New York Renewable Portfolio Standard Program Evaluation Report

2009 REVIEW

DRAFT REPORT

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EXECUTIVE SUMMARY

This report presents mid-term evaluation results for the New York Renewable Portfolio Standard (RPS) Program. In compliance with the Public Service Commission's (Commission) April 14, 2005 Order[1], this report was prepared by the New York State Energy Research and Development Authority (NYSERDA) in cooperation with Department of Public Service Staff (DPS Staff) using research performed by a team of third-party evaluation contractors. In fulfillment of the terms of the April 2005 Order, NYSERDA is filing this draft report with the Commission for public review and providing two independently prepared evaluation reports[2] in support of the 2009 evaluation. Following the close of the public comment period, a final report including specific recommendations will be submitted by DPS Staff to the Commission for its review and action.

This report presents key findings and recommendations provided by KEMA, Inc. and Summit Blue Consulting, LLC in their role as independent evaluation contractors. Findings are based on the scope and timing of the research conducted by the contractors, and the recommendations provided are not necessarily being advanced by NYSERDA or DPS Staff. The contractors' findings are intended to provide useful input on the RPS Program's progress and market conditions to help inform future program and policy decision making. If deemed worthy of consideration from a programmatic or public policy perspective, such recommendations offered by the evaluation contractors may be appropriate for consideration by the Commission or NYSERDA. Other recommendations may be outside the jurisdiction or authority of the Commission or NYSERDA and, if warranted, would require more broad policy changes in the State. As these are the findings of the independent evaluation contractors, NYSERDA anticipates filing its own comments and recommendations in the proceeding.

Background

By Order issued on September 24, 2004, the Commission adopted a policy designed to help achieve the goal of increasing the percentage of renewable electric energy sold to New York consumers to at least 25% by 2013[3], and authorized a new RPS Program to be administered by NYSERDA to achieve this goal. Based on a comprehensive cost study conducted in 2003, the Commission, in its September 24, 2004 Order (2004 RPS Order), specified an escalating annual collection schedule lasting through 2013 and totaling approximately $741.5 million.[4] At full achievement of the 25% RPS goal, roughly 4,600

[1] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Approving Implementation Plan, Adopting Clarifications, and Modifying Environmental Disclosure Program", issued and effective April 14, 2005.

[2] KEMA, New York Main Tier RPS Impact and Process Evaluation (March 2009) and Summit Blue, New York Renewable Portfolio Standard Market Conditions Assessment (February 2009).

[3] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, Order Regarding Retail Renewable Portfolio Standard, September 24, 2004 (2004 RPS Order).

[4] 2004 RPS Order, Appendix E.

MW of new renewable nameplate capacity[5] would enter service and produce approximately 14 million MWh annually of new renewable energy generation.[6] This 2009 RPS evaluation is presented to help the Commission in assessing the RPS Program's progress toward meeting its goals and objectives, and to provide information and input on how best to continue the State's investment in clean energy.

Evaluation Focus and Approach

Based on Commission Orders and activities that have subsequently impacted the scope and emphasis of the evaluation review for 2009, and NYSERDA's consultation with DPS Staff, a determination was made that the evaluation would focus on:

- Program implementation;
- RPS Program cost effectiveness and benefit/cost analyses;
- RPS Program impacts on the energy system reliability and economic development; and
- Market conditions including impacts of the RPS Program and other factors on the development of wholesale, retail, and voluntary power markets for renewable resources, including steps for transitioning the RPS Program to a market-based system.

Given that the RPS Main Tier is responsible for procurement of 98% of the attributes targeted for the Program, most of the evaluation resources were dedicated to the Main Tier Program.

In February 2008, NYSERDA competitively procured the services of two consulting firms with expertise in the evaluation of renewable energy programs to provide technical and analytical support for documenting the results and impacts of the RPS Program. KEMA, Inc. was selected to conduct program implementation and impact analyses including macroeconomic benefits and benefit/cost analyses. Summit Blue Consulting, LLC was selected to conduct an assessment of market conditions and to identify potential steps toward a transition to a more market-based system.

KEMA and Summit Blue collected and analyzed both primary and secondary data to inform the evaluation. Collectively, more than 90 in-depth interviews were completed with a range of market actors including: renewable energy developers, manufacturers, distributors and installers; financial community representatives; municipalities and citizens' groups; voluntary green power marketers; distribution companies and the New York Independent System Operator (NYISO); as well as trade associations and RPS program administrators in other states. Secondary data collection included official RPS documents; internal program documents provided by NYSERDA; and data obtained from programs in other states.

Program Progress and Key Evaluation Findings

Mid-term Program progress and important findings from the evaluation contractors are summarized below:

[5] 2004 RPS Order, Appendix D, Table 7.

[6] Includes contributions by the Long Island Power Authority.

- As of January 2009, more than 1,164 MW (28 projects) of renewable energy capacity are now under contract as a result of three Main Tier procurements. Of this, more than 1,100 MW of capacity are installed and operating at 23 project sites. These facilities are expected to produce 2.9 million MWh annually; or the equivalent of about 29% of NYSERDA's RPS obligation to procure 9.8 million MWh by 2013. NYSERDA has committed $509.5 million of the Main Tier budget, leaving a balance of over $110 million for use in developing additional renewable generation resources.

- As of January 2009, in the Customer Sited Tier (CST) program, over 2 MW of capacity are installed, 6 MW of capacity are under contract, and contract applications for 14 MW of project capacity have been accepted and wait contracting. Total expected energy production associated with this project capacity exceeds 73,000 MWh. This program activity accounts for approximately $77 million out of an authorized budget of approximately $88 million.[7]

- The evaluation concluded that the RPS Program is being administered efficiently and with due diligence concerning ratepayer funding risks. Nevertheless, currently approved funding levels are inadequate to meet the 2013 targets.

- The RPS Program has cost-effectively achieved new renewable energy capacity in New York. The Main Tier is highly cost-effective with a program administrative benefit-cost ratio exceeding 6 to 1. The specified benefits include investment and wages in the New York economy, electricity price suppression at the wholesale level, and environmental benefits in the form of avoided air pollution emissions. The specified costs include NYSERDA's cost to administer the program and the payments to developers under contract for RPS Program attributes.

- KEMA has reported that, should all of the renewable energy facilities selected in the three Main Tier solicitations enter commercial operation, the total economic benefits impact to New York is estimated to be about $4.2 billion over the average 20 year life of the facilities.[8] Most of these economic benefits are associated with wind projects. The evaluator's independent credibility assessment of developers' self-reported economic data concluded that, with a few minor exceptions, the data reported are reliable and could serve as a basis for this and other analyses of the economic benefits that can be claimed from renewable energy development.

- Main Tier renewable resources are suppressing wholesale electricity prices and, more modestly, natural gas prices. A regression analysis estimated electricity price suppression statewide in 2010 at $2/MWh.

- The RPS Program has played a critical role in advancing renewable energy markets in New York, highly influencing the development of wind and biomass in the State. Providing long-term contracts to Main Tier projects is a key factor affecting the success of the RPS Program. CST incentives are

[7] Excludes about $4 million in program funds set aside for field system performance monitoring and verification.

[8] The Impact and Process Evaluation Report does not incorporate the recent cancellations of three wind projects representing 174 MW in the RPS Main Tier Program.

also significantly increasing market activity for solar photovoltaics and anaerobic digesters. Installers across CST technologies reported that less than 10% of the current volume would have been installed in the absence of the RPS CST incentives. The State's investment in development of the renewable energy industry through many of NYSERDA's complementary Research & Development programs has helped advance market growth.

- The wind potential in New York is being developed at a pace exceeding other states with more abundant wind resources, indicating in part, the Program's positive influence on wind development.

- Program costs, in particular the prices paid for RPS Attributes[9], are reasonable and lower than those in most other states with an RPS program. However, the bid prices for RPS Attributes are substantial enough to indicate that they are a significant component of the projects' financing mix.

- In part, lower RPS Attribute prices result from having all technologies compete against each other in the Main Tier solicitation process. Using technology-specific tiers or allocations could attract more resource diversity but may come at the expense of paying higher prices for RPS Attributes, because less efficient facilities would advance their competitive position in a smaller bidder pool.

- The Commission chose a central procurement model that maximizes early ventures and ease of procurement, while laying the basis for a certificates market.[10] By engaging in attribute-only transactions, NYSERDA's intervention in the market is minimal.

- If the economic benefits evaluation criteria in the Main Tier RFP process were weighted higher than the current 30%, it could result in more Main Tier contracts to biomass facilities under existing bidding strategies.

- The current central procurement structure using an RFP approach is working well to select projects that satisfy the Program's objectives of providing least-cost renewable energy while promoting economic development in the State. NYSERDA as the administrator of the RPS is well-positioned (being a state entity) to take into consideration the economic benefits of new renewable projects in the award selection process. Given that renewable energy development is costly and lengthy, the central procurement approach also likely saves developers time and money by avoiding multiple competitive markets and customized requirements under a load-serving entity approach.

[9] One "RPS Attribute" is created by the production and delivery into New York's power system of one MWh of electricity by an eligible RPS resource. RPS Attributes are not to be confused with tradable renewable energy credits or RECs in other markets. This report attempts to clarify that distinction; however, NYSERDA's evaluation contractors used the term "RECs" or "renewable energy credits" interchangeably throughout their reports to mean an RPS Attribute. They also used the term to refer to "renewable energy credit" market transactions in other states.

[10] 2004 RPS Order, p. 49.

Opportunities for Improvement

Despite the Program's successes to date, both evaluation contractors identified certain elements of the Main Tier RPS Program and the market for renewable resources that limit the potential for future market growth. Programmatic limitations are related to: uncertainty in terms of targets and funding; market liquidity and transparency; and limited resource diversity. Market growth is also limited by barriers to development that are not directly related to the RPS Program and are outside of NYSERDA's control, including concern over the capability of the existing power grid to accommodate new renewable generation. Furthermore, some limitations highlighted by the evaluation contractors are outside of the Commission's jurisdiction. Based on their interviews with market actors, the contractors presented the following primary limitations of the Main Tier RPS Program with respect to building renewable energy markets:[11]

- The lack of regularly scheduled and known RPS competitive solicitations, and that the Program does not disclose the funding available for each procurement, send an uncertain market signal that impedes the development of new renewable capacity.

- Since the RPS Program has operated with infrequent solicitations and NYSERDA is the primary buyer of attributes for RPS goal attainment in the State, this constrains liquidity in the marketplace for renewable energy attributes. The lack of an attribute tracking system further limits liquidity as the State's current environmental accounting practice functions with a lag and is inconsistent with systems in place in neighboring regions.[12]

- To improve market liquidity, New York should formally recognize tradable RECs as a means of compliance with the RPS Program.

- Uncertainty and inevitable changes in equipment costs, electricity market pricing, and other factors may increase or decrease a project's revenue requirements. Lack of programmatic flexibility to use available funding in response to changing market conditions is a significant barrier to ensuring that New York meets its RPS targets.

- To the extent renewable resources' ability to serve load is limited by the physical limitations of the transmission system, policy goals will not be satisfied. In order to accommodate increased renewable generation, the State should consider alternatives for increasing transmission capability. To address this, the State should encourage the transfer of accurate and timely market knowledge from the NYISO to the renewable development community so expectations on delivery are realistic. The State

[11] The program design preferences expressed by the project development community through the evaluation interviews are not necessarily compatible with current procurement mechanisms, many of which have been deliberately employed in an effort to minimize costs to the ratepayer.

[12] New York does not convert RPS attributes into tradable "certificates" as is done for "renewable energy credits" in other states. The lack of a tracking system is secondary to this policy.

should investigate the current capabilities of the transmission system so that new renewable generation does not displace other renewable generation counted on to achieve aggressive program goals.

- New York's Main Tier RPS is designed such that all technologies compete with one another for the same funds. This structure ensures that the State secures the highest volume of RPS Attributes at the lowest cost; however, technologies other than land-based wind and hydro upgrade projects have, to date, experienced limited opportunities for success under this model. To the extent that the State seeks to achieve renewable resources diversity through the RPS Program, and achieve it at a more aggressive pace[13], this is a notable program limitation. However, resource diversity would come at a higher cost.

[13] With time, as more attractive wind resources become harder to find and develop, and as competition to deliver energy from these resource increases, non land based wind and hydro will grow in terms of price competitiveness. This is consistent with the analysis of resource costs as conducted for the 2008 RPS Cost Study Update.

1 INTRODUCTION

Historically, New York met as much as 32% of its electric power requirements through hydroelectric and other renewable resources. For several reasons, by 2001, the contribution from renewable resources had fallen to below 20%. The 2002 New York State Energy Plan recognized that the addition of electricity generated from renewable resources would help achieve fuel diversity, energy security, economic development, environmental benefits, and would help foster greater retail competition and customer choice.[14] To advance the deployment of renewable-based technologies in New York, the Energy Plan recommended that NYSERDA examine and report on the feasibility of establishing a Renewable Portfolio Standard (RPS).[15]

Establishment of the New York RPS

On September 24, 2004, following an extensive stakeholder process, the Commission issued an Order adopting an RPS (2004 RPS Order), with a goal of increasing the proportion of renewable energy used by New York consumers from the then-current 19.3% (baseline resources) to at least 25% by the end of 2013.[16] In the 2004 RPS Order, the Commission expected that voluntary market retail customers would contribute at least 1% toward the 25% goal, and State Agencies' purchases under Executive Order 111 (EO 111) and contributions of the Long Island Power Authority would also help attain the goal. As part of the 2004 RPS Order, the Commission designated NYSERDA as the central procurement administrator for the new RPS Program, and recognized that NYSERDA procurements would be necessary to realize the majority of the remainder of the goal.

The 2004 RPS Order directed the major investor-owned utilities to collect funds from ratepayers, in the amount of $741.5 million through 2013, with such funds to be administered by NYSERDA in support of the RPS Program implementation. The Commission recognized that NYSERDA would be entering into long-term contracts[17] requiring payments past 2013 but deferred specifying an amount of collections to cover those payments above the currently specified $741.5 million until the program was underway and program costs became better known. The estimate of costs to acquire resources through 2013 in the 2003 cost study excluded costs associated with: (a) program administration, (b) NYS public authority fees, (c) maintenance tier contracts, and (d) acquisition costs associated with NYSERDA contracts extending beyond 2013.

[14] New York State Energy Planning Board, New York State Energy Plan and Final Environmental Impact Statement, June 2002, Section 3.3 Renewable Energy Assessment, pp 3-40 – 3-79.

[15] State Energy Plan, page I-39.

[16] 2004 RPS Order.

[17] This applies to the Main Tier Program described in the next section.

NYSERDA, as the central procurement administrator, does not procure electricity.[18] Rather, NYSERDA pays production incentives for the environmental attributes ("RPS Attributes" or "attributes") created with the generation of electricity by eligible renewable resources under long-term contracts.[19] These RPS Attributes are defined to include any and all reductions in harmful pollutants and emissions, such as carbon dioxide and oxides of sulfur and nitrogen. In exchange for receiving production incentives, the renewable generator provides NYSERDA with all rights and/or claims to the RPS Attributes associated with each MWh of renewable electricity generated and delivered to the New York Control Area that are under an RPS contract. One RPS Attribute is created by the production and delivery into New York's power system of one MWh of electricity by an eligible RPS resource. By acquiring the RPS Attributes, rather than the associated electricity, the RPS production incentives ensure increasing amounts of renewable electricity will be developed and sold into the State's power system, while minimizing interference with competitive wholesale power markets.

In the 2004 RPS Order, the Commission directed that an RPS Implementation Plan be developed and approved to guide the program through 2013. In advance of this Implementation Plan and in order to help projects take advantage of a federal production tax credit set to expire at the end of 2005, the DPS and NYSERDA developed the first Main Tier procurement on a "fast track." In December 2004, the first Request for Proposals (RFP) was issued to procure the environmental or "green" attributes of new renewable electricity generation. After this "fast track" procurement, the Commission issued an Order Approving an Implementation Plan on April 15, 2005[20] (2005 Implementation Order) specifying implementation parameters for the RPS Program, and requiring a mid-term review of the program in 2009.

RPS Program Tiers and Targets

The 2004 RPS established two tiers of resource types under the RPS Program. The first, or "Main Tier," consists primarily of medium to large-scale electric generation facilities that deliver electrical output into the wholesale power market administered by the New York Independent System Operator (NYISO). The second, or "Customer-Sited Tier," consists of smaller, "behind-the-meter" resources that produce electricity for use on site. Only renewable energy systems installed on or after January 1, 2003 would be eligible to participate, and Customer-Sited Tier resources must be located in New York State. The Main Tier operates through the issuance of periodic competitive solicitations for the purchase of attributes. Eligible Customer-Sited Tier resources are served on a first-come, first-served basis, and are supported through a combination of incentives for the "buy-down" of capital costs and/or energy production.

[18] Thirty-three states currently have RPS polices and federal RPS legislation is under consideration. Among the array of state RPS policies, New York and Illinois' approach are unique in the nation. Most other states have enacted RPS compliance mandates on load-serving entities and/or utilities.

[19] One "RPS Attribute" is created by the production and delivery into New York's power system of one MWh of electricity by an eligible RPS resource. RPS Attributes are not to be confused with tradable renewable energy credits or RECs in other markets.

[20] Case 03-E-0188, Order Approving Implementation Plan, Adopting Clarifications, And Modifying Environmental Disclosure Program, issued and effective April 15, 2005.

Eligible resources and technologies for both the Main and Customer-Sited Tiers are described in the 2004 RPS Order and in subsequent Orders that added anaerobic digesters to the CST and maintenance resources to the Main Tier. The RPS Program includes a process for evaluating and certifying new resources and technologies for eligibility as the program progresses.

The 2004 RPS Order set forth annual renewable energy targets that represent an incremental "glide path" toward achievement of the 2013 goal of having 25% of the electricity consumed in New York come from renewable energy. This Order also designated NYSERDA as the administrator of the RPS Program, and NYSERDA is responsible for managing incentive programs to satisfy both the Main Tier and the Customer-Sited Tier targets. The renewable energy targets for those elements, as well as others, are shown in Table 1-1.

Table 1-1: Cumulative Energy Targets in MWh (as stated in the 2004 RPS Order)

	Main Tier Targets	Customer-Sited Tier Targets	EO 111 Targets	Voluntary Market Targets	Combined Targets
2006	1,121,247	25,259	282,812	228,584	1,657,902
2007	2,326,171	50,488	314,579	457,167	3,148,405
2008	3,549,026	75,685	346,366	685,751	4,656,828
2009	4,767,994	100,855	378,174	914,335	6,161,358
2010	6,012,179	125,988	410,002	1,142,919	7,691,088
2011	7,297,746	151,081	391,857	1,371,502	9,212,186
2012	8,556,710	176,123	373,712	1,600,086	10,706,631
2013	9,854,038	201,130	355,568	1,828,670	12,239,406

Note: Not shown are energy targets associated with any renewable energy development or purchases by the Long Island Power Authority (LIPA) and the New York Power Authority (NYPA).

In its June 28, 2006 CST Order[21], the Commission established new capacity and energy targets for the Customer-Sited Tier through 2009, authorized incentive funding of $45 million, and directed the development of a Customer-Sited Tier Operating Plan ("CST Operating Plan") for the solicitation of customer-sited renewable resources. Table 1-2 shows new capacity and generation targets for each CST resource category, based on the $45 million budget. The CST Operating Plan[22] reflected experience gained by NYSERDA through implementation of similar programs funded by the System Benefits

[21] Case 03-E-0188, Order on Customer-Sited Tier Implementation, June 28, 2006.

[22] The CST Operating Plan was released in February 2007 and can be found at http://www.dps.state.ny.us/CST_OP_02-12-07.pdf.

Charge (SBC) from 1998 through 2006. Table 1-2 below show the targets and funding for the CST Program pursuant to the CST Operating Plan.

Table 1-2: Customer-Sited Tier Expected Program Results by Resource Category 2007-2009*

Resource Category	Target Capacity in MW by 12/31/09	Target Annual Generation in MWh by 12/31/09	Authorized Funding (million $)
Solar Photovoltaics	3.5	4,533	13.8
Fuel Cells	2.7	18,700	11.2
Anaerobic Digester Biogas	3.7	25,700	11.0
Small Wind	1.8	3,945	4.5
Discretionary **			4.5
Program Total	11.7	52,878	45.0

* Pursuant to CST Operating Plan.

** Discretionary Funds may be used by NYSERDA to supplement allocated funding for: (1) resource categories for which demand clearly exceeds their allocations; (2) eligible technologies that would benefit from an increased allocation; and (3) for new technologies that the Commission determines to be eligible for CST support.

In establishing the RPS goal of 25%, the Commission recognized that 19.3% of retail electric sales in New York was being generated by renewable resources that existed prior to the RPS being adopted in 2004 (baseline resources). For the purpose of ensuring the continuing operation of these valuable existing resources, the Commission established an additional Maintenance Resource Program. To be eligible to receive RPS Program funding as a Maintenance Resource, an in-state generator must demonstrate financial hardship through a formal request to the Commission. The Commission then determines the existence and degree of hardship, and makes a determination as to the eligibility of the facility for Maintenance Resource treatment. The Commission may or may not grant Maintenance Resource status. If granted, the Commission determines the form and magnitude of support to be offered. As directed by PSC Orders, NYSERDA has contracts with two biomass facilities in New York as Maintenance Resources, the Lyonsdale plant in Lyons Falls and the Boralex plant in Chateaugay.

Market and Policy Context

Market conditions in 2009 are starkly different from those in 2004 when the RPS Program was designed. Current economic conditions have left many renewable energy developers struggling to find the necessary capital to complete projects. This constraint in the capital markets is responsible for the recent cancellation of three Main Tier wind projects, representing a reduction of 174 MW of anticipated new capacity. Moreover, prospective developers are scaling back their plans to grow or expand, potentially diminishing the number or size of projects able to bid into future RPS solicitations. Despite this financial market uncertainty, renewable energy provides job creation and other macroeconomic benefits that may help the economic recovery of the State.

In February 2008, then Lieutenant Governor Paterson released the First Report of the Renewable Energy Task Force on the current state of the renewable energy industry in New York and the potential for expansion of the renewable energy industry going forward. The Task Force Report[23] recommended that the Commission examine the possibility of increasing the RPS goal to 30% by 2015, and increasing the PV program target to 100 MW. Also in 2008, the Commission adopted an Energy Efficiency Portfolio Standard[24] and is now commencing programs to reduce the State's electricity use to 15% below forecast levels by 2015. Governor Paterson's 2009 State of the State message to the New York State Legislature pledged to meet 45% of New York's electricity needs through these expanded energy efficiency and clean renewable energy goals by 2015. The 2009 State Energy Plan[25] is expected to offer recommendations to advance the Governor's "45 by 15" goals and strategies to sustain the growth of New York's clean energy economy. Emerging State and federal policies and programs, including the Regional Greenhouse Gas Initiative and the federal "Economic Stimulus" offer potential additional funding mechanisms to achieve these new goals.

Program Evaluation

The 2005 Implementation Order required NYSERDA to conduct two evaluation reviews; one mid-course review in 2009 and one at the conclusion of the program in 2013, and specified the following elements to be included in a formal review:

- Overview of program status;
- Assessment of program's success in achieving program goals and objectives, including consideration of what renewable resource might have been added to the electric system with the RPS Program;
- Progress of the New York RPS Program as compared with the progress of programs in other states;
- Assessment of the impact on the RPS Program goals as a consequence of achievements in the voluntary green market;
- Complementary role of future demand-side management and energy efficiency initiatives to reduce statewide electric load;
- Estimated impact of reduced load on the amount of new renewable generation necessary to meet RPS goals and the amount of funding required for the program;

[23] Clean, Secure Energy and Economic Growth: A Commitment to Renewable Energy and Enhanced Energy Independence," The First Report of the Renewable Energy Task Force, February 2008.

[24] Case 07-M-0548 - Order Establishing Energy Efficiency Portfolio Standard and Approving Programs, June 23, 2008.

[25] Executive Order No 2: Establishing A State Energy Planning Board And Authorizing The Creation And Implementation Of A State Energy Plan, April 9, 2008.

- To the extent possible, assessment of program costs and benefits, including identification of cost/benefit ratios as appropriate, impacts of renewable resources developed through the RPS on the environment, energy security, economic development, and electric system reliability;

- Macroeconomic benefits accruing to New York as a result of implementation of the RPS Program, including the extent to which the RPS Program has advanced renewable resource technologies, attracted jobs and renewable resource generators, manufacturers, and installers to New York;

- Interaction of the RPS Program with Regional Greenhouse Gas Initiative, as the latter is implemented;

- Possible modifications to the list of eligible resources, if deemed appropriate;

- Possible modifications to the delivery requirement, if deemed appropriate;

- Steps for transitioning the RPS Program to a market-based system;

- Options for developing a regionally compatible certificate tracking and trading system;

- Input from stakeholders; and

- Additional program recommendations for improving the RPS Program.

Section 2 of this report describes the evaluation approach in more detail. Intervening Commission Orders and other program activities have further refined the Program's implementation, and several issues considered important for the 2009 review have been modified or resolved. The intervening orders and activities are discussed in Section 3 of this report in order to provide additional context for the program progress and evaluation findings presented in Sections 4 and 5, respectively.

2 2009 EVALUATION REVIEW APPROACH

This evaluation report has been prepared to comply with the given directives, to help the Commission assess the Program's contributions, and to shed light on how best to continue the State's public investment in the achievement of the original and recommended RPS Program goals. This report was prepared by NYSERDA using findings from the two reports by independent evaluation contractors.

Beginning in Fall 2007 and through early 2008, NYSERDA and DPS Staff engaged in a series of meetings to discuss the scope of the 2009 RPS Program evaluation. Based on these discussions and, in light of a series of intervening Orders and activities, the scope of the evaluation was focused on the following overarching issues:

- RPS Program implementation;
- RPS Program cost effectiveness and benefit/cost analyses;
- RPS Program impacts on the energy system reliability and economic development; and
- Market conditions including impacts of the RPS Program and other factors on the development of wholesale, retail, and voluntary power markets for renewable resources.

In February 2008, NYSERDA procured, through a competitive solicitation, the services of two consultant firms with expertise in the evaluation of renewable energy programs to provide technical and analytical support for assessing the results and impacts of the RPS Program.[26] KEMA, Inc. was selected to conduct program implementation and impact analyses including macroeconomic benefits and benefit/cost analyses. Summit Blue Consulting, LLC was selected to conduct an assessment of the market conditions, including steps to transition to a more market-based system.

RPS Program Objectives

The 2004 RPS Order specified RPS Program Objectives that were used to guide the development of the RPS Program and focus of the 2009 evaluation review. The Program Objectives are listed below as they appear in the 2004 RPS Order, along with the evaluation contractor report in which the progress toward that objective was most closely considered:

- Renewable Resources: institute an RPS to increase New York State's supply of renewable resources with the ultimate aim of establishing a viable, self-sustaining competitive renewable generation market; (Summit Blue, Market Conditions Assessment)

[26] Request for Proposals (RFP) 1133 (http://www.nyserda.org/funding/1133rfp.pdf) offered up to $500,000 for contractor support for the 2009 RPS Evaluation. The evaluation consultants were selected by a Technical Evaluation Panel (TEP) comprised of three individuals internal to NYSERDA and four external members with subject matter expertise. A DPS staff member participated on the TEP.

- Generation Diversity for Security and Independence: diversify the generation resource mix of energy retailed in New York State to improve energy security and independence, while ensuring protection of system reliability; (KEMA, Impact and Process Evaluation)

- Economic Benefits: develop renewable resources and advance renewable resource technologies in, and attract renewable resource generators, manufacturers, and installers to New York State; (Summit Blue, Market Conditions Assessment)

- New York's Environment: improve New York's environment by reducing air emissions, including greenhouse gas emissions, and other adverse environmental impacts on New York State, including upon underserved communities, of electricity generation; (KEMA, Impact and Process Evaluation)

- Equity and Economic Efficiency: develop an economically efficient RPS requirement that minimizes adverse impact on energy costs, allocates costs equitably among ratepayers, and affords opportunities for recovery of utility investment; (KEMA, Impact and Process Evaluation)

- Administrative Fairness and Efficiency: develop an RPS that is administratively transparent, efficient, and verifiable; (KEMA, Impact and Process Evaluation)

- Competitive Neutrality: develop an RPS compatible with competition in energy markets in New York State. (Summit Blue, Market Conditions Assessment).

Evaluation Parameters

Pursuant to the 2004 RPS Order, the Main Tier is responsible for procurement of 98% of the attributes targeted for the RPS Program; therefore, NYSERDA and DPS Staff agreed that most of the evaluation resources would be dedicated to the Main Tier program. It was also agreed that the 2009 evaluation would examine program results from program inception through June 2008.

Assignment of 2009 Review Elements

The following review elements, as set forth in the 2005 Implementation Order, were assigned to the evaluation contractors and are addressed in their evaluation reports as listed below. While a specific section of each evaluation report is cited herein, information pertaining to the review elements may also be addressed generally elsewhere in the evaluation contractors' reports.

Impact and Process Evaluation Report (KEMA, Inc.)

- Overview of program achievements (Section 4)
- Assessment of success in achieving program goals and objectives (Section 4)
- Program costs and benefits, including appropriate cost/benefit ratios (Section 5)
- Suggested modifications to the list of eligible resources, if deemed appropriate (Section 6)
- Overview of program status (Section 4)
- To the extent possible, assessment of program costs and benefits, including identification of cost/benefit ratios as appropriate, impacts of renewable resources developed through the RPS on

environment, energy security, economic development, and electric system reliability (Section 5)

- Macroeconomic benefits accruing to New York as a result of the RPS, including the extent to which the RPS has advanced renewable resource technologies, attracted jobs and renewable resource generators, manufacturers, and installers to New York. (Section5, Appendix A, see also Summit Blue Market Conditions Assessment, Section 7)

Market Conditions Assessment Report (Summit Blue Consulting, LLC)

- Appropriateness of continuing the delivery requirement (Section 4)
- Assessment of program's success in achieving program goals and objectives in terms of renewable resource that might have been added to the electric system with the RPS Program (Section 4)
- Progress of the New York RPS Program as compared with the progress of programs in other states (Sections 4 and 5)
- Assessment of the impact on the RPS Program goals as a consequence of achievements in the voluntary green market (Section 5 and 8)
- Interaction of the RPS Program with Regional Greenhouse Gas Initiative, as the latter is implemented (Section 4 and Appendix E-1)
- Possible modification to the delivery requirement, if deemed appropriate (Section 4)
- Steps for Transitioning the RPS Program to a market-based system (including ways to develop the voluntary market in the interim) (Sections 4, 5, 6 and 8)
- Options for developing a regionally compatible certificate tracking and trading system (Sections 4 and 8)

RPS Cost Study Update Report

Additionally, the following review elements were determined to be best analyzed in a separate, independently prepared RPS Cost Study Update, which was completed in 2008[27]:

- Complementary role of future demand-side management and energy efficiency initiatives to reduce statewide electric load
- Estimated impact of reduced load on the amount of new renewable generation necessary to meet RPS Program goals and the amount of funding required to achieve program targets.

The RPS Cost Study Update was commissioned by NYSERDA to estimate the costs to achieve the balance of the targets remaining after three Main Tier procurements and implementation of the CST Operating Plan. The Cost Study was provided to the Commission in November 2008 pursuant to a rule-making procedure discussed in more detail in Section 3.

[27] See RPS Cost Study Update, La Capra Associates & Sustainable Energy Advantage, LLC. March 18, 2008, submitted to the Commission for consideration in response to two Notices of Rulemaking: 03-E-0188SA18 and 03-E-0188SA19, published in the New York State Register on October 1, 2008.

2008 State Register Notices

On October 1, 2008, the PSC issued two notices in the State Register[28] seeking comments on new goals for solar photovoltaics and other on-peak resources in high cost load pocket areas, and new goals for the RPS Main Tier based on updated load forecasts with associated ratepayer collections reauthorization. Since KEMA and Summit Blue were asked to provide analyses deemed necessary to address any additional emerging policy issues and program needs, including analytical support for program changes that may be proposed, the evaluation contractors provided "accelerated" evaluation reports (labeled Exhibits B, C, and D below) to support NYSERDA's comments in these proceedings.

- Exhibit A; RPS Cost Study Update 2008 – LaCapra/Sustainable Energy Advantage

- Exhibit B: Analysis of the Renewable Portfolio Standard's Influence on Large-Scale Renewable Energy Project Development in New York (aka Attribution) – Summit Blue Consulting, LLC

- Exhibit C: Renewable Energy Credit Prices – the Market Signal - Summit Blue Consulting, LLC

- Exhibit D: Main Tier Economic Benefits Report - KEMA, Inc.

The accelerated contractor reports are part of the 2009 evaluation review. Exhibit B is discussed in Section 4.2.4, and Exhibit C is in Section 4.3 of the Summit Blue Market Conditions Assessment Report. Exhibit D is found in Appendix A of the KEMA Impact and Process Evaluation Report.

Data Sources

Both primary and secondary data collection and analyses were conducted. Evaluation contractors consulted official documents listed for Case 03-E-0188 on the DPS Web site, and NYSERDA provided both official and internal program documents. For the Main Tier, data were provided as requested, including developers' bid proposals and the scoring results of three Main Tier solicitations (RFPs 916, 1037 and 1168). For the Customer-Sited Tier, data summarizing the status of projects by technology were provided by NYSERDA. Data obtained from programs in other states, such as benefit/cost analysis approaches and available incentives, as well as trade association data on renewable energy development activity, informed the market conditions assessment.

Primary data collection activities were closely coordinated by the evaluation contractors. The overarching goals for primary data collection activities were to:

- Gather a diverse set of perspectives on the program and the market;
- Learn from the experiences of actual program and market participants;
- Leverage existing data sources; and

[28] See Notices of Rulemaking, No.03-E-0188SA18 and No.03-0188A19, published in the New York State Register on October 1, 2008.

- Conduct effective, efficient communications with program and market participants.[29]

The evaluation contractors jointly developed stakeholder interview guides and conducted in-depth telephone interviews. Table 2-1 provides a summary of the stakeholder interviews conducted for this report. The interviews focused on program and market participants having an existing or potential relationship with the Main Tier component of the RPS Program or, more broadly, with utility-scale renewable energy development in the State. These participants included wind, biomass, landfill gas and hydropower project developers (both non-participating developers and program participants), the financial/investment community, equipment manufacturers and distributors, green power marketers, Load Serving Entities (LSEs), host communities, citizen groups, NYSERDA program staff, as well as staffs of the New York Independent System Operator, the Long Island Power Authority, and other state entities active in renewable energy. Interviews were also conducted in other leading or neighboring RPS states to facilitate comparison to the New York RPS Program, with an emphasis on large-scale renewable energy development. For each of the technologies in the Customer-Sited Tier, NYSERDA's project managers and installers were also interviewed.

In-depth interviews consisted of questions covering a diverse set of topics related to program design and implementation, project finance, key market drivers, changes in market conditions, barriers to project development, and market experience in other states. The interview guides used for the assessment are appended to the contractors' reports.

[29] New York Renewable Portfolio Standard Market Conditions Assessment, Summit Blue Consulting, LLC, February 19, 2009.

Table 2-1: Summary of Surveys and Interviews Conducted by Summit Blue and KEMA

Market Actor	Targeted Completions	Actual Completions	Percent Complete	Comments on Completed Interviews
Participating developers	21	18	86%	Ten winning bidders and eight non-winning bidders
Non-participating developers	6	9	150%	Three onshore wind, two offshore wind, two biomass, one landfill gas, one tidal power
Representatives from the financial community	4	4	100%	One debt provider, two equity providers, one other
Equipment manufacturers and distributors	7	7	100%	Four wind, three solar
RPS administrators in other states	5	4	80%	California, Massachusetts, New Jersey, Pennsylvania
Installers of CST technologies	7	7	100%	Two ADG, two solar, two wind, one fuel cell
Voluntary green power marketers	7	7	100%	N/A
Distribution companies and NYISO	8	8	100%	One representative from each major utility, and the NYISO
NYSERDA program staff	10	10	100%	RPS staff and project managers of manufacturer industry incentives
Representatives from municipalities hosting renewable energy projects, and citizen groups	9	11	122%	Five municipal representatives, one landowner, five citizen groups
Trade associations	5	6	120%	N/A
Total	89	92	106%	N/A

Source: Summit Blue, Market Conditions Assessment, page 3-2. KEMA was involved in a subset of the interviews.

3 INTERVENING ORDERS AND ACTIVITIES

Some issues specified in the 2005 RPS Implementation Order for analysis and evaluation review in 2009 were addressed or superseded, fully or partially, in a series of Commission Orders and through other activities between 2005 and 2008, thereby modifying, to some extent, the scope and emphasis of the 2009 evaluation review. This section is intended to provide context on the Orders, reports and other activities that affected the scope or direction of the 2009 evaluation review. The section is organized according to original evaluation review elements. A list of Orders and activities is provided, for reference, at the end of this Section (Table 3-2).

Modifications to the Eligibility List

The Order issued on October 31, 2005[30] provided for the eligibility and participation of maintenance resources, *i.e.*, pre-existing facilities included in the baseline that are in danger of ceasing operations because of financial difficulties. The Commission clarified that projected costs for "maintenance resources" should be based on forward operating costs and new capital expenditures, not sunk costs, and that specific relief would be given on a case-specific basis. The Order issued on November 2, 2005[31] expanded eligibility to allow anaerobic digestion generator systems to be eligible for incentives as part of the customer-sited tier technologies. Subsequently, the Commission clarified that similar anaerobic digestion systems employed at non-farm locations are also eligible for CST incentives. The Order issued on January 26, 2006[32] resolved biomass fuel measurement, accounting, and emissions issues. Biomass eligibility issues were resolved in a guidebook issued on May 26, 2006. An Order issued June 28, 2006[33] and the Customer-Sited Tier Operating Plan in 2007[34] specified the eligibility requirements for PV, small wind, fuel cells, and anaerobic digesters.

[30] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Approving Modifications to Maintenance Resource Category," issued and effective October 31, 2005.

[31] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Approving Request for Inclusion of Methane Digester Systems as Eligible Technologies in the Customer-Sited Tier," issued and effective November 2, 2005.

[32] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Authorizing Additional Main Tier solicitations and Directing Program Modifications," issued and effective January 26, 2006.

[33] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard. "Order on Customer-Sited Tier Implementation," issued and effective June 28, 2006.

[34] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard. "Operating Plan for Customer-Sited Tier program," issued and effective February 12, 2007.

Appropriateness of Continuing the Delivery Requirement

The Order issued on January 26, 2006 expedited DPS Staff's review of the monthly delivery requirement in advance of the 2009 review. The Order issued June 28, 2006[35] modified the delivery requirement for imports from intermittent generators by requiring hourly matching of generation and delivery to New York to replace the original monthly matching requirement. The Order issued on October 19, 2006[36] further clarified the hourly delivery requirement as applicable to out-of-state intermittent resources, so that no out-of-state generation may have its energy or attributes recognized in two jurisdictions simultaneously, and required that non-intermittent generators must still deliver their energy into the New York Control Area. In the second and third solicitations (RFP 1037 and RFP 1168 respectively)[37] for Main Tier projects, NYSERDA further clarified that the hourly delivery requirement for intermittent resources would apply to "external" bid facilities and defined "external" as facilities located outside of the New York Control Area.

Complementary Role of Future Demand-Side Management and Energy Efficiency Initiatives to Reduce Statewide Electric Load

In Case 07-M-0548 on June 23, 2008, the Commission issued an Order establishing New York's Energy Efficiency Portfolio Standard (EEPS)[38], a statewide program to reduce New York's electricity use by 15% of forecast levels by the year 2015. The EEPS is expected to reduce the load forecast, which will result in a commensurate reduction in RPS Program targets. This topic is further discussed in the following element.

Estimated Impact of Reduced Load on the Amount of New Renewable Generation Necessary to Meet RPS Goals and the Amount of Funding Required

The 2003 RPS Cost Study estimated that it would cost upwards of $1.5 billion to achieve the Main Tier and Customer-Sited Tier RPS goals based on a 2013 load forecast done in 2003.[39] In 2004, the Commission authorized $741.5 million in ratepayer collections through 2013. Recognizing that long-term contract payments would go beyond 2013, the Commission approved but did not specify post-2013

[35] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order On Delivery Requirements for Imports from Intermittent Generators," issued and effective June 28,2006.

[36] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Authorizing Solicitation Methods and Consideration of Bid Evaluation Criteria and Denying Request for Clarification," issued and effective October 19, 2006.

[37] NYSERDA's RFP 1037 and 1168 can be accessed at: http://www.nyserda.org/funding/funding.asp.

[38] Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, "Order Establishing Energy Efficiency Portfolio Standard and Programs," issued and effective June 23, 2008.

[39] The estimate of costs to acquire resources through 2013 in the 2003 cost study excluded costs associated with a) program administration, (b) NYS public authority fees, (c) maintenance tier contracts and (d) acquisition costs associated with NYSERDA contracts extending beyond 2013.

collections, choosing to defer that decision until actual program costs became better known through experience with the program's operation.

A 2008 RPS Cost Study Update[40], conducted by an independent contractor to NYSERDA, was provided to the Commission as a part of two currently open SAPA proceedings before the Commission. One proceeding[41] is considering whether or not to increase funding for PV in high cost load pockets in the New York City metropolitan area (specifically, increasing the installed capacity of PV from 3.5 MW to 100 MW of PV) or whether the higher acquisition costs of PV and other on-peak renewable resources might be better financed directly by a utility as a rate base addition. The 2008 RPS Cost Study Update also included an estimate of the costs of achieving an overlapping 100 MW solar photovoltaic (PV) goal as was set forth in the first report of the Renewable Energy Task Force in February 2008 to then Lieutenant Governor Paterson.

The second proceeding[42] is considering whether to revise the base forecast, goals, tier allocations, annual targets, and schedule of collections for the Main and Customer-Sited Tiers. For this proceeding, the RPS Cost Study Update was provided to inform the Commission as to the costs of achieving the Main Tier and Customer-Sited Tier program goals under three different scenarios, as follows:

1. a reference case using the 25% goal applied to a new load forecast for 2013 that was updated in 2007;

2. a goal of 25% of the reduced post-EEPS load by 2013 (assumed to be reduced by the implementation of the EEPS); and

3. a goal of 30% of the post-EEPS load forecast by 2015.

The 2008 RPS Cost Study Update showed the new RPS Program targets in MWh that would be needed to achieve the final goals under different load forecasts including a load forecast reduced by the implementation of the EEPS. In so doing, the 2008 RPS Cost Study Update addressed a component of the 2009 evaluation review regarding the effect of reduced load due to energy efficiency on RPS goals.

The 2008 RPS Cost Study Update resulted in forecasted program and tier-specific costs on the basis of new Main Tier and CST program targets, as shown in Table 3-1. These targets were developed using formulas employed by the Commission in its 2004 RPS Order. That is, NYSERDA's total energy procurement obligations under the RPS Program were derived by applying the policy goals, expressed as a percent of retail load and subtracting (a) baseline/historical renewable generation, (b) energy procurement associated with compliance with EO 111 targets, contributions made by the Long Island Power Authority, and (c) anticipated voluntary green market purchases. CST program targets were set at 2% of the total NYSERDA procurement goal.

[40] La Capra Associates and Sustainable Energy Advantage. "2008 New York Renewable Portfolio Standard Cost Study Update," New York State Energy Research and Development Authority.

[41] Express Terms "SAPA 03-E-0188SA18," October 1, 2008.

[42] Express Terms "SAPA 03-E-0188SA19," October 1, 2008.

Table 3-1: RPS Program Targets (in MWh) Under Different Load Forecasts

	2004 RPS Order	25% by 2013 of Updated Load Forecast	25% by 2013 of reduced, Post-EEPS Load Forecast	30% by 2015 of Post-EEPS Load Forecast
Main Tier	9,854,038	8,319,625	4,570,699	10,123,157
Customer- Sited Tier	201,130[43]	169,788	93,280	206,595

Impact on the Environment

The Order issued on August 26, 2004[44] adopted and approved the issuance of a Final Generic Impact Statement and the Order issued October 19, 2006[45] reiterated that out-of-state generators would not be subject to the State Environmental Quality Review Act with regard to impacts in their host communities. However, it stated that the potential environmental impacts of out-of-state projects on New York should be evaluated before the letting of contracts. The environmental impacts of the RPS Program are addressed in the cost-effectiveness section of KEMA's report.

Macroeconomic Benefits Accruing to New York as a Result of the RPS

The Order issued on October 19, 2006 authorized NYSERDA's use of proposal scoring and evaluation criteria in the competitive solicitation process to ensure that economic benefits to New York are given appropriate value while preserving the pool of potentially eligible projects, some of which may not be located in New York. It authorized two proposal scoring categories: the "bid price" category was to be weighted at 70%, while the "economic benefits to New York " category would receive a 30% weight, and that job creation, tax or PILOT[46] payments, royalties and payments for fuels should be included in the economic benefits calculation.

For SAPA No.03-E-0188SA19 (October 2008) NYSERDA provided the Commission with an Economic Benefits report prepared by KEMA in 2008[47] that assessed the direct and indirect benefits accruing to

[43] This target was subsequently revised to 52,878 MWh in the CST Operating Plan presented to the Commission in February 2007. The CST Operating Plan established program year 2009 as the year for achieving program-specific targets (achievement measured on the basis of energy production associated with funding encumbered/contracted as of the end of program year 2009). The energy production target of 52,878 MWh through 2009 represented a reasonable assessment of what program resources could achieve given the $45 million of authorized funding.

[44] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Approving Final environmental Impact Statement," issued and effective August 26, 2004.

[45] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Authorizing Solicitation Methods and Consideration of Bid Evaluation Criteria and Denying Request for Clarification," issued and effective October 19, 2006.

[46] Payments in Lieu of Taxes.

[47] KEMA, Inc. and Economic Development Research Group, Inc. "NYSERDA Main tier RPS Economic Benefits Report", November 14, 2008.

New York as a result of the RPS, in terms of jobs and expenditures made in the State that are stimulating the economy. The Economic Benefits report was used to help develop the benefit/cost analysis that is contained in the more comprehensive Impact and Process Evaluation report prepared by KEMA to support the 2009 review.

Options for Developing a Regionally Compatible Certification Tracking and Trading System

The Commission, in an Order issued on January 26, 2006, concluded that unbundling energy from the associated environmental attributes could result in decreased financial risk to renewable generators and increased market liquidity. The Commission requested that NYSERDA and Staff consider the development and implementation of an attribute accounting system, including its implications for the administration of the current environmental disclosure program, and to report back on their findings. In an Order issued June 28, 2006[48], the Commission authorized the unbundling of environmental attributes from energy, and authorized DPS Staff to work with NYSERDA to develop a certificate-based tracking system, as well as to develop recommendations for modifying the environmental disclosure program in advance of the 2009 review.

In response to the Order Recognizing Environmental Attributes, NYSERDA is collaborating with the NYISO and DPS Staff to identify an appropriate tracking system for the New York Control Area to support policies associated with electric restructuring, the RPS, EO 111, and environmental disclosure. While specific tracking system options are not included in the evaluation, both the Market Conditions Assessment and the Impact and Process Evaluation discuss the pressing need for a regionally compatible tracking system to account for RPS Attributes, and REC creation and trading in both the compliance (RPS) and voluntary markets.

Interaction of the RPS Program with the Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) rule for New York State was adopted in 2008 and two auctions of emission allowances have been conducted to date. Under the RGGI program rule, fossil fuel generators that are subject to the carbon dioxide emission cap under RGGI can purchase carbon offset credits from projects that produce electricity by destroying methane from agricultural anaerobic digesters and landfills. Thus, RGGI offers a revenue stream for anaerobic digesters and landfills, but only if these projects are not simultaneously participating in the RPS program.

In response to this evolving initiative, NYSERDA modified its Standard Form RPS Contract in one instance to provide an opportunity for a generator affected under RGGI regulations to suspend its obligations to deliver RPS attributes to NYSERDA under the RPS Program and instead apply energy production associated with its use of renewable fuel as a qualifying RGGI offset against the affected generator's required volume of carbon allowances. This ensures that rights to carbon credits and/or offsets are counted only once; either for RGGI compliance or RPS compliance but not for both at the

[48] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Recognizing Environmental Attributes and Allowing Participation of Projects with Physical Bilateral Contracts, "issued and effective June 28, 2006.

same time. It also serves the objective of using the RPS Program to encourage renewable generation, but doing so to the minimum extent practicable and only to the extent market valuation of the environmental attributes derived from renewable fuel use is insufficient.

Steps to Transition RPS to a Market-Based System

The Order issued January 26, 2006 adopted a 5% set-aside of a facility's output for sales outside of the RPS Program, including voluntary green market sales. This means that the RPS Program is allowed to purchase up to a maximum of 95% of the attributes associated with a facility's output, leaving at least 5% of the attributes for sales into REC markets. Two RPS Main Tier wind projects have contracted to supply only 40% of their output, leaving 200,000 attributes, approximately, for sales to the voluntary green market or into other markets each year. A discussion about barriers and opportunities for New York to consider for the transition the RPS Program to a more market-based system are found in the evaluation report prepared by Summit Blue.[49]

Additional Program Recommendations

The Implementation Plan also called for the 2009 evaluation review to examine additional program recommendations. Intervening Orders and activities also provided context for additional program recommendations as summarized below.

- Contractual Provisions: After the 2005 "fast track" procurement, the Order issued January 26, 2006 approved the continuation of several contractual provisions: the pricing approach would pay fixed payments per MWh, the contract would require winning proposers to post security in the form of cash or a letter of credit, and NYSERDA would offer contract durations of a maximum term of 10 years and a minimum term of three years.

- Bi-Lateral Contracts: Following a recommendation in the January 2006 Order to expedite review of physical bilateral contracts, an Order issued June 28, 2006 authorized, in Main Tier solicitations, participation of projects with physical bilateral contracts.

- Customer-Sited Tier: In an Order issued June 28, 2006 the Commission authorized the creation of a plan for solicitation of Customer-Sited Tier resources. Pursuant to the CST Operating Plan[50], monies unused by a particular technology are placed in a discretionary fund category for use in the next funding year or as additional funding for eligible technologies that, in NYSERDA's judgment, would benefit from the increased allocation, and for use by any new technology that might be added. This allows NYSERDA to evaluate the effectiveness of the specific programs and modify them. To promote the initial installation and continued operation of the eligible technologies, a combination of capacity payments and/or performance-based payments is permitted, and capacity payments may be based on project milestones.

[49] Summit Blue Consulting, LLC, and Nexus Market Research, "New York Renewable Portfolio Standard Market conditions Assessment," issued and effective February 19, 2009.

[50] The CST Operating Plan was released by NYSERDA on February 12, 2007 and is discussed further in Section 4.

- Pricing Approach: The Order issued January 26, 2006 reserved making any changes to the RFP approach until the 2009 review. A Notice issued July 21, 2006[51] reported on Staff's recommendation that although there were sufficient potential bidders to validate the use of a declining clock auction[52], the model was not sufficiently developed. By Order issued on October 18, 2006, the Commission authorized NYSERDA to determine whether to execute RPS contracts based on the results of a pay-as-bid, sealed bid request for proposals (RFP) approach similar to that authorized for the prior solicitation, a standard offer method for small-scale solicitations, or a declining clock auction (with market-clearing-price pricing). The October 2006 Order also authorized NYSERDA to use tranches or purchases of blocks of attributes that are priced at different levels. The Order reaffirmed that the lowest bid prices, regardless of type of renewable technology, would be a deciding factor in the project selection process for the RPS Main Tier Program.

Table 3-2: Timeline of Orders and Activities

Orders and Activities	Date
PSC Order Approving Renewable Portfolio Standard	Sept 2004
PSC Order Authorizing Fast Track Certification and Procurement	Dec 2004
NYSERDA issues RFP 916 – first Main Tier Procurement Solicitation	Dec 2004
PSC Order Approving Implementation Plan	April 2005
PSC Order Approving Modifications to Maintenance Resource Category	Oct 2005
PSC Order Approving Request for Inclusion of Methane Digester Systems as Eligible Technologies in the Customer-Sited Tier	Nov 2005
PSC Order Authorizing Additional Main Tier Solicitations and Directing Program Modifications	Jan 2006
PSC issues Biomass Guidebook	May 2006
PSC Order on Delivery Requirements for Imports from Intermittent Generators	June 2006
PSC Order on Customer-Sited Tier Implementation (including revised list of eligible electric generation technologies)	June 2006
PSC Order Recognizing Environmental Attributes and Allowing Participation of Projects with Physical Bilateral Contracts	June 2006
PSC Order Authorizing Solicitation Methods and Consideration of Bid Evaluation Criteria and	Oct 2006

[51] Case 03-E-0188, "Staff Notice to Commission Concerning Main Tier Solicitation Mechanism" July 21, 2006.

[52] A declining clock auction starts with the total quantity of attributes for sale at an opening price. Qualified bidders offer quantity bids at this price. If excess supply exists at the end of a round, the price is lowered and bidders resubmit quantity bids at that price. The clearing price is determined when the supply of attributes at the end of the round is zero.

Orders and Activities	Date
Denying Request for Clarification	
NYSERDA issues RFP 1037 - second Main Tier Procurement Solicitation	Dec 2006
Operating Plan for Customer-Sited Tier Program	Feb 2007
NYSERDA issues RFP 1168 -- third Main Tier Procurement Solicitation	Dec 2007
NYSERDA contracts with KEMA Inc and Summit Blue LLC to provide evaluation support	Feb 2008
PSC Order Establishing Energy Efficiency Portfolio Standard (EEPS) (affecting the load forecast in 2013)	June 2008
RGGI New York Rule Adopted	Sept 2008
SAPA 03-E-0188SA19 Express Terms	Oct 1, 2008
Comments received in response to SAPA SA-18 and SA-19	Nov 20, 2008
In support of NYSERDA's comments to SAPA SA-18 and SA-19, the RPS Cost Study Update, Economic Benefits Report, Renewable Energy Credit Prices Report, and the Analysis of the RPS's Influence on Large-Scale Renewable Energy Project Development in New York Report were provided to the PSC	Nov 2008
2009 Draft Evaluation Report	Mar 2009

4 RPS PROGRAM PROGRESS

Main Tier

The most recent RPS Program performance report highlights the activities and status of the RPS Program through June 2008.[53] Because program activities evolve on an ongoing basis, the data contained in the June 2008 New York State RPS Performance Report was used as a basis for the evaluation and analyses conducted by both evaluation contractors. It should be noted, however, that recent project developments have occurred since this report was issued. These recent developments are explained below.

Recent Project Developments

Recently, several projects have successfully entered commercial operation or have progressed from the development phase to the later stages of construction and are expected to be operational no later than November of 2009. More than 1,119 MW of new renewable capacity are operational at 24 facilities, and nearly 45 MW of new renewable capacity at four facilities are expected to be operating by the end of November of 2009. By the end of 2009 there should be 28 new renewable facilities operating, representing more than 1,164 MW of capacity. A listing of the Main Tier projects, along with the status of each, can be found in Table 4-1.

[53] New York Renewable Portfolio Standard, Performance Report, Program Period Ending June 2008, September 2008

Table 4-1: Status of Main Tier Projects - January 31, 2009

Facility	Resource Type	Location	March 2009 Status	Comments
Spier Falls	Hydro	NY	Operating	N/A
Higley Falls	Hydro	NY	Operating	N/A
Browns Falls	Hydro	NY	Operating	N/A
Maple Ridge	Wind	NY	Operating	N/A
Bear Creek	Wind	PA	Operating	N/A
Jersey Atlantic	Wind	NJ	Operating	Facility built. Contract terminated by mutual consent.
Niagara Generating Facility	Biomass	NY	Operating	N/A
Allens Falls	Hydro	NY	Operating	N/A
Colton	Hydro	NY	Operating	N/A
Eagle	Hydro	NY	Operating	N/A
East Norfolk	Hydro	NY	Operating	N/A
Norfolk	Hydro	NY	Operating	N/A
Norwood	Hydro	NY	Operating	Awaiting Operational Certification
Oswego Falls	Hydro	NY	Operating	Awaiting Operational Certification
Raymondville	Hydro	NY	Operating	Awaiting Operational Certification
Cohocton Wind Farm	Wind	NY	Operating	Awaiting Operational Certification
Dutch Hill Wind Farm	Wind	NY	Operating	Awaiting Operational Certification
Noble Altona Windpark	Wind	NY	Operating	Awaiting Operational Certification
Noble Bliss Windpark	Wind	NY	Operating	N/A
Noble Chateaugay Windpark	Wind	NY	Operating	Awaiting Operational Certification
Noble Clinton Windpark I	Wind	NY	Operating	N/A
Noble Ellenburg Windpark	Wind	NY	Operating	N/A
Piercefield Hydro	Hydro	NY	Operating	Awaiting Operational Certification
Effley Hydro	Hydro	NY	Operating	Awaiting Operational Certification
Noble Wethersfield Windpark	Wind	NY	Operating	Awaiting Operational Certification
Sherman Island	Hydro	NY	In construction	Expected completion May 2009
High Falls	Hydro	Quebec	In construction	Expected completion May 2009
AES Greenidge, LLC	Biomass	NY	In construction	Expected completion May 2009
Noble Bellmont	Wind	NY	In construction	Expected completion November 2009
Windfarm Prattsburgh	Wind	NY	Cancelled	Project Cancelled citing current economic environment
Jordanville	Wind	NY	Cancelled	Facility failed to enter operation
Criterion	Wind	MD	Cancelled	Facility failed to enter operation
Noble Allegany Windpark	Wind	NY	Cancelled	Project Cancelled citing current economic environment
Noble Chateaugay Windpark II	Wind	NY	Cancelled	Project Cancelled citing current economic environment

Unfortunately, the current financial crisis has had negative impacts on the renewable energy market nationwide and the New York RPS Program. Citing financial difficulties, Noble Environmental Power cancelled two (2) projects: the 100.5 MW Noble Allegany Windpark in Allegany County, and the 19.5 MW Noble Chateaugay II Windpark in Franklin County. In addition to the Noble cancellations, First Wind cancelled its 54 MW Windfarm Prattsburgh project, also citing financial difficulties.[54]

As a result of these recent project cancellations, program progress as measured by the maximum contracted annual energy deliveries, will be reduced by approximately 360,000 MWh. Approximately $47.8 million that had been budgeted or encumbered for expected contract payments on these cancelled projects is now available for future Main Tier activities (subject to authorization by the Commission). Also, the financial security forfeiture provisions in the RPS Program contracts have resulted in additional revenue of approximately $1 million.[55] These funds are available for future Main Tier activities as well, subject to the Commission's authorization.

Performance-Related Contract Adjustments

Renewable resources such as wind and hydroelectric are intermittent in nature and it is difficult to estimate annual and long term electricity production. Therefore, each Main Tier and Maintenance Tier RPS contract includes a maximum annual payment which, depending on actual production, may not be realized. Pursuant to this contract design feature, any monies not paid out for deliveries of RPS Attributes in any given year are disencumbered and made available for future Main Tier activities. As a result, $12.4 million has been disencumbered from contracts under RFP 916 for 2006 and 2007 and an additional $5 million may be disencumbered as a result of under production in 2008.[56]

Also, to ensure that program goals are met and other projects are afforded opportunities for funding, NYSERDA contractually requires that each project deliver at least a minimum percentage of its bid-based contract quantity obligation each year. If this percentage is not met for a defined number of consecutive years, the annual quantity of RPS Attributes that NYSERDA is obligated to purchase is reduced for the remaining years of the contract.[57] For example, the Maple Ridge Wind Farm will not meet its obligation to deliver the required 85% of its contracted bid quantity for three consecutive years (2006, 2007, and 2008). As a consequence, this facility's contracted bid quantity will be reduced for the seven remaining years on the contract. While this adjustment represents a loss of approximately 176,000 MWh per year toward program targets, it will also free more than $28.2 million for future Main Tier activities.

[54] This project had contracted under RFP 1037 for 10% of its output, and then under RFP 1168 for an additional 30%.

[55] Project developers forfeit up to 100% of their financial security to NYSERDA should they elect to terminate a contract by a predefined date or if they fail to enter commercial operation.

[56] Due to a lag in invoicing cycles, NYSERDA has yet to calculate actual deliveries for 2008 and formally disencumber funds associated with under deliveries.

[57] Percentages and number of years vary by RFP and facility type (wind, hydro, etc.).

As mentioned above, setbacks in project development and underperformance of operating projects have not been overlooked in program and contract design. As projects face setbacks and fail to enter commercial operation or as projects underperform, program funds are liberated for future Main Tier activities. If NYSERDA had the authorization to reinvest these funds back into the market the resulting shortfall in program targets could be minimized, if not eliminated.

Main Tier Targets

The above mentioned cancelled projects and performance related contract adjustments have affected progress toward RPS goals and the amount of funding available for future Main Tier activities. A delay in the date facilities enter commercial operation can also affect progress toward annual targets. With respect to expected progress toward the 2008 Main Tier target of 3,549 GWh, projects were allowed contractually, subject to the payment of additional security, to delay their in-service date from January 1, 2008 to November 1, 2008. The majority of projects chose this option, thus reducing actual progress for 2008; however, these projects are expected to deliver their quantity obligations in full during 2009. Table 4-2 illustrates the most up-to-date progress in meeting the Main Tier targets.

Table 4-2: Main Tier Program Progress toward Targets

	2006	2007	2008[1]	2009	2010	2011	2012	2013
	(all values in GWh)							
Main Tier Targets:	1,121	2,326	3,549	4,768	6,012	7,298	8,557	9,854
Actual Progress toward Annual Targets from Installed Facilities:								
Progress toward Annual Targets:	582	583	841					
Progress as % of Annual Targets:	52%	25%	24%					
Expected Progress toward Annual Targets from Facilities under Contract:								
Progress toward Annual Targets:			2,639	2,947	2,878	2,878	2,850	2,850
Progress as % of Annual Targets:			74%	62%	48%	39%	33%	29%

[1] Does not include all production/delivery for program year 2008 because of lags in invoicing/verification.

Customer-Sited Tier

The September 2004 Order established the goal of the CST Program to achieve two percent of the total RPS Program's incremental megawatt-hour (MWh) target. Based on the 2004 RPS Order and information provided by DPS Staff, the cumulative CST target through 2013 was set initially at 201,130

MWh. In its June 28, 2006 Order[58], the Commission established new capacity and energy targets for the CST through 2009, authorized incentive funding of $45 million, and directed the development of a Customer-Sited Tier Operating Plan ("CST Operating Plan") for solicitation of customer-sited renewable resources.[59] NYSERDA developed a CST Operating Plan dated February 12, 2007 that set forth the specific technology-based programs to be implemented under the CST Program through 2009, along with the expected funding levels for each technology program, the program-specific support payment methods for each technology, the timing of various procurement methods, and other pertinent program design and operational details. The technologies included in the CST program are photovoltaic systems, fuel cells, small wind facilities, and anaerobic digesters. Based upon the CST Operating Plan's funding allocations as established by the Commission, the initial estimate of the cumulative MWh expected to be under contract (funding encumbered) through 2009 was approximately 50,733 MWh, which was subsequently revised to 52,878 MWh. The energy production target of 52,878 MWh and the CST Operating Plan terminal date of 2009 represented a reasonable assessment of what program resources could achieve given the $45 million of authorized funding.

With respect to the CST Operating Plan, four Customer-Sited Tier solicitations have been issued, offering funding support through an open enrollment, first-come, first-served process for photovoltaic (PV), fuel cell, anaerobic gas-to-electric digester (ADG), and small wind installations. Within months of rolling out new CST programs, market demand for PV and ADG systems exceeded authorized funding, even after re-allocation of discretionary program funding.[60] In 2008, NYSERDA requested that program funding allocated to the Main Tier component of the RPS Program, but unused, be re-allocated to the CST to keep pace with market demand in the PV and ADG programs.

Using updated RPS cost and funding information, NYSERDA's programmatic experience with CST technologies, and market preferences articulated to the Commission as part of the SAPA No.: 02-E-0188SA 18 proceeding, the Commission, in an Order dated October 28, 2008[61], approved the re-allocation of $47 million from uncommitted Main Tier funding resources to the CST Program. Of this amount, the ADG program received $7.6 million and the PV program $20.6 million, leaving $15.1 million for discretionary use and $3.7 million for system performance monitoring. Pursuant to the CST Operating Plan, at the end of each calendar year, funds not committed to projects within a particular category will be designated "discretionary."

In late 2008, federal tax incentives for PV installations grew more robust. In response to the

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[58] Order on Customer-Sited Tier Implementation, Case 03-E-0188.

[59] The Customer Sited Tier Operating Plan was released in February 2007 and can be found at http://www.dps.state.ny.us/CST_OP_02-12-07.pdf.

[60] Discretionary Funds may be used at NYSERDA's discretion to supplement allocated funding for: (1) resource categories for which demand clearly exceeds their allocations; (2) eligible technologies that, in NYSERDA's judgment, would benefit from an increased allocation; and (3) for new technologies that the Commission determines to be eligible for CST support. At the beginning of each calendar year, each technology resource category will start with a new annual allocation and with access to the discretionary pool as directed by NYSERDA throughout the funding year.

[61] Case 03-E-0188, Case 03-E-0188, *Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard,* Order Concerning Modification of Funding for the Customer-Sited Tier, issued October 28, 2008.

Commission's order dated October 28, 2008[62], and based on analysis of these new market developments, NYSERDA announced that program incentives offered through its current PV program would decrease by 25% from historic levels, effective February 2, 2009. This had the effect of encouraging a flurry of market activity that has nearly exhausted total funding under the PV program, even after accounting for a recent funding authorization by the Commission and the re-allocation of discretionary funding pursuant to the CST Operating Plan by NYSERDA.

Table 4-3 depicts budget and funding that is: a) encumbered; b) committed for project applications; and c) available for future project applications pursuant to the current CST Operating Plan as of January 31, 2009.

Table 4-3: Funding Status of CST Operating Plan effective January 31, 2009.

	Budgeted	Encumbered	Committed (Contract Applications Accepted)	Funding Balance Available for Future Contract Applications[63]
Photovoltaics	$ 60,333,734	$ 20,112,25	$ 37,932,094	$ 2,289,384
Fuel Cells	$ 5,794,420	$ 32,21	$ 2,032,210	$ 3,730,000
Anaerobic Digesters	$ 20,100,000	$ 8,090,74	$ 7,541,938	$ 4,467,318
Small Wind	$ 2,071,846	$ 439,58	$ 132,265	$ 1,500,000
Discretionary Funds	$ 0	$	$ 0	$ 0
System Performance Analysis	$ 3,700,000	$ 1,055,40	$ 431,400	$ 2,213,200
Total:	$ 92,000,000	$ 29,730,19	$ 48,069,907	$ 14,199,902

Tables 4-4 and 4-5 present a forecast of capacity and energy production associated with: (a) project capacity that is in operation and funding is encumbered; (b) project capacity for which funding is committed (formal applications have been accepted and contracts are pending/anticipated and for which funding is not yet encumbered), and (c) project capacity that could be supported with remaining uncommitted program budgets, based on current total authorized funding. The CST Operating Plan established program year 2009 as the terminal year for achieving program-specific targets and established that achievement of these targets would be measured not on the basis of actual energy being produced at the end of 2009; but on the basis of energy production associated with funding encumbered/contracted as of the end of program year 2009.

[62] PSC Order, issued October 28, 2008.

[63] Absent any increase in the pace of applications being processed since January 2009, available funding for the PV program is expected to support new contract applications only through May 2009. The funding balances shown for all technologies already reflect a discretionary re-allocation of funding by NYSERDA between programs for the program year 2009. Pursuant to the CST Operating Plan, NYSERDA has no further discretion to re-allocate funding balances between programs for program year 2009.

On the basis of applications in process, pending contracts and operating installations through January 31, 2009, energy production from eligible technologies is expected to approach 73,000 MWh or nearly 140% of the end-of-year 2009 program target of 52,878 MWh as specified in the CST Operating Plan. If available uncommitted funding is used as planned, total energy production from eligible technologies through the end-of-year 2009 is expected to approach 89,000 MWh or nearly 170% of the program target as shown in Table 4-5. With respect to PV and ADG technologies, total expected program production is expected to exceed the technology-specific end-of-year 2009 targets by multiples of 4 and 2 respectively.

Table 4-4: Actual and Expected Installed CST Capacity (MW)

CST Program	Original Operating Plan: Target Capacity by 12/31/09	Actual Installed	Under Contract	(Pending) Contract Applications Accepted	Projected (w/remaining funds)	Total Program Progress*	Total Expected Progress toward 12/31/09 Target
Solar Photovoltaics	3.5	2.14	2.84	9.63	0.87	15.48	442%
Fuel Cells	2.7	-	0.05	0.56	0.75	1.36	50%
Anaerobic Digesters	3.7	-	3.34	3.67	1.75	8.76	237%
Small Wind	1.8	-	0.14	0.03	0.50	0.67	37%
Program Total	11.7	2.14	6.37	13.89	3.87	26.27	224%

*Total Program includes actual installations, under contract, pending contracting, and projected with remaining funds.

Table 4-5: Actual and Expected Annual CST Energy Production (MWh)

CST Program	Original Operating Plan: Target Annual Generation by 12/31/09	Actual Energy Production from Installed Capacity	Expected Energy Production Based on Capacity Under Contract	Expected Production Based on Pending Contracts (Application Accepted)	Production Expected from Projected Capacity Based on Remaining Funds:	Total Expected Production Progress*	Total Expected Progress toward 12/31/09 Target
Solar Photovoltaics	4,533	2,774	3,682	12,485	1,129	20,070	443%
Fuel Cells	18,700	-	-	4,862	1,634	6,496	35%
Anaerobic Digesters	25,700	-	23,757	25,362	12,264	61,383	239%
Small Wind	3,945	-	175	32	626	833	21%
Program Total	52,878	2,774	27,614	42,741	15,653	88,782	168%

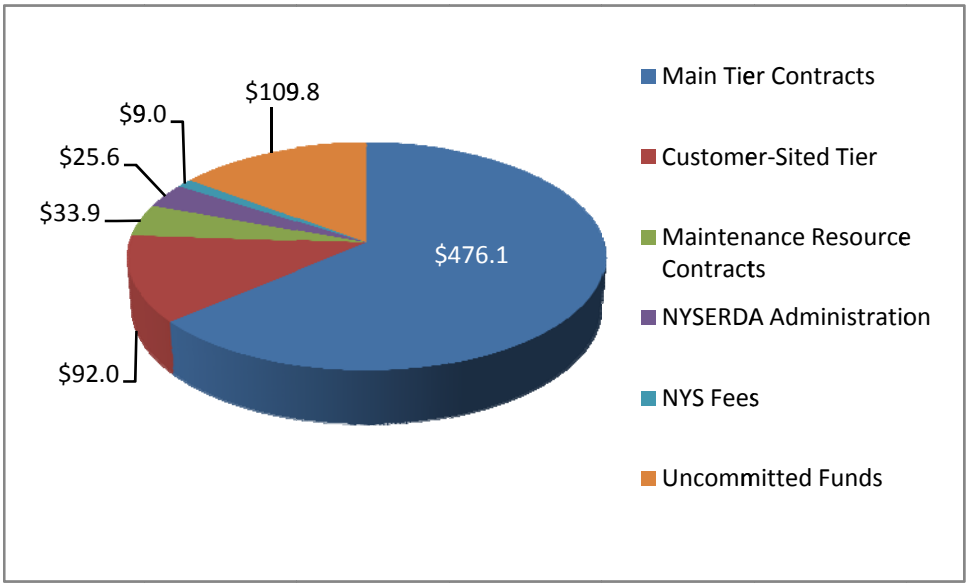
*Total Expected Production Progress includes: actual production, production under contract, production pending contracting, and expected production from projected capacity.

RPS Program Funding[64]

Total program funding is currently $746.4 million. This is comprised of specified collections of $741.5 million, accrued interest on collections of approximately $3.1 million and approximately $1.8 million in financial security forfeitures.

Taking into account the recently cancelled projects, actual and expected contract adjustments from underperforming facilities, and the October 28, 2008 reallocation of Main Tier funds to the CST, approximately $636.6 million is currently committed, leaving a balance of $109.8 million for future program activities. Figure 4-1 below illustrates RPS Program funding commitments as of January 31, 2009. The numbers for each category represent: 1) the actual dollars that have been expended for each category through January 31, 2009, and 2) the funds committed for future expenditures.

Figure 4-1: RPS Funding Expended and Committed



[64] As of January 31, 2009.

5 OVERVIEW OF EVALUATION CONTRACTOR REPORTS

This section presents key findings and recommendations provided by KEMA and Summit Blue Consulting in their role as independent evaluation contractors. Findings are based on the scope and timing of the research conducted by the contractors, and the recommendations provided are not necessarily being advanced by NYSERDA or DPS Staff. The contractor's findings are intended to provide useful input on the RPS Program progress and market conditions to help inform future program decision making and policy in this area. If deemed worthy of consideration from a public policy perspective, such recommendations offered by the evaluation contractors may be appropriate for consideration by NYSERDA and the Commission. Other recommendations may be outside the jurisdiction or authority of the Commission or NYSERDA and, if warranted, would require more broad policy changes in the State.

The 2009 evaluation review addressed program implementation and processes, impact analyses, and market characterization.

The RPS Program implementation and process evaluation examined several key questions, including:

- Is the Program efficiently implemented in a manner that best leverages ratepayer funds;
- Is it effective at reaching its targets, including driving the building of new generation capacity; and
- Are the targets used to benchmark Program progress appropriate.

The impact analysis focused on:

- Cost effectiveness of the Program given the overall costs to ratepayers and macroeconomic benefits throughout the economy; and
- The Program's impact on the electricity grid in terms of wholesale electric prices and system reliability.

Finally, market characterization questions addressed by the evaluation include:

- How critical is the RPS in the development of new renewable energy capacity in New York;
- What factors affect the RPS Attribute prices that are bid into the Program;
- What are the significant barriers impeding the development of renewable energy; and
- What are the steps New York should take to transition to a more market-based program.

The main findings of these evaluation elements are summarized in the remainder of this section.

Impact and Process Evaluation Report

The Impact and Process Evaluation report by KEMA, Inc. focused on progress toward RPS Program targets, macroeconomic benefits, impacts on the transmission system reliability, and the project selection process used in the Main Tier Program. The sections below summarize these key impacts. Additional discussion of these and other findings can be found in KEMA's detailed report.

Progress toward Targets

Achievement of the RPS policy goal is predominately based on the Main Tier's ability to attain its share of the goal, which is the vast majority of the total incremental target determined in the 2004 Order.[65] Achievement of the Main Tier target is dependent upon the schedule and timing of authorized funding in relation to market demands and conditions. The ultimate goal cannot be met without considerable additional renewable energy procurement, and therefore additional funding, through the Main Tier Program. Authorized funding at this time is inadequate to meet the Main Tier's 2013 target.

In the 2004 Order, the Commission authorized a collection schedule that totals $741.5 million. If all of the currently specified collections were dedicated to acquiring only the Main Tier 2013 target of 9.8 million MWh per year under 10 year contracts, contracted prices for RPS Attributes would need to average approximately $7 to $8 per MWh—a rate well below market averages throughout New York, New England, and below the average bid prices for the second and third solicitations.[66]

According to the 2008 RPS Cost Study Update, it is likely that the 2013 load forecast will be reduced by the successful implementation of the Energy Efficiency Portfolio Standard (EEPS). Consequently, the amount of attributes needed to achieve the 25% goal will change, as will the number of attributes needed to achieve the RPS Main Tier Program target.

Under a reduced load forecast for 2013, the 25% RPS Main Tier Program target is expected to require 4.57 million MWh of renewable attributes, a reduction from the original estimate of 9.85 MWh in 2004.[67] If the proposed RPS goal of 30% by 2015 is adopted by the Commission, the RPS Main Tier Program target would increase to a total of 10.1 million MWh of renewable attributes. Given that approximately 3 million MWh of renewable attributes are already procured in the Main Tier Program, this would leave an additional 1.5 million MWh to be procured in the future to meet the 25% goal by 2013, and an additional 7 million MWh to meet the 30% by 2015 goal.

The RPS Program targets are measurable, but fungible in terms of timing, funding levels, and subject to administrative discretion and prudence. From a policy perspective, the major advantage of this kind of target approach is that New York ratepayers do not risk paying exorbitant prices for renewable attributes or paying for compliance penalties.

[65] The total incremental target beyond baseline resources is approximately 12 million MWh (excluding LIPA).

[66] Average bid prices for the second and third solicitations were $15.30 and $14.92 respectively.

[67] La Capra/SEA, RPS Cost Study Update. Pg. 6.

The Program's economic risk is alleviated by the Main Tier bid scoring system that incorporates a price ceiling above which bid prices are not accepted. NYSERDA derives the price ceiling from current market conditions information. The Program's economic risk is further alleviated by a competitive market in which there was, at the time, an ample supply of potential projects.

Cost Effectiveness and Economic Benefits

KEMA's assessment found that the RPS Program has cost-effectively achieved new renewable energy capacity in New York. The Program has attracted new renewable energy generation capacity into the State beyond the levels financially supported by the Program and is poised to yield substantial economic benefits for the State's economy.

KEMA reported the economic benefits at two levels, direct and indirect. The direct benefits are comprised of project construction spending and plant operations spending in New York supported by the Main Tier Program. The indirect benefits are the multiplier effects throughout other sectors of the economy, which were estimated using an IMPLAN model of New York. The cost-effectiveness analysis was calculated on the basis of direct benefits since they are more conservative estimates of economic benefits. The macroeconomic analysis reports on both direct and indirect economic effects for current and future scenarios.

The economic benefits findings used in the cost-effectiveness analysis do not incorporate the recent cancellations of three wind projects representing 174 MW in the RPS Main Tier Program. Roughly, the total capacity supported by the RPS Program is reduced by 13% as a result of these cancellations; however, this percentage was not applied to the program progress findings made in KEMA's report. Caution is recommended against a simple 13% reduction of results of the macroeconomic benefits or the benefit/cost analysis. Moreover, the three cancelled projects, while all wind, are of very different size and geographic location. Therefore, any simplifying adjustment to these values would risk undermining the integrity of the model.

Cost-Effectiveness

The Main Tier RPS Program is highly cost-effective with a benefit-cost ratio exceeding 6-to-1. The specified benefits include direct benefits related to investment and wages in the New York economy, electricity price suppression at the wholesale level, and environmental benefits in the form of specific avoided air emissions. The benefits are described in more detail below. The specified costs include NYSERDA's cost to administer the program and the payments to developers under contract for RPS attributes.[68]

[68] KEMA conducted a program cost test, not a total resource cost test. The total costs to developers to build facilities are proprietary information and not disclosed to NYSERDA. The total opportunity costs to ratepayers were not included in the program cost test because the induced or indirect economic benefits were not included either.

Economic benefits used in the cost-effectiveness calculation, including the following inputs:

- The value added to the economy in terms of Gross State Product from developers' investment in renewable energy resources in New York;

- Price suppression from adding low or zero marginal fuel cost electricity resources to the NYISO loading used a rate of $1.92 per MWh for 2010, totaling approximately $323 million in electricity price savings in 2010[69]; and

- Environmental benefits of avoided emissions from conventional generation sources of carbon dioxide, nitrogen oxide, and sulfur dioxide were expressed in market values. Market values of avoided emission were derived from the New York Mercantile Exchange allowance prices (as of February 4th, 2009) at: $3.95 per ton for carbon dioxide, $3,250 per ton for nitrogen oxides, and $11 per ton for sulfur dioxide.

Macroeconomic Benefits

The macroeconomic report used the IMPLAN model to estimate economic effects, and the model inputs included self-reported developer data, standard industry classification data, and other demographic and firmographic sources. The direct economic benefits of the facilities and their indirect or multiplier economic effects throughout the economy are added together to comprise the total economic benefits to New York. As shown in Table 5-1, the total economic benefits to New York State resulting from the three Main Tier solicitations are estimated to be more than $4.2 billion over the average 20 year life of the facilities. If the RPS goal is increased to 30% by 2015 (assuming the post-EEPS load forecast), the total direct and indirect economic benefits could rise to approximately $12.5 billion.

Table 5-1: Total Economic Benefits ($M)

Scenario	Analysis Interval*	Direct Project Benefits ($M)	Indirect Benefits ($M)	Total Benefits ($M)
Scenario 1: First Three Solicitations	2005-2028	$2,065	$2,183	$4,248
Scenario 2: 25% by 2013	2005-2030	$2,627	$2,796	$5,423
Scenario 3: 30% by 2015	2005-2034	$6,007	$6,567	$12,574

*Analysis intervals capture the 20-year life of the facilities that are coming on-line progressively in subsequent years

[69] Summit Blue performed a regression analysis to calculate price suppression. This analysis is summarized in Appendix F of the Market Conditions Assessment.

Direct benefits result from the construction and operation of the facilities supported by the RPS and they are more conservative estimates of economic stimulus because they do not take into consideration the multiplier effects in the economy from spending wages in other economic sectors. Table 5-2 shows the total direct economic benefits per MWh of new renewable production. These amounts can be contrasted with the average price paid for the attributes per MWh of production. For example, based on the first three solicitations, the average price paid for attributes was approximately $15.50 per MWh, which is estimated to yield economic benefits of more than $25 per MWh.

Table 5-2: Direct Economic Benefits by Scenario

Scenario	Resource	New Renewable Energy Production (MWh/yr)	New Lifetime Renewable Energy Production (MWh over 20 year)	Total Direct $ (Construction to end of facility life)	Total Direct $ per MWh
Scenario 1: First Three Solicitations	All	4,066,553	80,852,940	$2,064,621,293	$25.39
Scenario 2: 25% by 2013	All	5,266,252	105,325,040	$2,627,132,184	$24.94
Scenario 3: 30% by 2015	All	10,995,279	219,905,580	$6,006,979,054	$27.32

Table 5-3 illustrates that economic benefits vary by technology. Due to the large volume of MWh procured from wind resources, most of the economic benefits identified are associated with wind projects. Wind projects under both future Scenarios 2 and 3 would still account for the largest share of total impacts created, but the relative dominance of wind lessens in the future somewhat as bio-fuel projects are expected to play a larger role in meeting incremental goals. In the future, biofuels are expected to contribute 19% of all renewable energy in Scenario 2, and 27% in Scenario 3 as compared to 17% under the first three solicitations. On a per-MWh basis, biomass projects are associated with larger direct economic benefits than wind ($39 versus $24 in the first three solicitations) because they employ more people per MW of capacity and purchase in-state fuel feed stocks. Landfill gas projects, which are expected to play a larger role in the future under either Scenario 2 or 3, would have the highest direct economic benefits in the future per unit of energy production, approximately $50 per MWh.

Table 5-3: Direct Economic Benefits by Technology ($ per MWh)

	Resource	Total Direct $ per MWh
Scenario 1: First Three Solicitations	Biofuel	$38.78
	Hydro	$11.06
	Wind	$23.92
Scenario 2: 25% by 2013	Biofuel	$39.38
	Hydro	$9.69
	Wind	$24.48
	Landfill Gas	$50.29
Scenario 3: 30% by 2015	Biofuel	$41.84
	Hydro	$9.38
	Wind	$26.56
	Landfill Gas	$49.45

Job Creation

Job creation estimates were reported in actual number of jobs (Table 5-4) and in job years (Table 5-5) which capture how long-lasting the job is.[70] Using the IMPLAN model, KEMA estimated the number of jobs that would be created, expressed in job years and associated payroll or labor income. The estimates are linked to the same three scenarios used in the macro-economic analysis described above. In all cases, these outputs are significant, leading to hundreds of full-time, well-paying jobs.

Annual jobs created in New York from the RPS Main Tier projects are related to short- and long-term employment opportunities. Short-term construction work is assumed to average three years, and long-term facility operations jobs are assumed to last through the 20-year life of the facility. Table 5-4 shows the total number jobs, in every year of the interval period, created in New York from the RPS Main Tier.

[70] For example, one job lasting two years would be expressed as two job years.

Table 5-4: Direct Annual Jobs Created in NYS from Main Tier RPS

Annual	First Three Solicitations	*25% by 2013*	*30% by 2015*
Short-term Jobs (3 years)	677	857	1,764
Long-term Jobs (20 years)	223	279	600

Table 5-5 expresses the annual jobs in job years. The macroeconomic analysis also shows that the jobs created to build and operate the renewable energy facilities are well-paying. Table 5 shows the average yearly compensation per job year for each scenario based on the direct and indirect job years created over the life of the facility. Indirect jobs are not as well compensated as direct jobs, since renewable energy facility workers spending their wages in New York tend to purchase goods and services from lower-wage sectors, such as retail.

Table 5-5: Main Tier RPS Impacts on Average Annual Worker Compensation

Over Facility Life	**First Three Solicitations**	***25% by 2013***	***30% by 2015***
Direct Job Years	6,492	8,298	19,607
Direct Payroll	$501,788,643	$635,533,210	$1,481,422,272
Avg. Compensation per Job	**$77,293**	**$76,589**	**$75,556**
Indirect Job Year Impact	16,184	20,230	45,201
Indirect Payroll Impact	$860,000,000	$1,070,000,000	$2,331,000,000
Avg. Compensation per Job	**$53,139**	**$52,892**	**$51,570**
Total Job Years	**22,676**	**28,528**	**64,808**

Data Credibility

Self-reported economic benefits data are provided by developers when they bid into the Main Tier solicitations. This data was used as a basis for KEMA's analysis of economic benefits. KEMA performed a credibility assessment on the developers' self-reported economic data and concluded that, with a few minor exceptions, the data reported in these bids are reliable. KEMA's analysis determined that the data from developers could serve as a basis for the current and other analyses of the economic benefits that can be claimed from renewable energy development.

Customer-Sited Tier

Customer-Sited Tier projects also have an economic impact. For example, the PV Program is now working with approximately 100 installers. In many instances, these are small, yet growing companies with a business model that is centered on the design, installation and maintenance of PV systems. NYSERDA has been active in the implementation of accredited training programs to expand the number of installers capable of serving the market. It is expected that by increasing the number of installation companies in the market, competition for customers will force a price reduction.

Impact on Grid Reliability

To the extent renewable resources' ability to serve load is limited by the physical limitations of the transmission system, policy goals will not be satisfied. This finding is based on conditions such as existing aging transmission infrastructure and load centers located far from generation and suitable feeding points.

The assessment also concluded that enhancing the value of dispatched capacity from wind resources could occur through improved market information, and that improving market information for wind generation would be more cost-effective approach than upgrading transmission infrastructure in the near-term. The assessment assumed that if the information derived from improved protocols for wind forecasting is incorporated into market information, there would be increased integration of intermittent capacity into the NYISO's interconnection, forecasting and market information systems. Enhancing market information for intermittent energy providers has many benefits: better planning, enhanced project profitability, increased competitiveness for financing of high quality projects, insurance against displaced output from other proximate renewable resources, and achievement of RPS goals. Enhanced performance of intermittent renewable energy systems through complete delivery of the capacity generated from zero cost fuel resources—the result of better market signals—likely offers more short-term solutions for both load serving entities and developers than added transmission infrastructure.

Program Design

The Commission chose a central procurement model that maximizes early ventures and ease of procurement, while laying the basis for a certificates market.[71] NYSERDA, as the procurement agent, is authorized to purchase only attributes, not energy commodity. This model is compatible with a market in which attributes are treated as a tradable commodity and are available for use in compliance of the RPS and in support of voluntary markets. By engaging in attribute-only transactions, NYSERDA's intervention in the marketplace is minimal.

In KEMA's assessment, the current central procurement structure using an RFP approach is working well to select projects that satisfy the RPS Program's objectives of providing least-cost renewable energy while promoting economic development within the State. As a public authority and a steward of public

[71] 2004 RPS Order. p. 49.

ratepayer funds, NYSERDA is positioned to officiate on economic benefits considerations. Developers reported that the market is too small for a Declining Clock Auction approach, which also suggests that individual RFP competitions among LSEs might reduce the bidder pool for each solicitation, resulting in higher costs to ratepayers. Given that the renewable energy project planning, development, and marketing cycle is costly and long, the central procurement approach also likely saves developers time and money by avoiding the situation of multiple competitive markets and customized response requirements under an LSE approach.

Several developers underscored that the lack of firm funding commitments to meet the Main Tier targets has a dampening effect on long-term interest in renewable energy investment in New York. The procurement authorization process, since it is not regularly scheduled, does not foster a great deal of certainty in the marketplace. Additionally, the project planning and development cycle and the time horizon for investment cost recovery are long. In this context, concerns raised by developers can be summarized as follows:

- Funding Certainty—Developers want to plan on a specific level of available funding and the time in which it will be available.

- Frequency—Developers would like more opportunities to compete for funding, perhaps as frequently as every six months as market conditions dictate; however, annual competitions are expected.

- Regularity—Developers note that a predictable procurement schedule would aid their planning processes.

- Advance Notification—A long term commitment for regular, frequent and certain funding levels would send a strong signal to project developers to focus on opportunities in New York.

Moreover, the analysis concluded that current RPS rules offer no remedy for NYSERDA to re-inject unexpended, disencumbered, or forfeited security funds back into the market to acquire replacement resources after a given solicitation process has ended. Additionally, the absence of this mechanism also reduces progress toward RPS targets and undermines to some extent the policy objectives of the RPS Program in general.

Project Selection Criteria

Promoting projects that provide significant economic benefits to New York State is a major objective of the program. The current scoring system provides 70% weighting of points for bid prices and a 30% weighting of points for economic benefits, and KEMA determined that this ratio constitutes a sound scoring system. The emphasis on in-state expenditures, which is clearly stated to developers in the RFP process in the scoring criteria, may encourage developers to purchase more goods and services in New York. The current system is designed to ensure that the winning bids capture the set of projects that best provide significant in-state economic benefits at a low price.

Project Selection Criteria Impact on Resource Diversity

The data presented earlier in this section suggest that factoring economic benefits into the equation to a greater extent would likely lead to more biomass projects, as biomass tends to have higher economic benefits on a per MWh basis. This is because biomass projects purchase domestic fuel feed stock and employ more people per MW of capacity. Biomass is also a base load technology. Compared to intermittent resources such as wind, biomass plants are able to take advantage of higher electricity revenues during on peak times and to derive profits from the full installed capacity value of the project.

Project Selection Impact on Financial Risk-Taking

KEMA's analysis concluded that the RPS Program is being administered efficiently and with due diligence mitigating risks to ratepayer funds. The current competitive process encourages low bids. While that competition could conceivably lead to "defective pricing," the standard contract provisions protect ratepayer's funds from investments in failed projects. "Defective pricing" is a case in which a winning bidder cannot deliver on the project, crowding out other legitimate bidders who would have been next in line to secure a RPS contract. However, NYSERDA's retention of a contract security, which is standard procedure in the RPS Main Tier contracting process, discourages defective pricing. Overall, the analysis concluded that requiring project developers to post a significant financial security is an approach which appears to have been effective at preventing frivolous or defective bids.

Project Selection Criteria Impact on System Reliability

The analysis considered whether factoring location considerations into the selection criteria process could encourage more projects to be sited closer to appropriate feed points on the transmission system, reduce grid congestion and/or offset pollution by encouraging renewable technologies to be sited closer to fossil fuel generators for the purpose of offsetting their output into the load order. On the other hand, location considerations could add to project development costs and place increasing strain on the RPS Program budget, because the sites with the best resources are not necessarily the same as those that would allow coal-generated power to be offset or minimize negative impacts to the transmission system. This problem might persist even if the best resource and transmission impact combination was combined into a single "capacity factor" criterion.

In responding to grid constraints, a bid scoring criterion that considers project location might prove less effective than efforts to improve market information. Such a locational criterion may simply add complication and potential ambiguity to the bid award process. While it is not clear that the potential transmission impacts of wind power's intermittency are properly or fully signaled in the market for RPS Attributes, for the most part it appears that existing market mechanisms account for locational factors to some degree. However, market information could be further improved to accommodate these concerns—such as reliance on the improved wind forecasting system being implemented by the NYISO.

Impact of Long-Term Contract Financing

During KEMA's interviews, developers typically described RPS Attributes contracts as "critical" or "essential" to financing their projects. Long-term contracts remain essential for new project development because such contracts reduce the developers' risk. By providing a guaranteed revenue stream, long-term contracts help developers secure financing for their projects, improving the debt terms that are negotiated. Even developers who finance their projects internally generally prefer to have a certain guaranteed level of revenue (*i.e.*, through a long-term contract) to reduce risk. From a policy perspective, the long-term contract protects ratepayers in two ways. Generally, it allows developers to offer lower bid prices than they would be willing to accept under short-term contracts, especially in a nascent market. It also provides a hedge against rising RPS Attribute prices over time. Through the first three solicitations, RPS Attribute prices in New York have compared favorably with prices in nearby states. By locking in these relatively low rates for ten years, NYSERDA protects the RPS funds from potential price spikes.

Impact of Program Design on the Voluntary Market

The RPS Main Tier's standard contract offers developers the option to suspend their contracts to deliver attributes if they are to be sold into the New York voluntary market or to a public agency through EO 111. This contractual provision not only supports New York's long term goals of creating a sustainable market, but also offers developers an option to sell RECs at higher profits if market conditions allow. This contract suspension clause supports the short- and long-term viability of the RPS Attribute and renewable energy market in New York. One developer has used this provision already.

It is unclear if the program set-aside structure is enough to ensure that the voluntary market targets (as were expected by the PSC in the 2004 RPS Order) will be met under current market conditions. Assuming RPS projects sell 90% to 95% of their attributes to NYSERDA through Main Tier contracts, then only 0.3% to 0.6% of New York's voluntary demand could be met through Main Tier projects—and that assumes the entire available set-aside green power supply is sold.

Developers of new generation cite the current Environmental Disclosure Program (EDP) tracking system as overly burdensome compared to others in the region, underscoring the conclusions reached by the Commission in its January 26 and June 28, 2006 Orders about the importance of having a regionally compatible tracking and trading system. The data requirements for what REC marketers can sell outside of New York and what consumers demand (*e.g.*, Green-e certified RECs) cannot be met in a timely manner under the current EDP system which has a time lag. Additionally, it is still difficult to predict how much generation would be offset from various fossil fuel facilities, and what the associated environmental benefits might be.

The critical element to any sustainable renewable energy market is the actual availability of renewable energy generation capacity. As discussed in Section 4, the RPS Program has been highly effective in achieving renewable energy capacity additions. As the RPS contracts expire, the capacity of these facilities will become available to the voluntary market.

Customer-Sited Tier Incentives

In the Customer-Sited Tier program, incentive levels are linked to a project's installed capacity and to expected performance. Installers stated that performance measurement standards on which incentives are based could be improved; however, they generally embrace the concept of standardization in performance measurement as well as capacity-based incentives. Installers stated a desire for industry-wide standards that are credible and evenly applied across the competition.

Installers of anaerobic digesters affirmed that the RPS incentives make the projects possible, and that the $1 million maximum cap is adequate. Installers of both PV and small wind believe that the incentive structures favor smaller systems. Installers of small wind technologies stated that the incentive levels are note adequate for projects over 100 kW; and that capacity-based incentives are essential to cover the upfront capital costs.

Market Conditions Assessment

The Market Conditions Assessment by Summit Blue finds that New York's RPS has played a critical role in advancing renewable energy markets in the State to date, highly influencing the development of wind and biomass in particular. The provision of long-term Main Tier contracts is a key factor affecting the program's success.

Presence and Level of Market Activity

Long-term contracts offered under the Main Tier Program have proven valuable in driving the development of large-scale wind projects in the State. Beginning around 2003, the wind industry in the U.S. underwent a rapid transition from one populated by many small domestic developers to one dominated by large European wind developers partnering with institutional investors (commercial bankers and lenders) offering both equity and debt capital. While the equity investors could take advantage of tax benefits, such as the Production Tax Credit, the RPS was designed to address gaps in securing debt financing. To secure debt financing, developers needed revenue guarantees of sufficient duration and amount to repay investors. Ten-year contracts became the means to provide the necessary secure revenue stream for wind; with the result being that the potential wind resource in New York is being more fully realized.

The dominance of large wind development corporations has a few implications for the growth of wind resources in New York. Their dominance has constrained opportunities for medium and small-sized wind developers who cannot realize economies of scale and risk mitigation strategies available to larger corporations. Also, larger investors have opportunities to invest anywhere, putting New York projects in competition with other key states for the same capital resources.

Landfill energy markets are distinct from wind markets. The market structure for landfill gas is still fragmented with smaller projects, and its potential is still largely unrealized in New York. Landfill gas projects require lower levels of capital and have less exposure to fuel supply risks when compared to

other biomass technologies. As a baseload resource, landfill gas can secure power purchase agreements that contribute to the low risk profile desired by small and independent developers. Recent biogas projects to enter the RPS Program are co-firing projects at the site of existing coal facilities; co-firing provides the developer with flexibility to respond to energy price volatility and fuel feedstock risks.

Barriers to Large-Scale Project Development

The top five barriers to large scale renewable development in New York are:

- project costs impacted by federal tax incentives and purchases of equipment and raw materials;
- transmission constraints;
- permitting;
- local opposition; and
- interconnection costs and protocols.

The uncertainty associated with the existence of a production tax credit has created development boom and bust cycles. Developers report that equipment costs have undergone increases of 15 to 20% between a project's planning and construction phases. Transmission, permitting, local opposition, and interconnection issues may arise depending on geographic location and infrastructure. In the absence of an Article X siting law[72], all projects are subject to a State Environmental Quality Review, which is a lengthy process and more vulnerable to parochial pressures. The interconnection protocols followed by the NYISO were viewed by developers as lengthy and inconsistently applied among utility service territories. Another significant barrier is the lack of an attribute tracking system that impedes market transactions of renewable attributes unbundled from the energy commodity, an approach typically used in voluntary and other compliance markets. Other barriers are the higher cost of doing business in New York, the limited availability of sites with strong potential (defined as a combination of resource potential, available land and a favorable locality), and the expenses associated with local property taxes and host communities payments.

Program Influence on Large-Scale Development

RPS Attribute financing is critical to the development of wind power, which is a capital-intensive endeavor. For biomass, the uncertainty about future fuel costs makes the stable RPS Attribute revenue stream important. In contrast, hydro upgrade projects are less dependent on RPS Attribute revenues, and landfill gas projects in New York can make more lucrative REC sales into New England's RPS compliance markets.

The wind potential in New York is being developed at a pace exceeding others states with more abundant wind resources, indicating the RPS Program's positive influence on wind development. The New York RPS Program solicitations attract a competitive pool of bidders, and the RPS Attribute bid prices reflect

[72] Article X refers to an expired Public Service law that provided a one-stop approach to securing approvals and permits for the siting of new energy generation facilities. The law expired in 2002.

that they are significant components of the projects' financing mix; both factors are seen as indicators of the Program's influence on wind development.

RPS Program Comparison with Other States

Key differences and similarities were assessed with three neighboring states (Massachusetts, Pennsylvania, and New Jersey) and California because it is a leading state in the U.S. in renewable energy development. The key difference is that New York is the only state with experience using a centralized procurement approach[73], which is characterized as having only one RPS Attribute buyer for compliance, operating within a pre-defined budget without penalty expenditures in the event interim targets are unmet. Also, New York's eligibility is open only to projects initiated after the date the RPS Program was established[74], while the vintage date used elsewhere includes facilities pre-existing their RPS. Unlike New York, waste-to-energy resources are eligible in these other states. Most other states have larger, multi-state control areas to draw on resources for compliance; however, Massachusetts recently enacted a law favoring in-state resources. Key similarities between New York and the comparison states include tiers for separate resources and allowing sales of unbundled RPS Attributes or RECs. Barriers were found to be similar across states, with transmission capacity identified among the top barriers in California and Massachusetts.

RPS Attribute Pricing

RPS Attribute prices are a key market signal the cost of renewable energy generation since the electricity market clearing price is typically set by fossil fuel generators. Average RPS Attribute prices for wind declined over New York's three RPS Main Tier procurements; while average RPS Attribute prices for repowered hydro and biomass rose over that same period. RPS Attribute prices in New York are less than the REC prices in most neighboring states' RPS compliance markets. RPS Attribute/REC price differences among states are likely attributed to different eligibility and vintage requirements[75], and the size of the control area from which resources can be drawn without incurring import requirements.

The 2003 vintage date in New York could result in higher RPS Attribute prices compared to larger eligibility pools in other states that also accept facilities pre-existing their RPS. However, New York's vintage date ensures that the RPS Attribute revenues are directed to new projects that need financing to be built, and not to pre-existing facilities. The hourly delivery requirement on external intermittent generators may also be driving up their RPS Attribute prices, limiting the bidder pool and reducing competition. Economic benefits and partial bid capacity appear to not affect RPS Attribute prices.

Factors favoring lower RPS Attribute prices in New York are: abundant wind resources, inclusion of hydro upgrades, long-term contracts, competition, and the capacity to limit expenditures to a pre-set price

[73] Illinois recently adopted a centralized procurement approach.

[74] Pre-existing facilities that demonstrate financial hardship are the exception.

[75] A vintage date refers to the date a facility was constructed for purposes of establishing RPS eligibility. New York's 2003 vintage date distinguishes facilities in existence prior to the establishment of the RPS in 2004.

ceiling, capped at fixed collections. The fact that all technologies compete against each other may also exert downward pressure. If the RPS program was to use technology-specific tiers or allocations to attract more resource diversity, it would also advance the competitive position of less efficient projects that would be competing in smaller bidder pools, resulting in higher bid prices.

In general, external influences on RPS Attribute prices reflect both cost and revenue factors. RPS Attributes are often the last source of financing in a complex financing package for new projects and thus, are affected by external credit markets. The long term nature of the RPS Attribute contract and the ability to make physical bilateral contracts likely exert downward trends on the RPS Attribute prices. On the cost side are equipment or fuel costs. On the revenue side are energy revenues, followed by the Production Tax Credit.

Factors affecting REC/attribute prices in the voluntary market are more lax vintage, resources, and geographic eligibility requirements which would lower prices, while more competition nationally and more demand than supply might drive up their prices.

Price Suppression

A regression analysis performed by Summit Blue[76] revealed that renewable resources are suppressing natural gas prices (modestly) and wholesale electricity prices. A more significant suppression on electricity prices arises through the addition of a resource with supply costs near zero within a more localized market. The analysis estimated electricity price suppression in 2010 at $2/MWh on a statewide load basis. This will effectively lower electricity costs by approximately $100 per MWh of renewable energy produced, which is significantly more than the weighted average RPS Attribute price of $15 per MWh in the third procurement. Price suppression will be higher in the early years as the renewable resources will first displace the highest costs resources on the supply curve.

Customer-Sited Tier[77]

A comparison of New York's incentives with other states revealed that New York's PV incentives equal or exceed other states, while total funds for PV were less in New York at the time the analysis was done.[78] New York's small wind incentives were comparable; ADG and small system fuel cell incentives were more favorable in other states.

Investment in PV, small wind and fuel cell technologies is primarily attractive to niche groups with discretionary resources and those interested in a hedge against rising electricity prices, preventing climate change, or interested in the technology.[79] That being said, CST incentives are significantly increasing market activity; installers across technologies reported that less than 10% of the current volume would be

[76] Summit Blue, Market Conditions Assessment, Appendix F.

[77] The sample interviewed for this tier was small, limiting the ability to generalize the findings.

[78] At the time the analysis was done, New York's PV Program was funded at $13 million.

[79] NYSERDA reports that customer interest in ADG is driven by waste management needs.

installed in the absence of the incentives. In terms of market activity, PV accounts for 92% of the total CST incentive applications while ADG represents 68% of the total capacity (average PV capacity is 7.7 kW and ADG is 347 kW). Complementary sources of funding include the US Farm Bill for ADG, municipal bonds for Waste Water Treatment Projects with ADG improvements, and loan subsidies for PV and small wind. Increasing use of third party ownership models is attracting more commercial sector participation. Survey respondents believe that net metering will improve the economics of CST installations. Top barriers cited by survey respondents cutting across technologies include upfront costs, customer awareness, cumbersome application processes, difficult permitting and siting in New York, and lack of tax incentive certainty.

Voluntary Green Power Market

New York's voluntary consumer market is expected to contribute 1% of the RPS goal (1,828,670 MWh). As of September 2007[80], 59,600 customers were purchasing green power.[81] RPS Program components for set-asides and contract suspensions for sales to other markets are designed to support the voluntary market. Currently, three participating wind projects are retaining 60% of their production for sales to other undisclosed markets. It is not clear whether RPS Attribute prices are affecting the price of attributes sold in the voluntary market. The RPS is increasing the supply of attributes and the Main Tier Program purchases only attributes from newer facilities, leaving pre-existing resources' attributes available to the voluntary markets. The top barriers (cited by survey respondents) to voluntary market growth are the lack of an attribute tracking and trading system, low consumer willingness to pay a price premium, lack of customer awareness, and insufficient marketing. Developers report that voluntary market sales are insufficient to drive large scale project development, largely because the voluntary market does not fulfill their revenue requirements. This is because voluntary attribute prices and procurement volumes are low and generally do not provide long-term contracts.

Manufacturing and Related Business Development

Some small manufacturers and distributors of wind equipment were active in New York before the RPS was instituted in 2004. For the most part, the renewable energy products produced by these companies were additions to their existing product lines and did not comprise a significant amount of their business. None of these businesses had located in New York with the sole purpose of serving the State's renewable energy market, yet they were able to leverage existing facilities to serve the growing need for renewable energy. NYSERDA's Research & Development Program support has had some beneficial impact on building the renewable energy industry and a qualified workforce.

No large-scale wind developers have located in New York due to the State's location on the east coast and lack of proximity to markets of scale. New York's market is also considered small when compared to states such as Texas, or states in the Midwest with tremendous wind resources. New York has, however,

[80] 2007 is the most recent date for which voluntary market data is current.

[81] Department of Public Service.

attracted companies manufacturing or distributing components for renewable energy systems, including wind turbine components. Opportunities exist for in-state companies to expand existing lines as more than 450 companies in New York are active in industrial sectors that could also supply components for clean energy technologies.

Steps to Transition to a More Market-Based System

The current RPS system is already market-based in that it provides a place for buyers and sellers to exchange goods. A more market-based system may involve less government participation as a buyer. A self-sustaining market would be one that did not rely on State mandates or incentives to attain the renewable energy levels sought by the RPS. The elements necessary for achieving a more market-based system to support renewable energy growth in New York were identified by Summit Blue as follows:

- Long-term market certainty;
- Open, liquid markets, wherein there is a diversity of buyers and sellers, frequent transactions, and flexibility for market participants to negotiate contracts that suit the characteristics of the project and its financing package;
- Limited barriers to participation;
- Existence of market drivers (both supply and demand) sufficient to achieve the level of market activity targeted; and
- Transparency of market data, such as winning bid prices.

These elements may present opportunities for developers that are at odds with the prudent expenditures of ratepayer funds. For example, increased transparency of market data, such as winning bid prices, could lead to higher bid prices in the future and higher RPS Program expenditures.

New York's Progress toward Achieving Self-Sustaining Renewable Energy Markets

Summit Blue reports that New York is making substantial progress toward building a self-sustaining market for renewable energy. In response to the RPS Main Tier Program, many projects are being built. The CST is also achieving strong results with its funding. Continued activity in New York's voluntary green power market is another favorable indicator of renewable energy market sustainability. Moreover, the State's investment in the development of the renewable energy industry through many of NYSERDA's complementary R&D program opportunities help advance market growth. Lastly, the implementation of the Regional Greenhouse Gas Initiative will help improve the economic competitiveness of renewable energy.

While substantial groundwork has been made, challenges remain. Most of the stakeholders interviewed agreed that the market is not ready to sustain itself in the absence of State-level incentives and assistance.

A number of challenges have bearing on the State's ability to realize its market growth potential over the long-term. These challenges are both within and outside the State's control and include the following:

- Potential for RPS Attribute prices increases in the future – this is uncertain, but future budgets should reflect this possibility;
- Transmission capacity constraints;
- Siting and permitting barriers;
- Lack of an appropriate attribute tracking and trading system;
- Interaction of RPS with RGGI and potential national carbon markets[82];
- Expanded net metering laws; and
- Complementary role of demand-side management and energy efficiency initiatives (*e.g.*, Energy Efficiency Portfolio Standard).

Evaluation Contractor Recommendations

As noted earlier, this section is comprised of recommendations provided by KEMA and Summit Blue in their role as independent evaluation contractors. Some recommendations may be appropriate for consideration by NYSERDA and the Commission, while others may be outside the jurisdiction or authority of the Commission or NYSERDA and may require more broad policy changes in the State.

Impact and Process Evaluation Report

KEMA's report identified recommendations in order to help meet targets and goals, and improve program effectiveness and efficiency. KEMA's recommendations are summarized below.

- First and foremost, adequate funding must be made available for additional Main Tier solicitations since that is the program responsible for the vast majority of the State's incremental renewable energy goal. If targets are not set in accordance with available funding, the target is not realistic. New York should define any future RPS procurements and targets in accordance with forecast cost requirements and take into consideration authorized funds. This approach would be congruent with how the CST targets have been recast in the current CST Operating Plan based on authorized funding levels.

- Developers interviewed by KEMA are seeking more market certainty. The evaluation recommends that one way to signal more market certainty would be to transform percentage targets into annual MWh production goals. Moreover, "hard" targets that must be met would also enhance market certainty because developers would know how much new renewable energy attributes were going to be procured in a Main Tier solicitation.

- Improving market certainty for renewable energy developers is important. Authorizing additional funds on a periodic basis for the procurement of hard targets will bolster market certainty for

[82] Since it is possible that RECs could be tradable commodities in both carbon and RPS compliance markets, the opportunity for double-counting or inconsistent eligibility rules may arise.

developers, thereby helping them obtain the equity and debt financing necessary for projects to go forward. NYSERDA should continue to offer long term contracts and consider flexibility to extend contract term offers beyond the current maximum of 10 years. A regular schedule with flexibility to conduct more frequent and smaller, if warranted, solicitations would provide the flexibility for the RPS Program to respond to market conditions and reduce market uncertainty for developers. This approach is dependent upon making funding available on a schedule that supports such periodicity in procurement cycles. The solicitation schedule should be published as far in advance as possible to increase market certainty.

- In order to serve smaller sized Main Tier resources that cannot compete economically against large-scale projects, NYSERDA should consider issuing a "standard offer" for smaller projects, perhaps from 1MW to 10 MW. While a standard offer could be issued at any time, it could also make use of unexpended or forfeited funds following awards from a competitive solicitation if a balance remains. A standard offer could also make use of monies that become available due to the suspension of contracts at the developer's initiation, or due to underperforming contracts.

- To improve market liquidity, New York should consider moving from a procurement system where only attributes from one physical generator are eligible to satisfy contract compliance to a product-based system where a tradable REC associated with the electric generation of any otherwise eligible RPS resource can be substituted for compliance purposes. In order to do this, New York should formally recognize tradable RECs as a means of compliance with the RPS.

- Although outside of NYSERDA's direct control and the Commission's jurisdiction, adopting a regionally compatible REC tracking and trading system would advance voluntary REC market activity and facilitate environmental disclosure. The voluntary market does not appear to be meeting policy objectives. New York may wish to engage in discussions with both Green Power Providers and distribution utilities to identify program changes that will increase the participation of this market segment.

- New York should consider alternative forums for working with wind and demand response providers to develop new solutions to transmission and distribution congestion issues. A starting point for this may be facilitated meetings on future transmission impacts, participation in the day-ahead market and assignment of dispatch base-points for wind operators.

- NYSERDA should maintain the practice of setting confidential bid price ceilings in Main Tier solicitations that are based on current market conditions. A bid price ceiling exerts restraint and encourages the prudent expenditure of public funds. Confidentiality serves to avoid having bid prices drift toward the ceiling price.

- NYSERDA should implement a proposal review and award schedule process to demonstrate as much transparency as possible, including a clear schedule for award date, debriefing window, and what debriefings will (*e.g.*, clarity of estimation and presentation of economic benefits) or will not cover (*e.g.*, disclosure of the bid price).

Market Conditions Assessment

The Summit Blue Market Conditions Assessment report also included recommendations for the Main Tier RPS Program based on an analysis of its strengths and limitations. Strengths of the Main Tier RPS Program, with respect to building renewable energy markets, include:

- Long-term contracts;
- New in-State project development;
- Ability to leverage non-funded capacity growth; and
- Optimal use of finite program funds.

Limitations of the Main Tier Program with respect to building renewable energy markets include:

- Uncertainty about the scale and timing of future RPS solicitations (reducing this uncertainty will help more developers get established in the State);
- Uncertainty about the volume of RPS Attributes to be purchased in a given procurement;
- Lack of transparency related to RPS Attribute prices (*i.e.*, limited of visibility of prices, other than average for a procurement);
- Uncertainty about long-term demand for renewable energy in New York;
- Lack of market transaction liquidity;
- Lack of funding flexibility to respond to changing market conditions; and
- Resource diversity is not fostered, as this would likely entail higher cost.

Based on these key findings, some overarching factors for possible consideration by the Commission and NYSERDA, related to the RPS Program and, more broadly, renewable energy markets in the State include:

- New York's competitiveness relative to other states that are also aggressively pursuing renewable energy market growth;
- Market certainty;
- Conflicting interests of developers and ratepayers (*i.e.*, a better market for developers comes at higher cost to ratepayers); and
- Potential future changes in market conditions, specifically the potential for national greenhouse gas regulations and the effects of changing financial markets.

Table 5-6 links recommendations for advancing large-scale renewable energy development in the State with the list of key elements necessary to achieve a more market based system to support renewable energy growth.

Table 5-6: Summary of Key Elements for a Market Based System and Corresponding Recommendations

Key Elements	Recommendations
Long-Term Market Certainty	• Define State's long-term goals and objectives for the future of renewable energy growth, beyond those already in place for 2013. • Establish the funding and oversight mechanisms needed to achieve those targets. • Provide a schedule for future RPS procurements.
Open, Liquid Markets	• Consider options for facilitating the development of a robust secondary market for renewable attributes in the State, with due consideration of ratepayer costs. For instance, allowing procurements for RPS Attribute shortfalls on a short term basis between procurement cycles to make up contract shortfalls. • Adopt an attribute tracking system that is compatible with those in place in the ISO-NE and PJM control areas.
Limited Barriers to Participation	• Implement strategies to address transmission capacity constraints, building on models in use in other states. • Address siting and permitting issues by adopting an Article X siting law, developing criteria for more objectively evaluating visual and noise impacts of wind projects, highlighting areas of the State that welcome renewable energy development, conducting community outreach, and monitoring approaches used in other states. • Develop an attribute tracking system that is compatible with those in neighboring regions.
Market Drivers Sufficient to Achieve the Target Level of Market Activity	• Sustain demand for RPS Attributes by defining State's long term renewable energy goals and objectives, and establishing funding and oversight mechanisms to ensure those targets are met. • Encourage long-term policy stability at the federal level to provide a more favorable investment environment. • Encourage more companies to expand their existing product lines to include renewable energy-related equipment.
Transparency	• Provide market participants with information about the total funding available in a given solicitation. • Provide more data on past program outcomes, while weighting ratepayer interests to avoid potential for gaming • Register facilities as "RPS eligible in New York" and post lists of eligible facilities. • Foster development of a secondary market for attributes that would result in another source of market data on transactions.

Source: Summit Blue Consulting, Market Conditions Assessment report.

The Summit Blue Market Conditions Assessment report also identified key findings and recommendations for CST technology programs as follows:

Strengths of the CST programs are:

- Project-level incentives;
- Aspects of program design (training of PV installers and code officials and the performance based aspect of the ADG incentive); and
- Program marketing.

Limitations of the CST RPS Programs are:

- Program application process and approval;
- Limits on capacity of systems eligible for incentives; and
- Inadequate program budgets and overly complex program procedures.

Key recommendations for the CST programs include:

- Increase program budgets;
- Simplify and streamline program processes;
- Adjust format for some program incentives; and
- Improve permitting conditions for small wind systems (this element is outside of NYSERDA's direct control and the Commission's jurisdiction, however).

The Market Conditions Assessment by Summit Blue recommends that overall funding budgets for CST programs be increased to satisfy market demand. Project application procedures may have several layers of review or time delays, and how incentives are determined based on the program's metrics could be adjusted. Finally, the report recognizes that local permitting requirements, or the lack thereof for small wind systems, may be impeding the deployment of this technology.