

PUBLIC SERVICE COMMISSION OF MARYLAND

RENEWABLE ENERGY PORTFOLIO STANDARD REPORT

With Data for Calendar Year 2014

In compliance with Section 7-712 of
the Public Utilities Article,
Annotated Code of Maryland

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I. INTRODUCTION

This document constitutes the annual report of the Public Service Commission of Maryland (“Commission”) regarding the implementation of the Maryland Renewable Energy Portfolio Standard (“RPS”) Program, with data for calendar year 2014. This report is submitted pursuant to § 7-712 of the Public Utilities Article, *Annotated Code of Maryland* (“PUA”), which requires the Commission to report to the General Assembly on the status of the implementation of the RPS Program on or before February 1 of each year.¹ The Maryland RPS Program is designed to support a stable and predictable market for energy generated from renewables, and to lower the cost to consumers of electricity produced from these resources. Implementation of the RPS Program assists in overcoming market barriers seen as impediments to the development of the industry. Moreover, increasing reliance upon renewable energy technologies to satisfy electric power requirements can result in long-term emission reductions, increased fuel diversity, and economic benefits to the State.²

The calendar year 2014 electricity supplier compliance reports, as verified by the Commission, indicate that the State of Maryland RPS obligations were almost entirely fulfilled through the submission of the appropriate level of Tier 1 and Tier 2 Renewable Energy Credits (“RECs”);³ the remainder of the calendar year 2014 RPS requirements were satisfied by a small reliance on compliance fees, also known as alternative compliance payments (“ACPs”). Since the inception of the Maryland RPS program, the use of ACPs to demonstrate partial compliance has been primarily linked to the Tier 1 Solar carve-out. For the fifth consecutive year, however, electricity suppliers did not rely heavily on ACPs to meet the State’s Tier 1 Solar requirements, and the number of Solar Renewable Energy Credits (“SRECs”) retired increased by just over 50% from the 2013 to 2014 calendar year. Despite this significant progress, the 2014 SREC retirement still reflects under 3% of total procured RECs in the State, as compared to retired RECs derived from other renewable resources.

For the 2014 RPS requirements, electricity suppliers retired a substantial quantity of Tier 1 RECs derived from small hydroelectric, black liquor, municipal solid waste, and wind renewable resources. While the 2014 percentage share of retired Tier 1 small hydroelectric and municipal solid waste RECs was comparable to calendar year 2013 data, the percentage share of retired black liquor RECs increased significantly in 2014 while the percentage share of retired wind RECs decreased substantially.

In 2014, four States (Maryland, Pennsylvania, Virginia, and Illinois) provided approximately 80% of the Tier 1 and Tier 2 RECs retired by Maryland electricity suppliers. Maryland was the largest provider in the aggregate of all RECs used to demonstrate compliance

¹ Electricity suppliers must file an RPS compliance report with the Commission for the prior calendar year by April 1st of the subsequent year. Consequently, this report, which is due to the General Assembly in February 2016, highlights data from electricity suppliers’ 2014 compliance reports and other relevant 2014 data. In compliance with PUA § 7-712, topics addressed in this report include the availability of Tier 1, Tier 1 Solar, and Tier 2 renewable energy sources, compliance fees collected to support in-State renewable projects, and other pertinent information.

² See PUA § 7-702, which describes the legislative intent and legislative findings in support of the enactment of the Maryland Renewable Energy Portfolio Standard.

³ See Section I.B.2 for a description of eligible Tier 1 and Tier 2 resources and requirements.

with the Maryland RPS Program, while Virginia and Pennsylvania were the largest providers of Tier 1 and Tier 2 RECs respectively.

A. Objectives of the Program

The objective of PUA § 7-701 *et seq.* (hereinafter, “RPS Statute”) is to recognize and to develop the benefits associated with a diverse portfolio of renewable energy resources to serve Maryland. The State’s RPS Program does this by recognizing the environmental and consumer benefits associated with renewable energy. The RPS Program requires electricity suppliers to meet a prescribed minimum portion of their retail electricity sales with various renewable energy sources, which have been classified within the RPS Statute as Tier 1 and Tier 2 renewable sources. The program is implemented through the creation, sale, and transfer of RECs.

The development of renewable energy resources is further promoted by requiring electricity suppliers to pay an ACP for failing to acquire sufficient RECs to satisfy the RPS as set forth in PUA § 7-703. Compliance fees are deposited into the Maryland Strategic Energy Investment Fund (“SEIF”) as dedicated funds to provide for loans and grants that spur the creation of new Tier 1 renewable energy resources in the State. Responsibility for developing renewable energy resources is vested with the Maryland Energy Administration (“MEA”).

B. Overview of the Maryland RPS Program

Under the RPS Program, Maryland electricity suppliers are required to demonstrate compliance on an annual basis with an escalating renewable energy portfolio standard. This requirement applies to both competitive retail suppliers and electric companies in the State – including those that provide Standard Offer Service.⁴ Electricity suppliers must file annual compliance reports with the Commission verifying that the renewable requirement for each entity has been satisfied.

Each electricity supplier must document annually the retirement of RECs equal to the percentage specified by the RPS Statute,⁵ or pay an ACP commensurate with any shortfalls. A REC constitutes the renewable attributes associated with the production of one megawatt-hour (“MWh”) of electricity generated using eligible renewable resources. As such, a REC is a uniquely-identified tradable commodity equal to one MWh of electricity generated or obtained from an eligible renewable energy resource. Generators and electricity suppliers may trade RECs using a Commission-approved system known as the Generation Attributes Tracking System (“GATS”). The GATS system is operated by PJM Environmental Information Services,

⁴ Standard Offer Service (“SOS”) is electricity supply purchased from an electric company by the company’s retail customers who cannot or choose not to transact with a competitive supplier operating in the retail market. *See* PUA §§ 7-501(n), 7-510(c).

⁵ Using the Tier 2 RPS requirement as an example, assume a hypothetical electricity supplier operating in the State had 100,000 MWh in retail electricity sales for 2014. In 2014, the Tier 2 requirement was 2.5%; therefore the electricity supplier would have to either verify the purchase of 2,500 Tier 2 RECs in satisfaction of the Tier 2 RPS obligation or pay an ACP for deficits. Similar requirements apply to Tier 1 and Tier 1 Solar, although the percentage obligation and ACP denomination differs depending on the tier and calendar year, as outlined by the RPS Statute.

Inc. (“PJM-EIS”) and is designed to track the ownership and trading of generation attributes.⁶ A REC has a three-year lifespan during which it may be transferred, sold, or redeemed.

1. Registration of Renewable Energy Facilities

Facilities eligible for the Maryland RPS Program must be located in PJM⁷ (the wholesale bulk power control area in which Maryland resides) or in a control area that is adjacent to the PJM region,⁸ so long as the electricity produced is delivered into the PJM region. However, facilities generating electricity from solar energy, geothermal, poultry litter-to-energy, waste-to-energy, or refuse-derived fuel are eligible only if the facility is connected with the electric distribution grid serving Maryland.

Before recommending certification of a Renewable Energy Facility (“REF”), Commission Staff must determine whether the facility meets the standards set forth by the RPS Statute and COMAR 20.61 – the Commission regulation by which the RPS Statute is implemented. REF applicants who may qualify under Maryland’s RPS Program initially work with Commission Staff and must complete the appropriate application for REF certification posted on the Commission’s RPS website.⁹ In addition to the geographic requirements, applicants must also meet the fuel source requirements associated with Tier 1 or Tier 2 REC creation. Verification of the fuel source is completed with the aid of Energy Information Administration Form 860 (“EIA-860”) to validate each facility’s rated nameplate capacity, fuel source(s), location, and commercial operation in-service date.¹⁰ Facilities that co-fire a REC-eligible renewable fuel source with non-eligible fuel sources must in addition submit a formula or methodology to account for the proportion of total electricity generated by the eligible fuel sources, which then may be credited with RECs. In addition to obtaining Commission certification, all REFs must register with GATS to create and transact business related to RECs. The GATS account must be established with the State facility certification number issued by the Commission upon approval of the REF application.

⁶ An attribute is “a characteristic of a generator, such as location, vintage, emissions output, fuel, state RPS Program eligibility, etc.” PJM-EIS, *GATS Operating Rules* (May 2014) at 3.

⁷ The PJM wholesale market includes all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

⁸ A control area is an “electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation. For the purposes of this document, a Control Area is defined in broad terms to include transmission system operations, market, and load-serving functions within a single organization. A Control Area operator may be a system operator, a transmission grid operator, or a utility.” PJM-EIS, *GATS Operating Rules* (May 2014) at 5. For example, the multi-state area controlled by the PJM Regional Transmission Operator is one control area, as is the adjacent Midwest Independent System Operator (“ISO”) multi-state area, and the adjacent New York ISO.

⁹ REF applications are maintained by the Commission and are accessible online, *available at*: <http://www.psc.state.md.us/electricity/wp-content/uploads/sites/2/Application-for-Certification-as-a-Renewable-Energy-Facility.pdf>.

¹⁰ Submitting Form EIA-860 is a requirement under Section 13(b) of the Federal Energy Administration Act of 1974 (“FEAA”) (Public Law 93-275) for generating plants, regulated and unregulated, which have a nameplate rating of 1 MW or more, are operating or plan to operate within 5 years, and are connected to the transmission grid.

2. Maryland RPS Annual Percentage Requirements

To comply with the Maryland RPS program, electricity suppliers must acquire RECs derived from Maryland-certified Tier 1 and Tier 2 renewable resources. Eligible fuel sources for Tier 1 RECs and Tier 2 RECs are listed in Table 1; solar has its own standard within Tier 1.

Table 1: Eligible Tier 1 and Tier 2 Resources

Tier 1 Renewable Sources	Tier 2 Renewable Sources
<ul style="list-style-type: none">• Solar (Tier 1 Solar), including energy from photovoltaic technologies and solar water heating systems• Wind• Qualifying Biomass• Methane from a landfill or wastewater treatment plant• Geothermal• Ocean• Fuel Cell that produces electricity from a Tier 1 source• Hydroelectric power plant less than 30 MW capacity• Poultry litter-to-energy• Waste-to-energy¹¹• Refuse-derived fuel• Thermal energy from a thermal biomass system	<ul style="list-style-type: none">• Hydroelectric power other than pump storage generation <p><i>(Note: Tier 1 RECs may be used to satisfy Tier 2 obligations)</i></p>

As shown in the table below, Tier 1 requirements gradually increase until peaking in 2022, and are subsequently maintained at those levels in 2023 and beyond. The Tier 1 Solar set-aside¹² requirement increases from 0.35% in 2014, to 2.00% by 2020. This ramp up period for the solar carve-out will likely correspond with the implementation of the three-year pilot program on community solar energy generating facilities, which was established by the passage of Senate Bill 398 and House Bill 1087 and signed into law in May 2015. While the Commission has not yet promulgated regulations pertaining to the pilot program, there is a potential that SRECs generated by eligible community solar facilities could serve to offset the increasing Tier 1 Solar set-aside in the coming years.

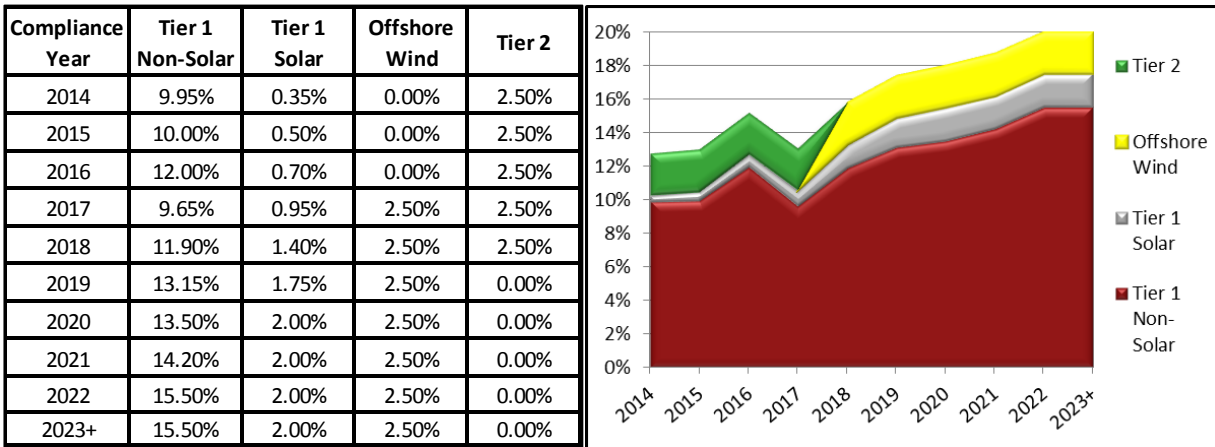
Beginning in 2017, a constant Tier 1 Offshore Wind set-aside of up to 2.5% begins as part of the Tier 1 portfolio.¹³ Maryland's Tier 2 requirement remains constant at 2.5% through compliance year 2018, after which time the Tier 2 obligation sunsets.

¹¹ Waste-to-energy was moved from Tier 2 to Tier 1 as a result of legislation (2011 Md. Laws, Ch. 519), which took effect October 1, 2011. This only affected RECs generated on or after October 1, 2011; RECs derived from waste-to-energy sources generated prior to the effective date of the legislation remain Tier 2 RECs.

¹² "Tier 1 Solar set-aside" refers to the set-aside (or carve-out) of Tier 1 for energy derived from qualified solar energy facilities. The Tier 1 Solar set-aside requirement applies to retail electricity sales in the State by electricity suppliers and is a sub-set of the Tier 1 standard.

¹³ The Maryland Offshore Wind Energy Act of 2013 (2013 Md. Laws, Ch. 003) established an offshore wind set-aside within the Tier 1 requirement. Beginning in 2017, Tier 1 may include a Commission-determined amount of offshore wind RECs, not to exceed 2.5%. The project must be generating RECs in order for the obligation to begin.

Table 2: Annual RPS Requirements by Tier



At certain renewable procurement cost thresholds, an electricity supplier can request the Commission to consider a delay in scheduled Tier 1 and Tier 1 Solar RPS percentages.¹⁴ To date, no such request has been made by electricity suppliers operating in the Maryland marketplace.

3. Maryland RPS Alternative Compliance Payment Requirements

Electricity suppliers who do not meet their RPS obligation through the retirement of eligible RECs must submit an ACP for every unit of shortfall. Table 3 presents the ACP schedule separated by tiers for each compliance year of the RPS Program moving forward.

Table 3: ACP Schedule (\$/MWh)

Compliance Year	Tier 1 Non-Solar	Tier 1 Solar	Tier 2	IPL ¹⁵ Tier 1
2014	\$40	\$400	\$15	\$3
2015	\$40	\$350	\$15	\$2.50
2016	\$40	\$350	\$15	\$2.50
2017	\$40	\$200	\$15	\$2
2018	\$40	\$200	\$15	\$2
2019	\$40	\$150		\$2
2020	\$40	\$150		\$2
2021	\$40	\$100		\$2
2022	\$40	\$100		\$2
2023 +	\$40	\$50		\$2

¹⁴ PUA § 7-705(e)-(f).

¹⁵ Industrial Process Load (“IPL”) means the consumption of electricity by a manufacturing process at an establishment classified in the manufacturing sector under the North American Industry Classification System. Under PUA § 7-705(b)(2) and COMAR 20.61.01.06.E(5), a supplier sale for IPL is required to meet the entire Tier 1 obligation for electricity sales, including solar. However, the ACP for an IPL Tier 1 non-solar shortfall and a Tier 1 Solar shortfall is the same. For IPL, there is no ACP for Tier 2 shortfalls.

ACPs are remitted to the Maryland Strategic Energy Investment Fund as dedicated funds to provide for loans and grants that spur the creation of new Tier 1 renewable energy resources.¹⁶ As outlined by statute, compliance fees may only be used to support the creation of new Tier 1 renewable energy resources in the State; the use of ACPs remitted to satisfy the Tier 1 Solar RPS obligation are further restricted to support the creation of new *solar* energy resources in Maryland.¹⁷

II. ELECTRICITY SUPPLIER COMPLIANCE REPORTS

Calendar year 2014 marked the ninth compliance year for the Maryland RPS, and the seventh year for electricity suppliers to comply with the Tier 1 Solar set-aside. The RPS compliance reports submitted to the Commission by electricity suppliers, along with information obtained from GATS, provide information regarding the retired RECs and the underlying REFs (e.g., type and location of generators) utilized by electricity suppliers to comply with Maryland RPS obligations.¹⁸ RPS compliance reports were filed by 88 electricity suppliers, including: 66 competitive retail suppliers; 11 brokers or competitive electricity suppliers with zero retail electricity sales; and 11 electric companies, of which 4 are investor-owned utilities.¹⁹

According to the filed compliance reports, there were approximately 61.0 million MWh of total retail electricity sales in Maryland for 2014 (down from 62.2 million MWh in 2013); 60.8 million MWh of retail electricity sales were subject to RPS compliance, and 1.1 million MWh were exempt.²⁰ Maryland electricity suppliers retired 7.8 million RECs in 2014, which was slightly more than the calculated obligation for the year and higher than the 6.5 million RECs retired in 2013. The total cost of RECs retired in 2014 totaled \$104.0 million, up from \$56.9 million in 2013.

Table 4 displays the average cost per REC retired in each tier since 2008. The rise in Tier 1 and Tier 2 REC prices likely reflects the growing need for new renewable generation to meet the regional RPS requirements; for the first several years of the program, the RPS

¹⁶ As a special, non-lapsing fund, the SEIF is also the depository of revenues generated through the sale of carbon allowances under the Regional Greenhouse Gas Initiative, the first market-based regulatory program in the United States to reduce greenhouse gas emissions.

¹⁷ State Gov't § 9-20B-05(i).

¹⁸ According to PUA § 7-709, a REC can be diminished or extinguished before the expiration of three years by: the electricity supplier that received the credit; a nonaffiliated entity of the electricity supplier that purchased or otherwise received the transferred credit; or demonstrated noncompliance by the generating facility with the requirements of PUA § 7-704(f). In the PJM region, the regional term of art is "retirement," which describes the process of removing a REC from circulation by the REC owner, *i.e.*, the owner "diminishes or extinguishes the REC." PJM-EIS, *GATS Operating Rules* (Sept. 30, 2010) at 54-56.

¹⁹ The number of filed compliance reports increased between calendar years 2013 and 2014, which is primarily attributable to an increased number of compliance reports submitted by competitive retail suppliers.

²⁰ According to PUA § 7-703(a)(2), exceptions for the RPS requirement may include: IPL which exceeds 300,000,000 kWh by a single customer in a year; regions where residential customer rates are subject to a freeze or cap (*see* PUA § 7-505); or electric cooperatives under a purchase agreement that existed prior to October 1, 2004, until the expiration of the agreement. COMAR 20.61.01.06(D) exempts any sale of electricity that is marketed or otherwise represented to customers as renewable or having characteristics of a Tier 1 renewable source or Tier 2 renewable source.

requirements could largely be met with the output from existing renewable facilities. Conversely, the drop in SREC prices may be attributable to decreasing solar technology costs and an increasing number of solar facilities eligible to meet the SREC requirements as compared to when the solar carve-out was first initiated.

Table 4: Cost of RECs per Tier (2008 – 2014)

Tier	2008	2009	2010	2011	2012	2013	2014
Tier 1	\$0.94	\$0.96	\$0.99	\$2.02	\$3.19	\$6.70	\$11.64
Tier 1 Solar	\$345.45	\$345.28	\$328.57	\$278.26	\$201.92	\$159.71	\$144.06
Tier 2	\$0.56	\$0.43	\$0.38	\$0.45	\$0.44	\$1.81	\$1.81

As demonstrated by the table below, the aggregated cost of compliance with the Maryland RPS Program has increased since 2008 (the first year in which the Tier 1 Solar carve-out applied). In the span of seven compliance years, the total cost of RECs has risen from approximately \$2 million in 2008 to almost \$104 million in 2014. The increased compliance costs are attributable to both an increasing RPS percentage requirement in-State, as well as a greater demand for RECs within the surrounding region.²¹

Table 5: Cost of RECs per Year

	Tier	2008	2009	2010	2011	2012	2013	2014
Total REC Costs	Tier 1	\$1,110,551	\$1,320,979	\$1,925,055	\$6,241,710	\$12,453,493	\$32,664,171	\$70,630,620
	Solar	\$78,418	\$1,125,598	\$5,076,720	\$7,769,279	\$11,346,967	\$21,417,989	\$29,372,737
	Tier 2	\$834,394	\$605,724	\$618,310	\$645,332	\$664,220	\$2,751,643	\$3,987,557
	Total	\$2,023,363	\$3,052,300	\$7,620,084	\$14,656,321	\$24,464,680	\$56,833,803	\$103,990,913
Total RECs Retired	Tier 1	1,184,174	1,280,946	1,931,367	3,083,141	3,902,221	4,871,586	6,062,135
	Solar	227	3,260	15,451	27,972	56,194	134,124	203,884
	Tier 2	1,500,414	1,509,270	1,622,751	1,565,945	1,522,297	1,526,789	1,521,022
	Total	2,684,815	2,793,476	3,569,569	4,677,058	5,480,712	6,532,499	7,787,041
RPS % Required	Tier 1	2.00%	2.00%	3.00%	4.95%	6.40%	7.95%	9.95%
	Solar	0.005%	0.010%	0.025%	0.050%	0.100%	0.250%	0.350%
	Tier 2	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
	Total	4.505%	4.510%	5.525%	7.50%	9.00%	10.70%	12.80%

Of the \$104 million of total RPS compliance costs in 2014, ACPs accounted for only \$65,965. While the reliance on ACPs increased slightly in 2014 (up from \$2,440 in 2013), this increase is due to a few small suppliers deciding to comply with their obligations solely via payment of the ACP instead of through the purchase of RECs. Despite this small uptick in 2014, the extent to which Maryland electricity suppliers have relied on ACPs to demonstrate compliance has decreased significantly since 2008.

²¹ In addition to Maryland, 7 other PJM states (DE, IL, MI, NJ, NC, OH, and PA) plus the District of Columbia have a RPS mandate outlined in statute, while an additional 3 PJM states (IN, VA, WV) have a voluntary RPS goal.

The trend of generally decreasing reliance on ACPs, even in light of escalating RPS obligations, is depicted in Table 6, which displays the breakdown of RECs submitted for each tier (MWh), the number of RECs retired in the year by tier (MWh), as well as the payments for the shortfalls in terms of the ACP amount required (\$ per MWh).²²

Table 6: Results of the RPS Compliance Reports

RPS Compliance Year		Tier 1 Non-Solar	Tier 1 Solar	Tier 2	Total
2006	RPS Obligation	520,073	-	1,300,201	1,820,274
	Retired RECs	552,874	-	1,322,069	1,874,943
	ACP Required	\$13,293	-	\$24,917	\$38,209
2007	RPS Obligation	553,612	-	1,384,029	1,937,641
	Retired RECs	553,374	-	1,382,874	1,936,248
	ACP Required	\$12,623	-	\$23,751	\$36,374
2008	RPS Obligation	1,183,439	2,934	1,479,305	2,665,678
	Retired RECs	1,184,174	227	1,500,414	2,684,815
	ACP Required	\$9,020	\$1,218,739	\$8,175	\$1,235,934
2009	RPS Obligation	1,228,521	6,125	1,535,655	2,770,301
	Retired RECs	1,280,946	3,260	1,509,270	2,793,475
	ACP Required	\$395	\$1,147,600	\$270	\$1,148,265
2010	RPS Obligation	1,922,070	15,985	1,601,723	3,539,778
	Retired RECs	1,931,367	15,451	1,622,751	3,569,569
	ACP Required	\$20	\$217,600	\$0	\$217,620
2011	RPS Obligation	3,079,851	28,037	1,553,942	4,661,830
	Retired RECs	3,083,141	27,972	1,565,945	4,677,058
	ACP Required	\$48,200	\$41,200	\$9,120	\$98,520
2012	RPS Obligation	3,901,558	56,130	1,522,179	5,479,867
	Retired RECs	3,902,221	56,194	1,522,297	5,480,712
	ACP Required	\$0	\$4,400	\$1,050	\$5,450
2013	RPS Obligation	4,858,404	133,713	1,521,981	6,514,098
	Retired RECs	4,871,586	134,124	1,526,789	6,532,499
	ACP Required	\$40	\$2,400	\$0	\$2,440
2014	RPS Obligation	6,062,635	203,827	1,520,966	7,787,428
	Retired RECs	6,062,135	203,884	1,521,022	7,787,041
	ACP Required	\$46,600	\$15,600	\$3,765	\$65,965

Note: Some electricity suppliers retired more RECs than required.

²² In Table 4, “RPS Obligation” represents the total obligation for electricity sales in MWh, which is equal to the number of RECs required for compliance. “Retired RECs” represents the actual number of RECs retired for RPS compliance in each corresponding compliance year. “ACP Required” represents the compliance payments owed, and is calculated by multiplying the difference between the RPS obligation and the actual retired RECs (*i.e.*, the shortfalls) by the applicable ACP.

RECs are valid to demonstrate RPS compliance for the calendar year in which they were generated and in the following two calendar years.²³ Figure 1 aggregates the Maryland RPS tiers on the basis of generation year. In 2014, 58.7% of the RECs retired for compliance were generated in 2014; 31.7% in 2013; and the balance (9.6%) in 2012.

Figure 1: RECs Retired in 2014 by Generation Year

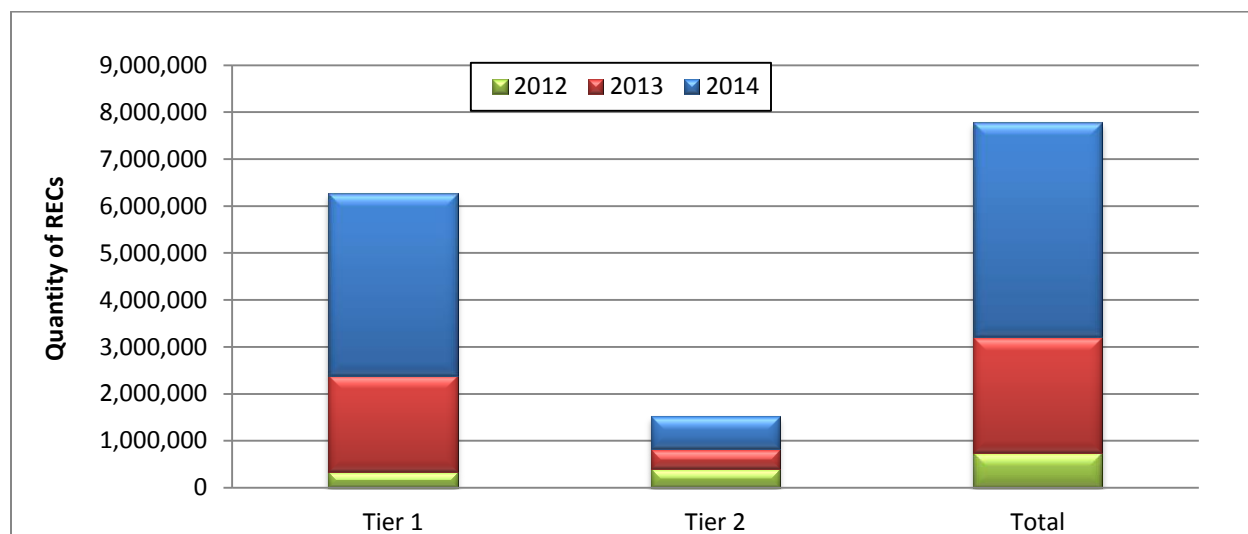
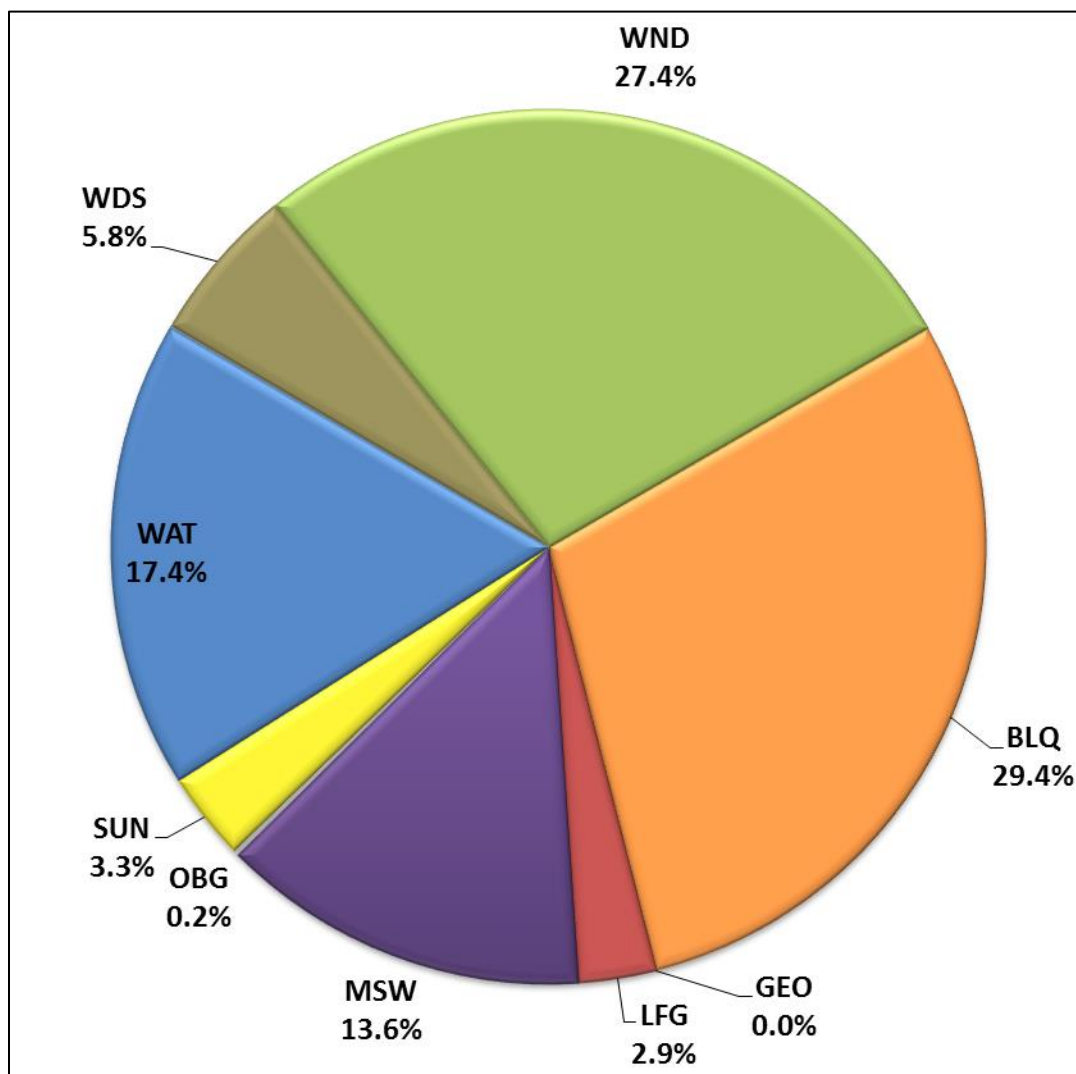


Figure 2 illustrates the fuel sources used to satisfy Tier 1 RPS requirements for the 2014 RPS compliance year. Of the Tier 1 RECs retired for 2014, the resources from which the RECs were sourced consisted primarily of black liquor, wind, and small hydroelectric plants. Although not pictured, Tier 2 RPS requirements for the 2014 RPS compliance year were satisfied exclusively by RECs derived from hydroelectric power.

²³ COMAR 20.61.03.01.C (unless the REC is diminished or extinguished before expiration).

Figure 2: 2014 Tier 1 and Tier 2 Retired RECs by Fuel Source²⁴

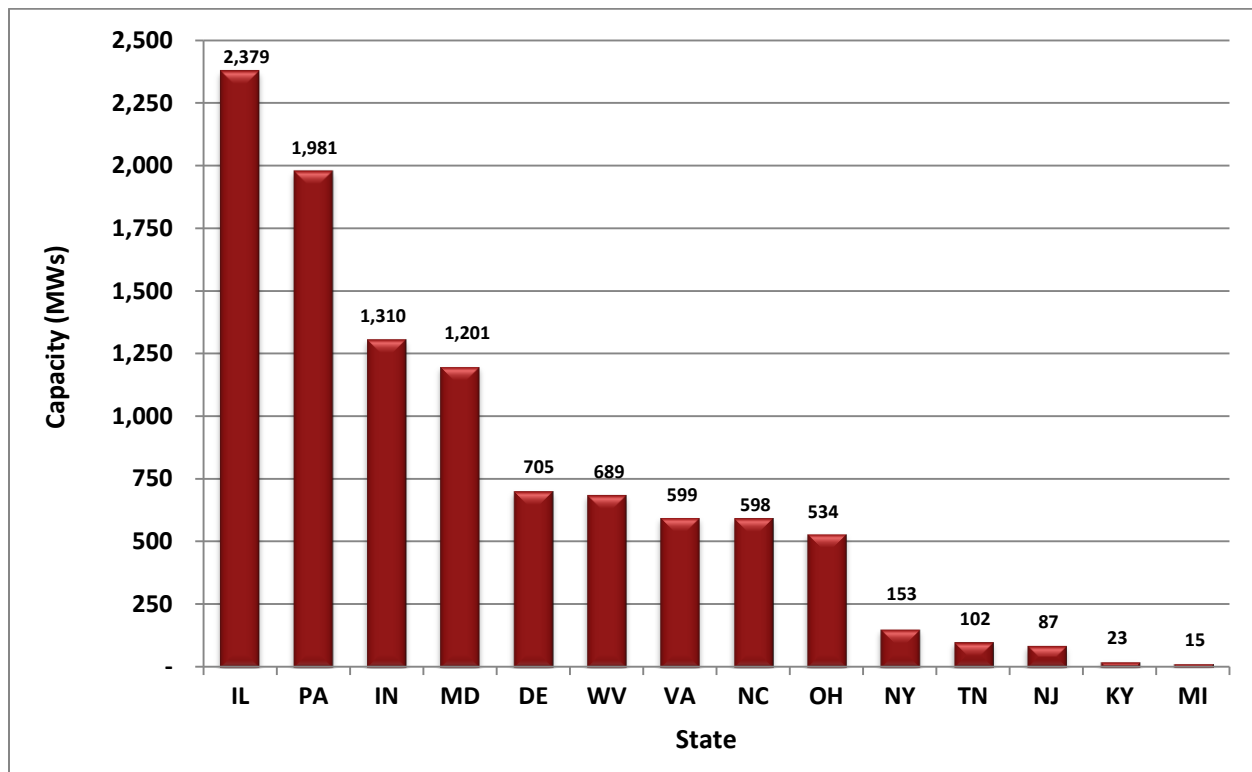


Abbreviations: BLQ, Black Liquor; GEO, Geothermal; LFG, Landfill Gas; MSW, Municipal Solid Waste; OBG, Other Biomass Gas; SUN, Solar; WAT, Small Hydroelectric; WDS, Wood and Waste Solids; and WND, Wind.

²⁴ WAT includes Tier 1 only; SUN includes PV and solar hot water.

Figure 3 presents the geographical location and the total generating capacity (10,376 MW, an increase from 9,317 MW in 2013) for all Maryland RPS-certified facilities regardless of Tier. RPS requirements also exist in the surrounding states, which generally support out-of-state and regional market participation. Of the renewable facilities that are eligible to participate in the Maryland RPS Program, 44.1% of the corresponding capacity is located in the Mid-Atlantic States. The locations of the remaining eligible resources span nine states and in total contribute the other 55.9% of the State's eligible renewable resource capacity.

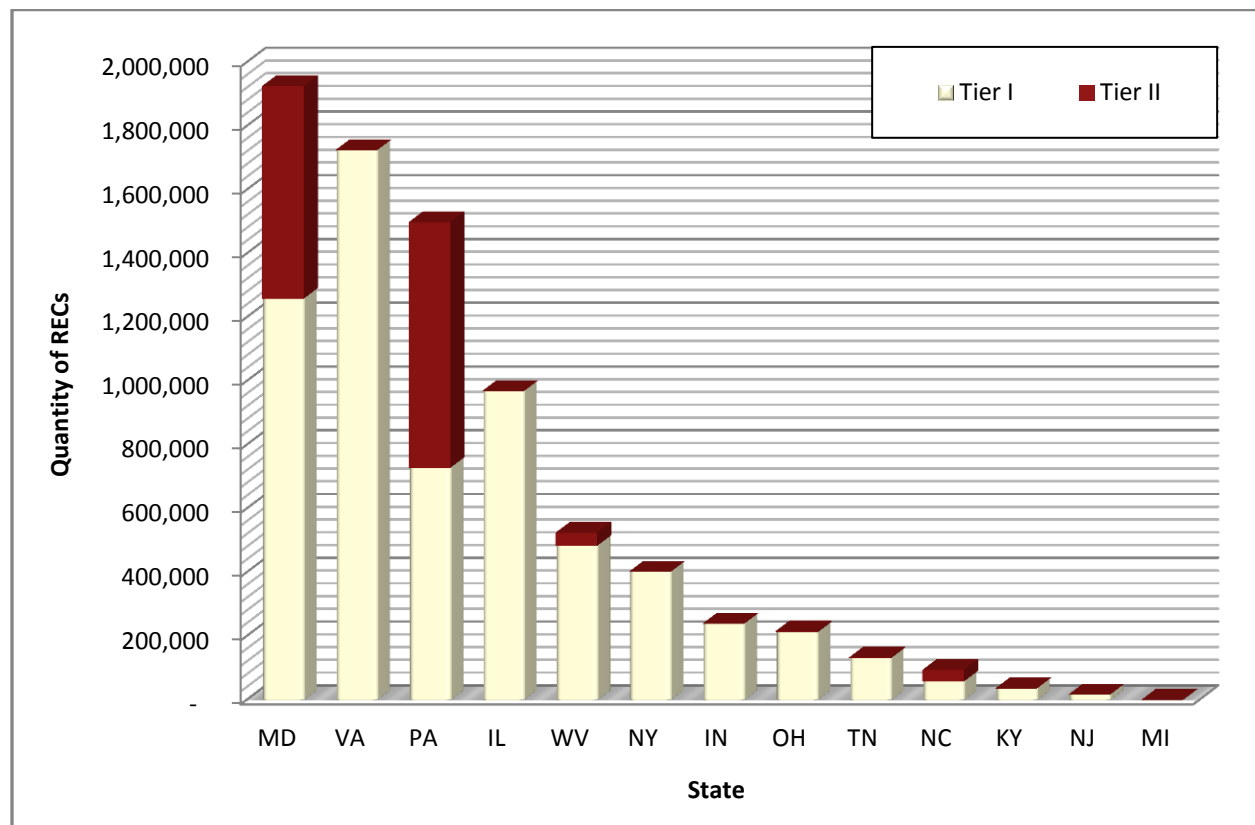
Figure 3: Total Rated Capacity by State²⁵



²⁵ PJM-EIS, Generation Attribute Tracking System, Database query, (June 11, 2015). The information in this figure does not include Commission-authorized REFs that have not established a REC account with PJM GATS.

For the 2014 compliance year, Figure 4 provides a visual display of aggregated REC data to convey general relationships among the States that contributed RECs in 2014. Maryland supplied the largest number of its own RECs purchased by retail electricity suppliers; with municipal solid waste (44.4%) and large hydroelectric (34.6%) contributing the majority of RECs from in-State generators. Virginia was the second highest source of RECs procured by Maryland electricity suppliers for 2014 compliance purposes, with Pennsylvania and Illinois also contributing a significant amount of RECs. The remaining 9 states contributed a total of 21.4% of all RECs retired in 2014.

Figure 4: Number of RECs Retired by Facility Location (2014)



Tables 7 and 8 provide the quantitative data in support of the previous figure. Table 7 provides the reported levels of RECs retired by Maryland electricity suppliers in 2014 on a Tier and aggregate basis, whereas Table 8 provides the information on a percentage basis. As noted above, Maryland-generated RECs, followed by Virginia and Pennsylvania, were used in the largest aggregate amounts by Maryland electricity suppliers for 2014 RPS compliance.

Table 7: 2014 REC Retirement by State

State*	Tier 1 Non-Solar	Tier 1 Solar	Tier 2	Total
MD	1,055,550	203,900	666,474	1,925,924
VA	1,725,125	-	-	1,725,125
PA	729,198	-	770,059	1,499,257
IL	969,395	-	-	969,395
WV	484,402	-	40,553	524,955
NY	402,480	-	-	402,480
IN	239,237	-	-	239,237
OH	212,469	-	4,121	216,590
TN	131,326	-	2,500	133,826
NC	58,523	-	36,014	94,537
KY	36,613	-	-	36,613
NJ	17,031	-	-	17,031
MI	837	-	-	837
Total	6,062,186	203,900	1,519,721	7,785,807

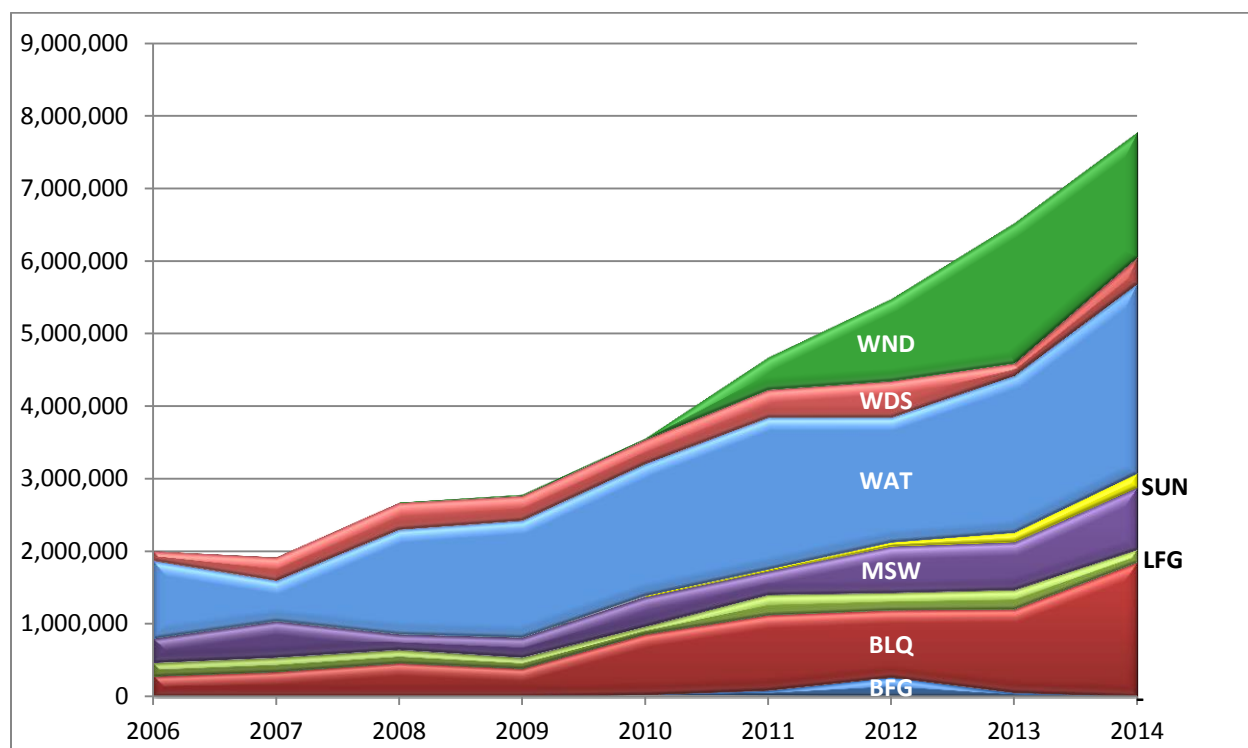
Table 8: 2014 REC Retirement by State (%)

State	Tier 1 Non-Solar	Tier 1 Solar	Tier 2	Total
MD	17.41%	100.00%	43.86%	24.74%
VA	28.46%	0.00%	0.00%	22.16%
PA	12.03%	0.00%	50.67%	19.26%
IL	15.99%	0.00%	0.00%	12.45%
WV	7.99%	0.00%	2.67%	6.74%
NY	6.64%	0.00%	0.00%	5.17%
IN	3.95%	0.00%	0.00%	3.07%
OH	3.50%	0.00%	0.27%	2.78%
TN	2.17%	0.00%	0.16%	1.72%
NC	0.97%	0.00%	2.37%	1.21%
KY	0.60%	0.00%	0.00%	0.47%
NJ	0.28%	0.00%	0.00%	0.22%
MI	0.01%	0.00%	0.00%	0.01%
Total	100.0%	100.0%	100.0%	100.0%

Additional information pertaining to the source of renewable energy used to meet Maryland’s 2014 RPS compliance requirements is presented in Appendices A and B. Appendix A provides a breakdown of the renewable resources used by electricity suppliers according to tier, fuel type, and facility location. Appendix B presents the number of facilities by state, tier, and type of renewable facility that provided REC’s for compliance with the 2014 RPS Program.

Figure 5 illustrates the growth in REC’s retired in total and by fuel type from the beginning of the RPS requirement in 2006. Large hydroelectric (“WAT”) has been the largest contributor in each of the nine years of the RPS, while wind (“WND”) has accounted for a significant portion of the increase since 2011. Note that the contributions from Geothermal, (“GEO”), Other Biomass Gas (“OBG”), and Solar Hot Water (“STH”) are too small to be seen on this chart.

Figure 5: REC’s Retired by Fuel Type, 2006 – 2014



Abbreviations: BFG = Blast Furnace Gas; BLQ = Black Liquor; LFG = Landfill Gas; MSW = Municipal Solid Waste; SUN = Solar Photovoltaic; WAT = Hydroelectric; WDS = Wood and Waste Solids; and WND = Wind.

In 2014, all of the REC’s retired from geothermal, solar, and municipal solid waste sources were located in Maryland, and all of the other biomass gas sources were located in Ohio. The five remaining fuels used to comply with Maryland’s 2014 RPS requirements came from multiple states. Figure 6 shows the percentage contribution from each state for each of these five fuels. Facilities located in Maryland provided a meaningful portion of hydroelectric and landfill gas REC’s retired for compliance in 2014. Conversely, Maryland resources provided less than 8% of black liquor REC’s and just 0.5% of the wind REC’s, and none of the REC’s derived from wood and waste solids. The total percentage of REC’s generated in Maryland and used toward

the State RPS obligation decreased in 2014, falling from 29.6% of the total RECs used for compliance in 2013, to 24.7% in 2014. However, the total quantity of RECs retired from in-State REFs in 2014 was largely unchanged.

Figure 6: Percentage of RECs by State for Each Fuel (2014)

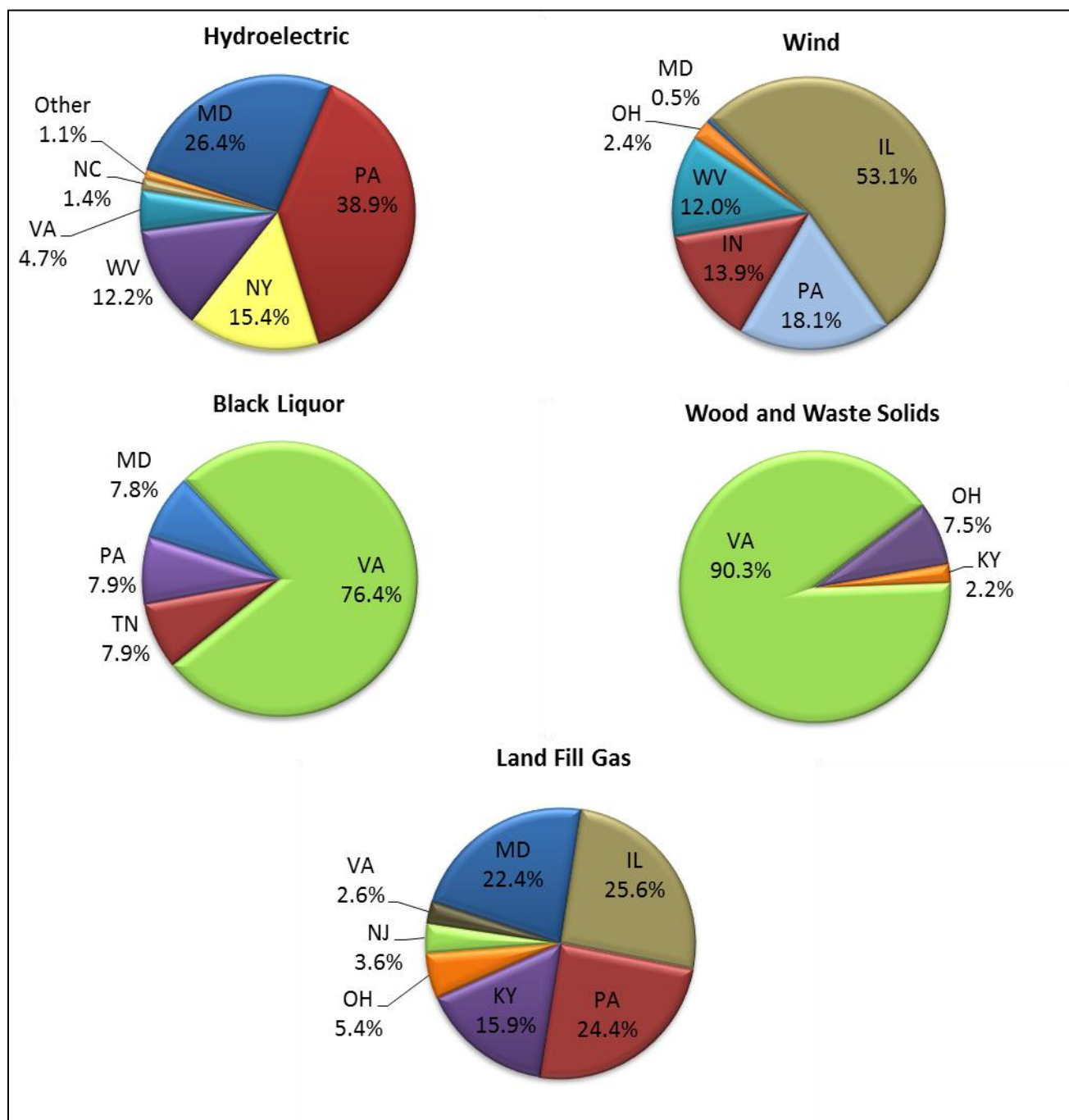
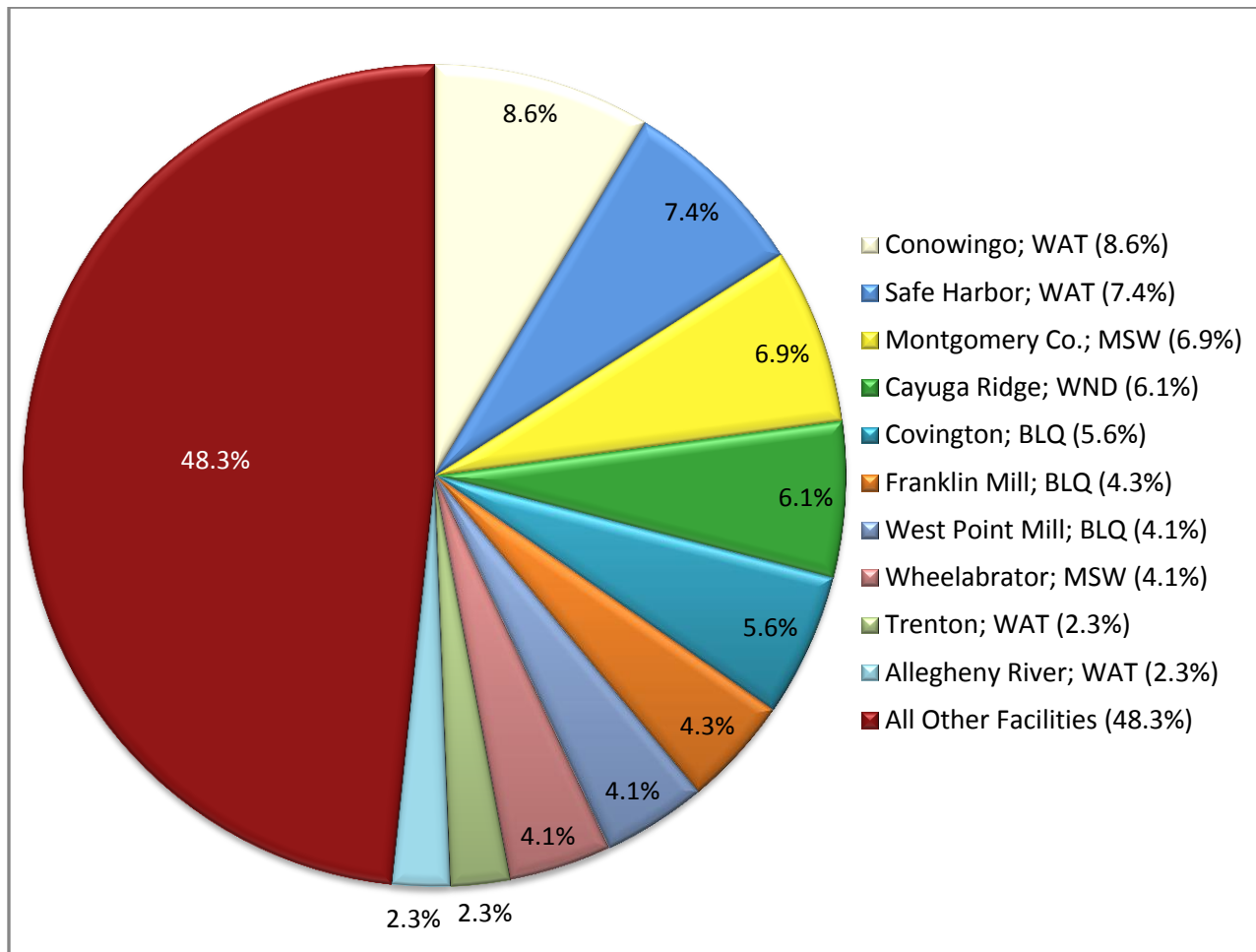


Figure 7 shows a list of those facilities that were major contributors of Maryland RECs retired in 2014, segregated by generation source and origin. The 10 facilities reflected in Figure 7 provided 51.7% of the RECs retired for 2014. The remaining 48.3% of RECs were provided by 144 non-solar facilities (45.7%) and 8,521 solar facilities (2.6%).

Figure 7: List of Significant REC Contributors (2014)



III. MARYLAND RENEWABLE ENERGY FACILITIES

The Maryland RPS Program requires electricity suppliers to obtain a minimum percentage of their power supply from renewable energy resources (*see* Table 2). Implementation of the Maryland RPS Program can provide an incentive for renewable generators to locate in Maryland and generate electricity. The renewable requirement establishes a market for renewable energy, and to the extent Maryland's geography and natural resources can be utilized to generate renewable electricity, developers may locate projects within the State. This section of the report provides information about the REFs located in Maryland in 2014.²⁶ Renewable energy generated in Maryland can be used in other states for RPS compliance purposes, and also can be sold in support of competitive retail electricity supplier product offerings (*i.e.*, green power products).²⁷ Green power products are offered to the public with higher concentrations of renewable energy than required by State RPS requirements.

As shown in Table 9, 1,496,781 Tier 1 RECs and 1,642,113 Tier 2 RECs were generated within Maryland in 2014, totaling 3,138,894 RECs. Additional analysis pertaining to the Maryland-based renewable generators is presented in Appendices C through E. Appendix C shows the distribution of RECs generated in Maryland in 2014. Appendix D provides the number of renewable energy facilities by county that are both located in Maryland, and registered with GATS to participate in any one of the PJM States' RPS programs. Appendix E provides the total capacity of these facilities, broken out by county and tier.

Table 9: 2014 Maryland Generated RECs by Fuel Source

Fuel Type	Tier I									Tier II	Grand Total
	BLQ	GEO	LFG	MSW	WAT	SUN	STH	WND	Total	WAT	
Quantity of RECs	113,508	283	96,336	700,539	23,755	239,279	2,701	320,380	1,496,781	1,642,113	3,138,894
Percentage	7.6%	0.0%	6.4%	46.8%	1.6%	16.0%	0.2%	21.4%	100.0%	100.0%	100.0%

Abbreviations: BLQ = Black Liquor; GEO = Geothermal; LFG = Landfill Gas; MSW = Municipal Solid Waste; STH = Solar Thermal; SUN = Photovoltaic; WAT = Hydroelectric; and WND = Wind.

²⁶ Specific information pertaining to the State's REFs as described herein was made available by PJM-EIS in the GATS State Agency Report.

²⁷ Facilities located in Maryland are not necessarily registered by the Commission for the Maryland RPS; rather, certain facilities may seek certification out-of-state in support of a long-term contract for the RECs from an out-of-state counterparty. Counterparties can include an electricity supplier operating in a different state and purchasing the RECs to satisfy the RPS requirement for another state or other entities, such as brokers that purchase the REC output for resale. PJM-EIS reported that as of June 2015, there are 14,043 registered renewable generators located in Maryland. Of the 14,043 generators, all but 15 are approved by the Commission for Maryland RPS compliance. The 15 facilities registered for use in other states include 13 solar PV or solar thermal facilities registered in the District of Columbia, Illinois, Pennsylvania and/or Virginia. The remaining two facilities are a landfill gas generator registered in New Jersey, and a wind facility registered in Illinois and Virginia.

Table 10 presents additional detail regarding the disposition of Maryland-generated RECs in calendar year 2014. Almost 58% of the RECs generated within Maryland by renewable facilities were held, or “banked,” for potential future sale in Maryland or other states in subsequent compliance years.²⁸ Over 42% of the RECs generated in Maryland were retired in 2014 to meet the RPS requirements in Maryland and various other PJM states. Labeled as “Other” in Table 10, just 0.2% of RECs were either: sold for other purposes; posted for sale; or pending transfer between two parties.

Table 10: Disposition of 2014 Maryland Generated RECs

	Banked	RPS Compliance	Other	Total
Tier 1	490,684	763,866	251	1,254,801
Tier 1 Solar	97,035	144,762	183	241,980
Tier 2	1,221,697	414,689	5,727	1,642,113
Total	1,809,416	1,323,317	6,161	3,138,894
(%)	57.6%	42.2%	0.2%	100.0%

Source: PJM-EIS.

²⁸ In part, banking provides an opportunity for generators and electricity suppliers to establish relationships in the renewable marketplace. The renewable marketplace is regional. As individual states first enacted legislation to support renewables (*e.g.*, RPS requirements), and then increased the percentage requirements and raised penalties for shortfalls, banking became an opportunity for market participants to employ regional strategies (*i.e.*, maximize revenues, minimize compliance costs).

Table 11 presents, on a state-by-state basis, the distribution of the RECs generated in the State of Maryland that were then retired for compliance purposes. In 2014, Maryland-generated RECs were used in five jurisdictions: the District of Columbia, Delaware, Maryland, New Jersey, and Pennsylvania.

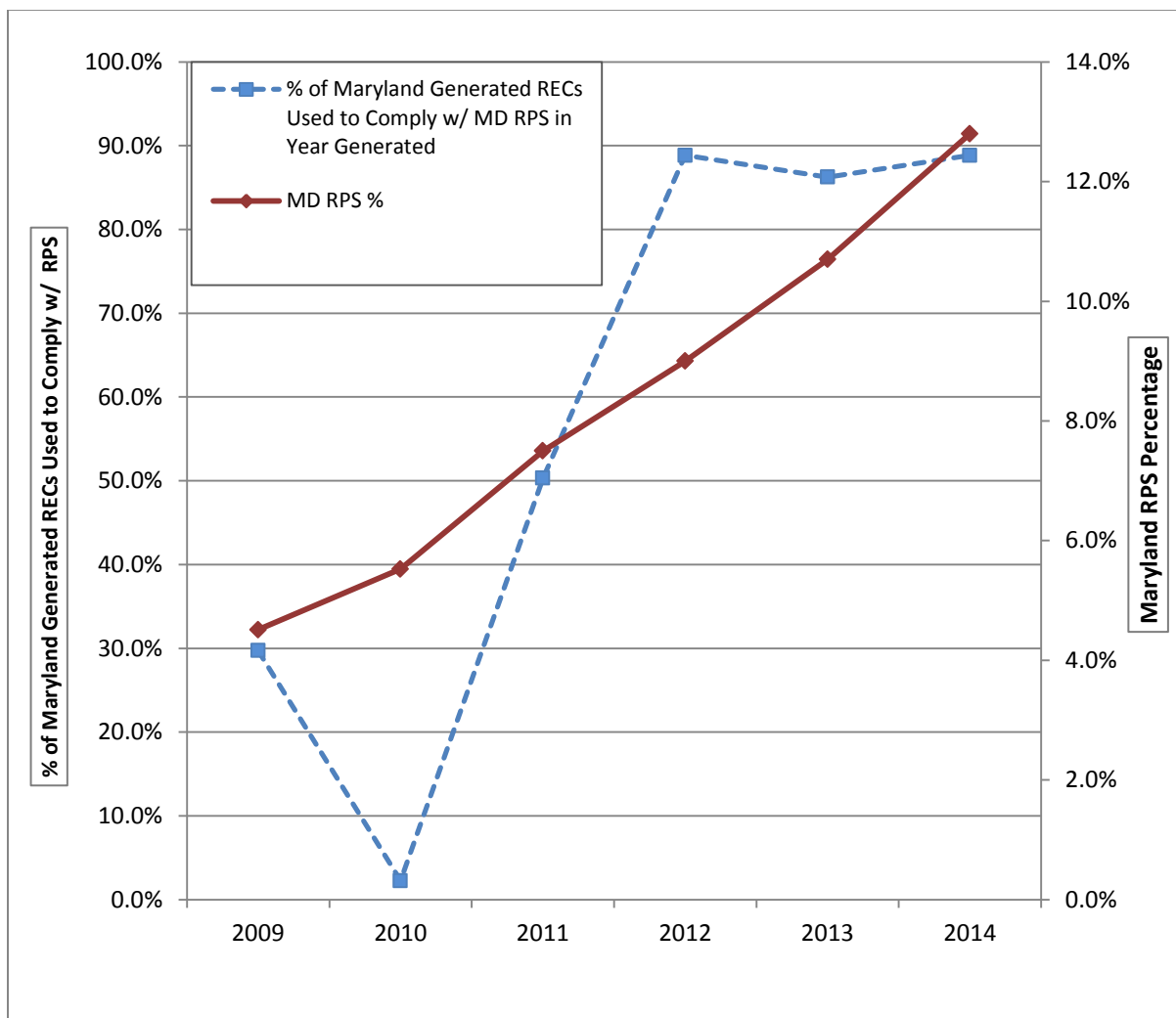
Table 11: 2014 Maryland Generated RECs Retired for RPS Compliance by State

	Fuel	DC	DE	MD	NJ	PA	TOTAL
Tier 1	Black Liquor	0	0	105,879	0	75	105,954
	Geothermal	0	0	82	0	0	82
	Land Fill Gas	0	0	15,825	531	1,267	17,623
	Municipal Solid Waste	0	0	534,401	0	0	534,401
	Small Hydro	0	0	21,703	0	0	21,703
	Solar PV	1,603	0	141,122	0	0	142,725
	Solar Thermal	0	0	2,037	0	0	2,037
	Wind	0	78,846	5,257	0	0	84,103
	Tier 1 Total	1,603	78,846	826,306	531	1,342	908,628
	Percentage	0.2%	8.7%	90.9%	0.1%	0.1%	100.0%
Tier 2	Large Hydro	21	0	349,457	65,211	0	414,689
	Tier 2 Total	21	0	349,457	65,211	0	414,689
	Percentage	0.0%	0.0%	84.3%	15.7%	0.0%	100.0%
Tiers 1 & 2	Grand Total	1,624	78,846	1,175,763	65,742	1,342	1,323,317
	Percentage	0.1%	6.0%	88.8%	5.0%	0.1%	100.0%

Source: PJM-EIS.

In 2014, 88.8% of Maryland-generated RECs retired for compliance purposes were retired in Maryland, a slight increase from 86.3% in 2013. However, in previous years a much lower percentage of Maryland-generated RECs were being used for compliance in Maryland; for example: 50.3% in 2011, to just 2.3% in 2010. Figure 8 below shows the percentage of Maryland-generated RECs retired in Maryland since 2009. The dip in 2009 – 2010 was due to significant banking of RECs, likely caused by an excess of REC supply. This excess was a result of low RPS requirements, and a corresponding large number of new facilities being registered in Maryland. The increase in Maryland's RPS requirements over time has resulted in an overall increase in Tier 1 REC prices since 2010; this increase is one factor driving the increased utilization of Maryland-generated RECs being used for compliance with Maryland's RPS.

Figure 8: RECs from Maryland Used to Comply with Maryland's RPS in the Year Generated



IV. CONCLUSION

The electricity supplier compliance reports of 2014, verified by the Commission, indicate that nearly all of the Maryland RPS obligations were met via the purchase and retirement of RECs. Almost a quarter of RECs used for compliance in 2014 came from in-State resources, with 80% of these RECs derived from two fuel types: hydroelectric and municipal solid waste.

REFs located in Maryland can register in multiple states to meet and comply with various policy objectives, and may sell additional RECs that support clean, green, or renewable products offered by electricity suppliers. Indeed, 42% of the RECs generated by in-State resources during calendar year 2014 were retired for compliance with various states' RPS. As depicted in Table 10 and Appendix C, a majority (57.6%) of these 2014 RECs generated by Maryland renewable resources were banked for future use.

The Commission will continue to: review applications from facilities requesting certification as a Maryland REF; oversee the RPS Program; and verify that the electricity suppliers in Maryland procure adequate renewable resources.

APPENDICES

Appendix A: 2014 Retired RECs by Facility

Tier 1*					
Facility Name	Resource	State	Quantity	WND %	Tier 1
AEP Blue Creek	WND	OH	27,173	1.58%	0.43%
AEP Fowler Ridge	WND	IN	49,832	2.90%	0.80%
AEP Meadow Lake	WND	IN	40,053	2.33%	0.64%
AEP Wildcat	WND	IN	35,651	2.07%	0.57%
Allegheny Ridge	WND	PA	57,512	3.35%	0.92%
AP Beech Ridge	WND	WV	45,788	2.66%	0.73%
AP Greenland Gap	WND	WV	32,847	1.91%	0.52%
AP Laurel Mountain	WND	WV	14,368	0.84%	0.23%
AP Pinnacle	WND	WV	113,749	6.62%	1.82%
AP Roth Rock	WND	MD	8,727	0.51%	0.14%
AP South Chestnut	WND	PA	338	0.02%	0.01%
AP Twin Ridges	WND	PA	6,644	0.39%	0.11%
Cayuga Ridge	WND	IL	476,647	27.72%	7.61%
COM Big Sky	WND	IL	115,500	6.72%	1.84%
COM Camp Grove	WND	IL	73,754	4.29%	1.18%
COM Eco Grove	WND	IL	25,000	1.45%	0.40%
COM Grand Ridge	WND	IL	66,753	3.88%	1.07%
COM High Trail	WND	IL	8,237	0.48%	0.13%
COM Minonk	WND	IL	44,812	2.61%	0.72%
COM Old Trail	WND	IL	30,713	1.79%	0.49%
COM Top Crop	WND	IL	24,505	1.43%	0.39%
Crescent Ridge	WND	IL	46,793	2.72%	0.75%
Fowler Ridge II	WND	IN	113,701	6.61%	1.81%
Haviland Wind	WND	OH	13,562	0.79%	0.22%
Klondike Rd Wind	WND	MD	183	0.01%	0.00%
Meyersdale Windpo	WND	PA	27,796	1.62%	0.44%
PL Locust Ridge	WND	PA	5,346	0.31%	0.09%
PN Highland	WND	PA	25,000	1.45%	0.40%
PN Lookout	WND	PA	7,967	0.46%	0.13%
PN Mehoopany	WND	PA	113,155	6.58%	1.81%
Stony Creek	WND	PA	67,174	3.91%	1.07%
Total			1,719,280	100.00%	27.44%
Facility Name	Resource	State	Quantity	BLQ %	Tier 1
AEP W Kingsport	BLQ	TN	131,326	7.13%	2.10%
Chillicothe	BLQ	OH	120,918	6.57%	1.93%
Covington	BLQ	VA	438,799	23.84%	7.00%
Franklin Mill	BLQ	VA	336,186	18.26%	5.37%
Hopewell Mill	BLQ	VA	147,921	8.04%	2.36%
Johnsonburg Mill	BLQ	PA	2,607	0.14%	0.04%
Kapstone	BLQ	NC	44,991	2.44%	0.72%
Kapstone Kraft	BLQ	NC	13,532	0.74%	0.22%
Luke Mill	BLQ	MD	130,022	7.06%	2.08%
MeadWestvaco	BLQ	VA	28,523	1.55%	0.46%
P.H. Glatfelter	BLQ	PA	15,207	0.83%	0.24%
Spring Grove	BLQ	PA	112,976	6.14%	1.80%
West Point Mill	BLQ	VA	317,812	17.26%	5.07%
Total			1,840,820	100.00%	29.38%
Facility Name	Resource	State	Quantity	MSW %	Tier 1
Harford Waste	MSW	MD	941	0.11%	0.02%
Montgomery County	MSW	MD	537,957	62.97%	8.59%
Wheelabrator	MSW	MD	315,378	36.92%	5.03%
Total			854,276	100.00%	13.63%

Tier 1*					
Facility Name	Resource	State	Quantity	WAT %	Tier 1
AEP Fries Hydro	WAT	VA	30,989	2.85%	0.49%
AEP Glen Ferris	WAT	WV	4,453	0.41%	0.07%
Allegheny 5 - 1	WAT	PA	18,223	1.67%	0.29%
Allegheny Lock	WAT	PA	18,518	1.70%	0.30%
Allegheny River Lock	WAT	PA	176,679	16.23%	2.82%
AP Misc Hydro	WAT	WV	22,218	2.04%	0.35%
Beardslee	WAT	NY	23,526	2.16%	0.38%
Beebee Island	WAT	NY	17,644	1.62%	0.28%
Big Shoals Hydro	WAT	VA	2,089	0.19%	0.03%
Black River	WAT	NY	13,815	1.27%	0.22%
Brasfield Hydroelect	WAT	VA	18,409	1.69%	0.29%
Coleman Falls Hydr	WAT	VA	6,654	0.61%	0.11%
Conemaugh Hydro	WAT	PA	29,982	2.75%	0.48%
Cushaw - 1	WAT	VA	12,328	1.13%	0.20%
Deep Creek	WAT	MD	21,703	1.99%	0.35%
Deferiet	WAT	NY	27,795	2.55%	0.44%
Dixon Hydroelectric	WAT	IL	3,829	0.35%	0.06%
E.J. West	WAT	NY	57,237	5.26%	0.91%
French Paper Co	WAT	MI	837	0.08%	0.01%
Granby	WAT	NY	17,341	1.59%	0.28%
Great Falls Hydro	WAT	NJ	10,616	0.98%	0.17%
Halifax Hydroelectri	WAT	VA	3,350	0.31%	0.05%
Holcomb Rock	WAT	VA	11,186	1.03%	0.18%
Inghams	WAT	NY	8,664	0.80%	0.14%
Lakeview Hydro	WAT	VA	1,289	0.12%	0.02%
London - 1	WAT	WV	76,148	7.00%	1.22%
Marmet - 1	WAT	WV	85,193	7.83%	1.36%
Niagara - 1	WAT	VA	6,046	0.56%	0.10%
Prospect	WAT	NY	41,129	3.78%	0.66%
Schoolfield	WAT	VA	7,179	0.66%	0.11%
Snowden Hydro	WAT	VA	16,173	1.49%	0.26%
Soft Maple	WAT	NY	14,797	1.36%	0.24%
Trenton	WAT	NY	180,532	16.59%	2.88%
Upper Sterling Hydr	WAT	IL	6,582	0.60%	0.11%
VP Emporia	WAT	VA	5,719	0.53%	0.09%
Winfield - 1	WAT	WV	89,638	8.23%	1.43%
Total			1,088,510	100.00%	17.37%
Facility Name	Resource	State	Quantity	GEO %	Tier 1
Florenzo -Geo	GEO	MD	74	58.73%	0.00%
Freeman geothermal	GEO	MD	20	15.87%	0.00%
Massey - Gladstone	GEO	MD	25	19.84%	0.00%
Sakakihara	GEO	MD	7	5.56%	0.00%
Total			126	100.00%	0.00%
Facility Name	Resource	State	Quantity	WDS %	Tier 1
Coshocton Mill	WDS	OH	27,422	7.51%	0.44%
Cox Waste	WDS	KY	7,958	2.18%	0.13%
Hopewell Mill	WDS	VA	21,223	5.81%	0.34%
MeadWestvaco	WDS	VA	43,958	12.04%	0.70%
Multitrade	WDS	VA	65,619	17.97%	1.05%
VP South Boston	WDS	VA	116,394	31.88%	1.86%
West Point Mill	WDS	VA	82,514	22.60%	1.32%
Total			365,088	100.00%	5.83%

Appendix A: 2014 Retired RECs by Tier and Resource (Cont'd)

Tier 1 (Cont'd)*					
Facility Name	Resource	State	Quantity	OBG %	Tier 1
AEP Zanesville	OBG	OH	331	2.44%	0.01%
Buckeye BioGas	OBG	OH	1,235	9.09%	0.02%
Central Ohio BioEner	OBG	OH	3,588	26.41%	0.06%
French Creek	OBG	OH	960	7.07%	0.02%
Haviland Energy	OBG	OH	3,125	23.01%	0.05%
Wooster Renewable	OBG	OH	3,905	28.75%	0.06%
Zanesville	OBG	OH	440	3.24%	0.01%
Total			13,584	100.00%	0.22%
Facility Name	Resource	State	Quantity	LFG %	Tier 1
AP Reichs Ford	LFG	MD	36	0.02%	0.00%
AP Upton	LFG	PA	360	0.20%	0.01%
Archbald Power	LFG	PA	31,559	17.48%	0.50%
Bavarian	LFG	KY	6,998	3.88%	0.11%
BC Millersville	LFG	MD	7,625	4.22%	0.12%
Beecher	LFG	IL	6,598	3.66%	0.11%
Broad Mountain	LFG	PA	2,699	1.50%	0.04%
BWWTP Co-Gen Plar	LFG	MD	11,704	6.48%	0.19%
CID - LFG Turbines	LFG	IL	3,945	2.19%	0.06%
City of Martinsville	LFG	VA	711	0.39%	0.01%
Des Plaines	LFG	IL	2,830	1.57%	0.05%
DPL NWLND PK	LFG	MD	1,691	0.94%	0.03%
FE Carbon Alum	LFG	OH	4,954	2.74%	0.08%
FE Erie County	LFG	OH	353	0.20%	0.01%
FE Geneva	LFG	OH	2,311	1.28%	0.04%
FE Mahoning	LFG	OH	2,192	1.21%	0.03%
Greene Valley	LFG	IL	4,954	2.74%	0.08%
Green Valley	LFG	KY	3,943	2.18%	0.06%
Hardin County	LFG	KY	5,287	2.93%	0.08%
Kankakee	LFG	IL	995	0.55%	0.02%
Lake Gas Recovery	LFG	IL	2,552	1.41%	0.04%
Lakeview Gas	LFG	PA	981	0.54%	0.02%
Laurel Ridge	LFG	KY	5,307	2.94%	0.08%
Mallard Lake	LFG	IL	7,680	4.25%	0.12%
O'brien Edgeboro	LFG	NJ	6,415	3.55%	0.10%
PE Pottstown	LFG	PA	1,576	0.87%	0.03%
PE SE Ches Co	LFG	PA	461	0.26%	0.01%
Pendleton County	LFG	KY	7,120	3.94%	0.11%
PEP GUDE	LFG	MD	1,742	0.97%	0.03%
PEP Oaks	LFG	MD	6,106	3.38%	0.10%
PEP Ritchie Brown	LFG	MD	6,574	3.64%	0.10%
PEP Ritchie PG	LFG	MD	5,035	2.79%	0.08%
Pine Grove	LFG	PA	546	0.30%	0.01%
PL Archbald	LFG	PA	3,472	1.92%	0.06%
Prairie View RDF	LFG	IL	6,907	3.83%	0.11%
Settlers Hill	LFG	IL	4,034	2.23%	0.06%
Tullytown	LFG	PA	2,420	1.34%	0.04%
VP Cheterf Landf	LFG	VA	1,680	0.93%	0.03%
VP King and Queen	LFG	VA	2,000	1.11%	0.03%
VP King George	LFG	VA	374	0.21%	0.01%
Westchester	LFG	VA	572	0.32%	0.01%
Woodland	LFG	IL	5,203	2.88%	0.08%
Total			180,502	100.00%	2.88%

Tier 2					
Facility Name	Resource	State	Quantity	WAT %	Tier 2
AEP Summerville	WAT	WV	6,102	0.40%	0.40%
Conowingo	WAT	MD	666,474	43.86%	43.86%
Covanta	WAT	WV	34,451	2.27%	2.27%
Gaston	WAT	NC	1,266	0.08%	0.08%
Lake Lynn	WAT	PA	149,541	9.84%	9.84%
Piney	WAT	PA	44,084	2.90%	2.90%
Racine	WAT	OH	4,121	0.27%	0.27%
Roanoke Rapids	WAT	NC	32,783	2.16%	2.16%
Safe Harbor	WAT	PA	576,434	37.93%	37.93%
XIC Calderwood	WAT	TN	2,500	0.16%	0.16%
XIC Cheoah	WAT	NC	1,965	0.13%	0.13%
Total			1,519,721	100.00%	100.00%
<div>Tier 1 REC Total6,062,186</div> <div>SREC Total203,900</div> <div>Tier 2 REC Total1,519,721</div> <div>Grand Total7,785,807</div>					
Resource Definitions					
Black Liquor	BLQ	Municipal Solid Waste		MSW	
Geothermal	GEO	Other Biomass Gas		OBG	
Landfill Gas	LFG	Wood/Waste Solids		WDS	
Hydroelectric	WAT	Wind		WND	
<div>*Solar facilities are not represented in this table. In 2014, 8,521 facilities produced 203,900 SRECs.</div>					

Appendix B: Location of Facilities which Provided RECs for 2014 RPS Compliance

	IL	IN	KY	MD	MI	NC	NJ	NY	OH	PA	TN	VA	WV	Total
<i>Tier 1</i>														
Black Liquor	-	-	-	1	-	1	-	-	1	2	1	4	-	10
Geothermal	-	-	-	4	-	-	-	-	-	-	-	-	-	4
Land Fill Gas	11	-	5	8	-	-	1	-	4	8	-	4	-	41
Municipal Solid Waste	-	-	-	3	-	-	-	-	-	-	-	-	-	3
Biomass Gas	-	-	-	-	-	-	-	-	6	-	-	-	-	6
Small Hydro	2	-	-	1	1	-	1	10	-	5	-	12	5	37
Solar (Photovoltaic)	-	-	-	7,864	-	-	-	-	-	-	-	-	-	7,864
Solar Thermal	-	-	-	654	-	-	-	-	-	-	-	-	-	654
Waste Wood	-	-	1	-	-	-	-	-	1	-	-	5	-	7
Wind	12	7	-	2	-	-	-	-	2	9	-	-	4	36
<i>Tier 2</i>														
Large Hydro	-	-	-	1	-	3	-	-	1	3	1	-	2	11
Total	25	7	6	8,538	1	4	2	10	15	27	2	25	11	8,673

Note: Municipal solid waste was moved from Tier 2 to Tier 1 effective October 1, 2011. In order to prevent double counting, only those facilities that provided just Tier 2 RECs are listed as Tier 2 facilities; the facilities that provided both are only listed as Tier 1.

Appendix C: Distribution of 2014 Vintage RECs Generated in Maryland

Fuel Type and Tier	RECs Retired for RPS Compliance by State						Banked	Other	Total RECs
	DC	DE	MD	NJ	PA	Total			
Black Liquor	0	0	105,879	0	75	105,954	7,554	0	113,508
Geothermal	0	0	82	0	0	82	201	0	283
Land Fill Gas	0	0	15,825	531	1,267	17,623	78,713	0	96,336
Municipal Solid Waste	0	0	534,401	0	0	534,401	165,887	251	700,539
Small Hydro	0	0	21,703	0	0	21,703	2,052	0	23,755
Solar PV	1,603	0	141,122	0	0	142,725	96,382	172	239,279
Solar Thermal	0	0	2,037	0	0	2,037	653	11	2,701
Wind	0	78,846	5,257	0	0	84,103	236,277	0	320,380
Tier 1 Total	1,603	78,846	826,306	531	1,342	908,628	587,719	434	1,496,781
Large Hydro	21	0	349,457	65,211	0	414,689	1,221,697	5,727	1,642,113
Tier 2 Total	21	0	349,457	65,211	0	414,689	1,221,697	5,727	1,642,113
Grand Total	1,624	78,846	1,175,763	65,742	1,342	1,323,317	1,809,416	6,161	3,138,894

Appendix D: Number of Renewable Energy Facilities Located in Maryland

Maryland County	Tier 1	Tier 1 Solar	Tier 2	Total
Allegany	1	21	-	22
Anne Arundel	4	1,669	-	1,673
Baltimore	3	1,227	-	1,230
Baltimore City	1	157	-	158
Calvert	-	212	-	212
Caroline	-	39	-	39
Carroll	-	595	-	595
Cecil	-	240	-	240
Charles	1	558	-	559
Dorchester	-	56	-	56
Frederick	2	821	-	823
Garrett	5	33	-	38
Harford	3	1,221	1	1,225
Howard	5	1,246	-	1,251
Kent	-	74	-	74
Montgomery	8	2,263	-	2,271
Prince George's	5	2,456	-	2,461
Queen Anne's	1	170	-	171
Somerset	-	41	-	41
St. Mary's	-	363	-	363
Talbot	2	78	-	80
Washington	1	209	-	210
Wicomico	3	137	-	140
Worcester	2	109	-	111
Grand Total	47	13,995	1	14,043

Note: This list includes all renewable generators that are both: 1) located within Maryland, and 2) registered to participate in any one of the PJM states' renewable energy programs as of June 11, 2015.

Appendix E: Capacity of Renewable Energy Facilities Located in Maryland (MW)

Maryland County	Tier 1	Tier 1 Solar	Tier 2	Total
Allegany	65.0	0.3	-	65.3
Anne Arundel	3.2	21.2	-	24.4
Baltimore	66.2	21.4	-	87.6
Baltimore City	0.1	5.8	-	5.9
Calvert	-	2.1	-	2.1
Caroline	-	3.4	-	3.4
Carroll	-	7.9	-	7.9
Cecil	-	10.2	-	10.2
Charles	0.0	13.1	-	13.1
Dorchester	-	1.5	-	1.5
Frederick	4.0	30.3	-	34.3
Garrett	180.0	0.1	-	180.1
Harford	1.3	15.9	474.0	491.1
Howard	1.1	13.7	-	14.8
Kent	-	8.1	-	8.1
Montgomery	81.7	25.0	-	106.7
Prince George's	13.4	31.4	-	44.8
Queen Anne's	0.0	5.6	-	5.7
Somerset	-	7.1	-	7.1
St. Mary's	-	4.5	-	4.5
Talbot	69.3	4.3	-	73.6
Washington	0.0	37.6	-	37.6
Wicomico	6.0	4.1	-	10.2
Worcester	2.0	2.2	-	4.2
Grand Total	493.3	276.8	474.0	1244.1

Note: This list includes all renewable generators that are both: 1) located within Maryland, and 2) registered to participate in any one of the PJM states' renewable energy programs as of June 11, 2015.