

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of Ohio)	
Edison Company, The Cleveland Electric)	
Illuminating Company, and The Toledo)	Case Nos.12-2190-EL-POR
Edison Company For Approval of Their)	12-2191-EL-POR
Energy Efficiency and Peak Demand)	12-2192-EL-POR
Reduction Program Portfolio Plans for 2013)	
through 2015)	

**OBJECTIONS TO THE PLANS AS FILED
BY THE
NATURAL RESOURCES DEFENSE COUNCIL
AND THE
SIERRA CLUB**

Christopher J. Allwein, Counsel of Record
Williams, Allwein and Moser, LLC
1373 Grandview Ave., Suite 212
Columbus, Ohio 43212
Telephone: (614) 429-3092
Fax: (614) 670-8896
E-mail: callwein@wamenergylaw.com

Attorney for the Natural Resources Defense Council and Sierra Club

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The Sierra Club and the Natural Resources Defense Council (“Environmental Intervenors”),¹ submit these objections to the 2013-2015 Energy Efficiency and Peak Demand Reduction Program Portfolio Plans (“Plan”) of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company (“FirstEnergy” or “Companies”), in accordance with the August 16, 2012 Entry in this proceeding and Ohio Administrative Code 4901:1-39-04(D). According to the rule, any person to file objections to a utility’s program portfolio plan; those objections must specify the basis for all objections and include any proposed additional or alternative programs or modifications to the proposed program portfolio plan.

These objections are organized to address portfolio-level objections first, followed by objections specific to the residential sector, the commercial/industrial sector generally, the large business sector, and the small business sector. The introduction to these objections includes a table that summarizes each objection, basis for the objection, and recommendation to address the objection.

¹ The Environmental Intervenors are the Natural Resources Defense Council and the Sierra Club.

I. Introduction

According to the Ohio Administrative Code, the Plan is required to be a “comprehensive energy efficiency and peak demand reduction program portfolio” that includes “a range of programs that encourage innovation and market access for cost-effective energy efficiency and peak-demand reduction for all customer classes,” and will “meet or exceed” the Companies’ statutory benchmarks for energy efficiency.² The Plan must include an assessment of potential energy savings from energy efficiency measures.³ The Plan’s energy efficiency programs must be designed considering relative cost effectiveness, the avoidance of lost opportunities, the promotion of market transformation, and other criteria.⁴

Rather than designing a plan that meets these objectives, the Companies in this proceeding propose a Plan that *may* meet only the letter of its obligations under the law and focuses on “maximizing kWh reductions per dollar spent ... *during the plan period.*”⁵ A balanced plan would focus more on transforming markets over time so energy efficiency is the “easy choice” for customers and do everything possible to avoid the creation of “lost opportunities.” Every inefficient building built or appliance bought today is an instant, expensive retrofit opportunity tomorrow. By spending more now on incentives to transform markets and capture use-it-or-lose-it savings opportunities, FirstEnergy can lock in savings for decades to come and save the customers within its service territory more money and energy. Implementing the recommendations in this document would correct the Plan’s flaws, better align the Companies’ strategy with that of other Ohio utilities and the long-term goals of Ohio policy, and provide the greatest benefit for customers’ investments.

The Environmental Intervenors’ objections, basis for the objections, and recommendations to address the objections are summarized in the chart below:

² R.C. 4928.66; O.A.C. 4901:1-39-04(A)

³ O.A.C. 4901:1-39-03(A)

⁴ O.A.C. 4901:1-39-03(B)

⁵ Toledo Edison EE & PDR Program Plan, Page 2.

Objection	Basis	Recommendation
Lack of Collaborative input	Collaborative had limited information pre-Plan filing on which to base recommendations O.A.C. 4901:1-39-03(D).	Approve Environmental Intervenors' recommendations Continue current plan cost recovery while Commission considers objections and modifications
Limited, short-term set of Plan goals	O.A.C. 4901:1-39-03(B) Need to avoid creation of lost opportunities Need to promote market transformation	Approve Environmental Intervenors' recommendations Require Companies to incorporate additional goals into Plan, along with programs and incentive budgets to achieve them
Myopic focus on reducing budgets means Companies' incentives will likely be too low	Evaluation Report at 20, Table 5-19 Need to promote market transformation Need to avoid creation of lost opportunities	Require Companies to reconsider incentives with Collaborative, benchmark incentives with AEP and Duke
Lack of contingency for budget increases if program interest is higher than anticipated	Program continuity (especially in rebate amounts) is critical to gaining trade ally and customer trust Evaluation Report ES-8. Plan Section 5.1.2.1.	Clarify that <i>customer sector</i> budgets can be increased, if requested by Companies or Collaborative members and approved by the Commission (rather than simply shifting funds <i>within</i> a customer sector or <i>between</i> customer sectors)
No provision to bid all eligible energy efficiency and demand response resources into PJM capacity markets	Commission Orders ⁶ Customer interests ⁷	Require Companies to bid all eligible (installed <i>and</i> forecasted) energy efficiency and demand response resources into PJM capacity markets Require Companies to file M&V plans at PJM with sufficient time to ensure resources are eligible
No explanation for T&D Improvements Program	O.A.C. 4901:1-39-04(c)(5)(i)	Disallow program until Companies' present detailed program budgets and plans
In Market Potential Study, extensive reliance on survey data to estimate future program participation	Psychological research Evaluation studies	In future potential studies, estimate "achievable potential" by applying observed data from efficiency programs in the field
In Market Potential Study, extensive reliance on unreliable customer opinions and speculation about future program participation	Psychological research Evaluation studies O.A.C. 4901:1-39-01(A)	In future potential studies, estimate potential participation based on existing best practice programs
In Market Potential Study, no documentation of the accuracy of the methods used or analysis to correlate survey results to	Market Potential Study methodology	Empirical data showing agreement between customer survey results, in advance of efficiency programs being offered, and eventual participation in

⁶ *In the Matter of the Commission's Review of the Participation of the Cleveland Electric Illumination Company, the Ohio Edison Company, and the Toledo Edison Company in the May 2012 PJM Reliability Pricing Model Auction*, Case No. 12-814-EL-UNC, Commission Entry at ¶10 (February 29th, 2012).

⁷ Id. at ¶4.

observed participation and achieved savings		efficiency programs should be cited and explained
Maximum achievable potential results are lower than results being achieved in on-going programs	Market Potential Study methodology	Revise methodology as suggested and calibrate to observation from programs in the field
Analytical methods and results of avoided cost calculations highly suspect	Common methodological practice Review of NRDC INT-2-RPD-10	Review avoided cost methodology, adopt standard methods ahead of next portfolio plan
No coordination with gas utilities, other electric utilities on program implementation	Lack of coordination creates market confusion and diminishes trade ally interest and ability to participate in programs O.A.C. 4901:1-30-03(B)(8)	Require Companies to coordinate with gas utilities on home performance program and electric utilities on commercial/industrial incentives and program design
Residential portfolio poorly designed	Portfolio risk from over-reliance on a few measures More efficient program delivery mechanisms available ⁸	Revise portfolio per Environmental Intervenors recommendations
Residential portfolio over-relies on lighting measures	Lighting only accounts for 11% of residential use, but makes up > 62% of projected residential savings	Reduce reliance on standard, all-electric kits, rebalance portfolio toward building shell, HVAC, domestic hot water savings
Companies providing incentives for measures that provide small incremental savings relative to baseline	Customer confusion Making best use of customer contacts	Eliminate plans to incentivize electric storage water heaters and more efficient halogens
Companies requirement that residential new construction program meet ENERGY STAR 3.0 criteria	Restriction will limit participation, reduce overall program savings	Develop efficiency “tiers” within program, move builders to higher efficiency tiers over time
Residential portfolio does little to develop and grow sustainable trade ally infrastructure	Reliance on kits and online audit program	Rebalance portfolio, engage HVAC, domestic hot water, home performance contractors
On-Line audit measure improperly evaluated	Other evaluations Experimental design LBNL paper	Terminate program, redirect budget to Comprehensive, All-Electric Audits and retrofits
Over-reliance on kit measure, which repeats past program mistakes and operates outside the market for energy efficiency services	Portfolio already heavily tilted toward lighting Gives away for free what customers are willing to pay for Inhibits market transformation	Eliminate standard and all-electric kits, redirect budget to Comprehensive and All-Electric Audits and retrofits, Energy Efficient Products Program
Long wait time for incentive application approval	Trade ally, customer relationships Evaluation Report ES-8, B-55.	Require Companies to reduce 90-day wait time to 30 days, report wait time statistics to Collaborative and Commission Staff
Long wait time for confirmation of receipt of application materials	Trade ally, customer relationships Evaluation Report ES-8	Require Companies to improve this confirmation time, and report confirmation time statistics to the

⁸ O.A.C. 4901:1-39-03(2) and (3).

		Collaborative and Commission Staff
Paper-based application process	Trade ally, customer relationships Evaluation Report ES-8	Require Companies to deploy online application for prescriptive measures within 6 months of portfolio approval
Trade ally network underdeveloped	Evaluation Report ES-8	Require Companies to expand network of trade allies, report number of registered trade allies and volume of approved applications (by kWh and incentive \$) to Collaborative and Commission staff quarterly
For program marketing, no planned “technology group” or “customer group” case studies	Customers need more specific information about available efficiency technologies applicable to their business Evaluation Report ES-8	Require Companies to develop “technology group” (lighting, HVAC, etc.) and “customer group” (food service, small retail, etc.) case studies within 6 months of portfolio approval
No LED lamps, fixtures on standard lighting application	Trade allies, customers want LEDs, program should make it easy Evaluation Report ES-6	Require Companies to add LED lamps, fixtures to standard lighting application
No program to support continuous energy improvement in large manufacturing customers	41% of large customer participants have energy efficiency goals, program should help these customers meet the goal AEP Program	Require Companies to implement Continuous Energy Improvement program modeled on AEP Program
No specific data center, server room, server equipment program	AEP Program Fast-growing end use	Require Companies to deploy dedicated data center and server room energy efficiency program
Minimal commitment of investment, expected savings in retro-commissioning in the Mercantile-Utility portfolio	Retro-commissioning not trade-ally driven, will need specific focus Retro-commissioning complementary to retrofit programs	Require Companies to deploy a comprehensive retro-commissioning program
Omission of retro-commissioning program (or measure) in the Small Enterprise portfolio	Retro-commissioning not trade-ally driven, will need specific focus Retro-commissioning complementary to retrofit programs	Require Companies to deploy a dedicated retro-commissioning “lite” program
Omission of efficient new construction program	Avoidance of “lost opportunities”	Initiate a comprehensive efficient new construction program for large C&I
Minimal commitment of investment, expected savings in efficient new construction	Avoidance of “lost opportunities”	Expand the new construction incentive for small C&I into a comprehensive efficient new construction program with technical design assistance and incentives that encourage high-efficiency system design
Companies appear to be providing incentives for baseline technology	FirstEnergy interrogatory response to NRDC Set 3-INT-31 indicates rebates for standard T8s in some situations. FirstEnergy interrogatory response to SC Set 1-INT-48 states that standard 32W T8s	Eliminate incentives for standard T8 retrofits even in situations where the existing equipment is T12. This simplifies messaging to trade allies around what qualifies as high-efficiency. Program efforts should focus on transforming market to high-

	are considered baseline. Savings from T12 to standard T8 retrofits are time-limited by EISA requirements, and have been phased out by other Ohio utilities Companies should get maximum efficiency out of each customer contact	efficiency T8s
Companies not fully utilizing or encouraging account representatives to promote new efficiency projects at large customer facilities	Market Potential Study at page 50	Tie a portion of account manager compensation to new energy efficiency projects
Companies are counting substantial savings from demand response actions that are unrelated to program efforts and that would take place regardless of Companies' actions	FirstEnergy interrogatory response: SC Set 2-INT-70	The Commission should direct the Companies to either 1) not count demand reductions resulting from actions unrelated to Companies' actions or 2) develop appropriate EM&V procedures to demonstrate that claimed savings are the result of Companies' actions
Companies' deployment of "kits" instead of a direct install, high incentives program	AEP Program Evaluation Report ES-6 Market Potential Study	Require Companies to deploy direct install program for small businesses, with higher incentives

II. Portfolio-level Objections

A. The Plan does not reflect meaningful Collaborative input.

According to the Companies, "When developing this Plan, the Companies solicited input from the Collaborative Group and related subcommittees on potential measures and programs to be included in this Plan on several occasions."⁹ The Companies did indeed solicit input, but the quality of the input the Environmental Intervenors and other Collaborative members were able to provide was severely limited by the nature of the Companies' presentations: No draft Plan or Plan sections were provided for input, but instead the FirstEnergy requested feedback on a list of programs and measures (on February 24, 2012), and on a 42-slide presentation (on July 10, 2012). In contrast, Environmental Intervenors and others were able to review and comment on complete program plans ahead of filing in AEP's first and second program portfolio plans, and viewed detailed program plans ahead of Duke Energy's filing of its recent application for five new energy efficiency programs. The length and depth of these objections are a

⁹ Toledo Edison EE & PDR Program Plan at 18.

regrettable consequence of the Companies' inability to work collaboratively ahead of deadlines in a substantive way, and a failure to provide interested stakeholders a detailed Plan ahead of filing to review and provide sufficient input.

B. The Plan's strategy is unbalanced. The Commission should require FirstEnergy to focus more on market transformation and the avoidance of lost opportunities.

According to the Plan, the Companies' four primary goals in developing the programs outlined in the plan were:

- Meeting statutory requirements
- Providing programs for each customer class
- Getting implementation flexibility
- "Maximizing kWh reductions per dollar spent" during the Plan period.¹⁰

The Environmental Intervenors object to this limited set of goals. Of course it is important for FirstEnergy to meet statutory requirements, but the Companies should be *exceeding* them now, banking savings for use later when the standard ramps up to require 2% savings a year in 2019. Of course the Companies should provide programs for all customer classes, but the Companies should also implement programs that increase efficiency among the main end-uses in a customer class. Of course the Companies should have some degree of implementation flexibility, but this flexibility should be balanced by Collaborative and Commission Staff influence on how that flexibility is employed. Moreover, "flexibility" should not be an excuse for poor planning or no planning, as it may have been in this Plan. In the Plan, FirstEnergy labeled as "measures" many efforts that other utilities term "programs," such as retro-commissioning or new construction, meaning detail on the strategy for these "measure/programs" is absent from the Plan.

Most importantly, the Companies' goal to maximize the ratio of kWh saved per dollar spent during the plan period is short-sighted and contrary to Ohio Rules, which requires the Companies to

¹⁰ Toledo Edison EE & PDR Program Plan at 2.

consider a number of criteria when designing programs, including relative cost-effectiveness, the avoidance of lost opportunities, the degree to which a program engages the energy efficiency supply chain, and the degree to which a program promotes market transformation.¹¹ Relative cost-effectiveness is only one of the criteria, and “cost effective” is defined on a Total Resource Cost test basis, not on the limited “life of the Plan” basis that the Companies’ designed programs to fit. A myopic focus on reducing costs over the life of the plan will indeed increase costs in the future, for at least three reasons. Efficiency measures that change the nature of the building stock have a long life, meaning the costs of a project and customer acquisition are spread over the long period of time that an investment saves energy. Second, a large portion of the costs of a program are expended in merely gaining the attention of customers and trade allies; it makes sense to get those customers to institute as much energy efficiency as possible once those costs have been incurred. Finally, many efficiency measures are time-limited: If the Companies do not have an attractive, broad scale effort to increase the efficiency of new construction, any new building or production process becomes an expensive retrofit prospect (perhaps prohibitively expensive) as soon as it is complete.

The Commission should require FirstEnergy to incorporate a broader set of goals, including promotion of market transformation and the avoidance of lost opportunities into this plan, along with programs and incentive budgets to achieve them. Approval of the recommendations below will move the Plan in that direction.

C. The Companies’ rebate amounts for efficient technologies and actions are too low. The Companies should benchmark their incentives with Duke and AEP-Ohio.

As explained below, the Companies dramatically lowered incentives for efficient technologies and actions during 2011, to levels recognized by trade allies as being insufficient to encourage customers to take efficient actions.¹² Uncorrected, the Companies’ myopic focus on reducing “costs per kWh-saved”

¹¹ O.A.C. 4901:1-39-03(B)

¹² ADM Associates, Appendix G, *2011 Evaluation of EnergySaveOhio Commercial and Industrial Energy Efficiency Incentive Programs*, Case No. 12-1533-EL-EEC, et al. at 20, Table 5-19.

over the plan period will reduce the attractiveness of FirstEnergy's program offerings. To encourage participation in programs beyond those customers who were already taking energy efficient actions, the Commission should require the Companies to benchmark their incentives with Duke and AEP-Ohio, at least for program launch in 2013. As written, the Plan includes incentive *ranges*, not precise amounts. If the Companies later think that incentives should be lowered to amounts below those used by Duke and AEP-Ohio, they should justify this to the Collaborative and Commission Staff.

D. The Commission should edit the Plan to clarify that customer segment budgets can be increased if requested by the Companies or Collaborative members and approved by the Commission.

The Environmental Intervenors object to the Plan's lack of contingency for increasing customer segment budgets if programs within a customer segment are on track to exceed their budgets. According to ADM Associates' evaluation of the Companies 2011 Commercial and Industrial ("C&I") prescriptive incentive program ("Evaluation Report"), "the rocky launch of the [C&I prescriptive incentive program] has damaged the program's credibility among trade allies and customers.... The more steps the program can take to operate without big changes and to operate with transparency the greater likelihood that the trust of trade allies and business owners will be regained."¹³ One "big change" especially damaging to trust was the large reduction in rebate amounts, made to keep the program within its budget. This change could have been obviated had the Companies requested Commission approval for an increase in the budget of the portfolio of programs available to Commercial and Industrial customers. Instead, the Companies shifted program budget from one C&I program to another. But there might not always be an underperforming program with a budget to raid. The Commission should edit Plan Section 5.1.2.1 to clarify that FirstEnergy or Collaborative members can request an increase in the budget of programs dedicated to customer segments (like "Small Enterprise Programs" or "Mercantile-Utility Programs"), not just a shift in budgets between measures within a customer segment or between customer segments, if the Companies are in danger of exceeding their annual budgets for a market segment (for example, if the

¹³ Toledo Edison EE & PDR Program Plan at ES-8.

Companies exceed 75% of a customer segment budget at or before the middle of the program year). This will give the Companies an additional option to capture savings and rebuild trade ally and customer relationships if a program is more popular than expected, and will better allow such a program to avoid “big changes” that damage relationships. Although an increase in the total program budget would increase the Rider amount, customers and the service territory benefit from cost-effective energy efficiency investments, and the Companies can bank savings in excess of the statutory energy efficiency benchmarks.

E. The Environmental Intervenors object to the Companies’ refusal to bid all eligible energy efficiency and demand response resources into the PJM capacity markets, contrary to customer interests and Commission Orders.

The Companies’ plan for future base residual auctions (“BRAs”) in its service territory is to bid only *installed* energy efficiency credits for which it has ownership rights *secured at the time of the PJM auctions*, provided these credits are *of scale*, will meet PJM standards, and are approved by PJM.¹⁴

The Companies have an obligation to take all reasonable and cost-effective steps to avoid unnecessary RPM price increases for their customers.¹⁵ This is an obligation already recognized by the Commission and expressed in the Ohio Revised Code.¹⁶ In order to ensure that FirstEnergy’s customers receive the full benefits of investing in energy efficiency and in order to mitigate the transmission constraint in the PJM ATSI zone, the Commission should require that FirstEnergy bid *all* eligible forecasted savings into the PJM auction and that FirstEnergy file timely Measurement and Valuation (“M&V”) plans with PJM to ensure that savings will qualify for participation in the BRAs.

Anticipating the record capacity prices for the 2015/16 BRA due to scheduled plant retirements and perceived transmission constraints in the ATSI zone, the Commission issued an Entry in Case No. 12-814-EL-UNC asking FirstEnergy to utilize all “reasonable and cost-effective steps” to address capacity prices, including the bidding of potential energy efficiency and peak demand reduction credits

¹⁴ Witness Dargie Direct Testimony at 15.

¹⁵ As discussed in PUCO Case No. 12-814-EL-UNC Entry at ¶4 which refers to Ohio Revised Code Sections 4905.22, 4905.70 and 4928.02

¹⁶ *Id.*

into the BRA.¹⁷ FirstEnergy refused to issue a detailed report as required in the 12-814 Entry, or to bid any resources into the BRA.¹⁸ Then, in its application and Stipulation for an electric security plan (“ESP”), FirstEnergy, at signatory parties’ request, decided to make a limited bid of only *some* of the *installed* energy efficiency into the BRA. As Sierra Club estimated in that case, limiting the bid to this portion of installed resources—essentially ignoring three years of statutorily mandated energy efficiency savings—cost FirstEnergy customers up to \$600 million.¹⁹

In response to objections over the Companies’ handling of the 2015/16 BRA, and to mitigate the impact of the transmission constraint in the ATSI zone for future BRAs, the Commission’s Opinion and Order in Case No. 12-1230-EL-SSO states the Companies should take steps to amend their energy efficiency programs to ensure that customers, knowingly and as a condition of participation in the programs, tender ownership of the energy efficiency resources to the Companies. Further, the Commission ordered FirstEnergy to verify that the energy savings will qualify for participation in the BRAs, and the Companies should bid qualifying energy resources into the auction. In order to comply with the efficiency and peak demand benchmarks in Revised Code Section 4928.66. Additionally, in Commissioner Roberto’s dissenting opinion, it was noted that “the information in [the Commission’s] record was insufficient to find that the Companies “dedicated sufficient resources to reliability, particularly in the form of participation in the [PJM] base residual auctions whose very purpose is reliability.”²⁰ FirstEnergy is going to spend the proposed budgets on the resource regardless of whether they participate or clear in the BRA. Therefore, the most reasonable strategy is to bid a relatively low cost for the resource, sufficient to cover the incremental PJM measurement and verification costs. This strategy will best ensure the resources will clear in the auction and provide FirstEnergy’s customers revenue to offset their energy efficiency investments and lowered capacity prices.

¹⁷ 12-814-EL-UNC Entry at paragraph 4.

¹⁸ Case No. 12-814-EL-UNC, FirstEnergy Reply (March 28, 2012).

¹⁹ Case No. 12-1230-EL-SSO, Sierra Club Initial Brief at 16-17 (June 22, 2012).

²⁰ Case No. 12-1230-EL-SSO, Opinion and Order, Dissenting Opinion of Commissioner Roberto at 5 (July 18, 2012).

The Commission's Orders addressed the *post hoc* excuses that FirstEnergy made for not bidding anticipated energy efficiency resources into the BRA. Specifically, FirstEnergy claimed that it could not bid planned energy efficiency resources into a BRA without clear ownership of those resources and an Order approving recovery of costs for the energy efficiency programs. With the ESP approved and the Commission's directive that energy efficiency resources, by default, belong to the Companies, there are no longer any viable excuses for restricting bidding energy efficiency into the BRA.

Yet despite the Commission's Entry in 12-814 and Order in 12-1230, FirstEnergy's plan as proposed in this Portfolio is to, once again, only submit a limited bid of installed resources in future BRAs. FirstEnergy witness Dargie states that the Companies intend to bid eligible *installed* energy efficiency resources for which it has ownership rights *at the time of the PJM auctions* provided that these credits are *of scale* (never defined), will meet PJM Measurement and Verification ("M&V") standards and are included in an M&V plan approved by PJM.²¹ The proposed strategy is simply a continuation of the Companies diminished bid strategy of the 2015/16 BRA, which resulted in an estimated \$600 million in avoidable costs to FirstEnergy customers.²² The Companies' restrictions, contradict the Commission's Order that "the Companies should bid qualifying energy resources into the auction."

In Case No. 12-814, the Companies stated they did not have time to evaluate and verify bids for the approaching BRA. In Case No. 12-1230, FirstEnergy cited uncertainty and risk, a lack of profit motive, and that the ESP was not the proper docket for evaluating BRA participation.²³ Since then, the Companies have had several months to evaluate and propose a comprehensive bidding plan. In this docket, the Companies provide no justification for severe restrictions on future, potential bids. The Companies have decided to not bid *any forecasted savings* into the PJM BRAs going forward.

It is critical that FirstEnergy bid the forecasted savings into the first BRA available for which those savings will be qualified as in accordance with PJM rules and procedures. PJM BRAs operate on a

²¹ FirstEnergy Dargie Testimony at 15.

²² Case No. 12-1230-EL-UNC, Sierra Club Initial Brief at 16-17.

²³ Case No. 12-1230-EL-SSO, FirstEnergy Initial Brief at 69-72 (June 22, 2012).

3-year forward basis, meaning that savings bid into the May 2013 auction will impact capacity prices for the 2016/17 deliverability year. Any delay in ensuring these savings are accounted for in the PJM baselines delays or eliminates the benefits of customers' investments in energy efficiency. For example, if FirstEnergy does not bid savings reasonably expected to occur in 2015 into the May 2013 auction and instead waits until those savings are installed, the impact of those savings would not be recognized until the May 2016 BRA for the 2019/20 deliverability year.

PJM allows for these forecasted savings to be bid in, so long as they meet the M&V requirements to which FirstEnergy witness Dargie testifies. Per the Commission's Order in Case No. 12-1230-EL-SSO, the Companies will have ownership of all forecasted savings, so the Companies can state no legitimate concern over the risk of ownership of forecasted resources. Other utilities have successfully employed the PJM BRA to secure for customers the full value of their energy efficiency investments and further state policy.²⁴ As described in their June 20, 2012 collaborative meeting, AEP bid energy efficiency resources, installed and forecasted, into the May 2012 BRA. FirstEnergy state they do not know or care about AEP's auction activities,²⁵ but the Commission should take note of AEP's approach. AEP evaluated savings produced in the last six months of 2011, all savings from 2012-2014, and savings from the first six months of 2015 to fill up the 4-year PJM window of allowed savings (even though PUCO approved cost recovery and the program portfolio plan expires in December 2014). Analyzing expected program performance, AEP calculated they had 283 MWs of energy efficiency resources eligible. AEP decided to bid in 204 MWs of efficiency, or 72% of the total, as a way to manage any risks of bidding forecasted savings into the auction. Considering the resulting PJM auction price of \$136/MW-

²⁴ O.R.C. 4928.02: "It is the policy of this state to [...] (A) Ensure the availability to consumers of adequate, reliable, safe, efficient, nondiscriminatory, and reasonably priced electric service; [...] (M) Encourage the education of small business owners in this state regarding the use of, and encourage the use of, energy efficiency programs and alternative energy resources in their businesses; [...] (N) Facilitate the state's effectiveness in the global economy."

²⁵ Cross Examination of William R. Ridmann, Case No. 12-1230-EL-SSO, Hearing Transcript Volume I page 333, line 2: Mr. Ridmann stated "don't know, don't care" when questioned on the bidding strategies of other Ohio utilities.

day²⁶ and the 204 MW bid, AEP will earn revenues in the 2015/16 deliverability year of approximately \$10.1 Million. This will be paid in monthly increments and offset future program costs. It is important to also recognize that AEP did this in a less-constrained zone than ATSI. Had FirstEnergy constructed a similar type of bid in the ATSI zone, a larger bid, containing forecast savings, would have produced larger amounts of revenue and would likely have significant impact on capacity price and the supposed need for transmission expansions.

AEP staff further explained to its collaborative that the incremental M&V cost approximately \$1.5 million, an amount that is expected to decline with more experience. Subtracting that M&V cost from the expected revenue, AEP stands to collect revenue for its customers of approximately \$8.8 million for its 204MW bid. According to AEPs presentation to the Collaborative, they would have to experience a savings shortfall of nearly 80 MWs in order to not cover its M&V costs.

The Commission should ensure in this proceeding that the Companies bid all eligible, forecasted resources into future PJM BRAs, including an amount that reflects statutorily mandated energy efficiency savings beyond the timeline of the Plan. The Commission should also require the Companies to file their M&V plans with PJM with enough advance notice to ensure that eligible savings will be qualified.

F. The Environmental Intervenors object to the proposed T&D Improvements Program. In its plan the Companies fail to explain planned T&D investments, justify its reliance on T&D improvements for energy efficiency compliance, or specify how much these improvements will cost customers and how they create new energy efficiency resources.

The Environmental Intervenors request that the Commission not allow the Companies to count Transmission and Distribution (“T&D”) projects towards energy efficiency benchmarks until the Companies provide the Commission and stakeholders specific plans for improvements, costs, and explanations as to how the planned investments differ from business as usual investments. FirstEnergy states that it plans to address this program in “separate future proceedings”.

²⁶ PJM 2012 BRA Results, May 18, 2012: http://www.pjm.com/markets-and-operations/rpm/~/_media/markets-ops/rpm/rpm-auction-info/20120518-2015-16-base-residual-auction-report.ashx

Revised Code Section 4928.66(A)(2)(d) allows energy efficiency programs implemented by electric distribution utilities to include “transmission and distribution infrastructure improvements that reduce line losses”. However, the Companies’ plans give no information on any specific project, its costs, its cost effectiveness, or anticipated energy savings.

OAC 4901:1-39-04(C)(5)(i) requires the filing of “a program budget with projected expenditures, identifying program costs to be borne by the electric utility and collected from its customers, with customer class allocation, if appropriate.” This information is missing in this case. As the Commission seeks to evaluate FirstEnergy’s planned three-year energy efficiency investment, it cannot reasonably do so if a Plan component that is anticipated to deliver significant energy savings is not explained in the Plan. FirstEnergy’s T&D Improvement Program deserves scrutiny; the Companies already have an obligation to make T&D investments on behalf of distribution customers through federal and state regulation. To date the Companies have made now showing that the T&D measures sought to be counted as energy efficiency extend beyond what is needed to meet reliability criteria.

The Commission should reject this program and limit FirstEnergy’s ability to fund and operate its proposed T&D Improvements Program until the Companies provide the Commission and all interested and intervened parties detailed program budgets and planned recovery, information on specific improvements, and data proving that the proposed improvements pass relevant cost tests.

G. The Environmental Intervenors object to the methods Black & Veatch used to determine energy efficiency potential. The Commission should not rely on the results of the 2012 Market Potential Study. Future potential studies should be developed with Collaborative and Commission Staff input, use field-verified data, and determine achievable potential by applying the results of the best-performing programs in other jurisdictions to service territory end-uses.

The Companies’ approach in developing the Plan was flawed for several reasons:

- It relies on surveys and interviews of customers and potential program participants to determine achievable program potential, rather than observed data from efficiency programs in the field
- It relies on customers' opinions and speculation about future participation in programs, before the programs, incentives and marketing efforts are deployed, rather than ex-post performance of real customers in response to such programs and incentives.
- While the Market Potential Study varies from the standard approaches to estimating achievable efficiency potential, it does not document any evidence that its methods are superior, or even correlated with real behavior
- It reports maximum achievable energy savings rates that are lower than actual rates being achieved in existing efficiency programs.

The Market Potential Study relied on “customer attitudes and preferences obtained through mail and telephone surveys and interviews”²⁷ to estimate achievable energy savings, program participation rates, and determine the make-up of end-use equipment on customers' premises. Surveys were conducted of random samples of residential customers (500 customer returned the mailed survey), commercial customers (100 responded to a phone survey), and 13 large account-managed industrial customers.²⁸ To determine the amount of “Base Case” achievable energy efficiency, the energy savings produced by customers who responded “I plan to change” to an efficient option within an end-use category or expressed very high interest in a program were extrapolated across an end use in a service territory. To determine the amount of “High Case” achievable energy efficiency, the additional energy savings produced by customers who were “considering changing” or expressed high interest in a program were extrapolated across an end use in a service territory.²⁹

²⁷ Toledo Edison EE & PDR Program Plan at 6.

²⁸ Black & Veatch, Market Potential Study: Energy Savings and Demand Reduction for Ohio Edison, Toledo Edison, and The Illuminating Company, June 22, 2012 at 35.

²⁹ Id. at 96.

While such survey data might be useful for the purposes of program design and targeting of marketing campaigns, it is difficult to see how such data would be indicative of the true future potential for all efficiency programs that might be offered to customers over the next decade. When asked if FirstEnergy or B&V had conducted any analysis to correlate their survey-based results with past performance of the Companies' energy efficiency programs or actual electricity use profiles at a customer's premises, they answered that "specific correlation analyses were not performed."³⁰

There is little reason to expect such correlation. Customers are not energy experts and they have multiple demands on their time and attention. People generally have little idea of why they make decisions, tend to confabulate when asked, and often don't know what they *will* want.³¹ Numerous studies have looked at the correlations between attitudes and behavior, some as early as the 1960's.³² Taken as a whole, these studies suggest that it is considerably more likely that attitudes will be unrelated or only slightly related to overt behaviors than attitudes will be closely related to actions. For example, in one study, householders interested in enhancing the energy efficiency of their homes or conserving water participated in comprehensive workshops on residential energy conservation or water conservation. Despite significant changes in knowledge and attitudes, householder's behavior did not change.^{33,34} In another study, when 500 people were interviewed regarding their personal responsibility for picking up litter, 94% acknowledged responsibility; however, when leaving the interview only 2% picked up litter that had been "planted" by the researcher.³⁵ A recent report of a multi-state effort to determine appropriate Net-to-Gross ratios for CFLs recently found almost no correlation between the number of

³⁰ Response to NRDC Set 3 INT-30

³¹ Kahneman, D., and Thaler, R., Anomalies: Utility maximization and experienced utility, *Journal of Economic Perspectives*, 2006, 20(1): 221-234.

³² Wicker, A., Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects," *Journal of Social Issues*, 1969, 25(4): 41-78.

³³ Geller, E., Evaluating energy conservation programs: is verbal report enough?, *Journal of Consumer Research*, 1981, 8(3): 331-335.

³⁴ Geller, E., Erickson, J., and Buttram, B., Attempts to promote residential water conservation with educational, behavioral and engineering strategies, *Population & Environment*, 1983, 6(2): 96-112.

³⁵ Bickman, L., Environmental attitudes and actions, *The Journal of social psychology*, 1972, 87(2): 323.

CFLs reported in a telephone survey and the number actually verified in an onsite visit.³⁶ These examples illustrate the importance of using a valid method to forecast achievable potential.

According to the Ohio Administrative Code:

"Achievable potential" means the reduction in energy usage or peak demand that would likely result from the expected adoption by homes and businesses of the most efficient, cost-effective measures, given effective program design, taking into account remaining barriers to customer adoption of those measures. Barriers may include market, financial, political, regulatory, or attitudinal barriers, or the lack of commercially available product.

"Achievable potential" is a subset of "economic potential."³⁷

In other words, the achievable potential is what could be achieved by aggressive implementation of efficiency programs designed to remove barriers and according to industry best practices, rather than what would be achieved following business-as-usual progress based on existing information and behavior. The survey-based methodology applied by B&V measures the latter and is therefore inadequate. Measuring the former, full efficiency potential requires observation of aggressive, well-designed programs and the results they have achieved in changing behavior and investment patterns.

Black & Veatch should have examined the performance of the best programs in the country in reducing energy use among each end-use technology analyzed. This method would have better approximated "achievable potential" as expressed in the Ohio Administrative Code: quantifying the real-world potential energy use reductions "given effective program design." Effective programs change existing information and investment patterns by increasing information availability, modifying investment patterns using program incentives and marketing, reducing transaction costs.

The results of the Market Potential Study speak to the shortcomings of its methodology. The incremental achievable efficiency is about 0.5% per year from 2015 onward, lower than the incremental

³⁶ NMR Group, Residential Programs: Results of the Multistate CFL Modeling Effort, March 7, 2010, Figure 4-5, available at: http://www.focusonenergy.com/files/Document_Management_System/Evaluation/resultsofthemultistatecflmodeling_effort_evaluationreport.pdf.

³⁷ O.A.C. 4901:1-39-01(A)

energy efficiency savings that are mandated by SB 221 and already in the implementation plans of other Ohio utilities. This scenario of 0.5% incremental savings is directly contradicted by experience with utility programs in states that, even after decades of activity, are still able to achieve incremental savings of more than 1% per year.³⁸ These cases include utilities in the Northwest, where energy prices are low, and are crowned by examples of Vermont and Massachusetts, which achieve about 2% incremental savings annually after many years of activity. In 2010, more than ten states achieved incremental savings of 1% or more, double the maximum achievable rate according to the Market Potential Study.

Today, First Energy customers have little experience with efficiency programs, and even less with well-designed programs of the type now being rolled out in the region. In the future, additional learning, improvement in program design, and customer education and familiarity with efficiency program benefits will expand the potential participation beyond the segment of the customer population that reports strong interest, sight unseen, today. It is reasonable to expect this potential to approach the levels now being achieved in states with mature efficiency programs and policies.

The Commission should not rely on the results of the Market Potential Study to limit energy efficiency program investment. In the future, market potential study methodologies should be reviewed by the Collaborative and Commission Staff, and the Companies should base “expected adoption” of efficient technologies on observation of the best performing programs in Ohio and other jurisdictions (taking into account service territory-related differences). To determine appliance saturations and technology shares, the Companies should use onsite visits, perhaps partnering with other utilities in Ohio or other FirstEnergy operating companies. AEP-Ohio, for example, based its assessment of achievable

³⁸ American Council for an Energy Efficient Economy, State Energy Efficiency Resource Standard (EERS) Activity, October 2011, available at: <http://www.aceee.org/files/pdf/policy-brief/State%20EERS%20Summary%20October%202011.pdf>

potential partially on a baseline survey³⁹ that included 68 residential and 136 commercial and industrial site visits.⁴⁰

H. The Environmental Intervenors object to the analytical methods used for determining the avoided costs of energy efficiency, and to the results obtained from these methods, which produced generally unrealistically low avoided costs.

Underestimating avoided costs will tend to discourage energy efficiency investments. Some potential efficiency measures will not pass utility cost-effectiveness tests using the depressed avoided costs, although the same measures would appear cost-effective using the full avoided costs. In future portfolio plans, FirstEnergy and its energy efficiency stakeholders should examine the avoided cost calculation methodology more carefully. By using full avoided costs to test the cost-effectiveness of efficiency programs, FirstEnergy can ensure that it captures as much of the cost-effective potential as possible.

The method the Companies used to estimate avoided costs is not transparent, and the source and method of calculation of key intermediate data are not referenced. While this lack of transparency makes it difficult to evaluate the results, we can conclude from first principles that the results are unrealistic and likely the result of methodological errors.

FirstEnergy's avoided costs appear to be either lower than one would expect using common-practice avoided cost analysis methods and assumptions,⁴¹ or else missing entirely (and presumably assumed to be zero).

Regarding the reported⁴² avoided energy cost values:

³⁹ AEP Ohio, 2012-2014 EE/PDR Plan-Appendices, Case No. 11-5568-EL-POR, et al., November 29, 2011, Page A-16.

⁴⁰ Navigant Consulting, AEP-Ohio Residential DSM Potential 2012-2014 Preliminary Results, presented to Stakeholder Group, May 4, 2011.

⁴¹ National Action Plan for Energy Efficiency, Guide to Resource Planning with Energy Efficiency, Prepared by Energy and Environmental Economics, Inc., 2007, available at: www.epa.gov/eeactionplan.

⁴² FirstEnergy provided an avoided cost spreadsheet in response to NRDC Interrogatories Set-2-RPD-10

- Avoided energy costs per MWh are estimated at about \$40 peak / \$30 average / \$25 off-peak in 2012, rising to about \$50 peak / \$40 average / \$33 off-peak in 2015, and escalating at about 1% annually thereafter
- These are rather low energy costs. However, when levelized in the cost-effectiveness calculations, the avoided energy cost appears to average only about \$25/MWh, or \$240 per annual kWh saved, which is very low
- First Energy's estimates of avoided energy cost seem low, and they do not escalate significantly after 2015. As the EPA's MATS regulations take effect, coal plants that comprise some of the lowest variable cost generation resources will need to be retrofitted or replaced, which would tend to increase costs for both energy and capacity.

Regarding the reported avoided capacity cost values:

- Avoided T&D capacity costs per kW-year are estimated at \$20, with no accounting of future cost escalation or inflation. This estimate seems very low, especially for systems that have any load growth at all
- According to the spreadsheet provided by FirstEnergy, avoided generation capacity costs per kW-year are estimated at only \$9 in 2013, jumping to about \$107 in 2016, dropping to \$52 in 2018, and escalating at about 2% annually thereafter
- These estimates raise questions: the peak value in 2016 appears to correspond to the annualized capital cost of a new combustion turbine or a coal-plant retrofit for environmental compliance, which are generally considered to be \$800-1000/kW. However, if the avoided cost is at this level in 2016, then in the years just before, the forward-looking avoided cost should be no less than this value reducing according to the assumed discount rate (about 8.5% per year). The fact that the reported values are so much less suggests a methodological error

- Also, the assumption that the later avoided generation capacity cost values never reach the marginal cost of new generation is unrealistic. This logical inconsistency also suggests a methodological error. Generally, the avoided cost estimates do not appear consistent with common methodological practice in this area.⁴³
- The future cost estimates are based on present forward capacity market values, escalated into the future in proportion to price projections in the Energy Information Administration's 2012 Annual Energy Outlook for the region. However adopting price forecasts and escalation forecasts from different sources is highly suspect. If the capacity market price never reaches the cost of new capacity, then by definition new capacity will never be built. Since the plan makes clear that new capacity will indeed be needed, this method is not realistic.
- Total avoided capacity costs per kW-year appear to be about \$50/kW-year, which corresponds to about \$450/kW and contributes only \$12/MWh to the total avoided cost. Netting out the assumed \$20/kW-year T&D capacity costs makes the estimated generation capacity cost about \$30/kW-year or less than \$300/kW.
- The generation capacity cost estimates of \$30/kW-year seem low, especially for systems that have any load growth at all, or where investments are needed to build new capacity in response to load growth or the need to retire out-of-compliance steam plans as First Energy has announced its plans to do.
- The assumed cost levels would not cover the capital costs of combustion turbines or environmental retrofits, let alone more expensive new baseload capacity. The apparent methodological errors noted above, leading to a 2013 estimate of \$9/kW-year, probably contributed to the unrealistically low values.

⁴³ Id.

Additional components of the avoided costs that were omitted should be addressed following common methodological practice.⁴⁴

- There appears to be no accounting for avoided T&D energy and capacity losses. This is typically a component of avoided cost calculations, since energy efficiency measures lower current levels in the T&D grid, reducing losses.
- There are no costs associated with emissions. For SO₂, NO_x and Hg, this suggests that residual (allowed) emissions have zero cost and that the costs of emissions above allowed levels are captured in the supply costs to achieve the assumed reductions. Residual emissions do have costs, but they are typically treated as externalities. Since there appear to be no explicit measures planned to reduce CO₂ emissions, and no cost of residual emissions, the implied cost of CO₂ emissions is zero. While that is true today, assuming zero cost over the entire planning horizon indicates zero chance of any CO₂ cost being imposed by regulators at any time during the planning time horizon. This doesn't seem like a prudent assumption.
- There is no accounting for the price feedback effect of demand reduction. This is typically a component of avoided cost calculations, since energy efficiency measures reduce the electricity demand of program participants and shift the market demand curve downward along the supply curve, causing a decrease in the market-clearing price for electricity that benefits all electricity consumers.

I. The Environmental Intervenors object to the Companies' failure to prioritize coordinated program design and joint implementation with other Ohio utilities. This will reduce the effectiveness and cost efficiency of program delivery and serve as a barrier to participation by trade allies including, but not limited to retailers, manufacturers, distributors, HVAC and insulation contractors, and builders.

⁴⁴ Id.

The Commission should require FirstEnergy – and of all of the Ohio utilities – to develop common program designs and joint program implementation models. Unless there is clear evidence to the contrary joint program implementation should be the expectation of all Ohio efficiency programs, per Ohio Administrative Code 4901:1-39-03(B)(8). While the Companies’ Plan notes the benefits of potential coordination with other Ohio utilities⁴⁵, common program designs and joint program implementation are neither a clear priority nor a Plan objective. Failure to fully align program designs and program implementation will diminish the interest and ability of key trade allies to participate in the programs and create market confusion. These concerns are most likely to affect the performance of the proposed upstream incentives for lighting and consumer products, HVAC and domestic hot water (“DHW”) equipment rebate efforts, the residential new construction program, the all-electric and comprehensive energy audits, and the Companies’ Commercial and Industrial programs, which increases the risk of the Companies not meeting their savings goals. By pursuing joint implementation, the Companies and the other Ohio utilities will achieve economies of scale and cost efficiencies that will not be attained otherwise.

FirstEnergy, and other Ohio utilities – both electric and gas - should eventually be expected to:

- Offer the same set of measures with identical eligibility criteria and incentive levels
- Develop common rebate forms and program applications
- Establish identical training and certification requirements for their new construction, HVAC, and existing home retrofit activities
- Develop and implement common quality assurance and quality control procedures, including contractor delisting protocols, for its new construction, existing home retrofit, and HVAC programs
- Procure the same statewide program implementation vendors for their programs

⁴⁵ Toledo Edison EE & PDR Program Plan, Page 2at18.

- Develop and release a common RFP to manufacturers and trade allies for upstream lighting and, if pursued, consumer products (appliances and consumer electronics) incentives. The RFP should provide sufficient flexibility to allow each utility to enter into individual memorandums of understanding (MOUs) with participating retailers and manufacturers. This will allow each utility to implement an upstream program component that reflects its specific program savings goals and retailer mix
- Procure the same rebate and incentive processing vendor
- Develop a common statewide website that will serve as a single point of customer and trade ally program engagement.

In this case, the Commission should require the Companies to coordinate with gas utilities on home performance program and electric utilities on commercial/industrial incentives and program design.

III. Residential Portfolio Objections

First Energy's residential program portfolio is poorly designed and should be substantially revised. The Companies' residential programs rely disproportionately on a very small number of uncertain program approaches, do not treat all electric end uses comprehensively, fail to take advantage of potential significant economies of scale, show a lack of strategic focus, inadequately support the development of a sustainable efficiency infrastructure, and promote technologies with only small incremental savings over current baselines.

This second Plan should demonstrate growth and improvement over the previous three-year plan by offering a growing number of customers the opportunity to achieve even deeper energy savings. While the Companies plan to add a number of new measures and propose several program enhancements, the vast majority of residential program savings come from a very small number of measures. A chart showing the savings by measure of the Cleveland Electric Illuminating Company's proposed 2015 residential portfolio is attached as Appendix A. Most of the proposed new program measures contribute

very little to the overall residential sector portfolio. This reliance on a few key measures increases the risk that the Companies will not meet their three year goals as the residential sector represents 34 percent of the total 2013-2015 pro rata energy savings.⁴⁶ Further, the proposed programs do not fully take advantage of more efficient program delivery approaches that would reduce the cost of program implementation and help support the development of a sustainable efficiency infrastructure not just in FirstEnergy's service territory, but statewide.

A. The Environmental Intervenors object to the Companies' overreliance on lighting savings within the residential sector. Lighting savings are disproportionate to their contribution to total residential energy consumption. As a result, other potential savings from heating, cooling and domestic hot water (DHW) are underserved. The Companies should increase program offerings to address other end use savings opportunities. Specifically, the Companies should increase their existing home retrofit activities, HVAC, DHW and refrigerator measure participation levels.

Lighting represents only 11 percent⁴⁷ of estimated residential sector electricity use, but accounts for at least 62 percent⁴⁸ of projected 2013-2015 residential program savings. An additional 16 percent of residential sector savings comes from refrigerator and freezer recycling. The Market Potential Study does not estimate the percentage of electricity used by second refrigerators and freezers. In comparison, heating, cooling and hot water comprise 32 percent of residential sector electricity use. However, less than four percent of residential sector savings come from efficient HVAC and DHW equipment rebates and from all three audit offerings (Comprehensive, All-electric, and Online).⁴⁹ Primary refrigerators and freezers represent an additional 15 percent of residential sector energy use, but savings from refrigerator and freezer rebates comprise less than one percent of 2013-2105 residential program savings. Increasing participation in non-lighting program activities will provide more FirstEnergy residential customers with

⁴⁶FirstEnergyTechnical Conference. September 6, 2012, Presentation page 6.

⁴⁷ Toledo Edison EE & PDR Program Plan at 99, Figure 8-2.

⁴⁸ This represents the combined lighting savings from the retail lighting program (35 percent of residential sector savings: Response to Request. SC Set 1-INT-36 Attachment 1) and from the Efficiency Kits based on 75 percent of total Efficiency Kit savings coming from lighting (27 percent of residential sector savings: Response to Request. SC Set 1-INT-7 and SC Set 1-INT-36 Attachment 1). It does not include additional lighting savings from the in home audits or from the new construction program.

⁴⁹ Some additional DHW savings will come from All-Electric Efficiency Kits

a greater diversity of choices to realize additional savings beyond lighting. Further, by diversifying its residential portfolio the Companies reduce their reliance on lighting savings and mitigate the risk of non-compliance associated with this narrow focus on a single end use to meet most of its residential sector savings goal.

To better address non-lighting program savings the Commission should order the Companies to modify the plan in the following ways:

- Increase focus on obtaining savings from improvements to the building shell and HVAC distribution system. As discussed below we recommend that substantial portions of the budgets for Efficiency Kits and Online audits be re-allocated to the Comprehensive and All-electric audit efforts
- Increase cooling, heating and hot water equipment rebate participation through greater contractor and distributor outreach, increased contractor training, cross-promotion of efficient HVAC and DHW equipment with other FirstEnergy residential programs (New construction, All-electric and Comprehensive audits), coordination with the Companies' small enterprise programs promoting the same equipment, joint implementation with other Ohio electric and gas utilities, and increased customer marketing. Also consider moving the financial incentive upstream to distributors as has been successfully done in California, Nevada and parts of the Pacific Northwest with dramatic increases in customer participation⁵⁰
- Better define installation requirements for efficient cooling equipment. At a minimum documentation of proper sizing should be required, even if already mandated by code. Over time the program should move to incorporate other aspects of the ENERGY STAR quality installation and verification (QIV) specification: proper charge and airflow and duct leakage requirements

⁵⁰ 2006-2008 Energy Efficiency Evaluation Report, California Public Utilities Commission, July 2010.

- Increase participation in its refrigerator and freezer rebate efforts through greater retailer outreach and sign-ups, additional sales staff training, joint implementation with other Ohio electric utilities, increased display of in-store point-of-purchase materials, potentially higher rebate levels (to address the higher incremental costs associated with the higher proposed program eligibility criteria for refrigerators), and increased program marketing. However, the 2013 refrigerator eligibility criteria levels should be set at a level above current ENERGY STAR levels. ENERGY STAR estimates that nearly 55 percent of refrigerators sold in 2011 met or exceeded current ENERGY STAR levels.⁵¹ Use of current ENERGY STAR levels in for refrigerators in 2013 will result in unacceptable levels of free-ridership. Further, the September 2014 Federal refrigerator and freezer standard will only accelerate the introduction of more efficient refrigerator models into the market as the new federal refrigerator standard closely tracks the current ENERGY STAR criteria. Use of the current ENERGY STAR levels for refrigerators in 2013 will result in unacceptable levels of free-ridership. The Companies should establish, in consultation with the Collaborative, revised minimum eligibility for refrigerator rebates at the 2014 federal standards level for 2013. For 2014 the eligibility criteria should be raised to the then current ENERGY STAR level, which is currently under revision and for which EPA has a proposed March 2014 effective date
- Similarly, we recommend that the eligibility criteria for all Energy Efficient Products Program measures be reviewed jointly by the Companies and the Collaborative to ascertain likely free-ridership and to revise them accordingly before the 2013 programs are implemented. In some cases ENERGY STAR criteria, such as in the refrigerator example cited above, may not be sufficiently rigorous to keep free-ridership to acceptable levels.

⁵¹ ENERGY STAR Draft 3 Version 5.0 Residential Refrigerators Cover Memo, September 6, 2012, page 1.

While the Companies were unable to provide estimates of the market share their rebate programs would capture,⁵² the proposed HVAC, DHW and appliance unit numbers seem small relative to the total lost opportunity potential from replacement at the time of equipment failure. To increase program participation above the proposed numbers in the 2013-2105 Plans, the Companies should:

- Revise customer rebate levels to better align with incremental costs and for internal consistency. For example, the Companies are proposing a rebate of \$375 for a ductless AC or heat pump mini-split, with estimated annual savings of 152 kWh (cooling-only units will likely save much less) and a \$400 rebate for an air-source heat pump rebate that saves 1,238 kWh/year
- Better engage HVAC and DHW distributors and retailers through joint promotions and upstream incentives. A number of efficiency programs in the Northeast are working with Lowe's, Sears and GE to promote GE's ENERGY STAR heat pump water heater.
- Increase trade ally outreach
- Develop and implement (if not already in place) training for proper HVAC equipment sizing, proper heat pump water heater installation, duct sealing, and measurement of proper charge and airflow
- Increase customer marketing, including cooperative advertising with retailers, distributors and manufacturers.

B. The Environmental Intervenors object to the Companies' plans to provide incentives for measures that provide only small incremental savings while also promoting competing measures that provide much larger savings and which are not ENERGY STAR qualified. FirstEnergy should restrict its equipment incentives to ENERGY STAR qualified products (or to higher levels of efficiency when ENERGY STAR eligibility would result in unacceptable levels of free-ridership) where such models exist in a given product category. In the case of lighting this would entail ENERGY STAR qualified CFLs and LEDs and for water heaters ENERGY STAR qualified heat pump water heaters.

⁵² Response to SC Set 2-INT-59.

The savings from efficient halogen lamps and efficient electric storage water heaters are small in comparison to their ENERGY STAR alternatives. A 50 gallon electric storage water heater complying with FirstEnergy's proposed measure eligibility requirements (Energy Factor of 0.93)⁵³ will use about three percent less energy than a similar unit that just meets federal standards (EF of 0.90). In comparison, an ENERGY STAR heat pump water heater (EF of 2.0 or greater) will use 45-55 percent less energy.

Similarly, the savings from an ENERGY STAR CFL or LED will be at least twice that from a halogen lamp. Promoting "competing" efficient products in the same product category may result in customer confusion as to what is the most efficient product choice. In turn this may result in increased sales of the less efficient technology cannibalizing those of the more efficient one. For lighting, the lamp choices facing consumers at retailers are already bewildering: incandescent, minimally compliant halogens, more efficient halogens, CFLs, and LEDs. Many, if not most, consumers already understand that CFLs and LEDs are an efficient technology choice. To promote halogens in general as an efficient lighting alternative would be a significant step backwards generating little savings and further confusing consumers. There has been a recent and limited market introduction of a more efficient (and more expensive) halogen technology that achieves about twice the efficiency of an EISA compliant halogen. This technology should be treated as an emerging technology and assessed further within Collaborative discussions to determine whether it is appropriate to include in FirstEnergy's residential sector portfolio.

- C. The Environmental Intervenors object to the requirement that all participants in the new construction subprogram meet the ENERGY STAR Homes V3.0 criteria. Such a requirement will limit builder participation, particularly first time builders, and overall subprogram savings. FirstEnergy should provide for additional means to participate in the new construction subprogram that are less demanding than ENERGY STAR V3.0. While per unit home savings may be smaller initially, it is expected that increased builder participation will more than compensate.**

⁵³ Appendix C-1

ENERGY STAR Homes V3.0 is an enviable and appropriate goal for a comprehensive new construction program. However, the specification's requirements may be an impediment for builders and participating HVAC contractors, even for those that have previously participated in new construction programs based on earlier versions of the ENERGY STAR Homes specification. FirstEnergy should develop a tiered new construction incentive structure that rewards homes with savings that are some percentage better than code. ENERGY STAR Homes V3.0 could be one of the subprogram tiers, or an optional certification tied to one or more higher tiers. Further, the residential new construction incentive and savings tier structure should include a highest tier based on a net zero energy home requirement or the Passive House standard.

Such a tiered incentive structure would better allow for new builders that are less familiar with efficient construction techniques to participate in the program. Over time the expectation would be that these builders would participate in higher program tiers generating greater per home and overall program savings. Requiring ENERGY STAR Homes V 3.0 might be a sufficient barrier to many builders that they would never participate in the program.

D. The Environmental Intervenors object to the Companies' focus on residential program delivery approaches that do little to develop and grow a sustainable trade ally infrastructure. In particular, the On-Line audits and Efficiency Kits divert significant program funding from subprograms and measures that engage Ohio-based contractors and retailers as well as from manufacturers of ENERGY STAR and other efficient products.

The Commission should require the Companies to modify the Plan and strategically re-allocate program funding away from Efficiency Kits and from the On-Line audit measure to programs and measures that directly engage retailers, contractors and manufacturers. Funds should be re-allocated to the Efficient Products Program (lighting, appliances, consumer electronics, HVAC and DHW equipment), and to the Comprehensive and All-Electric audit measures. These efforts would directly benefit participating Ohio retailers and the energy efficiency supply chain. As discussed below there are a

number of serious concerns regarding the Companies' massive On-Line audit and Efficiency Kit effort. FirstEnergy estimates that the All-Electric and Standard Efficiency Kits alone represent 29 percent of total residential sector funding.⁵⁴ This proposed budget expenditure would do little if anything to engage retailers and manufacturers of ENERGY STAR products. Moving additional funds into the Efficient Products program would allow for increased sales at retailers and distributors of qualified measures.

Similarly, increased funding of the All-electric and Comprehensive Audit program efforts would support the growth in the number of Building Performance Institute (BPI) certified contractors that would bring important diagnostic as well as air and duct sealing capabilities not only to FirstEnergy program participants, but to the general and larger market for home energy improvements. As currently proposed the Companies' Home Performance Program does little to live up to its name. Home Performance connotes a concerted effort to achieve comprehensive and significant savings in existing homes. However, the program's skewed focus on Efficiency Kits and online audits does little to achieve such deeper savings or to develop the required contractor infrastructure to deliver these deeper savings over time.

E. On-Line Audit measure

The Companies budget \$3.75 million⁵⁵ over three years for the On-Line Audit measure within the Home Performance Program, planning to reach 21,180 customers over the three years.⁵⁶ The On-Line Audit software tool helps the Companies "supply customers with ... information and education" they can use to lower their energy usage.⁵⁷ Customers opt-in to the program, provide their energy usage characteristics to the Companies, then receive information they can "understand and act upon."⁵⁸ Energy

⁵⁴ Responses to Sierra Club questions, July 16, 2012.

⁵⁵ Attachments A, B, and C, Appendix B-4.

⁵⁶ Attachments A, B, and C, Appendix C-2.

⁵⁷ Ibid 4 at Page 29-30, Section 3.4.

⁵⁸ Ibid 4 at Page 30. Section 3.4.

savings from the program, as a part of the Home Performance Program, will be measured using surveys, bill histories or metered data analysis, and file reviews.⁵⁹

The Environmental Intervenors object to the inclusion of the On-Line Audit measure in the portfolio. Though the Companies purport that the measure changes the way customers use energy – promoting changes to habitual behaviors, one-time behaviors, and purchasing behaviors, not unlike the Behavioral program also included in the Home Performance Program. The On-Line Audit program’s opt-in nature makes measuring its impact on energy use difficult, and the Companies’ evaluator currently uses an improper method to evaluate energy savings from the program. Programs that aim to change customer behavior should generally use Randomized Controlled Trial designs, so that the only difference between the treatment and control group is the application of the program. Moreover, there is no evidence that savings from the measure persist in the year following evaluation (note that this is different than other behavioral programs like OPower, where feedback generally continues over time).

As proposed, the online audit represents 1.1 percent of 2013-2105 residential sector savings. In comparison, the All-electric and Comprehensive audit programs – the only program venue by which FirstEnergy customers can make meaningful improvements to their home’s thermal envelope – constitutes only 1.4 percent of sector savings; highlighting how grossly underserved this market segment is by the proposed portfolio. Online audit (and Efficiency Kit) budget would be much better spent re-allocated to the All-electric and Comprehensive audit program

If the measure continues as currently designed, and if it is evaluated the same as in the past, the program will offset long-lived energy efficiency projects for uncertain, short-term savings. We recommend that the Companies direct the budget to all-electric and comprehensive audits and retrofits.

F. Programs that aim to change customer behavior should generally use Randomized Controlled Trial designs, so the only difference between the treatment and control group is the application of the program.

⁵⁹ Ibid 4 at 85, TE Table 17.

The evaluator currently uses – and is planning to continue using⁶⁰ -- an improper control group for the On-Line Audit measure, comparing 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.⁶¹ This “random sample of customers,” the control group, could have been very different than participating customers. As stated in a recent 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.”⁶²

G. Savings from the On-Line Audit program have not been shown to persist, and the program displaces budget and savings from programs that cost-effectively provide long-lived savings.

The Companies assume that the On-Line Audit program has a measure life of only one year.⁶³ Unlike attic insulation and other measures that would be installed through the All-electric and Comprehensive audits and retrofits, which may save energy for decades, this measure will have no long-term savings impact (beyond the encouragement of equipment purchases, many of which will be captured in the savings of the Companies’ other programs). In light of the Companies’ obligation to save a *cumulative* 22.5% of energy use in 2025, the Commission should encourage utilities to offer programs that promote comprehensive, long-lived changes in equipment and habit.

H. Kits sub-program

⁶⁰ Response to NRDC Set 2-INT-19

⁶¹ ADM Associates, Appendix B, Evaluation of the 2011 Home Energy Audit Program, May 14, 2012, Section 4, Page 4.

⁶² 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 14.

⁶³ Attachments A, B, and C, Appendix C-1.

The Companies plan to rely extensively on energy efficiency kits mailed to customers to generate savings, budgeting \$33.8 million⁶⁴ for kits over three years to reach 379,882 customers.⁶⁵ The Companies claim the kit is “meant to introduce customer segments to energy efficient technologies that can be easily installed in the home, and serve as a gateway for broader home energy education.”⁶⁶ Customers will opt-in to the program. The Standard Kit includes “CFLs, night lights, etc.” and the All-Electric kit includes those measures and additional measures targeted to hot water use.⁶⁷

The Environmental Intervenors object to the inclusion of the Kits sub-program in the portfolio. Similar to the original, ill-fated CFL program, the Kits sub-program would be a massive undertaking operating *outside the market* for the measures included in the kit. Customers buy lighting at retail stores, and the non-lighting measures included in the kit, specifically advanced power strips and faucet aerators (four of which are included in the All-Electric Efficiency Kits, as well as one low flow showerhead), have little chance of being installed or used correctly. The Environmental Intervenors recommend FirstEnergy shift the \$32 million it would have spent on Standard and All-Electric kits into a more robust Home Performance Program as described above, and into the Energy Efficient Products program (which targets the markets where customers would actually buy the kit contents). The Energy Efficient Products Program could likely accept more funding: the Companies budget \$34.4 million for the entire Energy Efficient Products Program,⁶⁸ while American Electric Power, a smaller utility, budgeted \$36.9 million for its energy efficient products program over 2012-2014 (when the energy efficiency benchmarks are lower).⁶⁹ The very low level of projected participation in the All-Electric and Comprehensive Audit programs (1,344 participants per year for Ohio Edison, for example), also shows that these home retrofit efforts could readily accept more funding and attention.

⁶⁴ Attachments A, B, and C, Appendix B-4.

⁶⁵ Attachments A, B, and C, Appendix C-2.

⁶⁶ Ibid 4 at 30, Section 3.4.

⁶⁷ Attachments A, B, and C, Appendix C-1.

⁶⁸ Attachments A, B, and C, Appendix B-4.

⁶⁹ AEP, Energy Efficiency/Peak Demand Reduction Action Plan, Case No. 11-5568-EL-POR, et al., November 1, 2011, Page 61.

The Companies stated rationale for the Kits sub-program – that it is necessary to introduce its customers to energy efficiency – is not supported by its own data. According to the Market Potential Study, “Nearly three quarters of the respondents in each operating company have compact fluorescent light bulbs installed in their homes. The median number of CFL bulbs reported installed in respondents’ homes is six.”⁷⁰ Even taking into account the unreliability of the B&V survey (described above), this suggests that the barrier keeping customer from installing more CFLs in their home is not the lack of knowledge that is implied by the Companies’ mission to “introduce” customers to energy efficiency: it is likely instead a combination of price, understanding the appropriate CFL for a given application, and misinformation about the performance of the current generation of ENERGY STAR CFLs, all of which are better-addressed in the Energy Efficient Products program itself.

Furthermore, the Companies’ efforts to generate post-opt-in actions from the kits are not likely to be successful. Customers need to have efficiency presented to them in a compelling manner when they are making a decision that has an impact on energy use, not a bewildering list of “100 ways to save” (in situations of uncertainty, excessive choice can be demotivating⁷¹). The Companies present no evidence that kit programs operating in their other jurisdictions have motivated customers to take further action to increase energy efficiency.⁷²

Instead of sending out kits, the Companies should focus on running their Energy Efficient Products program as well as possible. Even with the EISA Standards, there is still substantial remaining potential in CFLs (both standard and specialty) and LEDs. A recent evaluation for Dayton Power & Light found that the sockets in the service territory were less than a third of the way to the “practical maximum”

⁷⁰ Ibid 21 at 67.

⁷¹ Iyengar, S., and Lepper, M., “When choice is demotivating: Can one desire too much of a good thing?” *Journal of personality and social psychology*, 79(6): 995-1006, 2000.

⁷² See Sierra Club Set 1 - INT-6 where witness Miller provides: “...the Companies have not conducted formal studies linking participation in Kit programs to increased participation in other programs....” The response goes on to compare the results of a different efficiency kit that is delivered as part of a schools program by the Ohio Energy Project which is tied to a classroom curriculum discussing each included measure with students and includes homework assignments which engage parents/guardians, a program design element not included with the proposed kits discussed here. The comparison is not relevant and does not translate across programs.

CFL penetration.⁷³ Because lighting is essentially a store-triggered purchase, efforts to help retailers stock and sell CFLs can make a big difference. The Companies should transition as quickly as possible to an upstream incentive model for lighting and make use of the discount retailer relationships already developed from its current CFL Program, in addition to ensuring discounted CFL and LED availability and prominent placement in big box retailers, home improvement stores, drugstores, and other major retailers in its service territory. The Companies should develop the upstream lighting Request for Proposals with input from the Collaborative.

IV. Small Enterprise and Mercantile-Utility Programs: Cross-Cutting Objections

The Companies plan an \$85 million 3-year energy efficiency portfolio for Commercial and Industrial businesses of all sizes.⁷⁴ The Companies past and current efforts targeted at these customers have been beset by problems, as detailed in the Evaluation Report.⁷⁵ The program's launch was delayed, and when launched the "high level of interest in the programs" produced a glut of incentive applications,⁷⁶ quickly draining the program's incentive budget. In response, the Companies reduced incentives from \$.80 per-kWh saved to \$.05 per-kWh, which halted new applications⁷⁷ and produced widespread dissatisfaction⁷⁸ among the electrical service contractors ("trade allies") who serve businesses and are the Companies' main sales, marketing, and installation channel for the programs. The 2011 Evaluation Report includes a number of recommendations that, if implemented, would help rebuild trust between the Companies, their program implementer, and trade allies, and make the program more effectively encourage efficiency in the business sector. These numerous process recommendations are not reflected in the Companies' plan – the Companies' response to an NRDC interrogatory asking how the

⁷³ Bickel, Lauf, Leu, and Reeves. (Forthcoming). BETTER DATA BETTER DESIGN® Residential Lighting Market Profile, D&R International, Ltd.

⁷⁴ Attachments A, B, and C, Appendix B-4. Does not include governmental, demand response, or the "mercantile customer program."

⁷⁵ Ibid 8.

⁷⁶ Id. at ES-1.

⁷⁷ Id. at Figures 5-5 and 5-6.

⁷⁸ Id. at ES-7.

Plan incorporates evaluator recommendations included no process improvements⁷⁹ – the Companies are not closing the “evaluation loop” as pictured and described in the Plan.⁸⁰

This section contains recommendations for improving program processes, improving program marketing, and recommendations for additional programs that cut across the Small Enterprise and Large Enterprise Sectors.

A. The Commission should require the Companies’ to streamline the application process for Small Enterprise and Mercantile-Utility Programs, increase program transparency, establish process improvement goals and metrics, and report progress on achieving those goals and metrics to the Collaborative and Commission Staff.

According to the Evaluation Report, “trade allies and customers expressed dissatisfaction with the application progress and with the length of time for payment of the incentives in particular.”⁸¹ The Environmental Intervenors object to the Companies lack of proposals to improve C&I program processes. The Companies’ current incentive applications ask customers to wait *90 days* for an incentive from the date of receiving a completed application.⁸² The Commission should require the Companies to improve this wait time to 30 days, and report wait time statistics to the Collaborative and Commission Staff.

The current program application asks customers to wait *5 days* merely for confirmation that application materials were received. The Commission should require the Companies to improve this confirmation time, and report confirmation time statistics to the Collaborative and Commission staff.

The Companies’ recently deployed a well-received⁸³ Self Status Check that allows incentive applicants to check their progress toward receiving an incentive on a web site. The Commission should require the Companies to develop an online rebate application for prescriptive measures within Small Enterprise and Mercantile-Utility programs within 6 months of portfolio approval. An online application

⁷⁹ Response to NRDC Set 2-INT-18.

⁸⁰ Ibid 4 at 81.

⁸¹ Ibid 8.

⁸² Standard Lighting for Business Application Form at 7, available at: http://energysaveoh-business.com/forms/FE-Ohio-Standard_Ltg-Form_rev15e.pdf.

⁸³ Ibid 8 at B-55.

would reduce incomplete applications (by not allowing users to submit incomplete applications), decrease confirmation time, and streamline the application process. The Companies should seek Collaborative, Commission Staff, and trade ally feedback before deploying the online application.

B. The Commission should require the Companies to develop its network of trade allies.

The Environmental Intervenors object to the lack of a commitment by the Companies to develop its network of trade allies. The Companies' Staff have expressed concern that the Companies' trade ally network was underdeveloped for the current stage of the program cycle.⁸⁴ Making the program more stable, and marketing the C&I incentive programs better will attract more trade allies to the program. The Commission should require the Companies to expand its network of trade allies, and report on the number of registered trade allies and trade allies' volume of approved applications (by kWh and incentive amounts) quarterly to the Collaborative and the Commission Staff.

C. The Commission should require the Companies to develop technology group- and customer group-specific case studies to better market the C&I programs.

The Environmental Intervenors object to the lack of a commitment by the Companies to better-market the C&I programs using case studies. To help potential customers understand efficiency opportunities available in their business, the Commission should order the Companies' to develop technology group and customer group-specific case studies. Case studies will show customers how businesses similar to theirs have cut costs and reduced energy use. The Evaluation Report recommends the Companies create case studies, which can be especially important in marketing programs to small businesses.⁸⁵ The Commission should require the Companies to prepare case studies for each important technology group (Retro-commissioning, Servers, Lighting, HVAC, Water Heating, Compressed Air) and customer group (small retail, food service, hospitals, large offices, schools, colleges, lodging,

⁸⁴ Ibid 8 at ES-8.

⁸⁵ Ibid 8 at ES-9.

warehouses) within 6 months of the Commission order, after getting feedback from the Collaborative and Commission Staff, and feature the case studies prominently on the program web site.

D. The Commission should require the FirstEnergy to make several changes and additions to its planned portfolio of programs targeting Commercial and Industrial customers.

The Companies' planned suite of measures and programs targeted at Commercial and Industrial customers leaves substantial cost effective energy efficiency opportunities untapped. The Commission should supplement the Companies' Plan with the programs and measure changes described below, in order to capture more cost effective savings in the Companies' service territory, better position the Companies to comply with their energy efficiency benchmarks, and help businesses save money.

1. The Commission should require the Companies' to add additional LED lighting measures to their standard lighting application.

The Environmental Intervenors object to the lack of LED lighting measures in the Companies' standard lighting application. The Commission should require the Companies to add LED lamps and fixtures to their standard lighting application, as suggested by trade allies in the Evaluation Report.⁸⁶ In 2011, ex-ante savings from lighting measures listed in the standard lighting application were only around 1.5% of total lighting savings,⁸⁷ indicating that the standard lighting application is not capturing projects customers are actually implementing.

2. The Commission should require the Companies to implement a continuous energy improvement program for its largest customers.

According to the Evaluation Report, more than 40% of the Companies' Large Enterprise C&I program participants have corporate policies that incorporate energy efficiency in operations and

⁸⁶ Ibid 8 at ES-6, 21.

⁸⁷ Ibid 8 at Table 3-2, 3-3.

procurement. The Environmental Intervenors object to the lack of a continuous energy improvement program in the Mercantile-Utility portfolio that would help these and other businesses meet corporate energy goals. Continuous energy improvement programs help companies make long-term, strategic commitments to reducing energy use or energy intensity, plan how to accomplish these goals, work with companies on energy intensity reduction projects (including connecting these customers with utility incentives), check the results, and repeat the process. The programs help overcome two key barriers to energy efficiency in the industrial sector: getting executive-level buy-in for energy efficiency investments (there is often a disconnect between plant facilities personnel and the CFO, for example), and the lack of communication between utilities and customers about major plant improvements (the installation of a new line or production process offers giant, one-time savings opportunities).

The account manager interviews included in the Market Potential Study provide support for a continuous energy improvement program. Account representatives reported that they were seeing their customers (in the larger than 700kW demand sector) react to the improving economy by hiring additional staff, adding a new production run, or investigating a vacant commercial property for development. Black & Veatch states “this may be an opportunity for FirstEnergy to focus on as its large customers consider expansion of their facilities”⁸⁸ and “there continue to be opportunities for improvements in manufacturing process and behavioral improvements, particularly for the largest customers who are looking for higher potential EE savings.”⁸⁹

The Commission should order the Companies to develop a continuous improvement program by the end of 2013, based around AEP’s Continuous Improvement program approved by the Commission earlier this year, attached as Appendix B.

3. The Commission should require the Companies to deploy a dedicated data center and server room energy efficiency program.

⁸⁸ Ibid 21 at 48.

⁸⁹ Ibid 21 at 50.

The Companies C&I energy efficiency portfolio does not include any program activity directed specifically at data centers or small server rooms and server systems. The portfolio only provides for servers to be “eligible as custom equipment under the C&I Energy Efficient Equipment Programs, Small and Large,” according to the companies’ responses to previous interrogatories.⁹⁰

The Environmental Intervenors object to the omission of specific data center, server room and server equipment programs in the Energy Efficient Equipment Programs, Small and Large. Relegating this fast-growing source of electricity demand and efficiency potential to the customer equipment programs misses an important opportunity to capture cost-effective energy savings and help keep customers competitive. Rather than limiting data center and server efficiency to custom equipment programs to which customers might or might not apply, the Commission should order the FirstEnergy to deploy a program that directly targets these applications with marketing, incentives and program delivery, bundled together with other C&I programs such as lighting and HVAC and using the existing incentive structure (\$0.12 per annual kWh saved).

Data center and server efficiency programs were pioneered by Pacific Gas & Electric starting in 2005 and are now offered by utilities around the country. AEP-Ohio is introducing a data center efficiency program (recently approved by the Commission) that provides incentives for participating businesses to support:

- a facility assessment to identify energy efficiency opportunities
- technical assistance from an approved program implementation contractor
- program incentives paid directly to the contractor
- installation of approved energy-savings equipment by approved, trained contractor, and
- pre- and post-installation inspections to ensure quality and verify energy savings.

Although data centers, servers and IT equipment generally are considered “high tech,” these types of facilities and equipment are highly inefficient in their energy use. The diagram in Appendix C shows

⁹⁰ NRDC Set 2-INT-12.

that much of a data center's energy is wasted. Due to their rapid market growth and spread into all aspects of business, data centers and servers represent a major efficiency opportunity.

The energy efficiency measures covered by this type of program include:

- Identification and decommissioning of unused “ghost” servers
- Server Virtualization to reduce the number of physical servers by using virtual servers on a few host machine, increasing server utilization up to ten-fold and enhancing reliability
- Use of Centralized or Cloud Services by migrating IT workloads from equipment in server rooms to “the cloud” or a central data center, where operations are highly efficient
- Refreshing older equipment with Energy Star Servers with maximum power supply efficiencies and minimum power factors at various loads, saving 10-15%
- Efficient Cooling through improved airflow, efficient Computer Room Air Conditioning (CRAC) or Computer Room Air Handler (CRAH) units, variable-speed drives, etc.

In addition to the above measures that are applicable in small server rooms as well as larger data centers, the following measures should also be considered for application in specialized central data centers:

- High Efficiency Uninterruptible Power System (UPS), with savings of up to 10% of overall data center consumption
- Efficient Floor Layout with hot-aisle/cold-aisle arrangements, which is easier to achieve if coupled with server virtualization, to reduce cooling energy up to 10%
- Optimized Temperature and Humidity Set Points, which are typically set lower than needed for equipment operation, resulting in reduced reliability and increased energy use
- Air-side economizers to reduce cooling energy by using direct outside air whenever ambient temperature and humidity are low enough to cool the space and equipment without mechanical refrigeration. This strategy is enhanced by optimizing set points.

Other strategies include air-to-air heat exchangers (exhaust air heat recovery) or water-side economizers (direct use of cooling towers to bypass mechanical chiller operation).

The program description for the AEP Ohio data center program is attached as Appendix D. Note that implementation contractors for this type of program are not the same as those employed for familiar HVAC and lighting. They must be specifically trained for the more specialized IT work.

The Commission should order FirstEnergy to modify the Plan and implement a similar program by the end of 2013 that would:

- Overcome existing barriers to customers identifying and implementing energy efficiency opportunities in this fast-growing source of electric demand
- Provide credibility and confidence for customers to work with pre-approved, trained and qualified contractors
- Help customers remain competitive in their own businesses by reducing energy and IT costs while maintaining or improving reliability

We recommend that the program be fully deployed in the Large C&I Energy Efficient Equipment Program, for data centers are larger server room facilities, and that a subset of the full program be applied in the Small C&I Energy Efficient Equipment Program, where it should focus on a more limited set of measures aimed at smaller data rooms.

4. The Commission should require the Companies to deploy a comprehensive retro-commissioning program in its Mercantile-Utility portfolio and a “retro-commissioning-lite” program in its Small Enterprise portfolio.

The Companies C&I energy efficiency portfolio includes an insignificant (0.2% of total investment and savings) level of activity to deploy retro-commissioning in large C&I customer facilities. Moreover, the portfolio does not include any program activity directed specifically at retro-commissioning in smaller C&I customer facilities.

The portfolio only provides for retro-commissioning as a minor part of the custom buildings component of the C&I Energy Efficient Equipment Programs, Large. The broader program is aimed at building shell measures, which is completely different from retro-commissioning that targets operational efficiency and energy savings in building equipment and controls. This confusing positioning within the portfolio could be a barrier to participation. The portfolio plan calls for only 20 customer participants per year across all three Companies.

The efficiency measures are “intended to encourage customers to gain and utilize certified building system operation training and energy management systems to reduce energy consumption and demand by improved building energy performance.”⁹¹ This makes the program sound like a relatively passive incentive program that connects pro-active customers with approved contractors that deliver the commissioning service. However, the proposed budget for this measure is more than 80% operations and less than 20% incentives,⁹² which makes little sense based on the description. It would make more sense to devote considerable operations budget to building capacity to scale up such a program, but the projected participation is flat at 20 participants per year.

The Environmental Intervenors object to the insignificant level investment in retro-commissioning in C&I Energy Efficient Buildings Programs, Large, and to the complete omission of retro-commissioning in C&I Energy Efficient Buildings Programs, Small. Relegating this promising source of efficiency potential, which is complementary to C&I retrofit programs, to a small part of the custom building program misses an important opportunity to capture cost-effective energy savings and help keep customers competitive.

Rather than limiting retro-commissioning to the custom large building program to which customers might not even apply for an equipment-related activity such as commissioning, the Commission should order FirstEnergy to deploy a dedicated retro-commissioning program that offers financial incentives to cover the cost of the commissioning assessment and capital improvements

⁹¹ Ibid 4 at 50, Section 3.4.9.

⁹² Attachments A, B, and C, Appendix B-4.

recommended by retro-commissioning. In addition, conventional efficiency retrofit measures installed during the commissioning process should still be eligible for retrofit incentives. The retro-commissioning program can thus be integrated together with other C&I equipment programs such as lighting and HVAC, using the existing marketing, incentives and program delivery structure.

Retro-commissioning is the diagnosis and correction of operational problems in a building's energy systems and equipment, such as lighting and space conditioning, to ensure that they operate according to their intended design, which is rarely the case in practice. A recent study completed by Lawrence Berkeley National Laboratory surveyed over 560 existing buildings (>90 million ft²), commissioned by 37 different commissioning providers, and found:⁹³

- Median costs of measures implemented from retro-commissioning were \$0.30/ft²
- Whole-building energy savings averaged 15%
- Simple payback period was 1.1 years on average
- Most reported improved occupant comfort and/or productivity.

These energy savings result from restoring a building's operational performance and do not overlap with savings achieved by efficient technology upgrades. Rather retro-commissioning can be complementary and mostly additional to efficiency retrofits. The diagram in Appendix E shows the relationships between retro-commissioning actions and energy efficiency measures.⁹⁴

Retro-commissioning programs have been in operation for about ten years and are now offered by utilities around the country. In Illinois, Commonwealth Edison's Smart Ideas program includes retro-commissioning for large commercial buildings (>50,000 ft²), offering incentive that cover the commissioning assessment and M&V cost, with a customer implementation requirement, in addition to the standard utility incentives apply for implemented retrofit measures. ComEd is now piloting an instrumented "monitoring-based" (continuous) commissioning program to achieve deeper, more persistent savings, and also looking at new approaches for smaller buildings.

⁹³ Mills et al., Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions, 2009, available at: <http://cx.lbl.gov/2009-assessment.html>

⁹⁴ Ibid.

AEP-Ohio is introducing a retro-commissioning program (recently approved by the Commission) that provides financial incentives to help customers overcome the first-cost barriers to conducting a commissioning study and implementing the study's recommendations. The incentives support:

- An initial retro-commissioning study for the customer, in exchange for the customer's commitment to complete those recommendations with short (1.5 year) paybacks
- Recruitment, oversight and training, as needed, of one or more retro-commissioning service providers (RSP), who provide commissioning services, and installation contractors, who review the studies and install recommended measures
- Where applicable, the commissioning study may include an assessment of energy savings opportunities eligible for retrofit incentives through other utility C&I programs
- Program incentives paid directly to the contractors
- Pre- and post-installation inspections to ensure quality and verify energy savings
- A customer education component, linked to existing industry activity such as Building Operator Certification, to promote the value of retro-commissioning services, targeting senior management as well as facility operations and maintenance staff.

The AEP Ohio comprehensive retro-commissioning program is aimed at large (>500kW or about 100,000 ft²) C&I customers. The program also includes a "RCx Lite" component for smaller buildings, using a limited set of likely energy-saving opportunities in HVAC, lighting and motor controls. In the comprehensive program for large C&I, eligible measures include:

- HVAC systems and controls: Economizers, demand control ventilation, heat recovery ventilators, fan and pump control, head-pressure control, setback and night vent control
- Lighting controls: Occupancy/vacancy controls, photo-sensors, timer controls
- Motor controls: Variable frequency drives, timer controls
- Process controls: Where applicable.

The program description for the AEP Ohio retro-commissioning program is attached as Appendix F. Note that RSP and implementation contractors for this type of program are not the same as those employed for familiar HVAC and lighting. They must be specifically trained for the more comprehensive retro-commissioning assessment work.

The Commission should modify the Plan and order FirstEnergy to implement a similar program by the end of 2013, as it would:

- Overcome existing barriers to customers identifying and implementing operational energy efficiency opportunities in the C&I sector, which are highly complementary and additional to conventional retrofit efficiency measures and programs
- Provide credibility and confidence for customers to work with pre-approved, trained and qualified RSP and implementation contractors
- Help customers remain competitive in their own businesses by reducing energy and maintenance costs.

We recommend that a comprehensive retro-commissioning program be fully deployed in the Large C&I Energy Efficient Buildings Program, or the Large C&I Energy Efficient Equipment Program, and that a subset of the full program similar to the AEP Ohio “RCx Lite” be applied in the Small C&I Energy Efficient Buildings Program or the Small C&I Energy Efficient Equipment Program, where it should focus on a more limited set of measures aimed at smaller buildings.

5. The Commission should require the Companies to make a more significant investment in ensuring the efficiency of new construction.

The Companies C&I energy efficiency portfolio includes an insignificant (0.6% of total investment and savings, about one tenth as much devoted to small C&I efficiency “kits”) level of activity to advance energy efficiency in the design and construction of new, small C&I customer facilities. Moreover, the portfolio does not include any program activity directed specifically at new construction of large C&I customer facilities.

The portfolio only provides for new construction efficiency incentives as a minor part of the C&I Energy Efficient Buildings Programs, Small. The portfolio plan calls for 72 small C&I customer participants per year by 2015 across all three Companies, and no large C&I customer participants.

The program “provides financial support through incentives for the design and construction of buildings that exceed standard building codes and practices by 15% of the electrical consumption and meet ENERGY STAR. The incentives will cover a portion of the incremental cost for design services over the consumption and demand by improved building energy performance.”⁹⁵ This description makes the program sound like a relatively passive incentive program.

However, the proposed budget for this measure is more than 85% operations and less than 15 % incentives,⁹⁶ which makes little sense based on the description. It would make more sense to devote considerable operations budget to direct design assistance to building designers and marketing outreach to build capacity to scale up such a program, but the program design does not address these functions.

The Environmental Intervenors object to the insignificant level of investment in new building efficiency in C&I Energy Efficient Buildings Programs, Small, and to the complete omission of retro-commissioning in C&I Energy Efficient Buildings Programs, Large. Relegating this high-leverage source of savings, which reduces the need for and cost of future C&I retrofit programs, to a small part of the small building program misses an important opportunity to capture cost-effective energy efficiency potential that otherwise become “lost opportunities” after the building design phase.

The small projected scale of the new construction program may be due partly to the slow rate of new construction in today’s Midwest economy, but new construction potential is likely greater if one considers 1) new building will pick up as the local economy strengthens, and 2) the cost and performance synergies of high-efficiency design, not just measure-by-measure improvements. It should be a priority to capture these potential savings before they becomes “lost opportunities.”

⁹⁵ Ibid 4 at 41, Section 3.3.7.

⁹⁶ Attachments A, B, and C, Appendix B-4.

Retrofitting today's new buildings later to improve energy efficiency is sure to cost more and achieve less than maximizing efficiency in new construction. Realizing the cost and performance synergies possible in new construction requires high-efficiency system design, not just measure-by-measure improvements (although measure efficiency is complementary and indeed part of efficient system design). The potential cost and performance synergies in efficient system design include:

- The opportunity to down-size heating and cooling equipment based on reduced loads, thus reducing the capacity, size and cost of, for example, HVAC equipment
- Reduced cost by upgrading equipment when it is new and incremental costs are lowest, compared to replacing equipment still in service at higher incremental cost
- Focus on efficient system design in new construction provides for intensive upgrades, which avoids “cream-skimming” of only the fastest-payback measures.

Rather than limiting new construction incentives to a fixed target (based on ENERGY STAR) under the C&I small building program, the Commission should order FirstEnergy to modify the plan and deploy a comprehensive new construction program that offers direct design assistance and financial incentives to cover the cost of additional design and engineering as well as more efficient technology. In addition, conventional component-level efficiency measures should still be eligible for equipment incentives. These program incentives, including design assistance, should also be available and actively marketed to the large C&I customer segment.

C&I new construction programs have been conducted by some utilities since the 1980s and are now offered by utilities around the country. For example, Xcel Energy has run a new construction program for C&I customers in Minnesota and Colorado since 1993, initially called Energy Assets and now called Energy Design Assistance. The Xcel program funds independent design assistance, including building energy simulation analysis, and offers incentives for each peak kW saved compared to a code-compliant baseline.

Xcel's approach enables whole-system design that employs diverse design strategies and captures the system design performance synergies described above. The investment per unit of energy saved has

been similar to that proposed by First Energy (\$0.12/kWh), but larger investment levels (\$120,000) and load reductions (about 200 kW and 1000 MWh/y) are achieved per participant.⁹⁷ The program also includes relatively large buildings among the participants. Other utilities offer similar new construction programs with names like Savings by Design, which emphasize the support for design assistance to improve building performance in the design phase.

One of the challenges in designing new construction programs making it worthwhile for building owners and designers to invest additional design and analysis work to capture system synergies and achieve deeper savings than by simply applying a menu of prescriptive technology measures. Some utilities, such as Pacific Gas & Electric and BC Hydro, approach this problem by offering escalating incentives, with higher incremental payments per kW or annual kWh saved beyond a fairly ambitious threshold. The benefit from this type of program design is that successful designs can become models that local designers are driven to emulate, thus raising the standard of performance throughout the entire community.

In Ohio, AEP has an on-going C&I new construction program that provides design assistance to architects and engineers in the form of building simulation modeling of efficient designs. The program takes a whole-building approach and offers incentives for the design team as well as the owner. In addition to supporting design assistance, the program provides incentives for the installation of high-efficiency lighting, HVAC, building envelope, refrigeration and other equipment and controls. The program includes a marketing mechanism for architects and engineers to promote energy-efficient building design to building owners and managers.

The AEP Ohio C&I new construction program is aimed at all C&I new construction projects. The program design projects moderate levels of investment (\$20,000) and energy savings (25 peak kW and 200 MWh/y) per building project. The program is projected to be highly cost-effective (TRC benefit/cost > 12), suggesting that more generous incentives could be applied to try to capture deeper efficiency gains

⁹⁷ York, D., et al., "Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S." American Council for an Energy Efficient Economy, 2008, available at: <http://www.aceee.org/research-report/u081>.

without risking the program's cost-effectiveness. The program description for the AEP-Ohio new construction program is attached as Appendix G.

The Commission should order FirstEnergy to modify the plan and implement a similar program by the end of 2013, as it would:

- Overcome existing barriers to customers identifying and implementing energy efficient building design strategies in the C&I sector, which generally enable deeper and more cost-effective efficiency improvement than by retrofitting the building later
- Provide credibility and confidence for customers to work with pre-approved, trained and qualified independent building energy design engineers and analysts
- Help customers remain competitive in their own businesses by reducing energy and maintenance costs.

It is recommended the Commission modify the plan and consider expanding the FirstEnergy's new construction incentive for small C&I into a comprehensive efficient new construction program with technical design assistance and incentives that encourage high-efficiency system design under the Small C&I Energy Efficient Buildings Program, and that a similar type of new construction program be initiated in the Large C&I Energy Efficient Buildings Program.

6. The Commission should not allow the Companies' to provide incentives for baseline lighting technologies in certain retrofit circumstances. This simplifies messaging and promotes market transformation rather than just savings acquisition.

Despite current EISA commercial lighting standards, some customers still have older T12 lighting systems. These should definitely be a target for program efforts, but should not be allowed to upgrade just to standard T8 or T5 efficiency levels. From a cost-efficiency perspective, once a customer has been engaged, it is typically best to move them to the highest-efficiency technology that is feasible and still cost-effective. For a lighting retrofit the additional cost to go to high-performance is so small

compared to the cost of standard efficiency that the overall cost of savings is lower with the high-efficiency option. Furthermore, the Ohio TRM does not include standard efficiency T8 fixtures and lamps as baseline, even for early replacement/retrofit scenarios. Last, being able to promote a uniform definition of what qualifies as efficient linear fluorescent lighting will simplify program administration, increase customer and trade ally understanding, and promote market transformation towards high efficiency technologies.

Because the measure savings are greater when starting from the installed T12 efficiency rather than the EISA baseline, it is appropriate for the Companies to offer a greater incentive to customers with existing T12 lighting. Any higher incentive should take into account the fact that the customer would have had to upgrade their old lighting to the EISA minimum sometime in the near future.

V. Mercantile Utility Portfolio Objections

A. The Commission should require the Companies to make better use of its account representatives to promote new energy efficiency projects, and tie a portion of account representative compensation to new energy savings projects from their customers.

Large customers represent a unique type of opportunity for efficiency programs. They are more likely to have one or more staff dedicated to energy usage or, at least, facility operation. They are more likely to have access to capital for efficiency improvements and better able to understand the high rate-of-return these investments can provide as compared with other capital spending. Although projects may require longer lead times and more effort to bring to fruition, their large scale can provide substantial savings from a small number of projects. Account representative interviews conducted for the Market Potential Study indicate that some of the Companies' most important customers are currently considering facility expansion.⁹⁸

⁹⁸ Toledo Edison EE & PDR Program Plan at 50.

The Companies state that their existing large customer account executives will serve an advisory role. This fails to leverage these important relationships for efficiency. Account executives should be selling efficiency to their accounts as an integral part of that relationship. Furthermore, the account executives should be seen as a key source of information on the efficiency needs of this customer segment. Program updates should be based on feedback from the customers, not just a bundle of information that account executives pass along. As stated by B&V in the Market Potential Study, “utility account managers are a primary vehicle for introducing new energy efficiency programs to Large C&I customers.”⁹⁹ The Environmental Intervenors object to the fact that, in spite of the key role that account managers can play in advocating for energy efficiency with large accounts, the Companies’ base no portion of account manager compensation on the completion of new (or even “existing”) energy efficiency projects at their accounts.¹⁰⁰ The Commission should require the Companies to base a portion of account representative compensation on the completion of new energy efficiency projects, a practice used routinely at utilities, such as Duke Energy Indiana.

B. The Commission should direct the Companies to either 1) not count demand reductions resulting from actions unrelated to Companies’ actions or 2) develop appropriate EM&V procedures to demonstrate that claimed savings are the result of Companies’ actions.

The Companies are proposing to claim savings from demand response actions by market participants that are occurring or will occur without any intervention from the Companies or their programs. In effect, these savings are the result of the market baseline demand response activity. These are “free-rider” savings and are therefore not attributable to the Companies.

The Companies claim that this should not be relevant to the discussion, stating that they “are not aware of a specified requirement that a utility needs to offer an incremental program incentive to the

⁹⁹ Id.

¹⁰⁰ NRDC Set 2-INT-21.

resources participating in such a program.”¹⁰¹ While it is true that incentives are not the only way to influence customer behavior towards efficiency investments or demand response program participation, the Companies have not provided any indication that they took any action, financial or otherwise, to cause the subject demand response savings to exist. If no action is taken by the Companies, there is no program. The legislation clearly requires the utility to offer *programs* in order to demonstrate compliance with the benchmarks, or make use of mercantile customer capabilities, “existing or new.” Nowhere in the law are the Companies allowed to “take” another’s efficiency or demand response to demonstrate compliance. If that were the case, then the Companies could also take credit for savings resulting from, say, a local climate action group passing out CFLs on Election Day. The point of the energy efficiency and demand reduction benchmarks is to create activity *beyond what would have happened anyway*. Otherwise, there would be no reason to have benchmarks.

VI. Small Enterprise Portfolio Objections

The Companies budget \$60 million for the Commercial/Industrial Small Enterprise Portfolio over three years.¹⁰² The Companies have had difficulty reaching small business customers to-date. According to ADM Associates’ evaluation of the Companies’ 2011 C&I Energy Efficiency Incentive Programs, “smaller organizations that utilize less energy have not been as active in the programs,” and “the lower level of participation suggests that these organizations face additional barriers.”¹⁰³ The evaluator described several additional barriers that small businesses face compared with larger businesses:

- less expertise in energy efficiency equipment
- financial constraints that prevent the adoption of energy efficient equipment, and reduced benefits from improvements because they often rent or lease the space they occupy

¹⁰¹ Sierra Club Discovery Set 2 INT-70.

¹⁰² Attachments A, B, and C, Appendix B-4.

¹⁰³ Toledo Edison Plan EE & PDR Program Plan at ES-6.

- smaller businesses are less likely to have policies and procedures for managing energy efficiency improvements and less likely to have the resources to dedicate to personnel to make decisions about energy efficiency improvements
- larger businesses were more frequently the target of sales calls because of the potential scale of projects.¹⁰⁴

In spite of these additional barriers, the Companies plan few special efforts, beyond kits and a few other measures, to make energy efficiency easier and cheaper for small business customers. The Companies' planned incentives for small business customers are the same as for large enterprise customers where measures overlap.¹⁰⁵ The Companies' marketing strategies, implementation plans, ramp-up strategy, approach, and rationale are the same for programs targeted at Small Enterprise and Large Enterprise customers.

The Commission should require the Companies to implement a higher-incentive, direct install program for small businesses.

The Companies budget \$20 million¹⁰⁶ for the Energy Efficient Buildings Program Small over three years, which includes the planned distribution of 158,500¹⁰⁷ energy efficiency kits costing \$16 million. The kits represent nearly 40% of the cumulative three-year savings for this sub-sector for Ohio Edison and nearly 30% of the cumulative three-year savings for this sub-sector for the other two operating companies. Furthermore, these kits have a measure life of just three years. That is, while they will contribute to the 2013-2015 benchmarks, they provide little in the way of lasting savings for 2016 and beyond. After 2016, the remaining savings from the Small Enterprise segment of the Companies' programs will be dramatically diminished.

The kits are intended to "educate customers on the benefits of simple" energy efficiency measures, "provide the opportunity to get broad participation in the program which spurs additional

¹⁰⁴ Id.

¹⁰⁵ Attachments A, B, and C, Appendix C-4.

¹⁰⁶ Attachemnts A, B, and C, Appendix B-4.

¹⁰⁷ Attachments A, B, and C, Appendix C-2.

interest in energy efficiency,” and demonstrate the positive effects of energy efficiency measures.”¹⁰⁸ The kits will contain, at minimum, CFLs, faucet aerators, and smart strips.¹⁰⁹ While we do not know (because B&V did not ask¹¹⁰) we can assume that these customers are already knowledgeable about CFLs, remembering that 75% of the Companies’ customers report having CFLs installed in their homes.

The Environmental Intervenors object to the Energy Efficient Buildings Program Small. Rather than help the *existing* market for energy services better address small business customers needs and remove the well-document barriers to efficiency in the sector, the Companies plan a massive effort *operating outside the market*, working with the U.S. Postal Service where they should be working with trade allies and small businesses.

In place of the Kits Sub-program in the Energy Efficient Buildings Program Small, the Commission should order FirstEnergy to modify the plan and deploy a program that provides small businesses direct installation of efficiency measures at higher incentive levels than in the large C&I programs. Other utilities have found that higher incentives and direct installation are necessary to encourage efficiency in this sector. The direct-install, turn-key model was first offered by National Grid in 1990 in Massachusetts, and has continued to be a part of Massachusetts’ electric utility program portfolio.¹¹¹ AEP-Ohio runs a successful Express program (recently approved by the Commission) that provides participating small businesses:

- a free facility assessment to identify energy efficiency opportunities
- a proposal with a list of recommended improvements and estimates of energy savings, project cost, and payback period
- incentives paid directly to the contractor, up to 100% of the project cost
- installation of approved energy-savings equipment by a local, trained contractor, and
- pre- and post-installation inspections to ensure quality and verify energy savings.

¹⁰⁸ Ibid 4 at Page 43.

¹⁰⁹ Attachments A, B, and C, Appendix C-1.

¹¹⁰ Ibid 21, Appendix D-2 – 2012 Commercial Survey Results.

¹¹¹ 2010-2012 Massachusetts Joint Statewide Three-Year Electric Energy Efficiency Plan, October 29, 2009, Page 255, available at: <http://www.ma-eeac.org/docs/DPU-filing/ElectricPlanFinalOct09.pdf>.

The program has provided 6.4% of AEP-Ohio's ex-ante C&I sector savings (non self-direct) so far this year:¹¹² the program description for the is attached as Appendix H

The Commission should order FirstEnergy to modify the plan and implement a similar program by the end of 2013, as it would:

- help alleviate financial constraints that limit small business participation in energy efficiency programs
- make the energy efficiency investment decision easier by creating a “one-stop shop,” and
- get trade allies engaged by paying incentives directly to the contractor and offering higher incentives for the small business sector.

In addition to directly addressing the barriers to efficiency in the small business sector, an Express program would likely have greater positive economic impact than a program that simply mailed kits to small business customers, as the program would encourage substantial project activity. AEP-Ohio budgeted \$11.5 million for the program from 2012-2014; shifting a large portion of the \$16 million kit program budget to an Express-like program is feasible.

VII. Conclusion

The Natural Resources Defense Council and Sierra Club recognize the challenge the Commission and Companies will have in implementing the recommendations contained in these Objections. It takes time to build program infrastructure, to train employees to manage programs and implementers, to build relationships with trade allies. We are willing to work with the Commission, Companies, and other Intervenors to improve this plan. The Commission should consider extending the current Plan's cost recovery mechanism and programs as it reviews these objections and recommendations. The Commission should demand the same level of energy efficiency performance from the Companies as it does from other Ohio electric utilities.

¹¹² Williams, 2nd Quarter Transparent Reporting presentation, Collaborative Meeting, August 22, 2012, Slide

Respectfully Submitted,

/s/ Christopher J. Allwein

Christopher J. Allwein, Counsel of Record
Williams, Allwein and Moser, LLC
1373 Grandview Ave., Suite 212
Columbus, Ohio 43212
Telephone: (614) 429-3092
Fax: (614) 670-8896
E-mail: callwein@wamenergylaw.com

CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing *Objections to the Plan by Natural Resources Council and the Sierra Club* has been served upon the following parties via electronic mail on September 17, 2012.

/s/ Christopher J. Allwein
Christopher J. Allwein

Devin Parram
Attorney General's Office
Public Utilities Commission of
Ohio
180 East Broad St., 6th Fl.
Columbus, OH 43215
Devin.parram@puc.state.oh.us

Kathy J. Kolich
Carrie M. Dunn
FirstEnergy Service Company
76 South Main Street
Akron, OH 44308
kjkolich@firstenergycorp.com
cdunn@firstenergycorp.com
Attorneys for FirstEnergy Service
Company

Cathryn N. Loucas
Trent Dougherty
The Ohio Environmental Council
1207 Grandview Avenue, Suite 201
Columbus, OH 43212-3449
Cathy@theOEC.org
Trent@theOEC.org
Attorneys for the Ohio Environmental
Council

Colleen L. Mooney
Ohio Partners for Affordable
Energy
231 West Lima Street
Findlay, OH 45839-1793
cmooney2@columbus.rr.com

Robert Kelter
Justin M. Vickers
Nicholas McDaniel
Environmental Law & Policy Center
35 East Wacker Drive, Suite 1600
Chicago, IL 60601
jvickers@elpc.org
rkelter@elpc.org
NMcdaniel@elpc.org
Attorneys for the Environmental Law
& Policy Center

Todd M. Williams
Williams Allwein and Moser, LLC
Two Maritime Plaza, Third Floor
Toledo, Ohio 43604
Telephone: (567) 225-3330
Fax: (567) 225-3329
E-mail: toddm@wamenergylaw.com

Attorney for AEE-Ohio

Jody M. Kyler
David F. Boehm
Michael L. Kurtz
Boehm, Kurtz & Lowry
36 East Seventh Street, Suite 1510
Cincinnati, OH 45202
jkyler@bkllawfirm.com
dboehm@bkllawfirm.com
mkurtz@bkllawfirm.com
Attorneys for Ohio Energy Group

Richard L. Sites
General Counsel & Senior Director of
Healthy Policy
Ohio Hospital Association
155 East Broad Street, 15th Floor
Columbus, Ohio 43215
ricks@ohanet.org

Michael K. Lavanga
Brickfield, Burchette, Ritts & Stone, P.C.
1025 Thomas Jefferson Street, N.W.
8th Floor, West Tower
Washington, D.C. 20007
(202) 342-0800 (Main Number)
(202) 342-0807 (Facsimile)
Mike.Lavanga@bbrslaw.com

Attorney for Nucor Steel Marion

J. Thomas Siwo
Thomas J. O'Brien
BRICKER & ECKLER LLP
100 South Third Street
Columbus, OH 43215-4291
Telephone: (614) 227-2389
Facsimile: (614) 227-2390
E-mail: tsiwo@bricker.com
tobrien@bricker.com

Attorneys for Ohio Manufacturers' Association

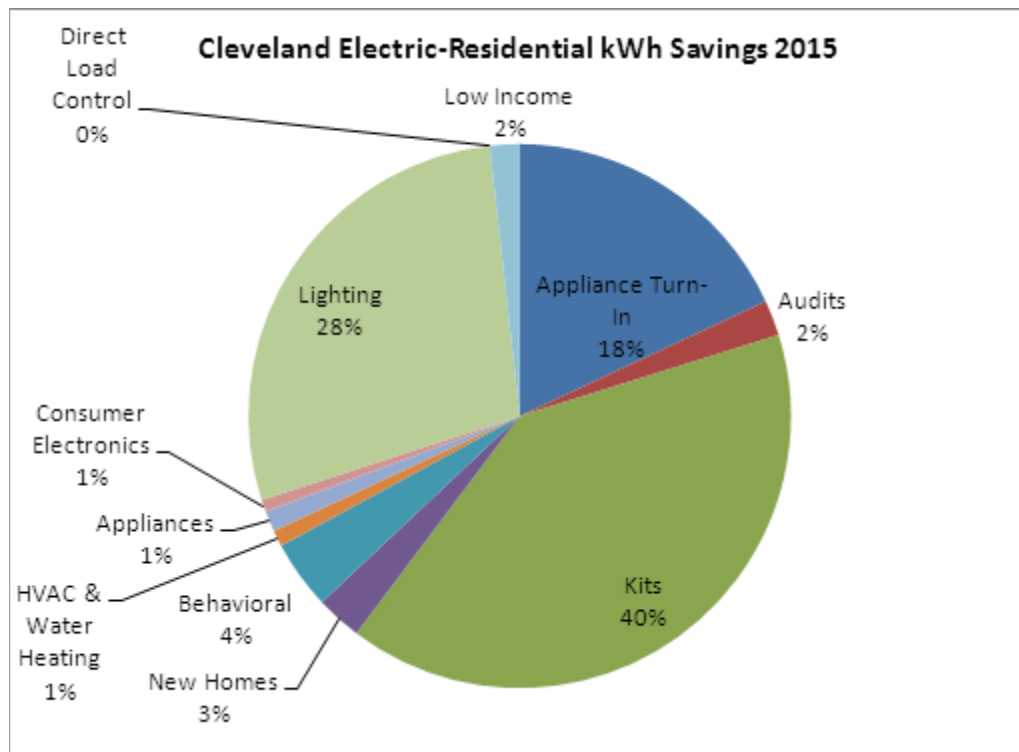
Kyle L. Kern
Assistant Consumers' Counsel
Office of the Ohio Consumers'
Counsel
10 West Broad Street, Suite 1800
Columbus, OH 43216
kern@occ.state.oh.us

Thomas J. O'Brien
Bricker & Eckler LLP
100 South Third Street
Columbus, Ohio 43215
tobrien@bricker.com

Attorney for Ohio Hospital
Association

**Objections of the Environmental Intervenors
Case No. 12-2190-EL-POR, et al.**

Appendix A



2015 Cleveland Electric Illuminating Company Residential Savings by Measure¹

¹ Data from NRDC Set-1 RPD-1.

4.2.8 Continuous Improvement (new program)

Program Objective	Continuous Improvement Program
	Facilitate a comprehensive and enduring strategic approach to energy reduction at key customer facilities. The Continuous Improvement Program (CIP) will realize widespread, substantial energy savings for participants willing to participate in and partner with the program.
Target Market	<p>Large, account managed business customers with site electric energy expenditures exceeding \$1,000,000 per annum. Direct customer outreach will target executive level decision makers within the customers' organization including CEO's, CFO's, energy managers, facility managers, etc. Target markets will include manufacturing facilities, hospitals, schools, hospitality, large offices, and large government facilities.</p> <p>Participating customers will commit to an on-site executive sponsor of the CIP initiative, an earmarked budget for the program, access to key human resources, the inclusion of an energy CIP statement in the corporate goals, and training on energy issues with existing personnel and new hires.</p>
Program Duration	The Continuous Improvement Program will be an ongoing component of AEP Ohio's EE/PDR Plan. An initial offering may be targeted to a limited number of customers ideally suited to the program. The program would then expand to all customers meeting the eligibility requirements.
Program Description	<p>The Continuous Improvement Program is designed to work with corporate long-term goals regarding demand-side management. Corporate goals should include a specific target, such as "25 percent reduction in energy consumption at all their facilities in Ohio by 2015 as compared to the 2010 baseline." By enabling customers to meet their stated goals, the value of the CIP will be enhanced and AEP Ohio will be better positioned to leverage predictable energy and demand savings from its largest customers.</p> <p>Once a customer site is qualified for the Continuous Improvement Program, the process will begin with a benchmarking assessment of the current baseline as compared to other facilities in the same market sector. A site level executive meeting will occur to analyze the corporate culture regarding energy management as well as the known technical opportunities. The customer will agree to a regular and active measurement program. Once baseline levels are recorded, the facility will undergo a continuous process of improvement plans, plan implementation, and effectiveness evaluation.</p> <p>A facilitator from AEP Ohio or designated by AEP Ohio may be appointed as part of the customer's energy management team, which meets regularly to develop ideas and</p>

prioritize programs. Annually, the AEP Ohio Account Manager will review with the customer overall progress towards the agreed upon strategic goals.

Incentive Strategy

The Continuous Improvement Program will leverage other existing funding mechanisms available to the customer. Additionally, the CIP will attempt to identify other funding mechanisms at the local, state and federal levels.

Participating facilities will receive recognition for their efforts and optional marketing assistance. Where applicable, assistance may be given to achieve certifications.

Eligible Measures

All measures demonstrating energy savings and capable of measurement and verification are eligible for the CIP. Typically, measures would additionally be eligible under another portion of the EE/PDR Plan.

Examples of technologies include:

- Process
- Lighting
- HVAC
- Refrigeration
- Compressed air
- Controls
- Retro-commissioning

Implementation Strategy

Delivery of the Continuous Improvement Program will be achieved primarily through the combined efforts of AEP Ohio EE/PDR program staff, marketing or outreach groups, AEP Ohio Account Managers, and an implementation contractor hired through a competitive bidding process.

AEP Ohio and the implementation contractor will work to generate awareness of the CIP among customers using a targeted approach. Outreach may expand as the program matures, as described in the following marketing strategy.

AEP Ohio and the implementation contractor will work with eligible customers to identify and pre-qualify prospective facilities. This effort may involve meeting with executives to gain insight on strategic energy goals.

If the facility is deemed eligible, the customer will be offered the opportunity to submit a more detailed Continuous Improvement Application. Once received, the application forms the basis for a contractual agreement between AEP Ohio and the customer outlining requirements and deliverables. The customer has a limited time (90 days) to sign the acceptance offer to initiate CIP support from AEP Ohio. Upon customer signature of the incentive offer, the Continuous Improvement Contract will be valid for a

period not to exceed three years, at which time a new contract may be mutually agreed upon.

Once projects are identified under the CIP, the implementation contractor will assist the customer in achieving incentives through other programs, which may or may not be part of the AEP Ohio EE/PDR Plan.

All program-specific administrative requirements will be handled by a third-party implementation contractor, selected through a competitive bid process. The implementation contractor will be responsible for:

- Marketing strategy and messaging.
- Market provider outreach, recruitment, and training.
- Administrative and technical assistance to customers in completing program applications.
- Review of applications.
- Program participant communications.
- Data tracking and reporting.
- Budget tracking and reporting.
- Managing public relations.
- Customer satisfaction and problem resolution.

Marketing Strategy

Solution Providers are the primary conduit for this program and will market the program through their direct relationships with commercial and industrial customers. Solution Providers will identify, communicate, and enroll customer participants through their own marketing initiatives and with the assistance of AEP Ohio Account Managers, which may be supplemented by the program.

The following are marketing strategies that will help meet program goals:

- Leverage, grow and diversify Solution Provider relationships to achieve aggressive targets.
- Educate and leverage existing resources (e.g., Solution Providers, AEP Ohio Account Managers) to their greatest potential to more effectively and economically reach customer segments.

Segment customers by their building type and tailor communications and incentive offerings based on this information.

Tactics include co-branded marketing collateral from AEP Ohio. Other tactics to be utilized are direct mail, newsletters, trade shows, and email communications to market the program.

Milestones

Tasks	Timeframe
Selection of Program Implementation Contractor	3 months
Program materials developed	5 months
Program launch – marketing begins	6 months

EM&V Strategy

All evaluation activities will be conducted by AEP Ohio's evaluation contractor. An integrated evaluation approach will be taken that includes the following components:

- Addressing evaluation needs at the onset of program design and collecting evaluation data as part of program administration.
- Assessing and documenting baseline conditions.
- Establishing tracking metrics.
- Conducting primary and secondary research as part of the impact and process evaluations.

The overall goal of the impact evaluation will be to validate/calibrate savings values and determine program cost-effectiveness. Self-report surveys with both participants and nonparticipants may be used to assess free riders/spillover. The participant and nonparticipant surveys will also address program awareness, barriers to participation, participant satisfaction, and process efficiency. These surveys will be enhanced by collecting market data and assessing trends as well as interviews with program staff, vendors, manufacturers, and other Solution Providers.

The process evaluation will be conducted during the first program year and then coordinated with follow-up impact evaluation work to be performed once program-approved measures have been installed and operating for a sufficient time to enable a robust impact evaluation.

AEP Ohio Administrative Requirements

Initial program administration will be conducted by AEP Ohio EE/PDR personnel and Customer Services account representatives. To develop and manage the third-party implementation, it is estimated that 0.5 FTE equivalent will be required for program oversight. Key oversight functions include:

- Customer recruitment.
- Recruitment, selection, and management of the implementation contractor(s).
- Coordination of marketing strategy/public relations among programs and market sectors.
- Coordination of all education and training.
- Data warehousing.

- Management of the evaluation contractor.
- Goal achievement within budget.

AEP Ohio and its implementation contractor will follow industry best practices during final program design and start-up to ensure success, including:

- Following an integrated evaluation approach as described above.
- Account manager and customer service training.
- Establishing requirements for supporting documentation, analysis methods, and reporting requirements on technical studies.
- Completing all program procedures from marketing through verification and payment and conducting a dry-run prior to launch.
- Preparing for stronger or weaker than expected participant response.

Participation

The following participation levels have been used for planning purposes. However, AEP Ohio may adjust qualifying energy efficiency measures and anticipated participation levels as necessary in accordance with current market conditions, EM&V results and program implementation experience.

Incremental Annual Participants				
Measure	2012	2013	2014	Total 2012 – 2014
Facility	10	30	60	100

Budget

The following budget has been used for planning purposes. However, AEP Ohio may adjust program budgets as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Budget				
	2012	2013	2014	Total 2012 – 2014
Administrative	\$1,000,000	\$1,500,000	\$2,000,000	\$4,500,000
Incentive	\$1,000,000	\$1,500,000	\$2,000,000	\$4,500,000
Total	\$2,000,000	\$3,000,000	\$4,000,000	\$9,000,000
Incremental Annual				
	2012	2013	2014	Total 2012 – 2014
Participant Costs	\$2,460,685	\$3,691,027	\$4,921,370	\$11,073,082

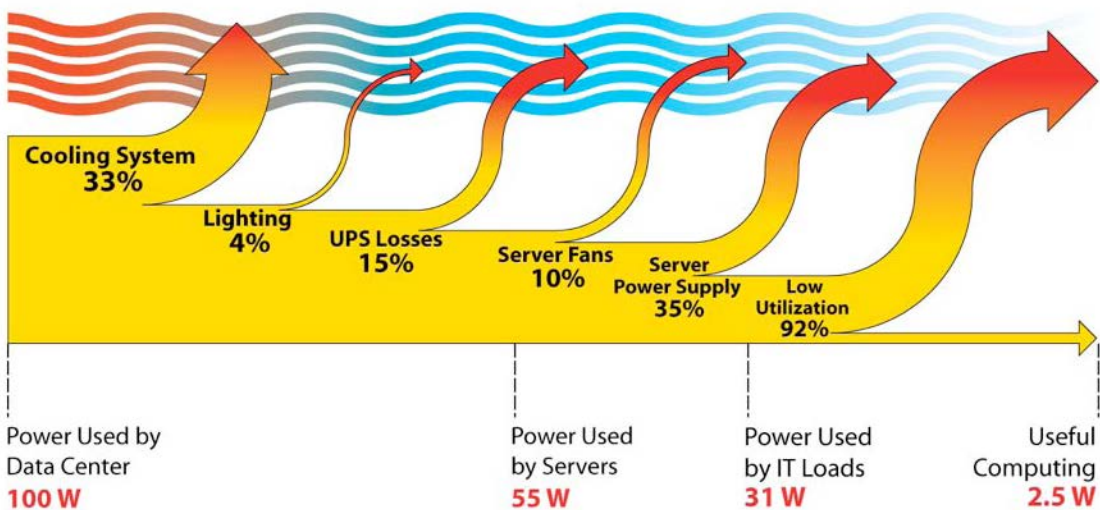
Savings Targets

Incremental Annual Savings – at Meter				
	2012	2013	2014	Cumulative Total 2012 – 2014
Energy (MWh)	10,000	15,000	20,000	45,000
Summer Peak Demand (kW)	1,230	1,845	2,460	5,535

Benefit-Cost Test Results

Benefit-Cost Test	2012-2014 Benefit-Cost Test Ratio
Total Resource Cost (TRC)	2.3
Utility System Resource Cost (UCT)	4.0
Participant Cost (PCT)	5.6
Rate Impact Measure (RIM)	0.8

Appendix C



Compounding energy losses (and hence savings potential) in data centers¹

¹ From Rocky Mountain Institute

4.2.10 Data Center (new program)

Program	Data Center Program
Objective	Provide energy efficiency opportunities for both new and existing data centers that lead to energy savings. Incentives will be given to qualifying measures as well as being offered to customers to offset the cost of a preliminary study, when appropriate. The study will be utilized in identifying current and new energy efficiency opportunities.
Target Market	The Data Center Program is designed for data centers seeking to improve the efficiency of new and existing facilities. Special attention will be given to meet the specific needs of each of the three sizes of data centers as defined by the Environmental Protection Agency, which include: Localized Data Centers (500-1,000 sq. ft.), Mid-tier Data Centers (1,000-5,000 sq. ft.), and Enterprise-class Data Centers (5,000+ sq. ft.)
Program Duration	The Data Center Program will be an ongoing component of the AEP Ohio's EE/PDR Plan.
Program Description	The Data Center Program is designed to assist customers in addressing energy efficiency opportunities in both new and existing data centers (i.e., a facility used to house computer systems and associated components). Funding for site evaluations will be offered as well as incentives to assist in the upfront costs of installing the identified energy efficiency opportunities. Although the program is designed to target a typical one megawatt (1 MW) sized facility, data centers from the relatively small to the very large facility will be encouraged to participate.
Incentive Strategy	Incentives will be offered to customers installing qualifying measures or to offset the cost of a preliminary study that will be utilized to identify current and/or new energy efficiency opportunities.
Eligible Measures	<p>The following energy efficient opportunities will be eligible for the Data Center Program:</p> <ul style="list-style-type: none"> • Server Virtualization – Reduce the number of physical servers by using virtual servers on a few host machines. Virtualization is accomplished by creating dynamic firewalls that enable sharing host servers for both central processing unit (CPU) and memory. Server utilization can increase ten-fold. Reliability is usually increased when servers are virtualized. • Energy Star Servers – Energy Star program requires Power Supply Unit (PSU) efficiencies and minimum power factors at various loads for blade servers, pedestal and rack-mounted servers. Savings of 10-15 percent are common as compared to a conventional PSU. • Best-in-Class UPS – Most Uninterruptible Power System (UPS) operate near 20 percent loading with 70 percent efficiency, while newer units with better load

matching operate at about 90 percent efficiency. In both new construction and retrofits, savings of up to 10 percent of overall data center consumption are common.

- **Power Distribution Optimization** – Energy savings can be realized by reducing the number of power transformers and operating at higher voltages. This strategy is achievable by converting the UPS from 277/480 VAC to 240/415 through an autotransformer and eliminating the power distribution unit (PDU) transformer, or the PDU may be fully replaced by a PDU autotransformer.
- **Distribution Power Transformer Optimization** – Energy savings can be realized by installation of filters and/or properly sized distribution transformers designed to mitigate harmonic currents from switched power supplies.
- **Storage Optimization** – Analyze storage strategy and evaluate efficiency on an energy per terabyte basis. Optimization may include right-sizing storage capacity and scalable storage.
- **Row-Oriented Cooling Systems** – Allows for shorter air paths (less fan power) and increased heat transfer with efficiency gains up to 15 percent. This efficiency upgrade, however, is only applicable to new high-density designs.
- **Efficient Floor Layout** – In both new designs and retrofits, cooling energy can be saved with hot-aisle/cold-aisle arrangements, producing savings up to 10 percent. Optimizing floor layout is easily achievable if coupled with server virtualization.
- **Properly Located Vented Floor Tiles** – Requires a professional assessment, but can produce cooling savings leading to overall savings of up to 5 percent. Program should insure wires in subfloor do not restrict airflow.
- **Optimize Temperature and Humidity Set Points** – Often temperature set points are set too low, resulting in reduced reliability and increased energy requirements. American Society of Heating, Refrigerating, and Air-Conditioning Engineers Technical Committee 9.9 has temperature and moisture guidelines for air entering the cold aisle.
- **Economizers** – Cooling system energy can be greatly reduced through economizers. Where applicable, consider using direct outside air, with good filters and evaluate humidity constraints. Other strategies include air-to-air heat exchangers or waterside economizers.
- **Efficient Lighting** – A small measure compared to IT and cooling loads, but often easy to implement and can produce overall savings of up to three percent.
- **PC Power Management** – Software approach to controlling IT equipment outside of the data center. It uses the network to control PC settings and put into hibernate mode. Auto wake-up and hibernate for security and virus scans as well as software updates. There are many products available.

- **Desktop Virtualization** – Users outside of data center use a thin client instead of a PC. Up to 50 thin clients per host machine. In addition to the energy savings, security is enhanced.
- **Emerging Technologies (Power Management)** – Vendors are starting to offer new technologies that manage power distribution and demand. Examples are Hewlett Packard ProLiant Server Systems Dynamic Power Regulator and VMWare Enterprise Level Latest Version – Distributed Power Management. Program may evaluate effectiveness of these technologies as they evolve.
- **Optimize Data Center Cooling Technology** – Improving the temperature change across the Computer Room Air Conditioning unit (CRAC) or installing high efficiency cooling systems can produce energy savings.

Implementation Strategy

Key aspects of the Data Center Efficiency program implementation strategy include:

- **Solution Provider Recruitment and Training:** Solution Providers will be a key delivery mechanism for the program as they promote participation and available incentives to their customers. Solution Providers will be recruited to participate in training sessions to inform them about program incentives, participation processes, and requirements. Solution Providers actively participating in the Smart Ideas program receive regular communications about program activities and changes to ensure they are informed and engaged.
- **Customer Recruitment:** Customers will be recruited by Implementation Contractor marketing and outreach activities, AEP Ohio Account Manager referrals, and Solution Providers. To ensure that commercial and industrial (C&I) customers perceive AEP Ohio EE/PDR programs as a seamless set of offerings, cross-referrals from other programs will also be provided where appropriate.
- **Technical Assistance:** The program implementation contractor will provide site evaluations and guidance regarding program offerings and participation processes to customers and Solution Providers as needed to minimize confusion and barriers to participation.
- **Application Submittal:** Customers will submit incentive applications and required documentation after installation of qualifying energy efficiency measures has been completed.
- **Quality Assurance/Quality Control (QA/QC) Review:** Incentive applications will be subject to a QA/QC review to ensure all required forms and documentation have been submitted and that the calculation of incentive totals are correct.
- **Project Verification:** AEP Ohio will reserve the right to site-verify installations prior to approval and incentive payment.
- **Incentive Payment:** To minimize barriers to participation, AEP Ohio will seek to expedite incentive payment.

Marketing Strategy

Solution Providers and AEP Ohio account managers are the primary conduits for this program and will market the program through their direct relationships with their business customers.

Milestones

Tasks	Timeframe
Selection of Program Implementation Contractor	3 month
Program materials developed	4 months
Program launch – marketing begins	5 months

EM&V Strategy

All evaluation activities will be conducted by a third-party evaluation contractor. An integrated evaluation approach will be taken which includes addressing evaluation at the onset of program design, collecting evaluation data as part of program administration, assessing and documenting baseline conditions, establishing tracking metrics, as well as conducting primary and secondary research as part of impact and process evaluations.

- The overall goal of the impact evaluation will be to validate/calibrate the deemed savings values and determine program cost-effectiveness. Self-report surveys with both participants and nonparticipants may be used to assess free riders/spillover. The participant and nonparticipant surveys will also address program awareness, barriers to participation, participant satisfaction, and process efficiency. These surveys will be enhanced by collecting market data and assessing trends as well as interviews with program staff, vendors, manufacturers, and other Solution Providers.
- The process evaluation will be conducted during the first program year and then coordinated with follow-on impact evaluation work to be performed once program-approved measures have been installed and operating for a sufficient time to enable a robust impact evaluation.

AEP Ohio Administrative Requirements

Initial program administration will be conducted by AEP Ohio EE/PDR personnel and Customer Services account representatives. To develop and manage the third-party implementation, it is estimated that 0.5 FTE equivalent will be required for program oversight. Key oversight functions include:

- Customer recruitment
- Recruitment, selection, and management of the implementation contractor(s)
- Coordination of marketing strategy/public relations among programs and market sectors
- Coordination of all education and training

- Data warehousing
- Management of the evaluation contractor
- Goal achievement within budget

AEP Ohio and its implementation contractor will follow industry best practices during final program design and start-up to ensure success, including:

- Following an integrated evaluation approach as described above
- Account manager and customer service training
- Establishing requirements for supporting documentation, analysis methods, and reporting requirements on technical studies
- Completing all program procedures from marketing through verification and payment and conducting a dry-run prior to launch
- Preparing for stronger or weaker than expected participant response

Participation

The following participation levels have been used for planning purposes. However, AEP Ohio may adjust qualifying energy efficiency measures and anticipated participation levels as necessary in accordance with current market conditions, EM&V results and program implementation experience.

Incremental Annual Participants				
Measure	2012	2013	2014	Total 2012 – 2014
Project	10	15	20	45

Budget

The following budget has been used for planning purposes. However, AEP Ohio may adjust program budgets as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Budget				
	2012	2013	2014	Total 2012 – 2014
Administrative	\$538,583	\$807,874	\$1,077,165	\$2,423,622
Incentive	\$398,950	\$598,425	\$797,900	\$1,795,275
Total	\$937,533	\$1,406,299	\$1,875,065	\$4,218,897
Incremental Annual				
	2012	2013	2014	Total 2012 – 2014
Participant Costs	\$807,986	\$1,211,978	\$1,615,971	\$3,635,935

Savings Targets

Incremental Annual Savings – at Meter				
	2012	2013	2014	Cumulative Total 2012 – 2014
Energy (MWh)	3,990	5,984	7,979	17,953
Summer Peak Demand (kW)	495	743	990	2,228

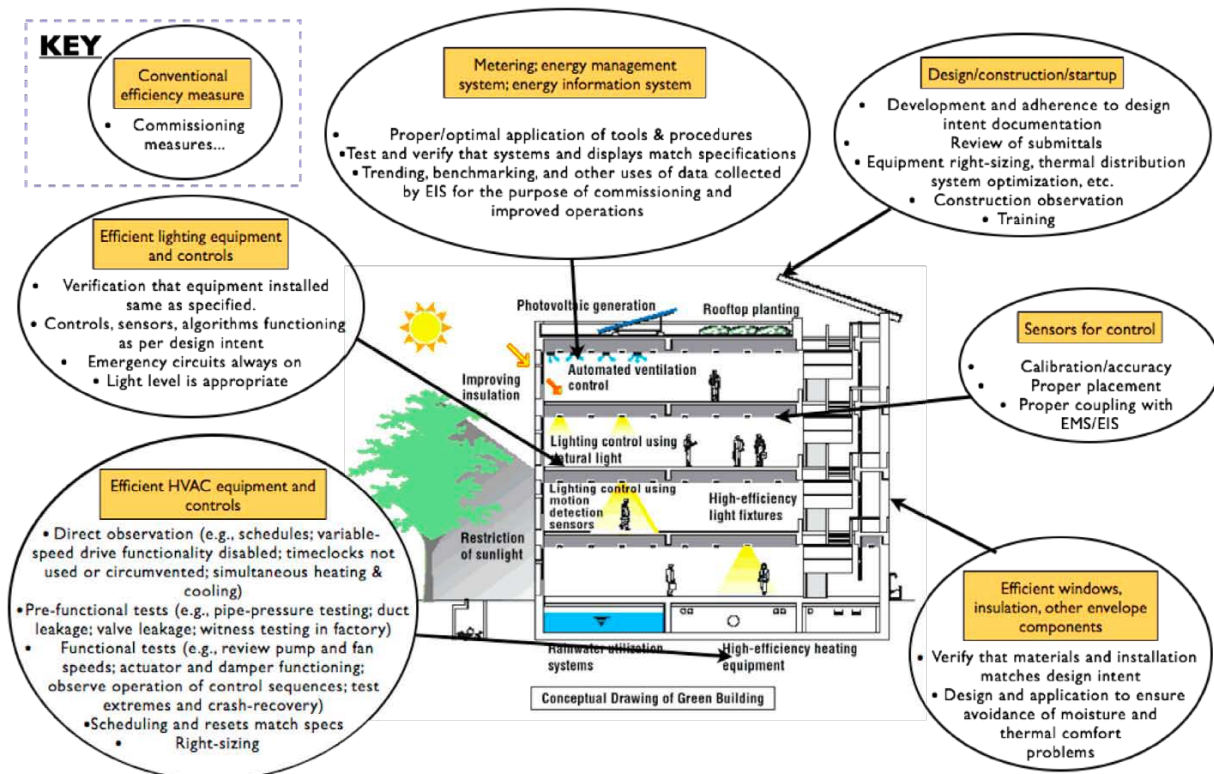
Benefit-Cost Test Results

Benefit-Cost Test	2012-2014 Benefit-Cost Test Ratio
Total Resource Cost (TRC)	1.4
Utility System Resource Cost (UCT)	2.0
Participant Cost (PCT)	5.3
Rate Impact Measure (RIM)	0.6

Objections of the Environmental Intervenor

Case No. 12-2190-EL-POR, et al.

Appendix E



Relationships between retro-commissioning actions & energy efficiency measures¹

¹ From Mills, et al., Lawrence Berkeley National Laboratory, 2009

4.2.7 Retro-Commissioning (new program)

Program	Retro-commissioning Program
Objective	Obtain energy savings through the identification and implementation of low-cost, operational adjustments that improve the efficiency of existing buildings' operating systems by optimizing the systems to meet the building's requirements, with a focus on building controls and HVAC systems.
Target Market	The Retro-commissioning (RCx) Program is targeted to medium to large business customers with a peak demand of 500 kW or greater.
Program Duration	The Retro-commissioning Program will be an ongoing component of the AEP Ohio's EE/PDR Plan.
Program Description	<p>The Retro-commissioning Program will be delivered through a network of retro-commissioning providers operating in AEP Ohio's service territory that have been trained in program protocols and participation processes. For smaller facilities, commissioning providers will conduct a targeted assessment of areas with substantial energy savings opportunities such as packaged HVAC units, otherwise called RCx Lite. Larger facilities will be eligible to receive a more comprehensive assessment of building systems and controls.</p> <p>To motivate participation, the cost of the RCx study, up to \$5,000 for RCx Lite and negotiable for more comprehensive RCx studies, is available to customers to assist in overcoming the barrier of customers' reluctance to spend money on a concept that is new to them. To ensure high implementation under this approach, AEP Ohio will institute the following program approaches:</p> <ul style="list-style-type: none"> • Market the program to customers occupying "good candidate" buildings for retro-commissioning through focused efforts of AEP Ohio Account Managers, the program's qualified retro-commissioning service providers, and the program implementation team. • Implement a detailed application screening process to qualify candidates having the highest potential for successful project completion. • The program requires participants to implement all recommended measures that have a simple payback of 1.5 years or less. • Design the Investigation/Implementation phase to ensure the customer, retro-commissioning service provider (RSP) who will provide commissioning services, and installation contractor who will install recommended measures are engaged in finding and fixing problems. This approach will create savings throughout the investigation/implementation process. In addition, the program will operate in a

highly controlled manner with significant technical and managerial oversight provided on each project to ensure project success.

Incentive Strategy

AEP Ohio also will offer financial incentives for assisting customers in overcoming first-cost barriers in implementing RCx study recommendations. The idea is to pay for the initial RCx study in exchange for the customer's commitment to complete those recommendations with short paybacks. Measure implementation support will be provided by the RSP and funded during the retro-commissioning process. This approach will also ensure measures are completed on time and installed properly.

The program will include a strong customer education component to promote the value of RCx services, targeting senior management decision-makers as well as facility operations and maintenance staff. Such education will be provided through program marketing activities, and also may be supported through other industry education and outreach, such as Building Operator Certification (BOC) training. Benchmarking of facility energy use, also part of AEP Ohio's planned market conditioning efforts, will support pre-screening efforts to identify buildings that would be good RCx candidates. Educational program components will promote participation by emphasizing the value of the RCx process, and also help to ensure savings persistence by promoting improved operations and maintenance practices.

Eligible Measures

Eligible measures will vary depending on the business sector served, but should include at least:

- **HVAC systems and controls:** Economizers, Demand Control Ventilation, Heat/Energy Recovery Ventilators, fan and pump controls, head-pressure controls, setback controls, night venting controls.
- **Lighting controls:** Occupancy/vacancy controls, photo-sensors, timer controls.
- **Motor controls:** Variable Frequency/Speed Drives, timer controls.
- **Process controls:** Where applicable.
- **Distribution transformers:** Harmonic filtering and harmonic mitigating.

Implementation Strategy

An implementation contractor will oversee RCx activities conducted by participating RSPs, review RCx studies and provide independent evaluation of savings estimates, and provide post-installation verification. AEP Ohio Account Managers will help market the program and identify potential customers for participation.

Key aspects of the RCx implementation strategy include:

- **RSP recruitment and training:** RSPs will be selected and approved through competitive RFP processes; customers must work with an approved RSP to be eligible for the incentive. RSPs will be the key delivery mechanism as they promote RCx services and available incentives to their customers. RSPs will be required to participate in training sessions to inform them about program incentives,

participation processes, and RCx protocols and requirements. RSPs actively participating in the RCx program and other program offerings will receive regular communications about program activities and changes to ensure their participants are informed and engaged.

- **Customer recruitment:** Program staff, as well as RSPs, will recruit customers. As the program targets larger customers, referrals by AEP Ohio Account Managers will be a key step in customer recruitment. To ensure that business customers perceive EE/PDR programs as a seamless set of offerings, cross-referrals from other programs also will be provided where appropriate.
- **Pre-screening:** To ensure that RCx efforts are focused on high-opportunity buildings, AEP Ohio will promote benchmarking with EPA's Portfolio Manager rating system and other standard industry benchmarks as a pre-screening mechanism.
- **RCx study:** During the study phase, the RSP will conduct a facility assessment to diagnose problems and make recommendations for improvement opportunities, including an assessment of cost, savings and payback. Where applicable, the RCx study may include an assessment of energy savings opportunities eligible for incentives through other AEP Ohio business program offerings, and in all such cases, the incentive levels established by those programs will be used.
- **Study review:** The implementation contractor will review the RCx study and ensure that it meets program standards and that those calculations and methodologies are correct.
- **Project implementation:** It will be the responsibility of the customer to implement those RCx study recommendations that have received program approval and are eligible for implementation incentives.
- **Project verification:** Measures implemented by the customer may be site-measured and verified.

Marketing Strategy

RSPs are the primary conduit for this program and will market the program through their direct relationships with business customers. RSPs will identify, communicate, and enroll customer participants through their own marketing initiatives and with the assistance of AEP Ohio Account Managers, which may be supplemented by the program.

The following are marketing strategies that will help meet program goals:

- Leverage, grow and diversify RSP relationships to achieve aggressive targets
- Educate and leverage existing resources (e.g., Solution Providers, AEP Ohio Account Managers) to their greatest potential to more effectively and economically reach customer segments
- Segment customers by their building type (minimum demand requirement:

500kW), and tailor communications and incentive offerings based on this information

Tactics include co-branded marketing collateral from AEP Ohio. Other tactics to be utilized are direct mail, newsletters, trade shows, and email communications to market the program.

Milestones

Tasks	Timeframe
Selection of Program Implementation Contractor	3 months
Program materials developed	4 months
Recruitment of RSPs	5 months
Program launch – marketing begins	6 months

EM&V Strategy

All evaluation activities will be conducted by AEP Ohio's evaluation contractor. An integrated evaluation approach will be taken that includes the following components:

- Addressing evaluation needs at the onset of program design and collecting evaluation data as part of program administration.
- Assessing and documenting baseline conditions.
- Establishing tracking metrics.
- Conducting primary and secondary research as part of the impact and process evaluations.

The overall goal of the impact evaluation will be to validate/calibrate savings values and determine program cost-effectiveness. Self-report surveys with both participants and nonparticipants may be used to assess free riders/spillover. The participant and nonparticipant surveys will also address program awareness, barriers to participation, participant satisfaction, and process efficiency. These surveys will be enhanced by collecting market data and assessing trends as well as interviews with program staff, RSPs, manufacturers, and other Solution Providers.

The process evaluation will be conducted during the first program year and then coordinated with follow-up impact evaluation work to be performed once program-approved measures have been installed and operating for a sufficient time to enable a robust impact evaluation.

AEP Ohio Administrative Requirements

Initial program administration will be conducted by AEP Ohio EE/PDR personnel and Customer Services account representatives. To develop and manage the third-party implementation, it is estimated that 0.5 FTE equivalent will be required for program oversight. Key oversight functions include:

- Customer recruitment

- Recruitment, selection, and management of the implementation contractor(s)
- Coordination of marketing strategy/public relations among programs and market sectors
- Coordination of all education and training
- Data warehousing
- Management of the evaluation contractor
- Goal achievement within budget

AEP Ohio and its implementation contractor will follow industry best practices during final program design and start-up to ensure success, including:

- Following an integrated evaluation approach as described above
- Account manager and customer service training
- Establishing requirements for supporting documentation, analysis methods, and reporting requirements on technical studies
- Completing all program procedures from marketing through verification and payment and conducting a dry-run prior to launch
- Preparing for stronger or weaker than expected participant response

Participation

The following participation levels have been used for planning purposes. However, AEP Ohio may adjust qualifying energy efficiency measures and anticipated participation levels as necessary in accordance with current market conditions, EM&V results and program implementation experience.

Incremental Annual Participants				
Measure	2012	2013	2014	Total 2012 – 2014
Building	10	38	50	98

Budget

The following budget has been used for planning purposes. However, AEP Ohio may adjust program budgets as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Budget				
	2012	2013	2014	Total 2012 – 2014
Administrative	\$365,260	\$555,195	\$730,519	\$1,650,974
Incentive	\$417,208	\$634,156	\$834,416	\$1,885,779
Total	\$782,468	\$1,189,351	\$1,564,935	\$3,536,753

Incremental Annual				
	2012	2013	2014	Total 2012 – 2014
Participant Costs	\$687,500	\$1,045,000	\$1,375,000	\$3,107,500

Savings Targets

Incremental Annual Savings – at Meter				
	2012	2013	2014	Cumulative Total 2012 – 2014
Energy (MWh)	3,653	5,552	7,305	16,510
Summer Peak Demand (kW)	748	1,137	1,495	3,380

Benefit-Cost Test Results

Benefit-Cost Test	2012-2014 Benefit-Cost Test Ratio
-	
Total Resource Cost (TRC)	1.5
Utility System Resource Cost (UCT)	2.1
Participant Cost (PCT)	7.2
Rate Impact Measure (RIM)	0.6

4.2.3 New Construction (ongoing program)

All business (non-residential) customers in AEP Ohio's service territory are eligible to participate in this program. This program is for new construction and major renovation projects to encourage building owners, designers, and architects to exceed standard building practices to achieve efficiency above current building energy code requirements. The program provides design assistance to the architects and engineers that are designing new buildings. The key design assistance tool is building simulation modeling of more efficient building designs. The program provides incentives to new facility owners for the installation of high-efficiency lighting, HVAC, building envelope, refrigeration and other equipment and controls. The program provides a marketing mechanism for architects and engineers to promote energy efficient new buildings and equipment to end users. This whole building approach has incentives for the design team as well as the owner. Currently, Prescriptive and Custom incentives are available for individual energy efficiency measures that exceed the ASHRAE/IESNA Standard 90.1-2004 minimum requirements. A program enhancement will be to include master-metered multifamily buildings.

Participation

The following participation levels have been used for planning purposes. However, AEP Ohio may adjust qualifying energy efficiency measures and anticipated participation levels as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Participants				
Measure	2012	2013	2014	Total 2012 – 2014
Building	50	50	50	150

Budget

The following budget has been used for planning purposes. However, AEP Ohio may adjust program budgets as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Budget				
	2012	2013	2014	Total 2012 – 2014
Administrative	\$500,000	\$500,000	\$500,000	\$1,500,000
Incentive	\$500,000	\$500,000	\$500,000	\$1,500,000
Total	\$1,000,000	\$1,000,000	\$1,000,000	\$3,000,000

Incremental Annual				
	2012	2013	2014	Total 2012 – 2014
Participant Costs	\$1,960,685	\$1,960,685	\$1,960,685	\$5,882,055

Savings Targets				
Incremental Annual Savings – at Meter				
	2012	2013	2014	Cumulative Total 2012 – 2014
Energy (MWh)	10,000	10,000	10,000	30,000
Summer Peak Demand (kW)	1,230	1,230	1,230	3,690
Benefit-Cost Test Results				
Benefit-Cost Test	2012-2014 Benefit-Cost Test Ratio			
Total Resource Cost (TRC)	12.8			
Utility System Resource Cost (UCT)	31.6			
Participant Cost (PCT)	7.0			
Rate Impact Measure (RIM)	2.8			

4.2.4 Express (new program)

Program	Express Program
Objective	<p>The Express Program provides a streamlined, one-stop, turn-key energy efficiency service delivered through registered local contractors. The program generates energy savings through program services and incentives to help qualifying customers reduce energy usage and lower energy costs. Incentives for energy efficiency retrofit projects are paid directly to contractors to speed payment and incentive levels are generally higher than the Prescriptive and Custom Programs, with a cap of 100 percent of the project costs.</p>
Target Market	<p>The Express Program is designed for small business customers. Business (non-residential) customers in AEP Ohio's service territory are eligible to participate. The Express Program targets customers with annual energy consumption of 200,000 kWh or less, based on the last 12 months of billing history. National accounts are not excluded from participation, however, program funding will be reserved for non-National accounts customers to encourage local small business participation. As with residential low income customers, small non-profit customers may need additional incentives to afford energy efficiency improvements, and these opportunities will be considered to remove barriers to this group's participation.</p>
Program Duration	<p>The Express Program is ongoing element of the EE/PDR Plan.</p>
Program Description	<p>An implementation contractor runs the day-to-day administrative side of the program. The implementation contractor is active in contractor recruitment; runs contractor training for online data systems; and conducts project proposal review, monitors and follows-up on contractor proposal status, pre-installation inspections and post-installation inspections, and payment review. The implementation contractor also staffs a contractor and customer phone line for questions and communicates program participation to AEP Ohio on a weekly basis.</p> <p>Rapid project completion is a hallmark of the program design. The program has several timing milestones to keep the projects moving toward completion. For example, participating contractors must commit to finishing projects 60 days after getting a signed contract from the customer. The implementation contractor reviews proposals within three days of contractor submission, and completes pre-installation and post-installation inspections within ten days of completed prerequisite paperwork. The implementation contractor also follows-up on approved proposals after 21 days to ensure contractor diligence in providing and following-up on proposals. Checks are cut to contractors weekly for finished projects with completed data.</p>

Participating small businesses receive:

- A free facility assessment to identify potential energy-saving opportunities
- A proposal that includes a list of recommendations and estimates of energy savings, project cost and payback period
- Incentives paid directly to the contractor, up to 100 percent of the project cost
- Installation of approved energy-savings equipment by a local, trained contractor
- Pre- and post-installation inspections to assure quality and to verify energy savings

Incentive Strategy

Incentives are generally higher in the Express Program as compared to similar measures installed through the Prescriptive and Custom Programs. Incentives vary based on the measure installed.

The Express Program is designed to assist small business owners in overcoming existing barriers to achieving energy efficiency. Common barriers include time constraints, capital constraints, lack of energy efficiency awareness, lack of labor resources, and getting the decision-maker's attention. There are three main ways the program will address these barriers to encourage program participation and ultimately change the small business owner's perception to embrace energy efficiency products and strategies:

- **An Initial Comprehensive Site Survey** – The site survey will identify a variety of electric efficiency measures available to the customer for either immediate installation or longer-term projects. The brief survey report – to be delivered the same day – will provide information for the small business owner to make educated decisions on what measures to implement. The report will discuss financial options identified and available to the customer.
- **Immediate Direct Installation** – There will be some measures the implementation contractor will install immediately during the site survey with the customer's permission. These will include – on the electric side – a few CFL bulbs and a beverage machine occupancy sensor, where applicable.
- **Scheduled Direct Installation** – In addition to the immediate direct installation, customers will also be offered the opportunity to immediately schedule the installation of measures that require capital investment. To facilitate this, AEP Ohio will have agreements with a pool of installation contractors, which can be scheduled to perform installations of the measures identified in the site survey. It is projected that some direct install measures may have incentives up to 80 percent of the market price. The customer will be responsible to pay the remaining balance of the project cost.

Implementation Strategy

The Express Program is delivered to customers by Express Registered Contractors who have been vetted by the implementation contractor and trained on the program and its database. The implementation contractor and AEP Ohio program staff are required to maintain an active approved contractor network in all areas of the AEP Ohio Territory (in Ohio) by talking to trade associations and chambers of commerce.

Express Registered Contractors market projects to their customers and include AEP incentives in their proposals to perform work. AEP Ohio and the implementation contractor have provided Express Registered Contractors with a one-page Express Program Fact Sheet. The document answers basic questions from customers and contractors seeking to participate with the program. Contractors each have their own marketing strategies, but some simply canvas a commercial street for likely, qualified AEP Ohio customers and promote the Express Program through proposals to do work. In this manner, the program has a targeted marketing plan. The implementation contractor may be required to supplement contractor marketing with cooperative canvassing to achieve program goals.

AEP Ohio has launched a public web page for the program linked to the suite of other gridSMART business programs.

Contractor Participation

In order to become a registered contractor, contractors need to fulfill certain requirements, including:

- Licensed Ohio contractor
- Insurance coverage complying with, or exceeding, AEP Ohio requirements,
- Actively working in Ohio
- Back equipment warranties for installed equipment
- Complete a two-page contractor application
- Supply references for 3 or more energy efficiency projects
- Capable of completing projects within 60-day timeframe
- Commit to dispose of any materials in an environmentally friendly manner
- Maintain good standing in all of these areas

The program has a policy for probationary standing if a contractor lapses in respect to these requirements.

The Express Program targets measures that are widely applicable in the small business market segment. Efficient lighting comprises a vast majority of all proposed and installed equipment. The program incentives also support HVAC equipment and

refrigeration equipment, such as display case lighting, electronically commutated motors (ECMs), anti-sweat heater controls and strip curtains.

The Express Program targets low cost measures where the unit energy savings can be reliably predicted. Each of the program measures is summarized below as they are planned to be delivered to customers. The list below has been specified for planning purposes only. AEP Ohio will establish eligible measures and incentive levels as needed in accordance with current market conditions, planning studies, technology development, EM&V results, and program implementation experience.

Lighting Measures

- Compact fluorescent lamps (screw-in and pin-based fixtures)
- LED exit sign
- High-performance T8 fixtures
- Occupancy sensors
- Exterior lighting

HVAC Measures

- Programmable thermostat
- ECM

Refrigeration Measures

- Controls
- Strip Curtains

Implementation Strategy

It is the responsibility of the implementation contractor to recruit select contractors for installation of direct install measures. The customer is responsible for paying the balance of installation costs for efficiency measure implementation and installation. Delivery efforts include coordinating with AEP Ohio Account Managers where appropriate, developing a marketing strategy, and producing the corresponding materials.

Key elements of implementation strategy include:

- **Contractor recruitment and training:** Contractors will be a key delivery mechanism because they will be responsible for the installation of the direct install measures. Contractors will be recruited via mailings, training events, and personal visits.
- **Technical assistance:** The implementation contractor will provide guidance regarding program offerings and participation processes to customers and contractors as needed to minimize confusion and barriers to participation.

Additionally, a facility survey will be offered to customers that will include a high-level walk through energy survey at no cost to the customer and will provide a report to the owner, outlining other energy efficiency improvements that could be installed.

- **Application submittal:** Customers will be asked to complete an incentive application at the time of the site survey and before the start of the installation of qualifying capital-intensive direct install energy efficiency measures. The application explains program qualification, gathers pertinent customer information, and details the program terms and conditions. This tool also provides a checklist of recommended measures from which the customer will select to proceed with the project, and gives a detailed specification for each measure.
- **Follow-up:** Contractors will be asked the proposal status after 21 days and the reasons for non-participation will be recorded.
- **QA/QC review:** Incentive applications will be subject to a QA/QC review to ensure all required forms and documentation have been submitted and that calculation of incentive totals are correct.
- **Project verification:** AEP Ohio will reserve the right to site-verify installations prior to approval and incentive payment.
- **Incentive payment:** To minimize barriers to participation, AEP Ohio will seek to expedite incentive payments.

Marketing Strategy

Both the Implementation contractors and AEP Ohio see marketing and outreach as key aspects of the program. There is a strong push to contact trade groups such as National Electrical Contractors Association (NECA) and the International Brotherhood of Electrical Workers (IBEW) to spread the word about the program and recruit new Express Registered Contractors. Contractors participating in the other gridSMART programs are also being recruited for the Express Program. The implementation contractor conducts webinar events and directing more marketing to contractors to expand the pool of Express Registered Contractors.

Materials and tactics for solution provider marketing would program materials and marketing collateral, sales tools, outreach, and training. Materials and tactics for marketing to customers include direct mail, telemarketing, outreach events, newsletters, bill insets, and printed collateral.

Milestones

N/A

EM&V Strategy

All evaluation activities will be conducted by a third-party evaluation contractor. An integrated evaluation approach will be taken which includes addressing evaluation at the onset of program design, collecting evaluation data as part of program administration, assessing and documenting baseline conditions, establishing tracking

metrics, as well as conducting primary and secondary research as part of impact and process evaluations.

- The overall goal of the impact evaluation will be to validate/calibrate the deemed savings values and determine program cost-effectiveness. Self-report surveys with both participants and nonparticipants may be used to assess free riders/spillover. The participant and nonparticipant surveys will also address program awareness, barriers to participation, participant satisfaction, and process efficiency. These surveys will be enhanced by collecting market data and assessing trends as well as interviews with program staff, vendors, manufacturers, and other Solution Providers.
- The process evaluation will be conducted during the first program year and then coordinated with follow-on impact evaluation work to be performed once program-approved measures have been installed and operating for a sufficient time to enable a robust impact evaluation.

AEP Ohio Administrative Requirements

Initial program administration will be conducted by AEP Ohio EE/PDR personnel and Customer Services account representatives. To develop and manage the third-party implementation, it is estimated that 0.5 FTE equivalent will be required for program oversight. Key oversight functions include:

- Customer recruitment
- Recruitment, selection, and management of the implementation contractor(s)
- Coordination of marketing strategy/public relations among programs and market sectors
- Coordination of all educational services
- Data warehousing
- Management of the evaluation contractor
- Goal achievement within budget

AEP Ohio and its implementation contractor will follow industry best practices during final program design and start-up to ensure success, including:

- Following an integrated evaluation approach as described above
- Account manager and customer service training
- Establishing requirements for supporting documentation, analysis methods, and reporting requirements on technical studies
- Completing all program procedures from marketing through verification and payment and conducting a dry-run prior to launch
- Preparing for stronger or weaker than expected participant response

Participation

The following participation levels have been used for planning purposes. However, AEP Ohio may adjust qualifying energy efficiency measures and anticipated participation levels as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Participants (units installed)					
Measure	Unit	2012	2013	2014	Total 2012 – 2014
Advanced Pre-Rinse Spray Nozzle	nozzle	1	1	1	3
Anti-Sweat Heat (ASH) Controls (or Humidistat Controls)	lamp	8	9	9	26
CFL: Pin-Based (<25W) Indoor	lamp	916	1,006	1,071	2,993
CFL: Pin-Based (>=25W) Indoor	lamp	64	70	75	209
CFL: Screw-In (<10W) Outdoor	lamp	34	36	17	87
CFL: Screw-In (>26W) Outdoor	lamp	7	8	8	23
CFL: Screw-In (10-15W) Outdoor	lamp	264	290	94	648
CFL: Screw-In (16-21W) Outdoor	lamp	175	53	59	287
CFL: Screw-In (22-26W) Outdoor	lamp	33	36	38	107
Delamping	fixture	1,755	1,884	1,943	5,582
Dimmable Electronic Ballasts	fixture	4,203	4,560	4,792	13,555
EC Motor: Reach-In Enclosure	motor	23	25	25	73
EC Motor: Walk-In Enclosure	motor	12	13	13	38
Evap Fan Controller for Med. Temp Walk-in	fan	54	58	58	170
High Performance T8 Lighting	fixture	251	279	303	833
Hot Water Circulation Pump Time Clock	unit	36	39	41	116
Intelligent Defrost Control	control	40	43	44	127
LED Exit Signs - from Incand.	lamp	6	6	7	19
LED Lighting <10W - Indoor	lamp	7	8	10	25
LED Lighting >=10W - Indoor	lamp	46	54	65	165
Night Covers	ln. ft. of case	476	514	527	1,517
Occupancy Sensor	sensor	1,981	2,181	2,366	6,528
Programmable Thermostat - Chiller / Elec Resist	thermostat	3	3	3	9
Programmable Thermostat - Chiller / Gas Heat	thermostat	3	3	3	9
Programmable Thermostat - Direct Exp / Elec Resist	thermostat	39	41	43	123
Programmable Thermostat - Direct Exp / Gas Heat	thermostat	24	26	26	76
Screw in cold cathode CFL	lamp	22	26	31	79
T5 Lighting	fixture	1,577	1,718	1,802	5,097
Vending Machine Controller - Cold Drink	unit	13	14	14	41

Budget

The following budget has been used for planning purposes. However, AEP Ohio may adjust program budgets as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Incremental Annual Budget				
	2012	2013	2014	Total 2012 – 2014
Administrative	\$2,195,533	\$2,379,509	\$2,507,766	\$7,082,808
Incentive	\$1,155,001	\$1,255,546	\$1,321,566	\$3,732,113
Total	\$3,350,534	\$3,635,055	\$3,829,332	\$10,814,921

Incremental Annual				
	2012	2013	2014	Total 2012 – 2014
Participant Costs	\$288,763	\$314,002	\$331,276	\$934,041

Savings Targets

Incremental Annual Savings – at Meter				
	2012	2013	2014	Cumulative Total 2012 – 2014
Energy (MWh)	9,736	10,552	11,063	31,351
Summer Peak Demand (kW)	1,623	1,759	1,844	5,226

Benefit-Cost Test Results

Benefit-Cost Test	2012-2014 Benefit-Cost Test Ratio
Total Resource Cost (TRC)	1.2
Utility System Resource Cost (UCT)	1.3
Participant Cost (PCT)	4.3
Rate Impact Measure (RIM)	0.5

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RESPONSES TO REQUEST

**NRDC Set 3–
INT-31**

Referring to Appendices C-4 of Attachments A, B, and C, do the Companies anticipate providing incentives for Linear Fluorescent Retrofits that change T12 lighting to Standard T8 and T5 lighting?

Response:

Yes, consistent with EM&V protocols as adopted by the Commission, the Companies would incent and claim savings based on as-found conditions for equipment that is replaced as early retirement. This may include T12 lighting to Standard T8 or T5 lighting retrofits.

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RESPONSES TO REQUEST

SC Set 1–
INT-48

Identify how the companies savings assumptions for linear fluorescent retrofits
incorporate recent EISA standards.

Response: The Companies modeled the annual savings of linear fluorescent retrofits according to
Section 3 of the Draft Ohio TRM, including establishing baselines in accordance with 2007
EISA standards. As such, the Companies estimated baseline equipment equivalent to
32W T8 for retrofit to higher efficiency linear fluorescent lighting for purposes of modeling.

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RESPONSES TO REQUEST

SC Set 2–
INT-70

The program description for the Demand Response program says that the Companies will now “count demand response resources participating in the PJM market for the applicable delivery year, without the need to contract for these resources separately.” How does FirstEnergy justify counting reductions in peak demand from resources participating in PJM capacity market if FirstEnergy has no involvement in those reductions and provided no incentives or payments for those reductions?

Response:

Pursuant to Ohio Administrative Code Chapter 4901:1-39-05(E)(2), an electric utility may satisfy its peak-demand reduction through a peak demand reduction program that meets the requirements to be counted as a capacity resource under the tariff of a regional transmission organization. The Companies are not aware of a specified requirement that a utility needs to offer an incremental program incentive to the resources participating in such a program. Nonetheless, it should be noted that the Companies and their Ohio customers do participate in capacity auctions in the PJM market and therefore do, indirectly, contribute to the PJM payments/incentives for demand resources participating in the PJM market for the applicable delivery year. Additionally, the Companies believe that this approach will help minimize compliance costs with the statutory mandates, and is thus a more cost-effective approach than requiring the Companies to offer an incremental program incentive to these participating resources. Should the Commission order an incremental program incentive be offered, the Companies’ proposed program budget and design incorporates that flexibility.

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RESPONSES TO REQUEST

**NRDC Set 3–
INT-30**

Referring to Fitzpatrick's response to NRDC Set-2, INT-15, describe the correlation the analyst found between the interests and intentions expressed in the Existing Plan's Market Potential Study and actual realized participation in the Companies' programs.

Response: Specific correlation analyses were not performed.

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REQUEST FOR PRODUCTION OF DOCUMENTS

NRDC Set 2 – Referring to Section 8.1 of Attachments A, B, and C, please provide a machine-readable,
RPD-10 Microsoft Excel-compatible spreadsheet of energy, capacity, and transmission and distribution costs used to value measures included in the EE&PDR Program Plan.

Response: Avoided costs for Energy, Generation capacity, and Transmission & Distribution capacity as used for Total Resource Cost test evaluation are included in the file “NRDC Set 2-RPD-10-Attachment 1”

Plan Savings



Summary of Portfolio Cumulative Energy and Demand Savings - Pro rata						
Sector	Program Years 2013-2015					
	OE MWh Saved	TE MWh Saved	CE MWh Saved	OE kW Saved	TE kW Saved	CE kW Saved
Residential Sector (inclusive of Low-Income) - Cumulative Projected Portfolio Savings	206,795	68,222	92,127	73,986	19,704	46,363
Small Enterprise - Cumulative Projected Portfolio Savings	184,642	88,578	121,185	81,934	31,815	62,100
Mercantile-Self Direct	88,789	43,405	41,797	47,230	43,732	53,374
Mercantile-Utility (Large Enterprise)- Cumulative Projected Portfolio Savings	49,610	66,091	29,999	99,259	32,276	66,395
Governmental/Non-Profit Sector - Cumulative Projected Portfolio Savings	438	64	659	54	11	27
Transmission & Distribution	0	0	0	0	0	0
Portfolio Plan Total - Cumulative Projected Savings	530,273	266,360	285,767	302,463	127,538	228,259

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RESPONSES TO REQUEST

**SC Set 1–
INT-36**

Provide aggregate annual kWh savings for each measure listed in the Tables found
Appendices B-1, B-2, B-3, and B-4.

Response: Please see SC Set 1-INT-036-Attachment 1 for aggregate annual MWh savings by
measure.

Sector	Program Name	Sub Program	Measure Name	Ohio Edison	Toledo Edison	CEI
				2013-2015 Aggregate Annual MWh	2013-2015 Aggregate Annual MWh	2013-2015 Aggregate Annual MWh
Residential	Appliance Turn-In Program	Appliance Turn-In	Freezer Recycling	9,988	3,198	7,785
			Refrigerator Recycling	28,946	8,658	18,114
			Room Air Conditioner Recycling	312	92	224
	Direct Load Control Program	Direct Load Control	DLC - CAC	-	-	-
			DLC - Pool Pump	-	-	-
			DLC - Water Heater	-	-	-
	Home Performance Program	Audits	All Electric Home Audit	733	225	236
			Comprehensive Audit	3,165	967	1,044
			On-Line Audit	2,985	861	1,557
		Kits	Efficiency Kit - All-Electric	14,481	4,905	7,040
			Efficiency Kit - Schools	4,345	1,195	2,281
			Efficiency Kit - Standard	75,345	25,503	36,616
		Behavioral	Energy Usage Reports	9,400	2,380	5,516
		New Homes	New Construction	5,499	1,630	3,944
	Energy Efficient Products Program	HVAC & Water Heating	Air Source Heat Pump	1,525	150	488
			Central Air Conditioner	290	200	242
			Ductless Mini-Split AC & HP	23	7	16
			Electric Water Heaters	389	66	129
			Ground Source Heat Pump	445	144	225
			HVAC Maintenance	227	91	182
			Room Air Conditioner	49	13	37
			Whole House Fan	73	21	52
		Appliances	Clothes Washers	464	99	238
			Dehumidifiers	713	141	453
			Freezers	287	49	235
			Pool Pump Motors	185	51	84
			Refrigerators	1,023	274	734
		Consumer Electronics	Computer Monitors	172	115	112
			Computers	103	68	67
			Smart Strips	106	35	76
			Televisions	821	274	532
		Lighting	Ceiling Fan with Integral CFLs	54	16	26
			Emerging Technology	-	-	-
			Energy Efficient Lighting Products	98,000	29,516	36,634
			Torchiere Floor Lamps	21	6	15
	Low Income Program	Low Income	Community Connections	2,019	1,067	2,568
Small Enterprise	C&I Energy Efficient Equipment Program-Small	HVAC & Water Heating	Air Conditioning 65,000-760,000 BTU/Hr (5-65TN)	2,413	772	1,741
			Dual Enthalpy Economizer	148	57	124
			Electric Chillers	956	819	1,024
			Electric Water Heaters - Small C&I	173	65	145
			Hotel Room HVAC/Receptacle Controls	306	144	319
			HVAC Maintenance - Small C&I	112	42	94
			Room Air Conditioners - Small C&I	31	12	26
			Water-Cooled cent Chiller Upto 300 tn	3	3	3
		Appliances	Clothes Washer - Small C&I	589	185	411
			Freezer Recycling - Small C&I	124	48	104
			Freezers - Small C&I	18	7	16
			Refrigerator Recycling - Small C&I	661	310	693
			Refrigerators - Small C&I	111	42	93
			Room Air Conditioner Recycling - Small C&I	52	20	43
			Smart Strip (Load Sensing & Occupancy) - Small C&I	1,811	573	1,273
			Vending Equipment Controller (Remote Mount, Lighting)	2,764	1,622	2,267
			Window Film	1,251	466	727
		Food Service	Anti Sweat Heater Controls	1,872	786	1,572
			Combination & Convection Ovens	429	164	314
			Commercial Glass Door Refrigerators	519	169	745
			Commercial Solid Door Freezers	2,663	1,478	3,595

Sector	Program Name	Sub Program	Measure Name	Ohio Edison	Toledo Edison	CEI
				2013-2015 Aggregate Annual MWh	2013-2015 Aggregate Annual MWh	2013-2015 Aggregate Annual MWh
			Commercial Solid Door Refrigerators	661	215	859
			Efficient Refrigeration Condenser	38	14	32
			Fryers & Griddles	233	89	200
			Hot Food Holding Cabinet	229	87	196
			Ice Machines	237	87	201
			LED Reach in Refrig / Freezer Lights	1,572	660	1,321
			Pre Rinse Sprayers	60	24	42
			Refrigerated Case Covers	4,507	2,704	4,958
			Steam Cookers	1,026	394	862
			Strip curtains for walk-in Refrig/Freezer	169	67	84
		Lighting	Emerging Technology - Small C&I	-	-	-
			Energy Efficient Lighting Products - Small C&I	29,963	24,720	23,554
			LED Exit Signs (Retrofit Only)	733	136	512
			Lighting Controls (Occupancy & Daylight) - Small C&I	1,573	375	1,099
			Energy Efficient Exterior Lighting (Area & Prk Gar)	954	183	726
			Linear Fluorescent Retrofits (Stdnd & Non Stdnd)	61,351	27,267	47,717
		Custom Equipment	Custom	1,235	494	206
			VFDs greater than 200 HP	1,041	625	208
			VFDs up to 200 HP	10,546	7,232	7,413
	Energy Efficient Buildings Program-Small	Audits	Audit - Small C&I	-	-	-
			On-Line Audit - Small C&I	31	10	21
		Kits	Efficiency Kits - Small C&I	84,117	28,676	38,713
		New Buildings	New Construction - Small C&I	988	544	1,186
		Custom Buildings	Custom Buildings	82	41	48
Government	Government Tariff Lighting Program	Government	LED Traffic Signals	378	76	189
Large Enterprise (Mercantile Utility)	Demand Reduction Program	Demand Response	Energy Efficient Street Lighting	147	-	611
			Contracted Demand Resources	-	-	-
	C&I Energy Efficient Equipment Program-Large	HVAC & Water Heating	Interruptible Tariff	-	-	-
			Air Conditioning 65,000-760,000 BTU/Hr (5-65TN) - Large C&I	182	364	121
			Dual Enthalpy Economizer - Large C&I	37	45	22
			Electric Chillers - Large C&I	729	1,457	600
			HVAC Maintenance - Large C&I	1	2	1
			Water-Cooled cent Chiller Upto 300 tn - Large C&I	3	3	3
		Lighting	Emerging Technology - Large C&I	-	-	-
			Energy Efficient Lighting Products - Large C&I	1,058	1,481	635
			LED Exit Signs (Retrofit Only) - Large C&I	6	9	4
			Lighting Controls (Occupancy & Daylight) - Large C&I	106	177	71
			Energy Efficient Exterior Lighting (Area & Prk Gar) - Large C&I	360	288	360
			Linear Fluorescent Retrofits (Stdnd & Non Stdnd) - Large C&I	35,295	47,487	16,043
		Custom Equipment	Custom - Large C&I	13,652	16,686	12,135
			VFDs greater than 200 HP - Large C&I	980	980	784
			VFDs up to 200 HP - Large C&I	1,362	1,702	1,191
	Energy Efficient Buildings Program-Large	Audits	Audit - Large C&I	-	-	-
		Custom Buildings	Custom Buildings - Large C&I	4,424	7,079	3,413
Mercantile T&D	Mercantile Customer Program	Mercantile	Retrocommissioning - Large C&I	607	607	303
	Mercantile Customer Program	Mercantile	Mercantile Customer Projects	88,789	43,405	41,797
	Conservation Voltage Reduction	CVR	Conservation Voltage Reduction	-	-	-
	T&D Improvements	T&D Improvements	Distribution Upgrades	-	-	-
	Smart Grid Modernization Initiative	Smart Grid	Smart Grid Modernization Initiative	-	-	-

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RESPONSES TO REQUEST

SC Set 1– Identify the amount, and percentage, of savings created by the Efficiency Kit savings are
INT-7 from lighting.

Response: Approximately $\frac{3}{4}$ of the modeled kit savings are from lighting-based measures. Please
note, this will vary based on kit type and final contents-which may change based on the
Companies' implementation experience and M&V results.

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RESPONSES TO REQUEST

SC Set 2–
INT-59

For the following measures, please identify the percentage of total annual unit sales First Energy's efficiency programs will capture:

- i. Residential
 - a. Residential light bulbs
 - b. Electric water heaters
 - c. Room air conditioners
 - d. Clothes washers
 - e. Refrigerators
 - f. Freezers
 - g. Pool pumps
 - h. Central air conditioners
 - i. Air source heat pumps
 - j. Ductless mini-split AC and HP
 - k. Televisions
 - l. Computers
 - m. Monitors
- ii. Commercial and Industrial
 - a. Packaged cooling equipment 65-760 kBtu/hr
 - b. Electric chillers
 - c. Electric storage water heaters
 - d. Linear fluorescent lighting retrofits
 - e. Efficient lighting products
 - f. Lighting controls
 - g. Commercial glass door refrigerators
 - h. Commercial solid door refrigerators
 - i. Commercial solid door freezers
 - j. New construction
 - k. Audits

Response: The Companies do not have this information as they did not project participation as a percentage of total annual unit sales in the market place, but rather as estimates of participating customers. The Companies' participation projections can be found in Appendix C-2.

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RESPONSES TO REQUEST

**NRDC Set 2–
INT-19**

How does FirstEnergy intend to evaluate the energy savings impact of the Online Audit Program?

Response:

The evaluation of the Online Audit Program will be conducted similar to the evaluation methodology used by FirstEnergy's EM&V Contractor in the current Online Audit Program which was developed in consultation with the Ohio Independent Evaluator. The energy savings impact of the Online Audit Program is evaluated from a retrospective perspective using a quasi-experimental approach. Because the program is designed to be opt-in, an evaluation approach that uses a randomized control trial, which must be applied prospectively, cannot be used. Moreover, this approach is consistent with approaches used by other evaluators to evaluate on-line energy audit programs.

The evaluation approach that FirstEnergy's EM&V Contractor uses for analyzing the energy savings impacts is the well-known "difference-in-differences" approach. With this approach, the starting point for determining the impact of an audit is to analyze changes over time in the energy use of audit participants, effectively comparing their energy use after receiving an audit to energy use before receiving the audit. However, changes in other factors besides the audit could have caused changes in energy use for the participants. To take these natural dynamics into account, the change in energy use over time is observed among customers not receiving an audit. Subtracting the change observed over time among non-participants from that observed among beneficiaries provides an estimate of the savings impact of receiving an audit.

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RESPONSES TO REQUEST

SC Set 1– Identify all evaluation results that confirm the savings estimates of the Efficiency Kits
INT-6 that FirstEnergy is planning to distribute, as well as information detailing whether the
Kits will increase participation in other residential programs.

Response: Efficiency Kits are being proposed as a new program component in this Portfolio Plan, and as such, evaluation results do not exist for this program element relative to Ohio. However, the Companies' affiliates in Pennsylvania have conducted program evaluations as part of the Home Audit Program—the savings of which primarily stem from a kit program. Recent realization rates for the home audit program have ranged from 98% to over 102%. While the Companies have not conducted formal studies linking participation in Kit programs to increased participation in other programs, the Companies' program managers and program designers, based on the inclusion of efficiency education materials and informal feedback and program success in other jurisdictions, believe that the wide array of easy-to-install technology and educational information presented in Energy Efficiency Kits will introduce customers to efficiency technologies, help inform customers of the Companies' suite of Energy Efficiency offerings and drive participation in other Company programs.

Additionally, the Ohio Energy Project administers a school energy efficiency kit program that informed the offering included in this Portfolio Plan. In its 2010 Annual Report¹, OEP states:

On post-program evaluations, students and parents stated that the energy efficiency kits motivated them to purchase additional CFL's. Families reported purchasing an additional 40,960 CFL's to install in their homes as a result of receiving the energy kits.

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RESPONSES TO REQUEST

**NRDC Set 2–
INT-18**

How has FirstEnergy's Proposed Plan incorporated recommendations from the Evaluation, Measurement, and Verification of programs under its Existing Plan and provide specific examples of evaluator recommendations that were, if any, included in the Proposed Plan.

Response:

In developing the proposed Plan, the Companies engaged their EM&V contractor for input regarding items such as participation projections, measure selection and assumptions, and budgets. The Company reviewed the 2011 EM&V findings on the 2011 programs to identify additional design considerations for development of the Plan. Specific examples that were incorporated into the 2013-2015 Plan stemming from this additional feedback include, but are not limited to, adjusted realization rates applicable to the Appliance Turn-In Program in both the Residential and Small Enterprise sectors, and adjusted savings assumptions related to residential CFLs and the On-line energy audit.

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RESPONSES TO REQUEST

**NRDC Set 2–
INT-12**

How does the plan encourage energy efficiency in the use of computer servers by
commercial and industrial customers, both large and small?

Response:

Computer servers are eligible as custom equipment under the C&I Energy Efficient
Equipment Programs, Small and Large. Program descriptions, including target market,
implementation strategy, and marketing strategy, are located in Plan Sections 3.3 and 3.4
for the Small and Large sectors, respectively.

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RESPONSES TO REQUEST

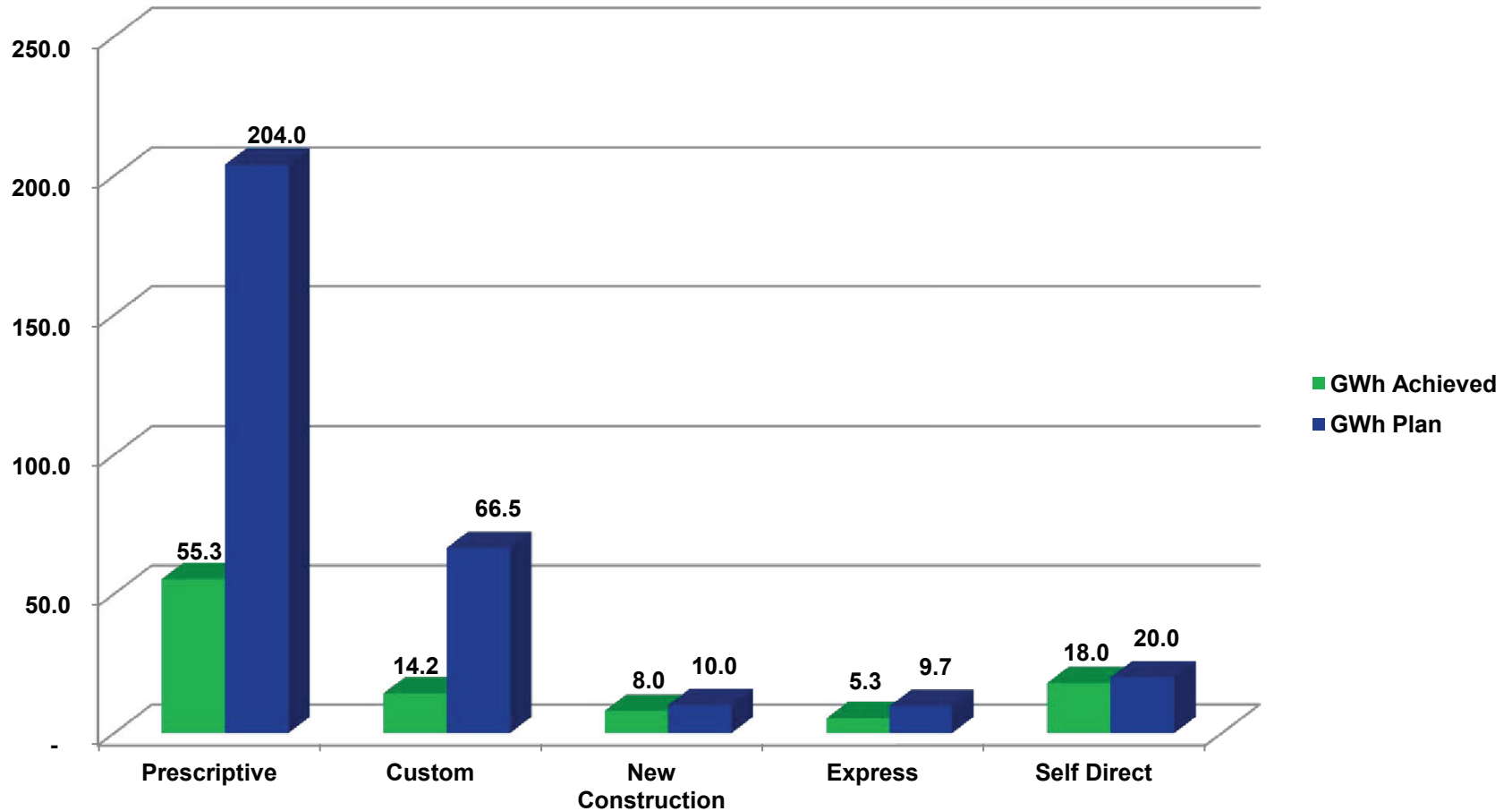
NRDC Set 2–
INT-21

Is any portion of, and in what way is, FirstEnergy Account Representative compensation tied to customer participation in energy efficiency programs?

Response: FirstEnergy Account Representative compensation is not tied to customer participation in energy efficiency programs.

2012 Business

GWh Achieved



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Summary: Objection to the Plan as filed. electronically filed by Mr. Christopher J Allwein on behalf of The Sierra Club and Natural Resources Defense Council