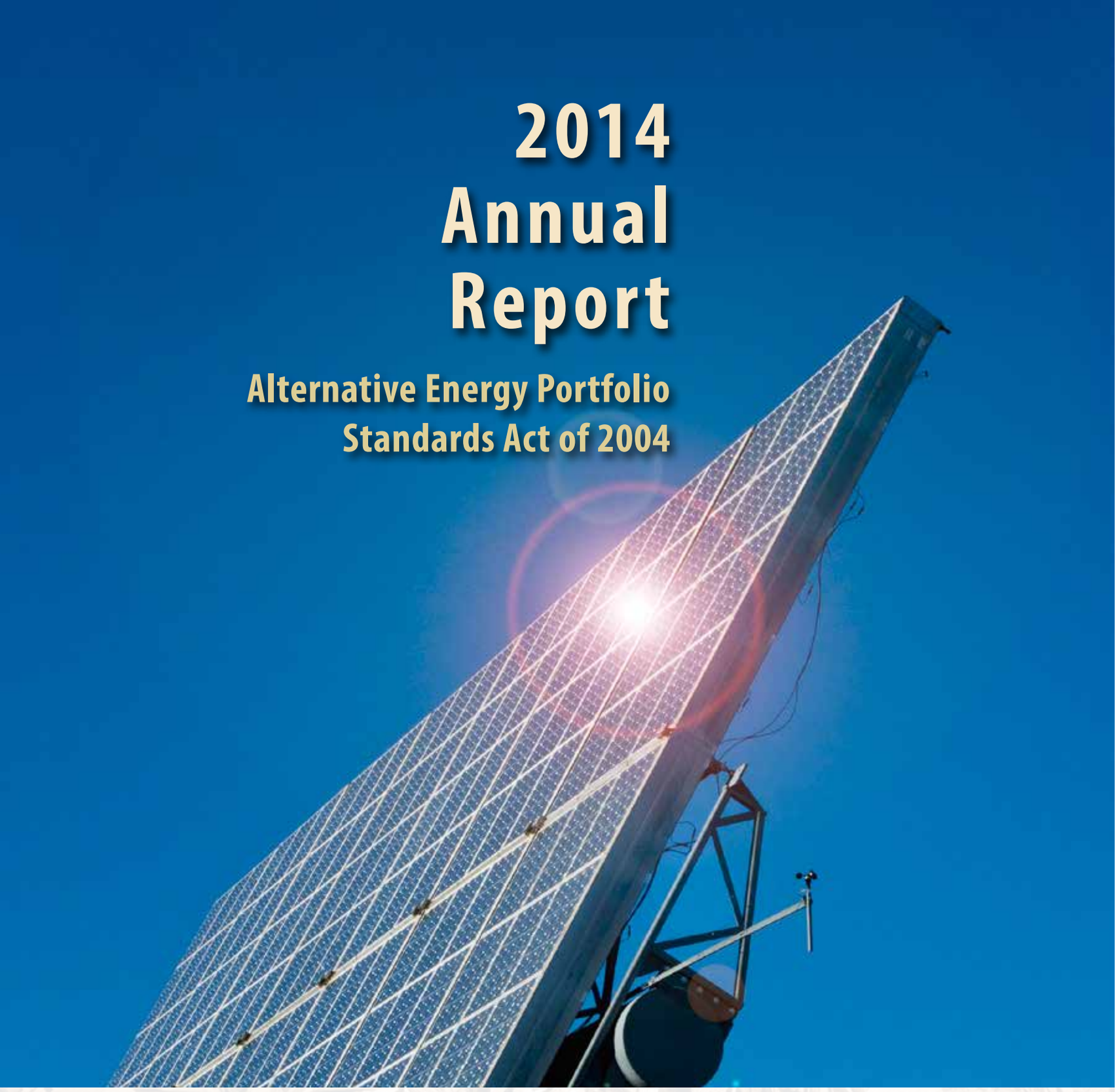
2014 Annual Report

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

2014 Annual Report
Alternative Energy Portfolio Standards Act of 2004

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Prepared by the
PUC Bureau of Technical Utility Services
Paul Diskin, *Director*

In cooperation with the
Pennsylvania Department of Environmental Protection
John Quigley, *Secretary*
www.dep.pa.gov

Cover photo: Dennis Schroeder / NREL/ Amonix CPV solar array being tested at SolarTAC (Technology Acceleration Center) in Aurora, Colorado
Back cover: PA Department of Environmental Protection

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 through alternative energy resources by 2021.[1] Alternative energy sources in Pennsylvania are broken down in two tiers – Tier I and Tier II. Solar photovoltaic (PV) is a Tier I resource but also has a stand-alone requirement. The percentage of Tier I, Tier II and solar PV alternative energy credits (AECs)[2] that must be included in sales to retail customers increases over the compliance period.[3] 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. This report satisfies that requirement.

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

[2] Solar PV AECs will be referred to herein as solar AECs.

[3] 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. *See* 73 P.S. § 1648.2 and 66 Pa.C.S. § 2814.

OVERVIEW

For the 2014 reporting year (June 1, 2013 – May 31, 2014), all EDCs complied with the AEPS requirements by retiring the required number of Tier I, Tier II, and Solar AECs needed to meet their obligations. Four EGSs did not meet their AEPS obligations by retiring the necessary AECs; alternative compliance payments (ACPs) were required of these four EGSs for their shortfall in AECs. Three of the four EGSs paid the required ACPs and one EGS that was out of business, did not pay ACPs.

AECs retired by EDCs and EGSs for the 2014 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 2014 reporting year, 85 percent of solar AECs, 31 percent of Tier I AECs and 65 percent of Tier II AECs originated from generation facilities located in Pennsylvania.

Recent analyses of proposed and existing resources indicates sufficient Tier I resources are available to meet the AEPS requirements through the 2021 reporting year and sufficient Tier II resources exist to meet the requirements past the 2021 reporting year. Sufficient solar PV capacity exists, or is planned, to meet AEPS obligations through the 2019 reporting year.

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SECTION 1 INTRODUCTION

PURPOSE

Act 213 of 2004 was signed into law on Nov. 30, 2004, establishing an alternative energy portfolio standard for Pennsylvania. The law took effect on Feb. 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 conducting 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 annually on 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, by providing notice of the payment as well as an opportunity to challenge whether the ACP was appropriately applied.

On July 19, 2007, Act 35 of 2007 was signed into law, amending 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 Dec. 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 Oct. 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

2014 COMPLIANCE SUMMARY

Table 2 provides a summary of compliance for all EDCs and EGSs subject to AEPS requirements during the 2014 reporting period. Included in the table is 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 at the end of the compliance period. For 2014, while no EDCs were required to pay an ACP, four EGSs were required to pay ACPs. Of these four EGSs, Reliable Power, LLC failed to comply with its obligations and went out of business before the Commission was able to recover the required ACPs.

The weighted average credit prices reflected below are 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 2014 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				
146,589,566	Solar	0.0840	123,111	$94.39	$11,476,752	25
	I	4.5	6,476,740	$9.78	$60,509,382	1,346
	II	6.2	9,086,794	$0.13	$1,150,824	1,909
	Total	10.7	15,686,645	N/A	$73,136,958	3,280

For the 2014 reporting period, the base obligation for non-solar Tier I was 4.416 percent. The Tier I quarterly adjustment added quarterly increases of: 0.0025 percent; 0.0032 percent; 0.0035 percent; and 0.0036 percent respectively. This resulted in 4,707 AECs added to the 6,473,394 credits that were retired without the adjustment.

Table 3 presents the details of each EDC's compliance obligation and compliance status for reporting period 2014. The table presents reporting period data on the number of AECs retired by tier in the EDC territories. All EDCs achieved compliance by retiring the requisite number of AECs but four EGSs did not retire sufficient AECs and, as a result, were required to make ACPs. Several EGSs retired excess credits beyond the required AEPS obligations and the overages are evident in the table. Because specific EGS sales information is considered proprietary, their numbers were combined and are shown with the appropriate EDC.

During the 2014 reporting period, 11 EDCs and 99 EGSs had compliance obligations for the entire 12-month reporting period. During this time period, only two EDCs, Citizens' and Wellsboro, did not have EGSs providing service in their service territories. 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.

TABLE 3 2014 AEPS COMPLIANCE REPORT BY EDC SERVICE TERRITORY

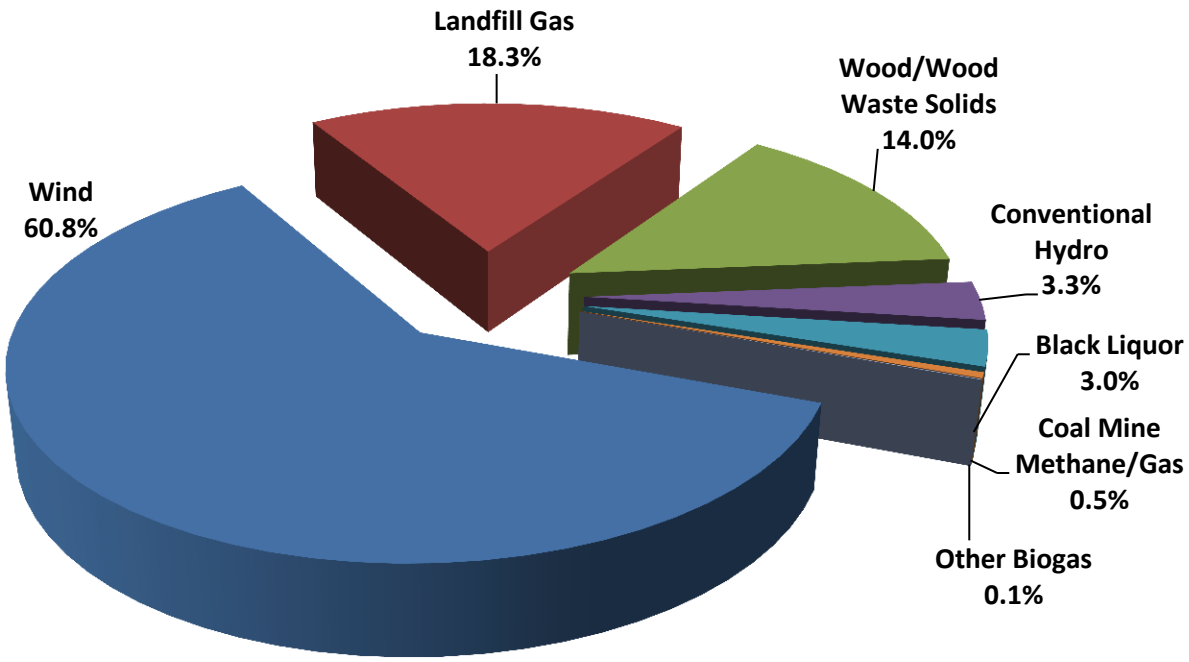
Distribution Service Territory	Total Energy Sold (MWhs)	Alternative Energy Requirement	Credits Required	Credits Retired	Compliance Status
Citizens' Electric	175,194				
Solar		0.084%	147	147	In Compliance
Tier I (non-solar)		4.416%	7,743	7,743	In Compliance
Tier II		6.20%	10,862	10,862	In Compliance
Duquesne Light and EGSs	14,211,289				
Solar		0.084%	11,932	11,932	In Compliance
Tier I (non-solar)		4.416%	628,026	628,029	In Compliance
Tier II		6.20%	881,104	881,104	In Compliance
Met Ed and EGSs	14,301,932				
Solar		0.084%	12,015	12,015	In Compliance
Tier I (non-solar)		4.416%	632,037	632,037	In Compliance
Tier II		6.20%	886,719	886,719	In Compliance
PECO and EGSs	38,785,053				
Solar		0.084%	32,581	32,557	In Compliance After ACP
Tier I (non-solar)		4.416%	1,713,971	1,712,694	In Compliance After ACP
Tier II		6.20%	2,404,672	2,402,905	In Compliance After ACP
Penelec and EGSs	14,253,545				
Solar		0.084%	11,974	11,974	In Compliance

Distribution Service Territory	Total Energy Sold (MWhs)	Alternative Energy Requirement	Credits Required	Credits Retired	Compliance Status
Tier I (non-solar)		4.416%	629,908	629,908	In Compliance
Tier II		6.20%	883,720	883,720	In Compliance
Penn Power and EGSs	4,816,618				
Solar		0.084%	4,046	4,046	In Compliance
Tier I (non-solar)		4.416%	212,856	212,856	In Compliance
Tier II		6.20%	298,628	298,628	In Compliance
Pike County and EGSs	76,678				
Solar		0.084%	64	64	In Compliance
Tier I (non-solar)		4.416%	3,390	3,390	In Compliance
Tier II		6.20%	4,754	4,754	In Compliance
PPL and EGSs	38,095,652				
Solar		0.084%	32,000	31,999	In Compliance After ACP
Tier I (non-solar)		4.416%	1,683,529	1,683,463	In Compliance After ACP
Tier II		6.20%	2,361,934	2,361,873	In Compliance After ACP
UGI Electric and EGSs	1,023,152				
Solar		0.084%	860	860	In Compliance
Tier I (non-solar)		4.416%	45,213	45,213	In Compliance
Tier II		6.20%	63,436	63,436	In Compliance
Wellsboro Electric	127,760				
Solar		0.084%	107	107	In Compliance

Distribution Service Territory	Total Energy Sold (MWhs)	Alternative Energy Requirement	Credits Required	Credits Retired	Compliance Status
Tier I (non-solar)		4.416%	5,646	5,646	In Compliance
Tier II		6.20%	7,921	7,921	In Compliance
West Penn Power and EGSs	20,722,693				
Solar		0.084%	17,409	17,409	In Compliance After ACP
Tier I (non-solar)		4.416%	915,782	915,782	In Compliance After ACP
Tier II		6.20%	1,284,807	1,284,872	In Compliance

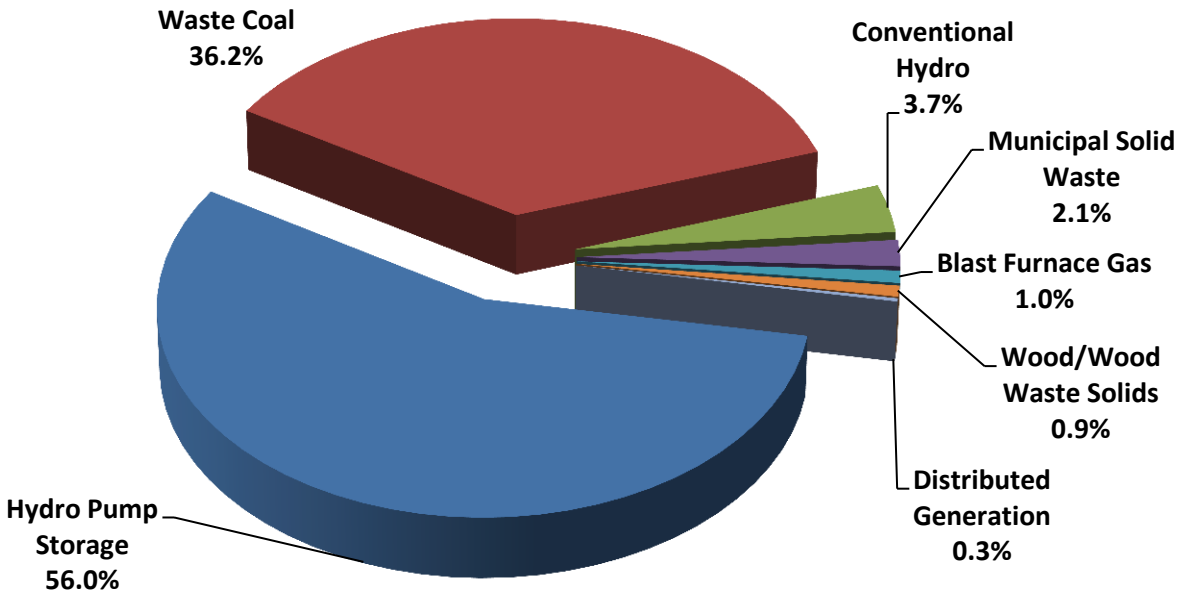
Charts 1A and 1B, below, indicate alternative energy types that were retired to meet the Tier I and Tier II obligations for the 2014 compliance period. During this reporting period a small amount of the Tier I obligation (0.0006%) was met using solar credits as a Tier I resource. As noted in the charts below, resources contributing less than one-tenth of one percent are not displayed.

Chart 1A: Retired Tier I Resources by Type - 2014



Note: Resources comprising less than 0.0 percent are not shown in these charts.

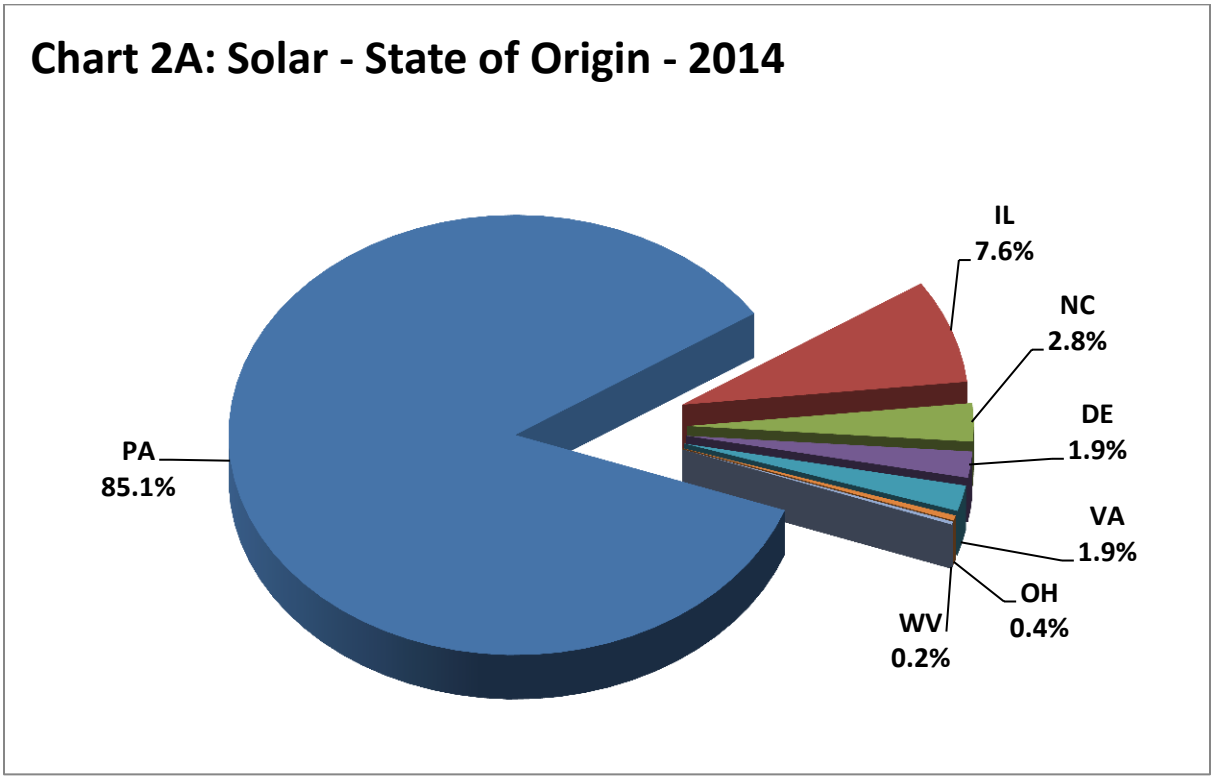
Chart 1B: Retired Tier II Resources by Type - 2014



For the 2014 reporting period, 85.1 percent of solar AECs, 30.6 percent of Tier I and 64.9 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 for reporting period 2014. This data is further illustrated in Charts 2A through 2C.

TABLE 4 AEC STATE OF ORIGIN - 2014

Tier	PA	NJ	MD	VA	WV	IL	OH	DE	NC	IN	KY
Solar	104,819	6	12	2,331	275	9,404	467	2,370	3,458	6	0
Tier I	1,984,301	32,150	24,858	884,422	463,109	2,042,814	422,618	37,494	0	562,868	22,069
Tier II	5,899,410	278,655	115	2,819,273	1,752	0	87,589	0	0	0	0
Total	**7,988,530**	**310,811**	**24,985**	**3706026**	**465136**	**2052218**	**510674**	**39864**	**3458**	**562874**	**22,069**



Note: States contributing less than 0.0 percent are not shown in the charts.

Chart 2B: Tier I - State of Origin - 2014

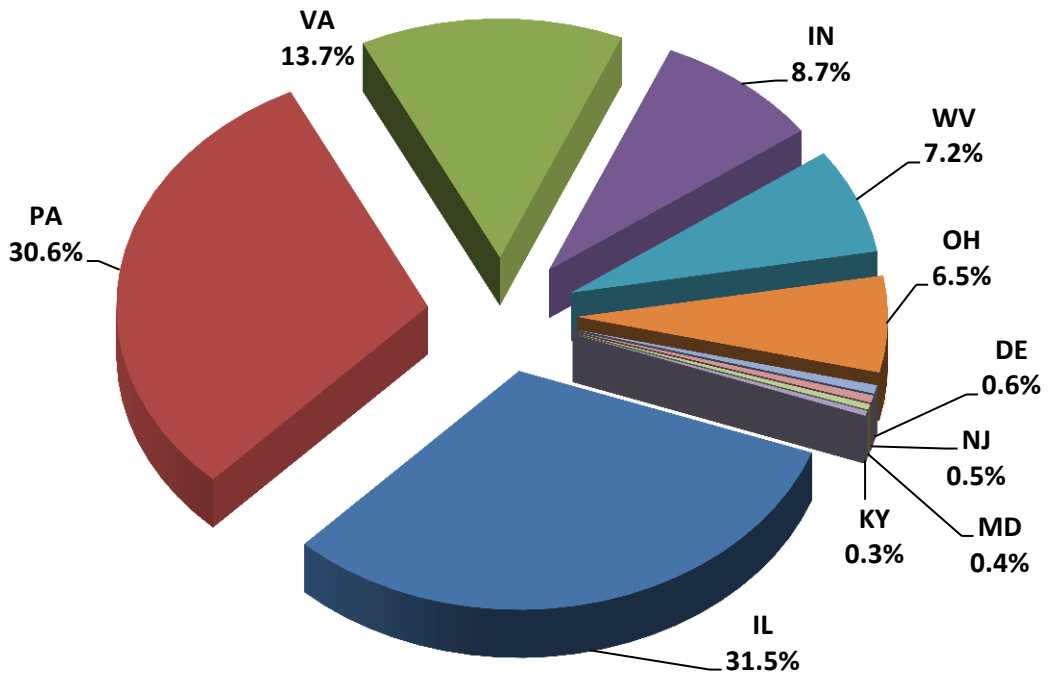
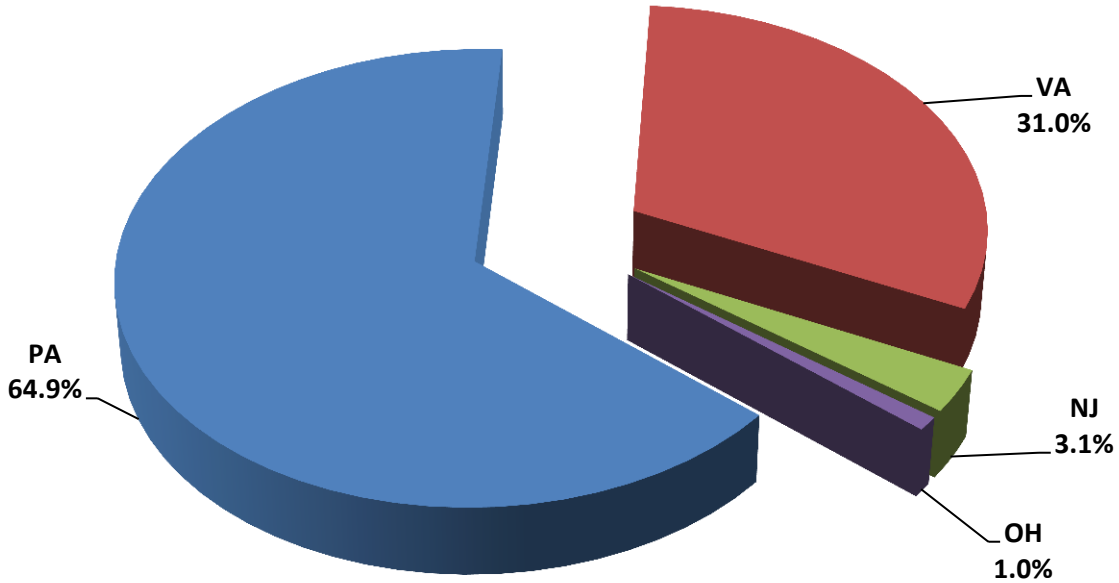


Chart 2C: Tier II State of Origin - 2014



AEPS CERTIFICATES/CREDITS CREATED

Table 5 shows the number of AECs by tier that are eligible for use in Pennsylvania, created in PJM-EIS[4] for reporting years 2005 through 2014. 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 2014 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 the 2021 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
2014	402,617	19,630,633	28,659,410
Estimated 2021 Requirement	720,205	10,803,072	14,404,096

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.[5] The reports contain the number of customer-generators interconnected to the distribution system, the status of interconnection requests, as well as the

[4] The PJM-EIS database is available at http://www.pjm-eis.com. Data as of May 31, 2015.
[5] 52 Pa. Code § 75.34.

length of time to complete these interconnection requests as processed by the EDCs within the past year. The data on customer-generator interconnects is summarized below in Table 6.

Descriptions of the varying interconnection levels and other data, as referenced above, can be found in the Net-Metering & Interconnection Report 2013 – 2015.[6] As of May 31, 2014, which marked the end of the 2014 program year, Pennsylvania's EDCs reported 8,707 Tier I and 14 Tier II customer-generators were interconnected to the distribution system. Those customer generators represented 205,468 kW of generation capacity. Solar PV accounted for about 96 percent of the Tier I customer-generators and 83 percent of Tier I generation capacity.

Of the 8,721 customer-generators, the EDCs received 724 interconnection requests between June 1, 2013, and May 31, 2014. There were two denials. The average time for EDCs to finalize an interconnection request was: Level 1 – four days; Level 2 – six days; Level 3 – 102 days; and Level 4 – one day.

TABLE 6 NUMBER OF CUSTOMER-GENERATORS INTERCONNECTED: 2012-2014

	Data as of May 31, 2012				Data as of May 31, 2013				Data as of May 31, 2014			
	Tier I		Tier II	Total	Tier I		Tier II	Total	Tier I		Tier II	Total
	Total	Solar PV			Total	Solar PV			Total	Solar PV		
Number of Customer Generators	6,953	6,667	18	6,971	7,595	7,327	12	7,607	8,707	8,407	14	8,721
Estimated Generation Capacity in kW	152,293	146,156	15,198	167,491	172,911	158,381	13,433	186,344	200,019	170,532	5,449	205,468

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

[6] http://www.puc.pa.gov/Electric/pdf/AEPS/Net_Metering-Interconnection_Report_2013-15.pdf

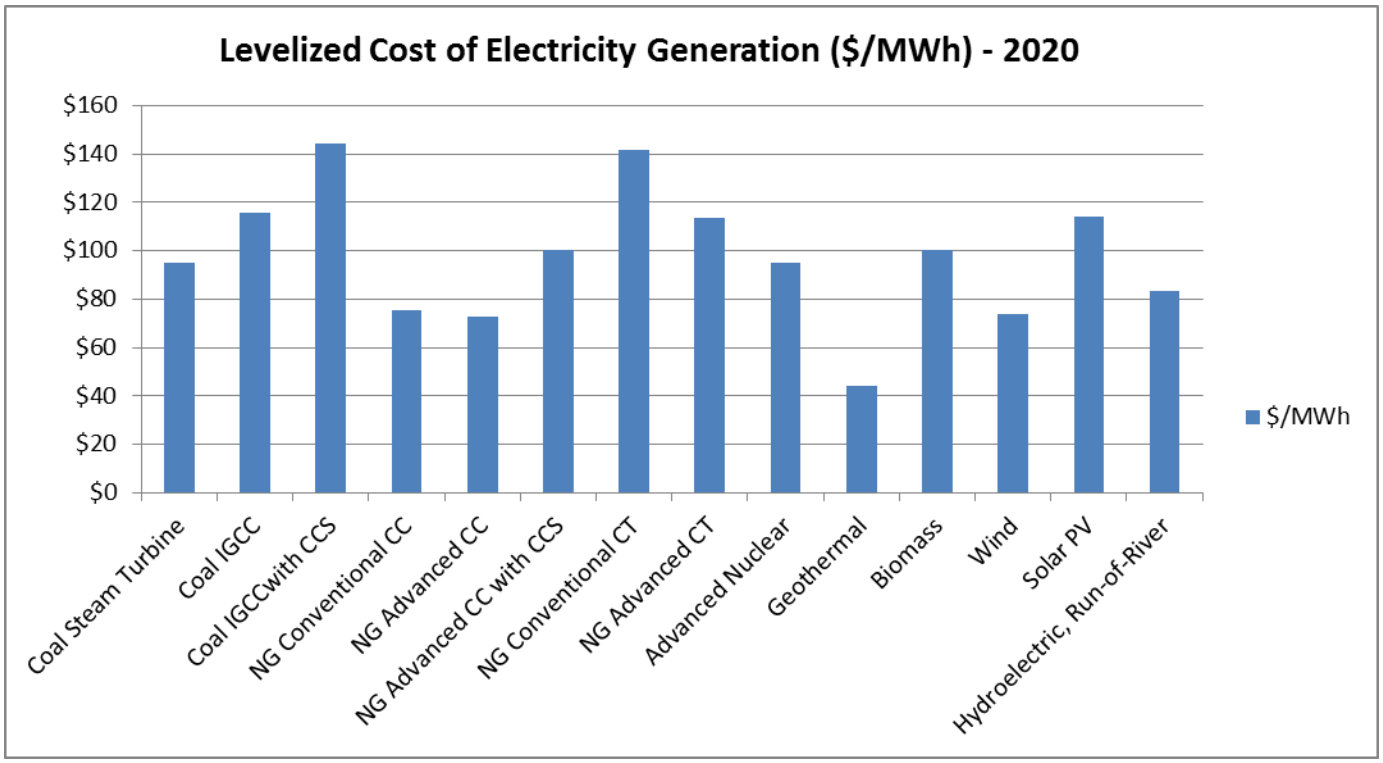
SECTION 3 COSTS AND BENEFITS OF ALTERNATIVE ENERGY GENERATION

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 2020.[7] 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, 2020 was selected to account for the lead time needed by some technologies to be brought online. EIA uses average data, including capacity factors, from across the country. Chart 3 compares these levelized costs, in 2013 dollars, for differing generation technologies on a dollars per megawatt-hour ($/MWh) basis over an assumed financial life of the plant. Levelized cost components include overnight capital costs, construction, operation and maintenance (O&M) costs and an assumed utilization rate for each plant type. O&M 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.

[7] *See* EIA document titled *Levelized Cost of New Generation Resources in the Annual Energy Outlook 2015* from EIA *Annual Energy Outlook 2015 with Projections to 2040*, April 2015, DOE/EIA-0383(2015). Available at http://www.eia.gov/forecasts/aeo/index.cfm

CHART 3 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 projections are presented in 2015 dollars, using a 6 percent discount rate and projected AEC costs. The projected total compliance costs are expected to increase each year as the percentage requirements of alternative energy increase. Two key variables, however, have been shown to have a demonstrable beneficial impact on containing AEPS compliance costs. First, Pennsylvania's energy efficiency and conservation program, known as Act 129, coupled with higher energy efficiency standards for appliances, has curtailed the rate of energy consumption and therefore limits the number of AECs required for annual compliance. Second, a large influx of out-of-state solar development that is eligible for use towards AEPS compliance has significantly impacted the solar AEC values in Pennsylvania.

As shown in Table 7 below, the estimated cost of AEPS compliance in 2021 is approximately $165 million. To put these figures in perspective, the average annual statewide customer expenditures on electric service totaled approximately $15.5 billion in 2013.[8] The cost

[8] *See* U.S. Energy Information Association – Electric Power Annual 2013 March 23, 2015, Table 2.9, http://www.eia.gov/electricity/annual/

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 historical pricing as reported by the AEPS Program Administrator,[9] as well as the results of EDC default service solicitations, with preferential weighting given to more recent solicitation results, and some assumptions as to the potential credit pricing into the near future.

TABLE 7 ESTIMATED STATEWIDE AEPS COST OF COMPLIANCE IN 2021

EDC	Solar Credits		Tier I Credits		Tier II Credits		Total Cost
	Credits Needed	Solar Credits @ $40	Credits Needed	Tier I Credits @ $20	Credits Needed	Tier II Credits @ $0.20	
Duquesne	68,183	$1,711,160	1,022,748	$12,833,697	1,363,664	$171,116	$14,715,972
Met Ed	73,519	$1,845,079	1,102,791	$13,838,092	1,470,388	$184,508	$15,867,679
Penelec	85,165	$2,137,335	1,277,470	$16,030,011	1,703,293	$213,733	$18,381,079
Penn Power	26,588	$667,255	398,814	$5,004,415	531,752	$66,726	$5,738,396
PECO	192,548	$4,832,288	2,888,225	$36,242,163	3,850,967	$483,229	$41,557,681
PPL	185,890	$4,665,176	2,788,343	$34,988,817	3,717,791	$466,518	$40,120,510
UGI	5057	$126,916	75,857	$951,871	101,143	$12,692	$1,091,479
West Penn	123,883	$3,109,021	1,858,240	$23,317,660	2,477,654	$310,902	$26,737,583
Citizens'	943	$23,672	14,149	$177,542	18,865	$2,367	$203,581
Pike County	403	$10,125	6,052	$75,938	8,069	$1,013	$87,076
Wellsboro	639	$16,037	9,585	$120,279	12,780	$1,604	$137,920
Totals	762,818	$19,144,065	11,442,274	$143,580,485	15,256,365	$1,914,406	$164,638,956

RENEWABLE ENERGY ECONOMIC BENEFITS - JOBS, EXPORTS, WAGES

Economic development associated with the development and deployment of renewable and alternative energy sources was a significant consideration in support of the passage of the AEPS. 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.

The *Clean Jobs Pennsylvania* report cites that Pennsylvania has a renewable energy workforce of 13,345 with the companies supporting these jobs typically being small businesses of 25 or fewer employees. The report also states that 37,468 Pennsylvanians are employed in the energy efficiency sector, a Tier II resource.[10]

[9] *See* AEPS Program Administrator- http://paaeps.com/credit/pricing.do
[10] Clean Jobs Pennsylvania – Sizing Up Pennsylvania's Clean Energy Jobs Base and its Potential, 2014.

In 2014, approximately 14 MW of solar electric generating capacity was installed in Pennsylvania and certified to earn AECs. These installations at private residences, businesses and institutions help sustain a workforce of nearly 4,000 that are engaged in all aspects from manufacturing, sales, distribution and installation of solar power components and systems and related support services.[11] Nationally, the average hourly wage for those engaged in the actual installation of solar energy systems is $24 with those involved in the installation of utility-scale solar farms earning more than the average.[12]

There was no in-state commercial wind development in 2014. The American Wind Energy Association (AWEA), a trade association representing wind producers and installers, reported the total number of direct and indirect jobs supporting the Pennsylvania wind industry in 2014 was in excess of 1,000, ranking the Commonwealth 11th in the nation. This includes jobs at 29 in-state manufacturing facilities. Companies such as Gamesa and wind farm development firm EverPower Wind Holdings located their North American headquarters in Pennsylvania. Gamesa also has warehousing, repair facilities and field technicians, collectively employing about 200 people, in the Commonwealth. Additionally, wind farm development employs hundreds of people and each wind farm typically requires a small, permanent crew of up to 15 people to oversee the maintenance and continued operation of the turbines. AWEA reports that every megawatt of installed wind generating capacity creates $1 million in economic development. 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 was approximately $4 million in 2014.[13]

With respect to hydropower, in 2014 Pennsylvania realized incremental generating capacity additions of 133 MW. Most of this incremental growth was larger-scale hydropower; all of this capacity was certified according to the Low Impact Hydropower Institute and therefore received Tier I certification. Supporting part of this growth in hydropower are two of the world's largest turbine manufacturers, Voith Hydro and Weir American Hydro, both Pennsylvania companies. 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. There is a renewed interest in Pennsylvania to consider developing other low-impact hydropower resources, many of which can take advantage of existing infrastructure. Analysis of a 2014 study issued by the Oak Ridge National Laboratory indicates more than 600 MW of potential hydropower could be developed at sites with existing water control infrastructure.[14] An earlier Navigant Consulting study indicates that for every 1 MW of hydropower generating

[11] The Solar Foundation. Data as of November 2014.
[12] National Solar Jobs Census 2014.
[13] "Pennsylvania Wind Energy" American Wind Energy Association
[14] *New Stream-reach Development: A Comprehensive Assessment of Hydropower Energy Potential in the United States, 2014.*

capacity developed, the equivalent of 5.3 full time jobs is created.[15] From February 2014 through May 2015, the Federal Energy Regulatory Commission (FERC), which has permitting oversight for hydropower projects, issued Active Preliminary Permits and/or Pending Licenses to Pennsylvania hydropower projects with an aggregate nameplate generating capacity of 335 MW. The passage of the federal Hydropower Regulatory Efficiency Act of 2013 helps to streamline some of the FERC permitting/licensing requirements for smaller hydropower projects and undoubtedly will facilitate the development of some smaller projects.

Pennsylvania continues to invest in renewable and alternative energy projects. In 2014, the Pennsylvania Energy Development Authority (PEDA) provided financial assistance to 17 projects across the Commonwealth deploying solar, biomass, anaerobic digesters and energy efficiency/demand management projects. In doing so, PEDA provided $8.6 million in grant funding to these projects to leverage $65 million of private investment and in-kind resources. These projects are estimated to result in a combination of 700 temporary and full-time jobs, including aspects such as site design, construction and long-term operation and maintenance. The combined lifetime economic impact of these investments is estimated at more than $357 million.

[15] *Job Creation Opportunities in Hydropower, 2009.*

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 the amount that will be needed to meet future AEPS requirements.

RENEWABLE AND ALTERNATIVE ENERGY GENERATION CAPACITY IN PENNSYLVANIA AND PJM

The Pennsylvania AEPS website[16] maintains a summary of qualified generation facilities and qualified energy efficiency and demand-side management (EE/DSM) resources. There were 9,867 qualified generation facilities certified as of May 31, 2014. Of those qualified generation facilities, 7,473 facilities (76 percent) are located in Pennsylvania and 2,394 are located outside of Pennsylvania.

Statistics for AEPS-registered generators, as of May 31, 2014, include:

- 7,473 generators located in Pennsylvania with a total nameplate generating capacity of 7,602.5 MW
- 2,394 generators located outside of Pennsylvania with a total nameplate generating capacity of 12,327.9 MW
- 7,341 solar facilities in Pennsylvania with a total nameplate generating capacity of 208.8 MW
- 2,219 solar facilities outside of Pennsylvania with a total nameplate generating capacity of 163.1 MW

Table 8 summarizes the active, certified alternative energy resources by type, as defined within the AEPS, and the capacity of each type in and outside of Pennsylvania. Generator facilities using biomass are further disaggregated by those using cellulosic or woody biomass and those using black liquor, a by-product of the wood pulping industry. Similarly, biologically derived methane gas is separated into anaerobic digester gas and landfill gas. In some instances a qualifying AEPS fuel may not be the primary fuel used at a facility for generating electricity. In such cases, because listing the nameplate capacity of the generator can cause confusion it is indicated when an AEPS fuel resource is not the primary fuel used in electricity generation.

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

TABLE 8 – AEPS EXISTING CAPACITIES OF CERTIFIED, ACTIVE FACILITIES

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	169.2	2.2	171.4
I	Landfill Gas	1571.6	1112.8	2684.4*
I	Other Biomass Gas	12.2	1.8	14.0
I	Solar	208.8	163.1	371.9
I	Wind	1304.6	4329.5	5634.1
I	Wood/Wood Waste Solids	18.6	1035.2	1053.8
I	Wood/Wood Waste Solids & Black Liquor	109.5	0	109.5
I	**Total of Tier I**	**3449.3**	**6732.6**	**10181.9**
II	Black Liquor	0.0	65.0	65.0
II	Blast Furnace & Other Gases	52.5	67.0	119.5
II	Distributed Generation	5.0	0.0	5.0
II	Hydro	2224.4	4323.0	6547.4
II	Municipal Solid Waste	252.4	449.6	702.0
II	Other Gases	31.0	0.0	31.0
II	Waste Coal	1582.9	244.6	1827.5
II	Waste Heat	5.0	0.0	5.0
II	Wood/Wood Waste Solids	0.0	7.2	7.2
II	Wood/Wood Waste Solids & Black Liquor*	0.0	438.9	438.9
II	**Total of Tier II**	**4280.2**	**5595.3**	**9875.5**
I & II	**Total of Tiers I & II**	**7602.5**	**12327.9**	**19930.4**

* Several facilities have the capability of utilizing multiple fuel sources that may include a combination of Tier I, Tier II or even non-eligible AEPS fuels to generate electricity. For example, a facility may co-fire coal and biomass or blend landfill gas and natural gas. For instance, the reported nameplate capacity for Tier I landfill gas includes 1,784MW capacity with natural gas as the primary fuel and landfill gas is a secondary fuel. Methodologies are in place to ensure that only AEPS-qualified generation is awarded AEPS credits but it is not possible to designate a single, static AEPS nameplate capacity associated with these generators.

PJM manages grid interconnection requests in construction queues. Not all projects submitted to PJM for interconnection are constructed. Historically, only about 25 percent of the interconnection requests from 2005 to 2012 led to projects that were actually built.[17] Table 9 summarizes the renewable generation in the queue for Pennsylvania as of May 31, 2015. Withdrawn projects and projects that are in service are not included.

TABLE 9 RENEWABLE GENERATION IN THE PJM CONSTRUCTION QUEUE FOR PENNSYLVANIA

Fuel Type	Nameplate MW
Wind	727
Solar	9
Biomass	16
Hydropower	
Conventional	0
Pumped Storage	40
Landfill Gas	16
Total	**808**

The AEPS Act allows Pennsylvania EDCs and EGSs to purchase AECs from the entire PJM region. PJM has substantial existing and proposed renewable generation capacity as detailed in Table 10.

TABLE 10 INSTALLED (AS OF 5/31/15) AND PROPOSED RENEWABLE CAPACITY IN PJM

Fuel Type	Installed Capacity Nameplate MW[18]	Proposed Capacity Nameplate MW[19]
Wind	6,717	10,826
Solar	2,360	3,456
Hydro	2,591	1,387
Landfill Gas	846	78
Other Biogas	38	0
Wood	404	80
Total	**12,956**	**15,827**

PJM states with renewable portfolio standards (RPS) 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 have an RPS. In states with RPS requirements, the final requirements range from 10 percent of retail sales of electricity in North Carolina and Ohio (currently in a state of suspension) to 25 percent in Illinois, Delaware and West Virginia by 2025.

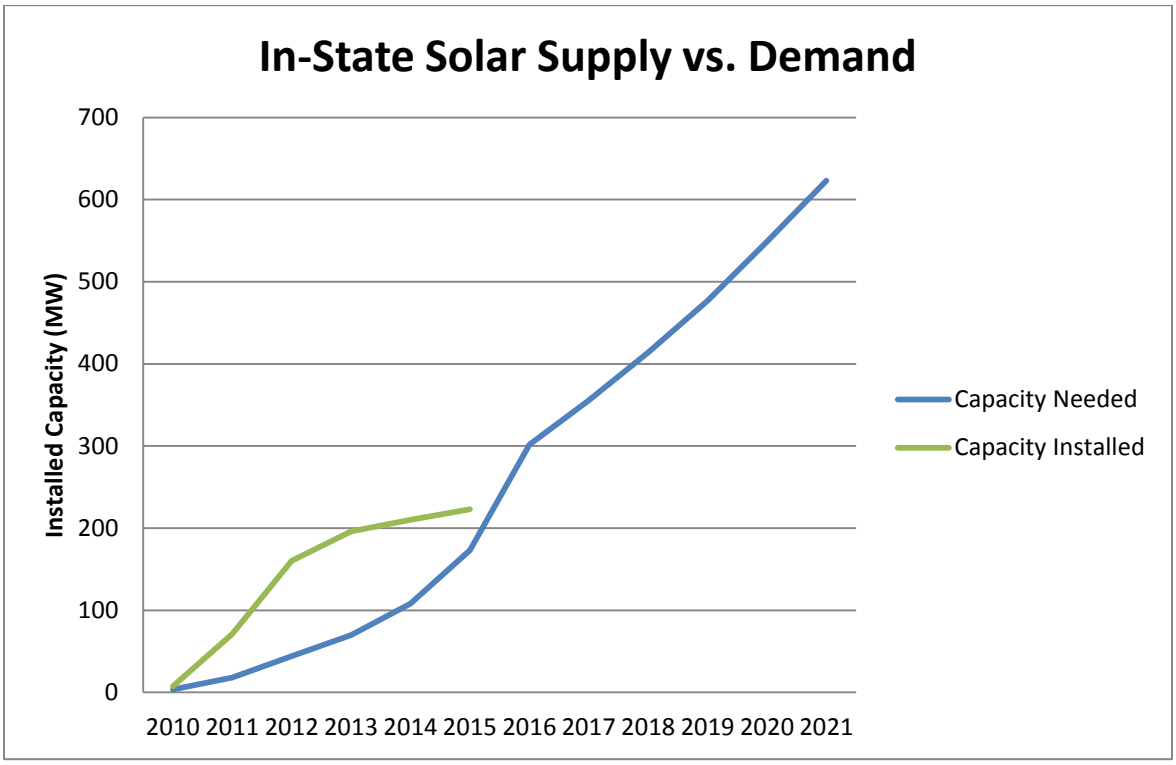
[17] *See* PJM 2012 Regional Transmission Expansion Plan.
[18] PJM-EIS Public Reports, Renewable Generators Registered in GATS
[19] PJM queue. Includes "Active" and projects "Under Construction"

The RPS requirements of the PJM states and the District of Columbia vary considerably regarding generation resources eligible to meet the requirements. Further, some states use credit multipliers for certain generation resources, thereby 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 qualifying generation facilities to be located within that state while other states allow resources originating from anywhere within PJM or outside of PJM to qualify. Also, EDCs, EGSs and municipal utilities may have different RPS requirements in some states.

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 and Tier II supply exists through 2021.

Graph 1 provides a comparison of Pennsylvania's solar requirement to in-state installed capacity. The graph shows that Pennsylvania will not be able to meet its solar requirement without drawing from resources in other states, unless significant increases in our own installed capacity are realized in each of the next several years. Even if all the solar projects proposed for Pennsylvania in the PJM planning queue came to fruition it would still only add an additional 9 MW of installed capacity. The PJM queue however, is not a good indicator of solar development given that most solar development tends to be small, distributed and behind-the-meter projects that are not tracked by the queue. Despite this, the graph illustrates that very likely, a significant and increasing percentage of out-of-state solar credits will be necessary to comply with the annual solar requirements of the AEPS.

GRAPH 1 SOLAR MARKET PLACE IN PA ONLY



Note: Solar PV supply in Graph 1 includes existing supply and 25 percent of the new capacity in the PJM construction queues. It 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 13 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
2015	197,074	173	223
2016	343,622	303	
2017	404,929	358	
2018	471,543	418	
2019	543,420	483	
2020	625,107	556	
2021	709,490	632	

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

SECTION 5 RECOMMENDATIONS FOR PROGRAM IMPROVEMENTS

PROPOSED RULEMAKING

Based on the Commission's experience to date in implementing the current regulations, the Commission determined that it was necessary to update and revise its regulations to comply with Act 129 of 2008, and Act 35 of 2007, and to clarify certain issues of law, administrative procedure and policy. On Feb. 20, 2014, the Commission issued a Notice of Proposed Rulemaking (NoPR) for public comment. The Proposed Rulemaking Order and proposed rules were published in the *Pennsylvania Bulletin* on July 5, 2014, at 44 Pa.B. 4179. The initial comment period deadline was extended at the Request of the Pennsylvania Department of Agriculture to September 3, 2014. Comments were received from numerous interested parties as well as the Independent Regulatory Review Commission. The Commission continues to work through the finalization of the proposed rules, in consideration of the comments received. A summary of the proposed changes follows:

- The addition of definitions for aggregator, default service provider, grid emergencies, micro-grids and moving water impoundments.
- Revisions to the interconnection rules to reflect the increase in limits on customer-generator capacity contained in the Act 35 of 2007 amendments.
- Revisions to net metering rules and inclusion of a process for obtaining Commission approval to net meter alternative energy systems with a nameplate capacity of 500 kilowatts or greater.
- Clarification of the virtual meter aggregation language.
- Clarification of net metering compensation for customer-generators receiving generation service from EDCs, default service providers and EGSs.
- Revisions to the definitions for low-impact hydropower and biomass to conform with the Act 129 of 2008 amendment.
- Addition of provisions for adjusting Tier I compliance obligations on a quarterly basis to comply with the Act 129 of 2008 amendments.
- Addition of provisions for reporting requirements for new low-impact hydropower and biomass facilities in Pennsylvania to comply with the Act 129 of 2008 amendments.
- Clarification of Commission procedures and standards regarding generator certification and the use of estimated readings for solar photovoltaic facilities.
- Clarification of the authority given to the Program Administrator to suspend or revoke the qualification of an alternative energy system and to withhold or retire past, current or future alternative energy credits for violations.
- Clarification of the process for verification of compliance with the AEPS Act.
- Standards for the qualification of large distributed generation systems as customer-generators.

The Commission initially proposed allowing net metered customers to produce their own electricity up to 100 percent of the their need, plus an amount equal to 10 percent in excess of

their needs (proposed 110 percent rule). In doing so, the proposed rule would have limited the availability of net metering to AEPS-qualifying systems not capable of producing more than 110 percent of the previous five-year historical average load for the customer. The regulatory process continued beyond the 2014 reporting year with changes made to the initial proposals. The Commission anticipates finalizing these regulations in early 2016.

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. An AEC does not represent the purchase of renewable energy, only the confirmation of the generation of renewable energy. 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 through 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 Jan. 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 Dec. 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 of CPM until Dec. 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 renewable 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 Dec. 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 customer-generator's property for a physical, single point of contact. Virtual meter aggregation

[22] *See generally*, 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.

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 Dec. 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 a 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.

[26] *See* 36 Pa.B. 7574, and 52 Pa. Code Ch. 75.
[27] 52 Pa. Code §§ 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, Order entered March 25, 2005

Implementation of the Alternative Energy Portfolio Standards Act of 2004 (Implementation Order II), PUC Docket No. M-00051865, Order 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, Order 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, Order 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, Order entered June 23, 2006.

Implementation of the Alternative Energy Portfolio Standards Act of 2004, Docket No. L-00060180, Order 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, Order entered Sept. 19, 2006.

Implementation of the Alternative Energy Portfolio Standards Act of 2004, Docket No. M-00051865, Order 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, Order 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, Order entered May 31, 2007.

Implementation of Act 35 of 2007; Net Metering and Interconnection, Docket No. L-00050174, Order entered July 2, 2008.

Implementation of the Alternative Energy Portfolio Standards Act of 2004, Docket No. L-00060180, Order entered Sept. 29, 2008.

Implementation of the Alternative Energy Portfolio Standards Act of 2004: Standard Interconnection Application Forms, Docket No. M-00051865, Order 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, Order 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, Order 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, Order entered on June 8, 2010.

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

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

PA Public Utility Commission
P.O. B ox 3265
Harrisburg, PA 17105-3265
www.puc.pa.gov

PA Department of Environmental Protection
P.O. Box 2063
Harrisburg, PA 17105-2063
www.dep.pa.gov