



**Massachusetts
Renewable & Alternative Energy
Portfolio Standards**

**MASSACHUSETTS RPS & APS
ANNUAL COMPLIANCE REPORT
FOR 2013**

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**Department of Energy Resources
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EXECUTIVE SUMMARY

The year 2013 was an excellent one for the Massachusetts Renewable and Alternative Energy Portfolio Standards (RPS and APS). Solar and other Class I certificates (SRECs and RECs) sourced from Massachusetts renewable generation rose by nearly 64% over 2012, while the total Alternative Compliance Payments (ACPs) fell by 55%, a decrease of more than \$40 million.

RPS is a statutory obligation created by the Electricity Restructuring Act of 1997. The statute was revised and expanded under the Green Communities Act of 2008 to encompass two classes of RPS plus the APS, and it was further modified under the Competitively Priced Electricity Act of 2012. Statute 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 statute, the Class I obligation increases by one percent annually and was eight percent in 2013. 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 per a formula set in regulation. The Class II Renewable Energy obligation rises annually per a schedule and a formula set in regulation, while the Class II Waste Energy obligation does not increase annually. The APS obligation increases by a schedule set in regulation.

The 51 Retail Electricity Suppliers with RPS and APS obligations in 2013 met their obligations with a mix of (a) 2013 Certificates purchased from the owners of qualified Generation Units, (b) Attributes banked from 2011 and 2012 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 the relevant 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 2013 RPS Class I RECs exceeded demand by 7%. The total retail load obligation in 2013 was 49,253 gigawatt hours (GWh),² of which the average 7.714% RPS Class I obligation (8% minus the average 0.286% Solar Carve-Out obligation within Class I)³ was 3,799 GWh. This obligation was met by 3,734 GWh of 2013 Class I RECs purchased by the Suppliers and 31 GWh of banked Attributes from 2012 surplus RECs, plus 32 GWh of ACPs (costing about \$2.07 million) paid by Suppliers that fell short of their REC obligations. The net result was a 330 GWh surplus of 2013 Class I RECs, almost all of whose Attributes were bankable for future compliance.

In addition to the MA RPS Class I RECs documented for compliance in the 2013 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 9% of MA RECs that *also* qualified for RPS in other New England states were used for RPS compliance in those states, with some of that possibly used to meet “green product” claims there.

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 energy.

³ See footnote 50 for an explanation of this year’s use of “average” Minimum Standard obligations for Class I RECs and SRECs.

RECs and SRECs from Class I renewable sources within Massachusetts in 2013 grew by almost 64% from 2012, the highest quantity of increase among all locations supplying RECs. Geographically, resources in the state of Maine (especially wind) supplied 25% of the RPS Class I RECs, while New York resources (landfills and wind) supplied 20%, Massachusetts (mostly landfills, wind, and solar) 18%, New Hampshire (mostly biomass and wind) 15%, and wind in adjacent Canadian provinces 11%, with the balance from other New England states. Most RPS Class I RECs came from electricity generated by wind turbines (59%), landfill methane fueled plants (22%), and biomass-fired plants (9%). The remaining supply came from hydroelectric plants, solar photovoltaic (PV) arrays (the fastest increasing source), and anaerobic digester gas plants.

For the RPS Solar Carve-Out (SCO) within Class I, steeply accelerating photovoltaic (PV) development yielded a substantial SREC surplus in 2013, which lowered SREC prices, activated the [Solar Credit Clearinghouse Auction](#) mechanism, and minimized use of the ACP option for compliance. The supply of 2013 SRECs available was double the 141 GWh required to satisfy the average RPS SCO obligation of 0.286% in 2013. In addition, 1 GWh of 2012 Auction SRECs and 1 GWh of 2012 banked SRECs were used for compliance. Of the 288 GWh total, 143 GWh were deposited into the Auction, 8 GWh became banked surplus, and 208 MWh were used for Class I compliance. However, thirteen Suppliers still met some or all of their SCO obligations with 4 GWh worth of ACPs, totaling \$307 thousand.

The supply of Class II RECs in 2013 for the recently reduced RPS Class II Renewable Energy obligation of 1.5% was much less short of demand in 2013 than in 2012. The obligation totaling 724 GWh was met with 510 GWh of RECs (mostly hydro) and 1 GWh of 2012 banked RECs, from which 168 GWh were banked forward. The resulting shortfall of 381 GWh was met by ACPs that totaled about \$10.2 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 1,690 GWh, Suppliers obtained 1,704 GWh and used 279 GWh banked from 2011 and 2012 surplus, while 14 Suppliers also used 14 GWh of ACP, costing \$148 thousand. The net result was a surplus of 308 GWh, of which 305 GWh were eligible to bank forward.

The supply of 532 GWh of AECs for the Alternative Energy Portfolio Standard (APS), augmented by 1 GWh banked from 2012 surplus, was significantly short of the 1,448 GWh needed to meet the 3% obligation. Consequently 922 GWh (64%) of the APS obligation were met by ACPs totaling about \$19.75 million, while a surplus of 7 GWh was banked forward by four Suppliers for future compliance. As in 2012, almost all AECs in 2013 came from combined heat and power (CHP) plants.

Two Suppliers exited the retail electricity business and failed to comply. The 6 GWh of Certificates (mostly Class I RECs) that they did not acquire in the market for RPS and APS compliance totaled nearly \$297 thousand in value at the relevant Alternative Compliance Payment Rates.

In sum, RPS Class I continued its intended role of incentivizing the accelerated development of new Renewable Generation Units, while RPS Class II continued incentivizing ongoing and improved operation of older renewable and waste energy facilities. The APS incentive has increased 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 in RPS Class I ensured further acceleration in the growth of PV, surpassing the state's initial target well ahead of schedule.

In 2013 regulatory activities, DOER revised the Class I regulations 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 II (or SREC II), which aims to achieve Governor Deval Patrick's new overall goal of 1,600 MW of PV installed by 2020. The SREC II will reach that aggressive target with regulation-based procedures designed to ensure a more carefully managed growth curve. In 2014, DOER completed the SREC II regulation and also revised the RPS Class II Renewable Energy regulation.

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 2013 pursuant to the Green Communities Act of 2008 (the “2008 Act”) and the Competitively Priced Electricity Act of 2012 (the “2012 Act”).⁴ The last three paragraphs briefly summarize changes that took effect during 2013 and 2014.

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 biomass⁵. 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. Under the 2008 Act, the RPS was renamed RPS Class I and, since 2009, has increased by one percent annually. The obligation was eight percent in 2013 and will be fifteen percent in 2020.⁶ In addition to RPS Class I, as of 2009 the Suppliers must comply with three new Energy Portfolio Standards mandated by the 2008 Act, and, as of 2010, with a Solar Carve-Out within Class I⁷. 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 mandated by the 2008 Act were implemented in three Regulations, respectively for RPS Class I, RPS Class II, and the Alternative Energy Portfolio Standard (APS).⁸ 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 impact⁹, 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

⁴ 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>) and further amended by the Competitively Priced Electricity Act of 2012 (<https://malegislature.gov/Laws/SessionLaws/Acts/2012/Chapter209>), were incorporated in Massachusetts law in M.G.L., c. 25A, §11F (<http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter25A/Section11F>).

⁵ In the case of woody biomass, the regulation since 2012 has included detailed fuel sourcing and energy conversion efficiency standards 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 supply. See the [Biomass Sustainability and Carbon Policy Study \(a.k.a. Manomet Study\) webpage](#) and the [RPS Biomass Policy Regulatory Process webpage](#).

⁶ The RPS law and regulations (except for the Solar Carve-out regulations) do not include final limits or ending dates.

⁷ Each year’s Class I obligation equals the obligation scheduled in regulation, 225 CMR 14.07(1), minus the Solar Carve-Out obligation calculated per a method specified in regulation, 225 CMR 14.07(2). But see the second paragraph of Section Two for additional detail.

⁸ 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, and revised again in 2014 to add a follow-up Solar Carve-Out II standard.

⁹ 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 2012 Act (referenced in footnote 4), 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.

NEPOOL Generation Information System (“GIS”)¹⁰ by independent Third Party Meter Readers (a.k.a., “Independent Verifiers”).¹¹

Under the 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 2008.¹² 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 of energy 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 2017.¹³ That goal was surpassed in 2013: a revised, final limit of 658.915 MW was announced in July, 2014; and in 2014 DOER launched the follow-up Solar Carve-Out II (a.k.a., SREC II).

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 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)¹⁴. For 2013, a revised regulation changed the previously unchanging Minimum Standard of 3.6% to 1.5%, and provided for subsequent annual increases. The RPS Class II Waste Energy Minimum Standard of 3.5% provides incentives for pre-1998 Waste Energy generation. The Class II eligibility of Waste Energy Generation Units – a.k.a., trash-to-energy 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.¹⁵ Two APS technologies are active to date: Flywheel Storage and Combined Heat and Power (CHP, a.k.a., cogeneration).¹⁶ The Alternative Energy Certificates (AECs) earned by a CHP Unit represent the energy saved (in MWh) by operating the Unit as a CHP Unit instead of separately operating an on-site thermal plant while drawing electricity from the grid.¹⁷ 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 the 2008 Act to mitigate the price impact of the newer standards for the Competitive Suppliers.¹⁸ Competitive Suppliers, unlike regulated Utilities, are not able to

¹⁰ See <http://www.nepoolgis.com>, as well as the middle paragraphs on page 7.

¹¹ 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 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).

¹² See the first two paragraphs of Section Three for additional qualification criteria.

¹³ For more detail about the Solar Carve-Out, visit the [RPS/APS homepage](#).

¹⁴ See footnote 9 for more details regarding the Hydroelectric MW limits. See footnote 5 for the Class I woody biomass eligibility standards that were extended to Class II woody biomass in rulemaking that occurred during the first half of 2014.

¹⁵ The APS statute is at <http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter25A/Section11F1~2>.

¹⁶ 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 third of the three technologies listed here, and a 2014 statute both removed the first two and added “renewable thermal” to APS as of 2015. See the last paragraph on page 28 regarding renewable thermal.

¹⁷ 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](#).

¹⁸ See the second paragraph on page 18 for a somewhat different transitional cost mitigation procedure used in the Solar Carve-Out.

pass the additional compliance costs along to retail customers with whom they already had 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, 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 confidentiality is promised) are reported in the aggregate in Section Seven, Table Eight. This exemption declines rapidly, and by 2017 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”).¹⁹ 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.²⁰ 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.²¹ 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 Standard²² 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.

¹⁹ See www.nepoolgis.com.

²⁰ 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>.

²¹ 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.

²² For example, banked Attributes from excess Class I and Class II certificates are not interchangeable, nor are Class II RECs and WECs. However, banked Attributes from excess Class I SRECs can be used towards either SCO or Class I compliance.

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, explain how Suppliers annually demonstrate their compliance with RPS and APS, and provide links to the statutes and regulations.

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 an unanticipated surge of applications in the spring of 2013.

[Class II regulatory revisions](#), announced on February 28, 2014, and completed on June 20, 2014, (a) adopted woody biomass eligibility standards that included forest sustainability and greenhouse gas reduction-based provisions earlier promulgated for Class I; (b) revised 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 2012²³; (c) revised the banking provisions for Waste Energy Certificates, and (d) incorporated a 2012 statutory increase in the hydropower size limit. All of these changes took effect with the 2013 Compliance Year, except that the hydropower limit had been effective since November 1, 2012.

Finally, although unrelated to 2013 RPS compliance, a [Class I rulemaking process](#), which was announced on January 3, 2014, completed on April 25, 2014, and effective on that date, established a follow-up to the 2010 Solar Carve-Out. The new "Solar Carve-Out II" is designed to achieve a gradual and orderly increase to a combined total of 1,600 MW of installed PV in Massachusetts by 2020, as announced by Governor Patrick on May 1, 2013²⁴.

SECTION TWO

RPS CLASS I COMPLIANCE IN 2013

Summary

DOER received filings from fifty-one Retail Electricity Suppliers, entities that provided electricity to retail customers (i.e., served retail load) in Massachusetts during 2013; they are 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-seven Competitive Suppliers that are licensed but not regulated by the DPU.²⁵ Five Suppliers new to the Massachusetts RPS market are listed in italics.

The total supply of electricity from 2013 RPS Class I Generation (represented by Class I RECs) exceeded demand by 7%, well up from the 9% current-year shortfalls of 2010-2012. Those shortfalls had followed three years of surplus (2007-2009), which had followed, in turn, supply shortages in the first four years of RPS (2003-2006). The 2013 RPS Class I obligation for each Supplier was eight percent (8%) of its retail load obligation at the NEPOOL GIS, from which the average Solar Carve-Out obligation of 0.286% was subtracted, leaving an average net Class I obligation of 7.714%²⁶.

²³ See DOER's report to the Legislature: *Evaluation of the Massachusetts RPS Class II Program*, available [here](#).

²⁴ The May 1, 2013, announcement is [here](#).

²⁵ Regulated distribution Utilities provide electricity under "Basic Service" to those customers in their franchise territories that 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.

²⁶ The SCO average was determined by dividing the aggregated Solar Carve-Out obligations (in MWh) by the 2013 Total Retail Load. See footnote 50 for this year's use of "average" Minimum Standard obligations for Class I RECs and SRECs.

Of the total compliance obligation, 99.1% of the compliance was met by Class I Renewable Generation. 98.3% came from 2013 generation, while 0.8% came from Attributes banked from 2012 compliance surplus. 0.8% was met using the Alternative Compliance Payment mechanism (vs. 8% for 2012) – by making ACPs to the Massachusetts Clean Energy Center (MassCEC). 8.7% of the RECs from 2013 generation were qualified to be Attributes banked forward for use towards Class I compliance in 2014 or 2015, compared to only 2.3% banked from 2012.

Although the 2013 REC supply exceeded demand, some Suppliers bought surplus for banking, leaving some other Suppliers short and, therefore, forced to use the ACP mechanism. On balance, surplus RECs banked forward significantly exceeded both the 2013 ACP totals and the total banked from the two previous years. Consequently, more banked RECs will be available for 2014 compliance than was the case in 2011 through 2013. Table Two, below, displays the compliance figures for the most recent ten years, 2004 through 2013, while additional details are in Appendix Two, Table A.²⁷

Table One
2013 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 Suppliers²⁸		
Cianbro Energy, LLC	Great Eastern Energy	OBE Electric
<i>Clearview Electric, Inc.</i>	Gulf Oil LP ²⁹	Open Book Energy, LLC
Consolidated Edison Solutions, Inc.	Hampshire Council of Governments	Peoples Power & Gas LLC
Constellation Energy Power Choice ³⁰	Hannaford Energy, LLC	Pepco Energy Services, Inc.
Constellation NewEnergy, Inc.	Harvard Dedicated Energy Limited	<i>Perigee Energy, LLC</i>
Devonshire Energy LLC	Hess Corporation	Public Power, LLC
Direct Energy Business, LLC	HOP Energy	Reliant Energy Northeast LLC
Direct Energy Services, LLC	Hudson Energy Services, LLC	REP Energy, LLC
Dominion Retail, Inc.	Integrays Energy Services, Inc.	South Jersey Energy Company
East Avenue Energy, LLC	Just Energy Massachusetts Corp.	Spark Energy, LP
Easy Energy of Massachusetts, LLC	Liberty Power Holdings LLC	Texas Retail Energy, LLC.
<i>Energy Plus Holdings</i>	Massachusetts Gas & Electric Co.	TransCanada Power Marketing Ltd
First Point Power, LLC	<i>Mega Energy Holdings, LLC</i>	<i>Verde Energy USA Massachusetts, LLC</i>
GDF Suez Energy Resources NA, Inc.	Mint Energy, LLC	Viridian
GDF Suez Retail Energy Solutions LLC, d/b/a Think Energy	NextEra Energy Services Massachusetts, LLC ³¹	Xoom Energy
Glacial Energy of New England, Inc.	Noble Americas Energy Solutions, LLC	

²⁷ Figures for earlier years, beginning with 2003, are found in earlier reports.

²⁸ Two 2013 Competitive Suppliers, Easy Energy of Massachusetts and Peoples Power & Gas, exited the Massachusetts retail electricity market late in 2013, did not submit their Filings, and have been found by DOER to be in noncompliance with the regulations. Another, Glacial Energy, is undergoing reorganization under Chapter 11 bankruptcy. Prior to submitting its Filing on time, Glacial informed DOER of this situation and of its intention to submit Alternative Compliance Payments to meet the portion of its obligation not met by Certificates. DOER fully expects to receive those ACPs and, accordingly, has included them in the data of this report. See Appendix One for more complete, updated information.

²⁹ 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 load as part of its own obligation.

³⁰ Constellation Energy Power Choice was formerly known as MxEnergy Electric, Inc.

³¹ NextEra Energy Services Massachusetts is also known as Gexa Energy, having acquired the latter in 2010.

The most noteworthy fact for 2013 is that the supply of REC's from Class I Renewable Generation in Massachusetts (including SRECs) rose by 63.5%, among the highest annual rates of increase to date, almost all attributable to accelerating wind and PV output³², and that the ACP total fell by more than \$14 million,

Note that all figures regarding the quantities and percentages of Class I REC's from different jurisdictions must be understood in the context of a regional market in which most MA Class I REC's can be used for RPS compliance in several New England states. Thus, many more REC's are actually created than are reflected in the 2013 RPS compliance figures. More than 4.6 million MA Class I REC's (including more than 285 thousand SRECs) were created at the NEPOOL GIS. Of those, 4,064,043 REC's (including 208 SRECs) were submitted in the Filings for Class I and 142,578 SRECs for Solar Carve-Out compliance, together totaling more than 90% of all MA Class I REC's, while 142,786 surplus SRECs (3%) were transferred to the Auction Account at the GIS.³³ Almost 204 thousand MA Class I REC's, about 4% of the total, were settled into Suppliers' GIS subaccounts for the other New England states (mostly in RI) where they also qualified for RPS, presumably to be used for RPS compliance there. In addition, almost 64 thousand REC's (more than 1%) were settled in the GIS "Reserved Account" for voluntary "green power product" sales, which were also represented by REC's in some Filers' green product subaccounts.³⁴ Finally, about 5,000 REC's were left unsettled at the GIS, most of them never sold.

Compliance Details

The total retail load obligation in 2013 was 49,252,929 MWh, for which the total of all 51 Suppliers' average 7.714% obligation was 3,799,402 MWh. The Class I REC supply totaled 4,064,043 REC's³⁵ from 2013 generation *plus* 31,102 MWh of Attributes banked from 2012 surplus REC's. That yielded a surplus of 330,272 REC's, and a net total of 3,764,948 MWh presented for compliance. Only sixteen Suppliers lacked enough REC's and met some of their compliance through 31,642 MWh of Alternative Compliance Payments (ACPs) totaling \$2,065,273.34 at the rate of \$65.27 per MWh.³⁶ Of the surplus, 328,984 MWh were eligible to be banked by 27 Suppliers for compliance use in 2014 and 2015. An additional 2,887 MWh of ACP, totaling \$188,434, is due from the two noncompliant Suppliers³⁷. Except for latter, the aggregate figures are displayed in Table Two, with more detail in Appendix Two, Table A, and Appendix Three, Tables F, G, and H. Note that the tables in Appendix Three include all 2013 SRECs, including those used for Solar Carve-Out compliance, as well as those transferred to the Auction³⁸.

³² If one omits the rapidly-growing Solar Carve-Out in the above analysis, then the in-state Class I REC supply grew by almost 37.5%, almost all of it from wind, but also some from hydroelectric, hydrokinetic, and PV.

³³ See additional detail in Section 3, Solar Carve-Out Compliance.

³⁴ The 81,647 Class I REC's retired as "Voluntary Renewable Energy (VRE) purchases" from the 2013 Filings DOER reported to the Massachusetts Department of Environmental Protection (MassDEP), which, in turn, will retire a calculated quantity of allowances for a future vintage year in the Regional Greenhouse Gas Initiative (RGGI). The retired allowances represent the Greenhouse Gas emissions avoided by 81,647 MWh of renewable energy and include 36,437 vintage 2012 SRECs that were purchased by DOER following the close of the 2012 SCC Auction. That quantity will reduce the number of allowances that can be sold in the RGGI Auction for that future year, which will, in turn, slightly reduce the regional allowance cap for non-renewable thermal power plants for that year. 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/>. The location and types of generation from which VRE was sourced in 2013 are listed in a new Table L in Appendix Three.

³⁵ This includes 208 SRECs that were not needed for SCO obligation or were in excess of the SCO banking limit, and that had not been transferred to the Auction account.

³⁶ Regarding the procedures for ACP and the use of ACP funds, see 225 CMR 14.08(3) and Section Eight of this report. 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>.

³⁷ See footnote 28 and Appendix One.

³⁸ By including all SRECs in that manner in this and subsequent Annual Reports, we treat them the same as Class I REC's that become banked; namely, they are counted as Compliance Year SRECs that are *or later will be* used for RPS compliance.

Table Two
Aggregated Data from the RPS Class I Annual Compliance Filings, 2004-2013 (MWh)³⁹

	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
CY Retail Sales (= Retail Load Obligation)⁴⁰	49,252,929	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
CY Minimum Standard (% obligation)⁴¹	7.714%	6.837%	5.8373%	4.9321%	4.0%	3.5%	3.0%	2.5%	2.0%	1.5%
CY aggregated compliance obligation⁴²	3,799,402	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
Total RECs from CY generation	4,064,043	3,056,894	2,613,122	2,323,609	2,129,918	1,896,008	1,599,533	938,772	644,849	444,680
minus CY total surplus RECs	(330,272)	(70,022)	(107,805)	(241,062)	(387,664)	(216,550)	(87,957)	(9,458)	(739)	(20,297)
Net CY RECs for CY obligation	3,733,771	2,986,872	2,505,317	2,082,547	1,742,254	1,679,458	1,511,576	929,314	644,110	424,383
plus Banked from pre-CY surpluses	31,102	107,351	271,303	380,824	189,835	80,605	6,863	1,661	19,531	61,147
Total RECs used for CY obligation	3,764,873	3,094,223	2,776,620	2,463,371	1,932,089	1,760,063	1,518,439	930,975	663,641	485,530
plus Total ACP Credits	31,642	255,388	106,203	3,965	0	1,208	10,920	322,625	367,858	265,424
Total for compliance obligation⁴³	3,796,515	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
Surplus Attributes banked forward⁴⁴	328,984	69,916	107,804	241,061	386,059	210,580	80,743	9,458	739	20,297
ACP proceeds (rounded)	\$2,065,273	\$16,350,132	\$6,598,386	\$241,551	\$0	\$70,765	\$623,750	\$17,786,316	\$19,566,367	\$13,645,448

³⁹ 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. See the earlier Annual Reports for 2003 data.

⁴⁰ 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 5/24/12 *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>.

⁴¹ The RPS Class I Minimum Standard obligation for each of the CYs after 2009 is calculated by subtracting from that CY's scheduled percentage the Solar Carve-out Minimum Standard. See Section Three and especially footnote 50.

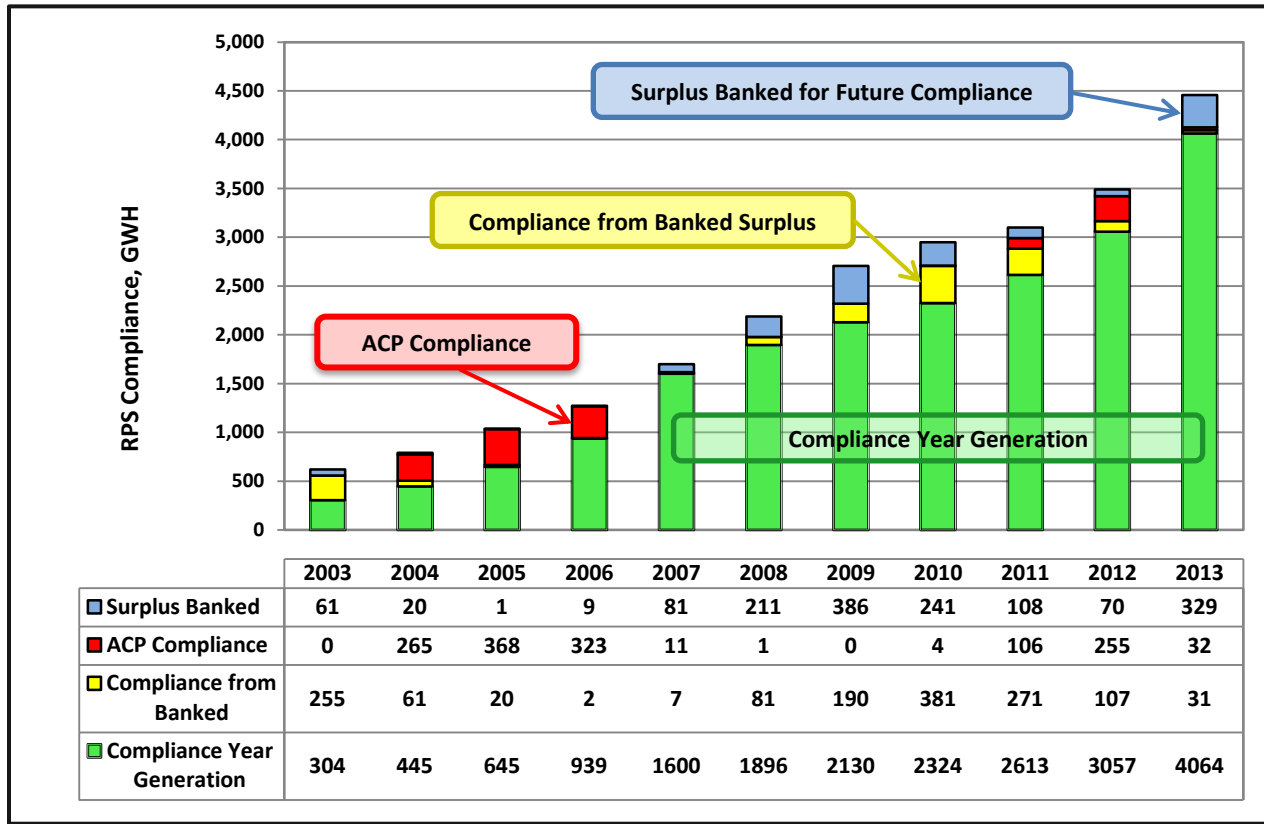
⁴² Note that the figures in this row usually are a bit higher than what one would obtain by calculating the total Retail Sales by the Minimum Standard for each year, as explained in footnote 39. For 2013, however, see footnote 43.

⁴³ Note a 2,887 MWh shortfall in the 2013 total, which resulted from noncompliance by two Suppliers. See footnote 28 and Appendix One for additional information.

⁴⁴ 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,

Changes in the manner of compliance during the first eleven years of the program, 2003-13, are shown 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. 2011 and 2012 saw a return to ACP reliance, which was reversed in 2013. Thus, the RPS obligation has succeeded in providing incentives for accelerated development of new Renewable Generation Units since the original RPS regulations were issued in April of 2002.

Figure One
RPS Class I Compliance, 2003-2013



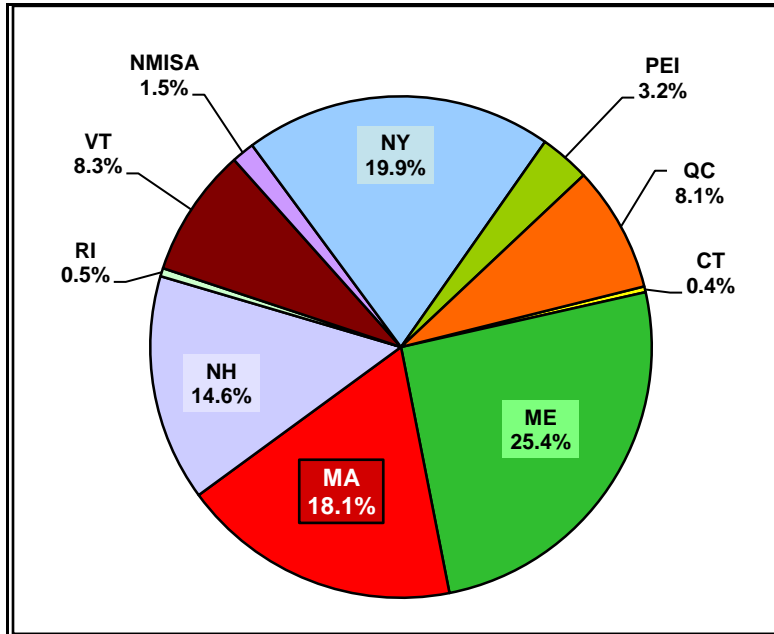
Generation Sources by Location

The percentages of 2013 RECs from the New England states, New York, and adjacent Canadian provinces are illustrated in Figure Two. 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 eleven 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. The figures in this subsection and in the referenced tables and graphs include all 2013 SRECs.

Massachusetts supplied 18.0% of the 2013 RECs presented for MA RPS Class I compliance, up from 14.2% in 2012, with almost all of the increase attributable to wind and PV projects. The 63.5% increase of Class I RECs and SRECs from Massachusetts projects between 2012 and 2013 is the highest year-to-year increase since the early years of RPS. However, larger shares continued to come from

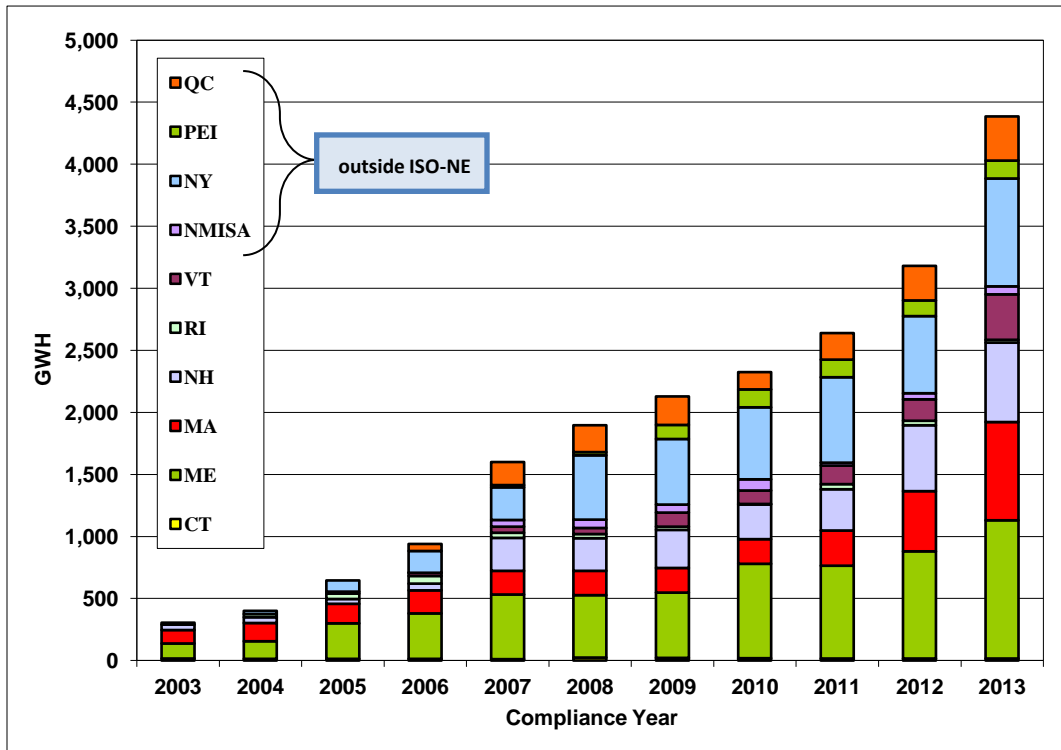
Maine, 25.4% (mostly from wind farms), and from New York, 19.9% (all from landfill methane and wind), while New Hampshire dropped into fourth place at 14.6% (mostly from wind and biomass).

Figure Two
2013 RPS Class I Compliance by Generator Location*



* Includes the Solar Carve-Out, all SRECs.

Figure Three
RPS Class I Compliance by Generator Location, 2003-2013*



* Includes the Solar Carve-Out, all SRECs.

Between 2012 and 2013, the supply of RECs for MA RPS Class I compliance that was sourced from Generation Units inside the ISO-NE control area increased by 40%, while the supply from electricity imported from Units outside of ISO-NE increased by only 33%. The ISO-NE share of the total rose slightly, from 66% in 2012 to 67% in 2013. The sources of imports also shifted, with the increase from New York being much higher than the increase from Canada (including NMISA in northern Maine).

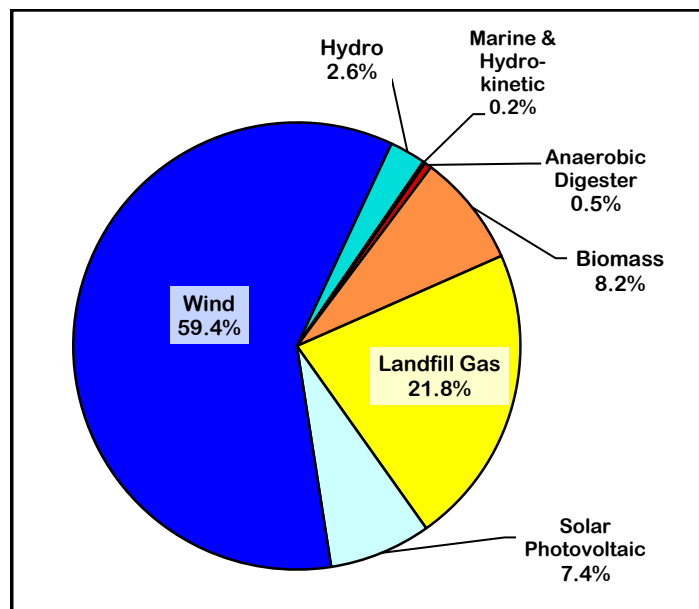
Generation Sources by Type

The percentages of 2013 RECs from the qualified types of renewable resources are illustrated in Figure Four, while Figure Five illustrates the eleven year trend of RECs by resource type. Table G in Appendix Three lists the data from which these graphs were generated. The figures in this subsection and in the referenced tables and graphs include all SRECs minted for 2013.

The supply of RECs from wind increased by 61% from 2012 to 2013, from hydroelectricity by 8%, and from landfill methane by 7%, while the RECs from anaerobic digestion declined by more than 16%, and RECs from other biomass declined by more than 9% (resuming a more or less continuous decline that began after 2007). Most notably, the supply of PV RECs used for Class I compliance rose by 31%. At the same time, overall PV generation increased by 134%; most of that generation qualified for the Solar Carve-Out. About half of the resulting SRECs were in excess of what could be used for SCO compliance; most of those were deposited, instead, in the Auction (discussed in Section Three, below), while 208 were used for non-SCO Class I compliance.

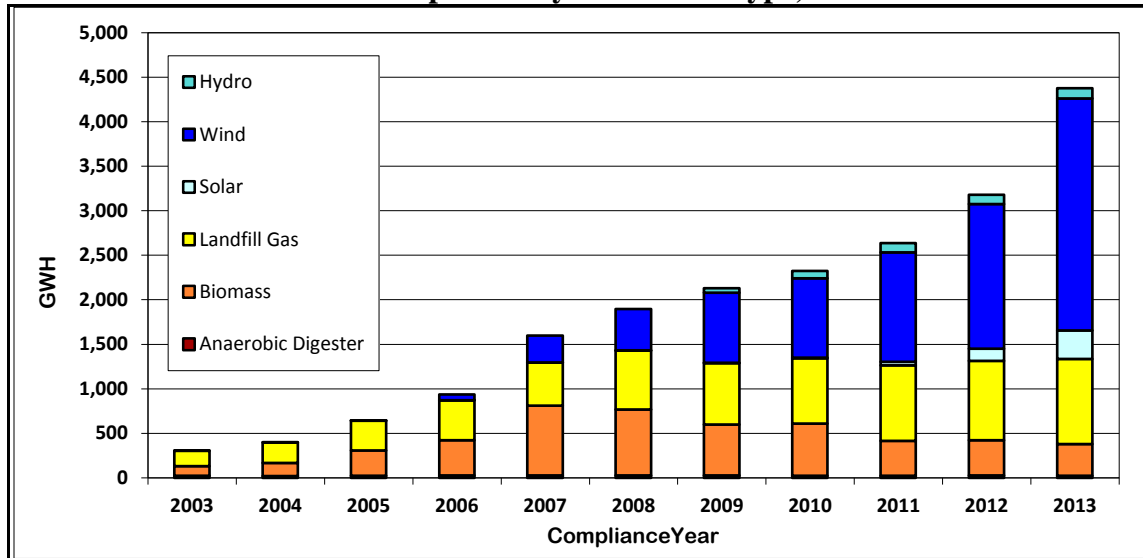
Wind power is the largest and, aside from PV, fastest growing source of RECs for RPS. Most of the wind RECs came from wind farms in Maine (33%), New Hampshire (15%), and in the adjacent control areas of Quebec (14%) and New York (14%). RECs for non-ISO-NE resources are earned only on electricity actually transmitted into ISO-NE. Wind output has been increasing at a higher rate than biomass and landfill methane since 2005. 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
2013 RPS Class I Compliance by Generator Type*



* Includes the Solar Carve-Out, all SRECs

Figure Five
RPS Class I Compliance by Generator Type, 2003-2013*



* Includes the Solar Carve-Out, all SRECs.

The bulk of landfill methane electricity output is from New York (54%) and Massachusetts (22%), 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 methane 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 Maine (51%) and New Hampshire (48%). 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, with most of the plants in Maine having either reduced or ceased production 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 less than 3% in 2013, mostly from Maine and Vermont.

In 2013 all of the anaerobic digester⁴⁵ output, which provided less than 1% of the 2013 RECs, was from in-state plants, most from the Deer Island Wastewater Treatment Plant and small amounts from Massachusetts dairy farms. Additional anaerobic digester potential exists at other wastewater treatment plants and other facilities that generate organic wastes. DOER is collaborating with the [MassDEP](#) to identify and encourage expanded production of digester gas and its use for electricity generation at wastewater treatment plants, food processing and food service facilities, and dairy farms.

Solar photovoltaic arrays provide a small but rapidly increasing share of RECs for RPS. This accelerating growth has been propelled by a number of factors in the last few years, including declining equipment costs, federal and state tax incentives, federal stimulus dollars, state “net metering” policy, and, notably, the RPS Solar Carve-Out (SCO) launched in January 2010.⁴⁶ Solar generation qualified for RPS Class I (but not for the SCO) rose from 4,120 MWh in 2010, to 10,108 MWh in 2011, 25,387 MWh in 2012, and 35,220 MWh in 2013. Although the SCO is attracting a large majority of new PV

⁴⁵ See footnote 102 regarding the relationship between anaerobic digester gas and biomass in the MA RPS regulations.

⁴⁶ In addition to RPS, MA has a suite of other programs helping to drive PV development. See the [Solar page](#) at DOER’s website.

development, over 62 MW of PV have also qualified outside of the SCO for RPS Class I, of which more than 22 MW are located in Massachusetts and about 40 MW are located in other New England states (34.5 MW in Vermont alone).

Finally, note that Marine and Hydrokinetic projects began to provide generation and RECs during 2013, including one tidal project on the far north coast of Maine and small, fresh water conduit-sited turbines within Massachusetts. Both types have potential for future growth.

SECTION THREE

RPS SOLAR CARVE-OUT COMPLIANCE IN 2013

The Solar Carve-Out (SCO) commenced in 2010, pursuant to the Green Communities Act of 2008. The Act 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).⁴⁷

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.

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.⁴⁸ However, the SCO Minimum Standard will continue for as long as any SCO-qualified system is still within its ten year Opt-

⁴⁷ PV systems that do not meet those criteria can still qualify for RPS Class I.

⁴⁸ Note that DOER raised the 400 MW cap to 658.915 MW in 2013 (described below) and also established follow-up Solar Carve-Out II Minimum Standard program, which went into effect on April 25, 2014.

In Term, the period of years during which it is entitled to deposit any surplus SRECs into the Solar Credit Clearinghouse (SCC) Auction, which is set when a system first qualifies for the program.⁴⁹

Table Three
Aggregated Data from the Solar Carve-Out (SCO) Compliance Filings, 2010-2013 (MWh)

	2013	2012	2011	2010
CY Retail Sales (=Retail Load Obligation)	49,252,929	48,992,430	49,386,169	50,026,093
Minimum Standard⁵⁰	0.286%	0.163%	0.1627	0.0679%
CY aggregated SCO obligation⁵¹	140,855	79,882	80,370	33,988
Total SRECs from CY generation⁵²	143,589	77,491	26,580	2,738
minus CY total surplus SRECs	(8,334)	(963)	(13)	0
Net CY SRECs for CY obligation	135,255	76,259	26,567	2,738
plus Banked from pre-CY surpluses	1,294	13	0	0
Total SRECs used for CY obligation	136,549	76,272	26,567	2,738
plus total ACP Credits	4,206	3,787	53,803	31,250
Total for compliance obligation	140,755	80,059	80,370	33,988
Surplus Attributes banked forward	8,066	961	13	0
ACP proceeds (rounded)	\$306,518	\$245,360	\$23,887,474	\$11,682,793

The large SREC supply shortfalls of 2010 and 2011 vanished in 2012 and 2013, due to the rapidly accelerating pace of new development. During 2013, the installed capacity of SCO-qualified PV increased from 165.5 MW to 408.7 MW. The SCO Minimum Standard for 2013 required 140,856 MWh of SRECs⁵³, while the SCO-qualified PV systems yielded 300,816 MWh of SRECs. Of that total, 143,192 were reported for SCO compliance⁵⁴, 10,000 were purchased and voluntarily retired by DOER⁵⁵, 208 were used for RPS Class I compliance, and 142,786 were deposited into the Auction Account. The remainder was left unsettled at the NEPOOL GIS and was not reported in the Filings. The surplus notwithstanding, twelve Suppliers depended on ACPs to meet some or all of their SCO

⁴⁹ With the latest RPS Effective Date for a SCO-qualified PV project being December 31, 2013, the SCO Minimum Standard will substantially end after 2023, but SCO II will still be in effect.

⁵⁰ While the Minimum Standards for 2010 through 2012 applied to all CY Retail Sales, the subsequent Standards represent the average resulting from the application of exemptions for certain load served under contracts entered into prior to specific dates. In 2013, all load served under contracts entered into prior to June 7, 2013, was subject to a Minimum Standard of 0.2744%. All load served under contracts entered into on or after June 7, 2013, was subject to a Minimum Standard of 0.3833%. Since such sales vary from Supplier to Supplier, DOER presents here the average percentage: aggregated SCO obligation of all Suppliers divided by total Retail Sales.

⁵¹ Also, see footnote 39 regarding the difference between totaling individual obligations and calculating overall obligation.

⁵² 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.

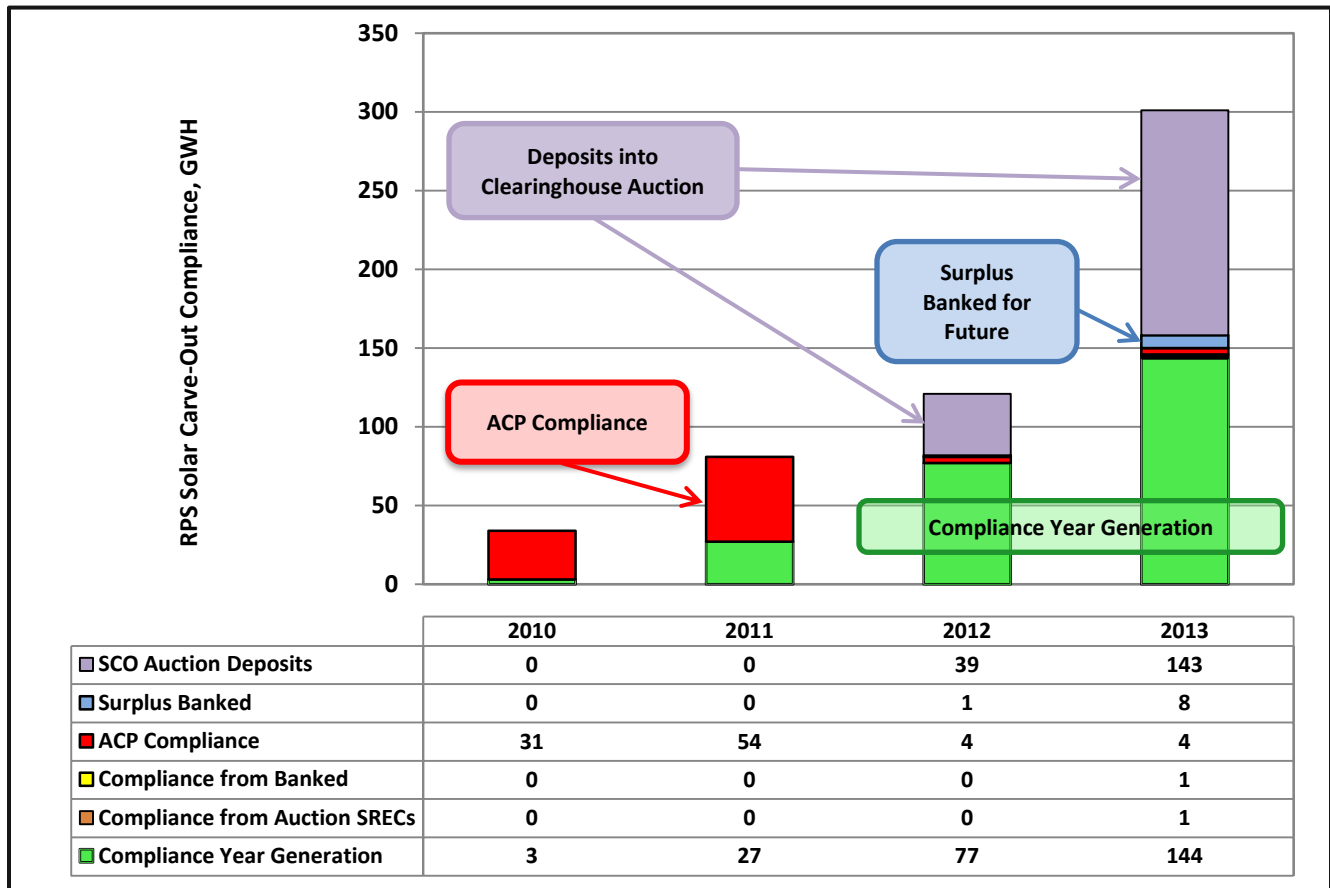
⁵³ The 2013 compliance obligation for the Solar Carve-Out was set at 189,297 MWh by Regulation in 225 CMR 14.07(2)(b), which yielded a Minimum Standard of 0.3833% of the 2011 retail load of 49,386,169 MWh under the procedures in 225 CMR 14.07(2)(a). Since the actual retail load for 2013 turned out to be 49,252,929, the resulting compliance obligation for 2013 was reduced to 188,787 MWh. However, due to the compliance exemption provided to retail suppliers in 225 CMR 14.07(2)(a)2 and each supplier rounding up any fractional MWh of its individual SREC obligation, the aggregated total needed for compliance was ultimately 140,856 MWh.

⁵⁴ 1,011 of the SRECs presented for compliance were vintage 2012 SRECs that were re-minted in the 2012 Auction.

⁵⁵ This purchase was made under a regulatory requirement established in 225 CMR 14.07(2)(a)3, which required DOER to purchase a number of SRECs “equal to the reduction of the compliance obligation attributable to the reduced Solar Carve-Out Minimum Standard resulting from the exempt electrical energy sales under pre-existing contracts in 225 CMR 14.07(2)(a)2.” DOER had purchased 36,437 SRECs immediately after the close of the 2012 Auction, but needed to purchase an additional 10,000 2013 vintage SRECs in order to satisfy its obligation. All 46,437 SRECs that DOER purchased were voluntarily retired on behalf of the Commonwealth.

obligations. 8,066 MWh of SCO Attributes were banked forward by 28 Suppliers, but in general, the Auction seemed to be a more attractive first option for suppliers with surplus SRECs.⁵⁶ The Filing figures (except for 100 MWh of SRECs owed by the two noncompliant Suppliers, worth \$55,000 at the ACP rate) are displayed in Table Three, with more detail in Appendix Two, Table B. Changes in the manner of compliance during the first four years of the program are shown in Figure Six.

Figure Six
RPS Class I Solar Carve-Out Compliance, 2010-2013



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, onset 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, \$65.27 per MWh in 2013. For any shortfall in serving retail loads under contracts *commencing* after 2009, the Rate in 2013 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 2013 was 4,140 MWh, for which the ACP totaled \$270,217.80 at the Class I rate of \$65.27/MWh, and the shortfall under retail load contracted in

⁵⁶ 142,786 SRECs were deposited into the 2013 Auction Account by Suppliers.

2010 or later was 66 MWh, for which the ACP totaled \$36,300 at the \$550/MWh rate.⁵⁷ These totals do not include 100 ACPs at the \$550/MWh rate that is owed by noncompliant Suppliers.⁵⁸

Three major developments occurred in the SCO program during 2013 and 2014. 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 was established through a rulemaking process that formally began on January 3, 2014, and concluded on April 25, 2014. The first year of SCO II compliance for Retail Electricity Suppliers is 2014.⁵⁹

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 issued an emergency regulation on June 28, 2013 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 SCO II regulation went into effect on April 25, 2014. All qualified projects over 100 kW were required to make a demonstration that they were mechanically complete by no later than June 30, 2014, in order to remain qualified. The following month, DOER announced that the final program capacity cap would be 658.915 MW, based on the number of qualified MW as of July 31st. At this time, there are still a handful of qualified projects waiting to receive their authorization to interconnect; DOER expects that all projects will be operational by early 2015.

Lastly, DOER administered its second Solar Carve-Out Clearinghouse Auction, for SRECs minted in 2013. The Auction required all three rounds, with the first one held on July 29, 2014, and the final one on August 1st. In the third round of the Auction, 232,060 bids were received, so that all 142,786 of the deposited SRECs were purchased by bidders. All SRECs sold were purchased at the \$300/MWh auction price, and depositors were paid \$285/MWh for each SREC deposited. These third round Auction SRECs can be used for compliance through CY 2016.

SECTION FOUR

RPS CLASS II RENEWABLE ENERGY COMPLIANCE IN 2013

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 one exception: hydroelectric plants in Class II are limited to 7.5 MW (vs. 37.5 MW in Class I), pursuant to the *Competitively Priced Electricity Act of 2012*⁶⁰.

⁵⁷ See Table Nine in Section Seven for a forward projection of the portion of the total retail load under pre-2010 contracts.

⁵⁸ See footnote 28 and Appendix One regarding the noncompliant Suppliers.

⁵⁹ More information on the SCO II program can be found on the [Solar Carve-Out II webpage](#).

⁶⁰ See footnote 9 for more information about hydro eligibility and for a link to the 2012 Act.

Because only pre-1998 plants that can qualify for Class II, the original 3.6% Minimum Standard did not rise over time.⁶¹ However, the quantity of pre-1998 generation that DOER originally had projected to qualify for Class II did not materialize during the early years of the program, resulting in very large REC shortfalls and a very high and costly reliance on the ACP mechanism. In the 2012 Act, the legislature directed DOER to conduct a study and recommend regulatory or statutory changes to alleviate that reliance. DOER completed and issued the study on December 31, 2012⁶². Based on the study, DOER developed regulatory changes during 2013 and began a rulemaking on February 28, 2014, which was formally completed on June 20, 2014. The revised regulation established a much reduced Minimum Standard of 1.5%, effective for 2013. The Standard rises to 1.75% for 2014 and 2.0% for 2015, following which the annual Standards are set by a formula that responds to changing market conditions⁶³. Given the timing of the new Standard, the regulation also provided that the 30% banking limit for 2013 would be based on the 3.6% Standard, thus protecting from loss any Supplier that had already purchased RECs under the previous Standard. The expected results of these changes materialized: a very much reduced dependence on the ACP mechanism for 2013 and increased banking.

Table Four
Aggregated Data from the RPS Class II Renewable Energy
Compliance Filings, 2009-2013 (MWh)

	2013	2012	2011	2010	2009
CY Retail Sales (=Retail Load obligation)	49,252,929	48,992,430	49,386,169	50,026,093	48,301,821
Exempt Load⁶⁴	973,011	1,584,015	3,799,666	8,233,703	31,918,771
Net Load	48,279,918	47,408,415	45,586,504	41,792,390	16,383,050
<i>Minimum Standard</i>	<i>1.5%</i>	3.6%	3.6%	3.6%	3.6%
CY aggregated obligation⁶⁵	724,222	1,706,727	1,641,134	1,504,544	589,801
Total Class II RECs from CY generation	509,609	246,665	236,472	103,837	35,543
<i>minus</i> CY total surplus Class II RECs	(167,874)	(874)	(1,757)	(63)	(653)
Net CY RECs for CY obligation	351,735	245,791	234,715	103,774	34,890
<i>plus</i> Banked from pre-CY surpluses	919	1,739	63	653	0
Total Class II RECs used for CY obligation	342,654	247,530	234,778	104,427	34,890
<i>plus</i> total ACP Credits	381,007	1,459,197	1,406,356	1,400,117	554,911
Total for compliance obligation	723,661	1,706,727	1,641,134	1,504,544	589,801
Surplus Attributes banked forward⁶⁶	167,874	874	1,749	63	653
ACP proceeds (rounded)	\$10,207,169	\$38,347,723	\$35,862,072	\$35,002,925	\$13,872,775

In 2013, the net (non-Exempt) load⁶⁷ for the Class II Renewable Energy obligation was 48,279,918 MWh, and the total of all 51 Suppliers' 1.5% Class II Renewable Energy obligations was

⁶¹ 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).

⁶² That study, [Evaluation of the Massachusetts RPS Class II Program](#), was issued and presented to the Legislature on December 31, 2012.

⁶³ The Minimum Standard for 2016, 2.5319%, was announced by DOER on September 8, 2014.

⁶⁴ The Exempt and Net Load figures pertain to the compliance obligation calculations only of unregulated competitive suppliers.

⁶⁵ See footnote 39 regarding the difference between totaling individual obligations and calculating an overall obligation.

⁶⁶ 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 44 regarding the 30% limit.

⁶⁷ See the discussion of Exempt Load for RPS Class II and APS above, on page 6-7.

724,222 MWh. Class II RECs available for Class II compliance, all from New England hydroelectric and hydrokinetic plants, were short of the demand, but much less so than in prior years. Fourteen Suppliers met their full obligations by acquiring RECs, with ten of them banking forward a combined surplus of 167,874 RECs. Another four acquired the remaining RECs, for an overall total of 509,609 RECs, more than double the 2012 total. That total, plus 919 RECs from 2012 banked surplus, minus the 167,874 RECs banked forward, yielded 342,654 RECs for 2013 compliance. That net total amounted to 47.3% of the total Class II Renewable Energy obligation, more than three times the 14.5% for 2012. The remaining 381,009 MWh (52.6%) of the obligation was met by the Alternative Compliance mechanism, that is, by making ACPs to the MassCEC at the rate of \$26.79 per MWh, totaling \$10,207,169. An additional 561 MWh of ACP, totaling \$15,029, is due from the noncompliant Suppliers (see footnote 28 and Appendix One). Except for the latter, the aggregate figures are displayed in Table Four, with more detail in Appendix Two, Table C, and in Appendix Three, Tables I and J.

The data for 2013 indicate that, while a substantial shortage of qualified Class II Renewable Energy generation continued, it was much smaller than before. Consequently, dependence on the ACP mechanism, with its attendant expense, was much reduced. At the same time, the continuing shortfall provides sufficient support for additional pre-1998 plants to be upgraded in order to qualify for Class II benefits. A confounding factor is the settlement of 16% of MA Class II RECs in other New England states, mostly in Connecticut (13%)⁶⁸, which reduced the quantity available for MA RPS Class II.

SECTION FIVE RPS CLASS II WASTE ENERGY COMPLIANCE IN 2013

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.⁶⁹ The MassDEP regulations, in addition to provisions for 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 2013, the net (non-Exempt) load for the Class II Waste Energy obligation was 48,279,918 MWh, and the total of the 51 Suppliers' 3.5% Class II Waste Energy obligations was 1,689,825 MWh. The Suppliers acquired 1,703,780 WECs, which, combined with the use of 278,771 Attributes banked from 2011 and 2012 surplus WECs, yielded a surplus of 307,868 WECs, of which 305,433 were eligible to bank towards Class II Waste Energy compliance over the next two Compliance Years.⁷⁰ The surplus notwithstanding, seven Suppliers acquired no WECs, and seven others failed to purchase enough WECs. Those fourteen Suppliers met their total shortfall of 13,828 WECs by making ACPs to the MassCEC at the ACP rate of \$10.72 per MWh, for total payments of \$148,236. An additional 1,310 MWh of ACP, totaling \$14,043, is due from the noncompliant Suppliers (see footnote 28 and Appendix One). Except for the latter, these figures are displayed in Table Five, with more detail in Appendix Two, Table D.

⁶⁸ Qualification for Connecticut RPS Class I does not include a vintage cut-off date. Therefore, many pre-1998 vintage plants that qualify for MA RPS Class II also qualify for CT RPS Class I, whose \$55 ACP rate for Class I is much higher than the ACP rate for MA Class II.

⁶⁹ The MassDEP regulations are in 310 CMR 7.08(2) and 310 CMR 19.000.

⁷⁰ 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.

The continued surplus in 2013 was due to the large, albeit declining, Exempt Load.⁷¹ In order to eliminate what DOER concluded to be a permanent and inherently large WEC surplus that Suppliers, on average, were carrying forward from year to year, DOER enacted through its 2014 RPS Class II rulemaking a banking moratorium for Compliance Years 2014 and 2015, and lowered the subsequent banking limit from 30% to 5%.

Table Five
Aggregated Data from the RPS Class II Waste Energy
Compliance Filings, 2009-2013 (MWh)

	2013	2012	2011	2010	2009
CY Retail Sales (=Retail Load obligation)	49,252,929	48,992,430	49,386,169	50,026,093	48,301,820
Exempt Load⁷²	973,011	1,584,015	3,799,666	8,233,703	31,891,115
Net Load	48,279,918	47,408,415	45,586,504	41,792,390	16,410,706
CY aggregated RPS II WE obligation, at 3.5%⁷³	1,689,821	1,659,318	1,595,546	1,462,750	574,384
Total WECs from CY generation	1,703,780	1,710,117	1,568,127	1,378,219	1,046,833
<i>minus</i> CY total surplus WECs	(307,868)	(282,023)	(212,565)	(251,554)	(473,177)
Net CY WECs for CY obligation	1,395,912	1,428,094	1,355,562	1,126,665	573,656
<i>plus</i> Banked from pre-CY surpluses	278,771	207,057	237,620	330,288	0
Total WECs used for CY obligation	1,674,682	1,635,151	1,593,182	1,456,953	573,656
<i>plus</i> total ACP Credits	13,828	24,167	2,364	5,797	728
Total for compliance obligation	1,688,511	1,659,318	1,595,546	1,462,750	574,384
Surplus WE Attributes banked forward⁷⁴	305,433	278,990	207,041	237,667	330,288
ACP proceeds (rounded)	\$148,236	\$253,993	\$24,113	\$57,970	\$7,280

SECTION SIX

APS ALTERNATIVE ENERGY COMPLIANCE IN 2013⁷⁵

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.

In 2013, the net (non-Exempt) load for the APS obligation was 48,279,918 MWh, for which the 51 Suppliers’ 3.0% APS obligations totaled 1,448,421 MWh. To comply with that obligation, the Suppliers purchased 531,781 AECs and used 1,239 AECs banked from 2012 surplus, from which four Suppliers banked all 7,347 of their surplus AECs, for a net total of 525,673 AECs. A net shortfall of 921,626 AECs was met by 41 of the Suppliers by making ACPs to the MassCEC at the rate of \$21.43 per MWh. The payments totaled \$19,750,452. An additional 1,122 MWh of ACP, totaling \$24,044, is

⁷¹ See the discussion of Exempt Load for RPS Class II and APS above, on page 6-7.

⁷² The Exempt and Net Load figures pertain to the compliance obligation calculations only of unregulated competitive suppliers.

⁷³ See footnote 39 regarding the difference between totaling individual obligations and calculating an overall obligation.

⁷⁴ 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.

⁷⁵ See the third paragraph on page 6 in Section One and footnote 17 for a description of the APS, an explanation of how AECs are determined for CHP plants, and a reference for further details.

due from the noncompliant Suppliers (see footnote 28 and Appendix One). Except for the latter, these figures are displayed in Table Six; more detail is in Appendix Two, Table E, and in Appendix Three, Table K.

Table Six
Aggregated Data from the APS Compliance Filings, 2009-2013 (MWh)

	2013	2012	2011	2010	2009
CY Retail Sales (=Retail Load Obligation)	49,252,929	48,992,430	49,386,169	50,026,093	48,301,821
Exempt Load ⁷⁶	973,011	1,584,015	3,799,666	8,233,703	31,918,771
Net Load	48,279,918	47,408,416	45,586,504	41,792,390	16,383,050
Minimum Standard ⁷⁷	3.0%	2.5%	2.0%	1.5%	1.0%
Aggregated APS Obligation	1,448,421	1,185,236	911,748	626,902	163,844
Total AECs from CY Generation	531,781	351,179	324,922	227,134	129,925
minus CY total surplus AECs	(7,347)	(1,239)	(7,636)	(520)	(10,600)
Net CY AECs for CY Obligation	524,434	349,940	317,286	226,614	119,325
plus banked from pre-CY surpluses	1,239	7,635	515	8,818	0
Total AECs used for CY Obligation	525,673	357,575	317,801	235,432	119,325
plus total ACP credits	921,626	827,661	593,947	391,470	44,519
Total for Compliance Obligation	1,447,299	1,185,236	911,748	626,902	163,844
Surplus APS Attributes banked forward	7,347	1,239	7,636	515	8,838
ACP proceeds (rounded)	\$19,750,452	\$17,397,429	\$12,116,514	\$7,829,400	\$890,380

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 2019. This scenario is based on the ISO-NE “reference case” for load growth in the *2014 CELT Report*,⁷⁸ following the approach of the RPS/APS Annual Compliance Reports for 2009 through 2012. However, the *2014 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 2018-2019.⁷⁹ As a result, electricity consumption now is projected to rise slightly through 2016 and then decline slowly during subsequent years. Regarding the ISO-NE forecast specifically for 2014, it should be noted that the forecast assumed normal weather and economic drivers; the actual electricity consumption for 2014 may differ to the extent that the weather and the economy deviate 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) regional and national economic conditions, (c) the degree of success in implementing energy efficiency programs, (d) the growth of behind-the-meter generation, and,

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 See footnote 39 regarding the difference between totaling individual obligations and calculating an overall obligation.

⁷⁸ The ISO-NE figures are from Tab 2, column P in the *2014 CELT Report* document “Forecast Data 2014”, dated 4/30/2014 and listed at <http://www.iso-ne.com/system-planning/system-plans-studies/celt>.

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.

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 2014 *CELT Report* 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
MA RPS Class I Annual Load & Compliance Obligations,
Actual (2003-2013) & Projected (2014-2019)⁸⁰

Year	Actual/Projected Load Obligation, MWh ⁸¹	RPS Class I % Obligation	Total RPS Class I REC Obligation ⁸²	Solar Carve-Out % Obligation ⁸³	Solar Carve-Out SREC Obligation	Solar Carve-Out II % Obligation	Solar Carve-Out II SREC II Obligation
2003	49,834,324	1.0%	498,343	n/a	n/a	n/a	n/a
2004	50,063,092	1.5%	750,954	n/a	n/a	n/a	n/a
2005	51,558,778	2.0%	1,031,176	n/a	n/a	n/a	n/a
2006	50,143,130	2.5%	1,253,578	n/a	n/a	n/a	n/a
2007	50,978,101	3.0%	1,529,343	n/a	n/a	n/a	n/a
2008	50,321,635	3.5%	1,761,257	n/a	n/a	n/a	n/a
2009	48,301,821	4.0%	1,932,089	n/a	n/a	n/a	n/a
2010	50,026,093	5.0%	2,501,305	0.0679%	33,988	n/a	n/a
2011	49,386,169	6.0%	3,007,569	0.1627%	80,370	n/a	n/a
2012	48,992,430	7.0%	3,429,493	0.1630%	79,882	n/a	n/a
2013	49,252,929	8.0%	3,940,235	0.3833%	188,787	n/a	n/a
2014	49,763,172	9.0%	4,478,685	0.9481%	471,805	0.0843%	41,950
2015	50,061,710	10.0%	5,006,171	2.1442%	1,073,423	0.3288%	164,603
2016	50,399,115	11.0%	5,543,903	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>
2017	50,310,629	12.0%	6,037,275	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>
2018	50,162,601	13.0%	6,521,138	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>
2019	49,994,725	14.0%	6,999,261	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>	<i>tbd</i>

Table Seven lists both the actual (2003-2013) and projected (2014-2019) total retail sales – as “retail load obligation”⁸⁴ – 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 2019, although the annual RPS Class I obligation continues increasing indefinitely. Given the above-noted ISO-NE expectation of a slow decline in overall demand, the Massachusetts projection in the second column would be 49,731,011 by 2023.

⁸⁰ The actual figures for 2003 through 2013 are from RPS annual compliance filings. The projections starting in 2014 are from the ISO-NE load growth projections in its *CELT Report* (see footnote 78), with 14% of the total Massachusetts load attributable to the RPS/APS-exempt 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.

⁸¹ See explanation and reference in footnote 40 regarding the use of “load obligation” for “retail sales.”

⁸² 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.

⁸³ The SCO and SCO II percentage obligations in this table do not take into account the several exemptions from these percentages. The exemption for 2013 SCO is described above in footnote 50; all of them are detailed via the [Minimum Standards page at DOER’s RPS website](#).

⁸⁴ See explanation and reference in footnote 40 regarding the use of “retail load obligation” for “retail sales.”

Figure Seven 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, ME RPS, NH RPS Classes I and II, and the mandate for new facilities in the RI Renewable Energy Standard.⁸⁵ The projections for all of the states are based on ISO-NE load growth projections cited above.⁸⁶ 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.

Figure Seven
New England Premium RPS Compliance Obligations by State,
Actual (2007-2013) & Projected (2014-2019)

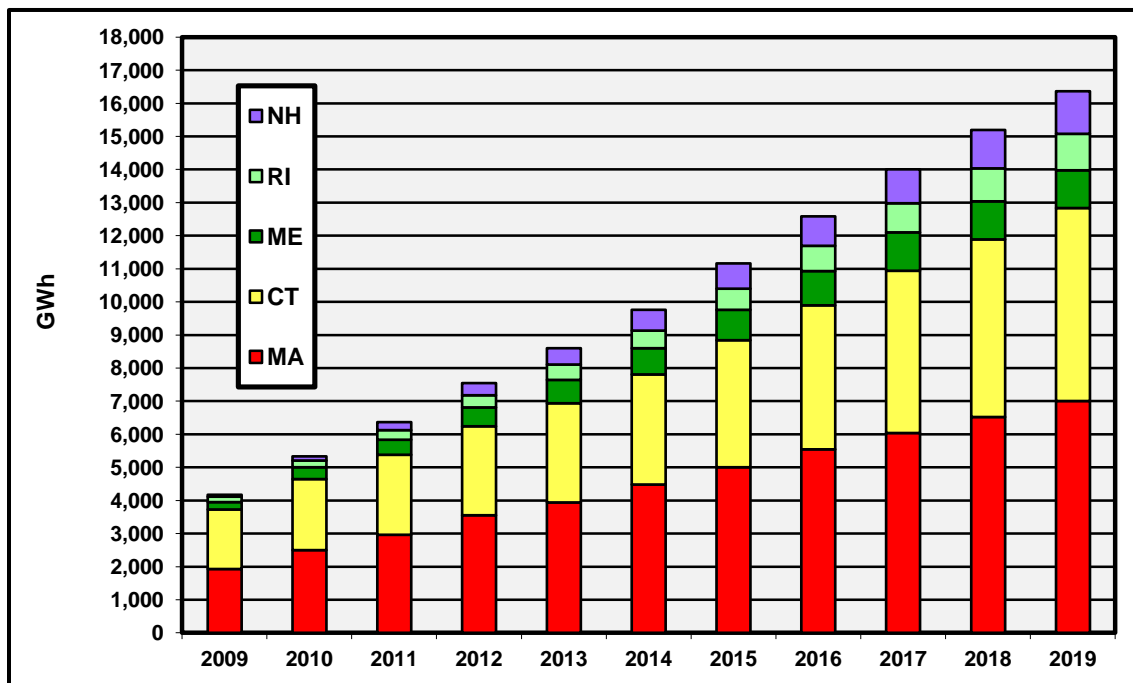


Table Eight lists the 2009-2013 actual load obligations for RPS Class II and APS, and load obligations projected for 2014 through 2019 (although, like Class I, the standards continue beyond that date). The total load obligation for each year is listed first and is identical to the figures in Table Seven. 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 yield the net load obligations. Note that DOER now expects 2017 to be the last year affected by the Exempt Loads, according to data in the 2013 Filings. Also note that the 2013 projected load obligation in the previous report was 754 GWh higher than the 2013 actual, which lowers all of the post-2013 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 Eight next multiplies the net load for each year by the mandated percentage standards. The standard does not rise annually for Class II Waste Energy, since that is for a known, fixed number of qualified pre-1998 plants. The standard does rise for APS, and, effective for 2013, the Class II Renewable Energy standard was lowered and subsequently began to rise annually, per a 2013 regulatory

⁸⁵ The other programs are summarized at <http://www.dsireusa.org/incentives/index.cfm?SearchType=RPS&&EE=0&RE=1>.

⁸⁶ See footnote 78 for the source of ISO-NE figures.

change⁸⁷. These Class II Renewable Energy changes are reflected in the new fifth column of Table Eight.

Table Eight
MA RPS Class II & APS Annual Load & Compliance Obligations, Net of Exempt Load, Actual (2009-2013) & Projected (2014-2019), in MWh⁸⁸

Year	Actual/ Projected Load Obligation ⁸⁹	Actual/ Projected Exempt Load Obligation	Actual/ Projected Net Load Obligation	RPS Class II REC Minimum Standard	RPS Class II RECs as % 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	3.6%	589,801	574,368	1.00%	163,844
2010	50,026,093	8,233,703	41,792,391	3.6%	1,504,526	1,462,734	1.50%	626,886
2011	49,386,169	3,799,666	45,586,504	3.6%	1,641,114	1,595,528	2.00%	911,730
2012	48,992,430	1,584,015	47,408,416	3.6%	1,706,727	1,659,318	2.50%	1,185,236
2013	49,252,929	973,011	48,279,918	1.50%	724,222	1,689,821	3.00%	1,448,421
<i>2014</i>	<i>49,763,172</i>	<i>93,912</i>	<i>49,669,260</i>	<i>1.75%</i>	<i>869,212</i>	<i>1,738,424</i>	<i>3.50%</i>	<i>1,738,424</i>
<i>2015</i>	<i>50,061,710</i>	<i>41,974</i>	<i>50,019,736</i>	<i>2.00%</i>	<i>1,000,395</i>	<i>1,750,691</i>	<i>3.75%</i>	<i>1,875,740</i>
<i>2016</i>	<i>50,399,115</i>	<i>10,948</i>	<i>50,388,167</i>	<i>2.5319%</i>	<i>1,275,778</i>	<i>1,763,586</i>	<i>4.00%</i>	<i>2,015,527</i>
<i>2017</i>	<i>50,310,629</i>	<i>445</i>	<i>50,310,184</i>	<i>tbd</i>	<i>tbd</i>	<i>1,760,856</i>	<i>4.25%</i>	<i>2,138,183</i>
<i>2018</i>	<i>50,162,601</i>	<i>0</i>	<i>50,162,601</i>	<i>tbd</i>	<i>tbd</i>	<i>1,755,691</i>	<i>4.50%</i>	<i>2,257,317</i>
<i>2019</i>	<i>49,994,725</i>	<i>0</i>	<i>49,994,725</i>	<i>tbd</i>	<i>tbd</i>	<i>1,749,815</i>	<i>4.75%</i>	<i>2,374,749</i>

Projecting 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 incentives, regulations, and decisions affecting all resources and types of electricity generation, as well as continued uncertainties in the national and global economies. DOER does expect growth in Massachusetts and elsewhere in the region from onshore and offshore wind farm development, as well as from hydropower, solar projects, and anaerobic digestion. The Cape Wind project’s supply effect over the next several years will depend on the actual timetable of construction. Decisions regarding new transmission and pipelines will impact the growth of more remote wind generation and competing natural gas generation in the region. The potential for new or incremental hydroelectric projects that meet the environmental standards of the program is difficult to predict. Accelerated solar PV development began to show up in the RPS market in 2010 and increased considerably during 2011 through 2014. DOER expects further strong growth in the years ahead, boosted by the new Solar Carve-Out II that commenced in 2014, as well by favorable equipment and installation cost trends. Finally, a largely untapped potential for anaerobic digester gas projects exists at agricultural, food processing, food service, and wastewater treatment facilities.⁹⁰

The 2012 completion of regulatory changes in the RPS Class I eligibility of woody biomass fueled plants ended the moratorium on biomass project qualifications but introduced challenging, overall

⁸⁷ See the second paragraph of Section Four for an explanation of this regulatory change.

⁸⁸ 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.

⁸⁹ The Load Obligation projections here are the same those for RPS Class I in Table Seven. See explanation and reference in footnote 40 regarding the use of “load obligation” for “retail sales.”

⁹⁰ In fact, DOER has been partnering with the MassDEP and MassCEC to identify, evaluate, and promote these opportunities under the [Clean Energy Results Program \(CERP\)](#).

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 2013. 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 expects most of the biomass plants that were temporarily grandfathered from the efficiency requirements of the new standards to become unqualified after the end of 2015, which will further reduce the quantity of woody biomass sourced RPS Class I RECs available to the market in 2016 and perhaps some time thereafter. However, some developers are actively working towards projects that can meet the challenge posed by the new woody biomass eligibility standards.

The **Solar Carve-Out** is experiencing a third year of surplus generation in 2014. Supply was short during 2010 and 2011, as project development ramped up – like the original RPS in its early years. 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 and 300,816 in 2013 – more than an eleven-fold increase in two years. During the first ten months of 2014, more than 520,000 SRECs already have been generated, according to NEPOOL GIS data plus July-October production data reported to the MassCEC’s Production Tracking System. 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 were installed in 2011, 135 MW in 2012, 230 MW in 2013, and more than 236 MW through the first ten months of 2014 (more than 34 MW of which is qualified under the Solar Carve-Out II Program). This dramatic increase in installed capacity led to a significant market oversupply that began in 2012 and continues through at least 2014. Current spot market prices seem to indicate a period of shortage after 2014. The shortage results from DOER’s regulatory formula, which raises the Minimum Standard in response to an oversupply that is indicated by the second SREC auction not clearing. This mechanism is intended to “assure” that all SRECs can eventually find purchasers without crashing prices.

Table Nine
MA Solar Carve-Out Loads Served under Pre-2010 & More Recent Retail Contracts,
Actual (2010-2013) & Projected (2014-2018), in MWh⁹¹

Year	Actual/Projected Total Load Obligation	Load Served under pre-2010 Retail Contracts, Actual/Projected	Load Served under 2010 or later Retail Contracts, Actual/Projected
2010	50,026,093	19,323,329	30,702,764
2011	49,386,169	7,248,357	30,099,623
2012	48,992,430	2,506,922	46,485,508
2013	49,252,929	1,547,374	47,705,645
2014	49,763,172	356,651	49,406,521
2015	50,061,710	50,836	50,010,874
2016	50,399,115	12,993	50,386,122
2017	50,310,629	1,322	50,309,307
2018	50,162,601	0	50,162,601

⁹¹ Also see footnote 50 and more detailed information at the URL provided there regarding still other ways in which the Minimum Standard may differ in relation to the amounts of retail load served under different contract dates.

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 2013), 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 forward schedule in regulation). Section Three describes recently enacted regulatory changes that have also affected SREC demand.

With regard to the **Class II** REC supply, the total pre-1998 installed capacity cannot rise, but some additional portion of that capacity is expected to qualify for Class II in future years. The unknown factors for future supply are (a) how *much* of that capacity, primarily from hydroelectric plants, will succeed in the future to meet the MA RPS Class II environmental criteria, and (b) how much of the MA Class II REC qualified supply will be used for compliance with classes of RPS in other New England states for which they are also qualified and some of which have higher ACP rates. The percentage of such loss to other states for 2010 through 2013 has been 19%, 24%, 28%, and 16% respectively. Most of those RECs were settled for New Hampshire in 2010 and 2011, for Connecticut in 2012 and 2013⁹².

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 so far by the effects of considerable banking forward of WECs prior to expiration of the Exempt Load. By means of the Class II rulemaking that concluded on June 22, 2014, DOER instituted a two year hiatus in banking (2014-2015), during which the quantity of already-banked WEC attributes would become zero (by compliance use or expiration). When banking resumes, it will be limited to 5% of a Supplier's WEC obligation, not the current 30%. DOER projects the Exempt Load to reach zero by 2018, which may result in a small balance of WECs being banked forward after 2015.

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 late 2014, the following indicate that higher levels of CHP output can be expected in the future:

- A number of large new CHP projects in the pipeline could add around 90 MW^e of generating capacity; and
- DOER recently qualified about 40 MW thermal of incremental thermal output from the existing 255 MW Kendall Generating Station, a CHP plant in Cambridge. The increased output is a consequence of 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.

In 2014 the legislature mandated DOER to add Thermal Renewable to the APS as of 2015. DOER will launch the necessary rulemaking by this winter and expects to complete the process before mid-2015, after which DOER anticipates AECs to begin coming from projects of a wide range of sizes utilizing solar domestic hot water and space heating, wood pellet heating, heat pumps, and other qualifying technologies. AECs from Renewable Thermal projects are expected to provide increasing shares of the supply demanded for the rising APS Minimum Standard during the years ahead, even while CHP development continues increasing.

⁹² See footnote 68.

SECTION EIGHT

USES OF THE ALTERNATIVE COMPLIANCE PAYMENT FUNDS

The Alternative Compliance mechanism for meeting RPS and APS obligations in CY 2013 resulted in total ACP proceeds of almost \$32.5 million, as detailed in Table Ten. Although substantial, this total is less than half the \$72.6 million of 2012. Below are observations on the ACP trends of the last several years.

- **RPS Class I:** Although the report for 2012 included an expectation of a third year of undersupply for 2013, the supply rebounded robustly (especially from wind projects), PV generation continued accelerating, and the use of ACPs plummeted.
- **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 continued through 2013, meeting DOER's expectations. Oversupply is also expected for 2014, the large Minimum Standard increase notwithstanding.
- **RPS Class II Renewable Energy:** The shortage is due to continued technical and financial issues for biomass-fired and hydropower plants, 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.⁹³ However, the use of ACPs declined substantially for 2013, due to DOER's sharp downward revision in the Minimum Standard through a rulemaking that ended on June 20, 2014, but applied to CY 2013 compliance.
- **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, expected in 2017. Although less ACP was paid for 2013 than for 2012 (for fewer than 14,000 WECs), more than 85,000 WECs were still left unsold by the owners of the Generation Units.
- **APS:** The annually increasing ACP totals are 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 annually growing supply shortfall and dependence on ACPs should be reversed by 2016 with the entry of Renewable Thermal supply into the APS, although increased CHP should also contribute to this turnaround.

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.⁹⁴ 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 place any restrictions, DOER uses Class II ACP funds to support or promote the development of

⁹³ For more extensive discussion, see DOER's 12/31/12 report to the Legislature: [Evaluation of the Massachusetts RPS Class II Program](#).

⁹⁴ These provisions are found in the Regulations for RPS Class I, RPS Class II, and APS respectively, as follows: 225 CMR 14.08(3)(d), 225 CMR 15.08(3)(b), 225 CMR 15.08(4)(b), and 225 CMR 16.08(3)(b).

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, 2010-2013
 (rounded to the nearest dollar)

Program/Class	2013	2012	2011	2010
RPS Class I	\$ 2,065,273	\$ 16,350,132	\$ 6,598,386	\$ 241,551
RPS Class I Solar Carve-Out	\$ 306,518	\$ 245,360	\$ 23,887,474	\$ 11,682,793
RPS Class II Renewable Energy	\$ 10,207,169	\$ 38,347,727	\$ 35,862,072	\$ 35,002,925
RPS Class II Waste Energy	\$ 148,236	\$ 253,993	\$ 24,113	\$ 57,970
APS (Alternative Energy)	\$ 19,750,452	\$ 17,397,429	\$ 12,116,514	\$ 7,829,400
Total⁹⁵	\$ 32,477,648	\$ 72,594,641	\$ 78,488,558	\$ 54,814,638

Concurrently with this *RPS & APS Annual Compliance Report for 2013*, DOER is issuing its *2013 ACP Spending Plan* for the substantial funds paid by Suppliers as Alternative Compliance with their 2013 RPS and APS compliance obligations. The *Plan* is available at the [Annual Compliance Reports page](#), accessible via DOER's RPS & APS homepage.⁹⁶

⁹⁵ Each of the totals, as rounded, is correct.

⁹⁶ <http://www.mass.gov/energy/rps>.

APPENDIX ONE

RPS and APS 2013 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 2013 were required to submit their Annual Compliance Filings for 2013 by Tuesday, July 1, 2014. DOER issued forms and instructions for the Filings on May 30, 2014, just over two weeks before the end of the NEPOOL GIS trading period for the fourth quarter of 2013. By July 1st DOER had received emailed Filings from all four regulated utilities and from 40 of the 47 Competitive Suppliers, with four more arriving on July 8th, and one on the 9th. However, two Suppliers neither submitted Filings nor responded to DOER reminders, as discussed below.

The review encompassed both printed and electronic copies of Filers' compliance 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 hardly any Suppliers initially failing to use that method and having to re-file, which they did expeditiously.

The 2013 Filings were complicated by four things related to SRECs, and by the failure of two Suppliers to comply with the RPS and APS Minimum Standards. First, the 2013 Minimum Standard was bifurcated into two percentages, established in the rulemaking completed on June 28, 2013, and based on the date by which contracts were entered for serving retail load. A number of Suppliers misunderstood the new spreadsheet by which DOER tried to help them sort their Load Obligations as required for use of the correct percentage obligations, and they had to correct their Filings.

Second, as with the 2012 Filings, some confusion occurred and resultant adjustments necessitated by options available for using the very high quantity of surplus SRECs generated in 2013, some of which were in excess of the quantity that could be banked by Suppliers for future compliance.⁹⁷ For 2013, most Suppliers realized the value of transferring them to the SSC Auction Account at the GIS, from which they were sold in the third round as Reminted Auction SRECs with a three year shelf life. However, some did not; of the latter, some immediately used them for non-SCO, Class I compliance. Some still did not understand their options.

The third complication is related to the previous one. On July 25, 2014, at the request of a competitive Supplier that had failed to transfer to the SSC Auction Account a large quantity of SRECs that it also could not bank for future compliance, the ISO New England approved and made effective immediately a NEPOOL GIS Operating Rules change, which provided that any Supplier could transfer SRECs between its GIS account and DOER's Auction after the end of the last quarter trading period of each Compliance Year, such that late-transferred SRECs in the Auction Account could participate in that CY's forthcoming Auction. DOER forewarned Suppliers of the pending rule change and permitted transfers through July 28, the day before the auction of 2013 SRECs. Those transfers also required appropriately revised Compliance Filings from 17 Suppliers

Fourth, recall the two-tiered ACP rate for the Solar Carve-Out, described on page 18. Some of the nine 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 \$65.27/MWh rate to comply under their older loads, rather than buying and using higher-priced SRECs. Some other Suppliers with

⁹⁷ SCO banking limit is 10% of each Supplier's SCO SREC obligation for the Compliance Year, and the limit for all other classes is 30%.

older loads deposited SRECs into the 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.⁹⁸ Three Suppliers used some non-bankable surplus towards non-Solar Carve-Out Class I compliance.

The complications described above required a number of Suppliers to revise their Filings into late summer, which delayed DOER's analysis of the data. However, improved workbook design and staff procedures also ensured better identification of errors and tracking of changes, with the felicitous result that the actual drafting of this Report took less time than in past years.

Easy Energy of Massachusetts, LLC, and Peoples Power & Gas LLC failed to comply with the RPS and APS Minimum Standards by failing to submit their Annual Compliance Filings. They also have failed to respond to DOER communications. DOER understands that each went out of business, stopped providing electricity to its customers, and consequently was barred by ISO New England from the retail electricity market. DOER, pursuant to its RPS and APS regulations, will notify the two Suppliers of their noncompliance, will post the notices of their noncompliance at the DOER website, and will recommend to the Massachusetts Department of Public Utilities (DPU) that it revoke their retail licenses. However, DOER does not expect to receive the \$296,551 in ACPs owed by the two companies for their 2013 compliance.

One Supplier, Glacial Energy of New England, Inc. submitted its Filing on time but did not make the required Alternative Compliance Payments to cover the portion of its obligation not met by Certificate purchases. Glacial stated that it was undergoing reorganization under Chapter 11 bankruptcy provisions, expected to continue to operating as a competitive Supplier in Massachusetts, and intended to make good on its 2013 ACP obligations, for which it requested an extension. DOER understands that Glacial customers in Massachusetts will continue to be served under a new owner, Agera Energy. After several months of email and telephone exchanges, on December 17, 2014, DOER has been informed that Glacial will submit its ACPs on December 29, 2014. If such payment is not received by that date, DOER will formally notify Glacial of its noncompliance, post the notice at DOER's RPS & APS webpage, and recommend that the DPU revoke its retail license.

⁹⁸ The 142,786 SRECs deposited into the 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 last paragraph on page 18.

APPENDIX TWO
2013 RPS and APS Compliance Summaries⁹⁹

Table A
RPS Class I Compliance Summary, 2013 (MWh)¹⁰⁰

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES	CLASS I RENEWABLE GENERATION ATTRIBUTES					6.837% RPS CLASS I OBLIGATION	BANKING FOR FUTURE COMPLIANCE		
	Load Obligation from Filing	2013 Class I RECs	2011 Banked Attributes	2012 Banked Attributes	Alternative Compliance Credits	Total RPS Class I Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES										
Fitchburg Gas & Elec.	229,262	21,169	0	0	0	21,169	17,689	3,480	5,307	3,480
National Grid	11,913,551	986,845	0	0	0	986,845	918,547	68,298	275,565	68,298
NSTAR	9,110,750	762,527	0	0	0	762,527	703,519	59,008	211,056	59,008
W Mass. Electric	1,913,650	142,045	0	0	5,746	147,791	147,791	0	44,338	0
SUBTOTALS	23,167,213	1,912,586	0	0	5,746	1,918,332	1,787,546	130,786	536,266	130,786
COMPETITIVE SUPPLIERS										
SUBTOTALS	26,085,716	2,151,457	0	31,102	25,896	2,211,349	2,011,856	199,486	603,580	198,198
TOTALS	49,252,929	4,064,043	0	31,102	31,642	4,129,681	3,799,402	330,272	1,139,846	328,984

⁹⁹ 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 One in Section Two.

¹⁰⁰ The Solar Carve-Out is netted out from the Class I table, although included in Tables F, G, and H of Appendix Three.

Table B
RPS Solar Carve-Out Renewable Energy Compliance Summary, 2013 (MWh)

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES		SOLAR CARVE-OUT RENEWABLE GENERATION ATTRIBUTES				0.286% avg. RPS SCO Obligation	BANKING FOR FUTURE COMPLIANCE			
	Load Obligation from Filing		2013 SRECs	2011 Banked Attributes	2012 Banked Attributes	Alternative Compliance Credits		Total RPS SCO Attributes	Excess Attributes	Banking Limit (10%)	Banked Attributes
DISTRIBUTION COMPANIES											
Fitchburg Gas & Electric	229,262		718	0	0	0	718	652	66	66	66
National Grid	11,913,551		37,982	0	9	0	37,991	34,538	3,453	3,454	3,453
NSTAR	9,110,750		27,386	0	352	0	27,738	25,341	2,397	2,535	2,397
W Mass Electric	1,913,650		5,304	0	0	0	5,304	5,301	3	531	3
SUBTOTALS	23,167,213		71,390	0	361	0	71,751	65,832	5,919	6,586	5,919
COMPETITIVE SUPPLIERS											
SUBTOTALS	26,085,716		72,199	0	933	4,206	77,439	75,023	2,415	7,530	2,147
TOTALS	49,252,929		143,589	0	1,294	4,206	149,190	140,855	8,334	14,116	8,066

Table C
RPS Class II Renewable Energy Compliance Summary, 2013 (MWh)

RETAIL ELECTRICITY SUPPLIERS	RETAIL SALES			CLASS II RENEWABLE ENERGY ATTRIBUTES					1.5% RPS Class II RE Obligation	BANKING FOR FUTURE COMPLIANCE		
	Load Obligation from Filing	Exempt Retail Load	Net Retail Load	2013 Class II RECs	2011 Banked Attributes	2012 Banked Attributes	Alternative Compliance Credits	Total RPS Class II RE Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES												
Fitchburg Gas & Electric	229,262	0	229,262	1,157	0	0	2,282	3,439	3,439	0	7,292	0
National Grid	11,913,551	0	11,913,551	160,295	0	0	18,409	178,704	178,704	0	378,851	0
NSTAR	9,110,750	0	9,110,750	4,767	0	0	131,895	136,662	136,662	0	289,722	0
W. Mass Electric	1,913,650	0	1,913,650	11,244	0	0	17,461	28,705	28,705	0	60,855	0
SUB-TOTALS	23,167,213	0	23,167,213	177,463	0	0	170,047	347,510	347,510	0	736,720	0
COMPETITIVE SUPPLIERS												
SUB-TOTALS	26,085,716	973,011	25,112,705	332,146	0	919	210,962	544,586	376,712	167,874	722,830	167,874
TOTALS	49,252,929	973,011	48,279,918	509,609	0	919	381,007	892,096	724,222	167,874	1,459,550	167,874

Table D
RPS Class II Waste Energy Compliance Summary, 2013 (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	2013 Class II WECs	2011 Banked Attributes	2012 Banked Attributes	Alternative Compliance Credits	Total RPS Class II WE Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES												
Fitchburg Gas & Electric	229,262	0	229,262	9,575	14	25	0	8,064	8,025	39	2,408	39
National Grid	11,913,551	0	11,913,551	384,426	0	122,641	0	507,067	416,975	90,092	125,093	90,092
NSTAR	9,110,750	0	9,110,750	321,996	0	85,388	0	407,384	318,877	88,507	95,664	88,507
W. Mass Electric	1,913,650	0	1,913,650	63,808	0	0	3,170	66,978	66,978	0	20,094	0
SUB-TOTALS	23,167,213	0	23,167,213	779,805	14	208,054	3,170	989,493	810,855	178,638	243,259	178,638
COMPETITIVE SUPPLIERS												
SUB-TOTALS	26,085,716	973,011	25,112,705	923,975	0	70,703	10,658	1,008,200	878,964	129,230	263,710	126,795
TOTALS	49,252,929	973,011	48,279,918	1,703,780	14	278,757	13,828	1,997,693	1,689,821	307,868	506,969	305,433

Table E
APS Alternative Energy Compliance Summary, 2013 (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	2013 APS AECs	2011 Banked Attributes	2012 Banked Attributes	Alternative Compliance Credits	Total APS Attributes		Excess Attributes	Banking Limit (30%)	Banked Attributes
DISTRIBUTION COMPANIES												
Fitchburg Gas & Electric	229,262	0	229,262	6,825	0	660	0	7,485	6,878	607	2,064	607
National Grid	11,913,551	0	11,913,551	165,400	0	0	192,007	357,407	357,407	0	107,223	0
NSTAR	9,110,750	0	9,110,750	104,460	0	0	168,863	273,323	273,323	0	81,997	0
W. Mass Electric	1,913,650	0	1,913,650	13,305	0	0	44,105	57,410	57,410	0	17,223	0
SUB-TOTALS	23,167,213	0	23,167,213	289,990	0	660	404,975	695,625	695,018	607	208,507	607
COMPETITIVE SUPPLIERS												
SUB-TOTALS	26,085,716	973,011	25,112,705	241,791	0	579	516,651	759,021	753,403	6,740	226,040	6,740
TOTALS	49,252,929	973,011	48,279,918	531,781	0	1,239	921,626	1,454,646	1,448,421	7,347	434,547	7,347

APPENDIX THREE

Data Tables for RPS and APS Compliance by Generation Location and Type¹⁰¹

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 (SCO), which is within Class I. SREC data beginning in 2012 also includes SRECs that were transferred to the Auction Account at the GIS, becoming reminted Auction SRECs, which are available to use for SCO compliance in the two or three years after their generation year. Note the 2013 arrival of Marine & Hydrokinetic.

Table F
RPS Class I Compliance by Generation Location, 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Location	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	%
Connecticut	13,810	14,353	13,204	10,180	25,333	21,371	20,146	16,414	16,070	16,452	0.4%
Maine	142,715	285,289	367,298	520,821	500,479	526,906	760,476	746,648	864,227	1,114,355	25.4%
MASSACHUSETTS	146,228	157,022	184,777	192,200	197,949	197,530	197,748	286,115	483,925	791,088	18.0%
New Hampshire	45,800	40,677	53,556	265,062	261,468	307,909	282,308	331,996	531,430	640,808	14.6%
Rhode Island	26,521	42,659	62,230	42,562	34,848	26,061	1,182	41,952	37,131	23,288	0.5%
Vermont	0	14,476	26,595	46,915	49,207	112,670	108,849	149,505	173,191	364,691	8.3%
No. Maine ISA (NMISA)	0	0	455	54,079	66,418	66,071	89,405	22,742	49,144	64,629	1.5%
New York	26,369	90,373	175,961	265,299	517,427	527,751	580,683	688,039	620,904	870,508	19.9%
Prince Edward Is,	0	0	0	16,922	28,111	113,282	144,549	142,688	125,713	142,478	3.2%
Quebec	0	0	54,696	85,493	215,835	230,367	138,263	213,713	278,794	356,139	8.1%
Totals	401,443	644,849	938,772	1,599,533	1,896,811	2,129,918	2,323,609	2,639,812	3,180,529	4,384,436	100%

Table G
RPS Class I Compliance by Generation Type, 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Type ¹⁰²	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	%
Anaerobic Digester Gas	20,662	23,710	27,115	27,511	26,328	28,204	24,292	25,115	27,373	22,853	0.5%
Other Biomass	146,228	285,289	395,856	782,315	743,882	571,757	584,505	392,629	394,754	357,575	8.2%
Hydroelectric						47,490	80,823	105,484	105,326	113,936	2.6%
Landfill Gas	230,553	335,151	449,633	486,558	660,937	690,851	736,298	848,229	891,798	954,656	21.8%
Marine and Hydrokinetic						0	0	0	0	6,837	0.2%
Solar PV	0	6	216	803	1,799	2,420	4,116	36,688	138,159	323,164	7.4%
Wind	4,000	693	65,952	302,346	463,865	789,196	893,575	1,231,667	1,623,119	2,605,415	59.4%
Totals	401,443	644,849	938,772	1,599,533	1,896,811	2,129,918	2,323,609	2,639,812	3,180,529	4,384,436	100%

¹⁰¹ 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.

¹⁰² 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. Note that, as of 2012, the Solar PV figures include SRECs that were transferred to the Auction and became reminted Auction SRECs. The latter were not included in this table of the original 2012 report, but the 2012 data are updated here and in a corrected 2012 report.

Table H
RPS Class I Compliance by Generation Location and Type, 2013 (MWh)

Type Location	Anaerobic Digester Gas	Other Biomass	Hydro- electric	Landfill Methane Gas	Marine & Hydro- kinetic	Solar Photo- voltaic	Wind	Total
Connecticut	0	0	257	15,286	0	909	0	16,452
Maine	431	183,256	47,962	34,184	0	344	848,178	1,114,355
MASSACHUSETTS	22,301	1,291	16,041	210,542	6,837	303,877	230,199	791,088
New Hampshire	0	173,028	0	84,139	0	282	383,359	640,808
Rhode Island	0	0	1,165	13,889	0	689	7,545	23,288
Vermont	121	0	48,511	76,569	0	17,063	222,427	364,691
No. Maine ISA (NMISA)	0	0	0	0	0	0	64,629	64,629
New York	0	0	0	520,047	0	0	350,461	870,508
Prince Edward Island	0	0	0	0	0	0	142,478	142,478
Quebec	0	0	0	0	0	0	356,139	356,139
TOTAL	22,853	357,575	113,936	954,656	6,837	323,164	2,605,415	4,384,436

Table I
RPS Class II Renewable Energy Compliance by Generation Location, 2009-2013

Year Location	2009	2010	2011	2012	2013	
	MWh	MWh	MWh	MWh	MWh	%
Connecticut	805	2,378	11,178	2,933	5,848	1.1%
MASSACHUSETTS	483	14,711	21,200	61,082	97,982	19.2%
Maine	0	18,605	42,540	72,014	171,754	33.7%
New Hampshire	33,514	29,369	69,674	55,454	86,931	17.1%
Rhode Island	741	3,040	3,524	1,448	1,597	0.3%
Vermont	0	28,837	30,610	53,106	145,497	28.6%
New York	0	6,897	57,856	0	0	0%
Totals	35,543	103,837	236,582	246,037	509,609	100%

Table J
RPS Class II Renewable Energy Compliance by Generation Type, 2009-2013

Year Type	2009	2010	2011	2012	2013	
	MWh	MWh	MWh	MWh	MWh	%
Hydropower	35,543	96,552	172,051	246,037	509,462	99.97%
Landfill Methane	0	7,285	64,531	0	0	0.0%
Marine/Hydrokinetic	0	0	0	0	147	0.03%
Wind	0	0	0	0	0	0.0%
Totals	35,543	103,837	236,582	246,037	509,609	100%

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

Table K
APS Compliance by Generation Type, 2009-2013
(all located in Massachusetts)

Type	Year	2009	2010	2011	2012	2013	
		MWh	MWh	MWh	MWh	MWh	%
Combined Heat & Power -- Biomass		0	0	0	0	2,689	0.50%
Combined Heat & Power – Natural Gas		128,922	225,104	324,619	347,993	529,462	99.40%
Flywheel Storage		1,003	2,030	303	3,186	489	0.09%
Totals		129,925	227,134	324,922	351,179	532,640	100%

Table L
Voluntary Renewable Energy Certificates by Generation Location & Type, 2013 (MWh)¹⁰³

Type	Anaerobic Digester Gas	Other Biomass	Hydro-electric	Landfill Methane Gas	Marine & Hydro-kinetic	Solar Photo-voltaic	Wind	Total
Connecticut	0	0	0	0	0	0	0	0
Maine	0	0	0	0	0	0	13,286	13,286
MASSACHUSETTS	786	0	0	0	0	48,991 ¹⁰⁴	7,419	10,759
New Hampshire	0	0	0	0	0	0	76	76
Rhode Island	0	0	0	0	0	0	0	0
Vermont	0	0	0	0	0	0	40	40
No. Maine ISA (NMISA)	0	0	0	0	0	0	0	0
New York	0	0	0	0	0	0	11,049	11,049
Prince Edward Island	0	0	0	0	0	0	0	0
Quebec	0	0	0	0	0	0	0	0
TOTAL	786	0	0	0	0	48,991	31,870	81,647

¹⁰³ These RECs were documented in the Filings and/or NEPOOL GIS reports and are qualified to be retired by the MassDEP for the Regional Greenhouse Gas Initiative. For additional details, see footnote 34.

¹⁰⁴ This figure includes 36,437 vintage 2012 SRECs that were purchased by DOER in the 2012 SCC Auction. These SRECs were voluntarily retired in 2013 by DOER along with 10,000 vintage 2013 SRECs on behalf of the Commonwealth. The SRECs were purchased pursuant to 225 CMR 14.07(2)(a)3.