

**EXHIBIT B**

**ANALYSIS OF THE RENEWABLE PORTFOLIO STANDARD'S INFLUENCE ON  
LARGE-SCALE RENEWABLE ENERGY PROJECT DEVELOPMENT IN NEW YORK**

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## ABSTRACT

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NYSERDA is required to present the New York Public Service Commission (PSC) with an evaluation report of the NYS RPS program results through the end of 2008. The report is to be issued for public comment by March 31, 2009. In support of this evaluation effort, Summit Blue Consulting and its affiliates (the Summit Blue Team) were selected to perform a market conditions assessment to help understand the current state of the market and how the program has changed market conditions since its inception. This report presents findings pertaining to Summit Blue's analysis of the RPS program's influence on large-scale renewable energy project development in New York. This work will be part of a comprehensive market conditions assessment report submitted to NYSERDA in November of 2008.

A traditional program attribution analysis was not conducted for the RPS program due to unique factors related to this evaluation. However, a more general analysis of program influence was completed, and program spillover effects were estimated. Based on results from interviews with nearly 20 developers, as well as input from a broad spectrum of other market participants, the RPS program was found to be the key driver behind large-scale renewable energy development in the state. The effects of the program varied by resource technology, with the RPS program having the greatest level of influence on wind and biomass projects.



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## SUMMARY

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This report presents findings pertaining to Summit Blue's analysis of the RPS program's influence on the large-scale renewable energy project development in New York. This work will be part of a comprehensive market conditions assessment report submitted to NYSERDA in November 2008.

A key question in the RPS program evaluation was to determine the extent to which new renewable generation capacity in the state can be attributed to the RPS program. Some of the new renewable capacity added since the RPS was adopted in 2004 might have occurred in the absence of the program, and some new capacity not supported directly by the program may be attributable to the program. Because of the unique nature of the evaluation conducted for the New York RPS, a traditional program attribution analysis was not completed. This is a report of the RPS program's influence on the renewable energy market, including program spillover.

It was found that, among winning bidders in the RPS program, the development of biomass and large wind projects was highly influenced by the program. The program had a moderate level of influence on hydro projects, and a low level of influence on medium-scale wind projects. Results were similar among non-winning bidders, though lower levels of influence were found for some biomass and medium-scale wind projects. In addition, the program was found to have a low level of influence on landfill gas projects, a technology not represented among winning bidders.

Wind and biomass projects are thought to be so highly influenced by the program because their project economics depend on securing a predictable REC revenue stream for at least some portion of the project output. For wind projects, this is largely due to the capital-intensive nature of development for this technology. For many biomass projects, uncertainty about future fuel costs makes the stable REC revenue stream more important. In contrast, hydro upgrade projects completed to date have tended to rely less heavily on REC revenues in order to be developed, and landfill gas projects in New York have been more successful selling RECs into the New England RPS compliance markets.

An additional indication of the influence of an RPS in general is the high percentage of New York's wind potential that has been realized relative to other states that also possess relatively strong wind resources, but lack an RPS. The highly competitive nature of the New York RPS program, and the fact that the competitive program is resulting in average REC prices in the mid-teens, provide further indication that the REC contracts offered under the RPS program are important drivers in the development large-scale

renewable energy projects in New York. Competitive REC prices would likely be lower if projects were not truly reliant on the REC contracts.

Responses to interview questions related to program attribution were used as the basis for analyzing program influence. Responses by 18 developers were used, including ten developers that hold RPS REC contracts with the New York State Energy Research and Development Authority (NYSERDA), and eight developers that have been unsuccessful in securing RPS REC contracts in New York.

## Section 1

# INTRODUCTION

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NYSERDA is required to present the New York Public Service Commission (PSC) with an evaluation report of the NYS RPS program results through the end of 2008. The report is to be issued for public comment by March 31, 2009. In support of this evaluation effort, Summit Blue Consulting and its affiliates (the Summit Blue Team) were selected to perform a market conditions assessment to help understand the current state of the market and how the program has changed market conditions since its inception. The Summit Blue Team's market conditions assessment, together with a program impact evaluation being conducted simultaneously by KEMA, will inform NYSERDA's March 2009 RPS evaluation report. This report presents findings pertaining to Summit Blue's analysis of the RPS program's influence on the large-scale renewable energy project development in New York. This work will be part of a comprehensive market conditions assessment report submitted to NYSERDA in November of 2008.

A key question in program evaluation is to what extent the measured impacts can be attributed to the program being evaluated. Some of the impacts resulting from participant actions might have occurred in the absence of the program, and some impacts not counted directly by the program may be attributable to the program. Because of the unusual nature of this evaluation, a traditional program attribution analysis was not completed. However, the program's general influence on large-scale renewable energy project development in the State was examined, as these large-scale renewable energy projects are the main contributors of renewable power generation that is counted toward RPS compliance in the State. This analysis included an estimate of program spillover. This report presents Summit Blue's analysis of program influence. The report starts with an explanation of the methods used, the challenges encountered, and the reasons why a traditional attribution analysis was not completed. A discussion of the results of the analysis follows.

## **DATA SOURCES**

Both primary and secondary data collection activities were conducted. Data collection activities were closely coordinated across the Summit Blue market conditions research team and the KEMA impact evaluation team. The overarching goals for our primary data collection activities were to:

- Gather a diverse set of perspectives on the market;

- Learn from the experiences of actual market participants;
- Leverage existing data sources;
- Conduct effective, efficient communications with market participants.

Primary data collection activities consisted of in-depth telephone interviews with a broad set of renewable energy market participants. The focus of primary data collection efforts was on market participants that have an existing or potential relationship with the Main Tier component of the RPS program, or with utility-scale renewable energy development in the State more broadly. These market participants include wind, biomass, landfill gas and hydro project developers (including both those participating in the RPS as well as non-RPS program participants), the financial/investment community, equipment manufacturers and distributors, voluntary green power marketers, Load Serving Entities (LSEs), trade associations and NYSERDA program staff. Interviews were also conducted with representatives from the agencies administering RPS policies in other states to facilitate comparison of the New York RPS experience and policy structure to those in other states, with an emphasis on large-scale renewable energy development.

In-depth interviews were also conducted with market participants closely related to the Customer Sited Tier programs of the RPS. Because the Customer Sited Tier was less of a focus for the evaluation, a more limited set of market participants related to these programs were interviewed. Interviews were conducted with a small sample of installers representing each of the technologies funded by the Customer Sited Tier programs, as well as program staff for each of the Customer Sited Tier programs.

A discussion of the specific interviews that played the greatest role in informing this program influence analysis are described in Section 2.

## Section 2

# METHODS AND CHALLENGES

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When evaluating an energy program, the goal of attribution analysis is to estimate the amount of total program impacts (in this case, generation counted toward RPS compliance) that have resulted from the program. The method for estimating these net impacts is to calculate a net to gross (NTG) ratio. The two main components accounted for in the NTG ratio are free ridership and spillover.

*Free ridership* is the share of new generation that would have occurred in the absence of the program. Since renewable energy projects are developed as “whole” projects, it is difficult to attribute portions of that whole project to different decision-making factors. For the purposes of attribution analysis, the intent of estimating free ridership would be to reflect that other factors, aside from the presence of the program, could have contributed to participating developers’ decisions to build projects or build larger capacity sized facilities in New York.

*Spillover* accounts for generation over and above the amount counted toward RPS compliance that has occurred as a result of the program. Energy program attribution evaluations often account for various types of spillover, including additional actions by program participants that occur as a result of the program, as well as actions by non-participants that occur as a result of the program.

This attribution analysis is unique for several reasons. To the knowledge of Summit Blue and NYSERDA, New York is the first state to evaluate its RPS program and attempt to estimate attribution for such a program. In addition, New York’s RPS program design is unlike other RPS states in that a public agency (NYSERDA) is the central procurement agent for RPS compliance RECs and is the main buyer of RECs for RPS compliance in the State. As a result, there is little precedent on which to base the definitions of free ridership and spillover for this analysis.

This analysis is also limited by the amount and depth of data collected. Attribution analysis is typically based on survey or interview responses to a full battery of questions focusing on the topic. However, due to the length and broad scope of the interviews conducted with developers for the RPS evaluation, a comprehensive set of questions that would be necessary to complete a rigorous attribution analysis could not be included.

Finally, this type of program, which is designed to influence stakeholders that are, in many cases, large corporations, imposes challenges different than many program evaluations. The multi-million dollar renewable energy project development decisions are, in general, more complex than decision-making related to installing energy efficiency measures, the focus of most energy program attribution analyses. The

long and involved renewable energy project development timeline is another key factor that makes it difficult to analyze the decision-making of large renewable energy project developers. In addition, it would be impractical to expect large renewable energy project developers to reveal to interviewers the full strategy and circumstances behind their decision making.

Because of the unique factors associated with this analysis, it was deemed most appropriate to broadly discuss “program influence,” rather than specify a NTG ratio. However, a sound approach for estimating program spillover was identified. Therefore, a spillover estimate has been included in this analysis.

## **ANALYZING PROGRAM INFLUENCE**

For the purposes of analyzing program influence, responses to the following three questions from in-depth interviews with both winning and non-winning developers who have bid into the RPS program were considered:

1. How valuable were the NYSERDA REC contracts in getting your project(s) financed? (Answer choices: critical; of significant value; of little or no value; and an obstacle to project finance.)
2. In the absence of the NYSERDA REC contract, how would your development plan have been different (examples: would the project have been developed in another state, same size project, timing of construction, etc.)?
3. Does the NYSERDA program affect the renewable energy market in New York as a whole (i.e., REC prices, making New York more favorable for development relative to other states, or in other ways)?

“Program influence” scores were estimated for all of these participating developers based on responses to the set of program influence questions presented earlier.<sup>1</sup> These scores were grouped into ranges that reflect high, medium, and low levels of program influence. Analysis of program influence was also informed by input from a broad range of other market stakeholders, including non-participating developers, trade associations, and utilities.

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<sup>1</sup> The questions were modified somewhat when asked of non-winning bidders.

## **ESTIMATING SPILLOVER**

For the purposes of this analysis, spillover includes all the generation output from RPS supported projects that was not sold to the RPS. The rationale is that developers participating in the RPS are required to set aside a minimum of 5% of generation for sale to other markets. In several cases, their set aside for sale to other markets was greater than 5% and even as high as 90%. In addition, the majority of developers selling project output to NYSERDA explained that the voluntary REC market alone would have provided insufficient demand on which to base their development decision. This indicates that the program was the key driver behind construction of the entire project, though only the bid quantity is sold to the RPS program.

Project development occurring in New York without NYSERDA REC contracts was considered for inclusion in the spillover definition. In part because of the complex and uncertain project development timeline, some renewable energy projects have been built in New York without first securing a RPS REC contract. These developers may have built the projects in hopes of securing an RPS contract in the future, or they may have developed the project because they had a good site secured in New York, but wish to sell into the more lucrative New England RPS compliance markets. In either case, the existence of the New York RPS program may have played a role in attracting the developer to pursue project development activity in the State in the first place. In addition, Systems Benefit Charge-funded incentive programs, which preceded the RPS, may have provided the project with pre-development assistance that facilitated the developers' initial activities in the State. If that was the case, it would have disqualified them from the RPS program.

Because insufficient data were available on which to determine the role of the RPS program in the development of new facilities in the state that do not hold RPS contracts, these facilities were excluded from the spillover definition used for this analysis. As a result, the spillover value estimated here is conservative.

## **SUMMARY OF DATA USED TO INFORM ANALYSIS OF PROGRAM INFLUENCE**

As part of the full RPS program evaluation effort, in-depth telephone interviews were conducted with nearly 90 New York renewable energy market stakeholders. As noted above, these interviews were structured to gather data on a wide range of topics and included three questions related to program attribution. Interviews were conducted with 18 participating developers, ten of which have secured contracts with NYSERDA through the RPS program. A more detailed summary of the interview effort is included in our discussion of methods used across the full market assessment completed by Summit Blue.

For the purpose of estimating spillover, the analysis factored in only responses from participating projects that have won NYSERDA contracts. This is appropriate given that spillover is defined as the portion of generation from RPS-contracted projects that is not actually sold to the RPS. In addition, as noted earlier for the purposes of discussing program influence, responses from all participating developers (both winning and non-winning) were considered.

Input from non-participating developers (those that have not bid into any of the RPS solicitations) and other market stakeholders (trade associations, utilities, program staff, etc.) was used for context and for purposes of comparing with responses from participating developers. It was determined that, because these other market participants have, to date, had more limited experience working to get projects built in New York, the focus of the program influence analysis should be on participating developers.<sup>2</sup> Many of the other interviewees also expressed that the participating developers were in the best position to make informed statements on program influence.

The program influence analysis was also placed in context by examining how project development activity in New York compares to that which is occurring in other states with comparable amounts of wind resources, but which lack an RPS.

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<sup>2</sup> While a few of the eight non-participating developers interviewed have actually built a renewable energy project in New York, the majority of interviewees in this category have yet to complete a project in New York.

**Section 3**  
**RESULTS AND DISCUSSION**

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This section discusses the spillover analysis and a broader program influence analysis.

**SPILLOVER ANALYSIS RESULTS**

Based on our analysis of projects holding REC contracts with NYSERDA, a spillover value of 19% was estimated. This result is influenced by the fact that some of the largest projects participating in the program have a large amount of generation that will be sold to markets other than the New York RPS compliance market. As shown in Table 1, the average project that secured an RPS contract only bid 85% of its output for sale to the New York RPS, and the weighted average percentage of spillover across projects holding RPS contracts is 19%.<sup>3</sup>

**Table 1. Summary of Bid Percentages and Spillover Percentages**

	<b>Bid Percentage</b>	<b>Spillover Percentage</b>
Average (bid %) / Weighted Average (spillover %)	85%	19% <sup>4</sup>
Median	95%	5%
Mode	95%	0%

Source: NYSERDA RPS program data

This analysis indicates that the RPS is a fundamental driver for renewable energy development activity in the State, and that the RPS program is responsible for additional renewable energy generation over and above that which is counted toward RPS compliance. These results are consistent with input collected from respondents across several different categories of market participants, including trade associations, utilities, manufacturers, the financial community, and program staff, all of whom indicated that very little project activity would have occurred or would be occurring in the State in the absence of the RPS program.

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<sup>3</sup> This includes projects from all three procurements. Note that, in the first procurement (RFP 916), projects were allowed to bid up to 100% of their project output, though in the later two solicitations, there was a maximum bid percentage limit of 95%.

<sup>4</sup> This represents a weighted average in which the percentage of output over and above that sold to NYSERDA is weighted by the bid quantity (MWh) represented by the projects.

## **PROGRAM INFLUENCE ANALYSIS**

This section discusses the RPS program's influence on the market for large-scale renewable energy in New York, and how program influence has varied and may vary in the future according to resource technology type. Finally, there is a comparison of New York's wind energy development activity to other non-RPS states to provide another indicator of the influence New York's RPS program has had on renewable energy development in the State.

Interviews with renewable energy market stakeholders in New York indicate that the RPS is a fundamental driver for renewable energy development activity in the State. Nearly all developers that have participated in the New York RPS program, both winning and non-winning bidders, indicated that the REC contract either had played or would play a key role in helping them secure financing for their project. The key benefits of the NYSEERDA REC contract are that its long-term nature helps mitigate revenue risk, and that NYSEERDA is a creditworthy entity. Both of these factors hold great value for project finance purposes. In addition, other market stakeholders explained that very little project development activity would be taking place in the State in the absence of the RPS program. As discussed in this section, Summit Blue's analysis did, however, find some variation in the way the program influenced different types of projects and developers.

The next subsection describes the level of influence by respondent type. This is followed by discussion of the role of New York's market structure, type of program influence, and other program influences.

### **Level of program influence by respondent type**

Table 2 presents program influence by category, breaking the categories down into large and medium scale wind, and then across each of the other relevant technologies. To protect the confidentiality of respondents, program influence is discussed in terms of the *amount of generation* associated with respondents' projects which fall into each technology category, rather than in terms of the *number* of projects represented within each category.

Among *winning bidders*, for the category representing the largest amount of generation, large wind, 100% of generation was found to be highly influenced by the program. One hundred percent of generation in the biomass category was found to be highly influenced by the program as well. In the category of medium scale wind, the program was found to have a high level of influence on 93% of generation. A low level of

program influence was found for only 7% of the generation in the medium-scale wind category. A medium level of program influence was found for all of the hydro projects associated with winning bidders.

For *non-winning bidders*, the large wind category again represented the largest amount of generation. One hundred percent of generation in this category was found to be highly influenced by the program. The program also had a high level of influence on medium-scale wind generation (43%) and biomass generation (41%). A medium level of program influence was found for the majority of landfill gas (88%) and hydro (87%) generation, and for a significant amount of the medium scale wind generation (34%) associated with non-winning developers. Low levels of program influence were found for a substantial amount of biomass (59%) generation, as well as moderate amounts of medium scale wind (24%), landfill gas (12%), and hydro (13%) generation.

**Table 2. Program Influence by Category**

		Winning Bidders		Non-Winning Bidders	
Technology	Level of Program Influence	MWh Represented (total project output when completed)	% of generation in technology category	MWh Represented (total project output when completed)	% of generation in technology category
Large Wind (>100 MW)	High	2,808,694	100%	744,506	100%
	Medium	0	0%	0	0%
	Low	0	0%	0	0%
Medium Wind (<100 MW)	High	763,951	93%	306,950	43%
	Medium	0	0%	243,747	34%
	Low	59,743	7%	171,467	24%
Biomass	High	220,000	100%	67,200	41%
	Medium	0	0%	0	0%
	Low	0	0%	96,798	59%
Landfill Gas	High	0	N/A	0	0%
	Medium	0	N/A	363,154	88%
	Low	0	N/A	51,315	12%
Hydro	High	0	0%	0	0%
	Medium	104,326	100%	14,998	87%
	Low	0	0%	2,331	13%
<b>Total Generation</b>		<b>3,956,714</b>		<b>2,062,466</b>	
<b>Total Projects Represented</b>		<b>35</b>		<b>23</b>	

These findings show that the majority of wind and biomass project development in the State has been highly influenced by the presence of the program, whether the project is a winning bidder or not. This is consistent with findings related to project finance needs for most renewable energy projects. Even though large developers have the ability to fund projects on their balance sheet, it is important to mitigate some portion of revenue risk in order to gain internal approval to pursue a project. For medium and small-scale project developers, a long-term REC contract typically plays a critical role in securing project financing, where debt is more likely to be part of the finance package and banks require a high degree of revenue certainty from creditworthy sources. Several developers of projects that have not secured REC contracts with NYSERDA explain that the presence of the program in and of itself played a key role in their

company's decision to pursue development activity in New York. Many of these companies either have developed or will develop their project with the intent to secure an RPS contract at some point in the future.

The following sections discuss program influence on wind and biomass, hydro, and landfill gas projects.

**Wind and biomass projects.** In the few cases where a wind or biomass developer reported that the RPS program was of medium or low importance, this generally pertained to the unique circumstances of a few specific projects that had managed to obtain REC contracts with other entities for a substantial portion of the project's REC output. For example, a project may have been developed prior to the launch of the New York RPS program. Alternatively, it may have been able to take advantage of early-mover advantages, such as an ability to select a site with exceptional wind resources, or to lock in a turbine supply agreement when equipment prices were much lower than they have been in the past few years. However, in most cases, these developers still expressed that the RPS program as a whole is of great importance to the New York renewable energy market and that little development activity would be occurring in the State in the absence of the program.

There is some indication that, for a limited number of wind and biomass projects, development is feasible in New York without RPS contracts. This is based purely on the development success of a few recent wind and biomass projects in the State that do not hold RPS REC contracts. For example, three wind plants built after the launch of the New York RPS lack NYSERDA REC contracts and are registered to sell RECs into the Massachusetts RPS. These include Maple Ridge II, Munnsville Wind Farm, and the Steel Winds Energy Project.<sup>5</sup> In addition, one biomass project, Laidlaw Energy and Environmental, is registered to sell RECs into the Massachusetts RPS market, though it did not apply for a REC contract under the New York RPS program. The project is expected to become operational in early 2009.<sup>6</sup>

While they may signal that some wind and biomass projects can succeed on their own, these data do not undermine the overall finding that the RPS program has a high level of influence on renewable energy development in the State. Both the Maple Ridge II and Steel Winds projects attempted, though unsuccessfully, to secure REC contracts through the New York RPS program in the NYSERDA RPS

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<sup>5</sup> In addition, the West Hill wind project, expected to come online in the fall of 2008, is registered as an eligible facility for the Massachusetts RPS.

<sup>6</sup> Commonwealth of Massachusetts Division of Energy Resources. *Massachusetts RPS Compliance Report for 2006*. February 15, 2008.

solicitation (RFP 1037) for which awards were made in 2007, the same year in which the two projects came online. In addition, these projects may choose to sell to New York if they are able to secure NYSEERDA REC contracts in the future. Furthermore, responses from all wind developers interviewed indicate that virtually all wind project development completed in the State is built with the expectation that the projects will, at some point, secure RECs through the NYSEERDA RPS program. However, due to the competitive nature and timing of the RPS program, developers cannot wait to receive a REC contract before initiating project development.

This input from the market, coupled with a likelihood that project finance will become more difficult with increasing instability in the financial markets, overshadows the ability of a few projects to be developed in New York without RPS contracts. Further, it supports the finding that, overall, the program is still a critical driver for project development.

In fact, an important theme which came through in the wind developers' comments was that the RPS program, or some alternative form of strong, consistent demand for RECs, will take on greater importance in the market in the coming years. This is primarily because project sites with the best resources will have already been developed. Project revenues are directly linked to a project's power production, and this output is highly sensitive to the amount of available wind resource. Therefore, as more projects are developed and the "low hanging fruit" is picked, project economics will become weaker and projects will become more dependent on REC revenue. Volatility in the U.S. and global financial markets also introduces a great deal of uncertainty around future equipment costs and costs of capital. For capital-intensive wind projects, increases in project costs would further weaken project economics. These effects may be countered by increases in energy prices over time and associated project revenues. However, many developers and other market participants expressed that the value of the REC contracts for project financing will only increase in the future.

**Hydro projects.** Developers of participating hydro projects expressed lower levels of program influence on their project activity; however, they considered the RPS program as significantly valuable in helping to get projects financed in general. It was reported that some of the earliest projects that secured RPS REC contracts had highly favorable economics and may have been developed without the RPS REC contract. Demonstrating consistency with comments from wind developers, it was noted that, as project sites with the most favorable characteristics are developed first, the remaining sites will have less favorable project economics. Therefore, development of these future projects will be more dependent on an ability to secure a stable, predictable REC income.

**Landfill gas projects.** No landfill gas projects have secured RPS contracts in New York. However, according to NYISO records, 16 landfill gas projects are producing electricity in the State.<sup>7</sup> Landfill gas projects have been heavily influenced by REC markets in neighboring regions. At present, these projects can command much more favorable REC prices in the New England RPS markets. Therefore, the REC prices bid into the New York RPS market, which presumably reflect competitive prices they can secure in other markets less any export costs, have been uncompetitive.

For example, 14% of Massachusetts' 2006 RPS compliance RECs came from renewable energy plants in New York, including output from five landfill gas plants.<sup>8</sup> Only one New York wind project, and no New York biomass or hydro projects sold RECs to the Massachusetts RPS market in that timeframe.<sup>9</sup> Seven additional New York landfill gas generators were registered to provide RECs for RPS compliance in Massachusetts as of fall 2008.<sup>10</sup>

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<sup>7</sup> New York Independent System Operator. *2008 Load and Capacity Data "Gold Book."* April, 2008.

<sup>8</sup> This included output from the following landfill gas plants: Colonie LF/Innovative Energy (Cohoes), Ontario LFG/Seneca Energy II (Stanley), Model City Energy Facility (Lewiston), Modern LFG (Youngston), and Seneca Falls Landfill Gas (Waterloo). In addition, this included output from the Fenner windfarm, which was built prior to the launch of the New York RPS program. Source: Commonwealth of Massachusetts Division of Energy Resources. *Massachusetts RPS Compliance Report for 2006.* February 15, 2008.

<sup>9</sup> As noted above, a handful of additional New York wind projects are registering to sell RECs into Massachusetts' RPS market, as well as one New York biomass project. However, these projects may choose to avoid the export costs and sell to NYSERDA if given the opportunity.

<sup>10</sup> This includes six facilities referenced in the Massachusetts Department of Energy Resource's (DOER) *Massachusetts RPS Compliance Report for 2006* (February, 2008), as well as one additional facility noted on DOER's website as approved in July, 2008.

The fact that many landfill gas plants are built in-state without New York RPS REC contracts likely reflects that dispatchable renewables face a lower economic hurdle for selling RECs into neighboring RPS REC markets than do intermittent resources. One key factor is that Massachusetts has an hourly matching requirement for delivery of energy into the ISO-NE control area. Since non-intermittent generators can better predict their project output, they can more cost-effectively schedule transmission for delivery of energy into the neighboring region. For landfill gas generators, the margin on REC prices in Massachusetts is, apparently, high enough to support their costs.<sup>11</sup> Biomass projects, the other key non-intermittent renewable resource, may not comply with Massachusetts' eligibility rules regarding pollution control, or the margins may not be sufficient for biomass projects, due to biomass projects' higher costs of fuel and equipment. The superior export conditions for landfill gas projects appear to be evidenced by the substantial role New York landfill gas projects have had in Massachusetts' 2006 RPS compliance market, noted above.<sup>12</sup> The success of New York landfill gas projects in the absence of New York RPS REC contracts likely also reflects the differences between the project economics of landfill gas projects and other types of renewable energy projects. First, landfill gas projects are currently more cost-competitive with conventional fossil fuel generation than are other renewable technologies. An RPS cost study prepared in 2008 for NYSERDA indicates that most new landfill gas projects brought online in New York in the future will require no levelized cost premium (REC revenue stream) under a long-term contract scenario.<sup>13</sup>

As corroborated from interviews with the landfill gas community, landfill gas project economics are less driven by upfront capital costs than are the economics of wind projects. Further, the fuel supply for landfills is more stable and predictable than for most biomass projects. For wind projects, the initial finance and construction decisions may be more dependent on the developers' ability to prove that the high capital costs can be recovered over time. And for biomass projects, given the uncertainty around their fuel supply and operating costs, it seems logical that project decision-making would be more dependent on a stable REC revenue stream than for a landfill gas project.

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<sup>11</sup> Massachusetts Department of Energy Resources is currently reviewing potential changes to the import rules it applies to generators in neighboring regions to become eligible to sell into the Massachusetts RPS market. These new rules, proposed as part of the Green Communities Act, would require external generators to participate in the New England capacity market and to "net" any brown power exports from the region from their green power imports (Chapter 169 of the Acts of 2008, Section 105).

<sup>12</sup> 2006 is the most recent year for which Massachusetts RPS compliance data are available.

<sup>13</sup> La Capra Associates and Sustainable Energy Advantage. 2008. *New York Renewable Portfolio Standard Cost Study Update: Main Tier Target and Resources*. New York State Energy Research and Development Authority.

### **The role of New York's market structure**

NYSERDA's REC contract is influential in the marketplace because it offers a much sought after source of long-term, stable-priced, credit-worthy REC off take. However, it is important to note that the structure of New York's renewable energy markets and that of neighboring markets also have a significant bearing on respondents' comments with regard to program influence. With only one really large scale REC buyer in the New York market (NYSERDA), market participants are, by default, highly dependent on the RPS contracts.

Without a NYSERDA REC contract, developers look to REC markets in neighboring regions for REC buyers, including the Long Island Power Authority (LIPA).<sup>14</sup> Developers consistently remarked that the voluntary REC market in New York was too small to serve as a driver for project development on its own. Given the uncertainty and constraints around rules for deliverability into neighboring regions, selling to neighboring regions has strong limitations for many market participants in New York, despite the fact that REC values are much higher in other northeast states.

### **Type of program influence**

Input from market participants indicates that the RPS program primarily affects whether a developer chooses to locate a project in New York as opposed to another state with similar or better resources and/or REC market potential. The program can also affect the timing or size of project development.

When winning bidders were asked how their project would have been different in the absence of the NYSERDA REC contract, four of the nine respondents stated that the program affected the timing of their project's development, and one commented that it affected the size of their project. Of those reporting that the program influenced their project's timing, most were biomass developers. However, all technologies were represented.

In responses to other questions by both participating and non-participating developers, as well as by other market participants, a number of respondents noted that the RPS program's timing has a significant influence on the timing of project development. Several respondents across a number of interview categories commented that the program's schedule was poorly suited to the renewable energy project

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<sup>14</sup> LIPA also purchases a substantial scale of RECs; however, LIPA's RPS targets are voluntary and are approximately equal to their proportionate share of statewide load served in New York.

development cycle, or had a detrimental effect on projects' development schedules. These comments pertained to the infrequent occurrence of the RPS solicitations, the uncertainty around when future solicitations will occur, as well as the program's policies regarding in-service dates for winning projects.

It is important to recognize that the RPS program is only one of many factors that can influence the development timeline. Other factors include the expiration of the federal Production Tax Credit (PTC), a project's placement in the NYISO's interconnection queue, availability of parts and supplies, and seasonal issues.

The timing elements of NYSERDA's REC procurements reflect the State's interest in balancing a variety of priorities. The program is designed to select non-speculative projects and to result in cost-effective RPS compliance for New York's ratepayers. While developers expressed concerns about requirements to pay additional security fees if a project's in-service date is delayed, contractual arrangement for delivery of energy or RECs with parties other than NYSERDA would also carry penalties for failure to deliver.

Regardless of the timing of a solicitation, there will always be projects that are ill-prepared to participate. However, the infrequent nature of the solicitations does not make it any easier on developers to manage the complex timing issues in the project development cycle. Greater certainty regarding the future of the RPS program would help reduce the timing-related challenges facing developers; developers could plan to submit a bid under a future RFP, the timing of which may be better suited to their projects' development schedules.

### **Other indicators of program influence**

Another compelling indicator of the influence NYSERDA's RPS program has had on the New York renewable market can be found by comparing the level of renewable energy development activity in New York to the level of activity in other states with substantial resources, but no accessible RPS compliance market.<sup>15</sup> In the case of wind power, the resource with the greatest level of activity in New York since the RPS went into effect, states with substantial wind development potential,<sup>16</sup> but no RPS (i.e., Idaho, Kansas, Nebraska, Oklahoma, and Wyoming) have seen far lower realization of their development potential than

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<sup>15</sup> West Virginia has significant wind and does not have an RPS, however, projects in that state can sell into the Pennsylvania and New Jersey compliance markets.

<sup>16</sup> As measured by annual energy potential in the billions of kWhs, factoring in environmental and land use exclusions for wind class of 3 and higher. [http://www.awea.org/pubs/factsheets/Top\\_20\\_States.pdf](http://www.awea.org/pubs/factsheets/Top_20_States.pdf).

New York (Table 3). New York is also ranked ninth in the nation for installed wind capacity, ahead of Kansas and Oklahoma, both of which possess far greater development potential than New York.<sup>17</sup>

**Table 3. Realization of wind development potential, New York v. non-RPS states**

	<b>New York</b>	<b>Kansas</b>	<b>Nebraska</b>	<b>Wyoming</b>	<b>Oklahoma</b>	<b>Idaho</b>
Rank in US for development potential	15	3	6	7	8	13
Development potential (MW)	7,080	121,900	99,100	85,200	82,700	8,290
Wind capacity (MW existing)	707	465	73	349	689	75
Wind capacity (MW under construction)	589	549	81	109	19	71
<b>Realization of development potential</b> ( <i>ratio of development potential to capacity, both existing + under construction</i> )	<b>18%</b>	<b>1%</b>	<b>0%</b>	<b>1%</b>	<b>1%</b>	<b>2%</b>

Source: AWEA.

Further indicators of the fact that the NYSEERDA RPS program plays an important role in the New York renewable energy market are that the RPS program is highly competitive, and REC prices bid into the program are not zero. If REC income from the program were of little importance to developers in the State, they would bid extremely low REC values, or would avoid the program altogether and instead just sell into other more lucrative markets. In addition, as noted earlier, our research found that several developers of renewable energy projects that are currently operational in New York, but lack NYSEERDA REC contracts, do plan to bid into future NYSEERDA RPS solicitations.

## CONCLUSION

A traditional program attribution analysis was not conducted for the RPS program due to unique factors related to this evaluation. However, a more general analysis of program influence was completed, and program spillover effects were estimated. Based on results from interviews with nearly 20 developers, as well as input from a broad spectrum of other market participants, it was found that the RPS program is the

<sup>17</sup> AWEA project data, current through June 30, 2008. <http://www.awea.org/projects/Default.aspx>.

key driver behind large-scale renewable energy development in the State. The effects of the program varied by resource technology, with the program having the greatest level of influence on wind and biomass projects.

## Section 4

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