2013 Annual Report

Alternative Energy Portfolio Standards Act of 2004

Prepared by the
PA Public Utility Commission
in cooperation with the
PA Department of Environmental Protection

PENNSYLVANIA PUC PUBLIC UTILITY COMMISSION

pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION

2013 Annual Report
Alternative Energy Portfolio Standards Act of 2004

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EXECUTIVE SUMMARY

INTRODUCTION

The Alternative Energy Portfolio Standards Act of 2004 (AEPS) requires electric distribution companies (EDCs) and electric generation suppliers (EGSs) to supply 18 percent of electricity using alternative energy resources by 2021.[1] The percentage of Tier I, Tier II and solar photovoltaic (PV) alternative energy credits (AECs) that must be included in sales to retail customers gradually increases over this period.[2] The solar PV requirement is a component of the Tier I obligation and solar PV AECs are hereafter noted as solar AECs. EDCs and EGSs meet their AEPS requirements through the purchase of AECs in amounts corresponding to the percentage of electricity that is required from alternative energy sources. One AEC represents one megawatt hour (MWh) of electricity generated from a qualified alternative energy source and can be purchased separate from electricity.

Section 7(c) of the AEPS Act requires that the Pennsylvania Public Utility Commission (PUC) and the state Department of Environmental Protection (DEP) work cooperatively to monitor the performance of all aspects of the AEPS and prepare an annual report to the Chairman and Minority Chairman of the Senate Environmental Resources and Energy Committee and the Chairman and Minority Chairman of the House Environmental Resources and Energy Committee.

[1] *See generally* 73 P.S. § 1648.1 et seq.

[2] Tier I sources include solar photovoltaic and solar thermal energy, wind power, low-impact hydropower, geothermal energy, biologically derived methane gas, fuel cells, biomass energy (including generation located inside Pennsylvania from by-products of the pulping process and wood manufacturing process including bark, wood chips, sawdust and lignin in spent pulping liquors) and coal mine methane. Tier II sources include waste coal, distributed generation systems, demand-side management, large-scale hydropower, municipal solid waste, generation of electricity outside of Pennsylvania utilizing by-products of the pulping process and wood manufacturing process including bark, wood chips, sawdust and lignin in spent pulping liquors and integrated combined coal gasification technology.

OVERVIEW

For the 2013 reporting year (June 1, 2012 – May 31, 2013), all EDCs and EGSs complied with the AEPS requirements by retiring the required number of Tier I, Tier II, and Solar AECs needed to meet their obligations. Accordingly, no alternative compliance payments were required for this reporting year.

AECs retired by EDCs and EGSs for the 2013 reporting period originated from alternative energy resources located both inside and outside of Pennsylvania. Pennsylvania EDCs and EGSs are permitted to obtain AECs from within the entire PJM Interconnection, LLC (regional transmission organization) area. For the 2013 reporting year, 76 percent of solar AECs, 40 percent of Tier I and 62 percent of Tier II AECs originated from generation facilities located in Pennsylvania.

Recent analysis of proposed and existing resources indicates sufficient Tier I resources are available through the 2014 reporting year and Tier II through the 2021 reporting year. Sufficient solar PV capacity exists and is planned to meet AEPS obligations through the 2015 reporting year.

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

PURPOSE

Act 213 of 2004 was signed into law on November 30, 2004, establishing an alternative energy portfolio standard for Pennsylvania. The law took effect on February 28, 2005, and required that an annually increasing percentage of electricity sold to Pennsylvania retail customers by EDCs and EGSs should be derived from alternative energy resources.

The PUC is responsible for carrying out and enforcing the provisions of the law. DEP is charged with rendering determinations of resource eligibility and ensuring compliance with all environmental, health and safety laws and standards relevant to the law's implementation. The PUC and DEP are charged with monitoring compliance with the Act, the development of the alternative energy market and the costs of alternative energy, and to conduct an ongoing alternative energy planning assessment. The PUC and DEP are to report their findings and any recommendations for changes to the Act to the General Assembly via an annual report.

The law establishes a 15-year schedule for complying with its mandates. The percentage of Tier I, Tier II and solar PV alternative energy resources that must be included in sales to retail customers gradually increases over this period. Compliance is monitored for successive 12-month reporting periods that begin on each June 1 and conclude on the following May 31. The law provides for a true-up period, during which EDCs and EGSs may acquire any additional alternative energy credits needed for compliance, at the conclusion of each reporting period. This three-month true-up period runs from the conclusion of each reporting period until September 1 of the same calendar year. After the conclusion of the true-up period, the PUC verifies compliance and imposes alternative compliance payments (ACPs), as appropriate, after providing notice and an opportunity for hearings for affected parties.

On July 19, 2007, Act 35 of 2007 was signed into law. It amended Act 213 by changing the compliance schedule related to solar photovoltaic (PV) energy. Act 35 also amended other provisions of the law, including definitions for customer-generator and net metering. On December 20, 2008, a PUC rulemaking based on the Act 35 changes became effective.

The final rule provides clarification of the solar PV obligation and includes the revised 15-year schedule for solar PV requirements. The clarification for solar PV obligation affirms that the percentage requirement is a percentage of all retail sales and that the solar percentage is a part of the total Tier I obligation. Table 1 provides an overview of the AEPS percentage sales requirements with the revised solar PV schedule.

TABLE 1 – OVERVIEW OF AEPS PERCENTAGE SALES REQUIREMENTS

Year	Period	Tier I			Tier II
		Total	Solar PV	Non-Solar	
1	June 1, 2006 – May 31, 2007	1.50%	0.0013%	1.4987%	4.20%
2	June 1, 2007 – May 31, 2008	1.50%	0.0030%	1.4970%	4.20%
3	June 1, 2008 – May 31, 2009	2.00%	0.0063%	1.9937%	4.20%
4	June 1, 2009 – May 31, 2010	2.50%	0.0120%	2.4880%	4.20%
5	June 1, 2010 – May 31, 2011	3.00%	0.0203%	2.9797%	6.20%
6	June 1, 2011 – May 31, 2012	3.50%	0.0325%	3.4675%	6.20%
7	June 1, 2012 – May 31, 2013	4.00%	0.0510%	3.9490%	6.20%
8	June 1, 2013 – May 31, 2014	4.50%	0.0840%	4.4160%	6.20%
9	June 1, 2014 – May 31, 2015	5.00%	0.1440%	4.8560%	6.20%
10	June 1, 2015 – May 31, 2016	5.50%	0.2500%	5.2500%	8.20%
11	June 1, 2016 – May 31, 2017	6.00%	0.2933%	5.7067%	8.20%
12	June 1, 2017 – May 31, 2018	6.50%	0.3400%	6.1600%	8.20%
13	June 1, 2018 – May 31, 2019	7.00%	0.3900%	6.6100%	8.20%
14	June 1, 2019 – May 31,2020	7.50%	0.4433%	7.0567%	8.20%
15	June 1, 2020 – May 31, 2021	8.00%	0.5000%	7.5000%	10.00%

On October 15, 2008, Act 129 of 2008 was signed into law, which, among other things, included additional energy sources in the definition of Tier 1. To accommodate the newly added Tier I alternative energy sources, Act 129 directed the Commission, on a quarterly basis, to increase the percentage of Tier I requirements for EDCs and EGSs to reflect the amount of generation from the new resources added by the Act. On May 28, 2009, the

Commission approved a Final Order that established procedures to increase the non-solar PV Tier I percentage requirement on a quarterly basis to account for the new resources.

SECTION 2 STATUS OF COMPLIANCE

2013 COMPLIANCE SUMMARY

Table 2 provides a summary of compliance for all EDCs and EGSs subject to AEPS requirements during the 2013 reporting period. Included in Table 2 are the combined MWhs sold, the number of AECs reserved for compliance, the weighted average credit price for each of the tiers, the cost of purchased credits and the number of ACPs paid. An ACP is required for each AEC lacking when an EDC and/or EGS is deficient in meeting its compliance obligation. For 2013, no EDCs or EGSs were required to pay an ACP. The solar requirement is a percentage of retail sales and is included in the Tier I requirement. The Tier I requirement also is adjusted as required by Act 129.

The weighted average credit price reflected below is calculated using data for credits that have a known cost. Some credits that are retired to meet obligations are self-generated or purchased bundled with the electricity and a cost for those credits is not available. Therefore, dividing the cost of purchased credits by the number of credits reserved will not yield the weighted average credit price reflected in the table. The weighted average credit price is used to calculate the solar ACP. The solar ACP, as established in statute, is 200 percent of the sum of the weighted average credit price of solar AECs sold during the reporting year and the value of the value of out-of-state solar rebates. The statutorily established ACP for Tier I and Tier II is $45.

TABLE 2 2013 AEPS COMPLIANCE REPORT BY TIER

MWhs	Alternative Energy Requirement		Number of Credits Reserved	Weighted Average Credit Price	Cost of Purchased Credits	Alternative Compliance Payments
	Tier	Percent of Total Energy Sold				
144,026,130	Solar	0.0510	73,443	$109.23	$7,870,764.38	none
	I	4.0	5,690,801	$8.31	$44,790,766.05	none
	II	6.2	8,926,454	$0.22	$1,777,910.53	none
	Total	10.251	14,690,698	N/A	$54,439,440.96	none

For the 2013 reporting period, the base obligation for non-solar Tier I was 3.949 percent. The Tier I quarterly adjustment added quarterly increases of: 0.0031181 percent; 0.0036189 percent; 0.0040431 percent; and 0.0038825 percent respectively. This resulted in 3,206 AECs added to the 5,687,595 credits that were retired without the adjustment.

Table 3 presents the details of each EDC's compliance obligation and compliance status for reporting period 2013. The table presents 2013 reporting period data on the number of AECs retired by tier in the EDC territories. All EDCs and EGSs achieved compliance by retiring the requisite number of AECs. Several EGSs retired excess credits beyond the required AEPS obligation and the overage is evident in the table below. Because specific EGS sales information is considered proprietary, their numbers were combined and are shown with the appropriate EDC.

TABLE 3 2013 AEPS COMPLIANCE REPORT BY EDC SERVICE TERRITORY

Distribution Service Territory	Total Energy Sold (MWhs)	Alternative Energy Requirement	Credits Required	Credits Retired	Compliance Status
Citizens' Electric	166,537				
Solar		0.05%	85	85	In Compliance
Tier I (non-solar)		3.95%	6,582	6,582	In Compliance
Tier II		6.20%	10,325	10,325	In Compliance
Duquesne Light and EGSs	14,337,443				
Solar		0.05%	7,313	7,320	In Compliance
Tier I (non-solar)		3.95%	566,714	566,714	In Compliance
Tier II		6.20%	888,921	888,924	In Compliance
Met Ed and EGSs	13,960,927				
Solar		0.05%	7,106	7,106	In Compliance
Tier I (non-solar)		3.95%	550,889	550,889	In Compliance
Tier II		6.20%	864,115	864,117	In Compliance
PECO and EGSs	38,037,793				
Solar		0.05%	19,382	19,397	In Compliance
Tier I (non-solar)		3.95%	1,502,394	1,502,394	In Compliance
Tier II		6.20%	2,356,623	2,356,624	In Compliance
Penelec and EGSs	14,357,081				
Solar		0.05%	7,323	7,323	In Compliance
Tier I (non-solar)		3.95%	567,488	567,488	In Compliance
Tier II		6.20%	890,142	890,143	In Compliance
Penn Power and EGSs	4,532,521				

Distribution Service Territory	Total Energy Sold (MWhs)	Alternative Energy Requirement	Credits Required	Credits Retired	Compliance Status
Solar		0.05%	2,311	2,311	In Compliance
Tier I (non-solar)		3.95%	179,154	179,154	In Compliance
Tier II		6.20%	281,016	281,016	In Compliance
Pike County and EGSs	75,475				
Solar		0.05%	38	38	In Compliance
Tier I (non-solar)		3.95%	2,982	2,982	In Compliance
Tier II		6.20%	4,679	4,679	In Compliance
PPL and EGSs	37,318,995				
Solar		0.05%	19,026	19,029	In Compliance
Tier I (non-solar)		3.95%	1,475,084	1,475,084	In Compliance
Tier II		6.20%	2,313,778	2,313,778	In Compliance
UGI Electric and EGSs	1,004,751				
Solar		0.05%	512	512	In Compliance
Tier I (non-solar)		3.95%	39,715	39,715	In Compliance
Tier II		6.20%	62,295	62,295	In Compliance
Wellsboro Electric	124,219				
Solar		0.05%	63	63	In Compliance
Tier I (non-solar)		3.95%	4,910	4,910	In Compliance
Tier II		6.20%	7,702	7,702	In Compliance
West Penn Power and EGSs	20,110,388				
Solar		0.05%	10,255	10,259	In Compliance
Tier I (non-solar)		3.95%	794,889	794,889	In Compliance
Tier II		6.20%	1,246,844	1,246,851	In Compliance

During the 2013 reporting period, 11 EDCs and 88 EGSs had compliance obligations for the entire 12 month reporting period. Two EDCs, Citizens' and Wellsboro, did not have EGSs providing service in their territories for the 2013 reporting year. Many EGSs provide services in more than one EDC territory. When an EGS retires too few or too many AECs, the excess or deficiency is not always connected to a specific EDC service area.

Charts 1A and 1B, below, indicate alternative energy types that were retired to meet the Tier I and Tier II obligations for the 2013 reporting period. During the 2013 reporting period some of the Tier I obligation was met using solar credits as a Tier I resource. The amount of solar used as a Tier I resource was very small, accounting for only 0.03 percent of the Tier I credits.

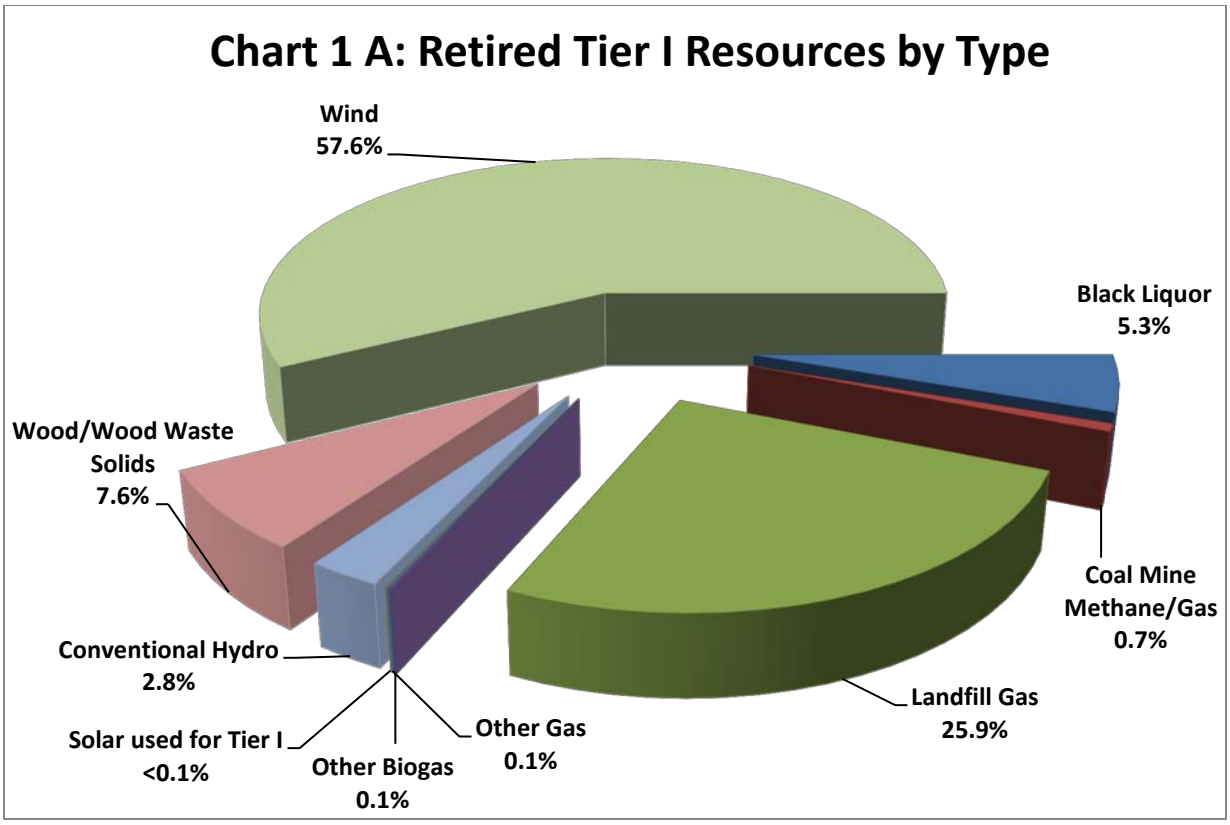


Chart 1 A: Retired Tier I Resources by Type
Wind
57.6%
Black Liquor
5.3%
Wood/Wood Waste
Solids
7.6%
Coal Mine
Methane/Gas
0.7%
Conventional Hydro
2.8%
Landfill Gas
25.9%
Solar used for Tier I
<0.1%
Other Biogas
0.1%
Other Gas
0.1%

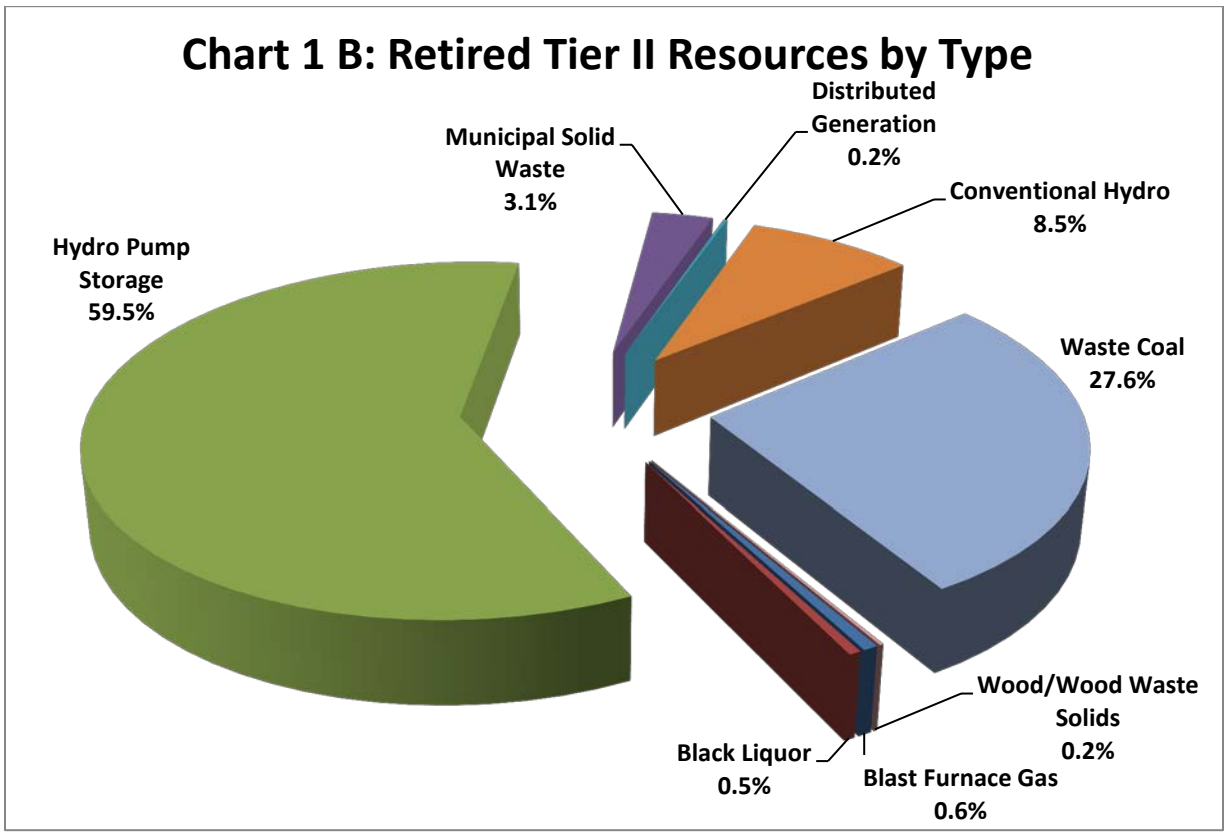
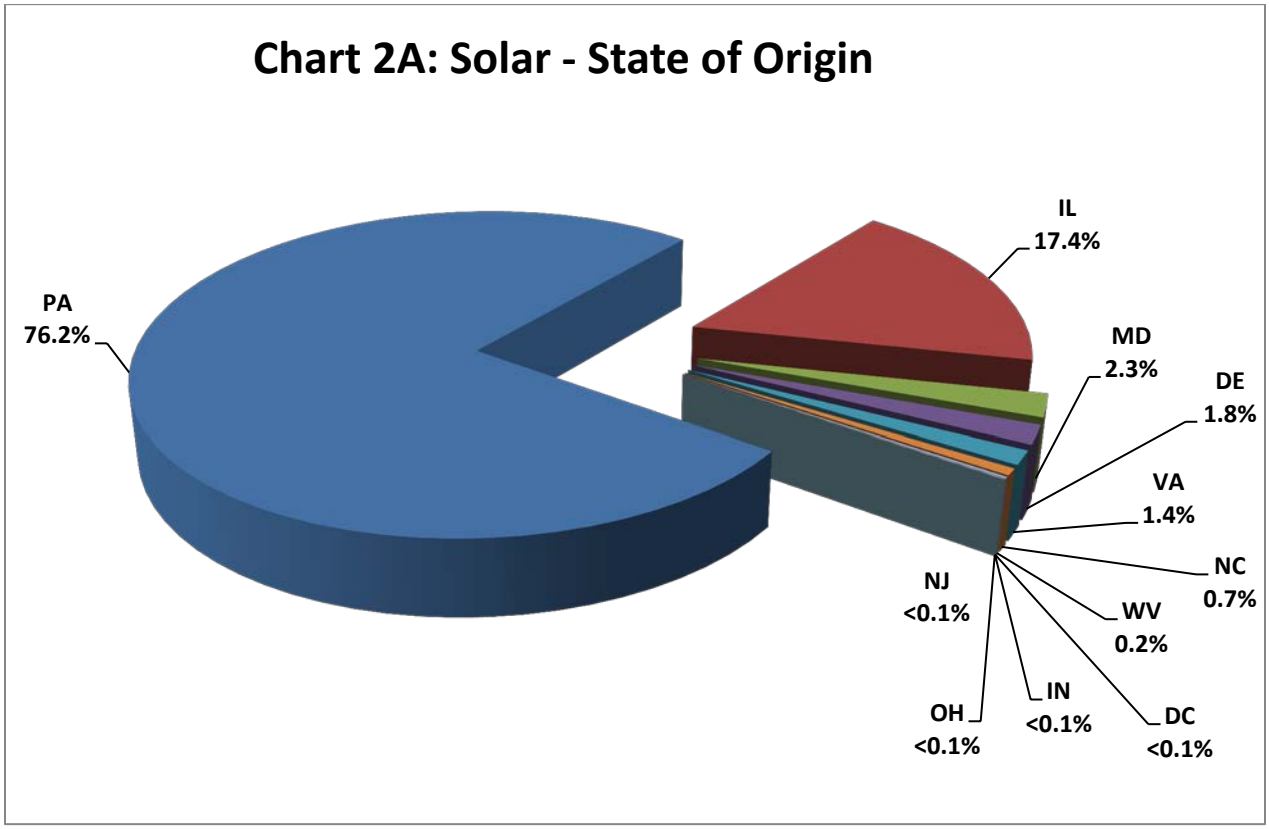


Chart 1 B: Retired Tier II Resources by Type
Distributed
Generation
0.2%
Municipal Solid
Waste
3.1%
Conventional Hydro
8.5%
Hydro Pump
Storage
59.5%
Waste Coal
27.6%
Wood/Wood Waste
Solids
0.2%
Black Liquor
0.5%
Blast Furnace Gas
0.6%

For the 2013 reporting period, 76.2 percent of solar AECs, 39.8 percent of Tier I and 61.6 percent of Tier II AECs retired by EDCs and EGSs originated from generation facilities located in Pennsylvania. Table 4 shows the state of origin for the AECS retired for AEPS compliance. This data is further illustrated in Charts 2A, 2B and 2C.

TABLE 4 AEC STATE OF ORIGIN

Tier	PA	NJ	DC	MD	VA	WV	IL	OH	DE	NC	IN
Solar	55,987	2	23	1,659	1,007	135	12,786	3	1,350	483	8
Tier I	2,262,435	20,937	0	101,289	543,220	272,060	2,018,834	46,296	79,130	0	346,600
Tier II	5,498,421	315,870	0	8,251	3,051,416	2,896	0	49,600	0	0	0
Total	**7,816,843**	**336,809**	**23**	**111,199**	**3,595,643**	**275,091**	**2,031,620**	**95,899**	**80,480**	**483**	**346,608**



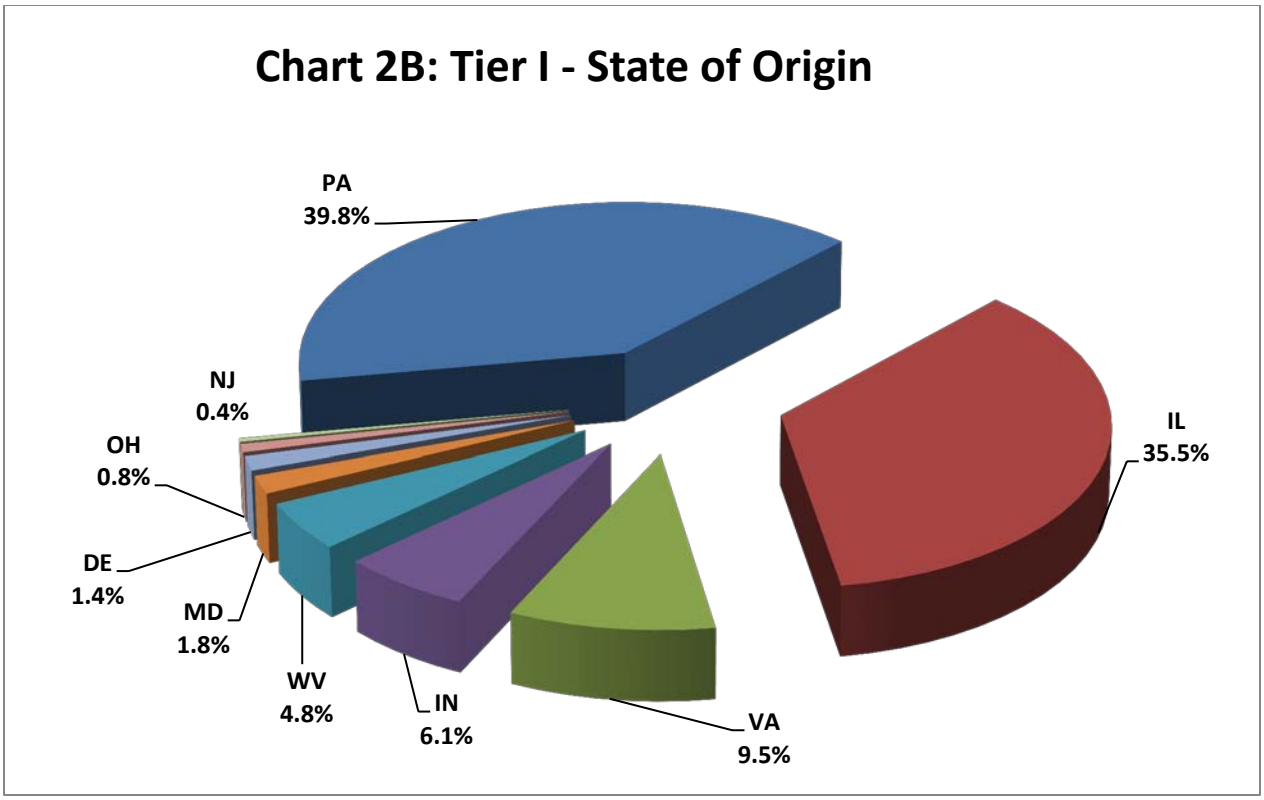


Chart 2B: Tier I - State of Origin
PA
39.8%
IL
35.5%
VA
9.5%
IN
6.1%
WV
4.8%
MD
1.8%
DE
1.4%
OH
0.8%
NJ
0.4%

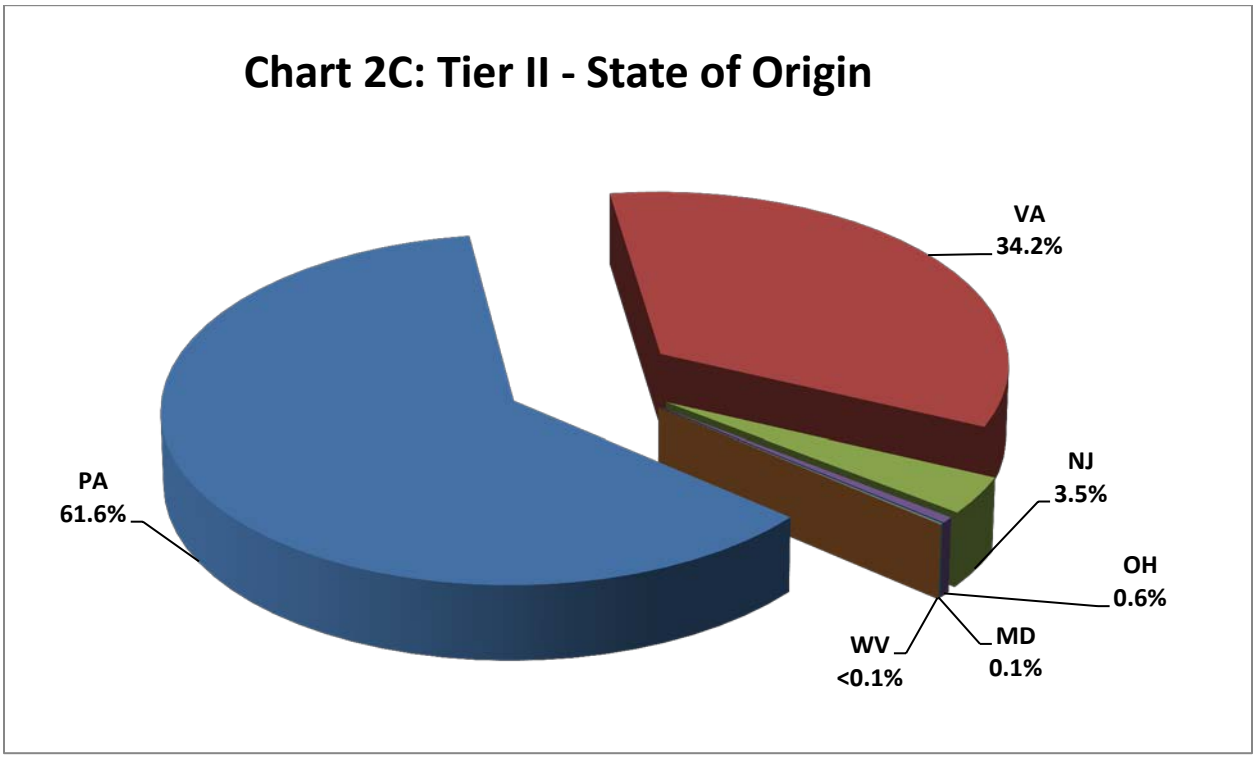


Chart 2C: Tier II - State of Origin
VA
34.2%
NJ
3.5%
OH
0.6%
MD
0.1%
WV
<0.1%
PA
61.6%

AEPS CERTIFICATES/CREDITS CREATED

Table 5 shows the number of AECs by tier and eligible for use in Pennsylvania, created in PJM-EIS[3] for reporting years 2005 through 2013. The data in Table 5 reveals a trend whereby the total number of AECs created has increased over time. While the number of solar and Tier I credits have shown an increase each year, the number of Tier II credits has fluctuated.

When comparing the number of credits created to the estimated number of credits needed in 2021, Table 5 shows that more Tier II credits were created in each year from 2006 through 2013 than will be needed in 2021. As described in more detail in Section 4 of this report, it is anticipated that Tier II credits will continue to be over-subscribed and that adequate Tier I credits exist through at least the 2014 reporting year.

AECs eligible for use in Pennsylvania may also be eligible to meet alternative energy requirements in other states. However, provisions are in place to ensure credits are used only once.

TABLE 5 CREDITS ELIGIBLE FOR USE IN PENNSYLVANIA AND ESTIMATED 2021 REQUIREMENTS

	Solar	Tier I	Tier II
2005	33	556,896	11,092,421
2006	132	1,941,184	29,559,094
2007	428	3,338,339	33,206,698
2008	933	4,931,730	32,391,332
2009	5,102	7,450,662	29,810,548
2010	19,988	9,394,472	31,675,042
2011	88,424	12,750,667	30,488,791
2012	226,356	14,991,180	29,247,832
2013	323,598	16,803,555	27,631,310
Estimated 2021 Requirement	808,718	12,130,776	16,174,368

STATUS OF CUSTOMER-GENERATOR INTERCONNECTIONS

PUC regulations for net metering and interconnection require EDCs to submit annual reports to the Commission on June 30. EDCs are required to review interconnection requests using one or more of four review procedures depending upon a proposed system's nameplate capacity and the type of interconnection.[4] The reports contain the number of customer-generators interconnected to the distribution system as well as the status of interconnection requests processed by the EDCs within the past year. The data on customer-generator interconnects is summarized below in Table 6.

[3] The PJM-EIS database is available at http://www.pjm-eis.com. Data as of July 8, 2014.
[4] 52 Pa. Code §75.34

Descriptions of the varying interconnection levels and other details can be found in the Net-Metering & Interconnection Report 2011 – 2013.[5] As of May 31, 2013, which marks the end of the 2013 program year, Pennsylvania's EDCs reported 7,595 Tier I and 12 Tier II customer-generators were interconnected to the distribution system. Those customer generators represented 186,344 kW of generation capacity. Solar PV accounted for 96 percent of the Tier I customer-generators and 92 percent of Tier I generation capacity.

Of the 7,607 customer-generators, the EDCs received 841 interconnection requests between June 1, 2012, and May 31, 2013. There were four denials. Approximately 200 requests were pending final decisions as of the end of the 2013 reporting period. The average time for EDCs to finalize an interconnection request was: Level 1 – six days; Level 2 – 11 days; Level 3 – 18 days; and Level 4 – 11 days.

TABLE 6 NUMBER OF CUSTOMER-GENERATORS INTERCONNECTED: 2011-2013

	Data as of May 31, 2011				Data as of May 31, 2012				Data as of May 31, 2013			
	Tier I				Tier I				Tier I			
	Total	Solar PV	Tier II	Total	Total	Solar PV	Tier II	Total	Total	Solar PV	Tier II	Total
Number of Customer Generators	4,435	4,201	7	4,442	6,953	6,667	18	6,971	7,595	7,327	12	7,607
Estimated Generation Capacity in kW	75,397	71,780	8,481	83,878	152,293	146,156	15,198	167,491	172,911	158,381	13,433	186,344

*Solar PV is a Tier I resource. The Solar PV column separately identifies the Solar PV component of Tier I.

[5] http://www.puc.pa.gov/Electric/pdf/AEPS/Net_Metering-Interconnection_Report_2011-13.pdf

SECTION 3 COSTS AND BENEFITS OF ALTERNATIVE ENERGY GENERATION

CURRENT ESTIMATED COSTS OF FUTURE ALTERNATIVE ENERGY GENERATION

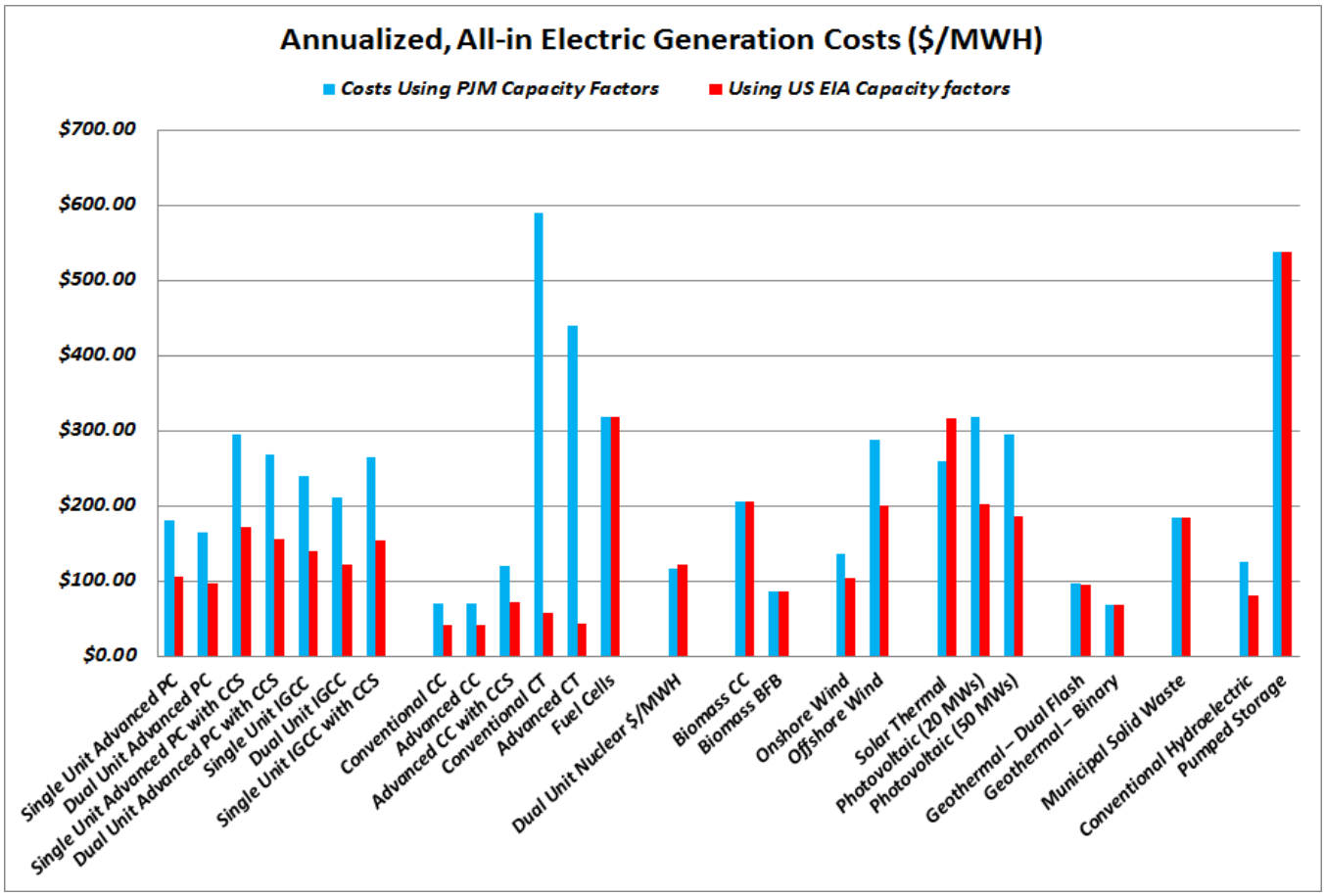
The Energy Information Administration (EIA) provided estimated cost data for the construction and operation of utility-scale generation plants that may be brought online in 2019.[6] It should be pointed out however, that most of the resources used to comply with the AEPS are smaller than utility-scale. The EIA data is used as the most consistently reliable information available. In using this data, 2019 was selected to account for the lead time needed by some technologies to be brought on line. EIA uses average data, including capacity factors, from across the country. For comparison, we have used average capacity factors in 2013 from PJM, as provided in the *2013 State of the Market Report for PJM.*[7] Graph 1 compares these levelized costs for differing generation technologies, using both EIA and PJM data, on a dollars per megawatt-hour ($/MWh) basis over an assumed financial life and duty cycle of the plant. Levelized cost components include, overnight capital costs, building and operation costs and an assumed utilization for each plant type. Operating costs include items such as fuel costs, maintenance, insurance and taxes and do not include state or federal incentives. EIA notes actual plant investment decisions are affected by the specific technological and regional characteristics of a project and levelized costs are a convenient summary measure of overall competiveness of generation technologies. Other considerations for plant investment include projected utilization rate and the existing resource mix in the region.[8]

[6] *See* EIA document titled *Levelized Cost of New Generation Resources in the Annual Energy Outlook 2014* from EIA *Annual Energy Outlook 2014 with Projections to 2040*, May 7, 20142013, DOE/EIA-0383(2014). Available at http://www.eia.gov/forecasts/aeo/index.cfm

[7] http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2013/2013-som-pjm-volume2-sec5.pdf

[8] *Id.*

GRAPH 1 ESTIMATED LEVELIZED COST OF NEW GENERATION RESOURCES



FUTURE ESTIMATED STATEWIDE AEPS COST OF COMPLIANCE

For analytical purposes, the Commission has estimated the statewide costs of AEPS compliance for 2021, the year of maturation for this standard. These cost projections are presented in 2013 dollars, using a 6 percent discount rate and projected AEC costs that increase 5 percent yearly. The projected total compliance costs will increase each year as the percentage requirements of alternative energy increase. As shown in Table 7 below, the estimated cost of AEPS compliance in 2021 is approximately $149.2 million. To put these figures in perspective, the average annual statewide expenditures on electric service total approximately $14.3 billion.[9] The cost estimates were broken down by the types of AECs, namely Solar, Tier I (non-solar) and Tier II. The AEC prices used in this analysis are based on

[9] *See* U.S. Energy Information Association – Electric Power Annual 2012 Dec. 2013, Table 2.9, http://www.eia.gov/electricity/annual/

historical pricing as reported by the AEPS Program Manager[10] as well as the results of EDC default service solicitations, with preferential weighting given to more recent solicitation results.

TABLE 7 ESTIMATED STATEWIDE AEPS COST OF COMPLIANCE

Projected 2021 AEPS Year Cost of Compliance in 2013 Dollars						
	Solar Credits		Tier I Credits		Tier II Credits	
EDC	Number of Required Credits	Cost with Credits Priced $60.00	Number of Required Credits	Cost with Credits Priced $9.00	Number of Required Credits	Cost with Credits Priced $0.20
Duquesne	73,324	$4,078,142	1,099,854	$9,175,820	1,466,472	$271,876
Met Ed	79,974	$4,448,046	1,199,615	$10,008,103	1,599,486	$296,536
Penelec	94,031	$5,229,862	1,410,466	$11,767,189	1,880,622	$348,657
Penn Power	26,762	$1,488,457	401,429	$3,349,029	535,239	$99,230
PECO	202,798	$11,279,299	3,041,968	$25,378,423	4,055,957	$751,953
PPL	206,732	$11,498,100	3,100,978	$25,870,726	4,134,637	$766,540
UGI	5,369	$298,588	80,528	$671,824	107,370	$19,906
West Penn	117,840	$6,554,054	1,767,594	$14,746,621	2,356,792	$436,937
Citizens'	884	$49,155	13,257	$110,598	17,676	$3,277
Pike	408	$22,719	6,127	$51,117	8,169	$1,515
Wellsboro	597	$33,226	8,961	$74,758	11,948	$2,215
Aggregate	808,718	$44,979,648	12,130,776	$101,204,208	16,174,368	$2,998,643

RENEWABLE ENERGY ECONOMIC BENEFITS - JOBS, EXPORTS, WAGES

The AEPS was largely enacted to provide economic development opportunities associated with broadening the portfolio of electricity generation in Pennsylvania. Since its inception, the AEPS has resulted in sustaining and creating thousands of jobs and business ventures associated with all aspects of renewable and alternative energy generation.

In 2013, 16 MW of solar-electric generating capacity was installed in Pennsylvania and certified to earn AECs. These installations at private residences, businesses and institutions resulted in $171 million of investments that help sustain the 2,900 person workforce from 428 companies involved in manufacturing, sales, distribution and installation of solar power components and systems in Pennsylvania[11]. These companies include all aspects of the value chain including manufacturing, sales, installation and support services.

[10] *See* AEPS Program Manager- http://paaeps.com/credit/pricing.do
[11] The Solar Foundation. Data as of November 2013.

Similarly, the American Wind Energy Association (AWEA) reports the total number of direct and indirect jobs, supporting the wind industry in 2013 in Pennsylvania, was in excess of 1,000, ranking the Commonwealth 11th in the nation. Twenty-eight in-state manufacturing facilities contributed to many of the aforementioned jobs. The Spanish wind energy giant, Gamesa, operates its North American sales and manufacturing operations out of Pennsylvania. Additionally, wind farms employ hundreds of people with each wind farm typically requiring a small, permanent crew of up to 15 people to oversee the maintenance and continued operation of the turbines. The total capital investment in Pennsylvania associated with wind power development is nearly $3 billion. Annual school tax, property tax and landowner lease payments from wind farm developments in Pennsylvania exceeded $3.6 million in 2013.[12]

The hydropower industry is impressively well represented in Pennsylvania with two of the world's largest turbine manufacturers, Voith Hydro and Weir American Hydro, located here. According to the National Hydropower Association, approximately 325 Pennsylvania businesses are part of the hydropower supply chain. The largest of these businesses is Voith Hydro whose York County manufacturing facility employs more than 550 people. While there has not been much hydropower development in the last decade in Pennsylvania, this trend is changing, in part because of efforts at the federal level to encourage private development at non-powered, federally-owned dams and to simplify federal licensing for low-impact projects. According to the Federal Energy Regulatory Commission website, there have been 10 new license applications and an additional 9 preliminary permit applications for conventional hydropower projects in Pennsylvania in the past two years.

Two studies completed by U.S. Department of Energy national laboratories point to the potential for small power generating opportunities as well as generation opportunities from existing infrastructure. Specifically, the Oak Ridge National Laboratory released a report in 2011[13] that estimates the potential for 12,600 MW of electric generating capacity by tapping into existing locks and dams on Pennsylvania waterways that currently have no generating capacity onsite. Additionally, the Idaho National Engineering and Environmental Laboratory released a report in 2004[14] estimating that Pennsylvania could develop 4,000 MW of hydroelectric generating capacity from low head/low power opportunities, defined as those with less than 30 feet of head and having less than 1 MW of generating capacity.

The Commonwealth continues to play an integral part in supporting and encouraging the investment in renewable and alternative energy projects that qualify for consideration under the AEPS. In program year 2013, DEP provided $3.4 million in rebate funding to residents and

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[12] American Wind Energy Association

[13] *An Assessment of Energy Potential at Non-Powered Dams in the United States, 2011* http://nhaap.ornl.gov/content/non-powered-dam-potential

[14] *Water Energy Resources of the United States with Emphasis on Low Head/Low Power Resources, 2004* http://hydropower.inel.gov/resourceassessment/index.shtml

small commercial customers under its Pennsylvania Sunshine (PA Sunshine) solar rebate program for the installation of 446 solar photovoltaic systems with an aggregate capacity totaling 5.5 MW. These Commonwealth funds stimulated the private investment of $16.6 million for a total investment in this industry sector of $20 million in 2013. 2013 was the final year of this highly successful program that also supported 678 companies and significantly more employees engaged in solar installations.

SECTION 4 STATUS OF PA'S ALTERNATIVE ENERGY PORTFOLIO STANDARDS MARKETPLACE

This section discusses renewable and alternative energy generation capacity both in Pennsylvania and in the PJM region. Specifically, this section compares the amount of renewable and alternative generation available and that which will be needed to meet future AEPS requirements.

RENEWABLE AND ALTERNATIVE ENERGY GENERATION CAPACITY IN PENNSYLVANIA AND PJM

The Pennsylvania AEPS website[15] maintains a summary of qualified generation facilities and qualified energy efficiency and demand-side management (EE/DSM) resources. There were 9,213 qualified generation facilities and 12 EE/DSM resources certified as of May 31, 2013. Of those qualified generation facilities, 6,989 facilities (76 percent) are located in Pennsylvania and 2,224 facilities are located outside of Pennsylvania.

Statistics for AEPS-registered generators, as of May 31, 2013, include:

- 9,213 certified generators
- 6,989 certified generators located in Pennsylvania
- 2,224 certified generators located outside of Pennsylvania
- 6,869 certified solar facilities in Pennsylvania with a capacity of 196.2 MW
- 2,063 certified solar facilities outside of Pennsylvania with a capacity of 112.5 MW

Table 8 summarizes the certified Alternative Energy Resources by type and the capacity of each type in and outside of Pennsylvania. Generator facilities using biomass are included within the Tier I Wood/Wood Waste Solids resource type.

TABLE 8 – AEPS EXISTING CAPACITIES IN PA AND IN PJM OUTSIDE OF PA

AEPS Tier	Alternative Energy Resource Types (s)	Nameplate Capacity of Facilities in PA (MWs)	Nameplate Capacity of Facilities Outside of PA (MWs)	Total Nameplate Capacity (MWs)
I	Black Liquor	54.0	0.0	54.0
I	Coal Mine Methane	0.8	88.0	88.8
I	Hydro	42.2	0.0	42.2
I	Landfill Gas	1,566.6	1,042.7	2,609.3
I	Other Biomass Gas	1.6	1.8	3.4
I	Other Gas	0.7	0.0	.7
I	Solar	196.2	112.5	308.7
I	Wind	1,304.6	4,200.5	5,505.1
I	Wood/Wood Waste Solids	18.0	827.1	845.1
I	Wood/Wood Waste Solids & Black Liquor	109.5	0.0	109.5

[15] http://paaeps.com/credit/

AEPS Tier	Alternative Energy Resource Types (s)	Nameplate Capacity of Facilities in PA (MWs)	Nameplate Capacity of Facilities Outside of PA (MWs)	Total Nameplate Capacity (MWs)
I	**TOTAL of Tier I**	**3,294.2**	**6,272.6**	**9,566.8**
II	Black Liquor	0.0	65.0	65.0
II	Blast Furnace Gas	0.0	67.0	67.0
II	Blast Furnace & Other Gases	52.5	0.0	52.5
II	Distributed Generation	5.0	0.0	5.0
II	Hydro	2,219.8	4,297.7	6,517.5
II	Municipal Solid Waste	252.4	464.2	716.6
II	Other Gases	31.0	0.0	31.0
II	Waste Coal	1,636.9	244.6	1,881.5
II	Waste Heat	5.0	0.0	5.0
II	Wood/Wood Waste Solids	12.5	0.0	12.5
II	Wood/Wood Waste Solids & Black Liquor*	0.0	438.9	438.9
II	**TOTAL of Tier II**	**4,215.1**	**5,577.4**	**9,792.5**
I & II	**TOTAL of Tiers I & II**	**7,509.3**	**11,850.0**	**19,359.3**

* Several facilities have the capability of generating electricity utilizing multiple fuel sources that include both Tier I and Tier II resource types, those facilities are accounted for as Tier II Wood/Wood Waste Solids & Black Liquor.

PJM manages grid interconnection requests in construction queues. Not all projects submitted to PJM for interconnection are constructed. Approximately 25 percent of the interconnection requests from 2005 to 2012 led to projects that were actually built.[16] Table 9 summarizes the renewable generation in the queue for Pennsylvania as of December 31, 2012.[17] Withdrawn projects and projects that are in service are not included.

TABLE 9 RENEWABLE GENERATION IN THE PJM CONSTRUCTION QUEUE FOR PENNSYLVANIA

Fuel Type	Name Plate MW
Wind	2,438
Solar	274
Biomass	18
Hydro	147
Landfill Gas	34
Total	2,911

AEPS allows Pennsylvania EDCs and EGSs to purchase AECs from the entire PJM region and not just those generated in Pennsylvania. PJM has substantial existing and proposed renewable generation capacity as detailed in Table 10.

[16] *See* PJM 2012 Regional Transmission Expansion Plan.
[17] *Id.*

TABLE 10 INSTALLED (AS OF 5/31/13) AND PROPOSED RENEWABLE CAPACITY IN PJM

Fuel Type	Installed Capacity Name Plate MW[18]	Proposed Capacity Name Plate MW[19]
Wind	7,159	27,118
Solar	1,359	2,646
Hydro	8,115	1,157
Landfill Gas	877	487
Total	17,510	31,408

PJM states with renewable portfolio standards include Pennsylvania, Michigan, Ohio, North Carolina, Illinois, Delaware, District of Columbia, Maryland, West Virginia, and New Jersey. Virginia, and Indiana have RPS goals and Tennessee and Kentucky do not yet have a final RPS. In states with RPS requirements, the final requirements range from 10 percent of retail sales of electricity in North Carolina and Ohio to 25 percent in Illinois, Delaware and West Virginia by 2025.

The RPS requirements of the PJM states and the District of Columbia vary considerably regarding generation resources eligible to meet the requirements. Differences are found in the types of renewable and/or alternative energy generation resources that qualify. Some states allow resources that are not permitted by other states. Also, some states use credit multipliers for certain generation resources, allowing certain resources to earn double or triple the amount of credits per MWh of generation. Generation facility location is another matter where the states differ. Some states require acceptable generation facilities to be located within that state. Other states allow resources originating from the whole of PJM and others allow resources outside of PJM to qualify. Also, within some states, EDCs, EGSs and municipal utilities have different requirements under their RPS.

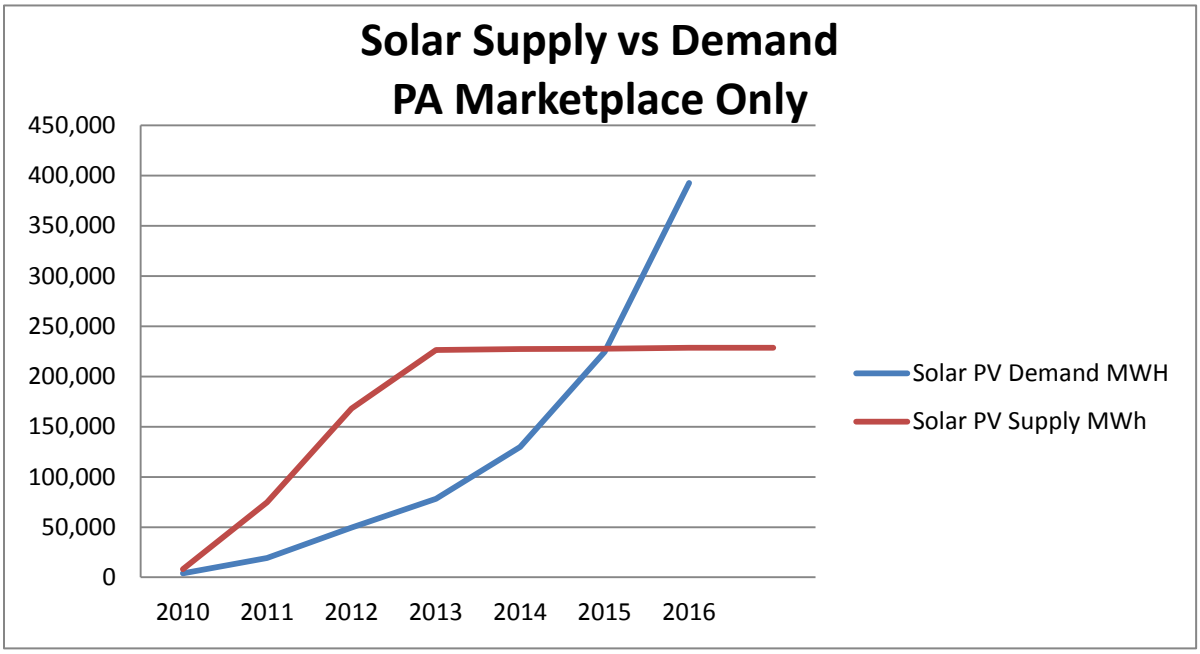
The AEPS Marketplace for Pennsylvania is quite complex due to numerous factors which must be considered, such as those previously referenced. To meet the RPS requirements, EDCs and EGSs can purchase AECs from sources outside of Pennsylvania but within the PJM region. Based on existing resources within PJM, staff estimates that adequate Tier I resources exist into 2014 and Tier II supply through 2021.

Graph 2 indicates sufficient solar PV supply is likely to exist for Pennsylvania from PV generation within Pennsylvania through 2015. This includes the existing 196 MWs of Pennsylvania sited solar PV and the Pennsylvania sited solar PV in the PJM construction queues. The data is based on the assumption that 25 percent of what is in the PJM queues is actually constructed. The PJM queue does not include planned solar projects beyond 2017

[18] *See* 2012 State of the Market Report for PJM, Detailed Analysis, Volume II, Monitoring Analytics, LLC., 2013.
[19] *See* PJM 2012 Regional Transmission Expansion Plan, 2013.

and consequently limits the scope of the graph. The PJM queue is also not a good indicator of future solar PV installations, since many installations are small, behind the meter systems, which are not tracked in the PJM queues.

GRAPH 2 SOLAR MARKET PLACE IN PA ONLY



Note: Solar PV supply in Graph 2 includes existing supply and 25 percent of the new capacity in the PJM construction queues and does not account for small, behind the meter systems.

Projected solar demand for Pennsylvania is summarized in Table 11. Please note that a capacity factor[20] of 12 percent was used for this table.

TABLE 11 SOLAR DEMAND FOR PENNSYLVANIA AND INSTALLED CAPACITY

Year	Generation Requirement (MWh)	Estimated Needed Capacity (MW)	Capacity Installed in Pennsylvania
2010	3,961.0	3.8	7.7
2011	19,247.0	18.3	71.0
2012	46,492.0	44.2	160.2
2013	73,443.0	69.9	196.2
2014	128,293.2	122.0	

[20] The relative percentage of time a generator actually produces electricity

Year	Generation Requirement (MWh)	Estimated Needed Capacity (MW)	Capacity Installed in Pennsylvania
2015	221,958.2	211.1	
2016	388,489.4	369.6	
2017	458,497.0	436.2	
2018	534,083.3	508.1	
2019	617,439.3	587.4	
2020	711,470.3	676.8	
2021	808,718.4	769.3	

SECTION 5 RECOMMENDATIONS FOR PROGRAM IMPROVEMENTS

ELIMINATION OF THE QUARTERLY ADJUSTMENT

In the 2010 Annual Report, the Commission recommended the elimination of the Act 129 quarterly adjustment applied to non-solar Tier I AEC obligations. As explained earlier, Act 129 of 2008 added additional energy sources in the definition of Tier I alternative energy sources. It also directed the Commission to increase the percentage of Tier I requirements for EDCs and EGSs to reflect the amount of generation from the new resources on a quarterly basis. On May 28, 2009, the Commission established the procedures to increase the non-solar PV Tier I percentage requirement quarterly.

The Commission recognizes and appreciates state Rep. Robert W. Godshall's effort in addressing this recommendation by introducing House Bill 208 on January 22, 2013 and House Bill 1962 in the previous legislative session. Though the Commission advocated for the passage of HB 208 the request to eliminate the quarterly adjustment is not continued. The administrative burden imposed by the quarterly adjustment has been greatly reduced for the program administrator through automation and has become standard procedure by EDCs and EGSs.

APPENDIX A BACKGROUND

ALTERNATIVE ENERGY CREDIT

One AEC represents one megawatt hour (MWh) of qualified alternative electric generation from within the PJM footprint, whether self-generated, purchased along with the electric commodity, or purchased separately through a tradable instrument. The AEC does not represent the purchase of renewable energy, only the confirmation of the generation of renewable energy. The generators are permitted to use generation on site or sell the energy by contract or participate in net metering if the facility is a customer-generator.

Generation output is confirmed by the PJM market settlement process or by metering of the generation system except for some small solar PV (<15 kW). AECs for solar PV systems that are not based on meter recordings of the generation output are calculated via the use of the National Renewable Energy Laboratory's (NREL's) PVWatts™ software to determine the energy production from the system. The PVWatts™ calculator works by creating hour-by-hour performance simulations that provide estimated monthly and annual energy production in kWh and energy value. Users can select a location and choose to use default values or their own system parameters for size, electric cost, array type, tilt angle and azimuth angle. In addition, the PVWatts™ calculator can provide hourly performance data for the selected location. There are two versions of PVWatts™ available. Pennsylvania uses Version 1 for the purposes of calculating estimates for solar generators participating in the PA AEPS program.

ALTERNATIVE ENERGY CREDITS REGISTRY

On January 27, 2006, the PUC designated PJM Environmental Information Services Inc.'s (PJM-EIS) Generation Attribute Tracking System (GATS) as the alternative energy credits registry.[21] GATS provides an unbundled, certificate-based tracking system for use by electricity suppliers and other energy market participants to comply with state policies and regulatory programs. The GATS database contains information about each megawatt hour of electricity generated, including megawatt hours produced, emissions data, fuel source, location, state program qualification and ownership of attributes. Each certificate is given a unique serial number for tracking purposes. Varying levels of information in the registry are available to EDCs, EGSs, state regulators and the public.

GATS is not an online trading platform where potential buyers can bid for and purchase AECs. The actual sale of alternative energy certificates or credits, and any of its associated attributes, such as the emissions' attributes associated with carbon dioxide, nitrogen oxides and sulfur dioxides, takes place outside of GATS between a buyer and seller. GATS simply records,

[21] www.pjm-eis.com

after the fact, the ownership transfer of certificates representing certain attributes between two GATS subscribers.

In April 2007, the PUC contracted with Clean Power Markets (CPM), a subsidiary of Enerwise Global Technologies,[22] to be the AEC Program Administrator in Pennsylvania. On June 3, 2010, the Commission entered into a new contract with the company until December 31, 2013, with the option for two one-year contract extensions. The Commission decided in July 2013, to exercise both one-year contract extensions to retain the services CPM until December 31, 2015. CPM verifies EGS and EDC compliance with requirements of the AEPS Act.

CPM works with DEP to administer the process of reviewing and qualifying alternative energy systems. CPM also tracks alternative energy credit prices, calculates ACP amounts, verifies data from behind–the-meter and energy efficiency/demand-side management, and confirms that the same alternative energy is not being claimed for compliance with another state's portfolio requirements. The company provides regular reports to the PUC and maintains a public website at http://paaeps.com.

NET METERING

The PUC regulations governing net metering for customer-generators became effective December 16, 2006, upon publication in the *Pennsylvania Bulletin*.[23] Net metering is defined as "the means of measuring the difference between the electricity supplied by an electric utility and the electricity generated by a customer-generator when any portion of the electricity generated by the alternative energy generating system is used to offset part or all of the customer-generator's requirements for electricity."[24] The net-metering requirements apply to EDCs that have customer-generators intending to pursue net-metering opportunities in accordance with the AEPS Act. EGSs may offer net metering to customer-generators under terms established in agreements between the EGS and the customer-generator taking service from the EGS.[25]

On July 17, 2007, Act 35 of 2007 was signed into law and amended a number of provisions of the AEPS Act, including the definition of net metering to include a restriction on virtual meter aggregation, described below as being within two miles.

VIRTUAL METER AGGREGATION

Virtual meter aggregation involves the combination of readings and billings for all meters, regardless of rate class, on properties owned or leased and operated by a single customer-generator, by means of the EDC's billing process, rather than through physical rewiring of the

[22] www.cleanpowermarkets.com, www.enerwise.com
[23] *See* 36 Pa.B. 7562 and 52 Pa. Code Ch. 75
[24] 73 P.S. §1648.2
[25] 52 Pa. Code § 75.13

customer-generator's property for a physical, single point of contact. Virtual meter aggregation on properties owned or leased, and operated by a customer-generator, shall be allowed for purposes of net metering. Virtual meter aggregation shall be limited to meters located within two miles of the customer-generator's property and within a single EDCs territory.

INTERCONNECTION STANDARDS

The PUC's regulations establishing interconnection standards for customer-generators became effective December 16, 2006.[26] The regulations promote onsite generation by customer-generators using alternative energy systems and eliminate barriers which may have previously existed regarding interconnection.

The interconnection regulations govern the process by which a customer-generator may interconnect onsite generation equipment to an electric utility's distribution lines. The regulations set forth specific levels of, and criteria for, review depending on the rated generation capacity of the generation equipment. The regulations also provide for a dispute resolution process to manage disputes which may arise during the interconnection process. The application forms and associated fees were not included in the regulations, but were developed through a stakeholder process. The Commission's Interconnection Standards Working Group developed a set of standard application forms for use by customer-generators that wish to interconnect to an EDC's distribution network.[27] The application forms cover Level 2 through Level 4 projects.[28]

Level 1 application reviews require a flat fee of $100 per application. Level 2 applications establish a base fee of $250 plus $1 per kW of nameplate capacity rating of the customer-generator's facility, plus other review costs that may not exceed $100 per hour. Level 3 applications specify a base fee of $350 plus $2 per kW of the nameplate capacity rating of the customer-generator's facility, plus other review costs that may not exceed $100 per hour. For a Level 4 application, when the Level 4 application is processed using the Level 1, Level 2 or Level 3 review process, the fees set forth for those particular review levels should apply. No fee shall be assessed for an area network impact study conducted under Section 75.40. A Level 4 application reviewed under Section 75.40(d) is subject to a base fee of $350 plus $2 per KW of nameplate capacity rating of the customer-generator's facility.

Act 35 amended a number of provisions of the AEPS Act, including revising the definition of "customer-generator" to increase the capacity limit on non-residential projects from 1 MW to 3 MW and from 2 MW to 5 MW for those projects that operate in parallel with the grid during emergencies or where a micro grid is in place for maintaining critical infrastructure.

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[26] *See* 36 Pa. 7574, and 52 Pa. Code Ch. 75

[27] 52 Pa. Code Sections 75.21-75.5

[28] On February 26, 2009, the forms were adopted by Commission Order and the associated application fees were adopted by Policy Statement. *See* 52 Pa. Code §§69.2101-69.2104.

CHRONOLOGY OF EVENTS

Table 2 provides a snapshot of the key chronology of events to date.

TABLE 2 CHRONOLOGY OF EVENTS

Event	Date
Act 213 of 2004	November 30, 2004
Act 213 of 2004 Effective Date	February 28, 2005
PUC Adopts Implementation Order I (M-00051865)	March 23, 2005
PUC Adopts Implementation Order II (M-00051865)	July 14, 2005
PUC Adopts Order: Standards for DSM Resources (M-00051865)	September 25, 2005
PUC Adopts Order: Designates PJM GATS Registry (M-00051865)	January 27, 2006
Final Net Metering/Interconnection Regulations in the *Pennsylvania Bulletin*	December 16, 2006
PUC Contracts with Clean Power Markets as Program Administrator	March 28, 2007
Compliance Required for Pennsylvania Power Co. & UGI Utilities Inc.	May 31, 2007
Act 35 of 2007	July 19, 2007
Compliance Required for Citizens' Electric Co., Duquesne Light Co., Pike County Light & Power, and Wellsboro Electric Co.	January 1, 2008
PUC Adopts Final Rulemaking Implementation Order (L-00060180)	September 25, 2008
Act 129 of 2008	October 15, 2008
Final Omitted Rulemaking Order (Net Metering) – Published in *PA Bulletin* (L-00050174)	November 29, 2008
PUC Adopts Act 129 Implementation Order – Relating to AEPS	May 28, 2009
Compliance Required for PPL Electric Utilities	January 1, 2010
PUC Adopts Solar Policy Statement	September 16, 2010
Compliance Required for PECO Energy Co., Pennsylvania Electric Co., Metropolitan Edison Co., and West Penn Power Co.	January 1, 2011
PUC Adopts Policy Statement, Net Metering – Use of Third Party Operators	March 29, 2012

APPENDIX B PUC ORDERS

Orders are available on the PUC Web site at www.puc.pa.gov, click Electricity, Alternative Energy. Information is also available at http://paaeps.com.

Implementation of the Alternative Energy Portfolio Standards Act of 2004 (Implementation Order I), PUC Docket No. M-00051865, PUC Public Meeting on March 23, 2005, entered March 25, 2005

Implementation of the Alternative Energy Portfolio Standards Act of 2004 (Implementation Order II), PUC Docket No. M-00051865, PUC Public Meeting on July 14, 2005, entered July 18, 2005

Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources, PUC Docket No. M-00051865, PUC Public Meeting on Sept. 29, 2005, entered Oct. 3, 2005.

Implementation of the Alternative Energy Portfolio Standards Act of 2004: Designation of the Alternative Energy Credits Registry, PUC Docket No. M-00051865, PUC Public Meeting on Jan. 27, 2006, entered Jan. 31, 2006.

Final Rulemaking regarding Net Metering for Customer-generators pursuant to Section 5 of the Alternative Energy Portfolio Standards Act, 73 P.S. §1648.5, Docket No. L-00050174, and Implementation of the Alternative Energy Portfolio Standards Act of 2004: Net Metering, Docket No. L-00050175, PUC Public Meeting on June 22, 2006, entered June 23, 2006.

Implementation of the Alternative Energy Portfolio Standards Act of 2004, Docket No. L-00060180, PUC Public Meeting on July 20, 2006, entered July 25, 2006.

Final Rulemaking regarding Interconnection Standards for Customer-generators pursuant to Section 5 of the Alternative Energy Portfolio Standards Act, 73 P.S. §1648.5, Docket No. L-00050175, and Implementation of the Alternative Energy Portfolio Standards Act of 2004: Interconnection Standards, Docket No. M-00051865, PUC Public Meeting on Sept. 15, 2006, entered Sept. 19, 2006.

Implementation of the Alternative Energy Portfolio Standards Act of 2004, Docket No. M-00051865, PUC Public Meeting on Nov. 30, 2006, entered Dec. 5, 2006.

Petition for Declaratory Order Regarding Ownership of Alternative Energy Credits Associated with Non-Utility Generating Facilities Under Contract to Pennsylvania Electric Company and Metropolitan Edison Company, Docket No. P-00052149, PUC Public Meeting on Dec. 21, 2006, entered Feb. 12, 2007.

Petition for Declaratory Order Regarding Ownership of Alternative Energy Credits Associated with Non-Utility Generating Facilities Under Contract to Pennsylvania Electric Company and Metropolitan Edison Company, Petition for Reconsideration of Viking Energy of Northumberland, Docket No. P-00052149, PUC Public Meeting on May 30, 2007, entered May 31, 2007.

Implementation of Act 35 of 2007; Net Metering and Interconnection, Docket No. L-00050174, PUC Public Meeting on May 22, 2008, entered July 2, 2008.

Implementation of the Alternative Energy Portfolio Standards Act of 2004, Docket No. L-00060180, PUC Public Meeting on Sept. 25, 2008, entered Sept. 29, 2008.

Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standard Interconnection Application Forms, Docket No. M-00051865, PUC Public Meeting on Feb. 26, 2009, entered Feb. 27, 2009.

Implementation of Act 129 of 2008 Phase 4 – Relating to the Alternative Energy Portfolio Standards Act, Docket No. M-2009-2093383, PUC Public Meeting on May 28, 2009, entered on May 28, 2009.

Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual Update, Docket No. M-00051865, PUC Public Meeting on May 28, 2009, entered on June 1, 2009.

Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standards for the Participation of Demand Side Management Resources – Technical Reference Manual Update, Docket No. M-00051865, PUC Public Meeting on June 3, 2010, entered on June 8, 2010.

Policy Statement in Support of Pennsylvania Solar Projects, Docket No. M-2009-2140263, entered Sept. 16, 2010.

Policy Statement regarding Net Metering – Use of Third Party Operators, Docket No. M-2011-2249441 entered March 29, 2012.

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