

**PENNSYLVANIA ELECTRIC COMPANY
EE&C PLAN**

**Revised Pages 103 and 104
(Revised, July 31, 2009)**

8. Cost Effectiveness

8.1. Explain and demonstrate how the proposed plan will be cost effective as defined by the Total Resource Cost Test (TRC) specified by the Commission.

The EE&C plan is based upon the requirements and guidance of the Total Resource Cost Test Manual (May 28, 2009), with some minor changes that were requested during the comment period. Notable changes were the use of a marginal transmission and distribution costs instead of the full transmission and distribution rates. As stated in the FirstEnergy Companies' Comments to the draft TRC test order, dated June 5, 2009, the Companies acknowledged that they would not have the ability to address changes at this late date but would review the final TRC Order and, if necessary, make any necessary changes in a filing by August 1, 2009.

The TRC method utilized by the Company takes into account the combined effects of the EE&C Plan on both participating and non-participating customers. The sum of costs incurred by both the Company and any participating customers was used to calculate the costs. The benefits calculated in the TRC test include the avoided supply costs, including generation, transmission and distribution capacity costs valued at marginal cost, and the avoided energy supply costs calculated using the Commission requested third stage approach.

On the benefits side the approach requires during the first five-year period that the avoided energy costs be calculated using the wholesale electric generation prices as reflected in the NYMEX PJM futures price, to reflect both on- and off-peak prices on a 50% on- and 50% off-peak basis. FirstEnergy assumes the 5 years as 2009 through 2013 as PJM West Hub forward contracts are not yet traded beyond 2013, and the 2009 data reflects actual settlement prices through May 22 and forward contracts thereafter. FirstEnergy chose a forward market data point of May 22, 2009, and applied an exponentially weighted moving average (EMA) method to the forward data to normalize for daily volatility. The EMA provides a balance between transmitting changes in market expectations as reflected by futures prices while dampening any possible influence of illiquidity (10 days of trades provides more available observations) and large swings due to few traders moving the market.

The Commission approach called for in the second five-year period has the avoided energy costs calculated using the NYMEX natural gas futures price. The natural gas futures price was then converted into an estimated wholesale energy price through the use of a standard spark spread method expanded to reflect monthly spreads for the "prompt year" applied to the entire 5 year period. The PJM West Hub price was derived based on the forward market price at Henry Hub and the relationship between PJM West Hub Power and Henry Hub Natural gas forwards in 2013. Specifically, heat rates for the Spark Spread calculation are based on the annual on peak and off peak forward market implied heat rate for 2013 (Off Peak On Peak) similar to the first 5 year period, this calculation used the natural gas forward market observation date of May 22, 2009 utilizing an averaging method to normalize for daily volatility.

The Commission approach in the third five-year period requires that the avoided energy costs use the EIA Annual Energy Outlook. The prices during this timeframe are based on the US Department of Energy's (DOE) Energy Information Administration's (EIA) Annual Energy Outlook (AEO) published in May 2009. The EIA AEO does not directly include price for PJM West Hub, rather, the AEO publishes national average retail "end user" prices. To derive wholesale prices for PJM West Hub, PJM on peak, off peak, and around the clock actual annual average PJM West Hub prices from 2006, 2007, and 2008 were compared to the EIA AEO national retail price averages in those years and a multiplier was calculated to convert EIA AEO nominal generation prices from AEO 2009 Low Price Case tables (table 8, line 90) prices to PJM West Hub wholesale prices for these 5 forecast years.

For the avoided ancillary services cost, yield curves were created based on monthly average on peak and off peak ancillary service price / PJM West Hub day ahead price relationships for 2006 - 2008. These historic relationships were applied to the provided power prices to create the associated ancillary service prices.

For the avoided capacity cost the Company used a price forecast based on the FirstEnergy latest official and confidential long term price capacity price forecast. It reflects Regional Pricing Model Auction (RPM) assumptions from the second quarter of 2008.

The retail transmission and distribution rates for Penelec are based on the most recent distribution rate case approved by the Commission on January 11, 2007. The tariff rate schedules were rolled up into rate classes in order to align with the Commission's Act 129 Implementation Orders. The distribution rates were escalated as defined by the Commission in the final TRC test Order entered on June 23, 2009. The escalator is the Producer Price Index Industry data as of July 14, 2009.

The inclusion of full retail distribution rates as avoided costs has changed the total plan TRC results from 1.96 to 2.39 but this change has no effect on the budgetary program costs nor the stated kWh or KW savings presented in the July 1 filing.

The benefits were then calculated using the measure kWh and kW savings multiplied by the assumed number of measure units¹² and the avoided capacity and energy costs. This value per year was then discounted by taking a Net Present Value (NPV) over the measure life-time using the post-tax weighted average cost of capital (WACC).

On the costs side the TRC test includes the costs of the various programs incurred by the Company and the participating customers, including, equipment, installation, operation, and maintenance costs, cost of removal (less salvage value) for turn-in programs, and administrative costs. The costs are in 2009 dollars and are "as spent" due to the fact that each year's program is evaluated separately by measure and the budgeted number of measure units. Program costs are budgeted by year in 2009 dollars, but operation and maintenance costs are based on measure life and are discounted using NPV back to the program year installed.

As a result, the Company's EE&C Plan is cost-effective based on the TRC test as described above. The results of the TRC test are presented in PUC Table 1 and are expressed as both a net present value and a benefit-cost ratio.

8.2. *Provide data tables (see Tables 7A thru 7E).*

The following tables present the summary TRC results by program, by year, in the five customer class segments outlined in the Commission Act 129 appendices.

¹² Measure Unit refers to participants and/or number of items. The measure units, for example, can be a single customer participant (i.e. a customer get a new CAC system) or a count of lights bulbs as in the CFL rebate program.

**PENNSYLVANIA ELECTRIC COMPANY
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**Tables 1 and 7 to Appendix G
Revised, July 31, 2009**

Appendix G

Table 1: Portfolio Summary of Lifetime Costs and Benefits

Portfolio Summary of Lifetime Costs and Benefits Net Lifetime Benefits, and TRC per the California Standard Practice Manual					
Portfolio	Discount Rate	Total Discounted Lifetime Costs (\$000)	Total Discounted Lifetime Benefits (\$000)	Total Discounted Net Lifetime Benefits (\$000)	Cost- Benefit Ratio
Residential <i>(exclusive of Low-Income)</i>	7.92%	71,442,882	199,580,375	128,137,493	2.79
Residential Low Income	7.92%	472,997	1,991,999	1,519,002	4.21
Commercial/Industrial Small	7.92%	44,102,338	118,206,511	74,104,173	2.68
Commercial/Industrial Large	7.92%	29,014,837	35,310,406	6,295,569	1.22
Governmental/Non-Profit	7.92%	21,487,728	43,257,145	21,769,417	2.01
Total	7.92%	166,520,783	398,346,436	231,825,653	2.39

Table 7A: TRC Benefits Table

Residential													
TRC Benefits By Program Per Year (\$000)													
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity Annual Benefits	Capacity Annual Gen/F&D	Energy Annual Benefits	Energy Annual On/Off Peak	Load Reductions in kW Annual	Load Reductions in kW Lifetime	Energy Annual	MWh Saved Annual	MWh Saved Lifetime
Demand Reduction	2010	0.86	876,536	750,110	852,586	See footnote 1	(102,476)	See footnote 2	978	27,729	47	15,405	15,405
	2011	0.92	12,075,218	11,130,140	12,567,598		(1,437,458)		14,656	27,729	701	15,405	15,405
	2012	0.98	11,599,534	11,334,614	12,728,052		(1,393,438)		27,729	27,729	1,331	15,405	15,405
	2013	0.00	-	-	-		-		27,729	27,729	1,331	15,405	15,405
Home Energy Audits	2010	5.49	457,704	2,512,611	196,258		2,316,352		339	5,283	3,598	394,084	394,084
	2011	6.06	2,037,167	12,344,402	1,023,241		11,321,161		1,987	5,283	20,531	394,084	394,084
	2012	6.31	2,037,167	12,844,726	1,103,291		11,741,434		3,635	5,283	37,463	394,084	394,084
	2013	6.52	2,037,167	13,288,779	1,151,460		12,137,318		5,283	5,283	54,395	394,084	394,084
Appliance Turn-In	2010	6.58	322,225	2,120,009	244,884		1,875,125		419	6,711	2,973	338,108	338,108
	2011	7.12	1,559,151	11,104,524	1,312,281		9,792,242		2,516	6,711	17,836	338,108	338,108
	2012	7.43	1,559,151	11,584,184	1,414,371		10,169,813		4,614	6,711	32,699	338,108	338,108
	2013	7.69	1,559,151	11,983,277	1,475,990		10,507,287		6,711	6,711	47,562	338,108	338,108
EE HVAC	2010	0.99	449,658	447,022	225,035		221,987		301	4,823	318	51,061	51,061
	2011	1.06	2,225,509	2,352,819	1,192,589		1,160,230		1,809	4,823	1,906	51,061	51,061
	2012	1.11	2,225,509	2,466,493	1,270,143		1,196,350		3,316	4,823	3,494	51,061	51,061
	2013	1.15	2,225,509	2,549,018	1,317,492		1,231,526		4,823	4,823	5,082	51,061	51,061
EE Products	2010	3.35	1,192,054	3,990,908	466,860		3,524,048		674	10,431	5,841	653,524	653,524
	2011	3.51	6,012,058	21,112,065	2,409,697		18,702,368		3,926	10,431	35,250	653,524	653,524
	2012	3.65	6,012,058	21,943,657	2,575,060		19,368,597		7,179	10,431	64,659	653,524	653,524
	2013	3.78	6,012,058	22,726,268	2,675,946		20,050,562		10,431	10,431	94,068	653,524	653,524
New Construction	2010	2.41	578,208	1,392,246	624,377		767,869		648	7,776	860	137,775	137,775
	2011	2.55	3,122,921	7,975,661	3,607,104		4,368,557		4,212	7,776	5,590	137,775	137,775
	2012	2.66	3,122,921	8,298,223	3,803,296		4,494,927		7,776	7,776	10,320	137,775	137,775
	2013	0.00	525	-	-		-		7,776	7,776	10,320	137,775	137,775
Whole Building	2010	1.12	425,839	475,617	97,795		377,822		111	526	440	22,973	22,973
	2011	1.19	519,468	618,797	128,770		490,028		249	526	989	22,973	22,973
	2012	1.23	519,468	640,473	136,223		504,250		387	526	1,538	22,973	22,973
	2013	1.27	519,468	658,639	140,897		517,742		526	526	2,088	22,973	22,973
Multiple Family	2010	3.68	14,608	53,782	3,754		50,028		7	115	88	8,764	8,764
	2011	5.84	48,292	282,236	20,229		262,007		43	115	528	8,764	8,764
	2012	6.08	48,292	293,768	21,938		271,830		79	115	967	8,764	8,764
	2013	6.32	48,292	305,066	22,935		282,130		115	115	1,407	8,764	8,764
Total		2.79	71,442,882	199,580,375	54,810,156		144,770,219		63,394	63,394	216,253	1,621,693	1,621,693

1. Generation, Transmission and Distribution Capacity costs are combined in a sum of avoided capacity costs. These costs are then NPV back to the year the measure unit was installed. The combined avoided capacity costs can not be identified by component therefore the total avoided capacity costs for Generation, Transmission and Distribution are displayed here.

2. The on and off peak energy costs are combined in a sum of avoided energy costs. These costs are then NPV back to the year the measure unit was installed. The combined avoided energy costs can not be identified by component therefore the total avoided energy costs for on and off peak energy costs are displayed here.

Table 7B: TRC Benefits Table

Residential Low-Income		TRC Benefits By Program Per Year (\$000)										
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity Annual Benefits	Capacity Annual Gen/T&D	Energy Annual Benefits	Energy Annual On/Off Peak	kW Annual	Lifetime	MWh Saved Annual	Lifetime
Low Income	2010	2.35	80,162	188,037	6,555	See footnote	181,482	See footnote	13	757	316	18,972
	2011	4.25	140,306	596,071	35,325	1 on PUC	560,746	2 on PUC	75	757	1,255	18,972
	2012	4.37	142,836	624,902	38,309	Table 7A	586,593	Table 7A	138	757	2,200	18,972
	2013	5.31	109,693	582,989	40,051		542,938		200	757	3,045	18,972
Total		4.21	472,997	1,991,999	120,240		1,871,759		200	757	3,045	18,972

Table 7C: TRC Benefits Table

Commercial/Industrial Small		TRC Benefits By Program Per Year (\$000)										
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity Annual Benefits	Capacity Annual Gen/T&D	Energy Annual Benefits	Energy Annual On/Off Peak	Load Reductions in kW		MWh Saved	
									Annual	Lifetime	Annual	Lifetime
Energy Audit	2010	4.18	328,687	1,375,343	349,434	See footnote 1 on PUC Table 7A	1,025,909	See footnote 2 on PUC Table 7A	667	10,678	2,363	235,522
	2011	4.37	1,670,794	7,305,866	1,883,152		5,422,714		4,004	10,678	14,177	235,522
	2012	4.61	1,670,794	7,696,948	2,042,243		5,654,705		7,341	10,678	25,991	235,522
2013	4.81	1,670,794	8,033,055	2,135,088		5,897,967		10,678	10,678	37,804	235,522	
Equipment Rebate	2010	2.04	2,771,711	5,666,072	1,743,027		3,923,044		2,193	31,774	6,141	990,603
	2011	2.12	13,335,193	28,300,395	8,395,378		19,905,017		12,053	31,774	35,485	990,603
	2012	2.21	13,335,193	29,451,937	8,915,883		20,536,055		21,914	31,774	64,830	990,603
	2013	2.28	13,335,193	30,376,895	9,242,916		21,133,978		31,774	31,774	94,157	990,603
Multiple Family	2010	1.05	64,853	68,346	14,801		53,545		15	246	54	11,617
	2011	7.34	48,292	354,337	77,735		276,602		92	246	326	11,617
	2012	7.59	48,292	366,390	81,963		284,427		169	246	598	11,617
	2013	7.80	48,292	376,733	84,632		292,101		246	246	870	11,617
Total	2.47	48,328,087	119,372,317	34,966,252		84,406,065		42,697	42,697	132,832	1,237,743	

Table 7D: TRC Benefits Table

TRC Benefits By Program Per Year (\$000)												
Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual	Gen/T&D	Annual	On/Off Peak	Annual	Lifetime	Annual	Lifetime
Equipment Rebate	2010	1.1335	1,365,986	1,548,327	544,346		1,003,981		601	9,617	1,795	335,972
	2011	1.1914	6,846,423	8,156,957	2,863,489		5,293,468		3,607	9,617	10,836	335,972
	2012	1.2411	6,846,423	8,497,182	3,026,298		5,470,884		6,612	9,617	19,877	335,972
	2013	1.2805	6,846,423	8,767,055	3,128,821		5,638,234		9,617	9,617	28,919	335,972
Industrial Motors and VSD	2010	1.8978	256,845	487,445	19,785		467,660		21	329	688	146,970
	2011	2.3617	1,073,849	2,536,141	103,909		2,432,233		123	329	4,128	146,970
	2012	2.4396	1,073,849	2,619,779	109,560		2,510,218		226	329	7,569	146,970
	2013	2.512	1,073,849	2,697,519	113,128		2,584,392		329	329	11,009	146,970
Total		1.39	25,383,647	35,310,406	9,909,336		25,401,070		9,946	9,946	39,928	482,942

Table 7E: TRC Benefits Table

Governmental/Non-Profit Program	Program Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	TRC Benefits By Program Per Year (\$000)						MWWh Saved	
					Capacity Annual Benefits	Capacity Annual Gen/T&D	Energy Annual Benefits	Energy Annual On/Off Peak	Load Reductions in kW Annual	Lifetime		Annual
Governmental & Institutional	2010	1.9335	1,388,362	2,684,407	578,134	See footnote	2,106,273	See footnote	762	11,273	3,520	487,858
	2011	2.081	7,000,838	14,568,800	3,150,589	1 on PUC	11,418,211	2 on PUC	4,626	11,273	21,699	487,858
	2012	2.1687	6,968,057	15,111,677	3,330,080	Table 7A	11,781,597	Table 7A	8,470	11,273	39,860	487,858
	2013	2.0339	4,782,243	9,726,454	2,512,961		7,213,493		11,272	11,273	50,724	487,858
Total		2.09	20,139,501	42,091,338	9,571,764		32,519,574		11,272	11,273	50,724	487,858