's vast background serves as the bedrock of the majority of renewable energy and carbon credit programs in existence today.

## *PIONEERS AND INNOVATORS*

1st to launch a renewable energy credit (REC) registry.

1st to implement a national framework for inter-registry transfers of RECs supporting renewable markets in North Carolina, Missouri, Illinois and Michigan.

1st to launch the Environmental Management Account - the first multi-market environmental asset viewer and transaction manager covering all REC and major carbon markets.

1st Software-as-a-Service solution for environmental markets.

1st to power offset project registries approved by the California Air Resources Board.

---

*This document was prepared for informational purposes only. The information used and statements of fact made are based upon an analysis of the Proposed EPA Rules and data displayed on publicly available reports but we neither guarantee nor represent the completeness or accuracy. The reader agrees not to hold APX, Inc. responsible for any transactions or decisions made, based on the information contained herein. APX, Inc. works with tracking systems across the United States but the statements in this analysis presents APX's analysis and not those of any of the registries or organizations we work with. Finally, as the process moves forward it is likely that the EPA rules and interpretations of their intent will change. As this occurs APX will continue to support its clients with updated analyses.*

For questions about this analysis please contact Lars Kvale at lkvale@apx.com