

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Energy Efficiency and)	
Peak Demand Reduction Program)	Case No. 13-1185-EL-EEC
Portfolio Status Report of the Ohio)	13-1186-EL-EEC
Edison Company, the Toledo Edison)	13-1187-EL-EEC
Company, and the Cleveland Electric)	
Illuminating Company.)	

**COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL, THE OHIO
ENVIRONMENTAL COUNCIL AND THE ENVIRONMENTAL LAW
AND POLICY CENTER**

Pursuant to Ohio Administrative Code 4901:1-39-06, the Natural Resources Defense Council, the Ohio Environmental Council and the Environmental Policy and Law Center submit the following comments in regard to the Energy Efficiency and Peak Demand Reduction Program Portfolio Status Report to the Public Utilities Commission of Ohio for the period January 1, 2012 to December 31, 2012 ("Report") of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company ("Companies").

I. The Companies should supplement their filing because they fail to address or employ evaluator recommendations to improve programs.

The energy efficiency program evaluation has two main purposes: 1. Determining the energy and demand savings of programs, known as impact evaluation, and; 2. Recommending improvements and changes to programs, known as process evaluation. ADM Associates' performed both impact and process evaluations of the Companies' 2012 energy efficiency programs. However, it does not appear that the Companies have employed or are planning to employ the evaluator's recommendations to improve

programs. The Companies mention no program modifications in their report, even though the evaluators made dozens of recommendations to improve programs. Some recommendations that merit consideration include:¹

- Cross promote the Appliance Turn-In program with other rebate or home audit programs;
- Further develop retailer partnerships in the Appliance Turn-In program and add metrics to measure progress;
- Offer more incentives directly to program partners in the Energy Efficient Products Program;
- Create time-limited special promotions to make best use of HVAC incentives in the Energy Efficient Products Program;
- Examine low incentive levels in the Residential Energy Audit Program;
- Consider bundling Energy Star Window rebates with rebates for other measures to get deeper savings in the Residential Energy Audit Program;
- Consider a tiered incentive program (higher incentives for higher savings) to increase participation and savings in the Residential New Construction Program;
- Streamline the participation process for the C/I Energy Efficiency Incentive Programs;
- Include the savings calculations used to estimate savings from motors and drives projects in the project documentation.

¹ All recommendations are from the “Recommendations” section of each program evaluation (See: The Companies’ filing and related Appendices).

The Companies have omitted an administrative code requirement. Ohio Administrative Code 4901:1-39-05(C)(2)(c) states that each utility must include “a recommendation for whether each program should be continued, modified, or eliminated.” Because this requirement is not fulfilled, neither the Commission nor the interested parties will be able to determine if the Companies are using ADM Associates’ evaluations to improve programs. Therefore, the Commission should require the Companies to supplement their report with a document detailing the Companies’ response to each recommendation.

II. Compact Fluorescent Lamp Distribution Program

- a. The Commission should adjust savings calculations downward and decrease lost revenues collected by the Companies because ADM Associates overstates ex-ante savings from the program.**

ADM Associates states it calculated ex-ante savings using the residential CFL “time of sale” formula in the TRM “and the ex post results obtained from the 2011 M&V analysis.”² However, ADM did not consistently use ex-post results from 2011, ignoring the fact that its 2011 evaluation found that customers insert most of the 23-Watt CFLs in sockets that held less-than-100W incandescents. In addition, ADM used a delta watts multiplier that conflicts with Ohio Rule. Both of these mistakes have the effect of overstating the savings that the Companies could reasonably expect to claim pre-program.

To calculate ex ante savings from the program, ADM Associates uses the same delta watts multiplier they used in the 2011 M&V Study, despite two pieces of information the Companies possessed as they implemented the CFL Distribution Program in 2012:

² Appendix G, Evaluation at 6.

- New Federal energy efficiency standards made the manufacture or importation of 100-Watt incandescent light bulbs illegal beginning January 1, 2012³
- The TRM delta watts multiplier assumes that an efficient light bulb replaces a less-efficient light bulb of roughly the same lumen output: a 23 Watt CFL replaces a 100 Watt incandescent. However, ADM Associates 2011 M&V Study found that “63% of the new CFLs replaced incandescent light bulbs of 75 Watts or less and approximately 37% of the new CFLs replaced incandescent light bulbs of 100 Watts or more.”⁴

To calculate ex ante savings, ADM Associates should have considered this readily available information and modified the delta watts multiplier used in the 2011 M&V Study. ADM claims there is no need to change the delta watts multiplier to take into account federal energy efficiency standards because, “Through an extensive study of retail stores, ADM determined that the 100W incandescent bulb was available throughout 2012 so the delta watts multiplier of 3.25, used in 2011 was suggested for ex ante calculations.” This is not supportable for two reasons: 1. It is counter to Ohio rule, and; 2. It relies on data and assumptions that are not cited or shared.

Ohio Administrative Code 4901:1-39-05(H) states: “[A]n electric utility shall not count in meeting any statutory benchmark the adoption of measures that are required to comply with energy performance standards set by law or regulation, including but not limited to, those embodied in the Energy Independence and Security Act of 2007, or an applicable building code.”

³ H.R. 6 (110th), Section 321(a)(3), Energy Independence and Security Act of 2007 (“EISA”).

⁴ ADM Associates, Appendix E, Evaluation of the 2011 Compact Fluorescent Lamp (CFL) Program, May 14, 2012, Page 19.

ADM's use of the same delta watts multiplier in 2012 as used in 2011 would allow the Companies to take credit for energy savings that are required by the aforementioned Energy Independence and Security Act of 2007. This is plainly contrary to Ohio rule. Moreover, ADM Associates share nothing about the "extensive study of retail stores" that they use to justify their delta watts assumption. The plain language of the rule requires that ADM use the EISA Standard (72 Watts) as a baseline for 100 Watt-equivalent-to-23 Watt replacements in 2012.

Also, ADM Associates made a mistake in not modifying the delta watts multiplier to take into account information contained in the 2011 evaluation about the actual wattage of the bulbs that the Companies' 23 Watt CFLs were replacing. ADM Associates 2011 M&V Study found that "63% of the new CFLs replaced incandescent light bulbs of 75 Watts or less and approximately 37% of the new CFLs replaced incandescent light bulbs of 100 Watts or more."⁵ ADM Associates should have used this information to create an "average delta watts multiplier" to create a more accurate 2012 ex ante calculations of savings. Using the non-adjusted multiplier results in the Companies receiving savings credit *and lost revenues from its customers* for illusory savings. As demonstrated below, these items must be adjusted.

An "average delta watts multiplier" can be constructed first from the average baseline wattage: The average bulb that the Company's 23 Watt CFLs were replacing. If 37% of the Companies' bulbs replace 72 Watt EISA-Compliant incandescents and 63% of the Companies' bulbs replace 75 Watt incandescents, the average baseline

⁵ADM Associates, Appendix E, Evaluation of the 2011 Compact Fluorescent Lamp (CFL) Program, May 14, 2012

wattage in 2012 was 73.9.⁶ Using the ratio of this average baseline wattage to the replacement wattage of 23 Watts, and subtracting 1, as shown in the Draft Ohio TRM,⁷ the 2012 ex-ante average delta watts is equal to 2.21. ADM Associates should have used this for “delta watts” (instead of 3.25) in its ex ante estimates of annual savings. Using this delta watts multiplier, the expected annual savings per-CFL is 44.163 kWh (instead of 65.108 kWh), using the calculation shown in section 4.3.1 of the evaluation. Ex ante savings from the CFL program, based on the information shown in Appendix An of the evaluation, should thus have been:

Utility	CFLs Distributed	Ex ante kWh Unit Impact, uncorrected	Ex ante kWh Unit Impact, Corrected	Ex Ante kWh Impact, Total, uncorrected	Ex Ante kWh Impact, Total, Corrected
OE	393,361	65.108	44.163	27,087,572	17,372,002
CEI	390,112	65.108	44.163	27,363,819	17,228,516
TE	109,397	65.108	44.163	7,618,257	4,831,300
Total	892,870			62,069,648	39,431,818

These mistakes should be corrected. The Commission should adjust this number as demonstrated above. The Companies should make the appropriate adjustments in their charges to customers for lost revenue.

b. The lifetime savings for the CFL program should be adjusted because ADM Associates overstates lifetime savings from the program.

To calculate lifetime savings from the program, ADM Associates multiplies ex post annual kWh savings by 8 years, as shown in Section 5.1.2. This is incorrect, because it uses the same delta watts multiplier in years 2013-2019 as used in 2012,

⁶ $(37 \times 72 + 63 \times 75) / 100 = 73.9$

⁷ PUCO Case No. 09-512-EL-UNC; Vermont Energy Investment Corporation, 2010 Ohio Technical Reference Manual at page 12, footnote 6, (August 6, 2010).

even though the baseline wattage – what customers would have installed had they not installed the Companies' CFL – will be lower in these years (72 Watts) than ADM found in 2012 (74.27). This should also be adjusted downward.

III. The Commission should not accept the savings as presented for the Home Energy Analyzer Program.

Unfortunately, ADM Associates uses the same methodology to evaluate the Home Energy Analyzer Program that they used last year: They compare the difference in energy use pre- and post-program of program participants to a “control group” of non-participants. The program likely saved some energy, but the current evaluation design is prone to self-selection bias. The Commission should not accept savings from this program until it is evaluated using a variation in adoption method.

a. The control group was not valid.

The program evaluation does not conform to best practice for measuring the impact of behavior-based energy efficiency programs (those that use strategies intended to affect customer energy use behaviors to achieve energy and peak demand savings). A recent report from the State and Local Energy Efficiency Action Network, prepared by scientists at the Lawrence Berkeley National Laboratory, states that:

“Because behavior-based programs do not specify, and generally cannot track, particular actions that result in energy savings, the impact evaluation of a behavior-based program is best done by measuring the actual energy use of program and non-program participants using a randomized controlled trial (RCT), and using the data to calculate an estimate of energy savings.... In cases for which RCTs are not feasible,

quasi-experimental approaches can be used, although these are typically less reliable.”⁸

In evaluating the savings from behavior-based energy efficiency programs, the true savings is the difference between the amount of energy used by program participants and what this same group of participants *would have used* without the program (the counterfactual). However, we cannot observe this counterfactual. Instead, we compare the change in energy use of the program participants (the treatment group) with the change in energy use of members of a control group. The variations in changes in energy use between the treatment and control group will be attributable to the impact of the program, pre-existing differences between households in the participant group and the control group (bias), and inherent randomness.

The Gold Standard of evaluation for behavior-based energy efficiency programs is thus a Randomized Controlled Trial (“RCT”). RCTs eliminate the possibility that program participants would have changed energy use behaviors without the program. OPower – an opt-out behavioral energy efficiency program – is routinely evaluated using a RCT approach (see AEP-Ohio’s Home Energy Comparison Report Program). It is also possible to design opt-in programs like the Companies’ Home Energy Audit Program as RCTs. A subset of customers who choose to participate in the program can act as the control group (receiving no program) and the change in energy use between the two groups can be compared. If a utility does not want to deny the program to some who want it, the utility can adopt a RCT with Encouragement design, where the control

⁸ Todd, A., Stuart, E., Schiller, S., and Goldman, C., “Evaluation, Measurement, and Verification (EM&V) of Residential Behavior-Based Energy Efficiency Programs: Issues and Recommendations,” Customer Information and Behavior Working Group, Evaluation, Measurement, and Verification Working Group, State and Local Energy Efficiency Action Network, United States Department of Energy, May 16, 2012, Page 2.

group is able to opt-in to the program but is not *encouraged* to join the program (by not targeting marketing to the control group, for example).

But instead of using any of the above approaches, ADM Associates compared the difference in energy use among the participants with the difference in energy use in a control group made up of a “random sample of customers who did not participate in the HEA program” supplied by the Companies.⁹ This “random sample of customers,” the control group, could have been very different than participating customers. As stated in the LBNL report, “if households that opt-in are compared with a control group of households that did not opt in, then these two groups contain very different types of households, which can result in selection bias and potentially invalid results.”¹⁰

b. The Commission’s independent evaluator should evaluate the 2011 Home Energy Audit Program using a valid control group.

The energy and demand savings determined by ADM should not be used toward compliance with the Companies’ 2012 statutory energy efficiency and peak demand reduction obligations. The evaluation contains potentially invalid results, as described above. The Commission should, however, attempt to determine the impact of the program and credit the Companies for a valid measure of savings. The Companies incurred costs to run the program, and it likely led to some energy savings for customers. To determine these savings, the Commission should use its independent evaluator to measure the impact of the program using a valid control group. We recommend the evaluator use the Variation in Adoption with Test of Assumptions method to evaluate the 2011 program. This method takes advantage of the fact that customers participate in a program at different times of the year. “This allows for the

⁹ Appendix F, Evaluation at 4-4.

¹⁰ Appendix F, Ibid 7 at 14.

comparison of the energy usage of households that opt in to the energy usage of households that have not yet opted in but will ultimately opt in at a later point.”¹¹ The assumption of this method is that those who participate early in a program year are the same type of households as those who participate later in the year, the only difference being when they received program marketing. Regardless of the method chosen by the evaluator, the Commission should not accept results of the program until the program is shown to have saved energy using a valid control group. If the new evaluation does not reject the null hypothesis (i.e., that the program saved no energy), the Commission should order the program terminated.

IV. The Companies must demonstrate how savings from the Commercial and Industrial Energy Efficiency Incentive Programs were calculated.

The Commission should not accept ex ante savings estimates from the Companies’ Motors and Drives Program toward its 2012 energy efficiency obligations because the Companies are unable to show how these claimed savings were calculated. The realization rate (the percentage of the Companies’ claimed savings that were verified) from these projects was only 47%,¹² and the largest sampled project had a realization rate of 1%:¹³ only 1% of the claimed savings materialized. The evaluator was unable to assess why ex-ante estimates diverged so much from realized savings: “ADM staff noted that the project documentation did not include the calculations used to estimate ex ante savings for many for the completed projects. Without calculations it was difficult to determine specifically why the realization rate was low for the projects

¹¹ Ibid 7 at 17.

¹² Appendix J, Evaluation at Table 1-2.

¹³ Appendix J, Evaluation at Table 5-8.

completed.”¹⁴ The Commission should not accept unjustified ex ante savings estimates toward the Companies’ 2012 energy efficiency obligations. Instead, the Commission should use ex post savings estimates this year, and require the Companies to implement the evaluator’s recommendation that project documentation include savings calculations.

V. Conclusion

The Natural Resources Defense Council, the Ohio Environmental Council and the Environmental Policy and Law Center respectfully request the Public Utilities Commission of Ohio consider and adopt the recommendations in these submitted comments.

Respectfully Submitted,

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¹⁴ Evaluation at Summary and Conclusions 3.

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CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing *Comments* has been filed with the Public Utilities Commission of Ohio and has been served upon the following parties via electronic mail on June 14, 2013.

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Summary: Comments electronically filed by Mr. Christopher J Allwein on behalf of Natural Resources Defense Council and Environmental Law and Policy Center and Ohio Environmental Council