Massachusetts Renewables Portfolio Standard:

RPS Accounting & Verification Mechanisms
and Policy Coordination Report

Executive Summary

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EXECUTIVE SUMMARY

Overview

The Massachusetts Electric Utility Restructuring Act (“the Act”) requires that the Massachusetts Division of Energy Resources (DOER) develop and implement a renewable energy portfolio standard, or RPS, that requires all retail electricity suppliers to end-use customers in the Commonwealth provide a minimum percentage of energy sales from eligible renewable energy generating resources. To implement the RPS, the DOER will need to develop accounting and verification mechanisms and related features that will be used to demonstrate compliance with the provisions of the Act.

Suppliers in New England will, at the same time, be required to comply with several other policies reflected as retail generation information reporting requirements (which we will refer to collectively as Generation Attribute Requirements), including state RPS requirements, information disclosure requirements, and generation performance standards (GPS), also known as emission performance standards (EPS). These generation attribute requirements rely in many respects upon the same information – characteristics of a retail electricity supplier’s generation supply sources – and each require a basis for accounting for such characteristics. However, to the extent that each policy is designed and administered separately, they may rely upon different methods of accounting or substantiation, or have design features that do not account for the presence of the other related policies. Potentially significant unintended and undesirable consequences may result from such uncoordinated action.

This report examines how DOER should account and verify compliance with the Massachusetts RPS, and how the RPS can be designed so that it is coordinated with these other policies. In this report, we:

- address the fundamentals of different attribute accounting and verification approaches to generation attribute requirements;
- identify other critical features characterizing generation attribute requirement accounting;
- highlight other generation attribute requirements (RPS, GPS, and disclosure) in the adjacent states and markets and compare their key features; and
- identify, describe, and analyze several possible accounting and verification mechanisms that might be used for supporting the Massachusetts RPS, without consideration of the presence of other generation attribute requirements.
- address the interaction between possible accounting and verification approaches for the Massachusetts RPS and those supporting other generation attribute requirements in Massachusetts and surrounding markets;
- analyze potential conflicts between other critical features of generation attribute requirement accounting approaches; and
- conclude by offering several recommendations on the development of a strategy for transitioning from today’s prevailing accounting and verification framework to a preferred future framework.
This executive summary highlights the analysis and conclusions derived from the report.

**Fundamentals: Attribute Accounting and Verification Systems**

**Background**

The Accounting and Verification Challenge: The Massachusetts RPS requires that all retail suppliers to end-use customers in the Commonwealth provide a minimum percentage of energy sales from eligible renewable energy generating sources. Eligibility is defined in terms of certain attributes of a generator such as resource and/or fuel type and vintage. An association of these attributes with sales to end-use customers determines RPS compliance.

There are multiple approaches to account and verify compliance with the Massachusetts RPS, each with advantages and disadvantages. DOER's choice of which system to establish will affect the cost of RPS compliance, the transaction costs and complexity facing retail suppliers in complying with the Act, the credibility and effectiveness of the RPS, and the administrative burden facing the DOER in monitoring compliance with the RPS. At the same time the DOER must consider how the RPS accounting mechanism will relate to other generation attribute requirements in Massachusetts and the region. Effective coordination of policies will improve the accuracy and credibility of the RPS, facilitate policy integration with competitive markets, reduce administrative burdens, reduce confusion, and reduce supplier transaction costs.

What is an Attribute Accounting System? As used in this paper, an attribute is a descriptive or performance characteristic of a generation resource, such as resource or fuel type, emissions characteristics, location or vintage. An attribute accounting system is a mechanism for uniquely associating attributes of energy production from specific generators with the sales of specific suppliers. Such an accounting is necessary to verify compliance with the Massachusetts RPS.

Property Rights must form the Basis for Accounting Systems. Because the identification and tracking of attributes associated with a retail sale by virtue of physical electron flow is impossible, property rights—i.e. title—(and the associated flow of money) must and do form the basis of all existing and planned attribute accounting systems.

Conservation of Attributes. Generation attribute requirements impose a need to demonstrate compliance in terms of a correspondence of attributes in proportion (adjusted for losses) to energy sales to end-users. This dictates a conservation of attributes requirement: within some defined scope the quantity of energy and the quantity of attributes must be equal. All accounting systems for generation attribute requirements should, and do, require conservation of attributes at some level (e.g. national, regional, within a company), depending on the objective of the policies. Conservation of attributes is fundamental to the integrity and meaningfulness of a standard.

**Defining Characteristics of Attribute Accounting & Verification Mechanisms**

An attribute accounting system requires that suppliers demonstrate their quantity of sales, quantity of attributes, and conservation of attributes with respect to how those attributes are associated with retail sales. While all attribute accounting systems hold some common traits, they also may differ along several dimensions. Some of the distinguishing features separating different possible accounting systems are described here:
1. Are Rights to Attributes Bundled With Rights to Energy? A supplier’s right to claim attributes (for marketing, information disclosure, GPS and/or RPS purposes) can follow one of two equally valid approaches:

- **Bundled:** Rights to claim attributes come with the payments for energy, and title to energy. In this case, it is assumed that attributes are bundled with energy.

- **Unbundled:** Rights to claim attributes could come from payments for and title to unbundled attributes. This approach assumes that the attribute is separable, or can be unbundled from, the energy transaction, and that it can be transacted separately. A critical feature of such an approach is the realization that when the attribute is stripped from the energy transaction, what remains is energy without attributes, or what we term “null energy”. A buyer of such “null” energy could make no claims about the sources of the energy. Under this approach, there must be a re-bundling of attributes and null energy at some point in the chain of title at or before the retail customer to maintain conservation of attributes. Unbundled attribute systems may take several forms. A “renewable energy credit system” is an example of a partial-market unbundling approach, which allows unbundling of attributes from energy transactions for a limited subset of resources, such as RPS-eligible renewable resources. Alternatively, a full-market unbundling would allow attributes to be separated from energy transactions for all generation in the market. An example is a “certificates” system for all generation, which might be used to support all generation attribute requirements.

Both bundled and unbundled approaches can be used to account for and verify compliance with an RPS. But, multiple policies relying on both unbundled and bundled accounting can only coexist in a market without losing their integrity under the limited circumstances in which policies are effectively coordinated. The key to these conditions is how the information disclosure system addresses the presence of null energy.

It is also important to recognize that most of the current and proposed accounting and verification approaches are, in fact, hybrids of the bundled and unbundled approaches, characterized by keeping energy and attributes bundled up to a point in the chain of title between generator and end-use customer, but allowing restricted unbundling thereafter, and re-bundling of attributes with null energy at some intermediary or final stage before sale to the end-use customer. A discretionary allocation is a particular form of restricted unbundling within a zone, which we will refer to as a free-trade-zone, that occurs at the discretion of market participant(s)\(^1\) in a fashion that generally cannot be independently tracked (generally out of view of the ISO, for instance). Examples of such discretionary allocations include creation of retail electricity “products” by allocating attributes in a supplier’s portfolio to specific groups or retail or wholesale customers; and “contracts that specify the associated generation units”, taking the form of either (i) system power contracts that uniquely allocate production of specific units to the buyer (specified source system power contracts), or (ii) requirements contracts.

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\(^1\) A single market participant’s discretion is involved in disaggregating a portfolio into products, while a contract between two market participants may transfer title to specific attributes.
2. **How are attributes associated with system power transactions and spot market interchange?**

The majority of transactions in the New England wholesale market are either bilateral system power transactions between a wholesale seller and a wholesale purchaser, or sales to or purchases from the spot energy market. In accounting systems that are not fully unbundled, the methods used to associate attributes with these transactions have a major influence on how the title to those attributes flows from generator to supplier.

System power transactions are governed by bilateral contracts that constitute an auditable contract path for energy. The method of associating attributes with these transactions for a given accounting system can fall into one of three categories:

- **Discretionary allocation** - a system power contract can be written to specify which attributes are associated with the energy transacted, for instance by specifying the generating units to be associated with the energy.

- **Pro-rata allocation** - through an after-the-fact calculation (accomplished via solving simultaneous equations) that assumes that the proportion of attributes associated with such a sale matches the proportion of attributes from different resources in the supplier’s portfolio (or LSE settlement account) during a settlement period.

- **Treat attributes as unknown**. Ultimately such systems will apply a proxy to approximate the attributes associated with all such unknown energy.

Spot market transactions are not governed by standard bilateral contracts. Rather, in any hour an LSE will either have more or less energy in its settlement account than load. When this positive and negative spot market interchange is aggregated over the applicable settlement period, an LSE can be either a net seller of spot energy, or a net buyer. For net sellers, the method of associating attributes with the spot market transactions fall into one of three categories:

- **Pro-rata allocation** - During a period in which a supplier is a net seller, its attributes would be assigned to the spot market sale in proportion to their percentage contribution to the portfolio during that period.

- **Supplier discretion or prioritization**. One way to deal with the arbitrary nature of the pro-rata allocation to spot sales is to allow a supplier to prioritize which attributes flow to the spot market and which are kept. In this way, attributes for which the supplier paid a premium are not lost.

- **Treat attributes as unknown**. Some approaches would label spot market transactions as unknown, or energy without known attributes. Strictly speaking, this approach fails a conservation of attributes, but this might be corrected depending on the proxy used to apply attributes to this energy.

For a given accounting system, the method of associating attributes with **net spot market purchases** can fall into one of three categories:

- **Attributes treated as unknown and replaced by system proxy**.
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- Attributes assigned based on system-wide pro-rata allocation. Under systems using this approach, net spot purchases will be assigned attributes representing the average of all sales into the spot market during that settlement period.

- Specific attributes purchased via the spot market by way of attribute-only contracts, a form of restricted unbundling typified by the New York “conversion transaction”, a generator selling energy into the spot market may sell the attributes associated with that energy to an entity that is purchasing an equivalent amount of energy from the spot market.

3. Is there a Separate Secondary Market for Attributes? A secondary market for attributes is characterized by the ability to freely trade attributes, completely independent of any energy transaction. Unbundling, combined with secondary market transactions, are the fundamental features distinguishing credit and certificates systems from other forms of accounting systems. Certificates or credits represent attribute commodities created “at birth” which uniquely document the attributes associated with a unit of energy production\(^2\). These can be thought of as unique, serial-numbered commodities that represent the attributes associated with a unit of energy generated at a particular time by a specific generator. Note that unbundling does not require such commodities (as with the hybrid accounting systems discussed later).


The mechanism for verifying a supplier’s right to claim attributes for marketing, information disclosure, GPS or RPS purposes can occur via some combination of:

- Tracking the contract path to title, or rights to claim attributes “each step of the way” from source (generator) to sink (retail customer). Tracking can be used to follow the title whether attribute title is bundled with energy (i.e. track the energy transactions, the flow of money for energy), or unbundled (i.e. tracking the contract transactions for the attributes themselves).

- Commodity attribute possession, through physical possession or registration in an electronic credit registry;

- Documentation of conservation of attributes associated with a (discretionary) allocation or free trade zone. Such documentation would detail the amount of energy and attributes coming in (verifiable via one of the above methods), the energy sold to various parties, and the attributes allocated to each. Total purchases and sales would balance, adjusted for losses.

- Non-discretionary allocation, along the lines of the pro rata allocation described above, as determined by an ISO or disclosure administrator.

\(^2\) Other terms have also been used for such commodities, such as “tags” and “tickets”. In general, tags can be considered the generic term encompassing all variations of commodity systems.
5. **Administration options for determining compliance** may involve several steps, including: (1) certification or verification of production of attributes, (2) reporting of claims, (3) verification or matching of supplier claims to production, and (4) matching of total production to supplier claims to ensure conservation of attributes. Alternative approaches include:

- **Self-certification** by a supplier, consisting of filing a report to an administrator or regulator responsible for overseeing the policy with sufficient documentation. This report and its backup documentation may be subject to (regular or spot) audit, may be prepared subject to compliance documentation protocol, based on publicly available or independently generated data (such as ISO settlement records), or may be accompanied by an independent certification.

- A **central program administrator** may utilize independent data sources regarding both the production of attributes and title to those attributes. For example, the ISO-New England as administrator might rely on energy settlement records (bundled approach). However, the ISO will not have information relating to discretionary allocations or sub-LSE transactions. For this reason, the central program administrator alternative may not be a self-contained system, and the ISO may be best suited for a complementary role.

- **Showing (or turning in) attribute commodities**.

**Other Features of Generation Attribute Requirements**

Other critical decisions with respect to generation attribute requirements have important policy coordination aspects, and apply under all accounting systems. The specific coordination issues, and possible mitigation approaches, are described later in this executive summary. Here we simply identify the features of accounting systems that will be addressed later.

**Level of Aggregation for Compliance Measurement**: The level of aggregation for compliance measurement differs between generation attribute requirements, which may prevent data collected to calculate or support compliance with one standard from directly determining compliance with another standard. For instance: (1) standards may be applied on a product basis or an aggregate (company portfolio) basis; and (2) compliance may be on the basis of retail sales within the state, or across the region.

**Range of Eligibility**: There are at least three areas where differences in the range of resource eligibility may lead to conflicts between generation attribute requirements. These include: (1) treatment of imports; (2) recognition of energy not transacted in the bulk power market (e.g., behind the meter or off-grid generation); (3) generation associated with energy storage facilities, and (4) difference in the classification of resources by vintage, size, or resource.

**Aggregation over Time**: There are three important features relating to the aggregation of attributes over time for demonstrating compliance with generation attribute requirements that may differ across different generation attribute systems. These include: (1) the settlement period over which there is a matching of generation and load; (2) the averaging, compliance, or reporting period; (3) allowance for banking, early, or make-up compliance.
Treatment of Spot Market Interchange and System Power: There are several features of the treatment of spot market interchange and system power transactions that may differ under different generation attribute requirements, and which may create coordination challenges. These include calculation of gross versus net interchange or system power, discretionary or pro rata allocation of settlement period surpluses to spot market interchange, the choice of a proxy attribute profile to apply to “unknown” system or spot power, and the degree to which proxy attributes associated with system power and spot market purchases may be “subdivided”.

Visibility to Customers: In states with information disclosure, attributes used for compliance with an RPS may or may not show up on disclosure labels. Even if the attributes do appear on disclosure labels, they may not do so in a fashion that would easily allow identification of an RPS-complainant supplier. Visible conflicts in appearance may be misleading, and therefore deceptive under green marketing guidelines.

Possible Accounting & Verification Mechanisms for Massachusetts RPS

Part I of this report describes and analyzes possible RPS accounting and verification mechanisms in order to identify those that may be suitable for supporting the Massachusetts RPS, without consideration for the presence of other generation attribute requirements. For this analysis, we identified the following distinct approaches to RPS accounting and verification, as well as some variations:

1. Pure bundled – tracking model, which we will refer to as “bundled tracking approach”.
2. Commodity Models. Variations include:
   a. partial-market unbundled – renewable energy credits models, referred to as “REC approaches”; and
   b. full-market unbundled – certificates model, which we will refer to as “certificates approach”.
3. Restricted unbundling – tracking models (hybrid), which we will refer to as the “restricted unbundling approach”.
4. Financial Compliance (Transferable Obligations) models. Variations to this wholesale-style approach include:
   a. A universal, mandatory, approach, which we will refer to as (mandatory) “financial compliance approach”; and
   b. A voluntary approach, which we will refer to as “transferable obligations approach”.


These approaches and some of their key features are summarized as follows:

### Summary of RPS Accounting & Verification Approaches

<table>
<thead>
<tr>
<th>Feature Model</th>
<th>Degree of Unbundling</th>
<th>Secondary Market?</th>
<th>Verification Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bundled Tracking</td>
<td>None</td>
<td>None</td>
<td>Track contract path for energy</td>
</tr>
<tr>
<td>2a. RECs</td>
<td>RPS-eligible resources only</td>
<td>Yes</td>
<td>Commodity attribute possession</td>
</tr>
<tr>
<td>2b. Certificates</td>
<td>All resources</td>
<td>Yes</td>
<td>Commodity attribute possession</td>
</tr>
</tbody>
</table>
| 3. Restricted Unbundling | Free-trade zone only | No | • Track contract path for energy outside zone  
• Conservation of attributes documentation in zone |
| 4a. Financial Compliance | RPS-eligible resources only | N/A | Payment of Obligation |
| 4b. Transferable Obligation | RPS-eligible resources only | Obligation is freely tradable to credit-worthy entities | Payment of obligation by supplier; contract path for compliance by transferee. |

A description of each of these accounting systems, their relative advantages and disadvantages, and a recommendation on their possible use, are summarized below.

### 1. Bundled Tracking Approach

Under this approach, title to attributes flows exclusively along the contract path of energy transactions from generator to supplier’s product. No unbundling or secondary attribute markets would be allowed. Verification could proceed via either self-certification by suppliers or exclusively by a central administrator relying to a large extent on ISO settlement records, supplemented by suppliers’ submitted data otherwise unavailable to an independent entity. Two variations are possible for system power and spot market interchange under this model: pro-rata allocation imposed on system power and spot market interchange or treating these categories of supply as “unknown”.

**Advantages & disadvantages:** Following the title for energy is both credible and familiar. The approach is supportable in part by existing ISO settlement/financial transaction data, and may require only a minimum of new institutions or capabilities to implement. Some parties view this approach as the most “credible” of the alternatives. However, the pure bundled tracking approach has many inherent disadvantages for meeting RPS obligations. These include:

- High transaction costs, resulting from reliance on inefficient transactions to procure renewable attributes, significant constraints on a supplier’s ability to fashion products, high margin of safety required to assure compliance or high exposure to risk of non-
compliance, illiquid market for renewable attributes, and potentially higher transmission costs relative to other approaches.

- Mechanisms for associating attributes with system power and spot market interchange are likely to be complex and costly.
- Data needs could not be met through ISO-New England settlement data alone, requiring other supplemental data sources.
- Complications are introduced by ISO-New England’s impending multi-settlement procedures.

Recommendation: Overall, we do not believe that the “pure” bundled tracking approach described here can effectively achieve Massachusetts’ RPS objectives. We are unaware of any generation attribute requirement in New England that employs a “pure” system of this type; all current systems allow some level of limited attribute unbundling. More importantly, the disadvantages of this approach are many, and its inflexibility would add significant complexity, risk, and cost to achieving compliance with the RPS.

2. Commodity Approaches

Under the commodity approaches, which include a “renewable energy credit” system and a “certificates” system, a supplier acquires rights to RPS-eligible attributes independently from energy transactions. Possession of these rights is represented through possession of a commodity attribute, which can be traded independently from energy in a secondary market. When attributes are unbundled from energy, null energy is created, which no longer carries the rights to such attributes. So long as the accounting system properly keeps track of this null energy, conservation of attributes should be achieved, and no double counting should result. Here we identify some of the features and benefits of commodity accounting approaches generically. The renewable energy credit and certificates variations to the approach are discussed in detail below. Important implementation issues associated with the generic commodities approach include:

- There would generally be two steps of independent certification of eligible renewables – ensuring that the plant has particular characteristics (registration) and providing attribute credits for its production (certification).
- The commodity would carry with it all potentially useful information applicable to the attributes and to the use of the commodity, and a unique serial number.
- A critical issue in terms of verification and substantiation, as well as the mechanics of transactions, is whether or not a central registry is used for supporting the commodity system. Two basic variations are:
  - Physical instrument. A unique, serial-numbered document is created corresponding to a unit of actual electrical production, similar to a unit of currency or a bearer bond.

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3 If the only policy in effect was RPS, this task would be straightforward. Re-bundling of attributes and null energy, whether at the supplier level or the ISO-New England level, is only a factor in the presence of other generation attribute requirements, which will be discussed further in Chapter 7.
The physical possession of this commodity is a substitute for needing to track title in a detailed fashion.

- **Account balance.** In this case, an independent entity (whether public or private) that might be called a credit registry serves as an electronic bank, maintaining account balances of commodities for all market participants, using the equivalent of electronic funds transfers to effectuate trades, and providing documentation of transfers and balances.

- A commodities system is only susceptible to gaming at the borders (between jurisdictions and/or perhaps generation attribute requirements). Within the system, the very existence of a unique certificate created at birth avoids gaming within the system. Where the credits or certificates are not recognized and regulators do not adequately address null power, gaming is possible. However, a central registry for renewable certificates can be used to prevent this.

**Advantages & disadvantages:** The commodity transaction is a much more efficient mechanism for acquiring attributes than contracting with a generator for energy. Generic advantages of commodity approaches include:

- low transaction-costs;
- reduced constraints to the workings of efficient wholesale energy transactions;
- a more liquid market for renewable energy than the alternatives;
- the commodity can be used to verify generation of renewable energy, the possession of title, and whether energy sold from a facility carries attributes or is null energy, thus lowering administrative costs and both administrative and transactional complexity;
- transmission-related constraints on energy flow need not prevent transactions for attributes between parties on opposite sides of a constraint;
- present no constraints on product design.
- amenable to handling sub-ISO (under 1 MW), on-site, and off-grid renewable generation.

- a commodities system might more easily be scaled up for national use if and when a national RPS is established.

There are two generic disadvantages to a commodity attribute approach worthy of mention.

- Perception of credibility issues.
- Need for new institutions.

**Recommendation:** We do not find the disadvantages described here to be compelling (though other policy coordination disadvantages discussed in Chapter 7 impact the viability of this approach). With respect to the credibility argument, the potential for double counting and opportunities for fraud or misleading claims are even greater in a bundled tracking environment (particularly across jurisdictions and generation attribute requirements), and are really independent of the accounting method. Commodity attribute approaches hold considerable promise for an RPS program. RECs and certificates are similar in their efficacy for RPS
purposes. The major distinctions come to light in the context of other generation attribute requirements.

2(a) REC Approach

In a Renewable Energy Credit (REC) system, attributes are unbundled from energy and RECs are created for only those renewable resources eligible for the RPS. The RECs serve as a commodity vehicle for a secondary attribute market, and serve as verification. The Act specifically requires DOER to evaluate such a system, and such a system has been developed or is under consideration for other state RPS requirements. Analogous approaches have also been relied on with great success in emission allowance trading.

Advantages & disadvantages: In addition to the generic advantages discussed above for commodities systems, a REC system has the advantage that an independent administrator may be established that would not need to have access to substantial market information, as the burden can be effectively placed on the market itself. If the RPS is the only policy, in lieu of an active retail choice market in which renewable resources are the source of marketing claims, a REC approach may be implemented easily and achieve its objectives crisply at low cost.

The aspect of RECs that we find fundamentally troubling is that New England’s existing or proposed information disclosure requirements (as well as certain state RPS and GPS requirements) are currently based on bundled tracking (with limited unbundling) model of accounting. Overlaying a REC system on top of such a system creates a clear double-counting threat. This concern is discussed further in Chapter 7.

Recommendation: RECs appear to present an effective, low cost approach to implementing an RPS in the absence of other generation attribute requirements or retail choice-driven markets for eligible renewable energy. The benefits of the REC system make it worthwhile for the DOER to attempt to work through the policy coordination challenges.

2(b) Certificates Approach

The purpose of a certificates system is to support any and all generation attribute requirements, encompassing all generators and suppliers and their attributes (at least throughout ISO-New England). A full certificates approach would not be appropriate if RPS was the only issue; in that case, the partial REC system would be sufficient in tracking RPS-eligible renewable generation.

Under the certificates approach, the accounting for attributes of all resources would start with a common certificate carrying information necessary to satisfy the information requirements of all uses. For each use, the accounting calculations might proceed independently. By its nature, such an approach would have to be mandatory within ISO-New England; resources imported from outside the ISO could in principle opt-in, or be treated generically. Presumably a certificates system would operate with a central registry using account balances.

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4 The administrator could be ISO-New England or another party. Since not all generation potentially eligible for the RPS would be visible to the ISO, and many suppliers are not ISO members, another party can rely on ISO metering data to supplement other data and set up accounts for retail suppliers, perhaps as easily as the ISO could.
Advantages & disadvantages: In addition to the generic advantages of commodity attribute approaches, a certificates approach could lead to reduced administrative and transactions costs in total, as well as reduced potential for confusion or mismatch among different generation attribute requirements in New England. Alone it cannot address all coordination issues, but it can assure no double counting of attributes originating within and sold within the New England region. Such uniformity among generation attribute accounting systems would clearly be advantageous. The primary disadvantage of the full certificates system is a practical one: it would require the consent of all regional regulators, and the support of the ISO and its participants. This could be difficult to achieve.

Recommendation: A certificates approach to accounting and verification would be effective in implementing an RPS. But, as noted, this approach should not be pursued for the RPS alone. Most importantly, it would be difficult to implement, in that it requires full market consent, and is outside of DOER jurisdiction.

3. Restricted Unbundling Approach

Restricted unbundling is fundamentally a hybrid approach that relies on tracking the title to attributes but allows a degree of unbundling under limited circumstances. This approach does not create a freely tradable commodity for a secondary market independent of energy transactions, and is similar to the information disclosure requirements currently in place or planned in the New England region. In summary:

- energy and attributes in equal proportions enter the free trade zone (supported by a bundled tracking contract path);
- there is a limited attribute unbundling within the free-trade zone at either the intermediary or final stages between generator and end-use customer, and
- attributes are re-bundled with an equal amount of energy leaving the free trade zone

There are variations on the degree, type and scope of discretionary allocations and free-trade zones that fall into this model. From an RPS perspective these variations all appear equally suitable. *Internal* free trade zones include:

- Sub-LSE disaggregation of attributes and energy into retail electricity products at the discretion of the supplier.
- Within a single LSE’s portfolio of energy and attributes:
  a. Disaggregation of attributes and energy into retail electricity products (or wholesale electricity products sold on a full-requirements basis, which are effectively indistinguishable from a wholesale market perspective).
  b. Allocation or assignment of attributes to specified source system power contracts, as specified in bilateral system power contracts.

superimpose generation data that it does not possess on an LSE-based accounting structure that would need to be adapted to reflect retail suppliers.
c. A restricted unbundling approach might allow a prioritization of attributes retained in the settlement account, versus those allocated to unspecified system power and net sales to spot market interchange.

*External* free trade zones include:

- A *power exchange* trading in just renewable energy; or
- A *conversion transaction*, in which energy is sold into a spot market and rights to unbundled attributes can be passed to another party via a bilateral contract, so long as the buyer purchases an equivalent amount of energy from the spot market (treated effectively as null energy for these purposes) during a settlement period.

For the discretionary allocation portions of the attribute chain of title (which are contractually out of view of the ISO), a conservation of attributes demonstration would be required. It would be difficult for the DOER to discriminate between market participants taking one or the other of the discretionary allocation approaches identified above, provided that the documentation of title to attributes is sufficiently supported by a combination of auditable contract path and documentation of the unique allocation of attributes.

**Advantages & disadvantages:** A restricted unbundling approach permitting most or all of the types of free-trade zones described above would appear to combine the best features of bundled tracking with many of the potential benefits of unbundling from the commodity attribute models. Specific advantages include:

- This approach fosters market innovation by allowing the creation of low cost, flexible zones, all subject to the same standard of evidence.
- The power exchange-level free-trade zone variation can provide reasonable liquidity and low enough cost to facilitate a viable market.
- This approach sidesteps the credibility issues raised about commodity attribute approaches.
- Restricted unbundling is expandable and flexible, and could transition into a REC or certificates system if and when such a system is developed.
- The *external* free trade zone approaches allow attributes to be matched with energy when taken by suppliers from a power exchange or spot market to serve load at any time within the settlement period, so that the risk of losing desirable attributes into the spot market is largely mitigated.

There are a few pragmatic advantages, as well:

- Because it is not a fundamentally separate approach such as RECs, restricted unbundling approaches could support multiple generation attribute requirements with fewer policy coordination challenges.
- It may not require anything out of DOER’s control.
- It does not purport to rely solely on data in the possession of the ISO.
- It is a minor logical extension of familiar concepts, and may not require any new institutions to implement.
This model shares some of the disadvantages of the bundled tracking approach, but provides a mechanism for suppliers to avoid or mitigate their severity. For instance:

- Suppliers will still be required to rely on some less efficient, constrained transactions, relative to a commodity attribute approach;
- It may not be able to avoid all of the potential problems inherent in impending multi-settlement or congestion management systems;
- If limited to the internal approaches, the risk of a supplier losing desirable attributes to the spot market is not mitigated.

Recommendation: A restricted unbundling approach holds significant promise as an RPS accounting and verification approach. It can accommodate many possible futures; therefore, restricted unbundling may be a reasonable end-point, or a transition stage to a commodity attribute market. The benefits of this approach make it worthwhile for the DOER to attempt to work through the policy coordination challenges. We believe that DOER should consider certifying free-trade zones, and setting rules for suitable documentation of conservation of attributes across those zones.

4(a) Financial Compliance Approach

The financial compliance approach to RPS accounting and verification is effectively a mandatory wholesale-style solution, in which an entity we will call an “RPS market maker” fulfills the aggregate RPS obligation for all suppliers in the state. A supplier achieves compliance through a financial obligation, by paying a bill issued to the market maker for its share of the total costs incurred by the market maker. The market maker, in turn, would:

- define the total RPS quantity required in the market;
- procure sufficient RPS-qualifying resources through bid or auction at the RPS market-clearing price, selling the energy and ancillary services in the wholesale markets; and
- charge each retail electricity supplier doing business in Massachusetts their share (proportional to their Massachusetts retail sales) of the overall cost difference between the RPS market-clearing price and the wholesale commodity market value of the generation (plus a share of market-maker’s operating/administrative costs).

Under this model, there is no need to track the title of the attributes to the retail customer. Attributes are conserved across the market as a whole, as the energy is never sold as renewable energy at retail. Suppliers, generators and others could make financial hedge contracts indexed to the RPS-market-clearing price (separate for new and existing renewables) to achieve price-certainty.

Advantages & disadvantages: The financial compliance approach has a number of compelling advantages, including:

- It sidesteps most potential policy coordination issues;
- Retail supplier risk is removed with greater certainty of compliance;
- There are low or zero supplier transaction costs, beyond payment to the market maker for its administration costs;
• No safety margins are required on the part of suppliers to assure compliance, thereby lowering costs to customers;
• It is competitively neutral and removes barriers to retail market entry;
• It reduces the possibility of double-counting renewable attributes;
• It achieves economies of scale in renewable procurement, generally not a cost-effective endeavor for each supplier to pursue for a small portion of its supply.

There are some issues that arise with the financial compliance approach that must be considered, including:
• The need to address what happens if supplier doesn’t pay its bill.
• A new institution would be required to implement this approach.
• How to efficiently minimize the costs of the market-maker so as to not raise compliance costs relative to a more decentralized alternative.
• Suppliers may want to use attributes for marketing, information disclosure or GPS compliance purposes, which would not be possible if attributes are isolated from use in these systems.
• The neutrality and efficiency of the market maker may be difficult to guarantee if the market maker is a private firm also engaged in the market in other ways.
• Finally, many of the benefits of this approach are significant relative to a bundled or limited-unbundled tracking model. Relative to commodities-based approaches, the magnitude of the benefits is less clear.

Recommendation: This approach is very effective at meeting the RPS objectives. It has a number of policy coordination-related benefits, as well as a few drawbacks.

4(b) Transferable Obligations Approach
A variation to the financial compliance approach would be a system of voluntary transferable obligations. Under this approach, retail suppliers could pay an ISO-New England LSE to take on their RPS responsibility in a given year. In exchange for that fee, the party taking on the obligation accepts the financial responsibility for providing the service (they are on the hook for default).

Advantages & disadvantages: This voluntary approach shares many of the advantages of the financial obligations approach, described above. Additionally, as a voluntary approach, several of the concerns with the mandatory financial compliance approach are mitigated. For example:
• No new institutions would be required, as any credit-worthy wholesale market player could take on the obligation.
• It is no longer a policy concern of DOER whether or not a market-maker is efficient, as these voluntary transactions would only take place to the extent it was a more efficient, less costly path to compliance. Likewise, there is no more policy concern over the neutrality of a
market-maker, since wholesale suppliers could compete to provide this service and there could therefore be several potential entities willing to accept RPS obligations.

- Suppliers concerned about interactions with marketing, information disclosure or GPS compliance need not take this route.

In addition, it provides the supplier an opportunity to set its cost for compliance ahead of time by shifting to another entity better suited in scale, resources and/or capabilities both the details and the responsibility of compliance. Once it does so, the retail supplier is no longer at risk for non-compliance.

Despite these advantages, there are credit issues that would require further study. DOER might only allow transfer of RPS obligation to credit-worthy LSEs, for instance. In addition, there are a number of questions related to how such an approach would interact with information disclosure and GPS. Finally, many of the benefits of this approach (and the financial compliance approach) are significant relative to a bundled or limited-unbundled tracking model. Relative to commodities-based approaches, the magnitude of the benefits are less clear.

**Recommendation:** The transferable obligation variation provides another interesting alternative worth considering. Most of the challenging issues arise when interactions with other generation attribute requirements are considered. The degree to which this remains a desirable alternative rests on how (whether or not) such an approach is reflected on information disclosure labels. Finally, relative to commodities systems, the benefits of the transferable obligation model become less clear.

**Preferred Mechanism for Massachusetts RPS, Independent of Policy Coordination Issues**

The preferred set of alternative approaches for an RPS accounting and verification mechanism, when considered independently from interactions with other generation attribute requirements or the presence of consumer-driven demand for renewables, include the following:

- The commodity attribute approaches, renewable energy credits or certificates, both hold great promise for RPS accounting and verification. These are mutually exclusive paths, driven by issues beyond RPS and the DOER’s control, and their degree of promise is significantly influenced by policy coordination issues.

- The restricted unbundling approach, if interpreted broadly as described in this chapter, holds promise for RPS accounting and verification. While the degree to which it can fulfill its promise and be effectively coordinated with other standards depends somewhat on the interpretations of regulators overseeing other generation attribute requirements, the DOER may be able to implement it on its own.

- The financial compliance approach is also an intriguing option. It has a number of attractive features on its own as an RPS accounting and verification approach, as well as some potentially attractive policy coordination benefits.

- The transferable obligation alternative is also worthy of further consideration. As a voluntary mechanism, it cannot stand alone, so it must be considered within a broader
context. The degree to which it is an attractive tool depends heavily on its interaction with other standards, particularly the degree to which suppliers choosing alternative compliance mechanisms might be treated comparably under those other standards.

We note that the disadvantages of the pure bundled tracking approach vastly outweigh the benefits, and we reject it from further consideration.

*** end of old summary

Coordination of RPS Accounting and Verification Mechanisms with Other Generation Attribute Requirements

The critical next step to identifying a preferred alternative for Massachusetts RPS accounting and verification is to examine how the candidate approaches identified above function in the presence of other generation attribute requirements in Massachusetts and surrounding states. Accordingly, for each of the remaining candidates for accounting and verification mechanisms identified above, we identify possible points of conflict and policy coordination challenges. We explore the alternatives for mitigating these problems. (A number of possible policy coordination conflicts are somewhat ancillary to the choice of RPS accounting and verification mechanism. Several of these relate to the “other features” identified earlier, and are examined in a following section).

1. Interactions between RPS and Other Policies: Areas of Potential Conflict

Policies regarding generation attributes fall into three categories: information disclosure requirements; renewable portfolio standards (RPS); and generation performance standards (GPS)\(^5\). Mismatches can occur when key features of the accounting and verification mechanisms fail to coincide, or when some of the “other features” described later do not align.

RPS and disclosure are linked by the need to identify attributes associated with retail sales. Where different accounting and verification systems support RPS and information disclosure, conflicts are most likely. GPS and disclosure interactions are not a concern of RPS design and will not be considered further here. The key concern with respect to the interaction between RPS and GPS occurs if RPS takes an “off-disclosure” path (e.g. wholesale approach to RECs, or financial compliance). In this event, if GPS relies on the attributes actually disclosed, the supplier may be unable to use RPS renewables to meet GPS.

Renewable Energy Credits – Coordination Analysis

Situation. There are several inherent conflicts that must be addressed if a REC system is to be established, including:

- Information disclosure rules adopted in Massachusetts, and those adopted or planned in other nearby states, rely on tracking title to attributes, largely along the lines of contract

\(^5\) Referred to as emission performance standards, or EPS, in the NESCAUM Model Rule.
paths for energy transactions, with varying degrees of restricted unbundling. They do not currently recognize or account for renewable energy credits.

- RPS rules in Maine and perhaps Connecticut that require bundled tracking along the contract path⁶.

**Analysis: Coordination Challenges and Conflicts.** There is a clear double counting (and potential gaming) threat as a result of the implementation of an REC system for the Massachusetts RPS in this environment. In particular, the presence of null energy is not currently addressed in existing information disclosure rules, potentially allowing renewable energy attributes to be counted by both those that purchase RECs and those that purchase the electricity from a renewable energy generator. Similarly, if a renewable generator sells RECs to a supplier for Massachusetts RPS compliance and sells energy to either the same or another supplier, that energy could potentially be claimed for Maine RPS purposes as well if the Maine retail supplier was unaware of the REC sale. Furthermore, existing information disclosure rules cannot recognize a supplier’s RECs as an attribute for information disclosure purposes, and RPS compliance would not therefore automatically be "on disclosure."

**Mitigation.** There are, however, opportunities to mitigate the potential coordination problems identified above associated with information disclosure. Conservation of attributes is violated, and double counting and/or gaming threats are introduced by the creation of RECs unless the presence of null energy, and possibly RECs, are addressed and effectively treated in implementation of information disclosure rules. Accordingly, the following approaches are discussed in more length in the body of the full report:

1. Allow RECs to appear on-disclosure, if ultimately re-bundled with null energy. In this option, information disclosure regulators would recognize RECs as the attribute, and at the same time recognize the existence of null energy. A benefit of this approach is that it would also allow REC attributes to be used towards GPS compliance.

2. Recognize null energy in information disclosure rules, while keeping REC attributes off-disclosure. Under this approach, information disclosure regulators would recognize and address null energy explicitly in its rules, but would not recognize RECs as valid attributes. RPS attributes would not appear on information disclosure labels, and might not count towards GPS compliance unless GPS rules make an explicit adjustment to accommodate these attributes.

To mitigate the potential conflicts of a Massachusetts REC system with other state RPS requirements, Maine's RPS might have to be adapted in a similar manner to avoid the risk of the same renewable generation from being counted towards both Maine and Massachusetts RPS requirements.

**Recommendation/Conclusion.** As discussed above, the coordination problems noted here can be mitigated through changes to state information disclosure regulations, as well as RPS rules of other states, to address explicitly the unbundling of attributes. Recommendations include:

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⁶ It is not yet entirely clear whether Connecticut and New Jersey RPS rules will require tracking title to attributes along a contract path, though the Connecticut RPS rule and the New Jersey draft rule appear to move in this direction.
A renewable energy registry would be helpful in allowing suppliers and regulators to distinguish null energy from energy whose purchase also brought title to associated renewable attributes, and to document the unique use of attributes.

REC attributes may either be reflected on the disclosure label or kept off-disclosure, as there are pros and cons to either approach.

Even if RECs are held off-disclosure, (a) disclosure regulators should explore how to assure that renewable attributes can’t be stranded, i.e. that RECs purchased by retail supplier in excess of amounts needed for RPS compliance can be recombined with null energy and disclosed to end-users for use in supporting sales of renewable energy to end-users; and (b) GPS regulators should allow suppliers to substitute emissions associated with RECs for system power attributes in the GPS compliance calculation.

A supplier would be required to associate an attribute uniquely with sales in one state.

Certificates – Coordination Analysis

Situation. A full certificates approach would presumably support all of the generation attribute requirements of the New England region. This approach would rely on a centralized administrator, which could be either ISO-New England, another party (with cooperation from the ISO), or alternatively could rely on an independent certificate registry and self-certification. As such, DOER would not pursue such a strategy in a vacuum, but only as a coordinated regional regulatory consensus.

Analysis: Coordination Challenges & Conflicts. A full certificates regime is fundamentally a coordinated approach. If all generation attribute requirement regulators throughout New England adopted a full certificates accounting and verification system, many potential coordination conflicts associated with the Massachusetts RPS could be avoided, as there would be no mistaking an energy transaction for an attribute transaction. However, such a system would be difficult to institute, as all regulators and generators in the region would have to consent. In addition, several data challenges would need to be overcome for a central administrator or data registry to function effectively.

Mitigation. There is little with respect to accounting and verification system policy coordination conflict to mitigate. The challenges are practical. Region-wide implementation of a certificates system will mitigate most issues other than those addressed in the next major section of this executive summary.

Recommendation/Conclusion. This approach would work well as an RPS accounting and verification mechanism. However, DOER would not pursue such a mechanism absent broad regional consensus for full certificates. Moreover, absent clear indications that such an approach is likely to coalesce imminently, DOER cannot rely on this approach and should pursue other avenues. However, due to both significant interest in a full certificates approach and the potential benefits, any system adopted by the DOER for RPS accounting and administration should have a clear transition path to converging with a full certificates approach.
Restricted Unbundling in a Tracking of Title Environment– Coordination Analysis

**Situation.** This section explores the issues associated with relying upon an accounting and verification mechanism for all generation attribute requirements that relies on tracking title to attributes through transactions where energy and attributes are ultimately bundled, but which may recognize restricted unbundling opportunities so long as attributes and energy are ultimately re-bundled. If disclosure regulations were to treat both internal and external restricted unbundling approaches (as described above) as valid transactions, DOER could implement the RPS in a manner that allows suppliers relatively efficient and flexible forms of transactions while relying on tracking title to attributes.

**Analysis: Coordination Challenges & Conflicts.** Disclosure rules generally acknowledge explicitly one or both of the internal free trade zone approaches, and it appears that existing rules are *not inconsistent with* tracking title through a power exchange or via a conversion transaction. All current and proposed generation attribute requirements recognize some degree of restricted unbundling, in the form of discretionary allocation of attributes to energy to be sold to the next titleholder.

This approach is credible so long as conservation of attributes is demonstrated. External free trade zone transactions require effectively the same verification standards that can be applied to the internal discretionary allocations that are already explicitly allowed: documentation of title to attributes where energy transactions are relied upon and demonstration of conservation of attributes through free trade zones.

**Mitigation.** Beyond steps that could be taken by the DOER, information disclosure regulators would need to recognize and acknowledge that neither internal nor external free trade zones are generally inconsistent with information disclosure rules.

**Conclusion/Recommendation.** With the consent of information disclosure regulators, this approach could be implemented expeditiously. It may suffice as an endpoint, or as a transition to a more fully unbundled approach. DOER may wish to encourage, and perhaps even certify zones in which restricted unbundling would be allowed to support RPS compliance, such as power exchanges, wholesale LSEs, and perhaps conversion transactions.

Financial Compliance - Coordination Analysis

**Situation.** Under a financial compliance accounting and verification approach, a retail supplier’s compliance is financial, consisting of paying the bill for a supplier’s share of Massachusetts RPS compliance costs.

**Analysis: Coordination Challenges & Conflicts.** We have conceived of this approach as both mandatory, and off-disclosure, in that attributes used for RPS compliance would not appear on the disclosure label. All generation from the renewable resources procured by the market-maker will be sold exclusively into the wholesale market. For purposes of other generation attribute requirements, so long as the residual system mix used for disclosure purposes is calculated excluding these resources, then attributes are conserved, and there is no threat of double-counting or gaming. By completely isolating RPS compliance from retail sales, most RPS-information disclosure coordination issues can be sidestepped: If attributes are held off the disclosure label as proposed, this approach may not require any changes to information disclosure regulations.
The downside of isolating RPS attributes from the disclosure system is that suppliers may desire to use attributes for marketing, information disclosure or GPS compliance purposes. Moreover, DOER needs to beware of balkanizing the markets for renewable generators, given that such generators will have uses for renewables beyond RPS compliance. Ideally, a generator’s attributes could be moved freely between RPS and other markets.

**Mitigation.** There are few if any changes necessary for DOER to effectively implement the financial compliance approach in the presence of other generation attribute requirements. As detailed in the full report, some modifications of disclosure and GPS regulations may be desired to ensure a more efficient financial compliance mechanism and to allow RPS attributes to flow through to disclosure labels and to be used for GPS compliance.

**Conclusion/Recommendations.** The financial compliance approach is especially well-suited to implementation in an environment with many generation attribute requirements whose rules are incompatible, still being drafted or otherwise in flux. As this approach has not explicitly been implemented elsewhere for RPS, there are many practical design issues to explore. Financial compliance might be a suitable long-term solution, or could be thought of as a transition approach. However, a regional full certificates system, or even a REC system on a regional or national basis, many accomplish many of the benefits of this approach, calling into question the incremental value of the infrastructure cost of operating the RPS financial compliance market.

**(Voluntary) Transferable Obligations – Coordination Analysis**

**Situation.** This accounting approach to RPS is a variation that may be layered on top of any of the previous accounting and verification approaches as an additional option for suppliers. There is little incremental benefit to this approach in a full certificate system. Therefore, we focus on the use of this tool as an alternative to ease the compliance burden when disclosure and GPS rely on tracking title via contact path.

**Analysis: Coordination Challenges & Conflicts.** How the transferable obligation would work in the presence of information disclosure and/or GPS regulations depends on critical design features. There are three basic design options with respect to how the attributes used for meeting the RPS requirements of the complying supplier would be treated for purposes of other generation attribute requirements when the obligation is transferred to a surrogate complier:

1. **Isolate the attributes from disclosure** - In this case neither the complying supplier nor the surrogate supplier can disclose the attributes used for RPS compliance or use those attributes in GPS compliance calculations. The complying supplier would lose the attributes for disclosure and GPS purposes, which may be undesirable from the suppliers' perspective. If the surrogate complier were to sell energy at retail in Massachusetts, there would be a clear risk for double counting, however, unless the disclosure regulators removed attributes used for RPS compliance of the complying supplier from disclosure calculations. Similar issues would hold for GPS calculations.

2. **Include attributes on the disclosure label of the surrogate complier** – This approach leads to potential double counting, and complicates appearances for disclosure as well as GPS calculations. It reduces to the previous case in the event that the surrogate complier is a purely wholesale entity and it disposes of energy in a manner not recognized as “known” for disclosure purposes.
3. Include attributes on the disclosure label and in GPS calculations of complying supplier. Effectively, this would resemble a swap of the complying supplier’s system power attributes for the surrogate complier’s renewable attributes, allowing attributes to appear on the label of the complying supplier.

Mitigation. To mitigate some of the potential coordination problems the following actions could be taken. First, DOER could limit surrogate compliers to purely wholesale entities, and/or require that surrogate compliers dispose of the renewable energy in a manner in which it would not be viewed by disclosure and GPS regulators as associated with the surrogate supplier’s retail customers. Second, disclosure and GPS regulators could adapt regulations to remove attributes used for the RPS compliance of the complying supplier from disclosure and GPS calculations of the surrogate supplier, treating the transactions effectively as unspecified system power. Finally, information disclosure and GPS regulations could allow and recognize the attribute swap described in option 3 above.

Conclusion/Recommendations. If tracking of title is relied upon for disclosure (and/or GPS), transferable obligations can provide additional flexibility. While it may present potentially significant policy coordination conflict if unrestricted, DOER could limit these conflicts by placing the aforementioned requirements on the activities of eligible surrogate suppliers. Alternatively, GPS and disclosure regulators could amend their regulations to assure that policy coordination challenges are effectively mitigated. If suppliers perceive significant value in the approach, DOER should consider it as a design feature. Otherwise, it may not be worth the added complexity.

Renewable Energy Credit Registry

The establishment of a voluntary REC registry at a state or broader level may prove beneficial to the DOER and others for a number of reasons even if the DOER were not to immediately introduce a REC system in support of RPS requirements. First, if a REC or similar approach is used in any nearby state but not in Massachusetts, it would help support the integrity of all the generation attribute requirement systems in the region by clarifying documentation to claims, eliminating double counting, and identifying null energy. Second, development of a REC registry may facilitate broader regional policy coordination. Third, a REC registry may serve the needs of many states to identify and/or certify eligible renewable generation. Such a registry would be voluntary, but so long as a state recognizes it, it would be helpful in allowing buyers and sellers to know that a generator is blessed by regulators, cutting down on the cost of supplier due-diligence. Finally, it may facilitate coordination with (a) a regional full certificates system if one is to be implemented, and (b) a possible future national RPS.

Coordinating Other Accounting-Related Features With Massachusetts RPS

1. Overview

Tightly intertwined with the accounting and verification system choices are several related design decisions that have significant policy coordination repercussions. A brief overview of these issues was highlighted earlier in the executive summary. In this section we address these other features, identifying the issue, analyzing the policy coordination challenges that arise due
to the presence of other generation attribute requirements, and recommending particular mitigation strategies. We also identify the disconnects that are not easily mitigated and that therefore may lead to inevitable customer confusion.

2. Differences in Level of Aggregation

Situation

For Massachusetts information disclosure compliance purposes, sales and generation attribute data is aggregated on a regional basis. Suppliers are required to disclose the resources used to back all of their retail sales, their regional portfolio in New England, on a company or portfolio disclosure label. They may also disaggregate that regional portfolio into retail products offered to end-use customers, consisting of the resources used to support a “product” sold to it and other customers throughout New England (regional products). In contrast, GPS legislation and NESCAUM’s EPS Model Rule require that compliance be shown across a supplier’s sales to end-use customers in the state. Thus, company or portfolio has a different meaning when used in the context of GPS, a state portfolio.

Like GPS, Massachusetts RPS requirements address the renewables associated with a supplier’s sales to end-use customers within Massachusetts. The Act does not definitively dictate whether RPS compliance should be applied on a state portfolio or (state) product basis. Previous analysis concluded that portfolio-based RPS compliance without mitigation would likely lead to consumer deception. As noted in White Paper #1: Applicability, such a potential problem can be mitigated by either: product-based RPS compliance, off-disclosure RPS compliance, clear disclosure to retail customers whether or not their purchases of new renewables is relieving other customers of supporting the supplier’s minimum RPS obligation, or reflecting renewables applied towards meeting the Massachusetts RPS on the Massachusetts disclosure label as a distinct category identifying them as resources used to meet mandatory renewables requirement.

An off-disclosure approach to RPS compliance is likely to be inconsistent with a full certificates system, a system that the New England region appears to be moving towards. Therefore, we proceed in this section based on the assumption that RPS may either be applied on a product basis for sales within the state, or across all supplier sales within Massachusetts if accompanied by proper disclosures.

Analysis: Coordination Challenges and Conflicts. To the extent that RPS and GPS rules apply on the basis of sales within the state while information disclosure regulations and proposals require disclosure for sales across the region, the meaning and composition of both portfolio and product will differ between generation attribute requirements. As discussed in detail in the full report, this mismatch may lead to considerable confusion, including the following coordination challenges:

1. Disclosure labels (or underlying annual reports) are unlikely to correlate with RPS-compliance status.
2. Product-based disclosure labels or underlying disaggregation data in annual reports are unlikely to correlate with product-based RPS-compliance status.
3. Data collected to calculate or support disclosure compliance will be of limited use for directly determining compliance with RPS or GPS.
4. Appearance of RPS compliance cannot consistently be accurately reflected on disclosure labels.

**Mitigation.** Options are available to mitigate these impacts, including:

1. Massachusetts, and other states, could redefine company/portfolio disclosure as the attributes associated only with the sum of all sales within the state.

2. Short of the preceding change, Massachusetts DTE could require in supplier annual reports that attributes be disaggregated not just by products but by attributes allocated to all sales to Massachusetts end-use customers, thus allowing the underlying annual report data submitted to the DTE to be useful in supporting RPS (and GPS) compliance verification.

3. If states were to define product for disclosure purposes as a state rather than regional product, it would make product disclosure correspond to or reflect products as defined for GPS and RPS product compliance, partially mitigating the inconsistencies.

**Recommendation/Conclusion.** Based on this analysis, we recommend that DTE (and other New England disclosure regulators) consider minor alterations to their disclosure regulations including: requiring each supplier in its annual reports to the DTE to disaggregate attributes not just by products but by attributes allocated to all sales to Massachusetts end-use customers; and defining product for disclosure purposes as a state rather than regional product. Such changes are straightforward and do not conflict with disclosure purposes. However, recommendation 1) above would be consistent with requiring a supplier to also provide a product disclosure label to the extent that attributes associated with its offering within Massachusetts differs from offerings in other states, even if the supplier does not differentiate products. We recommend this refinement as well. We do not recommend making company/portfolio disclosure reflect only sales within the state, as it may undermining a key purpose to company-based disclosure.

3. **Eligibility Disparities**

Massachusetts RPS eligibility definitions do not in many instances coincide with definitions used for disclosure or GPS requirements. These disparities are most notable in four categories: imports of remote generation into New England; energy not transacted in the bulk power market; generation associated with energy storage facilities; and classification of resources.

**Treatment of Imports of Remote Generation into New England**

**Situation.** Eligible renewable resources located outside of New England appear to be eligible for the Massachusetts RPS. However, Massachusetts DTE disclosure rules require that the fuel mix of electricity imports be labeled as “imports” (i.e., and not as “renewables,” even if they are). Other regulations and proposed regulations recognize fuel sources imported from outside of New England if a comparable disclosure system exists. **Analysis: Coordination Challenges and Conflicts.** The implication of this disparate treatment of imports is that there will be a mismatch between what appears on a supplier’s disclosure label and the supplier’s RPS compliance if the supplier relies on attributes from generators outside of New England to meet the RPS. Furthermore, because Massachusetts disclosure rules do not distinguish imports, the information reported to DTE by suppliers in annual reports is of limited use for RPS verification purposes.

**Mitigation.** If DOER allows eligible imports to qualify for RPS compliance purposes, then the problem is one of appearance on the disclosure label. One option available to mitigate the
disparate treatment of imports is for the Massachusetts DTE to alter the Massachusetts disclosure rules by either recognizing imports for disclosure purposes if originating from a region with a comparable information system. Another alternative is to reflect all renewables applied towards Massachusetts RPS compliance on the Massachusetts disclosure label as a distinct category, identifying them as resources used to meet mandatory renewables requirement, and removing that quantity from the “imports” category. We also recommend that the DOER limit import eligibility for RPS to no greater than a retail supplier’s net energy import quantity from (or through) the relevant interface, unless a full certificates system is used.

**Treatment of Energy Not Transacted in the Bulk Power Market**

**Situation.** Information disclosure rules (as well as the EPS Model Rule) recognize only those resources that are associated with and constitute a portion of the energy associated with sales as measured at the retail meter. Such resources would exclude generation sources being considered by DOER as potentially eligible resources for RPS compliance, including those interconnected behind the retail meter and consumed on-site, as well as off-grid generation.

**Analysis: Coordination Challenges and Conflicts.** Once again, the result of the different treatment of energy not transacted in the bulk power market is a mismatch between what attributes appear on the disclosure label and a supplier’s RPS compliance status. Furthermore, the NESCAUM EPS Model Rule would not count low-emission renewables in this category towards EPS compliance.

**Mitigation.** Should these resource be eligible for the Massachusetts RPS, the available options for addressing the mismatch include either (i) doing nothing and acknowledging that there are good reasons for disclosure, EPS and RPS to not fully align, or (ii) expanding the disclosure (and possibly EPS) scope to match RPS by adding such generation to the numerator and denominator of the disclosure (or EPS) calculation.

**Treatment of Generation Associated with Energy Storage Facilities**

**Situation.** Bulk electric energy storage facilities store off-peak energy in order to make a smaller amount of energy available during higher-value on-peak periods, the most prevalent of which is pumped storage hydro. Different policies spell out different treatment of storage facilities. For example, Massachusetts disclosure regulations treat generation by energy storage facilities as system power. Attributes disclosed must include any losses incurred as a result of storage. On the other hand, Maine's disclosure regulations and the NECPUC model disclosure rule require that the fuel mix associated with an energy storage facility be assigned the fuel mix of the energy used as input to the storage device. The characteristics disclosed must include any storage losses.

As detailed in the full report, the preferred alternative treatment of pumped storage for RPS treatment varies with the accounting and verification approach used.

**Analysis: Coordination Challenges and Conflicts**

The analysis of alternatives available to address pumped storage resources for RPS purposes, and the regulations adopted or proposed for information disclosure in Massachusetts and elsewhere in New England, make two things clear. First, compliance requirements for information disclosure are not precisely or clearly enough defined for a supplier to uniquely document compliance while conserving attributes. Second, none of the approaches to pumped storage accounting for disclosure fit with RPS requirements. Accordingly, there is significant potential
for mismatch between RPS and disclosure, and between disclosure regulations in different states, particularly with respect to a full certificates approach.

**Mitigation & Recommendation.** To mitigate the potential mismatches, the different generation attribute requirements throughout the region must take a common approach to storage facilities. The alternatives that appear most effective for all generation attribute requirements is to ignore pumped storage as a generation resource, and to either spread pumping losses across all retail suppliers, or ignore them altogether.

**Classification of Resources**

**Situation.** Information disclosure fuel source categories differ from RPS eligibility distinctions, in terms of details such as type, vintage, and location.

**Analysis: Coordination Challenges and Conflicts.** The two most important consequence of this observation are, first, that little about RPS compliance can be gleaned from reading a disclosure label. Products that appear to be RPS compliant on an information disclosure label may not be; companies with labels that appear to be out of RPS compliance may be complying. Second, information disclosure label data, as aggregated for disclosure, cannot be utilized to verify RPS compliance.

**Mitigation.** In lieu of action by disclosure regulators, there is little that can be done to address the concerns identified above. One alternative to mitigating these impacts would be for the DTE to require retail suppliers to disclose in their annual disclosure report their supply sources broken out into sufficiently detailed subcategories to identify RPS-eligible resources. Alternatively, DTE might consider altering the disclosure label format, adding a category reflecting “generation applied towards RPS.”

4. **Differences in Aggregation over Time**

The time periods over which attributes are aggregated for compliance with RPS do not always coincide with definitions used for disclosure or GPS requirements. Policy coordination issues may be created or exacerbated by: discrepancies in the settlement period used; different averaging, compliance, or reporting periods; and shifting attributes over time through banking or make-up compliance.

**Settlement Period**

**Situation.** The settlement period is the period over which there is a matching of generation and load. For different generation attribute requirements, the settlement period differs. For the Massachusetts RPS, an annual settlement is consistent with language in the Act, and also reflects the a low cost approach to compliance. In contrast, information disclosure regulations for Massachusetts and New York, for example, appear to reflect a quarterly settlement.

**Analysis: Coordination Challenges and Conflicts.** Under a contract-path title-tracking approach, the conflict that arises relates to the disconnect in settlement periods between policies. The shorter the settlement period, the more likely that desirable attributes may be “lost” for information disclosure purposes by being assigned to spot market or system power sales. At the same time, they would probably not be lost for RPS purposes due to the longer, annual settlement period. The result is likely to be double counting. In this case, some renewable attributes might be counted for RPS purposes, as well as finding their way onto disclosure labels via the use of a system power or residual system
power proxy. Under a full certificates approach, these problems do not arise, as there is a unique title to each attribute, and the settlement of attributes will be divorced from direct matching with load. Under a REC system, this double counting could occur to the extent that the disposition of RECs and null energy is not addressed for information disclosure purposes.

Mitigation. There are two clear options to mitigate these concerns: by relying on a full certificates approach (or a REC approach in which the treatment of RECs and null energy are clearly addressed for disclosure purposes), unique title to attributes for all purposes can be established; alternatively, by altering the settlement periods of the various requirements to match, on either a quarterly or annual basis, mismatches can be eliminated.

Averaging, Compliance or Reporting period

Situation. RPS and GPS requirements revolve around a calendar year over which generation attributes and the load associated with them are aggregated for reporting or compliance filing. In contrast, disclosure regulations (Massachusetts, NECPUC Model Rule) require that disclosure calculations be calculated on a rolling 12-month basis, updated each calendar quarter.

Analysis: Coordination Challenges and Conflicts. As a result of this mismatch, even if the classification of resources matched between RPS and information disclosure, three out of every four information disclosure labels will not correspond to RPS compliance calculations in time. End-use customers will not be able to rely upon the source mix reflected on information disclosure labels as an indication of a supplier’s (or a product’s) RPS compliance.

Mitigation. Short of reducing the frequency of disclosure updates to an annual basis (which disclosure regulators have found to be too infrequent to be a reliable indicator), there is little to be done to mitigate the likely mismatch between RPS compliance status and the source mix on information disclosure labels.

Banking, Early Compliance or Make-up Compliance.

Situation. Banking, early compliance, and make-up compliance may all add flexibility to RPS compliance, reducing costs and mitigating cost variations over time. In contrast, disclosure requirements permit no banking or make-up compliance across years, and the movement of attributes from one compliance period to another would likely undermine the meaningfulness of disclosure by violating conservation of attributes. For example, the quantity of attributes in a particular period would no longer match the quantity of energy sold, so source disclosure percentages may not be accurate, and in many cases, might not be meaningful.

Analysis: Coordination Challenges and Conflicts. The concept of moving attributes over time for RPS compliance is fundamentally at odds with a universal information disclosure requirement that respects conservation of attributes. Three types of policy coordination concerns arise, the specific implications of which depend in part on the accounting and verification system used for RPS as well as for information disclosure:

1. Conservation of attributes would be violated in both periods for information disclosure purposes;

2. If early compliance, banking, or make-up attributes appear on disclosure labels, there would either be explicit double-counting of renewable attributes in the year of generation and the year of use or withdrawal, or the appearance of double-counting.
3. Misleading or deceptive representations to customers could result. Of particular concern is the situation on which energy marketed and/or disclosed to customers as incremental “green” energy in one period is used for RPS compliance in a later year.

It is useful to note that banking is most commonly discussed in the context of an REC system. In a full certificates system, which relies on the same information system for accounting for each policy, RPS attributes banking may not be possible. Likewise, in a bundled contract-path tracking system, it is not clear how banking might be implemented.

Mitigation. There are several potential mitigation options available to consider, as detailed in the full report:

- Apply banking for disclosure and EPS as well as RPS purposes. This approach would require changes to disclosure regulations, in both Massachusetts and elsewhere, that are beyond the control of the DOER.

- Once banked for RPS purposes, remove attributes for disclosure purposes from both the current period of generation and the period of withdrawal. As with the previous alternative, disclosure requirements would need to be altered, although not as extensively.

- Exclude attributes used for RPS compliance at any time from both the numerator and denominator when calculating disclosure percentages.

- Require in RPS compliance filings an affidavit stating that attributes marketed as green cannot be banked for later RPS compliance, and attributes used for makeup cannot be marketed as green, in the event that RPS banking cannot be sufficiently isolated from disclosure labels to address the concerns regarding renewable energy sold in one period at a premium as “green” being banked for future RPS compliance.

- An alternative approach to banking, in which retail suppliers could bank compliance rather than attributes, may be most promising. This approach allows a limited degree of flexibility without requiring the movement of attributes over time. Thus, retail suppliers could over-comply in one year, so that is subsequent year(s) they would be required to have fewer attributes for RPS compliance, while all attributes are disclosed and information disclosure and EPS can be unaffected.

5. Treatment of Spot Market Interchange and System Power

Situation. Generation attribute accounting systems must address the characteristics to be assigned (and treatment of) spot market interchange, system power, and any other energy whose attributes are not clearly known. If accounting systems coexist that treat these issues differently, the potential for policy conflict may exist. We call attention to three issues in particular:

- Method of assigning attributes to net settlement period spot market or system power sales. The settlement period selected effectively determines the quantity of net generation identified as purchased from or sold to the spot market (as well as net system power purchases and sales). Three alternatives exist to determine which attributes are associated with such interchange:
  
  i. Discretionary (e.g. discretion of the seller)
  
  ii. Pro rata allocation
  
  iii. Assignment of proxy attributes.
• **The choice of a proxy attribute profile to apply to “unknown” system or spot power.** Some policies utilize a historical “system average mix”, others a current year average system mix, and others a “residual system mix”.

• **The degree to which attributes associated by proxy with system power and spot market purchases may be “subdivided”**. Whatever choice of method to associate attributes with spot market or other purchases of unknown pedigree, the compliance calculation of a generation attribute requirement which allows disaggregation of attributes into retail products will either assume that such attributes must be allocated in equal proportion to all customers (as the Massachusetts information disclosure label accomplishes with a separate column for system power) or that such attributes could be culled to design specific products.

From an RPS perspective, the preferred method of assigning attributes to net settlement period spot market or system power sales is a discretionary allocation, because it results in lower RPS compliance costs to retail suppliers and end-use customers. For RPS purposes, a residual system mix proxy for purchases of energy without a known set of attributes (if any) is most desirable. Otherwise, there is likely to be double counting, as the same renewables would appear in a supplier’s known resources as well as in the average system mix proxy for system/spot power purchases. Finally, for RPS compliance it is clearly not appropriate to count eligible renewables associated with a proxy spot market mix. The proxy is solely an estimate intended to generate meaningful comparisons for disclosure and EPS purposes, and is not intended to confer title to renewables attributes in a proxy.

**Analysis: Coordination Challenges and Conflicts.** If a full certificates approach is adopted, there should be no policy coordination problems associated with the treatment of spot market interchange and system power because it is a fundamentally coordinated approach, because there is unique title to all attributes, and because there is complete separation from the energy market. Similarly, if a REC system is adopted for RPS, the treatment of spot market interchange and system power by information disclosure requirements will not cause any incremental problems (beyond those noted elsewhere) for RPS compliance. If RPS and information disclosure requirements rely on tracking title, however, we find that there are potentially significant potential mismatches if different approaches to spot market interchange and system power are used for different policies. These problems are detailed in the full report.

**Mitigation/Recommendation**

Clearly, the best way to address potential mismatches in the treatment of spot market interchange and system power is to rely on a full certificates system. Short of such a system, regulators should attempt to conform RPS and disclosure regulations addressing settlement periods, as well as methods of allocating attributes to system power or spot market sales. Finally, if proxy attributes are assigned to purchases of spot market or system power, RPS and disclosure rules should not allow attributes to be subdivided and allocated to specific products for compliance purposes.

**Recommendations on Transition Strategy**

This report makes several conclusions with respect to preferred approaches to RPS accounting and verification. Regardless of which system is selected, however, regulations should be established by DOER with enough lead time to ensure that (1) retail electricity suppliers (and
end-use customers) experience the lowest cost of compliance possible, and (2) there is enough new renewable supply available to meet the minimum standard.

It is apparent that a degree of unbundling of attributes from energy transactions is desirable. However, in the presence of other generation attribute requirements, unbundling is only practical in a well-structured environment. Many of the recommendations herein require changes to rules that are outside of the control of DOER.

The new institutions required to implement the ideal Massachusetts RPS alternatives (full certificates or REC approaches) will require time and coordination. In addition, DOER requires explicit legislative authorization to implement a renewable energy credit system. It is difficult to predict with certainty whether such authorization, if requested, would be enacted in a timely manner, before DOER should have regulations in place. As either a full certificates or a REC system is desired, but neither can be established within the sole control and authority of the DOER, a transition strategy is required. Such a strategy should seek to:

- Establish regulations that are within the DOER’s jurisdiction at the earliest possible date with clear signal of DOER’s intentions regarding eligibility, accounting, property rights, banking provisions, and treatment of imports;
- Preserve flexibility to adopt a preferred accounting and verification approach when infrastructure, jurisdiction and coordination issues allow;
- Attempt to coordinate with other regulatory agencies responsible for generation attribute requirements in Massachusetts and throughout the region on issues of accounting, as well as other key features identified in this report; and

To meet these needs, DOER should consider:

- A phased approach, in which DOER (i) establishes rules that do not reflect either full certificates or RECs immediately, but rather reflect a hybrid, restricted unbundling model that is reasonably compatible with other existing GARs today, but (ii) leaves flexibility to evolve if conditions permit a certificates or REC system to be established.
- Establishing a voluntary REC registry. In the near-term, this can complement a restricted unbundling, contract-path-based approach, providing an additional level of certainty that attributes are only claimed once for those renewables that register. We anticipate that a smoother transition is possible to other states utilizing the registry (for RPS or other purposes) if its functions are outsourced, and are not performed directly by the Commonwealth.
- Establishing conditional regulations, such that some implementation details are left to DOER RPS implementation guidelines that can be altered at DOER’s discretion without the need for a proceeding or further legislative authority.