

**A REGIONAL ENVIRONMENTAL ATTRIBUTE CERTIFICATE ACCOUNTING
AND TRADING SYSTEM FOR NEW YORK STATE**

Prepared for

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ENERGY RESEARCH AND DEVELOPMENT AUTHORITY

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ABSTRACT

Through its New York Energy Smartsm Program, the New York State Energy Research and Development Authority (NYSERDA) engaged APX Inc. to explore the development of a **regional environmental attribute certificate accounting and trading system (REACTS)** in New York State. The REACTS is being contemplated to support the state's current and future environmental policy requirements, including disclosure and the recently adopted renewable portfolio standard (RPS), as well as to support the development of competitive green power markets. This document presents the justifications for implementation of a REACTS and provides a high-level overview of the desired system functions, features, and capabilities. The justifications and conclusions contained in this document are based on an in-depth analysis of the New York market, APX's opinion as subject matter experts, and stakeholder interviews conducted between June 10, 2002 and July 15, 2002. In addition, this document presents the steps that are necessary for the deployment of REACTS in New York and a timeline for deployment.

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EXECUTIVE SUMMARY

Through its New York Energy Smartsm Program, the New York State Energy Research and Development Authority (NYSERDA) engaged APX Inc. to explore the development of a **regional environmental attribute certificate accounting and trading system (REACTS)** in New York State. Such a system would facilitate the creation of an environmental attribute commodity that would allow the purchase and sale of the environmental attributes of energy transacted through the New York Independent System Operator (NYISO) and neighboring systems. The REACTS is being contemplated to support the state's current and future environmental policy requirements, including disclosure and the recently adopted renewable portfolio standard (RPS), as well as to support the development of competitive green power markets. The REACTS design goal is to provide the most cost-effective solution, promoting the development of renewable energy generation and facilitating seamless environmental markets with neighboring control areas.

APX conducted stakeholder interviews with a wide-range of New York market participants and other interested parties. During the interview process, and through an in-depth analysis of the New York marketplace, APX identified a series of critical market benefits that the REACTS requirements identified in this document are uniquely able to satisfy. The REACTS system requirements offer the flexibility and simplicity to:

- **meet current and future environmental requirements.** The open architecture system design requirement will enable a REACTS to support a wide range of environmental policies and programs and to adapt to evolving statutory or regulatory standards and/or market requirements.
- **foster the development of renewable energy markets.** REACTS, as specified in the system requirements, will be compatible with other regional information systems, thus facilitating and supporting the sale of certificates across borders. This will expand markets for renewable generators, increase market liquidity, and streamline and simplify cross-border transactions.
- **facilitate the development of retail markets in New York.** The REACTS system requirements enable the system to support the development of green power markets in New York. The current system in New York only allows the purchase of unbundled attributes through the spot market. However, the REACTS design greatly expands the procurement options for retail suppliers

allowing them to balance their portfolios between procurement options, thereby reducing risk, reducing transaction costs, and enabling them to offer more competitively priced products.

- **provide the most cost-effective solution for all affected parties.** The implementation of a REACTS can provide significant cost efficiencies for the New York market, its participants, and retail customers. The cost reductions will come from reduced transaction costs, increased reporting efficiencies, reduced administrative tasks, streamlined processes, and the system's ability to adapt to changing environmental regulations and markets.

A REACTS system can offer many additional benefits:

- The system would ensure that the premium for environmentally preferable generation flows directly to the generator thereby encouraging the development of new renewable energy projects.
- A REACTS would provide third-party verification that regulatory requirements have been satisfied and that products claims have been met. While many marketers self-certify their attribute products currently, they feel the verification that a REACTS can offer will firm up the integrity of their products.
- A REACTS would provide benefits to distributed generation and demand response markets if these resources could aggregate and sell their attributes in the certificates market while they sell the energy output from their resources into the spot market during high priced hours. A certificates market would offer particular benefits due to the intermittent nature of many distributed resources.
- A REACTS would provide the kind of transparency that is needed to establish a functional and predictable futures market. With the development of a futures market, market participants could hedge their positions and reduce risk.

The REACTS system requirements, developed through the interview process and described in this document, can provide these many benefits to New York and its market participants. However, there are key steps that must be undertaken prior to system implementation. APX has identified a series of steps that are necessary for the successful deployment of a REACTS in New York. These include the following:

- Development of a mechanism to address REACTS within the New York Independent System Operator (NYISO) committee structure;
- Commitment from the NYISO to take lead responsibility for REACTS acting as the customer;
- Revision of New York Public Service Commission's regulations to allow for the unbundling of energy and attributes; and
- Formation of a REACTS/New England Generation Information System working group to specify how the systems will interface with one another and to ensure compatibility between the two systems.

2.0 INTRODUCTION

Through its New York Energy Smartsm Program, the New York State Energy Research and Development Authority (NYSERDA) engaged APX Inc. to explore the development of a **regional environmental attribute certificate accounting and trading system (REACTS)** in New York State. Such a system would facilitate the creation of an environmental attribute commodity that would allow the purchase and sale of the environmental attributes of energy transacted through the New York Independent System Operator (NYISO) and neighboring systems. The REACTS is being contemplated to support the state's current and future environmental policy requirements, including disclosure and the recently adopted renewable portfolio standard (RPS), as well as to support the development of competitive green power markets. The REACTS design goal is to provide the most cost-effective solution, promoting the development of renewable energy generation and facilitating seamless environmental markets with neighboring control areas.

This white paper was developed from four documents APX delivered to NYSERDA under our contract: the REACTS System Requirements Document; the REACTS System Design Document, the REACTS Project Plan, and the REACTS Business Plan. It presents in detail the need for REACTS and describes the wide range of benefits that it can provide. The document also provides a high-level overview of the desired system functions, features, and capabilities. The justifications and conclusions contained in this document are based on an in-depth analysis of the New York market, APX's opinion as subject matter experts, and stakeholder interviews conducted between June 10, 2002 and July 15, 2002. These face-to-face and telephone interviews were conducted with a wide variety of stakeholders who are interested in the New York market including suppliers, generators, developers, environmental and consumer interests, and regulators. (Appendix A contains a listing of the organizations interviewed.)

The APX analysis included a review of all relevant regulations, policies, and current market trends and conditions. It also compared and contrasted the ability of New York's current tracking system with a potential REACTS to address numerous market and operating requirements identified by the interviewees. The analysis examined the political and regulatory implications of a potential REACTS implementation and analyzed the cost implications of a REACTS on market participants, end use customers, and regulatory agencies. In addition, APX provides a description of the steps necessary

for the successful deployment of a REACTS for New York and a timeline for system deployment.

This report is organized as follows:

- Section 2 provides a regulatory framework and policy background for a REACTS including the key events that have shaped the changing debate between contract path tracking and certificates since the debates began in the mid 1990s. This section also addresses the various policies and programs that a REACTS system can support.
- Section 3 justifies the development of a REACTS including the cost and administrative efficiencies it can offer and the benefits it can provide in terms of promoting renewable energy markets and encouraging retail market development.
- Section 4 describes the system requirements as defined in the stakeholder interviews including those design issues where there is widespread consensus, those where further discussion and analysis will be required to reach consensus, and those where significant negotiations among market participants will be required to reach consensus. This section also describes the current tracking system and discusses its ability to meet key system design requirements as described by stakeholders in the interview process.
- Section 5 outlines the various tasks that will need to be completed in order to successfully deploy REACTS including regulatory and legislative issues that are relevant to implementing a REACTS and regulatory and legislative changes that would be required to move forward with system implementation. In addition, this section presents a timeline for REACTS deployment.

2.0 POLICY AND REGULATORY FRAMEWORK

In the mid 1990s, when several Northeast states began restructuring electric markets and adopting various environmental requirements, a debate began over how to most accurately and meaningfully track the environmental attributes of energy. Two camps emerged from this debate, one favoring a contract-path approach, the second supporting an approach that allowed for unbundling the environmental attributes from the underlying energy commodity. In the early days of the debate, certificates were a brand new concept that had not yet been proven, and some regulators and environmental and consumer organizations were inclined to favor the contract-path approach. However, according to several stakeholders interviewed, since that time many of those who previously supported the contract-path method have changed their position. Many regulators and environmental and consumer advocates have come to believe that a certificates approach will offer the most benefit to renewable energy markets. Those environmental and consumer advocates interviewed feel that certificates systems can help green power markets, because they make it easier for suppliers to create differentiated products and reduce transaction costs, as suppliers are not forced to enter into bilateral contracts for renewable resources. Those advocates interviewed also believe that certificates can increase the available pool of dollars to be generated and passed on directly to renewable energy assets. Several other events and factors have also changed the way that environmental accounting is perceived and have led to the widespread adoption of the concept of attribute unbundling.

THE CERTIFICATES MODEL

According to interviewees, in the mid 1990s when these debates began, many consumer and environmental advocates questioned whether a certificates-based approach would offer the necessary consumer credibility and confidence. These groups were skeptical that customers would be capable of understanding the certificates model, thereby stifling any progress made in expanding markets for renewable energy. However, since this time, the majority of consumer and environmental advocates have changed their thinking on this issue according to those interviewed. Now groups such as the Union of Concerned Scientists (UCS) and the Natural Resources Defense Council (NRDC) have revised their positions in support of a certificates model. These groups have purchased green tags for their own use to improve their environmental footprint and actively support these programs around the U.S. NRDC stated in its interview that any consumer confidence or credibility concerns can be eliminated by developing credible operating rules that have been defined and accepted in an open stakeholder process.

State endorsement and support for the certificates approach and system is all that these organizations feel is required to ensure consumer confidence.

RTOS AND SEAMS ISSUES

Another key factor influencing the development of systems to account for the environmental attributes of energy is the emergence of seams issues as a major focus of the Federal Energy Regulatory Commission (FERC). The FERC is concentrating on eliminating seams issues during its proceedings regarding Regional Transmission Organizations (RTOs) and Standard Market Design (SMD). As the FERC strives to create seamless markets, it sees benefit in certificates systems that can be applied regionally and allow for regional trading of environmental attributes. For example, the New England Generation Information System (GIS) is recognized as a “Best Practice” in the “Business Plan for the Development and Implementation of a Single Regional Transmission Organization for the Northeastern United States.” This document was submitted by the participants in the FERC directed mediation under Docket RT01-99-000 to the Federal Energy Regulatory Commission on September 17, 2001.

The National Association of Regulatory Utility Commissioners (NARUC) has come out in support of FERC RTO/SMD activity that includes certificates-based systems as part of standard market design and regional transmission organizations as they are formed. On July 31, 2002, the NARUC Committee on Energy Resources and the Environment adopted a “Resolution to Support the Incorporation of Regional Energy Generation Tracking Systems in ISO/RTO Responsibilities and in FERC’s Standard Market Design.”¹ The resolution supports the separation of energy and attributes, the implementation of regional accounting systems to verify green power marketing claims and public policies such as disclosure and portfolio standards, and comprehensive systems that cover all generation, not just renewable energy. The NARUC Board of Directors further encourages each RTO/ISO or larger geographic region to assume responsibility for developing certificates-based accounting systems, and encourages FERC to include a requirement that each regional transmission organization develop and maintain a certificates-based system as part of its standard market design.

EMISSIONS TRADING

The emergence of emissions trading over the past five years is another key market change since the early debates regarding the accounting of environmental attributes.

¹ For the full text of the Resolutions, refer to http://www.naruc.org/Resolutions/2002/summer/ere/tracking_systems.shtml

With the variety of cap and trade programs that have been implemented as part of state, federal, and international programs aimed at reducing the emissions of greenhouse gases and other pollutants, emissions trading has become an accepted and ever-growing part of the energy industry and the energy lexicon. This market is driven largely by ongoing negotiations of the international global climate change treaty and has been shaped by the success of emissions trading programs such as the U.S. Acid Rain Program. Approximately 55 million tons of carbon dioxide equivalent emissions have been traded in the international greenhouse gas markets to date.² The development of these programs and markets demonstrates that emissions trading has gained acceptance as a preferred policy instrument and market mechanism to reduce emissions. In these programs, emissions of varying types are unbundled and traded separately from the underlying commodity – the same concept that serves as the basis for certificates-based accounting systems to account for the environmental attributes of energy.

Given each of these developments in the past several years, certificates-based systems have emerged as the method of accounting for the environmental attributes that can best promote renewable energy resource development and that are best aligned with the move towards seamless regional energy markets.

² Rosenzweig, R. et. al. “The Emerging International Greenhouse Gas Market.” (2002). Prepared for the Pew Center on Global Climate Change. March.

3.0 SYSTEM JUSTIFICATION

During the interview process, and through an in-depth analysis of the New York marketplace, APX identified a series of critical market benefits that the REACTS requirements identified in this document are uniquely able to satisfy. Below, we discuss how the REACTS system requirements as defined in the stakeholder interview process offer the flexibility and simplicity to:

- meet current and future environmental requirements,
- foster the development of renewable energy markets,
- facilitate the development of retail markets in New York, and
- provide the most cost-effective solution for all affected parties.

HOW THE REACTS REQUIREMENTS' BUILT-IN FLEXIBILITY WILL ENABLE THE SYSTEM TO MEET CURRENT AND FUTURE ENVIRONMENTAL REQUIREMENTS

The current tracking system operating in New York was designed to support the environmental disclosure requirements adopted by the New York Public Service Commission in 1998. At that time, additional environmental requirements were not discussed, and green power markets had not yet begun to develop. Now, the situation has changed significantly. Additional environmental requirements are both in place and under discussion. For example, on January 8, 2003 Governor Pataki stated in his State of the State Address "I am directing the Public Service Commission to implement a Renewable Portfolio Standard – a program which will guarantee that within the next 10 years at least 25% of the electricity bought in New York will come from renewable energy resources like solar power, wind power or fuel cells."³ In addition, several suppliers are actively trying to offer green power products. As described in a later section of this document, the current tracking system is not able to provide the necessary verification and compliance for these additional, changing needs.

There is general consensus among stakeholders that the REACTS developed for the New York market must be able to support the current environmental requirements including environmental disclosure and the RPS as well as any future requirements that may be implemented, such as generation performance standards. The system must also be

³ From Governor Pataki's State of the State Address on January 8, 2003. For the full text of the address please refer to <http://www.state.ny.us/03sosaddress/sos2003text.html>.

able to support green power marketing activities and allow suppliers to offer any kind of differentiated products they may wish.

Our survey of existing information systems has identified a system currently in operation that closely addresses the requirements expressed by the New York interviewees. The New England Generation Information System (GIS) was designed to support different environmental requirements across the six New England states. The New England states require varying definitions of renewable resources, varying data capture, and varying reporting periods that the GIS easily accommodates with its open architecture. Similarly, the REACTS requirements enable it to support the state's current environmental requirements including environmental disclosure, RPS, the green power purchase requirements specified in Executive Order 111, and green power marketing efforts being undertaken in the state by various marketers. In addition, the open architecture system design requirement will enable the REACTS to adapt to new or changing policies out into the future.

The flexible design specified in the system requirements not only will enable the REACTS to support a wide range of environmental policies and programs, but also will provide important benefits to market participants in the process. For example, both time and cost efficiencies can be gained through use of REACTS to comply with the RPS and Executive Order 111. In order to comply with Executive Order 111 under the current regulations and tracking system, the central procurement agent would have to either enter into unit entitlements with individual renewable generators or would have to purchase the renewable energy out of the spot market through the use of conversion transactions. Both of these options would lead to significant transaction costs for the central procurement agent and the NY Public Service Commission (PSC) due to the large volume of renewables that would be required and the time- and resource-intensive nature of these types of transactions. In contrast, the REACTS requirements allow the central procurement agent to use the system to meet the environmental requirements for all State agencies by purchasing a number of certificates equal to the State agencies' total obligation. These purchases would then be recorded in the REACTS, which would create reports providing verification that each agency had purchased the required amount of renewable energy. The procurement agent could easily and efficiently create the overall portfolio of renewable resources required for the State agencies and ensure their compliance with the Order. Similar efficiencies would be gained by those entities seeking to meet RPS requirements. Rather than entering into bilateral contracts for renewable resource, LSEs would use REACTS to acquire the proper certificates and

then REACTS would create reports providing verification that the LSE had purchased the required amount of renewable energy.

A key requirement of the REACTS is the ability to support and provide benefits to suppliers wishing to offer green power or other differentiated products. Currently, there are several green power marketing efforts underway in New York that could be supported through a REACTS. Community Energy Inc. is actively working with Niagara Mohawk and NYSEG to offer green attribute products within their respective service territories. Rochester Gas & Electric is also developing green products within the NYSEG territory. Con Ed Solutions and Strategic Power reported offering green power products, and several other marketers expressed interest in doing so based on the perception of customer demand. The current tracking system hinders the ability to offer green power products because it requires that environmental attributes remain bundled with the underlying energy commodity. In areas where there are transmission constraints and inadequate local renewable resources, suppliers must use conversion transactions to support their green portfolios. However, the necessity to purchase all the green resources out of the spot market places financial burden and risk on these suppliers because they cannot be flexible in their procurement strategy.

HOW THE REACTS REQUIREMENTS WILL ENABLE THE SYSTEM TO FOSTER EXPANDED RENEWABLES MARKETS WITH CROSS-BORDER TRADING

There is widespread consensus among stakeholders that New York needs an accounting system that is compatible with systems in other control areas and that facilitates and supports the sale of certificates across borders. At a time when the Federal Energy Regulatory Commission is moving towards regional transmission organizations and standard market design, the development of non-compatible tracking systems is leading to additional seams issues amongst control areas. There are major impediments to cross-boundary transactions as long as each control area has a uniquely different system driving the costs of cross-border trades to the point where the trades are uneconomical. As a result of generators' inability to sell across borders, the market for renewable energy generation is artificially limited. This section provides background on the current level of compatibility with tracking systems in neighboring control areas. This section also discusses the possibilities for cross-border trading under the current tracking system and under a REACTS, comparing and contrasting how transactions take place under each scenario. The focus is predominantly on transactions between

New York and New England; however, the discussion is broadly applicable to control areas where both compatible and non-compatible systems exist.

Compatibility of Current New York and New England Systems

With the deployment of the New England Generation Information System, the Massachusetts Division of Energy Resources (DOER) has been in discussions with the New York Public Service Commission regarding the compatibility of the two control areas' systems. In the interview process, DOER stated that it will not accept conversion transactions and does not believe that the New York system constitutes a compatible system due to concerns over data accuracy and precision. DOER feels that the New York system is adequate to support environmental disclosure requirements, but does not provide the revenue-quality data needed to support the financial transactions that occur in the RPS compliance market. In addition, DOER feels that the New York system will not work for any significant part of the market. As larger and larger portions of the market have potential value (i.e. under generation performance standards when they come into effect), the New York system will not be able to support this large number of transactions.

Compatibility of Current New York System with Other Control Areas

Recent developments in other regions also validate requirements for a certificates-based accounting system. Ontario is moving ahead with the development of a certificates-based accounting system. The Ontario Ministry of Energy was given the authority to develop and implement a certificates-based system in legislation that amended the Ontario Energy Board Act of 1998. The legislation stipulates that the Ministry can develop regulations "providing for the establishment, administration and operation of a tracking system to associate electricity with the processes and fuel types used by generation facilities and with the types and quantities of contaminants emitted by generation facilities" and "authorizing and governing the issuance of certificates related to determinations made for the purposes of the tracking system."⁴ Based on this authority, the Ministry of Energy is currently working to develop these regulations and expects to issue them for comment in early 2003. Ontario has selected a certificates-based system for a number of reasons, such as the desire to harmonize its markets with those in other regional control areas, including New England. In addition, there is pressure for a renewable portfolio standard. The Select Committee on Alternative Fuel Sources recommended an RPS in its final report to the Legislative Assembly of Ontario

⁴ Please refer to Ontario Energy Board Act, 1998 Part 88, Section a.1 through g for the full text. This text can be found at http://192.75.156.68/DBLaws/Statutes/English/98o15_e.htm#P1163_99393.

in June 2002, and the Ontario government is expected to take a position on this before the end of the year, reinforcing the need for a certificates-based system.⁵

Market participants in PJM are also currently working towards the development of a certificates-based tracking system through the Generation Attributes Tracking System Working Group. The group's recently adopted mission statement is: "To recommend to the PJM Energy Markets Committee a single information system that will support reporting, compliance, and verification requirements related to environmental attributes of electric generation. Such a system should: Ensure accurate accounting and reporting, facilitate efficient and transparent transactions among market participants, provide flexibility to accommodate varied and changing State policies or programs, maintain liquidity in the energy market, mitigate seams issues, and be cost effective."

The GATS Working Group has agreed that the information system will allow the attributes of every MWh to be unbundled from that MWh and traded separately from energy and that the system will create one "certificate" for each MWh that contains all of the attributes for that MWhr. The deployment schedule developed by the GATS Working Group calls for development of a functional specification by the end of the 1st quarter 2003 and system deployment in spring 2004.

While the New Jersey Board of Public Utilities and Department of Environmental Protection favor a combination contract-path/certificates program, market participants in PJM favor a certificates approach and continue to work to this end. A key goal of these participants, including PG&E National Energy Group, Green Mountain Energy Company, Community Energy, Hydro Quebec, and PSEG, is to create a system that is compatible with the New England GIS and other systems as they develop. PG&E National Energy Group recently submitted comments to the New Jersey Board of Public Utilities stating, "To fully realize all the benefits of a regional, certificates-based information system, it is critical that the system developed in PJM be compatible with the attribute markets being developed and implemented in neighboring markets."⁶

⁵ Select Committee on Alternative Fuel Sources Final Report to the Legislative Assembly of Ontario, June 2002.

⁶ PG&E NEG Comments on NJ BPU/DE Joint Recommendation to PJM on its System for Generation Attributes Tracking, submitted October 9, 2002.

Cross-Border Trading Under Current New York Tracking System

Many current seams issues must be overcome to effect cross-border trades into and out of the New York ISO. The implementation of certificates-based systems in Ontario and PJM will create additional seams issues between New York and its neighboring control areas. The New York Public Service Commission states that rules are in place that would allow unit-specific imports and exports to and from Ontario, PJM, and New England in the presence of compatible tracking systems, however no such systems currently exist. Because New England, Ontario, and PJM are committed to certificates-based systems, it is unlikely that compatible systems will exist. As a result, the conversion transactions created under New York's current tracking system are not, and will likely not be able to be, exported to other control areas. Without a compatible system, New York's renewable generators will find it very difficult and costly to sell their attributes outside of the New York market, hindering their ability to maximize revenue and expand their market. Interface compatibility with neighboring regional systems is thus an important requirement for the REACTS.

The remainder of this section discusses the level of cross-border trading based on current market conditions and then based on requirements for a REACTS implementation. Table 1 outlines the types of cross-border trades that have been contemplated to date and describes whether or not this type of transaction is possible under current market conditions. The emphasis in this section is on transactions between New York and New England, because other control areas have not yet implemented systems.

Table 1 shows that the only type of cross-border trade that can occur under the current tracking system in New York is a bilateral, unit-specific export from New York into New England. Enabling any of the other three scenarios to take place would require changes to New England's Operating Rules. Intense negotiations were undertaken to develop the Operating Rules regarding imports and exports, so it is unlikely that these positions will change in the absence of a compatible system.

Table 1. Cross-Border Transaction Types and Ability to Transact under Current New York Tracking System

Transaction Type	Ability to Transact Cross-Border Trades
A. Bilateral unit-specific export from New York	Possible under GIS Operating Rules but only for particular renewable energy generators.
B. Conversion transaction export from New York	Not possible.
C. New England unit-specific export into New York	Not possible unless tracked outside of the GIS.
D. New England system contract export into New York	Not possible.

Under the Operating Rules of the New England Generation Information System, renewable energy from New York can be exported to the GIS for sale in New England. Cross-border trades from New York into New England can be done for transactions that meet the criteria laid out in the New England GIS Operating Rules.⁷ Below are the GIS operating rules pertaining to imports from control areas with non-compatible accounting systems.

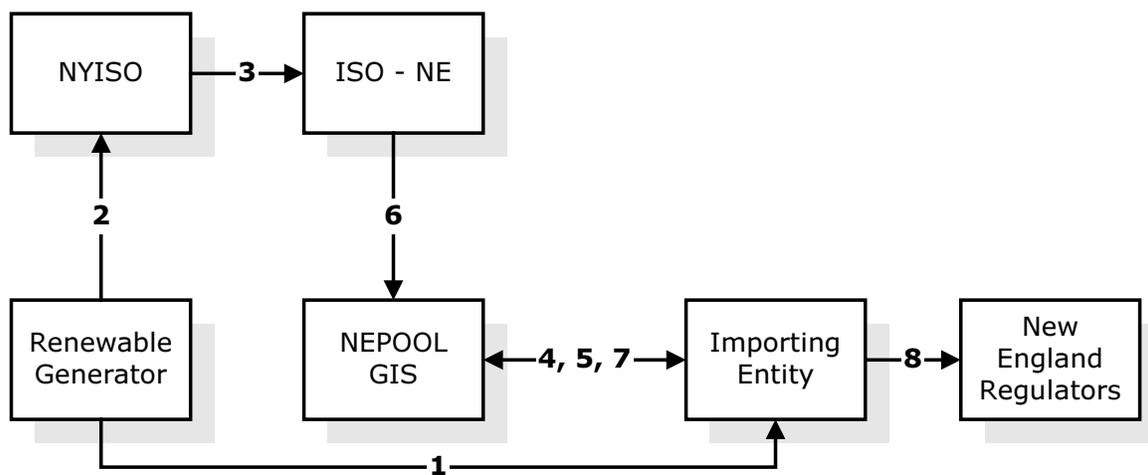
GIS Operating Rule 2.7(c) states that the certificates for energy imported into the control area pursuant to a unit contract shall reflect the attributes of the generating unit generating such energy if:

- The generating unit is eligible under one of the RPS fields listed in Part 2 of Appendix 2.4;
- Energy is imported from such generating unit in an adjacent control area into the control area with transmission rights over the ties to the control area;
- such energy is actually settled in the MSS;
- the importing account holder importing such energy has registered the applicable generating unit in the GIS as contemplated by Rule 2.3 and has provided the data contemplated by Rule 2.5;

- such importing account holder provides the GIS Administrator with evidence which has been verified by the GIS Administrator
 - i. that the generating unit actually generated such energy
 - ii. a NERC tag for such energy meeting the requirements of the Market Rules for External Unit Contracts for Energy 1 or Energy 2 and the requirements of the adjacent source control area
 - iii. a certification of the seller of such energy, in the form set forth in Appendix 2.7A, to the effect that the specified attributes have not been and will not be otherwise sold, retired, claimed, represented as part of energy sold elsewhere or used to satisfy obligations in another jurisdiction.

Figure 1 outlines the process by which these unit-entitlement transactions can occur between New York and New England under New York’s current tracking system.

Figure 1. Cross-Border Trades with New England under Current Tracking System



The following steps outline the process by which a New York renewable generator can currently export certificates into ISO New England.

1. New York renewable energy generator contracts with retail supplier in New England for the energy under an External Unit Contract for Energy 1 or Energy 2.

⁷ For the full text of the GIS Operating Rules, please refer to http://www.nepoolgis.com/GeneralDoc/NEPOOL%20GIS%20-%20operating%20rules1_03.PDF

2. New York renewable energy generator schedules its output with the New York ISO and secures transmission for export of the power to New England.
3. The generator runs, produces MWh and settles the energy within the importing entity's account.
4. The importing entity registers the New York unit in its GIS account and claims the attributes of the power.
5. The importing entity certifies that the attributes have not been otherwise sold or used.
6. The GIS Administrator performs hourly matching of the NERC tags, comparing the contract flow and the hourly energy output from the unit based on NYISO information.
7. If all criteria for the import are met, the certificates will be assigned to the importing entity's account.
8. The importing entity uses the report regarding the certificates in its account, including those imported from the New York generator, to verify compliance with environmental regulations that it may be subject to, including disclosure and RPS.

As the diagram and above steps demonstrate, renewable generators in New York must undertake several administrative steps and requirements in order to export renewable energy attributes into New England. Market participants have presented two main concerns in trying to meet the requirements outlined above. First, they are concerned with the hourly matching of generation with transmission rights as specified with NERC tags. Second, they are concerned with the costs of purchasing transmission rights to bring the exports from New York into New England. A wind generating company with assets in New York states that the requirement for NERC tags is problematic for several reasons. To encourage intermittent renewable generation, the NYISO has exempted wind generators from requirements to schedule ahead and from imbalance payments. Therefore, NERC tags are not routinely issued for New York wind facilities. This market participant asserts that under the current requirements of the Operating Rules, there is little to no possibility of exporting renewable energy into New England.

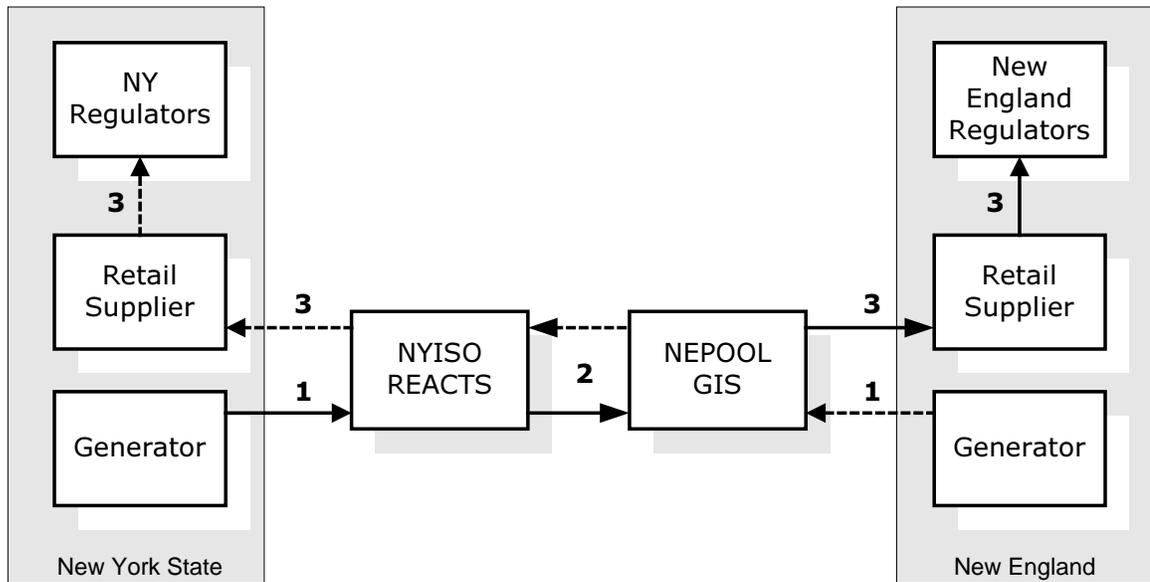
As stated above, the only type of cross-border transaction for renewable attributes that is possible under the current market conditions is a bilateral, unit-specific export from New York into New England. Given the requirements needed to complete this type of

transaction, it is unlikely that any will occur. The transactions are simply too costly for New York generators, particularly wind generators, to pursue this type of transaction.

Cross-Border Trading under a REACTS

The New England participants intend to amend the GIS Operating Rules regarding imports to allow the import of certificates from an adjacent control area without physical delivery of the associated energy, in the presence of a compatible accounting system in New York, such as a REACTS. Operating Rule 2.7 (b) states, “At such time as a source control area for imported Energy implements a generation information system that is compatible with the GIS, as determined by the NPC or its delegatee (a “Compatible GIS”), the NPC or its delegatee may amend this Rule 2.7(b) to address the creation of Certificates under this Rule 2.7(b).” A REACTS designed to address this issue would promote exports from New York into New England, and cross-border trades would become significantly easier and more cost-effective than under current conditions. Market participants would not be required to arrange for transmission and would not be subject to an hourly match between generation and transmission rights. Figure 2 illustrates how cross-border trades would occur in the presence of a REACTS.

Figure 2. Cross-Border Trades under a REACTS



The following steps outline how, in the presence of a REACTS, a New York generator could export certificates into New England and how a New England generator could export certificates into New York.

1. The New York generator produces energy, and the certificates associated with this energy are created in the REACTS and deposited into the New York generator's account. Or, the New England generator produces energy, and the certificates associated with this energy are created in the NEPOOL GIS and deposited into the New England generator's account
2. These certificates are imported into the NEPOOL GIS account holder's account that purchased the certificates; or these certificates are imported into the REACTS account holder's account that purchased the certificates.
3. This New England retail supplier uses the report regarding the certificates in its account, including those imported from the New York generator, to verify compliance with environmental regulations that it may be subject to, including disclosure and RPS. Or, this New York retail supplier uses the report regarding the certificates in its account, including those imported from the New England generator, to verify compliance with environmental regulations that it may be subject to, including disclosure and RPS.

Depending upon how the system is deployed, there may be a need for the delivery of system power across the border between New England and New York in order to complete the transaction.

Benefits of Cross-Border Trading under a REACTS

As Figure 2 shows, cross-border trades to New England under a REACTS become much more streamlined and simple. Transactions also become much more cost-effective, because the exporting generators need not arrange and pay for transmission and are not subject to hourly matching of NERC tags and generator output. Therefore, transaction costs are drastically reduced and cross-border trades become significantly more economical. Certificates can flow freely across borders, creating expanded markets for renewable generators and increasing market liquidity. Generators can maximize their return because they can effect transactions where it is most economical to do so within the level playing field created by the REACTS requirements. An additional benefit of the REACTS requirements is the creation of a common currency with New England and other regions as they develop compatible systems. The administrative burden on market participants decreases because they are only dealing with one currency, rather than two or more. The common currency also increases the incentive for traders and brokers to get involved in these markets, thereby enhancing liquidity and benefits to market participants as the brokers play a key role in bringing buyers and sellers together.

Additional benefits of cross-border certificate trading are described in “Transacting Generation Attributes across Market Boundaries.”⁸ This paper states that, because it is not possible or desirable at times to locate renewable resources where the demand exists, the ability to trade freely across borders creates benefits for renewable energy developers, because they can locate the unit where the resource is best. Flexibility in locating new resources also depends on factors such as environmental sensitivity, transmission issues, and land use compatibility. The ability to select a resource’s location based on these factors, rather than strictly on location, leads to more cost-effective, successful renewable energy projects. This paper also points out that the environmental benefits of renewables “transcend market boundaries,” suggesting a rationale for promoting cross-border trading.

HOW THE REACTS REQUIREMENTS WILL ENABLE THE SYSTEM TO FOSTER RETAIL COMPETITION AND RENEWABLE GENERATION THROUGH STREAMLINED TRANSACTIONS

A number of the stakeholders interviewed expressed concerns over how the current disclosure regulations are affecting their ability to participate in retail markets. For example, many feel that the current disclosure regulations in New York, including the conversion transaction mechanism, are unnecessarily complicated and prevent the exact kind of market liquidity for renewables that is desired. Because the current regulations do not allow for the separability of energy and attributes, marketers are required either to buy out of the spot market and set up conversion transactions or to enter into complicated bilateral deals. It is conceded that the ability to purchase attributes on the spot market is of some benefit, but their hands remain tied to some extent as to the kinds of procurement mechanisms they can employ. This section explores the process by which a supplier would offer green power products under the current tracking system and then compares this to how a supplier would offer similar products under a REACTS.

Green Power Products in Retail Markets

In retail markets, two types of green power products have emerged following two different business models. When a supplier delivers the first type of product, a green tag product, it delivers green tags for a premium over and above what a customer pays its distribution company for its energy supply. The tag provider sells only attributes,

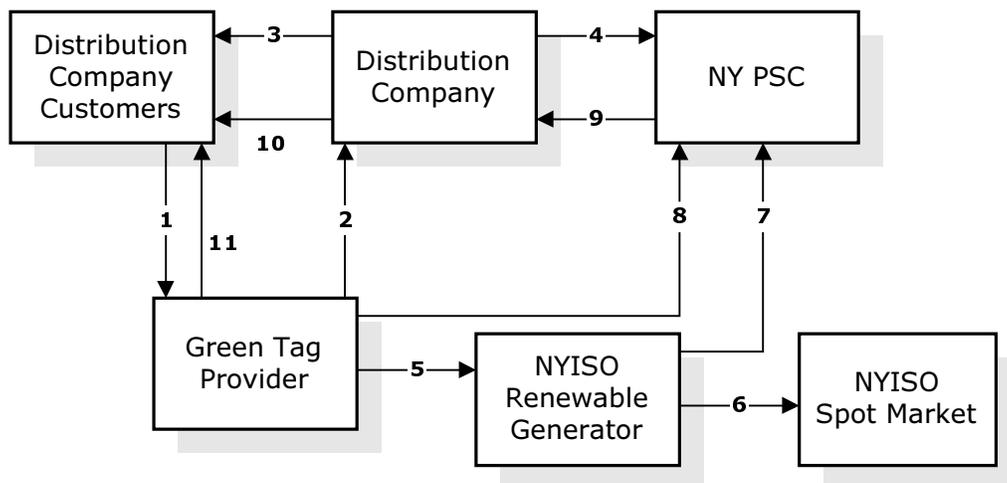
while the distribution company continues to supply generation, transmission, and distribution services. There are several benefits to this approach for the tag providers. They need not become members of the power pool in which they are doing business and need not perform all the requirements necessary in order to provide a delivered energy product. In addition, tag products offer retail customers the ability to purchase renewable energy while maintaining their relationship with their current provider. For some customers, it may be beneficial to stay on standard offer or default service through their distribution company.

The second type of green power product that had emerged in retail electric markets is the delivered green product. Under this business model, the retail supplier provides both energy and green attributes to its customers. In several retail markets around the country, this type of product has become one of the best ways for suppliers to differentiate themselves, and these products have been successful at capturing large percentages of customers switching suppliers.

Tag Products Under Current New York Tracking System and REACTS

Figures 3 and 4 outline the steps that retail suppliers and other entities would have to complete to offer tag products under both the current tracking system and a REACTS.

Figure 3. Tag Product under Current Tracking System



1. A distribution company’s customers sign-up for the tags product through distribution company solicitation.

⁸ Grace, B. and Wisner R. 2002. “Transacting Generation Attributes Across Boundaries: Compatible Information Systems and the Treatment of Imports and Exports.” Prepared for the U.S. Department of Energy and the New York State Energy Research and Development Authority, September.

2. The tag provider sends the distribution company the number of blocks signed-up for and the associated billing and reporting information.
3. The distribution company enters the reported information into its billing system so customers will see a line item on their bill for the tag product.
4. The distribution company sends a tag sales report to the PSC with a request that the PSC set-aside the equivalent number of conversion transactions.
5. The tag provider purchases a quantity of green tags from a New York renewable energy generator that matches its sales through the distribution company.
6. Renewable energy generators sell an equivalent amount of energy into to the New York spot market.
7. Renewable energy generators report tag sales to the PSC, which the PSC matches with the distribution company set-aside report.
8. The PSC recognizes the tag provider. The tag provider reports attributes purchased for conversion transactions. The PSC matches this with the distribution company set-aside report and the renewable generator report to complete the conversion transaction.
9. The PSC delivers a label to the distribution company that includes the conversion transactions purchased on behalf of the tag provider.
10. The distribution company then revises its disclosure label based on the conversion transaction for those customers who have purchased green tag products. It also delivers revised labels to its own customers.
11. The distribution company or tag provider delivers labels to tag customers.

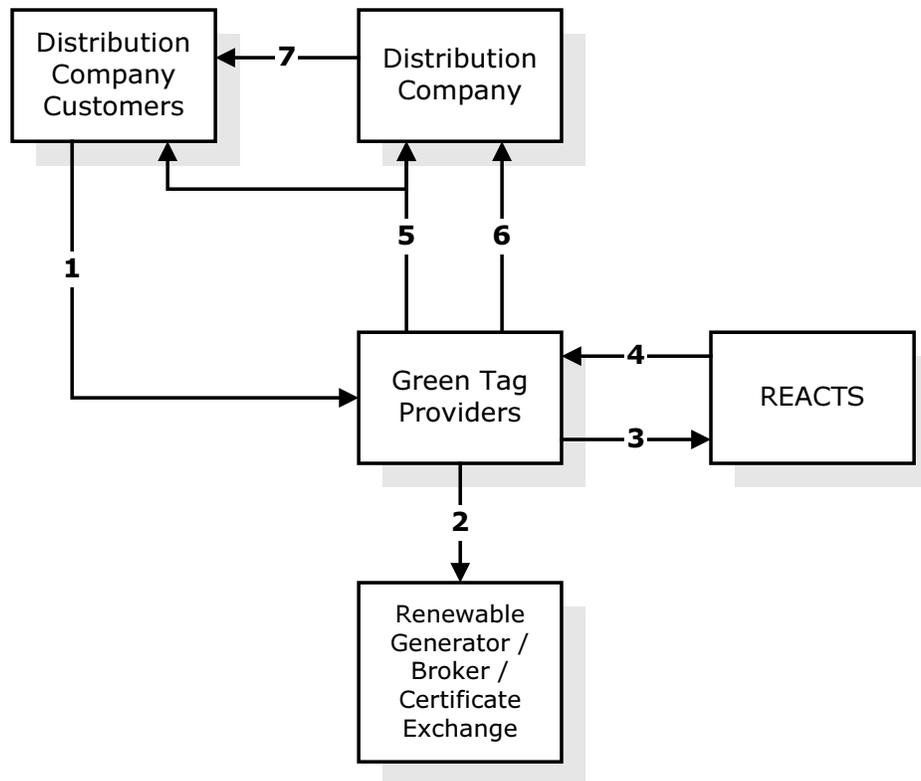
As the steps above show, the tag provider, the distribution company, the Public Service Commission, and the renewable energy generator must undertake numerous administrative tasks to enable the tag provider to offer its product under the current tracking system. Multiple reports must be made to the Public Service Commission, and the distribution company must act as the middleman in order to complete the conversion transaction. During the stakeholder interview process, one distribution company estimated that the required changes to its billing system to allow a separate line item on the bill for the tag product was \$40,000 and required over 500 labor-hours. Because tag providers can offer percentage-based products or block products, this added complexity to the billing changes required. For the percentage-based products, the distribution company must look at actual customer consumption in order for the

tag providers to provide the proper amount. The distribution company must develop the tag provider-specific labels from the aggregate data supplied by the PSC, notify the provider of how much load there was from customers, and report to the Public Service Commission the conversion transactions purchased on behalf of the provider. In addition, the distribution company must assign the distribution company mix to any portion of the customer label where the provider has not purchased enough conversion transactions to cover the product claim.

While the distribution company in this example says it is neutral on the development of a REACTS from a policy perspective, the company does see benefits to a certificates-based system in New York, because it would relieve the company of the administrative functions and the associated costs. This company feels that a certificates-based system would vastly simplify the process and enable suppliers to offer green power directly to customers without its having to act as the middleman.

Alternatively, the process is much simpler for suppliers that wish to offer green tag products under a REACTS. Rather than using the distribution company as the go-between to purchase conversion transactions, the tag provider can purchase certificates from the REACTS to satisfy its needs. This reduces cost for both the tag provider and the distribution company and eliminates many steps from the complicated process described in the example above. A tag provider would have to work through the steps shown in Figure 4 to offer a green tag product under a REACTS.

Figure 4. Tag Product under a REACTS

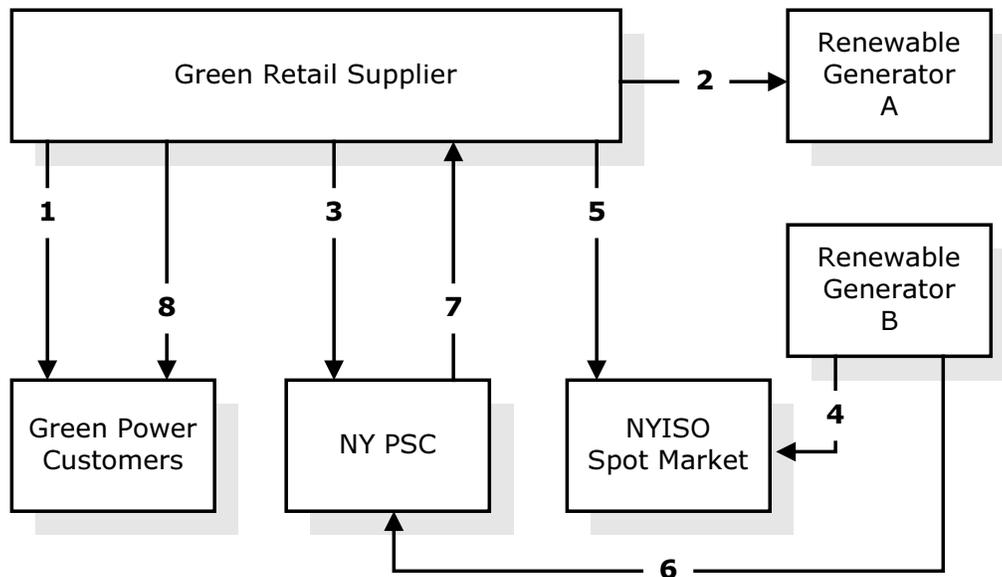


1. The tag provider signs-up green tag customers.
2. The tag provider purchases certificates from a REACTS participant in the amount of the tag purchases.
3. The tag provider enters these transactions into the REACTS.
4. The REACTS provides a disclosure label to the tag provider.
5. The tag provider either sends labels directly to customers or to the distribution company for their distribution.
6. If the distribution company is engaged in the billing process, the tag provider supplies billing information. (Optional)
7. If the tag provider supplies labels through the distribution company, the distribution company distributes the labels to customers. (Optional)

Delivered Green Products under Current Tracking System and a REACTS

Figures 5 and 6 outline the steps for offering a delivered green power product under the current tracking system and those under a REACTS. While similar to the steps outlined above for green tag products, the tasks necessary to offer this type of product are greatly reduced and streamlined under the REACTS requirements. Under the current tracking system, the supplier enters into unit-entitlement contracts and purchases conversion transactions to ensure that it can cover its customers' green power demand. Using a REACTS, the supplier has only to purchase the correct number of certificates, knowing what its customers' consumption was over a particular period of time. The REACTS requirements also reduce the needed administrative steps. Suppliers no longer must report to the PSC on conversion transactions, and the PSC no longer must perform the necessary steps to complete the conversion transactions.

Figure 5. Delivered Green Power Product under Current Tracking System

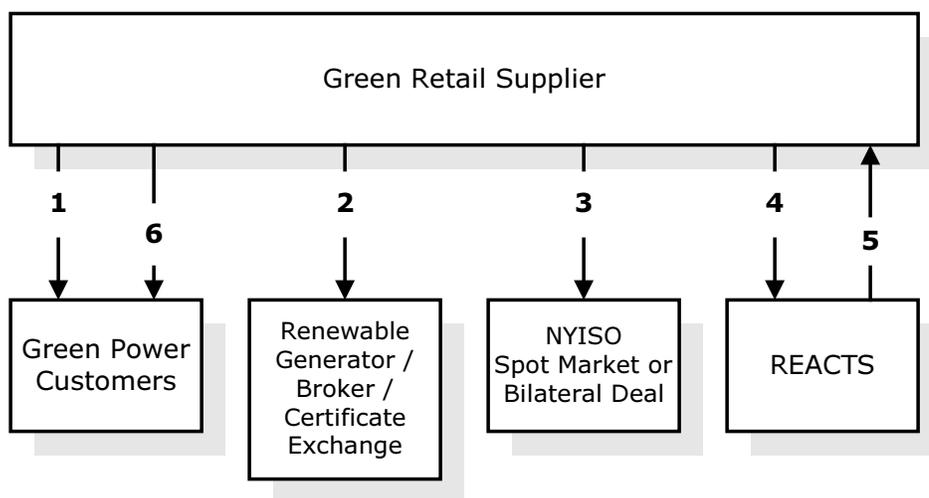


1. The retail supplier signs-up customers for the green power product.
2. The retail supplier purchases a unit entitlement of green energy from New York renewable energy generator A in an amount matching a portion of its sales. Generator A must be able to provide transmission and all other requirements for delivery.
3. To meet any additional supply needs, the retail supplier sends a green power sales report to the PSC with a request that the PSC set-aside the equivalent amount of conversion transactions from renewable generator B.

4. Renewable generator B sells an equivalent amount of energy into the New York spot market.
5. The retail supplier purchases additional green power needs in the form of conversion transactions through the NYISO spot market.
6. Renewable generator B reports to the PSC on the sale of green energy that the PSC matches with the retail supplier set-aside report.
7. The PSC matches the retail supplier set-aside report and renewable generator report to complete the conversion transaction and delivers a label to the retail supplier that includes the conversion transactions.
8. The retail supplier then revises its disclosure label based on the conversion transaction for those customers who have purchased green power products. Next, it delivers revised labels to its customers.

Figure 5 illustrates the inefficiencies and market barriers that result from the current tracking system. The current tracking system limits retailer suppliers' ability to compete based on transaction costs that are higher than necessary, because the only opportunity to purchase attributes without the associated energy is through the spot market. Similarly, the generators' ability to compete is compromised because they are sometimes forced to sell into the spot market for conversion transactions and cannot engage in bidding strategies that maximize return. The generators' ability to compete is also compromised by the current limitations on the markets they can access. To maximize new renewables development, generators need access to the largest market possible, and their market should not be limited by prohibitive costs on export transactions.

Figure 6. Delivered Green Power Product under a REACTS



1. The retail supplier signs-up green power customers.
2. The retail supplier purchases certificates from a REACTS participant in the amount of the green power purchases.
3. The retail supplier purchases energy to meet customer demand through a bilateral deal, the wholesale market, etc.
4. The retail supplier enters certificate transactions into the REACTS.
5. The REACTS provides the disclosure labels to the retail supplier.
6. The retail supplier distributes labels to customers.

Figure 6 illustrates the efficiencies that a REACTS can bring to New York's retail energy market in terms of reducing the administrative and cost burdens on suppliers in order to offer green power products. There are fewer steps involved, and the processes are streamlined, meaning that it would be easier for retail suppliers to offer green power products or other differentiated products to customers in New York. In addition, retail suppliers and tag providers would not have to enter into bilateral deals with renewable energy generators to provide green power or green tags to customers. The supply procurement options are expanded, allowing suppliers to negotiate the best deals for the power and attributes and to balance their portfolios between procurement options. This reduces transaction costs for suppliers and allows them to offer more competitively priced products.

Benefits of a REACTS for Tag and Delivered Green Power Products

For customers to gain the maximum access to clean and renewable energy resources, it is critical to facilitate suppliers' ability to offer both types of green power products.

Because customer acquisition costs and operating costs for suppliers entering retail markets are so high, it is critical for suppliers to offer these products in the most cost-effective manner possible. For retail markets to flourish, new retail suppliers must be able to compete under the very thin margins that they face. The examples above illustrate how a REACTS can offer a streamlined and more cost-effective method for suppliers to offer both types of green power products, thus increasing the likelihood of suppliers offering these products and the ability of customers to access these products. The end result is that suppliers will be able to tap into a larger demand for renewable energy resources and as a result, a larger number of new resources will be built to satisfy the demand.

Additional benefits to some suppliers can result from a REACTS. Many areas in New York are transmission- and resource-constrained; thus suppliers cannot produce or deliver renewable energy to customers who would be interested in purchasing green power. A REACTS can provide the ability to purchase energy and attributes separately and greatly increase the flexibility that retail suppliers have in creating their portfolios to serve customers. In some cases, the absence of a REACTS translates into suppliers not being able to offer green products where they desire.

HOW THE REACTS REQUIREMENTS ENABLE THE SYSTEM TO PROVIDE THE MOST COST-EFFECTIVE APPROACH

The implementation of a REACTS can provide significant cost efficiencies for the New York market, its participants, and retail customers. The cost reductions will come from reduced transaction costs, increased reporting efficiencies, reduced administrative tasks, streamlined processes, and the system's ability to accommodate changing environmental regulations. These cost efficiencies are each described below.

Reduced Transaction Costs

A REACTS can significantly reduce the transaction costs associated with RPS compliance and with developing green power or other differentiated products. The cost of acquiring preferred attributes is reduced for in-control-area transactions because suppliers are not required to arrange contracts for bundled energy and attributes. Suppliers are then free to purchase energy where it is most cost-effective rather than being bound to purchase energy where it is less so. Transaction costs are also greatly

reduced for acquiring out-of-control-area resources where a compatible information system exists. Suppliers are not required to purchase transmission, and they are not subject to hourly matching of generation and contract flow.

End-use consumers will benefit from these cost savings to retail suppliers, because marketers will be able to meet RPS requirements in a more cost-effective manner and will be able to offer more competitively priced, differentiated products.

Reduced Costs Associated with Reporting Requirements

Additional cost savings resulting from the implementation of a REACTS can be derived from reductions in the workload associated with reporting requirements. At the end of a trading period, the REACTS would automatically create the reports that market participants use to show compliance with the various environmental requirements. Because the reports are automatically generated, they can then be quickly and easily submitted to regulators for compliance purposes. Regulators are assured that the data they are receiving is credible and accurate and they can readily compile the data they receive for analysis purposes. The efficiency that a REACTS brings to this process reduces the compliance costs for both market participants and regulatory agencies. Market participants and regulators need not invest significant labor in tracking and compiling the necessary data.

Because the Northeast market is regional in nature, many market participants operating in New York also operate in New England and other control areas where certificates-based systems are being contemplated. These market participants will not be required to learn and operate under multiple systems across markets. Having to learn and utilize only one system will save both time and money for market participants. One market participant stated in particular that a very important feature of a REACTS is its similar look and feel to the New England GIS, which would promote compatibility and ease of participant use.

Reduced Administrative Costs

As discussed earlier in this document, implementation of a REACTS could reduce the administrative costs to distribution companies as well. Under the current tracking system, they must act as middlemen in order for green tag providers to offer products. They now incur costs to which they would not be subject under a REACTS. These costs, including billing system changes, label calculations, and marketing, would be

eliminated if green tag providers could directly access customers, as they could with a REACTS.

Reduced Costs Associated with Accommodation of Changing Requirements

The REACTS must be designed so that it can accommodate changing and future environmental requirements. This flexibility will provide significant cost savings. For example, if New York were to implement generation performance standards in the future, a REACTS could readily provide the necessary data and tools for verification and compliance without additional cost. In New England, any modification due to changing or new policies or regulations is included in the fees that market participants pay for the system, so that they incur no additional costs in the future.

OTHER STAKEHOLDER-IDENTIFIED BENEFITS RESULTING FROM IMPLEMENTATION OF A REACTS

In addition to those outlined above, the stakeholders interviewed identified numerous other benefits that could result from implementing a certificates-based REACTS in New York. These benefits are outlined below.

- The system would ensure that the premium for environmentally preferable generation flows directly to the generator. According to renewable energy developers, the ability to tap into this additional revenue stream based on the environmental value of energy is an important component of project development. An attribute market in New York would be a useful mechanism to encourage the development of new renewable energy projects. The developers noted that it is especially true if they are able to export attributes into other control areas.
- A REACTS would provide third-party verification that regulatory requirements have been satisfied and that products claims have been met. While many marketers self-certify their attribute products currently, they feel the verification that a REACTS can offer will firm up the integrity of their products.
- A REACTS would provide benefits to distributed generation and demand response markets if these resources could aggregate and sell their attributes in the certificates market while they sell the energy output from their resources into the spot market during high priced hours. A certificates market would offer particular benefits due to the intermittent nature of many distributed resources.

- The New York Department of Environmental Conservation (DEC) sees specific benefits for its programs based on the implementation of a REACTS in New York. A REACTS could offer them more timely and complete data to support their NOX trading system, non-ozone season trading program, and acid rain program. Currently, DEC creates emissions allowances using heat output data from the EIA. There is a yearlong time lag to access this data, and DEC feels that EIA's data standards are lax. In addition, the EIA does not allow DEC to capture all generators. DEC would like to move towards creating allowances based on electrical output; a certificates-based system could offer them the means to make this transition. Based on the New England model, DEC could expect a much quicker data turnaround. DEC also sees benefits from increased data transparency and accuracy based on the revenue-quality data available from the New York ISO.
- A REACTS would provide the kind of transparency that is needed to establish a functional and predictable futures market. With the development of a futures market, market participants could hedge their positions and reduce risk.

4.0 DESCRIPTION OF SYSTEM REQUIREMENTS

In this section, we present high-level system design criteria as specified in the stakeholder interviews. These system requirements, summarized in Table 2, are arranged in three sections. The first represents design issues where there is widespread high-level consensus among stakeholders. The second represents design issues where there is some agreement, but additional analysis and discussion will be needed to reach consensus. The third represents open design issues where there are significant differences of opinion among stakeholders and considerable analysis and discussion will be required to reach consensus.

Table 2. Summary of System Design Requirements

Design Issue	Consensus	Further Analysis Required	Open Issue	Detail
Separability of energy and attributes	√			The REACTS must support separability of energy and attributes
Coverage of all MWh	√			The REACTS must include all MWh of generation and load
Mandatory participation	√			Participation of generators and suppliers must be mandatory
Accounts	√			The REACTS must offer web-based account management
Information on certificates	√			Information must include emissions characteristics, fuel type, RPS eligibility etc.
Data sources	√			The REACTS must be based on NYISO settlements data
Small and behind-the-meter generation	√			The REACTS must allow for the participation of small and behind-the-meter generators

Design Issue	Consensus	Further Analysis Required	Open Issue	Detail
Regional compatibility	√			The REACTS must be compatible with other regional information systems
Reports	√			The REACTS must provide web-based reports
Trading period		√		Annual vs. quarterly trading period?
Banking		√		Certificate banking ability?
Unbundling of attributes		√		Is unbundling of attributes acceptable?
Green tag transactions		√		Are green tag transactions acceptable?
Market monitoring		√		What types of market monitoring functions are needed?
Trading platform/exchange		√		Is there a need for a trading platform?
Physical delivery for imports			√	Should the REACTS require physical delivery for imports from control areas without compatible information systems?

CONSENSUS DESIGN ISSUES

Purpose

The purpose of the REACTS is to provide an efficient and cost-effective accounting and verification mechanism for retail suppliers to track compliance with the State of New York Public Service Commission's environmental disclosure requirements and renewable portfolio standard as well as to provide third-party verification regarding environmental marketing claims. In addition, the REACTS should facilitate the implementation of the renewable power purchase requirements established for State

agencies in Executive Order 111. If any additional State policies or regulations are developed, the REACTS will accommodate any related verification and accounting.

System Overview

The REACTS shall consist of a web-accessible portal, database, and supporting services where participant and transactional data information extracted from the New York Independent System Operator (NYISO) Market Information System and other sources are used to create tradable certificates that contain information relevant to environmental reporting requirements. NYISO participants shall access the REACTS over the World Wide Web via a Uniform Resource Locator (URL), where participants can access their account information in real-time. Most interaction with the system will occur through this portal. These interactive functions include reviewing and verifying account balances, tracking certificate transfers, reviewing settlement information, and generating compliance reports.

Design Principles

The REACTS and database shall be developed based on the following principles:

Separability of Energy and Attributes. To provide market participants with the maximum flexibility, the REACTS must allow for separability of energy and attributes so that these two commodities can be traded independently from one another.

Coverage of All Megawatt Hours. The REACTS must track every megawatt hour of generation and load within the NYISO. The system must cover all megawatt hours to provide the kind of customer education needed to enable customers to make informed choices. Full disclosure on the part of all suppliers serves to educate customers on the environmental effects of energy generation.

Mandatory Participation for Generators and Suppliers. The REACTS for New York must require mandatory participation for both generators and suppliers. All suppliers must use the system for disclosure purposes regardless of whether the company is making any specific claims about the product(s) it sells.

Open Architecture. The REACTS must be developed with an open architecture capable of handling additional or changing data fields due to evolving statutory or regulatory standards and/or market requirements.

Additional Functional Requirements

The REACTS must accommodate the following design capabilities and functional requirements:

Accounts. Retail suppliers and generators, and other participants as deemed appropriate, will access their accounts through the web portal. In their accounts, participants will be able to manage certificate transfers, track compliance with applicable environmental requirements, and establish differentiated products. In addition, participant generators' accounts will include their portfolio of generating units.

Information on Certificates. The certificates must contain information required to support the current environmental requirements as well as green marketing claims and any future environmental requirements. If the goal is to create a system compatible with the New England Generation Information System (GIS), a working group must be convened to create common data fields between these systems. A similar process must occur should other control areas move ahead with the development of certificates-based accounting systems. The information on each certificate must include, but is not limited to:

- Fuel source (including the general categories listed below as well as the sub-categories that exist under each)
 - Biomass
 - Coal
 - Gas
 - Hydro
 - Nuclear
 - Oil
 - Solar
 - Solid Waste
 - Wind
- Vintage
- RPS eligibility

- Emissions factors for sulfur dioxide, nitrogen oxides, carbon dioxide
- Unit identification
- Unit location
- Time of generation

Several stakeholders also expressed interest in including energy efficiency as an integral part of the system. This would require additional fields on the certificates to account for megawatt hours.

Data Sources. The NYISO currently provides monthly settlement statements through the Market Information System (MIS) to all NYISO participants that take part in the wholesale electricity markets operated by the ISO. The basic MIS database maintained for financial settlement purposes will provide the initial set of inputs for hourly generation credits by resource for New York generators in the REACTS database. Stakeholders view the NYISO financial settlements data to be the most precise and accurate data available. Data from the NYISO is also preferred because it accurately accounts for line losses. The REACTS shall interface with the current NYISO MIS.

Additional information on emissions and other environmental characteristics must be collected for the REACTS to support current and future regulatory requirements. The NYISO currently does not collect other generating information such emissions or eligibility for RPS in various U.S. states. For market registration purposes, registered generating facilities could report RPS eligibility information directly to the ELTS database. In addition, the REACTS shall automate the process for entering emissions data, and generators will be able to upload emissions data directly to the system. Alternatively, the system shall automatically download emissions data from the Environmental Protection Agency's E-Grid system where possible.

Accommodation of Small and Behind-the-Meter Generation. The system must accommodate small and behind-the-meter generators that are not captured in NYISO settlements data ensuring that all generators in New York can participate.

Regional Compatibility/Interface with Adjacent/Non-adjacent Control Areas.

Based on stakeholder input, it is imperative that the New York system be compatible with systems in other control areas and facilitate and support the sale of certificates across borders. The presence of compatible systems eliminates the need for physical

delivery of energy from the specific unit along with attributes. There are major impediments to cross-border transactions as long as each control area has a uniquely different system. The inability to sell across borders artificially limits the marketplace for renewables, and incompatible systems can drive the costs of cross-border trades to the point where the trade is uneconomical, as described earlier in this document.

There is widespread consensus, as described above, that the REACTS facilitate cross-border trading of attributes. The next question must be, then, does this include cross-border trading only to adjacent control areas, or should it also include non-adjacent control areas? The general agreement among stakeholders is that cross-border trading without physical delivery of energy from the specific unit is acceptable as long as the control area has a compatible system, whether it be an adjacent or non-adjacent control area. At a base level, stakeholders feel that the systems must be compatible enough to provide a comfort level that there is no double counting. The key is seamlessness, whether there be one system that covers the entire region or multiple systems that are compatible enough to prevent double counting. It is noted that identical systems would be the best approach to ensure system integrity, but that this is not required. The REACTS shall provide for seamless cross-border trading of attributes and shall not require physical delivery of energy from the specific unit in the presence of a compatible information system.

Reports. The REACTS shall generate reports that track and verify certificate generation and transfers, certificate balances, and a variety of real-time program information. Reports shall be available through the account management portal and can be downloaded for participant analysis. The reports shall be developed based on participant needs to be determined in the design phase.

DESIGN ISSUES FOR FURTHER DISCUSSION AND ANALYSIS

The following design issues represent those issues where there is some agreement, but additional analysis and discussion will be needed to reach consensus.

Trading Period

A large number of those interviewed support the adoption of an annual trading period for many different reasons. Both those buying and selling certificates argue that the longer the certificate “shelf-life,” the better. They argue that an annual trading period creates additional market liquidity and flexibility over a more frequent trading period. Intermittent resources are in particular need of this additional flexibility. A wind

developer noted that because of the seasonal differences in production, i.e. summer months are low wind months, a quarterly trading period disadvantages this resource. This same developer noted that wind resources are fairly predictable, but if the REACTS is to spur the development of new renewable resources, this level of flexibility is needed in order to maximize the value of the environmental attributes.

The quarterly trading period adopted in New England was based on regulatory requirements in the Massachusetts disclosure regulations and the forthcoming Connecticut RPS regulations. Many stakeholders feel that this type of regulatory-imposed constraint cuts the value of certificates in the marketplace. There is a perceived need to work out these regulatory-imposed corners in order to effect a properly working market. However, a few stakeholders advocated for a shorter trading period. To reduce seams issues, one felt that the REACTS should match the quarterly New England trading period. Another feels that an annual trading period would deceive customers. Under an annual settlement, it is argued that marketers could buy all the certificates they required for one year in a single month, while they would be marketing throughout the year that their power is green. This, however, is the opinion of only one stakeholder; no others raised this concern.

The decision to adopt either a quarterly or annual trading period for the REACTS is ultimately a decision for New York stakeholders. APX recommends, however, that this decision be addressed regionally in order to create standardized, seamless markets. The REACTS shall accommodate trading on an annual or quarterly basis as determined by New York market participants.

Certificate Banking

Some market participants would like the ability to bank certificates for future use once the trading period has closed. However, others argue that a banking mechanism is not advisable for a system that is designed to support disclosure requirements. At this time, APX does not recommend that the system functionality allow for certificate banking.

Bundling/Unbundling of Attributes and Treatment of Emissions Allowances

There is a fair amount of division among stakeholders regarding the unbundling of attributes and the inclusion of emissions allowances in a REACTS. However, the environmental community feels very strongly that all attributes must remain bundled together, and that emissions allowances must remain an entirely separate commodity

from the certificates in a REACTS. Their position is that specific attributes cannot be disaggregated, because this will make it too difficult for customers to distinguish between the varying permutations of certificates that could result. How does a customer distinguish between a wind certificate that has had the carbon emissions stripped out and one that has had the SO₂ emissions stripped out? These same groups also feel that including allowances may result in double counting. If the system were to include allowances, they argue that an entity selling allowances may not disclose to its customers the higher emissions profile that results when the allowances are deducted from the entity's emissions mix.

Others, particularly those who will actively trade certificates from the generation side, would like to see emissions allowances rolled into the certificates market, because they feel it would create the most liquid markets. However, APX does not recommend that the system functionality allow for the unbundling of attributes at this time.

Green Tag Transactions

Most stakeholders feel that the REACTS should accommodate green tag transactions. Green tag transactions preserve marketers' ability to sell attributes to customers without any associated energy. If the market shows demand for this type of attributes-only product, then many stakeholders feel that these green tag transactions should be allowed. The need for this type of transaction stems from the lack of incentive for retail customers to switch suppliers—green tag transactions allow customers to purchase renewables without switching suppliers. However, one environmental interest stakeholder noted that green tag transactions, while acceptable in the short-term as competitive markets begin operation, are not acceptable in the long run. This stakeholder does not favor the adjustment needed to preserve a one-to-one match between generation and load. At this time, APX recommends that the REACTS design include the ability to complete green tag transactions based on market needs and the desire of stakeholders for compatible systems. The REACTS shall allow for green tag transactions.

Market Monitoring

Some stakeholders feel it is desirable for the REACTS to include market monitoring functions that would enable the diagnosis of market issues, including mismatch between supply and demand. APX recommends in-depth discussions of market monitoring and the associated issues before decisions can be made on the scale and

scope of these activities. The REACTS shall be designed to support market monitoring if the stakeholders determine that this function is needed.

Exchange/Trading Platform

To facilitate market liquidity and project viability, several stakeholders expressed a desire for an exchange or trading platform with which market participants can buy and sell certificates freely. As part of an exchange, traders would like to have price, volume, and term transparency, and any information regarding market depth, including bids and asks that will effect more liquid markets. A key element of this exchange is a forward market that enables trades for up to ten years out. As one developer described, developing a wind project requires an off-taker of some of the price risk so that the developer can get financing. To take that kind of price risk, the developer must know what the value of the certificate will be in the future. The key, then, is the ability to access a forward market. Any forward market that is developed should offer various kinds of products including the ability to buy and sell a fixed percentage of a unit's output over a year or a level amount of output per month with an annual true-up.

This exchange should ultimately be as easy to use as Enron On-Line, for example, but should also provide the capability to transact deals with different buyers and sellers. To deal with credit issues, one stakeholder suggested using a green list, where the ability to trade with counterparties can get turned on and off.

While some stakeholders desire an exchange that is an integral part of the REACTS platform, many feel that the REACTS should be compatible to interface with exchanges, but that these two functions should exist separately. This issue has been debated at length in New England, where it was decided that any exchange should remain separate from the accounting mechanism. Stakeholders do not want to create additional seams issues or to put the credibility of the REACTS into question. While APX feels that a REACTS will create an environment where there is benefit to developing a trading platform, we would not propose developing this trading platform as part of the REACTS design at this time.

OPEN DESIGN ISSUES

This section represents open design issues where there are significant differences of opinion among stakeholders and considerable analysis and discussion will be required to reach consensus.

Physical Delivery for Imports in the Absence of a Compatible Information System

There are competing arguments amongst stakeholders as to whether or not the REACTS should require physical delivery of power from the specific unit in order to accept attributes from a control area without a compatible information system. Generators argue that the incentive to participate in a market is greatly decreased if they must schedule the power and arrange for delivery from a specific unit; they simply will not go to the trouble or the costs. The problem increases if the generator is in a constrained area and faces congestion. It is too costly if the generation is stuck in a constrained area and the generator is trying to sell into a congested area when they are required to have physical delivery. The in-service costs are too high.

Many generators and marketers feel that generating units outside a control area should be treated similarly to those within a control area, even in the absence of a compatible information system. According to one generator, the REACTS should be “equitably agnostic, treating local and non-indigenous generation the same.” The idea is that if a wind generator runs in an hour and creates certificates, then a marketer purchasing these attributes in another control area should be able to deliver that amount of energy across the ties, but should not have to deliver from the specific generator. Others maintain, however, that imports should have to show that the power from the specific unit was delivered to the importing control area where there is no compatible information system. While the REACTS system design can accommodate either scenario, the requirement for physical delivery of the energy in the absence of a compatible information system is a serious design issue that must be addressed early in the process of system implementation.

5.0 STEPS FOR SYSTEM DEPLOYMENT

APX has identified a series of steps that are necessary for the successful deployment of REACTS in New York. Each of these steps is described in detail below.

DEVELOP MECHANISM TO ADDRESS REACTS WITHIN THE NYISO COMMITTEE STRUCTURE

New York ISO Market Participant Participation

REACTS, as proposed in the system requirements, is an NYISO-wide system. As such, it is appropriate that the NYISO market participants fully participate in the development and deployment of the system. One of the key steps necessary for system deployment is a mechanism to address REACTS within the NYISO committee structure, specifically the Business Issues Committee. Larry DeWitt, Chairman of the NYISO Business Issues Committee (BIC) reported that there are three standing working groups within the BIC currently – the Market Structures Working Group, Scheduling and Pricing Working Group, and the Reserve Working Group. Mr. DeWitt explained that for the purposes of REACTS, he would suggest raising the subject under one of these existing working groups since it is not customary for new working groups to be formed for new issues in the BIC. As such, a letter was sent to Mr. DeWitt requesting that REACTS be opened as an agenda item within one of these existing working groups. In response, REACTS was adopted as an agenda item in the Market Structures Working Group. At the January 14, 2003 Market Structures Working Group meeting, John Saintcross of NYSERDA and David Lawrence of the NYISO made a presentation regarding REACTS and apprised the participants of the plan for moving forward. The Working Group does not have any action items regarding REACTS at the moment. The NYISO will work with the PSC and NYSERDA and will report back to the Working Group once there is more to report.

Specific Tasks

The purpose of addressing REACTS within the NYISO committee structure is first to build support for the development and rollout of the system. Broad market participant support will be needed for system success. While the interviews completed showed

significant support, it is necessary to bring a wider range of market participants into the discussions. The working group structure should be used to:

- Finalize REACTS system requirements – using the system requirements specified in this document as a starting point, the working group members must develop a final System Requirements Document providing a high-level overview of the system functions, features, and capabilities.
- Finalize REACTS system design – using the system requirements document as a starting point, the working group must prepare a final system design document that outlines the concept of operations, software, hardware, and network architecture design.
- Adopt procedure or method to address data confidentiality needs – the working group must develop or adopt a method or procedure such as the NEPOOL Information Policy used for the NEPOOL Generation Information System to govern how confidential data will be handled for the purposes of REACTS.
- Develop and issue RFP for REACTS system and select contractor - the working group must prepare and issue an RFP to secure a contractor to develop and administer REACTS. Once issued, the working group must also engage in the contractor selection process, interview potential contractors, and contract with the selected party.
- Develop REACTS operating rules – the working group must develop a set of detailed operating rules by which the REACTS will operate and be administered.
- Develop cost allocation methodology – the working group must develop a cost allocation methodology that specifies how they system will be funded and by whom.

Participation of Regulators and Other Interested Parties

It is imperative that New York regulators and other interested parties play a role in each of the above-listed activities along with the New York market participants.

NYISO AS REACTS CUSTOMER

APX strongly recommends that the NYISO take the lead responsibility for REACTS acting as the customer. The REACTS customer must be the NYISO for several reasons. First, the NYISO has the unique ability to act as the billing agent for the NYISO market participants. Second, the REACTS database will use data from the NYISO Market Information System as the basis for certificate and obligation creation. As such, APX will have to work very closely with the NYISO to obtain and manage this data. Third, the NYISO committee structure is the appropriate venue to address REACTS development as it is proposed to be an NYISO-wide system and input must be sought from the full participant base. Finally, NYISO staff support for REACTS is a critical factor for REACTS success. Outlined below are four specific roles or tasks that the NYISO must be willing to take on as the customer in order to deploy the REACTS system.

NYISO Project Manager

As the customer, APX recommends that the NYISO appoint a project manager that will serve as the principal point of contact for all technical, operational, business, and contract matters related to REACTS. The project manager will provide the key channel of communications between APX and NYISO for all REACTS activity. The key functions of the NYISO project manager will include:

- Facilitate and coordinate the participation of NYISO participants in the establishment of REACTS functional and performance requirements during the project definition phase
- Support and participate in the Market Structures Working Group activity related to REACTS
- Help answer questions regarding NYISO business operations, market rules, and system operational performance
- Ensure timely responses to requests for information
- Review and provide timely comments on all project documentation including Project Plan, Detailed Statement of Work, System Requirements Document, System Design Document, Acceptance Test Plan and Procedures, training materials, and project status reports.

Development of Interface Control Document

NYISO staff support is also critical to the development of the Interface Control Document. The contractor building REACTS will require access to an NYISO engineering team to develop an Interface Control Document containing the following information: data availability, data access, data format (header, field, trailer formats), and data contained in each extract file required by the REACTS operating rules. For the GIS, the ISO New England system operator provides access to its Market Settlement System (MSS) data extracts via the File Transfer Protocol (FTP). The system operator's FTP server is "online;" the MSS extracts are available over the public Internet.

Agreement to Act as Billing Agent

APX recommends that the NYISO take on the responsibility for allocating the system costs to its market participants, collecting those fees, and providing the contractor with payment for its services. The rationale for the NYISO operating as the billing agent for REACTS is based on the established relationships that it has with the New York market participants with regards to the settlement processes.

Provision of Legal Assistance

In the process of drafting the operating rules for REACTS, the NYISO will need to provide legal assistance to its market participants. Legal assistance for market participants may also be required in the development of the cost allocation and in other development and deployment issues.

AFFECT CHANGE TO CURRENT PSC DISCLOSURE RULES TO ALLOW FOR UNBUNDLING OF ENERGY AND ATTRIBUTES

In order to implement REACTS, the New York Public Service Commission must revise the current disclosure rules to allow for the separability of energy and the associated environmental attributes. The Opinion and Order Adopting Environmental Disclosure Requirements and Establishing a Tracking Mechanism, adopted by the New York Public

Service Commission on December 15, 1998, adopts a contract-path tracking methodology to provide the necessary information to support environmental disclosure requirements. The verification methodology described in the regulation tracks energy purchases through bilateral contracts back to the source of electric generation. Because of this specification that the energy and attributes remain bundled, this language must be changed in order to implement REACTS to support the state's disclosure requirements.

On February 19, 2003, the NY PSC instituted a proceeding to develop and implement a retail renewable portfolio standard. In its Order Instituting Rulemaking, the Commission outlined several threshold issues that will be addressed as part of the proceeding. Among the issues outlined were:

- The appropriateness of a “renewable attributes trading” system, and the components of any such system that might be developed.
- The impact, if any, on the Commission's Environmental Disclosure Label Program, and any modifications that might be needed and appropriate for that program.
- The appropriate means to monitor progress towards meeting the goal and to ensure the results, including possible rewards and incentives.
- The best methods for retail suppliers to procure renewable resources (e.g., construction and ownership versus purchases).

Each of these threshold issues listed above is related to the REACTS and its deployment in New York. Because the REACTS will be addressed as part of the RPS proceeding, it will not be necessary to petition the PSC to change the disclosure regulations in a separate proceeding.

FORM REACTS/GIS WORKING GROUP TO ADDRESS COMPATIBILITY ISSUES

As discussed in Section 3, it is imperative that the New York system be compatible with systems in other control areas and facilitate and support the sale of certificates across borders. In order to ensure compatibility between REACTS and the New England Generation Information System, APX recommends the formation of a REACTS/GIS

working group to address compatibility issues. The key compatibility design issues for the REACTS/GIS Working Group will be in certificate creation, certificate fields, trading periods, and import/export rules. Compatibility between these two systems is feasible but will require compromise from both sides.

This working group will also be responsible for the specification of how REACTS and GIS will interface with one another. An interface document will need to be developed to outline how interaction between the two systems will occur.

OTHER REGULATORY AND LEGISLATIVE ISSUES

Other regulatory issues, if addressed, would increase the viability of a REACTS implementation. For instance, the New York Department of Environmental Conservation (DEC) must undergo a rulemaking if it adopts a REACTS as a means to implement the allocation methodology for its NO_x Budget Trading Program (Part 204) and Acid Deposition Reduction Program (Parts 237 and 238). DEC has stated that it is prepared to implement these rules changes in 2003. DEC sees specific benefits for its programs based on the implementation of a REACTS in New York and for undergoing a rulemaking. A REACTS could offer it more timely and complete data to support its NO_x trading system, non-ozone season trading program, and acid rain program.

In addition, the treatment of qualifying facilities must be addressed. The main question involves whether the PURPA contracts entitle the buyer to the attributes or whether the generator maintains title to the certificates. One stakeholder strongly suggested that New York resolve this issue prior to implementing a REACTS.

It was also noted that a successful renewable energy market and REACTS program will require that rules be developed enabling the implementation of Executive Order 111. A key to the success of Executive Order 111 will be the designation of the central procurement agent that does not currently exist. NYSERDA is currently working with the Office of General Services to prepare a procurement plan and with the Division of Budget to work out billing and funding issues.

Standard Market Design (SMD) and Regional Transmission Organization (RTO) proceedings at FERC may also affect the development of a REACTS for New York. A few stakeholders, including the New York Public Service Commission, expressed concern

about moving forward with a REACTS without a clear idea of what impacts the RTO and Standard Market Design proceedings may have on the system's implementation. There is concern that if the State moves ahead with a REACTS now, the State may have to implement an alternative system if required by SMD or any RTO that is implemented.

Based on the direction from FERC and from NARUC supporting the New England GIS model for certificates-based systems, upon which the REACTS design is largely based, APX does not foresee any roadblocks to proceeding with a REACTS now, especially since FERC has recognized the NEPOOL GIS as a best practice.

APX does not feel there are any threats to moving ahead with the development of a REACTS in New York prior to implementing SMD or an RTO for the Northeast. APX does not expect that any direction coming from FERC rulemakings or proceedings regarding RTO or SMD will cause any substantive or significant changes to the preferred model for a certificates-based system. If any system design changes were required, the system's open architecture allows enough flexibility to accommodate these required changes. APX does not feel that RTO or SMD activity will impede system development, and therefore, the REACTS could be implemented as early as next spring based on the schedule outlined below.

TIMELINE FOR DEPLOYMENT

APX estimates that it will take six months to develop the system once work begins. However, as described above, there are several steps that must take place prior to the start of the system development work. These steps and a timeline are presented below in Table 5.

Table 5: Timeline for Deployment

Activity	Timeline
Formation of NYISO working group structure	4 th Quarter 2002
NYISO Commitment of Staff and Resources	1 st Quarter 2003
Formation of REACTS/GIS working group	1 st Quarter 2003
Key system components finalized and RFP for system development issued	2 nd Quarter 2003
PSC Allows Unbundling	3 rd Quarter 2003
Contractor Selection	4 th Quarter 2003
Project Start	4 th Quarter 2003
REACTS Implementation	2 nd Quarter 2004

APPENDIX A: STAKEHOLDER ORGANIZATIONS INTERVIEWED IN REACTS STUDY

American Wind Energy Association
Community Energy
Con Ed Solutions
Constellation New Energy
Constellation Power Source
E Cubed
Enxco
Exelon Power Team
FPL Energy Power Marketing
Green Mountain Energy Company
Independent Power Producers of New York
Long Island Power Authority
Massachusetts Division of Energy Resources
NatSource
Natural Resources Defense Council
New York Consumer Protection Board
New York Department of Environmental Conservation
New York Independent System Operator
New York Office of the Attorney General⁹
New York Public Interest Research Group
New York Public Service Commission
New York State Electric and Gas
Niagara Mohawk
Ontario Ministry of Energy
Ontario Power Generation
Pace Energy Project
PG&E National Energy Group
PPL Energy Plus
PSEG Energy Resource and Trade
Sith Energy
Strategic Energy Limited
Strategic Power Management
Union of Concerned Scientists

⁹ The Attorney General's Office did not give an official response, but the report reflects its general comments.