

**METROPOLITAN EDISON 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 spark 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 Met-Ed 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 the 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 2.08 to 2.46 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 units<sup>12</sup> 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.

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<sup>12</sup> 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.

**METROPOLITAN EDISON 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**

<b>Portfolio Summary of Lifetime Costs and Benefits</b> 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
<b>Residential</b> <i>(exclusive of Low-Income)</i>	7.52%	85,524,151	224,587,916	139,063,765	2.63
<b>Residential Low Income</b>	7.52%	307,738	1,244,118	936,380	4.04
<b>Commercial/Industrial Small</b>	7.52%	36,387,406	116,028,487	79,641,081	3.19
<b>Commercial/Industrial Large</b>	7.52%	26,276,912	31,109,205	4,832,294	1.18
<b>Governmental/Non-Profit</b>	7.52%	21,639,072	45,751,096	24,112,024	2.11
<b>Total</b>	7.52%	<b>170,135,279</b>	<b>418,720,823</b>	<b>248,585,543</b>	2.46

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/USD	Energy Annual Benefits	Energy Annual On/Off Peak	Load Reductions in kW		MWh Saved	
									Annual	Lifetime	Annual	Lifetime
<b>Demand Reduction</b>	2010	0.86	3,106,248	2,656,011	2,405,425	See footnote 1	250,587	See footnote 2	3,464	30,368	169	16,829
	2011	0.92	12,116,433	11,149,150	10,135,635		1,013,515		17,194	30,368	824	16,829
	2012	0.98	11,677,385	11,394,404	10,392,216		1,002,188		30,368	30,368	1,455	16,829
	2013	0.00	-	-	-		-		30,368	30,368	1,455	16,829
<b>Home Energy Audits</b>	2010	5.60	489,736	2,740,072	147,371		2,592,701		322	5,086	3,837	477,488
	2011	6.08	2,289,869	13,927,342	788,213		13,139,130		1,910	5,086	22,492	477,488
	2012	6.32	2,289,869	14,469,989	861,004		13,608,985		3,498	5,086	41,148	477,488
	2013	6.53	2,289,869	14,957,362	903,124		14,054,238		5,086	5,086	59,803	477,488
<b>Appliance Turn-In</b>	2010	6.50	469,338	3,052,549	286,859		2,765,690		620	9,926	4,418	502,229
	2011	6.97	2,294,715	16,004,344	1,555,668		14,448,676		3,722	9,926	26,506	502,229
	2012	7.28	2,294,715	16,707,063	1,698,313		15,008,750		6,824	9,926	48,595	502,229
	2013	7.53	2,294,715	17,289,471	1,780,960		15,508,511		9,926	9,926	70,683	502,229
<b>EE HVAC</b>	2010	1.20	1,179,047	1,414,024	485,780		928,244		836	13,374	1,163	181,817
	2011	1.27	5,872,453	7,444,275	2,601,680		4,842,595		5,015	13,374	6,980	181,817
	2012	1.33	5,872,453	7,791,333	2,801,016		4,990,317		9,195	13,374	12,797	181,817
	2013	1.37	5,872,453	8,050,317	2,918,227		5,132,090		13,374	13,374	18,614	181,817
<b>EE Products</b>	2010	3.08	1,099,851	3,389,935	419,918		2,970,016		723	11,033	4,820	553,255
	2011	3.23	5,471,502	17,677,380	2,149,492		15,527,887		4,159	11,033	28,848	553,255
	2012	3.36	5,471,502	18,387,724	2,314,649		16,073,074		7,596	11,033	52,877	553,255
	2013	3.48	5,471,502	19,036,719	2,412,363		16,624,356		11,033	11,033	76,905	553,255
<b>New Construction</b>	2010	2.35	464,667	1,090,297	398,642		691,654		518	6,221	688	110,220
	2011	2.50	2,498,442	6,248,953	2,319,306		3,929,647		3,370	6,221	4,472	110,220
	2012	2.60	2,498,442	6,504,369	2,463,795		4,040,574		6,221	6,221	8,256	110,220
	2013	0.00	525	-	-		-		6,221	6,221	8,256	110,220
<b>Whole Building</b>	2010	1.09	425,839	462,560	77,952		384,608		111	526	440	22,973
	2011	1.16	519,468	602,191	103,443		498,748		249	526	989	22,973
	2012	1.20	519,468	623,538	110,336		513,202		387	526	1,538	22,973
	2013	1.23	519,468	641,350	114,482		526,868		526	526	2,088	22,973
<b>Multiple Family</b>	2010	3.52	14,277	50,268	2,858		47,411		7	111	85	8,461
	2011	5.66	46,634	264,081	15,621		248,460		42	111	509	8,461
	2012	5.90	46,634	275,057	17,176		257,881		76	111	934	8,461
	2013	6.13	46,634	285,788	18,062		267,726		111	111	1,358	8,461
<b>Total</b>		<b>2.63</b>	<b>85,524,151</b>	<b>224,587,916</b>	<b>52,699,588</b>		<b>171,888,328</b>		<b>76,644</b>	<b>76,644</b>	<b>239,162</b>	<b>1,873,273</b>

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	Load Reductions in		MW/h Saved	
									Annual	Annual		Annual
Low Income	2010	2.12	55,254	117,387	3,341	See footnote 1 on PUC Table 7A	114,046	See footnote 2 on PUC Table 7A	8	485	204	12,224
	2011	4.11	90,655	372,895	18,263	1 on PUC Table 7A	354,632		49	485	810	12,224
	2012	4.25	91,920	390,503	20,081		370,422		89	485	1,420	12,224
	2013	5.20	69,909	363,332	21,117		342,215		129	485	1,962	12,224
<b>Total</b>		<b>4.04</b>	<b>307,738</b>	<b>1,244,118</b>	<b>62,802</b>		<b>1,181,316</b>		<b>129</b>	<b>485</b>	<b>1,962</b>	<b>12,224</b>

Table 7C: TRC Benefits Table

Commercial/Industrial Small		TRC Benefits By Program Per Year (\$000)										
Program	Year	TRC	Program Costs (\$000)	Program Benefits (\$000)	Capacity		Energy		Load Reductions in kW		MWh Saved	
					Annual Benefits	Gen/T&D	Annual Benefits	On/Off Peak Annual	Annual	Lifetime	Annual	Lifetime
Energy Audit	2010	2.55	333,543	850,249	165,620	See footnote	684,629	See footnote	401	6,418	1,420	141,574
	2011	3.04	1,484,475	4,511,013	905,351	1 on PUC	3,605,662	2 on PUC	2,407	6,418	8,522	141,574
	2012	3.20	1,484,475	4,748,350	995,488	Table 7A	3,752,863	Table 7A	4,413	6,418	15,623	141,574
	2013	3.34	1,484,475	4,952,888	1,046,849		3,906,039		6,418	6,418	22,725	141,574
Equipment Rebate	2010	2.66	2,309,041	6,152,015	1,500,638		4,651,377		2,550	36,306	6,439	1,012,858
	2011	2.77	11,004,192	30,434,573	7,113,267		23,321,306		13,802	36,306	37,074	1,012,858
	2012	2.88	11,004,192	31,688,842	7,631,017		24,057,825		25,054	36,306	67,709	1,012,858
	2013	2.97	11,004,192	32,690,557	7,942,343		24,748,214		36,306	36,306	98,327	1,012,858
Multiple Family	2010	1.02	62,787	64,194	11,405		52,789		15	237	53	11,216
	2011	7.14	46,634	332,977	60,322		272,656		89	237	315	11,216
	2012	7.39	46,634	344,432	64,079		280,352		163	237	578	11,216
	2013	7.60	46,634	354,222	66,350		287,873		237	237	840	11,216
<b>Total</b>		<b>2.91</b>	<b>40,311,275</b>	<b>117,124,312</b>	<b>27,502,727</b>		<b>89,621,585</b>		<b>42,961</b>	<b>42,961</b>	<b>121,892</b>	<b>1,165,648</b>

Table 7D: TRC Benefits Table

Commercial/Industrial Large		TRC Benefits By Program Per Year (\$000)											
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	1.1805	1,213,362	1,432,384	437,093	See footnote 1 on PUC	995,292	587	9,385	1,458	303,364		
	2011	1.2175	6,423,233	7,820,504	2,313,735	See footnote 1 on PUC	5,506,769	3,520	9,385	9,248	303,364		
	2012	1.2673	6,423,233	8,139,862	2,461,443	See footnote 1 on PUC	5,678,419	6,453	9,385	17,039	303,364		
	2013	1.3065	6,423,233	8,391,733	2,550,591	See footnote 1 on PUC	5,841,141	9,385	9,385	24,829	303,364		
Industrial Motors and VSD	2010	1.7848	174,612	311,640	9,279	Table 7A	302,361	12	193	420	89,703		
	2011	2.4443	662,683	1,619,773	49,077	Table 7A	1,570,696	72	193	2,520	89,703		
	2012	2.5233	662,683	1,672,178	52,135		1,620,044	133	193	4,620	89,703		
2013	2.5972	662,683	1,721,132	53,982		1,667,151	193	193	6,719	89,703			
<b>Total</b>		<b>1.37</b>	<b>22,645,722</b>	<b>31,109,205</b>	<b>7,927,334</b>		<b>23,181,872</b>	<b>9,579</b>	<b>9,579</b>	<b>31,548</b>	<b>393,067</b>		

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)							
					Capacity Annual Benefits	Capacity Annual Gen/T&D	Energy Annual Benefits	Energy Annual On/Off Peak	Load Reductions in kW Annual	Lifetime	MWh Saved Annual	Lifetime
Governmental & Institutional	2010	1.9971	1,402,839	2,801,619	508,161	See footnote	2,293,458	See footnote	850	12,452	3,425	494,579
	2011	2.1253	7,100,288	15,089,959	2,712,335	1 on PUC	12,377,624	2 on PUC	5,036	12,452	21,088	494,579
	2012	2.2131	7,067,508	15,640,809	2,892,254	Table 7A	12,748,555	Table 7A	9,201	12,452	38,722	494,579
	2013	2.2034	5,048,104	11,122,884	2,318,883		8,804,000		12,451	12,452	50,415	494,579
<b>Total</b>		<b>2.17</b>	<b>20,618,739</b>	<b>44,655,271</b>	<b>8,431,634</b>		<b>36,223,637</b>		<b>12,451</b>	<b>12,452</b>	<b>50,415</b>	<b>494,579</b>