

# **RENEWABLE PORTFOLIO STANDARD**

## **Customer-Sited Tier Program**

Program Goals and Funding Plan

**(2010-2015)**

June 29, 2010

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## **SECTION 1: INTRODUCTION**

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### **PURPOSE**

This 2010 Customer-Sited Tier Program Operating Plan (“Plan”) sets forth the plan for Customer-Sited Tier program implementation under the New York Renewable Portfolio Standard for the 2010 through 2015 period.

The program goals and implementation strategies contained in this Plan incorporate the decisions and guidance set forth by the Public Service Commission in its April 2, 2010 order (“Order”).<sup>1</sup> These goals and strategies also reflect program area experience with the technical evolution and market deployment of the affected technologies, market reaction to program incentives, and the outcome of the NYSERDA program evaluation. In the Order, the Commission took the following actions:

- a) established new CST program goals for the previously approved CST technologies (photovoltaic (PV); fuel cell, anaerobic gas-to-electric digester technologies (ADG), and on- site wind installations) to help support the overall RPS program target of 30% by 2015;
- b) authorized a new CST program aimed at encouraging additional customer-sited installations in the downstate region (NYISO Zones G, H, I and J);
- c) authorized a new CST program focused solely on the deployment of Solar Thermal energy systems; and
- d) authorized funding through the full compliance period for the overall RPS program, inclusive of new CST programs and program administration that it determined to be sufficient to achieve overall program goals by 2015.

This Commission decision results in a slate of CST programs, estimated targets and associated funding as described more fully in the following sections of this Plan. The Order further directed NYSERDA to consult with the DPS on the development of this Plan for solicitation of customer-sited renewable resources, and provided the parameters and principles that are incorporated herein.

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<sup>1</sup> “Order Authorizing Customer-Sited Tier Program Through 2015 and Resolving Geographic Balance and Other Issues Pertaining to the RPS Program,” issued and effective April 2, 2010 (“Order”).

## CST PROGRAM PROGRESS

Four Customer-Sited Tier solicitations were issued under the 2007 Operating Plan, offering funding support through an open enrollment, first-come, first-served process for photovoltaic (PV), fuel cells, anaerobic gas-to-electric digester technologies (ADG), and small wind installations.

Table 1-1 below describes the status of CST programs on the basis of program funding commitments and planned expenditures using authorized funding through December 31, 2009. Tables 1-2 and 1-3 below present a forecast of installed capacity and production of energy from committed and planned facilities on the basis of current funding authorizations described in Table 1-1.

**Table 1-1. Funding Status of 2007 CST Operating Plan effective December 31, 2009**

	<b>Budgeted Funds</b>	<b>Encumbered and Pending Contracts</b>	<b>Balance</b>
Photovoltaics	\$ 75,333,734	\$ 75,333,734	\$ --
Fuel Cells	\$ 5,794,420	\$ 2,507,860	\$ 3,286,560
Anaerobic Digesters	\$ 20,100,000	\$ 19,274,750	\$ 825,250
Small Wind	\$ 2,071,846	\$ 1,405,036	\$ 666,810
Metrics and Verification	\$ 4,300,000	\$ 2,359,400	\$ 1,940,600
Total:	\$ 107,600,000	\$ 100,880,780	\$ 6,711,220

**Table 1-2. Actual and Expected Installed Capacity effective December 31, 2009 (MW)**

<b>CST Program</b>	<b>Original Operating Plan: Target Encumbered Capacity by 12/31/09</b>	<b>Pending Contracts</b>	<b>Planned Capacity (w/remaining funds)</b>	<b>Actual Installed Capacity</b>	<b>Total Pending, Installed, and Planned Capacity</b>
Solar Photovoltaics	3.5	11.44	--	8.11	19.55
Fuel Cells	2.7	.415	0.75	.005	1.36
Anaerobic Digesters	3.7	6.01	--	3.20	9.21
Small Wind	1.8	0.30	0.15	.140	0.59
Program Total	11.7	18.17	.90	11.45	29.77

**Table 1-3. Actual and Expected Energy Production effective December 31, 2009 (MWh)**

<b>CST Program</b>	<b>Original Operating Plan: Target Annual Generation Encumbered by 12/31/09</b>	<b>Expected Production from Pending and Planned Contracts</b>	<b>Actual Energy Production from Installed Capacity</b>	<b>Total Expected Production Progress</b>
Solar Photovoltaics	4,533	14,837	10,512	25,349
Fuel Cells	18,700	1,680	--	1,680
Anaerobic Digesters	25,700	41,775	22,243	64,018
Small Wind	3,945	604	170	774
Program Total	52,878	58,895	32,925	91,820

## **SECTION 2: PROGRAM GOALS AND FUNDING**

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### **CST PROGRAM GOALS AND FUNDING BUDGET**

Pursuant to the Commission's April 2, 2010 Order, the Plan sets forth CST program funding as presented in Table 2-1 below.

**Table 2-1. Customer-Sited Tier Funding Budget by Program <sup>2</sup>**

Program	Funding Amounts (in millions)						Total
	2010	2011	2012	2013	2014	2015	
Solar Photovoltaics	24.000	24.000	24.000	24.000	24.00	24.000	144.000
Geographic Balancing <sup>3</sup>	---	30.000	30.000	30.000	30.000	30.000	150.000
Fuel Cells	3.600	3.600	3.600	3.600	3.600	3.600	21.600
Anaerobic Digestion Systems	13.275	13.300	12.000	11.600	10.200	10.200	70.575
On-Site Wind	1.575	2.800	2.900	3.100	3.800	4.000	18.175
Solar Thermal	3.225	4.300	4.300	4.300	4.300	4.300	24.725
<b>Total</b>	<b>45.675</b>	<b>78.000</b>	<b>76.800</b>	<b>76.600</b>	<b>75.900</b>	<b>76.100</b>	<b>429.075</b>

Budgets provided in Table 2-1 are for program costs only. Costs for program administration and evaluation are provided for separately in the April 2, 2010 Order. In accordance with the Order, NYSERDA administration will include developing and issuing Program Opportunity Notices for each technology and solicitations for the Geographic Balancing component; reviewing and analyzing each application; performing project reviews to ensure proper commissioning and operation prior to issuing payments; performing measurement and verification; and performing monitoring of system performance through real-time internet-based systems. In accordance with the Order, the cost of monitoring equipment will be charged to the budget for program costs.

Program Evaluation will include an assessment of the contribution of the applicable technologies towards the overall RPS goal. This will include both market and impact evaluation. Administration and Evaluation are discussed in more detail in Sections 4 and 5 of this Operating Plan.

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<sup>2</sup> Table values may not be equivalent to annual program budgets as expressed in Section 3 because of rounding.

<sup>3</sup> Unlike the other programs described in the table, the geographic balancing program incentives and implementation service budget are not restricted to supporting one technology (refer to Section 3).

Also pursuant to the Order, the estimate of installed capacity and energy production associated with projects under contract by the end of 2015 is expected to approximate 254 MW and 531,599 MWh, as outlined in table 2-2 below. Achievement of the targets expressed in table 2-2 will be measured on the basis of energy production that is associated with funding that is encumbered/contracted as of the end of program year 2015. As noted by the Order, the “figures illustrate expectations” and are not intended as hard targets. Actual rates of achievement will vary somewhat from these figures.

**Table 2-2. Customer-Sited Tier Expected Results by Program 2015**

<b>Resource Category</b>	<b>Capacity in MW Encumbered by 12/31/15</b>	<b>Annual Generation in MWh Encumbered by 12/31/15</b>
Solar Photovoltaics	82.3	93,806
Geographic Balancing	82.9	130,477
Fuel Cells*	8.7	67,385
Anaerobic Digester Biogas	24.1	169,657
On-Site Wind	10.5	18,351
Solar Thermal	45.5	51,923
Program Total	254.0	531,599

\*Estimated targets for fuel cells were corrected by DPS Staff on April 14, 2010.

## **GENERAL PROGRAM REQUIREMENTS**

### **Program Structure**

NYSERDA has designed programs to achieve the program principles and goals stated in a series of Commission orders addressing the CST. The general requirements for the CST program are presented below. These general requirements will apply unless specified otherwise in the program specific plans outlined in detail in Section 3 below.

In general, programs will offer funding support through an open enrollment, first-come, first-served process initiated by resource-specific solicitations. The on-site wind program will be modified to include a competitive offering, and the new, geographically focused program in the downstate region will be implemented entirely through competitive solicitations. Details on this program are outlined in Section 3. The design of the individual program solicitations and the amount of funding to be provided for individual projects will be tailored to the target technologies and markets. More specific information on the programs for each of the CST technology resource categories is provided in Section 3 below.

NYSERDA will share with the customer the costs of installing and operating eligible equipment. The CST program will offer financial incentives in the form of capacity buy-down payments, performance-based incentives, or some combination of the two. Funding support may be provided directly to customers or through intermediaries such as eligible system installers if the customers make appropriate assignments to the intermediaries. NYSERDA notes that there have been requests from some installers for a low-interest loan program to encourage installations of PV systems. NYSERDA will continue to monitor program demand, and if warranted, may recommend a loan subsidy in lieu of incentives in the future.

### **General Eligibility**

The CST program is designed to promote the adoption of emerging technologies that offer direct benefits to customers and that, in the aggregate, may offer broad benefits to ratepayers. Eligible technologies defined in the Order include PV, on-site wind, fuel cells, anaerobic digestion biogas to electricity systems solar thermal systems and in the case of a new, geo-geographically focused program in the downstate region, electric generating technologies that use renewable biogas fuels.

In general, participants must meet the following program requirements:

- (1) only customers that pay the RPS program surcharge are eligible to receive funding through the CST;
- (2) eligibility includes only self-generation, behind-the-meter facilities located in New York State;
- (3) while no upper limit has been established for the size of eligible installations, individual program offerings may include capacity-based incentive caps, and incentives may be limited to that portion of capacity/production that is necessary to satisfy connected peak customer load.

### **Program Incentive Structures**

The technologies eligible for support in the CST have, in many cases, different target customers, different installation and operating requirements, and different levels of market penetration. To meet the goals of the CST Program effectively, capacity and performance-based incentives will be designed to address the unique technology and market needs associated with each of the CST subprogram areas.

For each technology resource category, capacity and performance-based incentive levels will be established in open enrollment solicitations that are expected to be issued soon after issuance of this Plan. Incentive levels will be reviewed and may be modified periodically thereafter by NYSERDA based on considerations such as the availability of funds and levels of market penetration of individual technologies. Initial and revised incentive levels will be published on NYSERDA's website along with the application form and other informational materials pertaining to the CST program.

## **Quality Assurance/Quality Control (QA/QC)**

To protect ratepayer investments in the program, ensure the quality and long-term operation of systems, and to maximize participant benefit from the program, the CST will include a quality assurance and quality control (QA/QC) component. QA/QC will be performed by independent third parties who will review both administrative (QC) and installation (QA) practices. NYSERDA will select contractors to perform design reviews and inspect installations to confirm that the appropriate equipment was properly installed and is performing at optimum levels.

QC inspections will inform NYSERDA staff of any changes needed to administrative processes to ensure appropriate equipment is specified. QA inspections will identify any installation deficiencies that must be corrected. A schedule of inspections will be established based on past program experience, past history of inspection results, and other factors as appropriate. QA contractors may also provide technical support to ensure deficiencies identified during QA inspection are corrected.

For programs requiring such, QA inspections will also enable NYSERDA to track the overall performance of installers, to ensure that only those providing quality services remain eligible to participate. For these programs, NYSERDA will require appropriate installer training or certifications, where available, to improve quality workmanship.

Also, to enable effective QC and QA processes, NYSERDA will continue to use certain web-enabled software and databases (e.g., Clean Power Estimator, Power Clerk (PV), NYSERDA's CHP website (Fuel Cells and ADG)), performance monitoring equipment and systems, and other databases for documenting program design, performance and status. QA and QC contractors will have access to the systems.

Based on a combination of NYSERDA's experience in conducting program activities under the 2007 CST Operating Plan, similar efforts associated with other NYSERDA program activities, and an assessment of needs under the next phase of the RPS, NYSERDA expects that QA/QC activity costs will approximate \$3.2 million per year (See Section 4).

## **Outreach and Education**

To assist in the adoption of emerging technologies by customers, a measured level of outreach and education may be needed, particularly to support the solar thermal program. Typically, outreach and education funds would be used early in the program cycle, over the initial three years of program implementation. However, funding for outreach was not provided by the Order. Response to program opportunities will be evaluated in consultation with Staff during the initial year of the program to determine whether funding should be allocated for outreach and education.

## **CAPACITY LIMITATIONS**

Subject to limits that may appear as to individual programs, incentives may generally be provided as large as necessary to meet the customer's approximate peak connected load at the meter. However, where there are recognized public benefits, or where practical considerations suggest, incentives may be approved for projects that are sized larger than the customer's load.

CST facilities, because of physical requirements, can be slightly larger than the customer's load if an exact match is not practicable. The physical requirements may include the incremental size of the electric power generation and ancillary equipment currently available and, with respect to anaerobic digester systems, the system size necessary to effectively use the biogas produced from the anaerobic digestion of the customer's waste feedstocks.

For all technologies other than anaerobic digestion systems, in cases where physical, technical or economic considerations result in CST systems that more than slightly exceed the participant's approximate peak connected load, incentives may be based on the customer's approximate peak connected load.

## **THIRD PARTY OWNERSHIP**

Under a third-party ownership scenario, contractors that meet the eligibility requirements included in individual solicitations and incentive programs may be permitted to build, own and operate a CST-eligible technology at a customer's site if the customer pays the RPS surcharge and if the contractual relationship between the customer and the third party clearly indicates that the entire incentive payment is being passed on to the customer.

## **RENEWABLE ENERGY CREDITS AND ENVIRONMENTAL ATTRIBUTES**

NYSERDA will seek to ensure that the environmental benefits, including the environmental attributes, associated with the CST program accrue, where possible, to the ratepayers of New York. The definition of RPS-eligible environmental attributes will follow the requirements outlined in NYSERDA's solicitations for the Main Tier of the RPS. NYSERDA will control the rights and all claims to the environmental attributes created by the portion of the electric generation systems installed with CST funding for the duration of the performance payments or three years, whichever is greater, starting with the date the system is commissioned to NYSERDA's satisfaction.

To provide flexibility and to foster voluntary green energy markets, NYSERDA will allow customers who participate in kWh performance-based programs (*i.e.*, those receiving \$/kWh incentives only) to terminate CST performance-based incentives and move to a green energy market in New York State with the attributes.

As has been the case with the CST program to date, the environmental attributes associated with biogas methane destruction are considered to be separate from electricity-based RPS-eligible attributes and will be retained by the customer.

Until a system is in place to track and account independently for environmental attributes associated with power generated by customer-sited resources, the success of the CST program will be measured by the installed capacity and by measured or forecasted energy production.

### **SYSTEM BENEFITS CHARGE (SBC) FUNDING LIMITATION**

The RPS and System Benefit Charge (SBC) programs have been designed to coordinate but not duplicate activities. Facilities that have received NYSERDA funding under a contract that includes the purchase and/or installation of power generating equipment through but not limited to, SBC-funded solicitations, will not be eligible for CST capacity-based incentives for the original power-generation equipment. The facilities, however, may be eligible for CST performance-based incentives subject to conditions described in Section 3 below and individual solicitations. Previous funding through NYSERDA for the purchase and installation of such generating equipment will offset contract awards for affected CST projects. Individual solicitations will provide instructions and limitations regarding the eligibility of projects as to which applications are pending under another NYSERDA program.

### **UNUSED PROGRAM FUNDING BALANCES**

No later than 30 days after the close of each calendar year, NYSERDA will report on the balance of funding, by CST program that is not yet the subject of a incentive-based contract (unencumbered) and after consultation with DPS, prepare a recommendation for the Commission's consideration regarding the use of any available funding balances.

## **SECTION 3: PROGRAM-SPECIFIC GOALS AND FUNDING BUDGET**

### **SOLAR PHOTOVOLTAIC (PV) PROGRAM**

#### **Background**

The Customer-Sited Tier (CST) PV program will be offered to customers in all sectors on a first come-first serve basis. The Program will be managed by NYSERDA's Residential Energy Affordability Program (REAP) in collaboration as necessary with NYSERDA's Research and Development and Energy Efficiency Services groups. Careful planning and coordination is needed to leverage cross-program strengths for: (a) systematic identification and breaking down of barriers, and (b) effective planning and communication with markets. This is also needed for a successful launch of the new Geographic Balance Program described later in this section.

#### **Program Description and Types of Incentives**

The PV incentive program will be designed to offer the lowest incentive possible to continue to grow the market for PV. Incentive levels will be adjusted regularly to address consumer demand and market factors in a way that will avoid program "starts and stops" and enable renewable energy business to continue to grow in New York State. The program will also integrate an electric energy efficiency audit as a component of the program, as described below.

The following guidelines will be incorporated into the solicitation(s):

1. The program will initially have a monthly incentive budget of \$2 million.
2. No new incentive applications will be accepted in a month when incentive applications for that month already equal or exceed the monthly budget.
3. The Program will be offered through an open enrollment solicitation and include the following elements:
  - a. The incentive level for all systems will start at \$1.75 per watt;
  - b. The caps will be: 7 kW for residential, 25 KW for not-for-profits, and 50 kW for commercial systems;
  - c. If applications in the prior two-month period exceed, by a material amount, the available incentive funding for that period, NYSERDA will reduce the incentive level for the subsequent months;
  - d. If applications in a two-month period do not equal the available funds for that time period, NYSERDA may increase the incentive for the subsequent two months;

- e. NYSERDA may impose an incentive cap per installer to ensure that multiple installers have an opportunity to participate in the program;
- f. The NYSERDA incentive will not exceed 40% of installed cost after all other tax credits have been applied;
- g. Incentives will be based on expected performance (based on Clean Power Estimator or PV Watts), which takes into account losses associated with shade, orientation, and geographical location.

After the incentive program has been operating for at least 6-9 months and NYSERDA demonstrates that it can manage incentive levels, demand, and market factors adequately, NYSERDA will work with Staff to investigate a megawatt hour block program design with incentive steps that might better serve the PV market and the ratepayers.

In addition, depending on demand levels and market conditions, NYSERDA may consider, in consultation with Staff, offering a low-interest loan in lieu of a portion of the otherwise available incentives.

### **Eligibility Criteria**

Customer eligibility:

- Customers must pay into SBC/RPS;
- New or existing homes and buildings are eligible for incentives;
- 5-year system warranties will be required with a 20 year warranty on modules;
- Residential customers must either have a New York ENERGY STAR<sup>®</sup> home or have a “clip board” (walk through) energy audit conducted by the installer to determine cost-effective energy efficiency measures related to electricity.<sup>4</sup> Customers will NOT be required to implement energy efficiency measures to receive a PV incentive.

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<sup>4</sup> A clip board audit would consist of two main components: an interview of the home/building owners to ascertain energy use habits and the age of the building, and an inspection of the building to identify potential energy efficiency measures, especially low and no cost measures that could reduce the electricity load of the building. This would include an inspection of the hard-wired lighting systems and free-standing light fixtures, appliance ages and whether they are ENERGY STAR, the presence of advanced power strips for consumer electronics, existence of “vampire loads” related to consumer electronics and battery chargers, use of programmable thermostats or timers for air conditioners, age and condition of the doors and windows, and inquiries to the owner regarding any recent installation of insulation. The PV Installer would conclude the audit with a homeowner debriefing. The installer would leave a copy of the inspection form with the owner at the end of the inspection. The form will include a description of the home, recommendations of changes to reduce electric consumption, and easy fixes the homeowner can do. The installer will also leave a list of Home Performance Contractors that could install more complex energy efficiency measures, informational brochures informing the owner of the details of utility or NYSERDA energy efficiency programs available to the home owner, and a brochure of low cost/no cost tips for reducing energy consumption. The inspection should last no more than 60 minutes.

<sup>5</sup> Installers will be provided training on ENERGY STAR’s Portfolio Manager and will be provided program brochures and website links on NYSERDA and Utilities Energy Efficiency Programs for distribution to their customers.

- The PV Installers will provide non-residential building owners with the ENERGY STAR® Portfolio Manager Benchmarking Tool or other equivalent tool and, if requested by the building owner, assist them to enter utility bill information into the Tool in order to produce an EUI (Energy use index)<sup>5</sup> and, where applicable a Home Energy Rating Score. Customers will not be required to benchmark or implement energy efficiency measures as a pre-requisite to receiving a PV incentive.

Installer eligibility:

- North American Board of Certified Energy Practitioners (NABCEP) certification or an International Brotherhood of Electrical Workers (IBEW) Journeymen Electrician, with documented PV training and experience, such as that provided by the National Joint Apprenticeship and Technical Committee (JATC) apprenticeship program will be required for all installers by 6/30/2011.
- Additionally, the local authority having jurisdiction may also require the services of a Master Electrician.

### **Transfer of RPS Attributes**

Customer agreements will require the transfer to NYSERDA of ownership of the contracted RPS Attributes generated from the installation for the duration of the performance payments or three years, whichever is greater starting with the date the system is commissioned to NYSERDA's satisfaction.

### **Quality Assurance/Quality Control**

The Program is designed to ensure that customers receive properly installed, reliable solar photovoltaic systems that produce the expected amount of energy. Design reviews and inspections will be performed for systems that are installed by new installers with limited experience, larger than 15 kW or relatively complex, or installed by installers with prior design and installation deficiencies. Random design reviews and inspection will be performed for systems installed by experienced installers with no reported problems. Third party technical experts, under contract with NYSERDA, will perform such reviews and inspections with detailed guidance from NYSERDA, and may provide technical assistance as the need arises. The technical experts will be selected through competitive solicitation. Installers will be required to monitor each system and provide performance data to NYSERDA for two years after installation. To facilitate QA/QC and customer participation, NYSERDA will extend its contract with Clean Power Research to provide annual costs and fees associated with:

- The use and maintenance of Power Clerk and the PV Incentive Program Database that is used by program staff, installers and QA/QC contractors to review applications and status of installations; use and maintenance of the Clean Power Estimator, a web-based tool that can be used by contractors and consumers for evaluating current market costs and benefits of PV and other related costs, and used to estimated expected system output taking into account equipment, shading, and orientation losses, etc.
- The use and maintenance of PV Check, a consumer and installer tool for evaluating real-time system performance. PV Check is an online service that allows: (1) system owners, installers or others to enter the production details of a PV system that they own or are associated with and, in turn, compare that to expected production; (2) system owners to track production over time and to assess performance through a performance index that compares actual production to expected production; and (3) NYSERDA, DPS, and utilities to monitor the performance of individual systems or fleets of systems.

All PV systems greater than 15 kW will include internet-based, real-time monitoring equipment that will achieve a 90/10 confidence level via statistical sampling. NYSERDA has been authorized by the Commission to charge the cost of this monitoring equipment to the program budget.

NYSERDA expects that QA/QC activity costs for the PV Program will approximate \$740,000 per year, exclusive of monitoring equipment costs (See Section 4).

### **SOLAR PHOTOVOLTAIC BUDGET AND PERFORMANCE EXPECTATIONS**

Funding allocations for the specific time periods and technology categories appear in Table 3-1. Table 3-2 exhibits expectations for energy production. NYSERDA will monitor participation rates, and in consultation with Staff, determine whether consumer and contractor education and outreach initiatives are needed.

**Table 3-1 Solar Photovoltaic Program Budget (\$ millions)**

<b>Period</b>	<b>Incentive Budget</b>
<b>2010</b>	\$ 24.0
<b>2011</b>	\$ 24.0
<b>2012</b>	\$ 24.0
<b>2013</b>	\$ 24.0
<b>2014</b>	\$ 24.0
<b>2015</b>	\$ 24.0
<b>Total</b>	\$144.0

**Table 3-2. Solar Photovoltaic Program Expectations**

<b>Capacity in MW Encumbered by 12/31/2015</b>	<b>Total Generation in MWh Encumbered by 12/31/2015</b>
82.29	93,806

## **GEOGRAPHIC BALANCING PROGRAM**

### **Background/Continuity**

The Geographic Balance program is a new initiative in the Customer-Sited Tier designed to encourage additional customer-sited installations of larger-scale, renewable- electric generation in the downstate region (NYISO Zones G, H, I and J). The program will be designed to:

(a) facilitate larger installations of eligible projects (above 50 kW), including projects where renewable biogas is extracted from a pipeline and used to generate electricity at a location separate from that producing the renewable biogas; and

(b) through coordination with the distribution companies within the target zones, assess and account for the electric grid and location-based value of installations.

### **Program Description and Types of Incentives**

The primary delivery mechanism for the program will be competitive solicitations, to be issued at least annually. NYSERDA will structure the solicitations in a manner that will lead to rapid deployment within the constraints of the budget and collection schedule. The solicitations may be modified in future rounds to account for market conditions and opportunities, or adjustments to balance the eligible technologies. The program will also be coordinated with other Customer-Sited Tier programs to optimize the use of resources and minimize the potential for market confusion.

The following guidelines, contained in the Order, will be incorporated into each solicitation:

A limitation on the number of awards made to individual installation companies with the goal of supporting as many companies possible;

Initially, only non-utility market participants will be allowed to submit proposals to the competitive solicitations.

In advance of issuing the competitive solicitations, NYSERDA will work with the utilities and other stakeholders to identify strategic locations to install the eligible technologies to realize possible environmental, load reduction and economic development benefits and to analyze system performance and the impact of any installations on their respective distribution systems. The solicitations will include evaluation criteria, or some other means, to signal preference for these strategic locations, but the strategic locations will not be used to establish the eligibility of an installation.

Incentives will be a combination of capacity and performance-based payments. In the case of renewable biogas-to-electricity systems, the maximum amount of funding is \$3 million in incentives for each installation.

Limit incentive payments for electric generation systems fueled by renewable biogas in combination with other gases to the portion of fuel that is from renewable resource feed stocks.

There will be no transfer of funds between the zone groups (GH and IJ).

Variables to be considered as part of the selection process in the competitive solicitation(s) will include both price variables (the relative level of the incentive request on either a capacity (kW) or energy (kWh) basis) and non-price variables. Examples of non-price variables may include, but are not limited to: the potential for measurable value to the utility electric power distribution system; the potential for additional public benefit (installations that can operate during a disruption in the electric grid); quality of the implementation plan; qualifications of the proposer; quality control and performance measurement and verification plan; and, the expected installation schedule. The solicitation will be developed in consultation with the DPS Staff, and will specify the proposal evaluation and selection criteria.

NYSERDA will convene Technical Evaluation Panels to review, evaluate and rank proposals according to the evaluation criteria defined in the solicitations. DPS Staff will be invited to participate.

### **Eligibility Criteria**

The electric energy provided by the installation must be received by a customer who pays into the RPS program at a point on the "customer side" of the utility meter.

Solar photovoltaic energy (PV) and renewable biogas fueled electric power generation are eligible. For the purpose of determining eligible renewable biogas fuels, the definitions and procedures for renewable biogas contained in the NY RPS Biomass Guidebook will be applied.

Renewable biogas is defined as fuel from the anaerobic digestion of farm, food or wastewater treatment materials that is currently not being used for the production of heat, power, or steam.

Renewable biogas can be used to produce electric energy at the site where the gas is generated or cleaned-up to pipeline quality for sale to an end user at another location where electric energy is generated. To convert the renewable biogas to electricity, any prime mover capable of converting biogas to electricity would be eligible including, but not limited to: fuel cells, internal combustion reciprocating engines, micro-turbines, combustion gas turbines, steam turbines where the steam is provided from a biogas-fueled boiler (including but not limited to a close-coupled gasifier using sustainably-managed biomass), and Stirling engines where the heat is provided from a biogas-fueled boiler (including but not limited to a close-coupled gasifier using sustainably-managed biomass). Electric generation equipment could be

configured as electric-only, or as combined heat and power (CHP). If a system is configured as CHP, program payments will be made specifically for the electric production component.

Initially, to be eligible the electrical output must be generated by new electric generation equipment (i.e., newly installed not pre-existing, newly manufactured not used/refurbished), or must be expanded electric output above the pre-existing (baseline) amount.

Electric generation equipment funded in whole or in part with Systems Benefits Charge funds are not eligible for the program.

End-user customers who pay the RPS surcharge may use renewable biogas created at an outside facility so long as the source is within the same NYISO zone group. The ownership of the fuel source is not relevant to the program in terms of eligibility. Depending on the circumstances, the renewable biogas may be conveyed through a private pipeline or pipeline operated by a local gas distribution company (LDC). If the supplier conveys the renewable biogas to the user via a pipeline operated by the LDC, then the supplier and end-user will be expected to follow the procedures contained in the NY RPS Biomass Guidebook for Renewable Pipeline Gas. These procedures include a requirement that a contract between the supplier of renewable biogas and the end-user be established that includes provisions for metering gas volumes to ensure that the heat input rate associated with the renewable biogas injected into a pipeline can be readily established. NYSERDA anticipates initially establishing a gas reconciliation period to be a month long. In this case, program payments associated with electricity generation will be conditioned on the end-user demonstrating that a sufficient quantity of renewable biogas has been purchased during the calendar month to support electricity generation in that same month. NYSERDA may establish a longer reconciliation period after further experience and study (e.g., quarterly, and semi-annually).

For projects involving the installation of solar photovoltaic systems, contractors will be required to conduct a walk-through electricity efficiency audit concurrently with a consultation on solar photovoltaic installation. The process will be consistent with the solar photovoltaic application program in the CST and initially include requirements as follows:

Residential customers must have New York ENERGY STAR<sup>®</sup> home or the installation company must conduct a “clip board”<sup>5</sup> or walk through energy audit to determine cost-effective energy efficiency measures related to electricity use<sup>5</sup>. Customers will NOT be required to implement energy efficiency measures to receive program incentives.

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<sup>5</sup> A clip board audit would consist of two main components: an interview of the home/building owners to ascertain energy use habits and the age of the building, and an inspection of the building to identify potential energy efficiency measures, especially low and no cost measures that could reduce the electricity load of the building. This would include an inspection of the hard-wired lighting systems and free-standing light fixtures, appliance ages and whether they are ENERGY STAR, the presence of advanced power strips for consumer electronics, existence of “vampire loads” related to consumer electronics and battery chargers, use of programmable thermostats or timers for air conditioners, age and condition of the doors and windows, and inquiries to the owner regarding any recent installation of insulation. The PV Installer would conclude the audit with a homeowner debriefing. The installer would leave a copy of the inspection form with the owner at the end of the inspection. The

The PV Installers will provide non-residential building owners with information on the ENERGY STAR® Portfolio Manager Benchmarking Tool or other equivalent tool and, if requested by the building owner, assist them to enter utility bill information into the Tool in order to produce an EUI (Energy use index) 5 and, where applicable a Home Energy Rating Score. Customers will not be required to benchmark or implement energy efficiency measures as a pre-requisite to receiving a PV incentive.

### **Transfer of RPS Attributes**

Customer agreements will require the transfer to NYSERDA of ownership of the contracted RPS Attributes generated from the installation for the duration of the performance payments or three years, whichever is greater starting with the date the system is commissioned to NYSERDA's satisfaction.

### **Quality Assurance/ Quality Control**

NYSERDA will employ the services of contractors to ensure that installations meet program requirements including power generation projections. Contractors may be used to review installation plans and verify/commission installations accordingly. Performance-based payments will be predicated on post-installation measurement and verification of energy production over a sufficient period of time to establish that the installation is performing as contracted. Installations will include monitoring equipment and evaluation tools for NYSERDA and its contractors to evaluate and verify actual performance relative to expected performance. NYSERDA contractors will work with utility planners and operators to establish criteria that may lead to selection of installations/locations having the potential to provide measurable value to the utility electric power distribution system. NYSERDA and its contractors will work with the local utility in establishing data requirements and acquisition methods associated with post-installation system analysis. The developer and the host site will be required to participate in a data monitoring and analysis program to evaluate actual benefits. The performance of Renewable Biogas fueled electric power generation will be monitored similar to existing NYSERDA monitoring procedures as applied to Combined Heat and Power installations and performance data will be posted and available to the public.

NYSERDA expects that QA/QC activity costs for the Geographic Balancing Program will approximate \$835,000 per year (See Section 4).

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form will include a description of the home, recommendations of changes to reduce electric consumption, and easy fixes the homeowner can do. The installer will also leave a list of Home Performance Contractors that could install more complex energy efficiency measures, informational brochures informing the owner of the details of utility or NYSERDA energy efficiency programs available to the home owner, and a brochure of low cost/no cost tips for reducing energy consumption. The inspection should last no more than 60 minutes.

<sup>6</sup> Installers will be provided training on ENERGY STAR's Portfolio Manager and will be provided program brochures and website links on NYSERDA and Utilities Energy Efficiency Programs for distribution to their customers.

**GEOGRAPHIC BALANCING BUDGET AND PERFORMANCE EXPECTATIONS**

Funding allocations for the specific time periods and technology categories appear in Table 3-3. Table 3-4 exhibits expectations for energy production on the basis of the zonal distribution of funding as authorized by the Order. NYSERDA will monitor participation rates, and in consultation with Staff, determine whether consumer and contractor education and outreach initiatives are needed.

**Table 3-3. Geographic Balancing Program Budget (\$millions)**

<b>Period</b>	<b>Competitive Capacity/Performance Incentive Program Zones G&amp;H</b>	<b>Competitive Capacity/Performance Incentive Program Zones I&amp;J</b>	<b>Incentive Budget</b>
<b>2011</b>	\$ 5.0	\$ 25.0	\$ 30.0
<b>2012</b>	\$ 5.0	\$ 25.0	\$ 30.0
<b>2013</b>	\$ 5.0	\$ 25.0	\$ 30.0
<b>2014</b>	\$ 5.0	\$ 25.0	\$ 30.0
<b>2015</b>	\$ 5.0	\$ 25.0	\$ 30.0
<b>Total</b>	\$25.0	\$125.0	\$150.00.0

**Table 3-4. Geographic Balancing Program Expectations<sup>6</sup>**

	<b>Capacity in MW Encumbered by 12/31/2015</b>	<b>Annual Generation in MWh Encumbered by 12/31/2015</b>
Solar Photovoltaic	77.14	87,943
Anaerobic Digesters/Fuel Cells	5.78	42,504
<b>Total</b>	<b>82.92</b>	<b>130,477</b>

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<sup>6</sup> Table values reflect NYS DPS corrected expectations from those described in the Order and are meant to be indicative values. Actual program results will be a direct function of the resulting mix of technologies and pricing that arise from the competitive solicitation process.

## **FUEL CELLS PROGRAM**

### **Background**

Fuel cells use electrochemical reactions to convert fuel into electricity without combustion. Fuel cells produce more electricity in proportion to the amount of fuel used than traditional electric generation technologies, and emissions from fuel cells are significantly less harmful to the environment. Growing the market for this emerging technology resource will improve the State's energy efficiency and reduce negative environmental impacts associated with power generation and use. There are many technological and market transformation challenges for wide scale deployment of fuel, but fuel cell technology represents a promising route to cleaner, more efficient energy production.

For the past several years, NYSERDA has provided financial support for fuel cell technologies to improve the efficiency, durability, and manufacturability of fuel cell components and systems. NYSERDA has also undertaken long-term demonstrations of the operational reliability and effectiveness of fuel cells at end-use sites in commercially promising applications; these sites consist predominantly of large institutional customers. In addition, federal funds have been available to support the demonstration of fuel cells at end-use sites. While NYSERDA's Research, Development and Demonstration programs will continue to provide financial support for improving fuel cell technologies, the CST program will continue to be the primary venue for supporting the acquisition of fuel cells for long-term operation at end-user sites. As has been the case with the RPS CST Fuel Cell program to date, fuel cells running on natural gas remain eligible for the program.

The qualifications of the proposed fuel cell installation team will be assessed on a project-by-project basis.

### **Program Description and Types of Incentives**

Different pools of funds, monitoring protocols, and likely incentives will be applicable to fuel cell systems of 25 kW or less (Small Fuel Cell Track) and fuel cell systems larger than 25 kW (Large Fuel Cell Track).

Detailed incentive levels, project caps, and monitoring protocols will be described in each solicitation. General distinctions between the two tracks are described below.

Each particular make and model fuel cell must have been offered for commercial sale and covered by commercial warranties within the two-year period preceding its entry into the program, and each must have received certification of compliance with ANSI Standard FC-1 from a nationally recognized testing

laboratory. NYSERDA will maintain a list of fuel cell systems that are eligible to receive awards under the CST.

### ***Capacity-based Incentives.***

Capacity incentives based on installed kilowatts of eligible fuel cells will be offered for fuel cells that have been purchased and installed through an award under a CST solicitation or application program. Fifty percent of approved capacity payments will be made when all major equipment is on-site and necessary permits are obtained; the remaining 50 percent will be paid when projects are successfully commissioned and the post-installation site inspection is completed and approved by NYSERDA.

### ***Incentives for Secure Power Projects.***

The open-enrollment solicitation for fuel cell systems will offer an increased capacity incentive for approved systems that provide secure power at locations that provide essential public services, such as police stations and hospitals.

### ***Performance-Based Incentives.***

Performance-based incentives will be available for systems that are intended to run on a regular basis and convey this design intent to NYSERDA's satisfaction (systems that are intended to serve primarily as an emergency back-up power supply will not be expected to accrue many kWh of performance, and therefore, for program administration simplification, will not be eligible for performance-based incentives). For those projects eligible to receive performance-based incentives, performance-based incentives will be paid at two different rates: a high-performance rate and a low-performance rate. For any given year, high-performing systems, such as those that produce 4,380 kWh or more per installed nameplate kW per year will receive larger performance-based incentives than projects that produce less than 4,380 kWh per installed nameplate kW per year.

### **Eligibility Criteria**

Only projects that involve purchased and installed fuel cell equipment through an award under a CST solicitation or application program are eligible to seek any funds under the CST's Fuel Cell subprogram. Fuel cells that have previously received RPS funding cannot be awarded additional funding.

### **Transfer of RPS Attributes**

Customer agreements will require the transfer to NYSERDA of ownership of the contracted RPS Attributes generated by the installation for the duration of the performance payments or three years, whichever is greater, starting with the date the system is commissioned to NYSERDA's satisfaction.

## **Quality Assurance/Quality Control**

Verification of system installation and verification of successful commissioning are necessary for authorizing payment of the two fractions of the capacity-based incentive.

Verification of system performance is necessary for computing the appropriate amount to be paid for each performance-based incentive payment.

Implementation and performance verification requirements at the site level, including specification for monitoring and communications equipment, will be established by NYSERDA in the initial program solicitations and will be designed to be consistent with requirements of NYSERDA's other combined heat and power (CHP) programs.

### **Small Fuel Cell Track**

Small projects will provide monitoring data through a less expensive method than large projects. The use of daily remote transfer of data in electronic format is not anticipated.

### **Large Fuel Cell Track**

Large Fuel Cell Track projects will be responsible for the purchase and installation of necessary monitors and sensors (*e.g.*, fuel and electric meters), and projects will provide the necessary instrumentation and communications systems (*e.g.*, phone lines, internet access) to monitor systems for remote data collection. If not provided by the project site, NYSERDA will arrange for connecting sensors and meters to data acquisition systems.

Projects participating in the Large Fuel Cell Track must provide monitoring data for a minimum of three years through an automated data collection and remote transfer mechanism that will be described in the initial solicitation. These requirements may be revised in subsequent solicitations.

All quality control data will be available to the public on the CHP Data Integration web page. NYSERDA will continue to require that projects upload real-time system performance data to NYSERDA's Combined Heat and Power (CHP) web site ([chp.nyserda.org](http://chp.nyserda.org)) to ensure that installations are performing as expected to meet electricity generation projections and to achieve a minimum 90/10 confidence level for the overall energy generation estimate.

NYSERDA expects that QA/QC activity costs for the Fuel Cells Program will approximate \$75,000 per year (See Section 4).

**FUEL CELL BUDGET AND PERFORMANCE EXPECTATIONS**

Funding allocations for the specific time periods and fuel cell program tracks appear in Table 3-5. The initial allocation between the small and large fuel cell programs is subject to revision by NYSERDA depending on the market’s response to the program. Table 3-6 exhibits expectations for energy production.

**Table 3-5 Fuel Cell Program Budget (\$ millions)**

<b>Period</b>	<b>Small Fuel Cell Track Incentive Budget</b>	<b>Large Fuel Cell Track Incentive Budget</b>
<b>2010</b>	\$0.1	\$3.5
<b>2011</b>	\$0.1	\$3.5
<b>2012</b>	\$0.1	\$3.5
<b>2013</b>	\$0.1	\$3.5
<b>2014</b>	\$0.1	\$3.5
<b>2015</b>	\$0.1	\$3.5
<b>Total</b>	\$0.6	\$21

**Table 3.6 Fuel Cell Program Expectations<sup>7</sup>**

	<b>Capacity in MW Encumbered by 12/31/2015</b>	<b>Annual Generation in MWh Encumbered by 12/31/2015</b>
Large Fuel Cell Track	8.400	66,226
Small Fuel Cell Track	0.300	1,159
Total	8.700	67,385

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<sup>7</sup> Expectations shown here are different than those in the Order for the following reason: the values in the Order were derived based on a budget indicated in the Midcourse Report which was substantially larger than the budget adopted in the Order (the Midcourse Report anticipated that all CST fuel cell projects would be funded under this program, whereas the Order provides for funding of some CST fuel cells under the Geographic Balancing Program and therefore established a reduced budget for this program). Estimated targets were corrected by Staff on April 14, 2010.

## **ANAEROBIC DIGESTER BIOGAS-TO-ELECTRICITY PROGRAM**

### **Background**

Since the inception of the CST program there has been high demand for anaerobic digester gas (ADG) installations. ADG systems not only produce electricity, but directly reduce greenhouse gas emissions while mitigating solid waste burdens and negative water quality impacts. ADG systems are also one of the lowest cost CST program technologies on a \$/MWh basis.

### **Program Design and Types of Incentives**

Following the guidance reflected in the Order, the ADG-to-Electricity Program will be continued with a similar structure to that currently offered, providing capacity and performance incentives for ADG systems installed at farms treating manure and other agricultural waste products, wastewater treatment plants (WWTPs), and businesses that treat organic wastes. Modest increases to the capacity incentive and overall project cap are proposed to partially offset the impacts of the poor dairy economics and unanticipated costs of interconnection. NYSERDA will continue to monitor ADG costs, barriers, benefits, and opportunities to determine whether the incentives should be further increased or decreased in the future. However, incentive levels are not expected to be decreased before 2011, so that New York projects can take maximum advantage of ARRA incentives for renewable energy and economic recovery.

Third-party developers of ADG systems will continue to be eligible to receive incentives, provided that the host site (e.g. farm, WWTP or business) has agreed to contract terms with that third party governing the disposition of the incentives.

The Program will continue to be administered through a standard-offer, open-enrollment solicitation. Applicants will continue to be required to complete project information forms provided by NYSERDA that describe such information as:

- the type and quantity of available feedstock resources;
- engineering estimates of the quantity and Btu value of biogas to be produced;
- all major equipment to be used in the project, such as digesters, gas clean up equipment, engines, and generators by manufacturer, model, size, and rating;
- any alternative non-biogas fuels and other generation capacity on-site at the time of application;
- records of average and peak site electrical load and annual energy use;
- proposed installation schedule;
- estimates of annual net and gross kWh to be produced;
- planned operations and maintenance protocols and expenses.

### ***Capacity-based Incentives***

Capacity incentives will be offered for new generation equipment based on kilowatts generated from biogas. Capacity incentives cover a portion of the total installed costs for the generating system including controls, biogas cleanup, interconnection, and necessary monitoring equipment.

To encourage the use of anaerobic digestion systems treating farm wastes, incentives may be provided based on (a) the eligibility capacity limit in the net energy metering law that is in effect at the time of application, which currently caps farm waste electric generating equipment at 500 kW, or (b) the customer's approximate peak connected load, whichever is greater.

### ***Performance-based Incentives***

Performance-based payments for new generation will continue to be made annually for three years based on verified kWh generation. Reduced performance-based payments will continue to be made for existing facilities. Consideration will also be given to making performance payments on a quarterly basis rather than on an annual basis.

### **Transfer of RPS Attributes**

Customer agreements will require the transfer to NYSERDA ownership of the contracted RPS Attributes generated from the installation for the duration of the performance payments or three years, whichever is greater, starting with the date the system is commissioned to NYSERDA's satisfaction. RPS Attributes generated in excess of those required to be transferred to NYSERDA in a given year, as well as those generated once the three year period has ended are retained for sale or other disposition by the Customer (or Host Site as appropriate).

When projects generate environmental attributes that are not associated with power-generation, such as carbon credits for destruction of methane that would otherwise have been emitted without anaerobic digestion, these environmental attributes are also retained for sale or other disposition by the Customer (or Host Site as appropriate).

### **Quality Assurance/Quality Control**

NYSERDA has selected independent third-party QA/QC contractors to perform design reviews and inspect installations to confirm that the appropriate equipment is properly installed and performing at optimum levels.

QC includes application review and review of all subsequent requests for incentive payments (capital and performance). QC also includes specifications for monitoring equipment, communications equipment,

and collection of system performance data. All projects are responsible for the purchase and installation of biogas and electric meters, and must provide the necessary communications systems (i.e., phone lines, internet access) for remote performance data acquisition. If not performed by the project participant, NYSERDA may arrange for a QA/QC contractor to connect monitoring devices to data acquisition systems.

As part of NYSERDA’s QA requirement, NYSERDA will continue to require that projects upload real-time performance data to NYSERDA’s Combined Heat and Power (CHP) web site (chp.nyserdera.org) to ensure performance as expected to meet electricity generation projections. All data will be available to the public via the web site. NYSERDA will also continue to require quarterly QA inspections. If deficiencies are identified during these inspections, QA/QC contractors may also provide technical support to ensure deficiencies are corrected.

NYSERDA expects that QA/QC activity costs for the Anaerobic Digester Program will approximate \$900,000 per year (See Section 4).

### **ANAEROBIC DIGESTER GAS BUDGET AND PERFORMANCE EXPECTATIONS**

Funding allocations for the specific time periods and technology categories appear in Table 3-7. Table 3-8 exhibits expectations for energy production:

**Table 3-7. ADG-to-Electricity Program Budget (\$ millions)**

<b>Period</b>	<b>Farm ADG</b>	<b>WWTP and Industry</b>	<b>Incentive Budget</b>
<b>2010</b>	\$11.5	\$1.8	\$13.3
<b>2011</b>	\$11.5	\$1.8	\$13.3
<b>2012</b>	\$10.4	\$1.6	\$12.0
<b>2013</b>	\$10.1	\$1.5	\$11.6
<b>2014</b>	\$8.8	\$1.4	\$10.2
<b>2015</b>	\$8.8	\$1.4	\$10.2
<b>Total</b>	\$61.1	\$9.5	\$70.6

**Table 3-8. ADG-to-electricity Program Expectations**

<b>Capacity in MW Encumbered by 12/31/2015</b>	<b>Annual Generation in MWh Encumbered by 12/31/2015</b>
24.06	169,657

## **ON-SITE WIND PROGRAM**

### **Background**

NYSERDA first implemented a standardized approach to providing incentives for customer-sited wind turbines with support through the Systems Benefits Charge (SBC) program. Under this program 37 turbines were installed with a total rated capacity of 340 kW. These turbines are expected to generate 380,000 kWh annually. A 10-kW system was the largest system installed under this program.

At the conclusion of the SBC program, financial support for customer-sited wind was transferred to the RPS program. Interest in small wind installations has escalated. The number of active installers has doubled and 54 applications have been approved, with over one-half of these applications being received during the last six months of the program. These applications are expected to generate 700,000 kWh annually from a total rated capacity of 500 kW. A 20-kW system was the largest system installed under this program.

This new program will build upon the success and lessons learned from these past programs to promote larger systems, create more renewable energy jobs, and expand New York's network of distributed, renewable generation sites. This program will be designed to meet the needs of a diverse customer-base and workforce, while improving the processes that are in place to manage costs and schedules.

### **Program Description and Types of Incentives**

The program will include a competitive solicitation component and, potentially, an open enrollment-based program. The initial emphasis will be on the competitive solicitation and the success of this program will determine the need for an open-enrollment program.

#### ***Competitive Solicitation:***

Regular and predictable competitive solicitations will provide installers with assurances early in their project development process, that financial incentives will be available and assist the companies in planning for and responding to local siting and permitting requirements. Incentives may cover multiple installations and, by using a competitive model, apply downward pressure on the incentive levels. Prior to issuing the solicitation, a maximum acceptable incentive level will be determined. It is anticipated that size categories will be established and that incentives will be paid on a combination of milestones and performance.

Variables to be considered as part of the selection process in the competitive solicitation(s) will include, both price variables (the relative level of the incentive request on either a capacity (kW) or energy (kWh) basis) and non-price variables. Examples of non-price variables include experience of the proposer,

corporate viability; quality of the implementation plan; quality control and performance measurement and verification plan; and, the expected installation schedule.

***Open Enrollment Program:***

Should an Open Enrollment program be implemented, it is estimated that no more than one-third of the incentive budget would be allocated to this category. A goal of the competitive program will be to create a solicitation that allows installation businesses with varying levels of experience to effectively compete for funding. Should, for example, the competitive program inhibit growth in the number of new installation businesses, an Open Enrollment program will be considered to provide a mechanism for installers to gain more installation and business experience.

The Open-Enrollment program will be designed to ensure that customers receive properly installed, reliable wind systems that produce the expected amount of energy. System designs and energy estimates will be reviewed prior to approval of incentive applications, and systems may be inspected during and following the installation. The extent of this review will be dependent on the previous performance of the installer.

**Eligibility Criteria**

In addition to the general CST program requirements previously outlined, the on-site wind incentive program may include installer and hardware eligibility requirements. Only commercially available wind turbines with a proven record for power performance, reliability, safety, and acoustics will be considered. Any site whose intention is to deliver power to the wholesale grid will be directed to the Main Tier Program, regardless of the size of the wind energy conversion system. Installations that do not meet the Main Tier requirements, but are designed for self-generation while meeting the general CST program requirements, may be considered under this program. Funding will be capped at a 600-kW turbine.

**Transfer of RPS Attributes**

Customer agreements will require the transfer, to NYSERDA, of ownership of the contracted RPS Attributes generated from the installation for the duration of the performance payments, or three years, whichever is greater, starting with the date the system is commissioned to NYSERDA's satisfaction.

**Quality Assurance/ Quality Control**

NYSERDA will competitively select independent third-party QA/QC contractors to perform design reviews and inspect installations to confirm that the appropriate equipment is properly installed and performing at optimum levels, for a select number of projects to confirm NYSERDA's process.

QC may include manufacturer, installer, and incentive application review and review of performance-based incentives. All projects are responsible for the purchase and installation of generation meters, and when determined to be applicable, provide the necessary communications systems (i.e., phone lines, internet access) for remote performance data acquisition. Performance based payments, if used, will be predicated on post-installation measurement and verification of energy production over a sufficient period of time to establish that the installation is performing as contracted.

As part of NYSERDA’s QA requirement, NYSERDA will continue to require that projects provide performance data to NYSERDA in a timely manner to ensure performance as expected to meet electricity generation projections. If deficiencies are identified during scheduled or random QA inspections, QA/QC contractors may also provide technical support to ensure deficiencies are corrected.

NYSERDA expects that QA/QC activity costs for the On-Site Wind Program will approximate \$155,000 per year (See Section 4).

**ON-SITE WIND BUDGET AND PERFORMANCE EXPECTATIONS**

Funding allocations for the specific time periods and technology categories appear in Table 3-9. Within a time period, funding may be shifted between categories as warranted by interest in the program. Table 3-10 exhibits expectations for energy production.

**Table 3-9. On-Site Wind Program Budget (\$ millions)**

<b>Period</b>	<b>Incentive Budget</b>
<b>2010</b>	\$1.575
<b>2011</b>	\$2.800
<b>2012</b>	\$2.900
<b>2013</b>	\$3.100
<b>2014</b>	\$3.800
<b>2015</b>	\$4.000
<b>Total</b>	\$18.175

**Table 3-10. On-Site Wind Program Expectations**

<b>Capacity in MW Encumbered by 12/31/2015</b>	<b>Annual Generation in MWh Encumbered by 12/31/2015</b>
10.5	18,351

## **SOLAR THERMAL PROGRAM**

### **Background**

Solar Thermal will be an eligible technology under the Customer-Sited Tier for the first time since New York State instituted a Renewable Portfolio Standard. Solar Thermal technology acceptance in New York State is currently at a level, that PV was about five years ago: limited customer knowledge, insufficient numbers of certified installers, and small number of yearly installations (~ 500). In addition to an incentive program, marketing of solar thermal is necessary to grow the market. Results obtained through the development of a Solar Thermal Roadmap (issued in May 2010) provide guidance for development and implementation of a marketing and consumer education program aimed at reducing customer unfamiliarity with solar thermal systems. It is anticipated that some RGGI funds will be available for solar thermal marketing. The response to solar thermal program opportunities will be evaluated in consultation with Staff during the initial year of the program to determine whether additional outreach and education efforts should be funded through the CST to increase demand.

### **Program Description and Types of Incentives**

The Solar Thermal Incentive Program will be similar to the PV incentive program and will be an application-based program with incentives for solar hot water systems for all sectors. The program will be designed to match the incentive levels to a level of demand that can be satisfied within a calendar year with the budget outlined in the table below. Like the PV program, this program will also integrate an electric energy efficiency audit as a component of the program, as described below.

The following guidelines are expected to be incorporated into the solicitation(s):

1. Eligible measures are solar water heating for residential (single and multifamily), commercial buildings, and non-profits that replaces or displaces electric water heating. Equipment and systems must be certified by the Solar Rating and Certification Corporation (SRCC).
2. Expected performance will be based on the Solar Rating and Certification Corporation (SRCC) estimates or standard industry software such as RETScreen.
3. Incentives will be based on expected performance in \$/kWh/yr or \$/MMBtu/yr up to a maximum of 40% of installed cost after all other tax credits have been applied, with a set dollar maximum for residential and non-residential systems.

4. The program will be first-come, first-served. The residential program is likely to be implemented as a simple incentive process, as the typical residential system is small and often pre-packaged.
5. Solar Thermal hot water systems will receive incentives as an alternative to electric water heating only. MWhs saved due to electric water heating replacement/supplementation with solar water heating will be calculated and scored towards the RPS goal.
6. Installers will be required to conduct annual follow-up visits for a designated period of time.

### **Eligibility Criteria**

#### Customer Eligibility:

- customers must pay into the RPS;
- new or existing homes and buildings will be eligible;
- five-year warranty for the system will be required;
- residential customers must have a New York ENERGY STAR® home or have a “clip board”<sup>8</sup> or walk through energy audit conducted to determine cost-effective energy efficiency measures related to electricity use<sup>8</sup>. Customers will NOT be required to implement energy efficiency measures to receive an incentive.

#### Installer Eligibility:

- Solar Thermal installer eligibility will be similar to NYSERDA PV installer eligibility criteria; in that installers will have to provide evidence that, they have solar water heating installation training and installation experience to qualify as eligible installers.
- NABCEP certification will be required for companies participating in the program within a year of program inception. Given the small number of NABCEP-certified installers in the U.S. at

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<sup>8</sup> A clip board audit would consist of two main components: an interview of the home/building owners to ascertain energy use habits and the age of the building, and an inspection of the building to identify potential energy efficiency measures, especially low and no cost measures that could reduce the electricity load of the building. This would include an inspection of the hard-wired lighting systems and free-standing light fixtures, appliance ages and whether they are ENERGY STAR, the presence of advanced power strips for consumer electronics, existence of “vampire loads” related to consumer electronics and battery chargers, use of programmable thermostats or timers for air conditioners, age and condition of the doors and windows, and inquiries to the owner regarding any recent installation of insulation. The ST Installer would conclude the audit with a homeowner debriefing. The installer would leave a copy of the inspection form with the owner at the end of the inspection. The form will include a description of the home, recommendations of changes to reduce electric consumption, and easy fixes the homeowner can do. The installer will also leave a list of Home Performance Contractors that could install more complex energy efficiency measures, informational brochures informing the owner of the details of utility or NYSERDA energy efficiency programs available to the home owner, and a brochure of low cost/no cost tips for reducing energy consumption. The inspection should last no more than 60 minutes.

present (112), and in NYS (4), NABCEP installer certification as a requirement for participation immediately would be counterproductive to the achievement of program goals.

**Quality Assurance/ Quality Control**

All system designs (except for simple pre-packaged) and installations will be subject to review; it is anticipated that, initially, 100% of the installed systems will be inspected. It is anticipated that the inspection rate will drop down to 20-25% over time, depending on experience.

As described in the Order, evaluating the performance and MWh saved by solar thermal systems is more complicated than simply measuring the electrical output of PV systems. NYSERDA will work with DPS staff to develop QA/QC plans that reflect the increased complexity of the technology, and accurately account for electricity displaced by solar water heating.

NYSERDA expects that QA/QC activity costs for the Solar Thermal Program will approximate \$530,000 per year (See Section 4).

**SOLAR THERMAL BUDGET AND PERFORMANCE EXPECTATIONS**

Funding allocations for the specific time periods and technology categories appear in Table 3-11. Table 3-12 exhibits expectations for energy production NYSERDA will monitor participation rates, and in consultation with Staff, determine whether consumer and contractor education and outreach initiatives are needed.

**Table 3.11. Solar Thermal Program Budget (\$millions)**

<b>Period</b>	<b>Incentive Budget</b>
<b>2010</b>	\$3.225
<b>2011</b>	\$4.300
<b>2012</b>	\$4.300
<b>2013</b>	\$4.300
<b>2014</b>	\$4.300
<b>2015</b>	\$4.300
<b>Total</b>	\$24.725

**Table 3-12. Solar Thermal Program Expectations**

<b>Capacity in MW Encumbered by 12/31/2015</b>	<b>Annual Generation in MWh Encumbered by 12/31/2015</b>
45.54	93,806

## **SECTION 4: PROGRAM ADMINISTRATION**

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Program administration costs include salary and fringe benefit costs for NYSERDA staff involved in managing programs, allocable salary and fringe benefit costs for administrative support staff, direct program management expenses (travel and other costs), and allocable overhead administrative, facility and equipment expenses.

The Commission's April 2, 2010 Order provides a description of program administration that lists developing and issuing Program Opportunity Notices for each technology and a solicitation for the Geographic Balancing component; reviewing and analyzing each application; performing project reviews to ensure proper commissioning and operation prior to issuing payments; performing measurement and verification; and performing monitoring of system performance through real-time Internet-based systems. While this list of activities describes a considerable portion of the activities that are necessary to program administration, NYSERDA understands that the list was not intended as a limitation, as many additional tasks are routinely performed as part of program administration.

The Order provides \$22,329,000 to administer the \$429,075,000 CST program from 2010 through 2018. While the Order provides various tables reflecting separate amounts for CST administration and Main-Tier administration, according to guidance from DPS Staff, the Order did not intend to limit the amount of administrative expenditures allowable in any one-year for any one program (ie. CST, Main-Tier). In addition, funds not expended within a given calendar year may be carried forward to future years and an exceedance in any one year can be compensated for by using less funding in the succeeding year.

NYSERDA will manage within the administration budget, optimize administration of the programs to the best of its ability, and keep Staff informed of actual costs over time. In accordance with the Order, NYSERDA will bring any concerns that arise to the Commission if it appears that an adjustment to the approved budgets is warranted.

NYSERDA has expressed to DPS staff its concern regarding four specific issues, in particular, their potential impact on effective implementation and financial management of the CST program. These issues will warrant continued Commission attention and tracking.

- Quality Assurance/Quality Control (QA/QC) Costs. The Order does not specifically provide funds for necessary QA/QC expenses. These expenses are described in Section 2 and further details are provided for each technology in Section 3. These expenses are designed to ensure that the program supports systems that are safe, reliable, and effective. Under Phase I of the RPS, these QA/QC services were typically provided by third-party experts under contract to NYSERDA. NYSERDA estimates that the CST program will require approximately \$3.2 M per year in QA/QC expenses *in addition to* the total aggregate funding of \$22.3 M provided for CST program administration explicitly provided by the Order.

The CST level of administrative funding (which equates to approximately 4.9% of CST program costs) is considerably lower than the level of administrative funding provided by the Commission for other deployment programs under EEPS and SBC. The level for the QA/QC activities identified above is also lower than QA/QC levels provided by the Commission for other comparable deployment programs under EEPS and SBC.<sup>9</sup> The level for QA/QC proposed by NYSERDA (~\$3.2 M/yr) is, however, greater than the level for QA/QC implemented in Phase I of the RPS. NYSERDA cautions against using the historical expenditures for QA/QC as the sole basis for estimating QA/QC needs in this next phase of the program. NYSERDA recommends the modestly higher level of QA/QC going forward, in an attempt to (i) be responsive to the Commission's request for more data and information on the actual performance of the technologies supported in the CST; (ii) improve the performance of systems under the CST; and (iii) ensure that the new solar thermal program and nascent solar thermal industry develops with proper quality controls and adequate focus on performance.

The Order states that the CST Operating Plan should build on the 2007 Operating Plan. The 2007 CST Operating Plan specifically identified funds as allocated to QA/QC activities and noted that if administrative funding was insufficient to cover these critical activities, NYSERDA could use unallocated RPS program funds to cover these activities.

In accordance with recent guidance provided by DPS Staff, initially, QA/QC activities will be funded through NYSERDA's administrative budget, to the extent funding is available. NYSERDA is concerned about the potential impact of these expenditures on the overall CST administrative budget. However, NYSERDA and DPS Staff have agreed to closely monitor and track costs for QA/QC activities. NYSERDA will work with DPS Staff to develop and refine QA/QC budgets. Per discussions with DPS Staff, once a baseline is established for actual QA/QC expenses, NYSERDA will seek an appropriate adjustment to the Administrative budget for the Program.

- **Inflationary Increases** - Using its experience in administering similar deployment programs, NYSERDA developed a staffing plan for administering the programs and provided estimated costs on an annual basis during the period 2010 to 2018, including inflationary increases. The Order provided amounts which did not include any inflationary increases. It is both practical and sound budgetary practice to plan for inflationary increases in expenses. Future costs will rise due to increases in salary costs (which NYSERDA provides to staff to match cost of living increases and salary step increases provided to State Management/Confidential employees), increases in fringe benefit costs (in the past several years costs for employee health insurance and State pension contributions have outpaced general inflationary rates), and general inflationary increases in administrative expenses. While it is difficult to anticipate inflationary increases and productivity offsets through 2018, assuming that future costs increase at an annual rate of 2.6% (equal to the average annual increase in the Consumer Price Index 2004-2009), the funding approved by the Commission for program administration would provide for marginally lower staffing levels than those deemed necessary by NYSERDA to effectively administer the program. This

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<sup>9</sup> EEPS and SBC include QA/QC as Program Expenses – not Administration expenses.

reduced staffing level could impact program administration activities for the program. NYSERDA and DPS Staff have agreed that this issue be tracked closely and, if appropriate, presented to the Commission for adjustment.

- New York State Cost Recovery Fee - In addition to the budget approved for NYSERDA's program administration, the Order provides funding for the program's allocable share of the Authority's annual assessment from New York State for the Cost Recovery Fee for central governmental services to various public authorities under Section 2975 of the Public Authorities Law. The statute provides that each public authority's assessment is set by the Director of the Budget, subject to a maximum amount assessable to applicable public authorities. NYSERDA allocates this annual assessment to all programs based on each program's total expenditures. The Order provides for a NYS Cost Recovery fee of approximately \$992,000 for each year. In total for the period 2010 through 2024, the budgeted amount for this fee represents .5% of total budgeted expenditures. For the fiscal year ended March 31, 2010, the Authority's total assessment under Public Authorities Law Section 2975 was \$6,850,000, which equates to 1.7% of applicable expenditures. So if this allocation percentage continues, the budgeted amount included in the Order may not be sufficient. NYSERDA and DPS Staff propose that this issue also be tracked closely and, if appropriate, presented to the Commission for adjustment.

- DPS Staff have advised that outreach and marketing is not an eligible expense under CST program funding. Given the constraints on the administration budget as outlined in the QA/QC item above, funding is not available in the administrative budget to support outreach. Therefore, this CST Operating Plan does not include any outreach and marketing costs. NYSERDA cautions that the targets for some of the categories (i.e. small wind, fuel cells and digesters) are considerably higher than the activity in phase I of the RPS and some level of outreach may be needed to reach target audiences and achieve the CST goals. NYSERDA further cautions that the solar thermal program is a new program in New York State and may need outreach and marketing (above and beyond those funds available to NYSERDA through other programs) to reach target audiences and achieve CST goals. In the event that customer participation is not adequate to achieve MWh targets, this issue of outreach and marketing may need to be revisited and presented to the Commission for consideration.

## **SECTION 5: EVALUATION**

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As specified in the Commission's April 2, 2010 Customer-Sited Tier Order, program evaluation will include both an impact and market evaluation of each CST technology. Evaluation surveys may also address relevant process evaluation questions, to the extent possible. The evaluation will be designed to provide NYSERDA with information to maximize program efficiency and effectiveness, and the Commission with information to support future policy decisions related to New York's renewable energy goals. The evaluation activities described below will culminate in a complete evaluation report at the end of 2013.

### **Market and Process Evaluation**

Primary and secondary research will be used, as appropriate, to address important market and process related issues and provide actionable recommendations for program improvement. As the timing for commencing this work draws nearer, NYSERDA will work with DPS Staff to ensure that the most important research issues are addressed by the evaluation with consideration of the authorized budget. Market and process evaluation studies can address issues such as the following:

- Market response to and use of the program and supported technologies;
- Key elements of the program design and delivery, such as participant satisfaction, adequacy of incentive levels by technology, and barriers to participation and technology adoption;
- Impact of net metering on customer decision making and installer promotion of PV systems;
- Behavioral aspects of the relationship between renewable energy and energy efficiency.

The market and process evaluation will be completed in 2013.

### **Impact Evaluation**

The CST impact evaluation will measure and verify the clean energy generation attributable to the program spending and assess program contributions, including each applicable technology, toward the RPS "30 x15" goal. The impact evaluation will be based on a combination of metered data, project information and engineering methods. The evaluation will leverage resource investment and data collection by the program's monitoring and verification work, and will include only minimal extra sampling for metering and site visits to obtain data that will support a highly rigorous determination of gross energy generation from these systems.<sup>10</sup> For example, internet-based, real-time monitoring of PV systems is expected to enable the evaluation to:

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<sup>10</sup> Where sampling is necessary, the evaluation will aim to achieve 90/10 statistical precision for CST energy generation from each technology. More granular precision, e.g., by geographic area, will be pursued where warranted and possible within the available budget.

- adjust the program's estimated energy generation based on analysis of actual energy production;
- understand variation of energy generation over the course of the year, including the amount of energy generation is coincident with system peak, and to some extent;
- examine whether energy generation is reliable to aid in alleviating certain transmission and distribution network constraints through the Geographic Balance effort.

In addition, fuel cells, anaerobic digesters and on-site wind turbines will also be subject to program-supported performance monitoring which will be leveraged by the evaluation to the maximum extent possible.

Impact evaluation can be coordinated with market and process evaluation surveys to assess the extent of energy generation that is attributable to the CST program. Survey research may also examine operational characteristics that could be impacting the amount of renewable generation seen through the monitoring.

The impact evaluation will be completed in 2013. In addition to examining energy generation impacts of the programs, the impact evaluation will also assist with collecting information to determine overall cost effectiveness and, to the extent possible, persistence of energy generation of the supported technologies.

The total budget authorized for evaluation of the Customer-Sited Tier is \$1.4 million through 2016. NYSERDA and DPS staff have agreed that this aggregate budget will be managed over the duration of the Program as necessary to deliver the evaluation reports identified above.