

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Petition of PPL Electric Utilities for
Approval of its Energy Efficiency and Conservation Plan
Under Act 129 of 2008**

Docket No. M-2009-2093216

PPL Electric Utilities Corporation

Statement No. 2 –S

Supplemental Direct Testimony of M. Hossein Haeri, PhD.

Date: July 31, 2009

1 **Supplemental Direct Testimony of M. Hossein Haeri, PhD.**

2 **Q. Please state your full name and business address.**

3 A. My Name is Hossein Haeri, and my business address is 720 SW Washington Street,
4 Portland, OR 97205.

5
6 **Q. On whose behalf are you presenting testimony in this proceeding?**

7 A. I am testifying on behalf of PPL Electric Utilities Corporation (“PPL Electric” or the
8 “Company”).

9
10 **Q. Have you previously submitted testimony in this proceeding?**

11 A. Yes. I submitted Direct Testimony (PPL Electric Statement No. 2) in support of PPL
12 Electric’ petition for approval of its Energy Efficiency and Conservation Plan under Act
13 129 of 2008 (Docket No. M-2009-2093216).

14
15 **Q. What is the purpose of your supplemental direct testimony?**

16 A. The purpose of my testimony is to support and provide supplemental information
17 regarding PPL Electric’s amended Act 129 Energy Efficiency and Conservation Plan
18 (“EE&C Plan”). The amended filing revises the initial estimates of Total Resource Cost
19 (“TRC”) reported in the Company’s July 1, 2009 based upon the Pennsylvania Public
20 Utility Commission’s (“Commission”) June 23, 2009 Order regarding Implementation of
21 Act 129 of 2008 – Total Resource Cost (TRC) Test, Docket No. M-2009-2108601.

22
23 **Q. Are you sponsoring any exhibits in the filing?**

1 A. Yes. I am sponsoring PPL Electric's Amended EE&C Plan, which has been identified as
2 PPL Electric Exhibit No. 1 - Amended. Within that exhibit, I am primarily responsible
3 for and am sponsoring all revisions to the data in Sections 2, 3 and 8. The remainder of
4 PPL Electric's initial EE&C Plan, which was identified as PPL Electric Exhibit No. 1,
5 remains unchanged and the sponsoring witnesses remain the same.

6
7 **Q. What was your role in preparation of PPL Electric's initial and revised TRC**
8 **calculations?**

9 A. I —and the staff of The Cadmus Group working under my direct supervision— carried
10 out all calculations in accordance with our understanding of the guidelines established in
11 the Commission's original January 16, 2009 Implementation Order and subsequent
12 revisions in the June 23, 2009 TRC Order.

13
14 **Q. Please explain the reason for revisions to TRC calculations.**

15 A. The TRC calculations in the initial filing were based on the methods and assumptions set
16 forth in the Commission's January 16, 2009 Implementation Order. The amended TRC
17 calculations reflect changes in avoided costs and their effect on TRC benefit-to-cost
18 ratios based on the revised methodology for calculating avoided costs as outlined in the
19 Commission's June 23, 2009 Order regarding Implementation of Act 129 of 2008 – Total
20 Resource Cost (TRC) Test (Docket No. M-2009-2108601).

21
22 **Q. How did the methodology and assumptions for calculating avoided costs change**
23 **between the initial January 15, 2009 Order and the June 23, 2009 Order and what**

1 **effect did these changes have on the TRC benefit-to-cost ratios in the PPL Electric's**
2 **EE&C portfolio?**

3 A. Changes in the TRC were entirely the result of revised avoided electricity supply costs,
4 including reductions in transmission, distribution, and generation (including capacity)
5 ("GTD") costs. These GTD costs constitute the basis for determining the monetary
6 value of energy and capacity savings resulting from implementation of the EE&C Plan.
7 The revised methodology for calculating avoided costs in the Commission's June 23,
8 2009 Order changed the initial methodology in four components of avoided costs: 1)
9 generation price assumptions in each of the first, second and third 5-year periods for
10 fifteen years, 2) treatment of gross receipts taxes, 3) calculation of transmission charges,
11 and 4) valuation of avoided capacity. Specific changes in each of these areas are
12 summarized in PPL Electric Exhibit MHH-1.

13
14 **Q. How did the revised methodology affect the TRC calculations?**

15 A. The attached PPL Electric Exhibit MHH-2 shows a comparison of the initial and revised
16 avoided costs for the small commercial and industrial, large commercial and industrial,
17 and the residential customer sectors. As can be seen, the revised mythology caused the
18 avoided costs to decrease during the first five years and to increase during the second and
19 third five years on average for all three customer sectors.

20
21 **Q. What was the effect of the revised avoided cost calculations on the economic**
22 **performance of PPL Electric's portfolio as measured by the TRC benefit-cost**
23 **ratios?**

1 A. The revised methodology led on average to an increase in avoided costs over the 15-year
2 period, hence increasing the monetary benefits of the portfolio and improving its
3 economic performance. The effects of revisions in avoided costs on the benefit-to-cost
4 ratios for individual programs in PPL Electric's portfolio and the portfolio as a whole are
5 shown in PPL Electric Exhibit MHH-3. As shown, the TRC results improved for all
6 programs in the portfolio. In fact, the TRC benefit-cost ratio for the entire portfolio
7 improved by approximately 12 percent, increasing from about 2.7 to slightly over 3.0 on
8 average across all programs.

9
10 **Q. Are there any additional changes in specific assumptions that may have an effect on**
11 **the TRC benefit-cost calculations?**

12 A. Since the initial filing of PPL Electric's EE&C Plan on July 1, 2009, new data became
13 available indicating an error in the determination of line-loss factors used in calculating
14 the source energy savings of the portfolio. In its initial filing, the Company had used the
15 same line-loss factor of 8.52 percent for the residential, small commercial and industrial
16 and large commercial and industrial sectors. As shown in Table 1, the correct line loss
17 factors are 8.33 percent in the residential and small commercial and industrial sectors and
18 4.12 percent in the large commercial and industrial sector.

19 Further analysis indicated the revised line-loss factors resulted in decreasing the
20 portfolio's TRC benefit-cost ratio by no more than 2 percent. Given this negligible
21 effect, the Company did not incorporate these changes in its revised TRC calculations.

22 This approach ensures a direct comparison of TRC calculations between the initial and

1 amended filings resulting solely from changes in the Commission's revised methodology
2 for calculating avoided costs.

3
4 **Table 1: Initial and Revised Line-Loss Factors**

Line-Loss Calculation	Residential	Small Commercial and Industrial	Large Commercial and Industrial
Original and Amended Filings	8.52%	8.52%	8.52%
Updated	8.33%	8.33%	4.12%

5
6
7
8 **Q. Does this conclude your supplemental direct testimony?**

9 **A. Yes.**

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Exhibit MHH-1

Summary of Changes to Avoided Cost Components

PPL Electric Exhibit MHH-1: Summary of Changes to Avoided Cost Components

Component	Initial Filing	Amended Filing
Generation Prices – first 5-year period	NYMEX values obtained June 2, 2009. Missing on-peak values for 2014 were estimated by adjusting 2014 off-peak prices by the ratio of 2013 on-peak to off-peak prices.	NYMEX prices from May 28, 2009
Generation Prices – second 5-year period	EIA AEO low-price case costs.	NYMEX gas prices from May 28, 2009 adjusted as directed in Order.
Generation Prices – third 5-year period	EIA AEO low-price case costs.	EIA AEO low-price case costs(no adjustment).
Transmission (including ancillary charges) and Distribution Prices	Transmission and distribution prices in the original filing were not escalated.	Transmission and distribution prices in the amended filing are escalated after 2010 using the U.S. Bureau of Labor and Statistics (BLS) industry index for Electric Power Generation.
Gross Receipts Tax	5.9%	Removed in accordance with the Order.
Capacity Costs – first and second 5-year periods	PJM base residual auction results are used through 2012. After 2012, prices were escalated using the consumer price index of 2.1%.	PJM base residual auction results are used through 2012. After 2012, prices were escalated using the U.S. Bureau of Labor and Statistics (BLS) industry index for Electric Power Generation of 8.45%.
Capacity Costs – third 5-year period	PJM base residual auction results are used through 2012. After 2012, prices were escalated using the consumer price index of 2.1%.	Assumed to be a component in the EIA AEO low-price case generation costs.

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Exhibit MHH-2

Comparison of the Initial and Revised Avoided Costs

PPL Electric Exhibit MHH-2: Comparison of the Initial and Revised Avoided Costs

<i>Program Year</i>	Small Commercial and Industrial		Large Commercial and Industrial		Residential	
	<i>Original Filing</i>	<i>Amended Filing</i>	<i>Original Filing</i>	<i>Amended Filing</i>	<i>Original Filing</i>	<i>Amended Filing</i>
Year 1	\$65.47	\$60.21	\$54.87	\$50.24	\$81.08	\$74.89
Year 2	\$73.85	\$62.88	\$63.25	\$52.56	\$89.46	\$78.08
Year 3	\$76.33	\$71.55	\$65.73	\$60.36	\$91.94	\$88.04
Year 4	\$77.97	\$76.72	\$67.29	\$64.58	\$93.71	\$94.59
Year 5	\$79.61	\$80.39	\$68.70	\$67.23	\$95.68	\$99.77
Year 6	\$81.50	\$116.86	\$70.65	\$102.59	\$97.50	\$137.88
Year 7	\$83.77	\$119.71	\$73.17	\$104.24	\$99.37	\$142.51
Year 8	\$86.56	\$122.80	\$75.97	\$106.02	\$102.17	\$147.53
Year 9	\$89.72	\$125.95	\$79.12	\$107.75	\$105.33	\$152.76
Year 10	\$92.89	\$129.31	\$82.30	\$109.58	\$108.50	\$158.39
Year 11	\$95.99	\$107.62	\$85.40	\$86.22	\$111.60	\$139.16
Year 12	\$98.62	\$112.83	\$88.03	\$89.62	\$114.23	\$147.03
Year 13	\$100.98	\$118.02	\$90.39	\$92.85	\$116.59	\$155.10
Year 14	\$103.60	\$123.70	\$93.01	\$96.41	\$119.21	\$163.92
Year 15	\$105.99	\$129.43	\$95.40	\$99.83	\$121.60	\$173.05
Year 16	\$105.99	\$135.57	\$95.40	\$103.47	\$121.60	\$182.87
Year 17	\$105.99	\$142.41	\$95.40	\$107.60	\$121.60	\$193.70
Year 18	\$105.99	\$149.33	\$95.40	\$111.59	\$121.60	\$204.96

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Exhibit MHH-3

Comparison of TRC Benefit-Cost Ratios

PPL Electric Exhibit MHH-3: Comparison of TRC Benefit-Cost Ratios

Program	Customer Sector	Original Filing	Amended Filing
Efficient Equipment Incentive Program	Residential	2.19	2.61
Energy Assessment & Weatherization Program	Residential	1.00	1.23
Compact Fluorescent Lighting Campaign	Residential	4.16	4.83
Appliance Recycling Program	Residential	7.96	9.85
ENERGY STAR® New Homes	Residential	1.08	1.38
Renewable Energy Program	Residential	1.25	1.52
Direct Load Control Program	Residential	0.96	0.97
Time of Use Rates	Residential	3.56	3.63
Energy Efficiency Behavior & Education	Residential	3.28	3.66
Low-income WRAP	Low-Income	0.64	0.79
E-Power Wise	Low-Income	1.19	1.42
Compact Fluorescent Lighting Campaign	Low-Income	4.09	4.75
Direct Load Control Program	Low-Income	0.96	0.97
Time of Use Rates	Low-Income	3.55	3.62
Efficient Equipment Incentive Program	Small Commercial and Industrial	2.81	3.33
Compact Fluorescent Lighting Campaign	Small Commercial and Industrial	3.81	4.37
Commercial and Industrial Custom Incentive Program	Small Commercial and Industrial	2.56	3.02
HVAC Tune-up Program	Small Commercial and Industrial	5.44	5.84
Direct Load Control Program	Small Commercial and Industrial	0.95	0.97
Time of Use Rates	Small Commercial and Industrial	3.15	3.21
Efficient Equipment Incentive Program	Large Commercial and Industrial	2.78	3.11
Commercial and Industrial Custom Incentive Program	Large Commercial and Industrial	2.08	2.32
Load Curtailment Program	Large Commercial and Industrial	2.81	2.90
Efficient Equipment Incentive Program	Government/Non-Profit	2.51	2.96
Commercial and Industrial Custom Incentive Program	Government/Non-Profit	2.62	3.08
HVAC Tune-Up Program	Government/Non-Profit	5.57	5.97
Renewable Energy Program	Government/Non-Profit	0.89	1.09
Direct Load Control Program	Government/Non-Profit	0.93	0.95
Time of Use Rates	Government/Non-Profit	3.18	3.24
Load Curtailment	Government/Non-Profit	2.89	3.01