

**Massachusetts
Renewable & Alternative Energy
Portfolio Standards**

**MASSACHUSETTS RPS & APS
ANNUAL COMPLIANCE REPORT
FOR 2012**

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EXECUTIVE SUMMARY

The Massachusetts Renewable and Alternative Energy Portfolio Standards (RPS and APS) are statutory obligations under the Green Communities Act of 2008 (the Act), with minor changes under the Competitively Priced Electricity Act of 2012. The Act requires Massachusetts Retail Electricity Suppliers to obtain from qualified sources certain percentages of the electricity needed to supply their retail customers each year. Sources eligible for RPS Class I are post-1997 renewable plants; for RPS Class II Renewable Energy, pre-1998 renewable plants; for RPS Class II Waste Energy, pre-1998 Massachusetts waste-to-energy plants; and for APS, plants using certain “alternative energy” technologies. These standards commenced in January 2009. RPS Class I succeeded the original RPS, which began in 2003 with an obligation of one percent and increased by a half percent annually until it reached four percent in 2009. Under the Act, the Class I obligation increases by one percent annually and was seven percent in 2012. As of 2010, the Class I standard has included a Solar Carve-Out obligation that began at less than one tenth of one percent and rises annually. The Class II obligations do not increase annually, while the APS obligation increases by a half percent annually through 2014 and a quarter percent annually thereafter.

The 47 Retail Electricity Suppliers with RPS and APS obligations in 2012 met their obligations with a mix of (a) 2012 Certificates purchased from the owners of qualified Generation Units, (b) Attributes banked from 2010 and 2011 surplus Certificates, and (c) Alternative Compliance Payments (ACPs) in lieu of Certificates. Each RPS Class I and Class II Renewable Energy Certificate (REC), each Solar Carve-Out Renewable Energy Certificate (SREC), and each Waste Energy Certificate (WEC) represents the Generation Attributes of one megawatt hour (MWh)¹ of electricity generated during the Compliance Year by a Generation Unit qualified for a specific standard. Alternative Energy Certificates (AECs) represent the APS Attributes of the energy from APS qualified facilities during the Compliance Year, as calculated in a manner prescribed in the APS regulations for each specific alternative energy technology.

The supply of 2012 RPS Class I RECs fell almost 9% short of demand. The total retail load obligation in 2012 was 48,992 gigawatt hours (GWh),² of which the 6.837% RPS Class I obligation (net of the 0.163% Solar Carve-Out obligation) was 3,350 GWh. This obligation was met by 3,057 GWh of 2012 Class I RECs purchased by the Suppliers and 107 GWh of banked Attributes from 2010 and 2011 surplus RECs, plus 255 GWh of ACPs (costing about \$16.35 million) by 25 Suppliers that fell short of their REC obligations. The net result was a surplus of 70 GWh of 2012 Class I RECs, almost all of whose Attributes were eligible to be banked forward by nineteen Suppliers for future compliance.

Note that, in addition to the MA RPS Class I RECs documented for compliance in the 2012 Filings, a number of additional RECs were used by several MA Suppliers to meet “green product” claims, i.e., to acquire RECs for customers who voluntarily signed up for 50% or 100% renewable electricity. Also, some RECs were transferred into the NEPOOL GIS Reserve Account for retirement by various entities as “green” or for other purposes. About 11% of MA RECs that *also* qualified for RPS in other New England states were used for RPS compliance in those states, while about 0.3% of all MA RECs were not settled in any kind of account at the GIS and, therefore, appear to have been left unsold by generators.

RECs from Class I renewable sources within Massachusetts in 2012 grew by 51% from 2011, exceeded on a percentage and an absolute basis only by increases from new wind farms in northern New England. Most RPS Class I RECs came from electricity generated by wind turbines (52%), landfill methane fueled power plants (28%), and biomass-fired power plants (13%). The remaining supply came from hydroelectric plants, solar photovoltaic (PV) arrays (the fastest increasing source), and anaerobic digester gas

¹ One megawatt hour (MWh) = one thousand kilowatt hours (kWh) = one million watt hours of electrical energy.

² One gigawatt hour (GWh) = one thousand MWh = one million kWh = one billion (US) watt hours of electrical capacity.

plants. Geographically, resources in the state of Maine (especially wind) supplied 29% of the RECs, while New York resources (landfill methane and wind) supplied 20%, New Hampshire (mostly biomass and wind) 17%, Massachusetts (mostly landfill methane, wind, and solar) 14%, and wind in adjacent Canadian provinces 13%, with the balance from resources in other New England states.

For the RPS Solar Carve-Out (SCO) within Class I, steeply accelerating photovoltaic (PV) development yielded a substantial SREC surplus in 2012, which lowered SREC prices, activated the Solar Credit Clearinghouse Auction (SCC Auction) mechanism, and almost eliminated use of the ACP option for compliance. The supply of SRECs to satisfy the RPS SCO obligation of 0.163% in 2012 far exceeded the 80 GWh required. The large surplus notwithstanding, twelve Suppliers met some or all of their SCO obligations with 4 GWh worth of ACPs, totaling about \$245 thousand. From a total surplus of 41 GWh of SRECs, 39 GWh were deposited into the Auction (and not reported in the 2012 Filings), while 25 Suppliers banked a total of 1 GWh forward to use for future compliance, and some were used for Class I compliance.

The supply of Class II RECs in 2012 for the RPS Class II Renewable Energy requirement was far short of the demand in 2012, with only 156 MW of pre-1998 plants (mostly hydroelectric) qualified for Class II. Only 247 GWh of available Class II RECs were acquired by just 17 of the 47 Suppliers towards meeting the 3.6% obligation totaling 1,707 GWh, while 2 GWh of banked RECs were used, and 1 GWh were banked forward. 86% of the obligation was met by ACPs, which totaled about \$38 million.

The supply of WECs for the RPS Class II Waste Energy requirement, on the other hand, exceeded demand. To meet the 3.5% obligation totaling 1,659 GWh, Suppliers obtained 1,710 GWh and used 207 GWh banked from 2011 surplus, while ten Suppliers also used 24 GWh of ACP, costing \$254 thousand. The net result was a surplus of 282 GWh, of which 279 GWh were eligible to bank forward for future compliance. An additional 85 GWh of WECs were minted at the NEPOOL GIS but not sold to Suppliers.

The supply of 351 GWh of AECs for the Alternative Energy Portfolio Standard (APS), augmented by less than 8 GWh banked from 2010 and 2011 surplus, was significantly short of the need for 1,185 GWh to meet the 2.5% obligation. Consequently 828 GWh (70%) of the APS obligation were met by ACPs totaling about \$17.4 million, while a surplus of only 1 GWh was banked forward by four Suppliers for future compliance. As in 2011, almost all AECs in 2012 came from combined heat and power (CHP) plants.

In sum, RPS Class I continues its intended role of providing incentives for the accelerated development of new Renewable Generation Units, while RPS Class II provides incentives for the continued and improved operation of older renewable and waste energy facilities. The APS incentive increases the financial viability of new and incremental CHP projects, which generate large savings in net, source-fuel consumption when compared with the conventional sources of electricity and thermal energy. Finally, the Solar Carve-Out within RPS Class I, after a slow start in 2010, has provided sufficient incentive for a rapid acceleration in PV development since then and surpassed its initial target ahead of schedule. The successful SCO will be followed up by a second phase with a more aggressive target but with regulation-based procedures designed to ensure a more carefully managed growth curve.

In other activities, the process of revising the woody biomass eligibility standards within the RPS Class I regulations reached its conclusion on August 17, 2012. The new standards were based on forest sustainability and life-cycle CO₂ emissions criteria, and were also informed by extensive stakeholder comments and legislature input. In 2013, DOER revised the Class I regulations again, primarily to provide an orderly end to qualifying new PV systems under the Solar Carve-Out when the 400 MW program cap was suddenly exceeded in June. DOER also began developing in 2013 a follow-up Solar Carve-Out, which aims to achieve Governor Deval Patrick's new overall goal of 1,600 MW of PV installed by 2020.

SECTION ONE

INTRODUCTION TO THE RENEWABLE & ALTERNATIVE ENERGY PORTFOLIO STANDARDS

This section describes the Massachusetts Renewable and Alternative Energy Portfolio Standards (RPS and APS) as structured in 2012 pursuant to the Green Communities Act of 2008.³ The last paragraph briefly summarizes changes that took effect during 2013 and early 2014, after the period of this report.

The original 1997 RPS statute obligated Retail Electricity Suppliers (“Suppliers”), both regulated distribution Utilities and licensed but unregulated Competitive Suppliers, to obtain for their retail customers a small but growing percentage of electricity (the “Minimum Standard”) from sources that qualified as New Renewable Generation Units, namely generators that began operation after 1997 and used eligible renewable resources and technologies – especially solar, wind, landfill methane, and low-emission/advanced technology biomass. The RPS began with an obligation of one percent in 2003 and increased by a half percent annually through 2009, when it reached four percent and was renamed RPS Class I. Since 2009, RPS Class I has increased by one percent annually. The obligation was seven percent in 2012 and will be fifteen percent in 2020.⁴ In addition to RPS Class I, as of 2009 the Suppliers must comply with three new Energy Portfolio Standards mandated by the Green Communities Act, and, as of 2010, with a Solar Carve-Out within Class I. These Standards are also structured as percentage obligations for Suppliers, but with each Standard having different eligibility criteria and percentage obligations.

In 2009, the changes were implemented in three Regulations, respectively for RPS Class I, RPS Class II, and the Alternative Energy Portfolio Standard (APS).⁵ The new Regulation for RPS Class I continues to limit eligibility to post-1997 Generation Units, but with some grandfathered Vintage Generation Units from RPS still partially qualified, and, as of 2010, with a “carve-out” for post-2007 solar photovoltaic projects (the latter detailed below). The list of RPS eligible resources was expanded to include hydroelectricity plants of small size and low environmental impact⁶, as well as geothermal and “marine and hydro-kinetic” facilities. In addition, as of 2009, Behind-the-Meter distributed generation units, which formerly had to be located within Massachusetts, could be located anywhere in the ISO New England (ISO-NE) control area (the New England grid), but all such generation now must be reported to the NEPOOL GIS⁷ by independent third parties (termed Independent Third Party Meter Readers or Independent Verifiers).⁸

³ The RPS provisions of the Electricity Restructuring Act of 1997, later replaced by provisions of the Green Communities Act of 2008 (<http://www.malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter169>), were incorporated in Massachusetts law in M.G.L., c. 25A, §11F (<http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter25A/Section11F>).

⁴ The RPS law and regulations (except for the Solar Carve-out regulations) do not include final limits or ending dates.

⁵ The [Regulations](#) – 225 CMR 14.00 (RPS Class I), 15.00 (Class II), and 16.00 (APS) – became effective on an “emergency” basis on January 1, 2009, and the subsequent, formal rulemaking process concluded with the promulgation of final revised Regulations effective on June 12, 2009. The RPS Class I regulation was subsequently revised to include a Solar Carve-Out standard on an emergency basis in January of 2010, launching a process that culminated in December of 2010. Section One of this report describes RPS Class II and APS in their final, 6/12/09 form and RPS Class I in its 12/10/10 form, incorporating the Solar Carve-Out provisions in effect through 2012. Revision of the woody biomass eligibility standards in the Class I Regulation was promulgated in August of 2012, and is only briefly summarized in this report; additional information can be found at this account of the [revision process](#).

⁶ Hydroelectric plants in Class I initially were limited to post-1997 facilities of no more than 25 MW *or* to incremental output at pre-1998 facilities attributable to added capacity or efficiency improvements amounting to no more than 25 MW, while the Class II per-facility capacity limit was 5 MW. However, under the [Competitively Priced Electricity Act of 2012](#), the eligible hydroelectricity capacity limits were increased, effective as of November 1, 2012, to 30 MW in Class I and 7.5 MW in Class II. In addition, stringent statutory environmental criteria apply to facilities under both Class I and Class II; these are normally met through certification by the non-profit, [Low Impact Hydropower Institute \(LIHI\)](#). See the details for Class I hydropower in 225 CMR 14.05(1)(a)6 and for Class II hydropower in 225 CMR 15.05(1)(a)6.

⁷ See <http://www.nepoolgis.com>, as well as descriptive paragraphs below.

⁸ Another substantive change in RPS Class I was the addition of a provision that a qualified plant *not* commit its generation capacity to Control Areas other than ISO-NE, with some exceptions. In addition, non-intermittent generators now must participate in the ISO-NE Forward Capacity

Under the new Solar Carve-Out (SCO) Minimum Standard, each Supplier must demonstrate annually that, *within* its Class I percentage obligation, it has obtained a specified, much smaller percentage of its electricity from small, on-site, grid-connected, photovoltaic (PV) systems within Massachusetts that were installed after 2008.⁹ The SCO percentage obligation rises annually through a methodology detailed in the Class I Regulation (225 CMR 14.07(2)). On a dollar per MWh basis, PV is costlier to install than the other major Class I renewable technologies. That expense is reflected in higher Alternative Compliance Payment (ACP) rates, with the original intent of providing sufficient incentive to bring 400 MW of new PV generating capacity on line in Massachusetts by 2017.¹⁰ That goal was surpassed in 2013, and DOER has proposed a new “Solar Carve-Out II” (see the last paragraph of this section). With the SCO obligation of 0.163% netted out, the remaining 7% Class I obligation for 2012 was 6.837%, which was met mostly by RECs from non-SCO, Class I qualified generation.

RPS Class II is limited to, and intended to support the continued operation of, two classes of pre-1998 Generation Units. The RPS Class II Renewable Energy Minimum Standard of 3.6% is for Units that meet the same technology, resource, and location criteria as Class I, but with some differences for hydropower (limited to 7.5 MW)¹¹ and biomass (not necessarily “advanced technology”)¹². The RPS Class II Waste Energy Minimum Standard of 3.5% provides incentives for pre-1998 Waste Energy generation, which had been listed as “renewable” but not “eligible” under the original RPS. The Class II eligibility of Waste Energy Generation Units (a.k.a., trash-to-energy plants or municipal solid waste [MSW] plants) is conditioned on recycling and other regulatory criteria that are specific to Massachusetts.

The Alternative Energy Portfolio Standard (APS) is limited to, and intended to support, certain “alternative,” largely non-renewable, technologies and resources whose development the Legislature deemed worthy of incentives modeled on RPS.¹³ Two APS technologies are active to date: Flywheel Storage and Combined Heat and Power (CHP, a.k.a., cogeneration).¹⁴ The Alternative Energy Certificates (AECs) earned by a CHP Unit represent the energy saved (in MWh) by operating the Unit as a CHP Unit as compared to separately operating an on-site thermal plant while drawing electricity from the grid.¹⁵ The quantity of AECs earned by a flywheel storage Unit is equal to 65% of the electricity discharged by the Unit and represents a value placed upon the Unit’s reduction of peak power generation and voltage regulation.

A major but temporary difference between RPS Class I and all of the newer standards (RPS Class II and APS) is a transition mechanism mandated by law to mitigate the price impact of the newer standards for the Competitive Suppliers.¹⁶ Competitive Suppliers, unlike regulated Utilities, are not able to pass the additional compliance costs along to retail customers with whom they were already contracted to deliver electricity at prices that did not include the purchase of the newly-required Class II RECs, WECs, and AECs. A Competitive Supplier, rather than having to comply with RPS Class II or APS for its entire retail load,

Market except to the extent that their capacity is previously committed elsewhere. For details, see 225 CMR 14.05(1)(e). In the case of plants outside of ISO-NE, the import rules now also include a “round-tripping” prohibition, for which see 225 CMR 14.05(5)(d).

⁹ To qualify for the SCO, a PV system also must meet certain limitations on the types and percentages of public funding of installation costs.

¹⁰ For more detail about the Solar Carve-Out, visit the [RPS/APS homepage](#).

¹¹ See footnote 6 for more details.

¹² On August 23, 2012, DOER [announced suspension](#) of the consideration of Class II applications for Generation Units fueled by woody biomass until the completion of a pending process to revise the biomass eligibility standards in the Class II Regulation. See the last paragraph of this section of the Report for more on the proposed Class II revisions.

¹³ The APS statute is at <http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter25A/Section11F1~2>.

¹⁴ Other technologies qualified under APS include (1) the displacement of fossil fuels by certain paper-derived fuel cubes, (2) coal gasification with permanent carbon sequestration, and (3) “efficient steam technology”. Stringent carbon dioxide emission reductions and other emission and efficiency criteria apply. However, regulations have not yet been developed for the second and third of the three technologies listed here.

¹⁵ For how an AEC is calculated for CHP Units, see the APS Regulation in 225 CMR 16.05(1)(a)2 and the [APS Guideline for CHP](#).

¹⁶ See the first paragraph on page 17 for a somewhat different transitional cost mitigation procedure used in the Solar Carve-Out.

must meet those standards only for the portion of its load that is served under contracts that were executed or extended on or after January 1, 2009. Accordingly, each Competitive Supplier is required to report in its Filing to DOER the quantity of electricity delivered under pre-2009 contracts (termed Exempt Load) and to subtract that amount from the total load reported for Class I, in order to ascertain the net amount on which to base its RPS Class II and APS obligations. In addition, each Supplier is required to project its Exempt Load for the next five years; these data (for which DOER has promised confidentiality) are reported in the aggregate in Section Seven, Table Eight. This exemption declines rapidly, so that by 2018 all Suppliers will have to comply with RPS Class II and APS for all or nearly all of their total load obligations.

Retail Electricity Suppliers meet their annual RPS and APS obligations by acquiring a sufficient quantity of MA RPS Class I and Class II qualified Renewable Energy Certificates (“RECs”), Solar Carve-Out Renewable Energy Certificates (“SRECs”), Class II Waste Energy Certificates (“WECs”), and APS qualified Alternative Energy Certificates (“AECs”). These certificates are created, recorded, and tracked at the web-based, NEPOOL Generation Information System (“GIS”).¹⁷ The GIS tracks all electricity generated within the ISO New England control area and fed onto the New England grid, as well as electricity exchanged between ISO-NE and adjacent control areas.¹⁸ For each megawatt-hour (MWh) of electricity, whether renewable or not, the GIS creates and deposits one serially-numbered, electronic certificate in the account of the entity that generated or imported the MWh. Any certificate for energy output that qualifies for one or more of the New England states’ energy portfolio standards is coded as such.¹⁹ A Supplier with a Massachusetts portfolio standard obligation purchases RECs, SRECs, WECs, and AECs from qualified generators, either directly or via brokers, and they are electronically transferred from the generators’ GIS accounts to the Supplier’s GIS account. Each GIS certificate qualified for a Massachusetts portfolio standard can be used for compliance with *only* the standard for which it is qualified; thus, for example, a Class I REC can be used only for Class I compliance, a Class II WEC only for Class II Waste Energy compliance. However, since SRECs are for a “carve-out” within Class I and are a type of Class I REC, they can be used for non-SCO Class I Renewable Energy compliance.

An additional mechanism of importance for RPS and APS compliance flexibility is “banking”. The Attribute represented by a certificate that is in excess of the quantity that a Supplier needs for compliance with one of the Minimum Standards in a given Compliance Year can be “banked” for use towards that *same* Minimum Standard²⁰ in one of the following two Compliance Years. The total amount that a Supplier can bank is limited to no more than 30% of the amount the Supplier needs for Compliance in the Compliance Year in which the surplus generation occurs, but only 10% in the case of the Solar Carve-Out.

The RPS and APS requirements are further detailed in the RPS and APS Regulations and on DOER’s RPS/APS web pages (www.mass.gov/energy/rps), which also explain how facilities become qualified, list all qualified facilities, and explain how Suppliers annually demonstrate their compliance with RPS and APS.

¹⁷ See www.nepoolgis.com.

¹⁸ The ISO-NE “control area”, covering most of New England, is a geographic region in which a common control system is used to maintain scheduled interchange of electrical energy within and without the region. ISO New England Inc. is the independent system operator for the ISO-NE control area, operating the New England electric power grid. It also qualifies as the regional transmission operator (RTO) under the rules of the Federal Energy Regulatory Commission (FERC). See <http://www.iso-ne.com/aboutiso/index.html>.

¹⁹ Each REC is encoded with Attributes that indicate the Generation Unit name, location, and fuel, energy resource or technology, as well as whether or not the Generation Unit and its RECs are qualified for *each* of the several New England state RPSs. A Massachusetts qualified REC that is also qualified for RPS in another New England states can be sold, transferred, and used to meet either state’s RPS obligation. However, by the end of each GIS Certificate trading year (midnight on June 15 of the year following the Compliance Year), each REC can be located in only one state-specific Supplier sub-account at the NEPOOL GIS; thus, double-counting of RECs is not possible. Each state’s RPS statute and regulations define the RPS eligibility of generation a bit differently, and those definitions can be changed over time by each state. Thus, not every GIS certificate that is termed a REC is qualified for MA RPS.

²⁰ Banked Attributes from excess SRECs can be used towards either SCO or Class I compliance, since SRECs are a type of Class I Certificate. Banked Attributes from excess Class I and Class II certificates are not interchangeable, nor Class II RECs and WECs.

Although unrelated to 2012 RPS compliance, note that a [Class I rulemaking process](#) that commenced in May of 2011 and concluded on August 17, 2012, changed the RPS Class I eligibility standards for fuel sourcing and energy conversion efficiency for generation units fueled by woody biomass. The standards are based on forest sustainability and life-cycle carbon dioxide (CO₂) emissions, informed by a DOER-commissioned, 2010 study on the relative environmental impacts of woody biomass as a fuel. The standards were also informed by extensive stakeholder comments and legislature input.²¹

In 2013, DOER completed two formal rulemakings for the Class I Solar Carve-Out. The regulatory changes incorporated a forward schedule for Alternative Compliance Payment rates, modified the formula used for calculating future compliance obligations, and established procedures for an orderly end to the process of qualifying PV systems for what proved to be an unanticipated surge of applications in the spring of 2013.

Finally, as of the completion of this report early in 2014, DOER had recently commenced two new rulemakings, one each for Class I and Class II.²² The [proposed regulatory revisions to Class I](#), announced on January 3, 2014, would establish a follow-up or second phase to the Solar Carve-Out (“Solar Carve-Out II”) that is designed to achieve a gradual increase to a combined total of 1,600 MW of installed PV in Massachusetts by 2020, as announced by Governor Patrick on May 1, 2013.²³ This rulemaking is nearing completion as of the date of this report. The [proposed Class II revisions](#), announced on February 28, 2014, would (a) adopt for woody biomass eligibility those provisions of the recently promulgated Class I biomass standards deemed appropriate for Class II; (b) revise the Class II Renewable Energy Minimum Standard downward to reduce reliance on the ACP compliance mechanism, as DOER had recommended in its December 31, 2012, report to the Legislature required under the Competitively Priced Electricity Act of 2012²⁴; (c) revise the banking provisions for Waste Energy Certificates, and (d) incorporate a 2012 statutory increase in the hydropower size limit.

SECTION TWO

RPS CLASS I COMPLIANCE IN 2012

Summary

The total supply of electricity from 2012 RPS Class I Generation (represented by Class I RECs) fell a bit less short of demand than in 2011 (8.8% vs. 9.4%). The shortfalls in 2010-2012 followed three years of surplus (2007-2009), which had followed, in turn, supply shortages in the first four years of RPS (2003-2006). The 2012 RPS Class I obligation for each Supplier was seven percent (7%) of its retail load obligation at the NEPOOL GIS, from which 0.163% was subtracted for the Solar Carve-Out obligation, leaving a net Class I obligation of 6.837%. (See Section Three for 2012 Solar Carve-Out compliance.)

The total retail load obligation in 2012 was 48,992,430 MWh, for which the total of all 47 Suppliers’ 6.837% obligation was 3,349,611 MWh. The Class I REC supply presented for compliance totaled 3,164,245 MWh, which consisted of 3,056,894 RECs²⁵ from 2012 generation plus 107,351 MWh of Attributes banked from 2010 and 2011 surplus RECs. More than half of the Suppliers (24) did not acquire enough RECs and had to meet some of their compliance through 255,388 MWh of Alternative Compliance

²¹ See the [Biomass Sustainability and Carbon Policy Study \(a.k.a. Manomet Study\) webpage](#). Information on this rulemaking process, including further actions, is on the [RPS Biomass Policy Regulatory Process webpage](#).

²² DOER’s current rulemaking activities can be accessed via DOER’s RPS/APS homepage, <http://www.mass.gov/energy/rps>.

²³ The May 1, 2013, announcement is [here](#).

²⁴ See DOER’s report to the Legislature: *Evaluation of the Massachusetts RPS Class II Program*, available [here](#).

²⁵ This includes some SRECs that were not needed for SCO obligation or that were in excess of the SCO banking limit.

Payments (ACPs) totaling \$16,350,132 at the rate of \$64.02 per MWh.²⁶ The resulting 3,349,611 MWh total yielded a surplus of 70,022 MWh, of which 69,916 MWh were eligible to be banked by nineteen Suppliers for compliance use in 2013 and 2014. Thus, while some of the shortfall in 2012 supply was met by many Suppliers by drawing down their banked supply, any new surplus that was banked forward was much less than had been withdrawn, leaving a smaller cushion of banked supply for use in 2013.²⁷ Table One, below, displays the 2012 figures, along with those of the previous nine compliance years, and additional details are in Appendix Two, Table A.

The supply of RECs from Class I Renewable Generation in Massachusetts (including SRECs) rose by 51.1%, which is higher than most of the prior annual rates of increase. 39% of that increased supply was attributable to PV, 30% to landfill methane, and 29% to wind.²⁸

Note that all figures regarding the quantities and percentages of Class I RECs from different jurisdictions must be understood in the context of a regional market in which most, but not all, MA Class I RECs can be used for RPS compliance in several New England states. Thus, many more RECs are actually created than are reflected in the 2012 RPS compliance figures. 3,643,818 MA Class I RECs (including 118,356 SRECs) were created at the NEPOOL GIS. Of those, 3,064,320 RECs (including 890 SRECs) were submitted in the Filings for Class I and 77,491 SRECs for Solar Carve-Out compliance, together totaling about 86% of all MA Class I RECs, while 38,866 surplus SRECs (1%) were transferred to the SCC Auction Account at the GIS.²⁹ More than 400,000 MA Class I RECs, about 11% of the total, were settled into Suppliers' GIS subaccounts for the other New England states where they also qualified for RPS, presumably to be used for RPS compliance there (mostly in RI and NH). In addition, about 49,061 RECs (>1%) were settled in MA subaccounts at the GIS or in the GIS "Reserved Account" for voluntary "green power product" sales.³⁰ Finally, about 12,000 RECs were not settled in any account at the GIS and, therefore, appear to have been left unsold by generation owners.

Compliance Details

DOER received filings from forty-seven Retail Electricity Suppliers, entities that served retail load in Massachusetts during 2012, as listed below in Table One. These included the four investor-owned, distribution Utility companies that are regulated by the Massachusetts Department of Public Utilities (DPU) and forty-three Competitive Suppliers that are licensed but not regulated by the DPU.³¹ Eleven Suppliers new to the Massachusetts RPS market are listed in italics, and one other underwent a name change.³²

²⁶ See 225 CMR 14.08(3) and Section Eight of this report regarding the procedures for ACP and the use of ACP funds. The announcement and calculation of the annual ACP rate can be accessed via the [Compliance Information for Retail Electric Suppliers link](http://www.mass.gov/energy/rps) on the RPS/APS homepage, <http://www.mass.gov/energy/rps>.

²⁷ DOER intends to sell for 2013 Class I compliance 36,437 SRECs that it purchased after the SCC Auctions. See the top of page 19.

²⁸ If one omitted the rapidly-growing Solar Carve-Out in the above analysis, then the in-state Class I REC supply grew by almost 37%. 46% of the 2012 increase was attributable to landfill methane, 44% to wind, and 7% to solar PV.

²⁹ See additional detail in Section 3, Solar Carve-Out Compliance.

³⁰ The 49,061 Class I RECs retired as "Voluntary Renewable Energy (VRE) purchases" from the 2012 Filings DOER reported to the Massachusetts Department of Environmental Protection (MassDEP), which, in turn, retired 17,637 allowances for the 2017 vintage year in the Regional Greenhouse Gas Initiative (RGGI). The retired allowances represent the Greenhouse Gas emissions avoided by 49,061 MWh of renewable energy. That quantity will reduce the number of allowances that can be sold in the RGGI Auction for 2017, which will, in turn, slightly reduce the regional allowance cap for non-renewable thermal power plants in 2017. DOER's regulatory basis for this report is the CO₂ Budget Trading Program Auction Regulation, 225 CMR 13.14. More information about RGGI can be found at this website: <http://www.rggi.org/>.

³¹ Regulated distribution Utilities provide electricity under "Basic Service" to those customers in their franchise territories who have not chosen to purchase electricity from Competitive Suppliers. Competitive Suppliers compete for and supply electricity to retail customers in any or all of the DPU-regulated distribution utility territories.

³² In addition, one Supplier left the market: WFM Intermediary New England Energy LLC, which had served the load of the Whole Foods Markets.

Table One
2012 Massachusetts Retail Electricity Suppliers

Distribution Utilities		
Fitchburg Gas & Electric Co. (Unitil)	Massachusetts & Nantucket Electric Companies, d/b/a National Grid	NSTAR Electric Co. Western Massachusetts Electric Co.
Competitive Suppliers		
Cianbro Energy, LLC	Glacial Energy of New England, Inc	NextEra Energy Services Massachusetts, LLC ³³
Consolidated Edison Solutions, Inc.	<i>Great Eastern Energy</i>	Noble Americas Energy Solutions, LLC
Constellation Energy Power Choice ³⁴	<i>Gulf Oil LP</i> ³⁵	<i>OBE Electric</i>
Constellation NewEnergy, Inc.	Hampshire Council of Governments	Open Book Energy, LLC
Devonshire Energy LLC	Hannaford Energy, LLC	<i>Peoples Power & Gas LLC</i>
Direct Energy Business, LLC	Harvard Dedicated Energy Limited	Pepco Energy Services, Inc.
Direct Energy Services, LLC	Hess Corporation	Public Power, LLC
Dominion Retail, Inc.	<i>HOP Energy</i>	<i>Reliant Energy Northeast LLC</i>
East Avenue Energy, LLC	Hudson Energy Services, LLC	REP Energy, LLC
Easy Energy of Massachusetts, LLC	Integrays Energy Services, Inc.	South Jersey Energy Company
First Point Power, LLC	Just Energy Massachusetts Corp.	Spark Energy, LP
<i>Energy Plus Holdings LLC</i>	Liberty Power Holdings LLC	<i>Texas Retail Energy, LLC.</i>
GDF Suez Energy Resources NA, Inc.	<i>Massachusetts Gas & Electric Co.</i>	TransCanada Power Marketing Ltd
<i>GDF Suez Retail Energy Solutions LLC, d/b/a Think Energy</i>	Mint Energy, LLC	<i>Viridian</i> XOOM Energy Massachusetts LLC

Of the total compliance obligation, 92.4% of the compliance was met by Class I Renewable Generation. 89.2% came from 2012 generation, while 3.2% came from Attributes banked from 2010 and 2011 compliance surplus. 7.6% was met using the Alternative Compliance mechanism (double the 2011 figure) – by making ACPs to the Massachusetts Clean Energy Center (MassCEC). 2.3% of the RECs from 2012 generation were qualified to be Attributes banked forward for use towards Class I compliance in 2013 or 2014, compared to 3.7% of 2011 RECs banked forward. The detailed compliance figures for all ten RPS Compliance Years are in Table Two.

Changes in the manner of compliance during the ten years of the program, 2003-12, are shown below in Figure One. The initial shortage of qualified generation and RECs is evident in the high reliance on ACPs during 2004-06. That was followed by four years of little or no use of ACPs, while 2011 and 2012 saw a return to ACP reliance. The more recent shift notwithstanding, the RPS obligation clearly has demonstrated its success in providing incentives for accelerated development of new Renewable Generation Units since the original RPS regulations were issued in April of 2002.

³³ NextEra Energy Services Massachusetts is also known as Gexa Energy, having acquired the latter in 2010.

³⁴ Constellation Energy Power Choice was formerly known as MxEnergy Electric, Inc.

³⁵ Some of Gulf Oil's retail load (the portion serving Boston's Fenway Park) was transferred in the NEPOOL GIS to TransCanada, which met the RPS and APS compliance obligation for the Fenway Park sales as part of its own.

Table Two
Aggregated Data from the RPS Class I Annual Compliance Filings, 2003-2012 (MWh)³⁶

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
CY Retail Sales (= Retail Load Obligation)³⁷	48,992,430	49,386,169	50,026,093	48,301,821	50,321,635	50,978,101	50,143,130	51,558,778	50,063,092	49,834,324
CY aggregated compliance obligation³⁸	3,349,611	2,882,823	2,467,336	1,932,089	1,761,257	1,529,343	1,253,578	1,031,176	750,946	498,343
Total RECs from CY generation	3,056,894	2,613,122	2,323,609	2,129,918	1,896,008	1,599,533	938,772	644,849	444,680	304,112
<i>minus</i> CY total surplus RECs	(70,022)	(107,805)	(241,062)	(387,664)	(216,550)	(87,957)	(9,458)	(739)	(20,297)	(60,837)
Net CY RECs for CY obligation	2,986,872	2,505,317	2,082,547	1,742,254	1,679,458	1,511,576	929,314	644,110	424,383	243,275
<i>plus</i> Banked from pre-CY surpluses³⁹	107,351	271,303	380,824	189,835	80,605	6,863	1,661	19,531	61,147	255,069
Total RECs used for CY obligation	3,094,223	2,776,620	2,463,371	1,932,089	1,760,063	1,518,439	930,975	663,641	485,530	498,344
<i>plus</i> Total ACP Credits	255,388	106,203	3,965	0	1,208	10,920	322,625	367,858	265,424	181
Total for compliance obligation	3,349,611	2,882,823	2,467,336	1,932,089	1,761,271	1,529,359	1,253,600	1,031,499	750,954	498,525
Surplus Attributes banked forward⁴⁰	69,916	107,804	241,061	386,059	210,580	80,743	9,458	739	20,297	61,314
ACP proceeds (rounded)	\$16,350,132	\$6,598,386	\$241,551	\$0	\$70,765	\$623,750	\$17,786,316	\$19,566,367	\$13,645,448	\$9,056

The next two subsections detail provide details about the location of the Generation Units from which Suppliers acquired RECs for 2012 Class I compliance and about the types of fuels, resources, and technologies by which the electricity was generated. Details of the 2012 Class I REC supply by both location and type are in Table H in Appendix 3, a table new with the 2012 report.

³⁶ CY is the abbreviation for Compliance Year, coterminous with a calendar year. These are aggregated figures, and compliance is calculated separately for each Supplier, with fractions always rounded upwards. Therefore, if one calculated the RPS Obligation using the total “CY Retail Sales,” the result usually would be less than the “CY Aggregated Compliance Obligation” listed in this table and elsewhere in the report. This is true for all RPS classes and for APS.

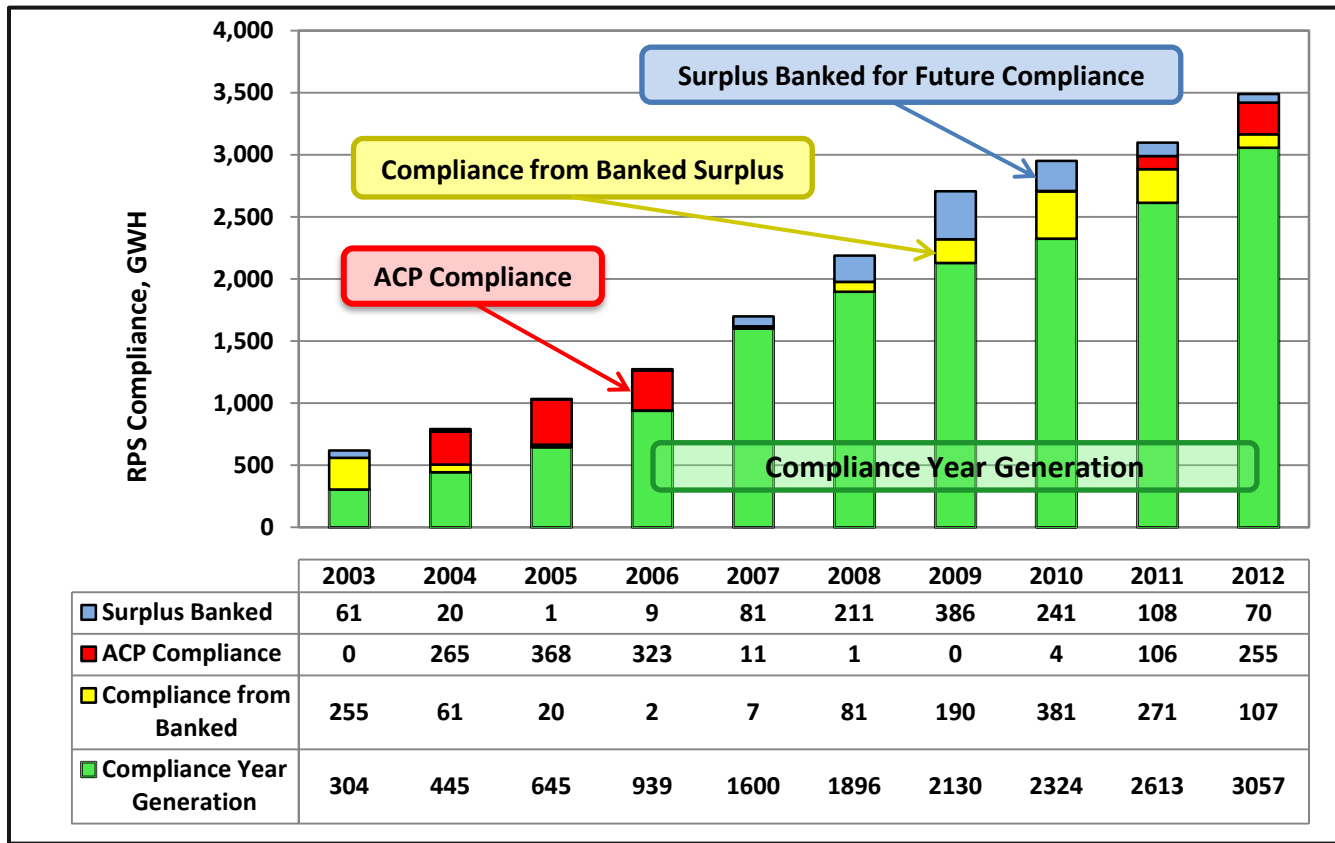
³⁷ DOER requires that each supplier use as its “retail electricity sales” the CY’s total of its 90 Day Resettlement figures provided to the Suppliers by the regulated utilities both directly and via DOER. For additional detail, see the *Guideline for Retail Electricity Suppliers on the Determination of Sales to End-use Customers for Calculating the Annual RPS Obligation*, at <http://www.mass.gov/eea/docs/doer/rps-aps/rps-compliance-basis-guideline.pdf>.

³⁸ The RPS Class I Minimum Standard obligation for each of the CYs 2003 through 2010 was, respectively, 1%, 1.5%, 2%, 2.5%, 3%, 3.5%, 4%, 4.9321% (=5% minus the Solar Carve-out Minimum Standard of 0.0679%), 5.8373% (=6% - 0.1627%), and 6.837% (=7% - 0.163%). Note that the figures in this row usually are a bit higher than what one would obtain by calculating the total Retail Sales by the Minimum Standard for each year, as explained in footnote 36.

³⁹ RECs for RPS qualified New Renewable Generation from 2002, were “banked” by some Retail Suppliers to use for 2003 compliance under the “Early Compliance” provision of the 2002 regulation in 225 CMR 14.08(2) and 14.09(2). Those Early Compliance RECs “jump-started” the program when the financial incentives of RPS had not yet resulted in a sufficient supply of RECs.

⁴⁰ The large differences in some years between the quantity of surplus RECs and the quantity banked is due to some Suppliers purchasing more RECs than the limit that they are permitted to bank. A Supplier cannot bank a quantity of RECs that is greater than 30% of its total RPS compliance obligation for the year in which those RECs were generated (only 10% for SRECs). Banked RPS Class I RECs can be applied to compliance only with the RPS Class I obligation, not any other portfolio standard class or subclass and not the Solar Carve-Out. However, since SRECs are a type of Class I REC, surplus SRECs and banked SRECs can be used for Class I compliance,. Finally, note that, in addition to the banked Class I Attributes from 2012, DOER intends to sell to Suppliers 36,437 MWh of 2012, surplus, post-SCC Auction SRECs to use towards 2013 RPS Class I compliance. See the top of page 19 and footnote 56 for more information.

Figure One
RPS Class I Compliance, 2003-2012



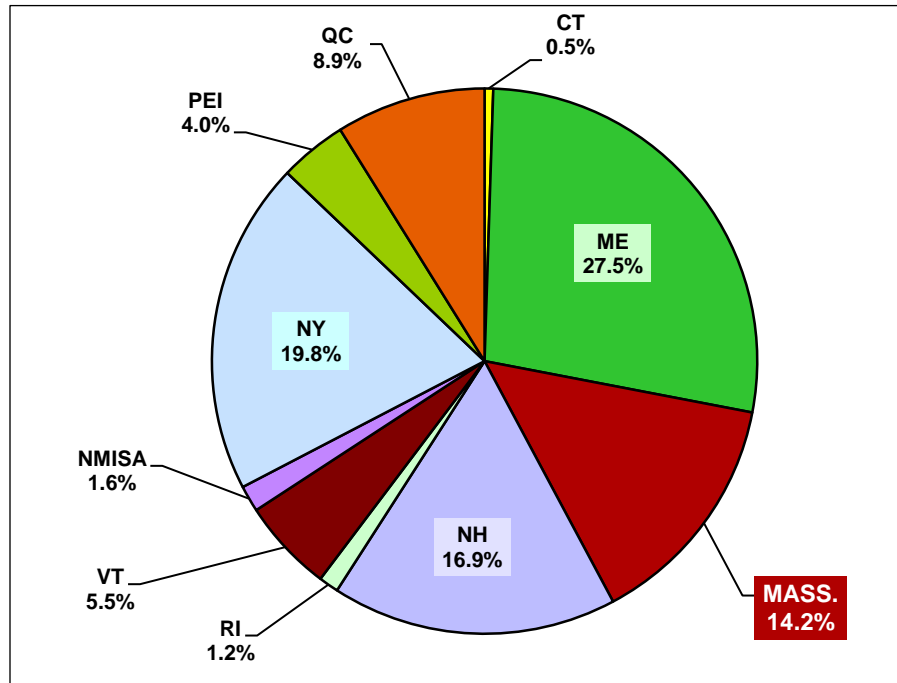
Generation Sources by Location

The percentages of 2012 RECs from the New England states, New York, and adjacent Canadian provinces are illustrated in Figure Two, below. Note that the Northern Maine Independent System Administrator (“NMISA”) is outside the New England grid and connects to ISO-NE via the New Brunswick control area; therefore, the output of NMISA generators must be imported via Canada to ISO-NE in order to earn RECs, as with all generation located in electricity control areas outside of and adjacent to ISO-NE. Figure Three illustrates the ten year trend in the location of the REC generation since 2003. Table F in Appendix Three lists the data from which these graphs were generated.

Massachusetts supplied 14.2% of the 2012 RECs presented for MA RPS Class I compliance, up from 10.8% in 2011, with most of the increase attributable to landfill methane, wind, and PV projects. The 51.1% increase of RECs from Massachusetts projects between 2011 and 2012 is one of the highest year-to-year increases since the early years of RPS. However, larger shares continued to come from Maine, 27.5% (down from 2011’s 28.3%, mostly from wind farms, as biomass output continued declining), and from New Hampshire, 16.9% (up from 2011’s 12.1% mostly from biomass and wind), as well as from New York, 19.8% (down from 2011’s 26.1%, mostly from landfill methane and wind).

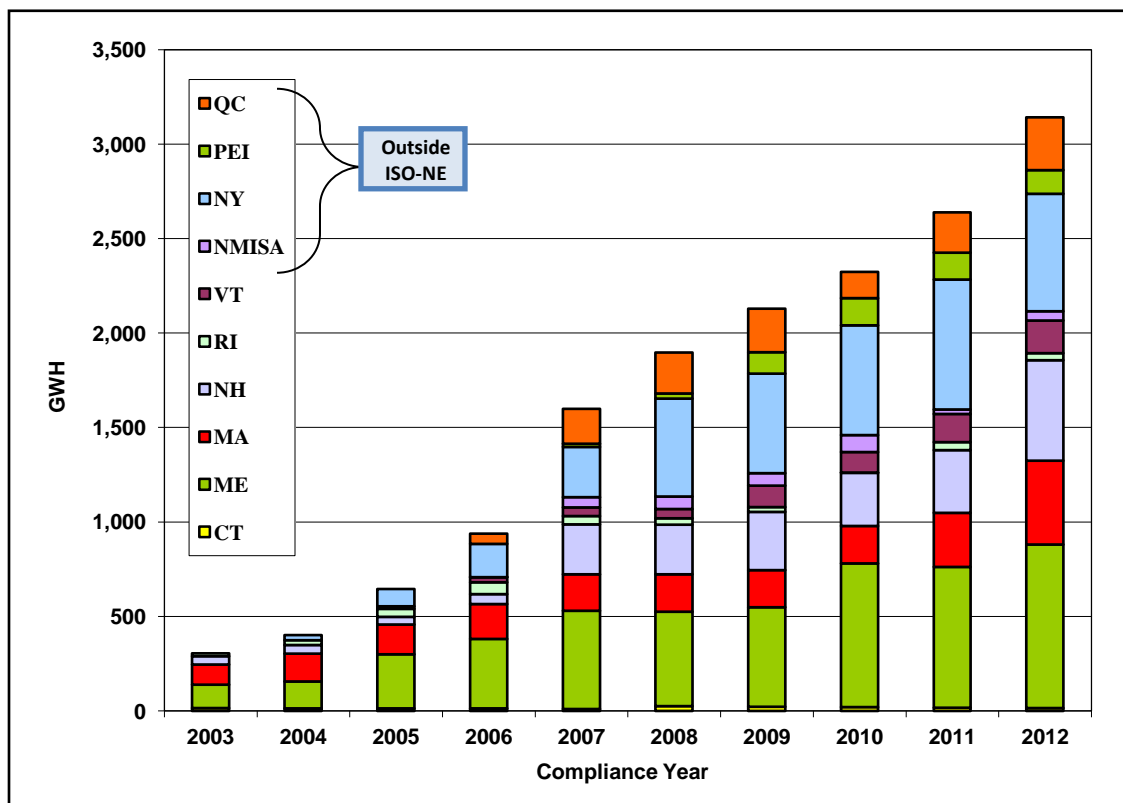
Between 2011 and 2012, the supply of RECs for MA RPS Class I compliance that was sourced from Generation Units inside the ISO-NE control area increased by 31%, while the supply from electricity imported from Units outside of ISO-NE increased by only 1%. The ISO-NE share of the total rose from 60% in 2011 to 66% in 2012, while the imported share fell proportionately. The sources of imports also shifted, with those from Canada (including NMISA in northern Maine) increasing and those from New York decreasing.

Figure Two
2012 RPS Class I Compliance by Generator Location*



* Includes the Solar Carve-Out.

Figure Three
RPS Class I Compliance by Generator Location, 2003-2012*



* Includes the Solar Carve-Out.

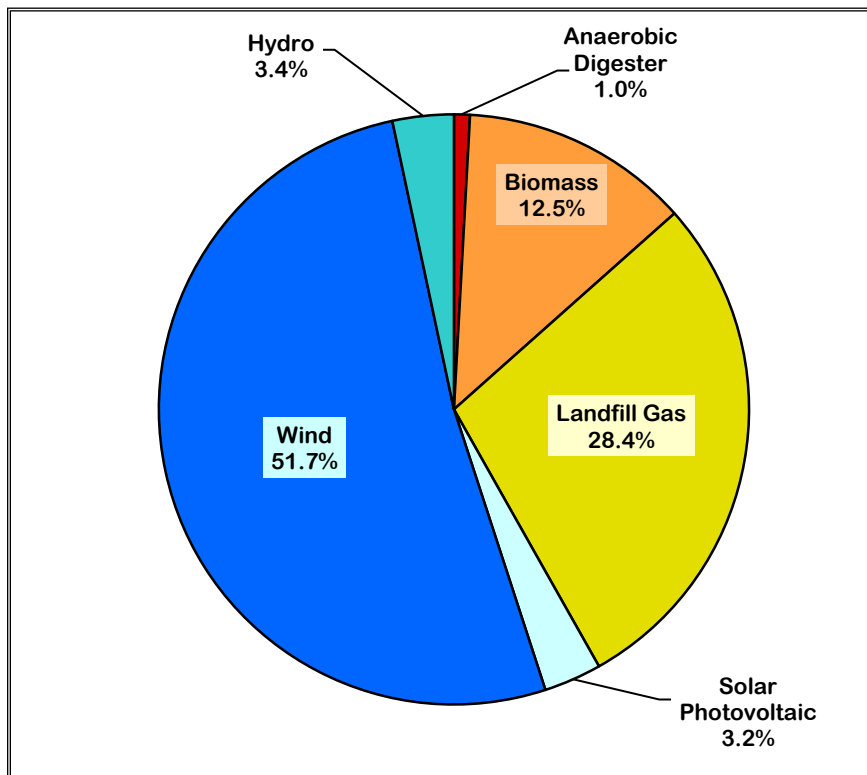
Generation Sources by Type

The percentages of 2012 RECs from the qualified types of renewable resources are illustrated in Figure Four, while Figure Five illustrates the ten year trend of RECs by resource type. Table G in Appendix Three lists the data from which these graphs were generated.

The supply of RECs from wind increased from 2011 to 2012 by 24%, from anaerobic digestion by 8%, from landfill methane by 5%, and from biomass by only a half percent (following a more or less continuous decline that began after 2007), while hydroelectricity held steady. Most notably, the supply of PV RECs used for Class I compliance rose by 116%. At the same time, overall PV generation increased by 223%; most of that generation qualified for the Solar Carve-Out. About a third of the resulting SRECs were in excess of what could be used for SCO compliance; most of those were deposited, instead, in the SCC Auction (discussed in Section Three of this report, below), while 890 were used for non-SCO Class I compliance.

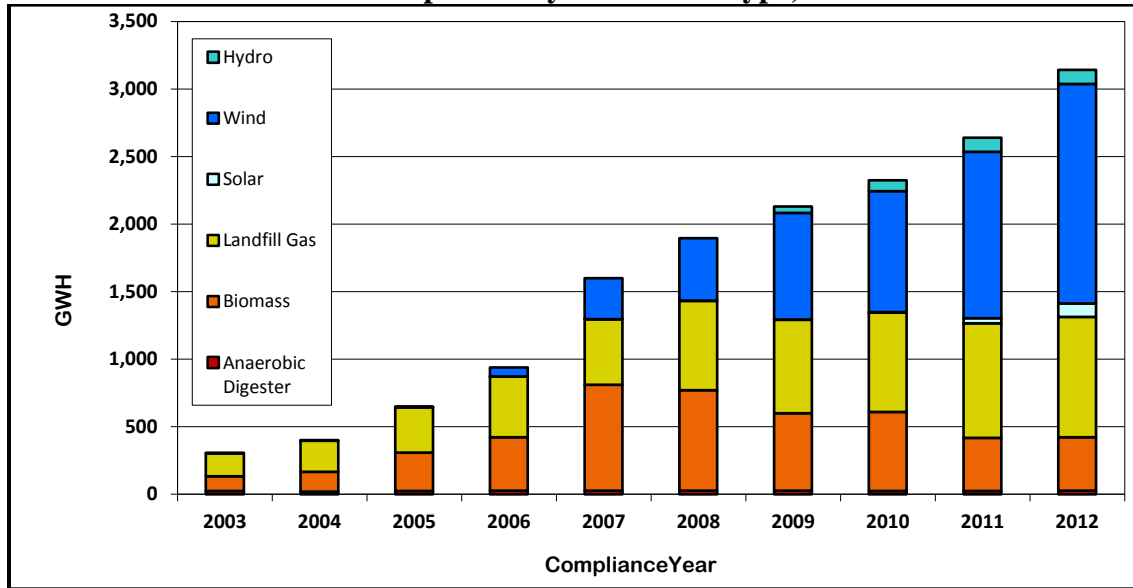
Wind power is the largest and, aside from PV, fastest growing source of RECs for RPS. Most of the wind RECs came from wind farms in Maine (41%) and in adjacent control areas: Quebec, New York, and New Brunswick (especially Prince Edward Island), and NMISA. RECs for non-ISO-NE resources are earned only on electricity actually transmitted into ISO-NE. Wind output has been increasing at a higher rate than biomass and landfill methane since 2005, and its share of the growing REC pie has reached 52% in 2012. Given the magnitude of the wind resource – in the mountains, on the New England coast, off the coasts of Massachusetts and other New England states, and in adjacent control areas – DOER expects wind to continue increasing its leading market share in the RPS.

Figure Four
2012 RPS Class I Compliance by Generator Type*



* Includes the Solar Carve-Out.

Figure Five
RPS Class I Compliance by Generator Type, 2003-2012*



* Includes the Solar Carve-Out.

The bulk of landfill methane electricity output is from New York (49%) and Massachusetts (24%), but with some from all of the other New England states. Landfill output was the largest source of RECs for several years but increased more slowly than biomass, which overtook it in 2007. Energy from new landfill plants in New York entered the market in 2008 and has continued to rise, while biomass energy has declined. When landfill overtook biomass again in 2009, both had been surpassed by wind, with landfill methane remaining the second largest REC source since then.

Almost all the RPS-qualified biomass generation is located in New Hampshire (68%) and Maine (31%).⁴¹ Biomass plant output increased substantially until 2007, when it overtook landfill methane as the largest resource type. Thereafter, however, output from biomass plants has declined. One plant in Maine stopped production at the beginning of 2009, while other Maine plants have had periods of reduced or no operation since 2008.

Hydroelectricity was added to the qualified mix for RPS Class I in 2009, mostly from post-1998 increases in output at some older plants from capacity and efficiency upgrades. Hydro as a source of RECs has risen very slowly, amounting to only 3% in 2012, almost all from Maine and Vermont.

In 2012 all of the anaerobic digester⁴² output, which provided only 1% of the 2012 RECs, was from in-state plants, mostly from the Deer Island Wastewater Treatment Plant. Additional anaerobic digester potential exists at other wastewater treatment plants and other facilities that generate organic wastes. Late in 2011 the first two RPS-qualified, anaerobic digester plants at Massachusetts dairy farms began operation, contributing to the REC supply in 2012. DOER is collaborating with the [MassDEP](#) to identify and encourage the expanded production of digester gas – at wastewater treatment plants, food processing and food service facilities, and dairy farms – and its use for electricity generation.

Solar photovoltaic arrays provide a small but very rapidly growing quantity of RECs for RPS. This accelerating growth has been propelled by a number of factors in the last few years, including declining costs, federal and state tax incentives, federal stimulus dollars, state “net metering” policy,

⁴¹ Prior to 2010, Maine had been the leading source of biomass RECs.

⁴² See footnote 106 regarding the relationship between anaerobic digester gas and biomass in the MA RPS regulations.

and, notably, the RPS Solar Carve-Out (SCO) launched in January 2010.⁴³ Generation qualified for RPS Class I (but not for the SCO) rose from 4,120 MWh in 2010, to 10,108 MWh in 2011, and to 25,387 MWh in 2012. Although the SCO is attracting a large majority of the new development of PV, nearly 44 MW of PV have also qualified for RPS Class I, of which 22 MW are located in Massachusetts and 22 MW are located in the other New England states (20 MW in Vermont alone).

SECTION THREE RPS SOLAR CARVE-OUT COMPLIANCE IN 2012

The Solar Carve-Out (SCO) commenced in 2010, pursuant to the Green Communities Act of 2008, which provided for a Minimum Standard to be carved out *within* the Class I Minimum Standard for the output of small, on-site, distributed generation located within Massachusetts, with the details to be determined by DOER via public rulemaking. Responding to Governor Deval Patrick's commitment in 2007 to achieve 250 MW of total installed PV capacity in Massachusetts by 2017 and consistent with PV's environmental and economic benefits, DOER chose PV for the carve-out provided by the 2008 Act. DOER initially set a higher goal of 400 MW, intended to provide a sufficient and long-term market that could better attract solar business development to Massachusetts.

The eligibility requirements for a PV system to qualify include the following: (a) location within Massachusetts, (b) use of some electricity on-site with the balance of the output connected to the grid, and (c) nameplate, direct current capacity limited to no more than 6 MW on a single parcel of land. In addition, a system is *not* eligible if funded by programs administered by the Massachusetts Renewable Energy Trust or the successor Massachusetts Clean Energy Center (MassCEC) prior to 2010 or if more than 67% of its installed cost was funded by the American Reinvestment and Recovery Act (ARRA).⁴⁴

The installation cost of PV is higher per MW than the other technologies currently participating in RPS Class I and thus presents greater financial challenges. To meet those challenges, DOER developed and established in regulation an innovative design for the SCO Minimum Standard, a design that annually adjusts the Minimum Standard through a formula that maintains a reasonable balance of supply and demand, with the intent of assuring a robust development curve. In addition to that design, the SCO has an Alternative Compliance Payment (ACP) Rate that began high at \$600 per MWh in 2010 and declines according to a ten-year forward schedule that is updated annually.

Third, DOER sought to establish an SREC price support mechanism through an innovative clearinghouse auction mechanism, with a fixed price per SREC of \$300, of which \$285 per SREC would be transferred to the SREC seller and \$15 per SREC applied to administrative costs. The clearinghouse auction mechanism provides a "buyer of last resort" for unsold SRECs whenever a surplus of supply over demand develops for a given Compliance Year. Further details of the SCO program design are provided in DOER's [Solar Carve-Out web pages](#).

Finally, unlike all other classes of RPS and APS, the SCO has a sunset provision: additional PV systems will not be qualified for the SCO after the program cap has been met.⁴⁵ However, after that threshold has been met, the SCO Minimum Standard will continue for as long as any SCO-qualified system is still within its ten year Auction Opt-In Term, the period of years during which it is entitled to

⁴³ In addition to RPS, MA has a suite of programs driving PV development. 1. DOER includes PV as one of the clean energy technologies funded under its [Green Communities Designation and Program](#). 2. MassCEC provides Commonwealth Solar rebates for residential PV projects. 3. DOER partners with the MassCEC on the [Solarize Massachusetts](#) program. 4. DOER has completed a U.S. DOE funded [Sunshot Rooftop Solar Challenge](#) and has recently engaged in a Phase II regional SunShot collaboration that seeks to streamline permit processes, update planning and zoning codes, improve interconnection standards, and increase access to financing.

⁴⁴ PV systems that do not meet those criteria can still qualify for RPS Class I.

⁴⁵ Note that DOER has begun a rulemaking to establish a new SREC program (SREC II) after the program cap has been reached.

deposit any surplus SRECs into the Solar Credit Clearinghouse (SCC) Auction.⁴⁶ Each PV system's ten year Opt-in Term is set when the system is first qualified.

The large SREC supply shortfalls of 2010 and 2011 vanished in 2012, due to the rapidly accelerating pace of new development. During 2012, the installed capacity of SCO-qualified PV increased from 52.9 MW to 184.4 MW. The 0.163% SCO Minimum Standard for 2012 required 79,882 MWh of SRECs⁴⁷, while the SCO-qualified PV systems yielded 118,356 MWh of SRECs. Of that total, 77,491 were reported for SCO compliance, while 38,866 SRECs were deposited into the SCC Auction Account at the NEPOOL GIS and not reported in the Filings.⁴⁸ The surplus notwithstanding, twelve Suppliers depended on ACPs to meet some or all of their SCO obligations. Only 961 MWh of SCO Attributes were banked forward by 25 Suppliers, since the SCC Auction seemed to be a more attractive option for surplus SRECs. Finally, some SRECs that were in excess of what could be banked forward for the SCO were used towards Class I compliance, allowable because an SREC is a type of Class I REC. The Filing figures are displayed in Table Three, with more detail in Appendix Two, Table B.⁴⁹

In order to ease the compliance cost for Suppliers with previously contracted retail loads, the Regulation was adjusted during the 2010 rulemaking to provide a two-tiered ACP Rate. For the portion of a Competitive Supplier's retail load served under contracts entered *prior* to the January 1, 2010, start of the SCO obligation (with the cost of the obligation not known at that time and not incorporated into already-contracted rates), the ACP Rate for SREC shortfall was the same as for Class I, \$64.02 per MWh in 2012. For any shortfall in serving retail loads under contracts *commencing* after 2009, the Rate in 2012 was \$550. Following a methodology provided by DOER for the Annual Compliance Filings, each Supplier was able to calculate its SCO SREC ACP at each of the two rates. Of the total SCO obligation, the shortfall under pre-2010 contracted load in 2012 was 3,781 MWh, for which the ACP totaled \$242,060 at the Class I rate of \$64.02/MWh, and the shortfall under retail load contracted in 2010 or later was 6 MWh, for which the ACP totaled \$3,300 at the \$550/MWh rate.⁵⁰

Three major developments occurred in the SCO program during 2012 and 2013.⁵¹ First, Governor Patrick's goal of installing 250 MW of PV by 2017 was reached four years ahead of schedule. This was announced on May 1, 2013, along with the Governor's new goal of 1,600 MW of PV by 2020. To reach this goal, the Governor instructed DOER to expand the SCO accordingly. DOER immediately set about doing this through the development of a new compliance standard termed the RPS Solar Carve-Out II (SCO II, a.k.a. SREC-II). This new program has been established through a rulemaking process that formally began on January 3, 2014, and will conclude on April 25, 2014. The first year of SCO-II compliance for Retail Electricity Suppliers will be 2014.

⁴⁶ With the latest RPS Effective Date for a SCO-qualified PV project being December 31, 2013, the SCO Minimum Standard will substantially end in 2023, but SCO II would still be in effect then.

⁴⁷ The 2012 compliance obligation for the Solar Carve-Out was set at 81,559 MWh by Regulation in 225 CMR 14.07(2)(b), which yielded a Minimum Standard of 0.163% of the 2010 retail load of 50,321,635 MWh under the procedures in 225 CMR 14.07(2)(a). Since the actual retail load for 2012 turned out to be 48,992,430, the resulting compliance obligation for 2012 was reduced to 79,858 MWh. However, due to each supplier rounding up any fractional MWh of its individual SREC obligation, the aggregated total for compliance was 79,882 MWh.

⁴⁸ The overall supply of PV RECs increased by 223%, including non-SREC, Class I RECs. The SREC supply used for SCO compliance increased by 171%., with most SRECs that were in excess of the SCO compliance obligation deposited into the SREC auction.

⁴⁹ Two suppliers declined to use 269 higher-priced SRECs towards meeting the portion of their SCO obligation that was attributable to pre-2010 retail contracts, for which the ACP rate equals the rate for Class I; the extra value of those SRECs was left unused because the Regulation does not provide for banking non-surplus SRECs (see the last paragraph in Appendix One for additional discussion). The two-tiered SCO ACP rates are described in the next paragraph of this section.

⁵⁰ See Table Nine in Section Seven for a forward projection of the portion of the total retail load under pre-2010 contracts.

⁵¹ Additional detail and documentation of the activities described in this and the next two paragraphs are available at the [Regulatory Proceedings for RPS webpage](#). The May 1, 2013, announcement is [here](#).

Table Three
Aggregated Data from the Solar Carve-Out (SCO) Compliance Filings, 2010-2012 (MWh)

	2012 ⁵²	2011	2010
CY Retail Sales (=Retail Load Obligation)⁵³	48,992,430	49,386,169	50,026,093
CY aggregated SCO obligation⁵⁴	79,882	80,370	33,988
Total SRECs from CY generation⁵⁵	77,491	26,580	2,738
<i>minus</i> CY total surplus SRECs	(963)	(13)	0
Net CY SRECs for CY obligation	76,259	26,567	2,738
<i>plus</i> Banked from pre-CY surpluses	13	0	0
Total SRECs used for CY obligation	76,272	26,567	2,738
<i>plus</i> total ACP Credits	3,787	53,803	31,250
Total for compliance obligation	80,059	80,370	33,988
Surplus Attributes banked forward	961	13	0
ACP proceeds (rounded)	\$245,360	\$23,887,474	\$11,682,793

The second major event was a massive influx of over 800 MW of applications that were received in May and June of 2013. At the time, there were only about 200 MW of available capacity remaining under the SCO's 400 MW cap. Given that significant investments and development progress had been made on many of the projects for which applications had been submitted, DOER announced on June 7, 2013, the outline of an emergency regulation that it subsequently filed to deal with the issue. The emergency regulation extended qualification to any project over 100 kW that could demonstrate execution of an Interconnection Services Agreement with its local distribution company dated June 7, 2013, or earlier. Projects equal to or less than 100 kW were allowed to continue to apply and qualify until the effective date of the proposed SCO II regulation. While it is not yet known what the final cap will be, it definitely will exceed 400 MW. The final cap will be announced in July 2014, following the June 30, 2014, construction deadline that qualified projects larger than 100 kW must meet in order to remain qualified.

Lastly, DOER administered its first Solar Carve-Out Clearinghouse Auction, for SRECs minted in 2012. The Auction required all three rounds, with the first one held on July 26, 2013, and the final one on August 2nd. Following the third round of the Auction, 38,863 of the 38,866 SRECs deposited remained unsold. Per a regulatory provision in DOER's June 7, 2013, version of the Class I Regulation, DOER was obligated to buy a number of 2013 eligible SRECs equivalent to the number of SRECs that would have been purchased by Retail Electricity Suppliers had an exemption for the regulatory change made in the June 7, 2013, regulation *not* been made. This provision was expected to require DOER to purchase somewhere between 35,000 and 50,000 SRECs eligible for compliance in 2013. The 38,863 SRECs remaining unsold from the Auction provided DOER with an opportunity to purchase a significant portion of that quantity. DOER chose to offer to buy the remaining SRECs from depositors

⁵² Note that 269 SRECs neither used for compliance nor deemed bankable as surplus (see footnote 49) are included in "SRECS from CY generation", but *not* in any figures below that. Also, two surplus SRECs were beyond the 10% SCO banking limit (see footnote 104).

⁵³ This figure is the same as the Class I figure in Table Two.

⁵⁴ The SCO Minimum Standard was 0.0679% in 2010, 0.1627% in 2011, and 0.163% in 2012. Also, see footnote 47 regarding the difference between totaling individual obligations and calculating overall obligation.

⁵⁵ This figure includes only SRECs that were reported in the Filings, not those that were deposited into the SREC Auction Account at the NEPOOL GIS before the end of the 2012, quarter 4 trading period or others that were not reported.

at the \$285/MWh rate they would have received if they had been sold in the Auction. Ultimately, 36,437 of these SRECs were purchased by DOER, while the remaining 2,426 SRECs were returned to depositors and are eligible to be used for compliance in any one of the following three compliance years, per the SCC Auction rules. DOER plans to sell for 2013 RPS Class I compliance the SRECs that it purchased, a one-time action authorized in the June 7, 2013, Regulation.⁵⁶

SECTION FOUR RPS CLASS II RENEWABLE ENERGY COMPLIANCE IN 2012

RPS Class II was established in the Green Communities Act of 2008 with the purpose of providing incentives for the continued operation of pre-1998 renewable energy plants and Massachusetts waste energy plants. RPS Class II Renewable Energy is generated by the same resources and technologies as Class I, with two exceptions.

- Before November 1, 2012, hydroelectric plants in Class II were limited to 5 MW (vs. 25 MW in Class I). However, as of that date, the Class II limit is 7.5 MW, pursuant to the *Competitively Priced Electricity Act of 2012* (“2012 Act”).⁵⁷
- Biomass plants in Class II share the Class I “low emissions” criteria but omit the Class I “advanced technology” criteria. However, on August 23, 2012, a moratorium was announced on applications for plants using *woody* biomass. The moratorium will be lifted when DOER has promulgated in the Class II Regulation woody biomass eligibility standards that will be modeled, to the extent appropriate, on those in Class I. This rulemaking was initiated formally on February 28, 2014, and should be completed in the spring of 2014.

Because only pre-1998 plants that can qualify for Class II, the Minimum Standard does not rise over time.⁵⁸ That standard is 3.6% of total retail sales, as represented by retail load obligations. However, DOER was directed by the 2012 Act to conduct a study and recommend regulatory or statutory changes to alleviate the program’s reliance on the ACP mechanism.⁵⁹ Once the current Class II rulemaking is concluded this spring, the implementation of DOER’s recommended changes should result in a lowering of the Minimum Standard, effective with Compliance Years 2013 through 2015, and a mechanism for subsequent annual adjustments that respond to changing market conditions.

In 2012, the net (non-Exempt) load⁶⁰ for the Class II Renewable Energy obligation was 47,408,415 MWh, and the total of all 47 Suppliers’ 3.6% Class II Renewable Energy obligations was 1,706,727 MWh. Class II RECs available for Class II compliance, all from New England hydroelectric plants, were very short of the demand.⁶¹ Only three Suppliers met their full obligations by acquiring RECs, with two of those banking forward a combined surplus of 874 RECs. Another fifteen acquired all of the remaining RECs, for a total of 246,665 RECs. That total, plus 1,739 RECs from 2011 banked surplus, minus the 874 RECs banked forward, yielded 247,530 RECs, which amounted to only 14.5% of the total Class II Renewable Energy obligation. The remaining 1,459,197 MWh (85.5%) of the obligation was met by the Alternative Compliance mechanism, that is, by making ACPs to the

⁵⁶ See 225 CMR 14.07(2)(a)3 for the regulatory provision under which DOER purchased the unsold Auction SRECs and plans to sell them for 2013 RPS Class I compliance.

⁵⁷ See footnote 6 for more information about hydro eligibility and for a link to the 2012 Act.

⁵⁸ If a pre-1998 Generation Unit increases its annual output by installing additional capacity or improving its efficiency, then that increased output may qualify for RPS Class I under the Incremental Generation provisions in 225 CMR 14.05(2).

⁵⁹ That study, [Evaluation of the Massachusetts RPS Class II Program](#), was issued and presented to the Legislature on December 31, 2012.

⁶⁰ See the discussion of Exempt Load for RPS Class II and APS above, on page 6-7.

⁶¹ 28.4% of the 355,889 MA Class II RECs that were settled at the NEPOOL GIS were settled for RPS use in other states, mostly in Connecticut (17%) and New Hampshire (9%), which reduced the quantity available for MA RPS Class II.

MassCEC at the rate of \$26.28 per MWh, totaling \$38,347,723. The aggregate figures are displayed in Table Four, with more detail in Appendix Two, Table C, and in Appendix Three, Tables I and J.

Table Four
Aggregated Data from the RPS Class II Renewable Energy
Compliance Filings, 2009-2012 (MWh)

	2012	2011	2010	2009
CY Retail Sales (=Retail Load obligation)⁶²	48,992,430	49,386,169	50,026,093	48,301,821
Exempt Load⁶³	1,584,015	3,799,666	8,233,703	31,918,771
Net Load	47,408,415	45,586,504	41,792,390	16,383,050
CY aggregated RPS II RE obligation, at 3.6%⁶⁴	1,706,727	1,641,134	1,504,544	589,801
Total Class II RECs from CY generation	246,665	236,472	103,837	35,543
<i>minus</i> CY total surplus Class II RECs	(874)	(1,757)	(63)	(653)
Net CY RECs for CY obligation	245,791	234,715	103,774	34,890
<i>plus</i> Banked from pre-CY surpluses	1,739	63	653	0
Total Class II RECs used for CY obligation	247,530	234,778	104,427	34,890
<i>plus</i> total ACP Credits	1,459,197	1,406,356	1,400,117	554,911
Total for compliance obligation	1,706,727	1,641,134	1,504,544	589,801
Surplus Attributes banked forward⁶⁵	874	1,749	63	653
ACP proceeds (rounded)	\$38,347,723	\$35,862,072	\$35,002,925	\$13,872,775

The above facts indicate a significant shortage of qualified Class II Renewable Energy generation. 2012 began with 79 MW of qualified capacity at 30 hydropower units, six landfill methane gas units, and one wind farm. The year ended with an additional 77 MW at 30 more hydropower plants. Although much the output of that capacity qualified during the second half of 2012 and will provide RECs during all of 2013, DOER has since qualified only about 21 additional MW of hydropower capacity for 2013.⁶⁶ The proposed RPS Class II regulatory changes now under consideration, as noted above, should substantially alleviate the structural shortage of Class II RECs as of Compliance Year 2013.

SECTION FIVE

RPS CLASS II WASTE ENERGY COMPLIANCE IN 2012

RPS Class II Waste Energy is a separate sub-class within RPS Class II. This means that each Supplier must comply separately with both the Renewable Energy subclass and the Waste Energy subclass. Qualification is limited to plants that meet the Massachusetts Department of Environmental Protection regulations for such facilities.⁶⁷ The MassDEP regulations, in addition to provisions for

⁶² This figure is the same as the Class I figure in Table Two.

⁶³ The Exempt and Net Load figures pertain to the compliance obligation calculations only of unregulated competitive suppliers.

⁶⁴ See footnote 36 regarding the difference between totaling individual obligations and calculating an overall obligation.

⁶⁵ Any surplus RPS Class II Attributes (measured as quantities of qualified surplus RECs) beyond the 30% banking limit can be applied to compliance only with the RPS Class II Renewable Energy obligation, not any other portfolio standard. See footnote 40 regarding the 30% limit.

⁶⁶ Note that, some of the hydropower plants also produce Class II RECs, for the percentage of their output attributable to post-1998 capacity or efficiency improvements. See the on-line Class II Qualified Units table for details.

⁶⁷ The MassDEP regulations are in 310 CMR 7.08(2) and 310 CMR 19.000.

municipal solid waste handling, emissions, etc., provide for enhanced sorting and recycling and for the owner of each plant to remit to the MassDEP 50% of the proceeds from selling its RPS Class II WECs. The MassDEP uses those funds to help finance municipal recycling programs.

In 2012, the net load for the Class II Waste Energy obligation was 47,408,415 MWh, and the total of the 47 Suppliers' Class II Waste Energy obligations of 3.5% was 1,659,318 MWh. To comply with that obligation, the Suppliers acquired 1,710,117 WECs, which, combined with the use of 207,057 Attributes banked from 2010 and 2011 surplus WECs, yielded a surplus of 282,023 WECs, of which 278,990 were eligible to bank towards Class II Waste Energy compliance over the next two Compliance Years.⁶⁸ The surplus notwithstanding, seven Suppliers acquired no WECs, and three others failed to purchase enough WECs. Those ten Suppliers met their total shortfall of 24,167 WECs by making ACPs to the MassCEC at the ACP rate of \$10.51 per MWh, for total payments of \$253,993. These figures are displayed in Table Five, with more detail in Appendix Two, Table D.

Table Five
Aggregated Data from the RPS Class II Waste Energy
Compliance Filings, 2009-2012 (MWh)

	2012	2011	2010	2009
CY Retail Sales (=Retail Load obligation)⁶⁹	48,992,430	49,386,169	50,026,093	48,301,820
Exempt Load⁷⁰	1,584,015	3,799,666	8,233,703	31,891,115
Net Load	47,408,415	45,586,504	41,792,390	16,410,706
CY aggregated RPS II WE obligation, at 3.5%⁷¹	1,659,318	1,595,546	1,462,750	574,384
Total WECs from CY generation	1,710,117	1,568,127	1,378,219	1,046,833
<i>minus</i> CY total surplus WECs	(282,023)	(212,565)	(251,554)	(473,177)
Net CY WECs for CY obligation	1,428,094	1,355,562	1,126,665	573,656
<i>plus</i> Banked from pre-CY surpluses	207,057	237,620	330,288	0
Total WECs used for CY obligation	1,635,151	1,593,182	1,456,953	573,656
<i>plus</i> total ACP Credits	24,167	2,364	5,797	728
Total for compliance obligation	1,659,318	1,595,546	1,462,750	574,384
Surplus WE Attributes banked forward⁷²	278,990	207,041	237,667	330,288
ACP proceeds (rounded)	\$253,993	\$24,113	\$57,970	\$7,280

The continued surplus in 2012 was due to the large, albeit declining, Exempt Load.⁷³ The output of the seven plants was higher in 2012 than in previous years, which counteracted the declining Exempt Load and resulted in more WECs unsold than in 2011: about 227 GWh, compared with about 190 unsold in 2011. As the Exempt Load continues its decline to nearly zero over the next five years, the net load and, thereby, the demand for WECs will rise.

⁶⁸ Note that, in addition to the excess WECs reported in the Filings, 85,000 WECs were not sold to Retail Suppliers by the generation owners. This is the difference between the total WECs minted (in a public report at the NEPOOL GIS) and the WECs reported in the Filings.

⁶⁹ This figure is the same as the Class I figure in Table Two.

⁷⁰ The Exempt and Net Load figures pertain to the compliance obligation calculations only of unregulated competitive suppliers.

⁷¹ See footnote 36 regarding the difference between totaling individual obligations and calculating an overall obligation.

⁷² Any surplus RPS Class II Waste Energy Attributes (measured as quantities of qualified surplus WECs) can be applied to compliance only with the RPS Class II Waste Energy obligation, not any other portfolio standard.

⁷³ See the last paragraph on page 6.

SECTION SIX

APS ALTERNATIVE ENERGY COMPLIANCE IN 2012⁷⁴

The Alternative Energy Portfolio Standard (APS) is an obligation mandated under the Green Communities Act of 2008. The APS is designed to support certain “alternative” electric power system technologies that largely do not utilize renewable energy resources and that the legislators deemed worthy of support. That support takes the form of financial incentives provided by an energy portfolio standard on the model of RPS. Each Supplier must comply separately with both APS and RPS.

Table Six
Aggregated Data from the APS Compliance Filings, 2009-2012 (MWh)

	2012	2011	2010	2009
CY Retail Sales (=Retail Load Obligation)⁷⁵	48,992,430	49,386,169	50,026,093	48,301,821
Exempt Load⁷⁶	1,584,015	3,799,666	8,233,703	31,918,771
Net Load	47,408,416	45,586,504	41,792,390	16,383,050
Aggregated APS Obligation (2.5% in 2012)⁷⁷	1,185,236	911,748	626,902	163,844
Total AECs from CY Generation	351,179	324,922	227,134	129,925
<i>minus</i> CY total surplus AECs	(1,239)	(7,636)	(520)	(10,600)
Net CY AECs for CY Obligation	349,940	317,286	226,614	119,325
<i>plus</i> banked from pre-CY surpluses	7,635	515	8,818	0
Total AECs used for CY Obligation	357,575	317,801	235,432	119,325
<i>plus</i> total ACP credits	827,661	593,947	391,470	44,519
Total for Compliance Obligation	1,185,236	911,748	626,902	163,844
Surplus APS Attributes banked forward	1,239	7,636	515	8,838
ACP proceeds (rounded)	\$17,397,429	\$12,116,514	\$7,829,400	\$890,380

In 2012, the net (non-Exempt) load for the APS obligation was 47,408,416 MWh, for which the 47 Suppliers’ 2.5% APS obligations totaled 1,185,236 MWh. To comply with that obligation, the 47 Suppliers purchased 351,179 AECs and used 7,635 AECs banked from 2011 surplus, from which four Suppliers banked 1,239 surplus AECs, for a net total of 357,575 AECs. A net shortfall of 827,661 AECs was met by 41 of the Suppliers by making ACPs to the MassCEC at the rate of \$21.02 per MWh. The payments totaled \$17,397,429. Of the total AECs, 99.1% came from CHP plants, while 0.9% came from flywheel storage units. These figures are displayed in Table Six; more detail is in Appendix Two, Table E, and in Appendix Three, Table K.

⁷⁴ See the third paragraph on page 6 in Section One and footnote 15 for a description of the APS, an explanation of how AECs are determined for CHP plants, and a reference for further details.

⁷⁵ This figure is the same as the Class I figure in Table Two.

⁷⁶ See Section Three for an explanation of Exempt and Net Load, which pertain to the compliance obligation calculations only of unregulated competitive suppliers..

⁷⁷ The APS Minimum Standard was 1.0% in 2009, 1.5% 2010, 2% 2011, and 2.5% 2012. See footnote 36 regarding the difference between totaling individual obligations and calculating an overall obligation.

SECTION SEVEN

PROJECTION OF FUTURE RPS AND APS COMPLIANCE OBLIGATIONS AND SUPPLY

DOER provides here one possible scenario for the future RPS and APS compliance obligations through 2018. This scenario is based on the ISO-NE “reference case” for load growth in the *2013 CELT Report*,⁷⁸ following the approach of the RPS/APS Annual Compliance Reports for 2009 through 2011. However, the *2013 CELT Report* differs from the pre-2012 reports by its inclusion of ISO-NE’s forecast of incremental energy efficiency beyond the Forward Capacity Market beginning in 2015-2016.⁷⁹ As a result, electricity consumption now is projected to be nearly flat over the next ten years. Regarding the ISO-NE forecast specifically for 2013, it should be noted that the forecast assumed normal weather and economic drivers; the actual electricity consumption for 2013 may differ to the extent that the weather and the economy deviated from those assumed norms.

In general, any scenario is determined by one’s choice of assumptions, which can be subject to substantial uncertainty. Important variables affecting electricity consumption include (a) weather (especially temperature), (b) national and regional economic conditions, (c) the degree of success in implementing energy efficiency programs, (d) the growth of behind-the-meter generation, and, sometime in the future, (e) the degree of electric vehicle penetration into the market. Presenting a single scenario offers simplicity but misrepresents the degree of uncertainty in these variables. Rather than developing multiple load scenarios, which is outside the scope of this report, DOER chose to base its RPS reference case on the ISO-NE 2013 CELT Forecast. Other analysts can easily replace the CELT Forecast with other ISO-NE scenarios or with non-ISO alternative scenarios to see the effect of various assumptions on the RPS and APS obligations.

Table Seven lists both the actual (2003-2012) and projected (2013-2018) total retail sales – as “retail load obligation”⁸⁰ – and the resulting actual and projected RPS Class I obligations. The RPS Class I percentage obligations (the Minimum Standard) increase as specified in the statute and regulations. This table provides figures only through 2018, although the annual RPS Class I obligation continues increasing indefinitely.

Figure Six shows DOER’s projection for the growth in demand for RECs by the “premium” RPS mandates of the five New England states that have similar, albeit not identical, mandates for new renewable energy generation. Those mandates consist of the CT RPS Class I, the ME RPS, the NH RPS Classes I and II, and the mandate for new facilities in the RI Renewable Energy Standard.⁸¹ The projections for all of the states are based on ISO-NE load growth projections cited above.⁸² It should be noted that any changes that may have occurred in the RPS mandates of the other states since April of 2013 are not reflected in this graph.

Table Eight lists the 2009-2012 actual load obligations for RPS Class II and APS, and load obligations projected for 2013 through 2018 (although, like Class I, the standards continue beyond that date). The total load obligation for each year is listed first and is identical to the figures in Table Seven. However, since, as explained in Section Three, electricity sold under pre-2009 contracts is exempt from the Class II and APS standards, the projected Exempt Loads provided by Suppliers are then deducted to

⁷⁸ The ISO-NE figures are from Tab 2, column P in the *2013 CELT Report* at http://iso-ne.com/trans/ceft/fsct_detail/2013/isone_fcst_data_2013.xls.

⁷⁹ This ISO forecast is the culmination of efforts by the ISO to develop a “discreet Energy-Efficiency Forecast” that recognizes increasing investment in energy efficiency through state-sponsored demand-side management.

⁸⁰ See explanation and reference in footnote 37 regarding the use of “retail load obligation” for “retail sales.”

⁸¹ The other programs are summarized at <http://www.dsireusa.org/incentives/index.cfm?SearchType=RPS&&EE=0&RE=1>.

⁸² See footnote 78 for the source of ISO-NE figures.

yield the net load obligations. Then the net load for each year is multiplied by the mandated percentage standards. The standard does not rise annually for Class II, since that is for qualified pre-1998 plants, but it does rise for APS. However, note that DOER has recently proposed a downward revision in the Class II REC standard, as noted in Sections Two and Seven, and that revision would change the projections for that sub-class. Also note that the 2012 projected load obligation in the previous report was 3,918 GWh higher than the 2012 actual, which lowers all of the post-2012 projections, and that the Exempt Load obligation load projections have also changed. This should serve as a reminder that the projections can have a fairly wide range of reliability.

Table Seven
MA RPS Class I Annual Load & Compliance Obligations,
Actual (2003-2012) & Projected (2013-2018)⁸³

Year	Actual/Projected Load Obligation, MWh ⁸⁴	RPS Class I % Obligation	Total RPS Class I REC Obligation ⁸⁵	Solar Carve-Out % Obligation	Solar Carve-Out SREC Obligation
2003	49,834,324	1.0%	498,343		
2004	50,063,092	1.5%	750,954		
2005	51,558,778	2.0%	1,031,176		
2006	50,143,130	2.5%	1,253,578		
2007	50,978,101	3.0%	1,529,343		
2008	50,321,635	3.5%	1,761,257		
2009	48,301,821	4.0%	1,932,089		
2010	50,026,093	5.0%	2,501,305	0.0679%	33,988
2011	49,386,169	6.0%	3,007,569	0.1627%	80,370
2012	48,992,430	7.0%	3,429,493	0.1630%	79,882
2013	50,006,917	8.0%	4,000,553	0.3833%	191,677
2014	50,221,233	9.0%	4,519,911	0.9481%	476,148
2015	50,380,109	10.0%	5,038,011	<i>tbd</i>	<i>tbd</i>
2016	50,793,847	11.0%	5,587,323	<i>tbd</i>	<i>tbd</i>
2017	50,807,087	12.0%	6,096,850	<i>tbd</i>	<i>tbd</i>
2018	50,790,537	13.0%	6,602,770	<i>tbd</i>	<i>tbd</i>

Projection of future RPS Class I REC supply is particularly difficult for various reasons. Much of the uncertainty derives from forces external to the program itself, especially from changing prospects for renewable energy and climate policies at the federal level, including the uncertain future of the federal Production Tax Credit and other federal stimulus funding, and continued uncertainties in the national and global economies. DOER does expect growth in Massachusetts and elsewhere from onshore and offshore wind farm development, as well as from hydropower, solar, and anaerobic digester gas projects. The effect of the pending Cape Wind project on the supply over the next several years will depend on the actual timetable of construction. The potential for new or incremental hydroelectric projects that meet the small nameplate capacity and environmental standards of the program is difficult to predict. Solar PV projects have received strong state and federal financial incentives since 2009. Accelerated PV development began to show up in the RPS market in 2010 and increased considerably

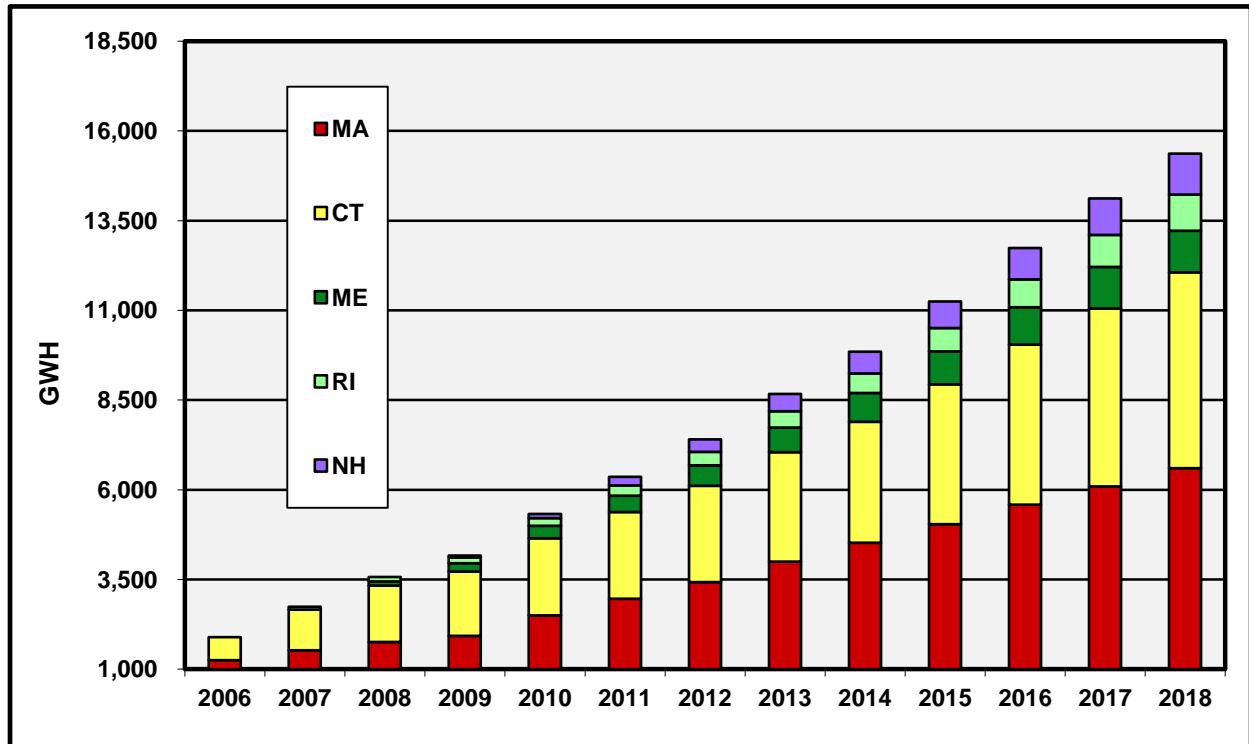
⁸³ The actual figures for 2003 through 2012 are from RPS annual compliance filings. The projections starting in 2013 are from the ISO-NE load growth projections in its 2013 CELT Report (see footnote 78), with 14% of the total Massachusetts load attributable to the municipally owned companies netted out. In this table, the Solar Carve-Out annual obligation is not deducted from the Class I obligation, although it is deducted for compliance purposes.

⁸⁴ See explanation and reference in footnote 37 regarding the use of “load obligation” for “retail sales.”

⁸⁵ Actual total obligation is the sum of individual obligations, which may be larger than the calculation of an overall RPS obligation. Note that the Solar Carve-Out obligations are *not* deducted from the Total Class I obligations in this column.

during 2011 through 2013; DOER expects further strong growth in the years ahead. Finally, a largely untapped potential for anaerobic digester gas projects at agricultural, food processing, food service, and wastewater treatment facilities.⁸⁶

Figure Six
New England Premium RPS Compliance Obligations by State,
Actual (2007-2012) & Projected (2013-2018)



The 2012 completion of regulatory changes in the RPS Class I eligibility of woody biomass fueled plants ended the moratorium on biomass project qualifications. Those changes add challenging, overall efficiency requirements on the development of new biomass projects and should focus development activities on such technologies as CHP. Meanwhile, although the new standards will not apply to already qualified plants until 2016 (except for the requirement and documentation of sustainable fuel sourcing, which was effective on January 1, 2013), several of the qualified plants in northern New England already had ceased operation or reduced output well before 2012. Note that those decisions seemingly resulted, not from anticipation of the regulatory revisions, but rather from the decline in electricity prices due to lower natural gas prices and reduced electricity demand during the economic recession, as well as higher feedstock supply costs derived from higher costs for diesel fuel to harvest and transport the supply. DOER does not expect all of the biomass plants that were temporarily grandfathered from the efficiency requirements of the new standards to remain qualified past the end of 2015, which will reduce the quantity of RPS Class I RECs available to the market.

⁸⁶ In fact, DOER has been partnering with the MassDEP and MassCEC to identify, evaluate, and promote these opportunities under the [Clean Energy Results Program \(CERP\)](#).

Table Eight
MA RPS Class II & APS Annual Load & Compliance Obligations, Net of Exempt Load,
Actual (2009-2012) & Projected (2013-2018), in MWh⁸⁷

Year	Actual/ Projected Load Obligation ⁸⁸	Actual/ Projected Exempt Load Obligation ⁸⁹	Actual/ Projected Net Load Obligation	RPS Class II RECs at 3.6% of Net Load Obligation	RPS Class II WECs at 3.5% of Net Load Obligation	APS Minimum Standard	APS AECs Obligation
2009	48,301,821	31,918,771	16,383,050	589,801	574,368	1.00%	163,844
2010	50,026,093	8,233,703	41,792,391	1,504,526	1,462,734	1.50%	626,886
2011	49,386,169	3,799,666	45,586,504	1,641,114	1,595,528	2.00%	911,730
2012	48,992,430	1,584,015	47,408,416	1,706,727	1,659,318	2.50%	1,185,236
2013	50,006,917	746,583	49,260,333	1,773,372	1,753,366	3.00%	1,477,810
2014	50,221,233	125,062	50,096,171	1,803,462	1,760,144	3.50%	1,753,366
2015	50,380,109	90,275	50,289,834	1,810,434	1,775,760	3.75%	1,885,869
2016	50,793,847	57,845	50,736,002	1,826,496	1,778,021	4.00%	2,029,440
2017	50,807,087	6,496	50,800,591	1,828,821	1,777,669	4.25%	2,159,025
2018	50,790,537	<i>tbd</i>	≤ 50,790,537	≤ 1,828,459	≤ 1,753,366	4.50%	≤ 2,285,574

The Solar Carve-out began in 2010 and, like the original RPS in its early years, exhibited a shortage of generation as project development ramped up. However, the development curve has moved sharply upward since 2010. While only 26,598 SRECs were generated in 2011, 118,356 were generated in 2012, more than a four-fold increase in generation from one year to the next. Through the first three quarters of 2013, 231,227 SRECs have been generated, with at least 54,000 additional SRECs expected to be generated by the end of the year according to production data reported to the MassCEC’s Production Tracking System (PTS) through the end of December 2013. This dramatic increase in generation is the result of a rapid increase in installed capacity. While only 12 MW of new solar capacity were installed in 2010, 39 MW was installed in 2011, and more than 135 MW were installed in 2012, which is far greater than the total cumulative capacity installed in all prior years. This dramatic increase in installed capacity led to a significant market oversupply in 2012, which is expected to last into 2013 and possibly also 2014.

The price of SRECs and the cost of the Solar Carve-Out are affected by the relative amounts of the retail load that are under pre-2010 contracts and contracts entered or revised on or after January 1, 2010 (see Table Nine). As explained in Section Three, any shortfall in a competitive Supplier’s (but not a regulated utility’s) SRECs for meeting the earlier contracts can be met by ACPs at the default Class I rate (\$64.02 per MWh for 2012), while any shortfall under 2010 and later contracts can be met by ACPs under a higher SCO rate (\$550 for 2011-2013, declining thereafter per a published schedule).

⁸⁷ Each of the REC, WEC, and AEC obligations for each year is the total of all the individual obligations in that year and, due to consistent upward rounding, is greater than the result of multiplying the total load obligation by the Minimum Standard.

⁸⁸ The Load Obligation projections here are the same those for RPS Class I in Table Seven. See explanation and reference in footnote 37 regarding the use of “load obligation” for “retail sales.”

⁸⁹ DOER did not request 2018 exempt load obligation figures from the Filers but assumes that they will be at or approaching zero by then, as pre-2009 contracts continue to expire. Thus, the *net* certificate obligations for 2018 are stated as “less than or equal to” each number.

Table Nine
MA Solar Carve-Out Loads Served under Pre-2010 & More Recent Retail Contracts, Actual (2010-2012) & Projected (2013-2018), in MWh

Year	Actual/ Projected Total Load Obligation	Load Served under pre-2010 Retail Contracts, Actual/Projected ⁹⁰	Load Served under 2010 or later Retail Contracts, Actual/Projected
2010	50,026,093	19,323,329	30,702,764
2011	49,386,169	19,286,547	30,099,623
2012	48,992,430	2,506,922	46,485,508
2013	50,006,917	1,922,990	48,083,927
2014	50,221,233	415,012	49,806,221
2015	50,380,109	98,350	50,281,759
2016	50,793,847	59,997	50,733,850
2017	50,807,087	8,124	50,798,963
2018	50,790,537	<i>tbd</i>	≤ 50,790,537

With regard to Class II RECs, the pre-1998 installed capacity cannot rise, so the unknown factors are how much of that capacity potentially can meet the environmental criteria to qualify for Class II, along with the likelihood that many potentially MA Class II RECs will be used for compliance with RPS in other New England states. In recognition of the expense to ratepayers and Suppliers of the unacceptably large shortage of Class II RECs to meet the Minimum Standard, the Legislature requested and DOER provided in 2012 a report in which it evaluated and recommended program changes, which it formally proposed in a rulemaking initiated on February 28, 2014. If those changes are accepted, they will lower and improve the Minimum Standard and will reduce reliance on the ACP mechanism beginning with Compliance Year 2013.⁹¹

Class II WECs are likely to remain in surplus for several more years, while the net load obligation rises toward rough parity with the annual supply. However, the desired approach to parity has been undermined by the effects of considerable banking forward of WECs prior to expiration of the Exempt Load. DOER has proposed in the current Class II rulemaking a two year hiatus in banking (2014-2015), during which the quantity of already-banked WEC attributes would become zero (by use and/or expiration), following which the Exempt Load will have been reduced to almost zero. When banking resumes, it will be limited to 5% of a Supplier’s WEC, not the current 30%.

APS is experiencing a growing rate of applications for CHP Units. The rate of deployment of new CHP systems is highly dependent on the pace at which projects receive incentive awards for capital expenses from the Massachusetts Energy Efficiency Program administered by Mass Save for the electric utilities. As of early 2014, the following indicate that higher levels of CHP output can be expected in the future:

- Several large new CHP projects in the pipeline could add around 23 MW of generating capacity; and
- DOER recently qualified for APS the incremental thermal output of the existing 255 MW Kendall Generating Station, a CHP plant in Cambridge. The increase output is a consequence of

⁹⁰ DOER did not request 2018 figures from the Filers but assumes that the figure will be approaching zero by then, as pre-2010 contracts continue to expire.

⁹¹ See footnote 24 regarding the report to the Legislature.

the plant's recent interconnection to a large district steam system in Boston, to which it now supplies steam.

The growing supply of AECs will have to chase a growing net load obligation, as the Exempt Load declines during the next several years, and the Minimum Standard continues rising.

SECTION EIGHT

USES OF THE ALTERNATIVE COMPLIANCE PAYMENT FUNDS

The Alternative Compliance mechanism for meeting RPS and APS obligations in CY 2012 resulted in total ACP proceeds of almost \$72.6 million, as detailed in Table Ten. Although substantial, this total reverses the upward trend that began in 2009. The ACP totals of the last three years are attributable to the following:

- RPS Class I: REC demand, after being lower than supply in 2008-10, modestly exceeded supply in 2011 and significantly surpassed supply in 2012, as anticipated in the 2011 report. This undersupply is expected to continue at least through 2013, along with the use of ACPs.
- RPS Class I Solar-Carve Out: The high ACP total in 2010 and 2011 were due to the commencement of this obligation in 2010 and the delay of supply emerging from the project development pipeline. However, as expected, the rapidly accelerating development of PV arrays was more than enough to eliminate the shortfall and resulted in a market oversupply and minimal use of ACP for 2012, a trend that should continue through 2013.
- RPS Class II Renewable Energy: The shortage is due to technical and financial issues for biomass-fired and hydropower plants (which has continued in 2013), including a preference for settling certificates in the RPS programs of certain other New England states on the part of some Units that potentially qualify for MA RPS Class II; that preference is due to differences between the programs with regard to eligibility standards and REC prices.⁹²
- RPS Class II Waste Energy: There should be very little need for the ACP mechanism, due to the continued substantial oversupply of WECs until the Exempt Load disappears. The increased use of the ACP mechanism in 2012 is difficult to explain, given that 85,000 WECs were left unsold by the Units. Nonetheless, the ACP dollar total remained small.
- APS: The increasing ACP total is due to an increased non-exempt retail load subject to the obligation (noted above for Class II), combined with annual increases in the obligation, and a delay in supply emerging from the project development pipeline of this relatively young program.

The proceeds from Alternative Compliance Payments are held and spent in accordance with the RPS and APS statutes and regulations, as follows. The funds are held in an account at the Massachusetts Clean Energy Center ([MassCEC](#)) that is separate from other funds of the MassCEC. Expenditure of the ACP funds by the MassCEC is overseen by DOER under the terms of agreements between the two entities and under any limitations specified in the regulations.⁹³ The regulations provide that the expenditure of ACP funds from RPS Class I and the Solar Carve-Out must "further the commercial development of RPS Class I Renewable Generation Units and Solar Carve-Out Renewable Generation Units," while expenditure of ACP funds from APS must "further the commercial development of Alternative Generation." Although the statute and regulations for RPS Class II do not

⁹² For more extensive discussion, see DOER's 12/31/12 report to the Legislature: [Evaluation of the Massachusetts RPS Class II Program](#).

⁹³ These provisions are found in the Regulations for RPS Class I, RPS Class II, and APS respectively, as follows: 225 CMR 14.08(3)(c), 225 CMR 15.08(3)(b), 225 CMR 15.08(4)(b), and 225 CMR 16.08(3)(b). Under the current rulemaking, the Class I provisions would be found in 225 CMR 14.08(3)(d).

place any restrictions, DOER uses Class II ACP funds to support or promote the development of renewable and other clean energy, including local and state-level clean energy projects and activities of DOER’s Green Communities Division.

Table Ten
ACP Proceeds per Portfolio Standard, 2010-2012
(rounded to the nearest dollar)

Program/Class	2012	2011	2010
RPS Class I	\$ 16,350,132	\$ 6,598,386	\$ 241,551
RPS Class I Solar Carve-Out	\$ 245,360	\$ 23,887,474	\$ 11,682,793
RPS Class II Renewable Energy	\$ 38,347,727	\$ 35,862,072	\$ 35,002,925
RPS Class II Waste Energy	\$ 253,993	\$ 24,113	\$ 57,970
APS (Alternative Energy)	\$ 17,397,429	\$ 12,116,514	\$ 7,829,400
Total⁹⁴	\$ 72,594,641	\$ 78,488,558	\$ 54,814,638

DOER has just issued its *2012 ACP Spending Plan* for the substantial funds paid by Suppliers as Alternative Compliance with their 2012 RPS and APS compliance obligations. The Plan is at the [Annual Compliance Reports page](#), accessible via DOER’s RPS & APS homepage.⁹⁵

⁹⁴ Each of the totals, as rounded, is correct.

⁹⁵ <http://www.mass.gov/energy/rps>.

APPENDIX ONE

RPS and APS 2012 Compliance Filings, Review, and Verification

All Suppliers that sold retail electricity to end-use customers in the territories of the four Massachusetts regulated utilities during 2012 were required to submit their Annual Compliance Filings for 2012 by Monday, July 1, 2013. DOER issued forms and instructions for the Filings on May 31, 2013, just over two weeks before the end of the NEPOOL GIS trading period for the fourth quarter of 2012. By July 2nd DOER had received emailed Filings from all four regulated utilities and from 38 of the 43 Competitive Suppliers, with two more arriving on July 3rd, and one each on the 8th, the 12th, and the 19th.

The review encompassed both printed and electronic copies of Filers' compliance summary tables and GIS spreadsheet reports. The electronic files enabled DOER to aggregate, analyze, and summarize the information in the Filings, while the printed versions of GIS reports were used to verify the electronic versions of those reports. DOER contacted fewer than half of the Suppliers for corrected or additional information, documentation, explanations, and clarifications. The revised method for ascertaining annual compliance, which was introduced for 2011, has simplified the task of Suppliers in calculating their obligations, with only two Suppliers initially failing to use that method and having to re-file, which they did expeditiously.

One set of adjustments that was made in the Filings was a consequence of the very high quantity of SRECs generated in 2012, which was well in excess of the quantity that could be banked by Suppliers for future compliance.⁹⁶ Recall the two-tiered ACP rate for the Solar Carve-Out, described on the top of page 18. Some of the fifteen Suppliers that served load under older contracts purchased no more SRECs than they needed to cover the loads under their newer contracts, and they paid ACPs at the \$64.02/MWh rate to comply under their older loads, rather than buying and using higher-priced SRECs. Some other Suppliers with older loads deposited SRECs into the SSC Auction Account at the GIS, thus avoiding the use of those higher-priced SRECs for the portion of their SCO compliance that should cost less.⁹⁷ Seven Suppliers with earlier-contracted loads that purchased more SRECs than they needed for their loads under their new contracts did not deposit them into the Auction Account and instead used a total of 890 higher-cost SRECs toward compliance for load they served under pre-2010 contracts, and a few used some non-bankable surplus towards non-Solar Carve-Out Class I compliance.⁹⁸

However, two Suppliers held a total of 269 high-value SRECs that they *neither* deposited into the SCC Auction account *nor* chose to use for compliance for their pre-2010 contracted load. They chose, instead, to make ACPs at the \$64.02 rate for that quantity of SREC obligation. Since those 269 SRECs were not in excess of their SREC obligations under the SCO, their SCO attributes were not bankable for 2013 or 2014 SCO compliance.⁹⁹

⁹⁶ SCO banking limit is 10% of each Supplier's SCO SREC obligation for the Compliance Year, while the limit for all other classes is 30%.

⁹⁷ The 38,866 SRECs deposited into the SCC Auction Account at the GIS could be sold or, if left unsold, could be returned to depositors with a three-year lifespan (vs. two years for banked SRECs). See additional detail in the past paragraph on page 18.

⁹⁸ Although this possibility was noted at the top of page 8 of the [RPS & APS Annual Compliance Report for 2011](#), it was not stated in the Filing Instructions, and the 2012 Compliance Workbook did not provide for this option, which had not been relevant in any previous Compliance Years. However several Suppliers managed to do this, some with DOER assistance after the Filings were submitted, in order to avoid losing all value for the non-bankable SRECs that had not been deposited into the SCC Auction Account. This deficiency in the Filing Instructions and Workbook will be corrected for future Compliance Years.

⁹⁹ This is based on the Banking provision in the RPS Class I Regulation, 225 CMR 14.08(2).

APPENDIX TWO

2012 RPS and APS Compliance Summaries¹⁰⁰

Table A
RPS Class I Compliance Summary, 2012 (MWh)¹⁰¹

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES	CLASS I RENEWABLE GENERATION ATTRIBUTES					6.837% RPS CLASS I OBLIGATION	BANKING FOR FUTURE COMPLIANCE ¹⁰²		
	Load Obligation from Filing	2012 Class I RECs	2010 Banked Attributes	2011 Banked Attributes	Alternative Compliance Credits	Total RPS Class I Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES										
Fitchburg Gas & Elec.	207,841	14,200	-	4	6	14,210	14,210	-	4,263	-
National Grid	11,682,420	752,728	-	-	45,999	798,727	798,727	-	239,619	-
NSTAR	8,924,054	606,220	-	2,911	1,006	610,137	610,137	-	183,042	-
W Mass. Electric	1,922,585	130,184	-	-	1,263	131,447	131,447	-	39,435	-
SUBTOTALS	22,736,900	1,503,332	-	2,915	48,274	1,554,521	1,554,521	-	466,359	-
COMPETITIVE SUPPLIERS										
SUBTOTALS	26,255,530	1,553,562	49	104,387	207,114	1,864,538	1,795,090	70,022	538,547	69,916
TOTALS	48,992,430	3,056,894	49	107,302	255,388	3,419,059	3,349,611	70,022	1,004,906	69,916

¹⁰⁰ All data for the Competitive Suppliers is aggregated in these four tables in accordance with the provision for confidentiality of product-specific data in the RPS Class I Regulation, 225 CMR 14.09(2)(b). Data for the regulated distribution utility companies are made public in filings at the MA Department of Public Utilities. Names of all Retail Electricity Suppliers are listed in Table Two in Section Two.

¹⁰¹ The Solar Carve-Out is netted out from the Class I table, although included in Tables F, G, and H of Appendix Three.

¹⁰² See the top of page 19 and footnote 56 regarding DOER-purchased, surplus SCC Auction SRECs that will be made available for 2013 Class I compliance. Those would increase the quantity of 2012 RECs available to use towards 2013 Class I compliance.

Table B
RPS Solar Carve-Out Renewable Energy Compliance Summary, 2012 (MWh)

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES		SOLAR CARVE-OUT RENEWABLE GENERATION ATTRIBUTES				0.163% RPS SCO Obligation	BANKING FOR FUTURE COMPLIANCE			
	Load Obligation from Filing		2012 SRECs	2010 Banked Attributes	2011 Banked Attributes	Alternative Compliance Credits		Total RPS SCO Attributes	Excess Attributes	Banking Limit (10%)	Banked Attributes
DISTRIBUTION COMPANIES											
Fitchburg Gas & Electric	207,841		371	-	-	-	371	339	32	34	32
National Grid	11,682,420		19,052	-	-	-	19,052	19,043	9	1,905	9
NSTAR	8,924,054		14,899	-	-	-	14,899	14,547	352	1,455	352
W Mass Electric	1,922,585		3,136	-	-	-	3,136	3,134	2	314	2
SUBTOTALS	22,736,900		37,458	-	-	-	37,458	37,063	395	3,708	395
COMPETITIVE SUPPLIERS											
SUBTOTALS	26,255,530		40,033	-	13	3,787	43,564¹⁰³	42,819	568¹⁰⁴	4,301	566
TOTALS	48,992,430		77,491	-	13	3,787	81,022	79,882	963	8,009	961

Table C
RPS Class II Renewable Energy Compliance Summary, 2012 (MWh)

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES			CLASS II RENEWABLE ENERGY ATTRIBUTES					3.6% RPS Class II RE Obligation	BANKING FOR FUTURE COMPLIANCE		
	Load Obligation from Filing	Exempt Retail Load	Net Retail Load	2012 Class II RECs	2010 Banked Attributes	2011 Banked Attributes	Alternative Compliance Credits	Total RPS Class II RE Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES												
Fitchburg Gas & Electric	207,841	0	207,841	6,077	0	0	1,406	7,483	7,483	0	2,245	0
National Grid	11,682,420	0	11,682,420	70,673	0	0	349,895	420,568	420,568	0	126,171	0
NSTAR	8,924,054	0	8,924,054	34,371	0	0	286,895	321,266	321,266	0	96,380	0
W. Mass Electric	1,922,585	0	1,922,585	0	0	0	69,214	69,214	69,214	0	20,765	0
SUB-TOTALS	22,736,900	0	22,736,900	111,121	0	0	707,410	818,531	818,531	0	245,561	0
COMPETITIVE SUPPLIERS												
SUB-TOTALS	26,255,530	1,584,015	24,671,516	135,544	0	1,739	751,787	889,070	888,196	874	266,480	874
TOTALS	48,992,430	1,584,015	47,408,416	246,665	0	1,739	1,459,197	1,707,601	1,706,727	874	512,041	874

¹⁰³ This Subtotal figure and the Total below it do not include the 269 SRECs that two Competitive Suppliers did not use for SCO compliance and that DOER did not deem to be bankable surplus, which is explained in the last paragraph in Appendix One. Those 269 SRECs are included under the 2012 SRECs heading of this table, as well in the "Total SRECs from CY generation" of Table Three in Section Three of this report.

¹⁰⁴ Note that two SRECs from one Competitive Supplier were in excess of its Solar Carve-Out compliance obligation. However those two surplus SRECs were also in excess of the 10% banking limit for the SCO and, therefore, are not included under the Banked Attributes heading of this table, nor in the 2012 "Surplus Attributes banked forward" figure of Table Three in Section Three of this report..

Table D
RPS Class II Waste Energy Compliance Summary, 2012 (MWh)

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES			CLASS II WASTE ENERGY ATTRIBUTES					3.5% RPS Class II WE Obligation	BANKING FOR FUTURE COMPLIANCE		
	Load Obligation from Filing	Exempt Retail Load	Net Retail Load	2012 Class II WECs	2010 Banked Attributes	2011 Banked Attributes	Alternative Compliance Credits	Total RPS Class II WE Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES												
Fitchburg Gas & Electric	207,841	0	207,841	7,300	0	0	0	7,300	7,275	25	2,183	25
National Grid	11,682,420	0	11,682,420	512,286	0	19,240	0	531,526	408,885	122,641	122,666	122,641
NSTAR	8,924,054	0	8,924,054	300,000	0	97,730	0	397,730	312,342	85,388	93,703	85,388
W. Mass Electric	1,922,585	0	1,922,585	67,293	0	0	0	67,293	67,291	2	20,188	2
SUB-TOTALS	22,736,900	0	22,736,900	886,879	0	116,970	0	1,003,849	795,793	208,056	238,740	208,056
COMPETITIVE SUPPLIERS												
SUB-TOTALS	26,255,530	1,584,015	24,671,516	823,798	43	90,044	24,167	937,492	863,525	73,967	259,077	70,934
TOTALS	48,992,430	1,584,015	47,408,416	1,710,677	43	207,014	24,167	1,941,341	1,659,318	282,023	497,817	278,990

Table E
APS Alternative Energy Compliance Summary, 2012 (MWh)

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES			APS ALTERNATIVE ENERGY ATTRIBUTES					2.5% APS Obligation	BANKING FOR FUTURE COMPLIANCE		
	Load Obligation from Filing	Exempt Retail Load	Net Retail Load	2012 APS AECs	2010 Banked Attributes	2011 Banked Attributes	Alternative Compliance Credits	Total APS Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES												
Fitchburg Gas & Electric	207,841	0	207,841	5,800	0	57	0	5,857	5,197	660	1,560	660
National Grid	11,682,420	0	11,682,420	39,438	0	0	252,623	292,061	292,061	0	87,619	0
NSTAR	8,924,054	0	8,924,054	29,334	0	0	193,768	223,102	223,102	0	66,931	0
W. Mass Electric	1,922,585	0	1,922,585	25,297	0	0	22,768	48,065	48,065	0	14,420	0
SUB-TOTALS	22,736,900	0	22,736,900	99,869	0	57	469,159	569,085	568,425	660	170,530	660
COMPETITIVE SUPPLIERS												
SUB-TOTALS	26,255,530	1,584,015	24,671,516	251,310	0	7,578	358,502	617,390	616,811	579	185,062	579
TOTALS	48,992,430	1,584,015	47,408,416	351,179	0	7,635	827,661	1,186,475	1,185,236	1,239	355,592	1,239

APPENDIX THREE

Data Tables for RPS and APS Compliance by Generation Location and Type¹⁰⁵

The first three tables below provide the data from which the Class I graphs in Figures Two through Five were generated. Those graphs and these tables include SREC data for the Solar Carve-Out, which is within Class I. SRECs represent energy from solar PV systems located in Massachusetts that meet all SCO eligibility criteria.

Table F
RPS Class I Compliance by Generation Location, 2003-2012

Year Location	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	%
Connecticut	15,209	13,810	14,353	13,204	10,180	25,333	21,371	20,146	16,414	16,070	0.5
Maine	122,958	142,715	285,289	367,298	520,821	500,479	526,906	760,476	746,648	865,593	27.5
MASSACHUSETTS	108,106	146,228	157,022	184,777	192,200	197,949	197,530	197,748	286,115	443,693	14.2
New Hampshire	42,845	45,800	40,677	53,556	265,062	261,468	307,909	282,308	331,996	531,430	16.9
Rhode Island	15,117	26,521	42,659	62,230	42,562	34,848	26,061	1,182	41,952	37,131	1.2
Vermont	0	0	14,476	26,595	46,915	49,207	112,670	108,849	149,505	173,191	5.5
No. Maine ISA (NMISA)	0	0	0	455	54,079	66,418	66,071	89,405	22,742	49,144	1.6
New York	0	26,369	90,373	175,961	265,299	517,427	527,751	580,683	688,039	620,904	19.8
Prince Edward Is,	0	0	0	0	16,922	28,111	113,282	144,549	142,688	125,713	4.0
Quebec	0	0	0	54,696	85,493	215,835	230,367	138,263	213,713	278,794	8.9
Totals	304,235	401,443	644,849	938,772	1,599,533	1,896,811	2,129,918	2,323,609	2,639,812	3,141,663	100

Table G
RPS Class I Compliance by Generation Type, 2003-2012

Year Type ¹⁰⁶	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	%
Anaerobic Digester Gas	24,571	20,662	23,710	27,115	27,511	26,328	28,204	24,292	25,115	27,373	0.9
Other Biomass	108,106	146,228	285,289	395,856	782,315	743,882	571,757	584,505	392,629	394,754	12.6
Hydroelectric	0	0	0	0	0	0	47,490	80,823	105,484	105,326	3.4
Landfill Gas	171,025	230,553	335,151	449,633	486,558	660,937	690,851	736,298	848,229	891,798	28.4
Solar PV	0	0	6	216	803	1,799	2,420	4,116	36,688	99,293	3.2
Wind	533	4,000	693	65,952	302,346	463,865	789,196	893,575	1,231,667	1,623,119	51.7
Totals	304,235	401,443	644,849	938,772	1,599,533	1,896,811	2,129,918	2,323,609	2,639,812	3,141,663	100

¹⁰⁵ Note that regularly updated tables listing all RPS and APS qualified Generation Units, including their locations and types, are available for viewing and downloading via DOER's RPS/APS homepage, www.mass.gov/energy/rps.

¹⁰⁶ Note that the Massachusetts RPS statute and regulations include "biogas" (including anaerobic digestion gas) within the list of Eligible Biomass Fuels. However, DOER tracks anaerobic digester generation separately. Landfill gas, which is included within "biomass" in some state RPS programs, is listed separately from Biomass in the Massachusetts RPS statute and regulations. Also, note that the Solar PV figure for 2012 does not include the 38,866 surplus SRECs that went to DOER's Auction and were not reported in the Filings.

Table H
RPS Class I Compliance by Generation Location and Type, 2012 (MWh)

Type Location	Anaerobic Digester Gas	Other Biomass	Hydro- electric	Landfill Methane Gas	Solar PV ¹⁰⁷	Wind	Total
Connecticut	0	0	55	14,886	1,129	0	16,070
Maine	0	122,246	50,159	26,316	0	666,872	865,593
MASSACHUSETTS	27,373	2,508	11,236	216,232	92,124	94,220	443,693
New Hampshire	0	270,000	0	87,077	12	174,341	531,430
Rhode Island	0	0	725	36,398	0	8	37,131
Vermont	0	0	43,151	73,159	6,028	50,853	173,191
No. Maine ISA (NMISA)	0	0	0	0	0	49,144	49,144
New York	0	0	0	437,730	0	183,174	620,904
Prince Edward Island	0	0	0	0	0	125,713	125,713
Quebec	0	0	0	0	0	278,794	278,794
TOTAL	27,373	394,754	105,326	891,798	99,293	1,623,119	3,141,663

Table I
RPS Class II Renewable Energy Compliance by Generation Location, 2009-2012

Year Location	2009	2010	2011	2012	
	MWh	MWh	MWh	MWh	%
Connecticut	805	2,378	11,178	2,933	1.2%
MASSACHUSETTS	483	14,711	21,200	61,082	24.8%
Maine	0	18,605	42,540	72,014	29.3%
New Hampshire	33,514	29,369	69,674	55,454	22.5%
Rhode Island	741	3,040	3,524	1,448	0.6%
Vermont	0	28,837	30,610	53,106	21.6%
New York	0	6,897	57,856	0	0.0%
Totals	35,543	103,837	236,582	246,037	100%

Table J
RPS Class II Renewable Energy Compliance by Generation Type, 2009-2012

Year Type	2009	2010	2011	2012	
	MWh	MWh	MWh	MWh	%
Hydropower	35,543	96,552	172,051	246,037	100%
Landfill Methane	0	7,285	64,531	0	0.0%
Wind	0	0	0	0	0.0%
Totals	35,543	103,837	236,582	246,037	100%

¹⁰⁷ Note that the Solar PV figure for MA does not include the 38,866 surplus SRECs that went to DOER's SREC Auction.

No table is provided for RPS Class II Waste Energy because all of the qualified units are of the same type, and all are located in Massachusetts.

Table K
APS Compliance by Generation Type, 2009-2012
(all located in Massachusetts)

Type	Year	2009	2010	2011	2012	
	MWh	MWh	MWh	MWh	MWh	%
Combined Heat & Power		128,922	225,104	324,619	347,993	99.1%
Flywheel Storage		1,003	2,030	303	3,186	0.9%
Totals		129,925	227,134	324,922	351,179	100%