**BEFORE**

**THE PUBLIC UTILITIES COMMISSION OF OHIO**

|  |  |  |
| --- | --- | --- |
| In the Matter of the Audit of the Energy Efficiency and Peak Demand Reductions Achieved by the Electric Distribution Utilities Pursuant to R.C. 4928.66. | )))) | Case No. 19-0002-EL-UNC |

**COMMENTS**

**BY**

**THE OFFICE OF THE OHIO CONSUMERS’ COUNSEL**

 Bruce Weston (0016973)

 Ohio Consumers’ Counsel

 Christopher Healey (0086027)

Counsel of Record

Angela O’Brien (0097579)

Assistant Consumers’ Counsel

 **Office of the Ohio Consumers’ Counsel**

 65 East State Street, 7th Floor

 Columbus, Ohio 43215

 Telephone [Healey] (614) 466-9571

 Telephone [O’Brien]: (614) 466-9531

 christopher.healey@occ.ohio.gov

angela.obrien@occ.ohio.gov

July 1, 2020 (willing to accept service by e-mail)

**TABLE OF CONTENTS**

 **PAGE**

[I. COMMENTS ON THE AUDIT REPORTS 2](#_Toc44511354)

[A. The Audit Reports are wholly inadequate to protect consumers and do not fulfill the requirements set forth in the PUCO’s request for proposal. 2](#_Toc44511355)

[1. The Auditor failed to provide (but should have provided) an evaluation of utilities’ charges to consumers for utility profits (shared savings) and lost distribution revenue. 2](#_Toc44511356)

[2. The Audit Reports say nothing at all about the vast majority of programs and the potential charges to consumers for those programs. 4](#_Toc44511357)

[3. Despite auditing five years of energy efficiency programs offered by four utilities, the Auditor made no recommended adjustments to the charges that consumers paid—*not a single dollar for a single program for a single year for a single utility*. 5](#_Toc44511358)

[B. Savings can and should be calculated *differently* for purposes of meeting mandates versus purposes of calculating shared savings and lost distribution revenues that are charged to consumers. 6](#_Toc44511359)

[II. COMMENTS ON THE DRAFT TECHNICAL REFERENCE MANUAL 11](#_Toc44511360)

[A. The draft TRM uses an unreasonably low 5% discount rate, which artificially inflates the purported cost-effectiveness of programs, thus making them look better than they really are and driving up costs to consumers. 11](#_Toc44511361)

[B. The TRM should adjust energy savings to account for free riders and non-utility customers. 13](#_Toc44511362)

[III. CONCLUSION 14](#_Toc44511363)

**BEFORE**

**THE PUBLIC UTILITIES COMMISSION OF OHIO**

|  |  |  |
| --- | --- | --- |
| In the Matter of the Audit of the Energy Efficiency and Peak Demand Reductions Achieved by the Electric Distribution Utilities Pursuant to R.C. 4928.66. | )))) | Case No. 19-0002-EL-UNC |

**COMMENTS**

**BY**

**THE OFFICE OF THE OHIO CONSUMERS’ COUNSEL**

In the midst of consumer health and financial crises, this case brings to the PUCO an opportunity for consumer protection from higher charges, (even though the legitimacy of the premise for the charges seems unfortunately not at issue). Despite the ratemaking jargon and promotional naming of charges like “shared savings” (meaning utility profits at consumer expense) and “lost distribution revenues” (suggesting there are revenues that utilities are missing), consumers are on the tab for many millions of dollars.

A third-party auditor, Evergreen Economics, (the “Auditor” or “Evergreen”) filed an audit report (the “Audit Reports”) for each of Ohio’s four electric distribution utilities for 2014 to 2018 energy efficiency programs.[[1]](#footnote-2) The audit process is a consumer protection mechanism. Unfortunately for consumers, this Auditor did not recommended *any* adjustments (reductions) to the charges for consumers. But it should have.

Customers have been charged way too much for lost distribution revenue and likely for utility profits (shared savings) as a result of utilities counting more energy savings from 2014 to 2018 than were actually achieved by their energy efficiency programs. The PUCO should also modify the Auditor’s draft of the Ohio Technical Reference Manual (“TRM”) because it too could result in higher charges to consumers as a result of over-counting energy savings from utility energy efficiency programs.

# I. COMMENTS ON THE AUDIT REPORTS

## A. The Audit Reports are wholly inadequate to protect consumers and do not fulfill the requirements set forth in the PUCO’s request for proposal.

The PUCO should reject the Audit Reports and require the Auditor to file updated reports that comply with the PUCO’s January 3, 2019 Entry and the RFP attached to that Entry. The Audit Reports do not come close to providing the type of detailed review of electric utility energy efficiency programs that is required under the PUCO’s RFP and which would more adequately protect consumers from paying too much for energy efficiency.

### 1. The Auditor failed to provide (but should have provided) an evaluation of utilities’ charges to consumers for utility profits (shared savings) and lost distribution revenue.

The most glaring deficiency is the Auditor’s failure to address utility profits (shared savings) and lost revenues. The basic purpose of this case is to independently audit and verify, for consumer protection, the energy efficiency and peak demand reduction savings that Ohio’s electric utilities reported from 2014 to 2018.[[2]](#footnote-3) As the PUCO explained in the audit RFP, energy efficiency savings must be accurately counted because charges to consumers for shared savings (aka utility profits) and lost distribution revenues are based on those savings numbers.[[3]](#footnote-4) Understandably, then, the RFP includes a page with “Audit Program Standards,” requiring the Auditor to evaluate each utility’s “computation and recovery of lost distribution revenue and shared savings attributable to its energy efficiency activities during the audit years in question.”[[4]](#footnote-5)

Despite this PUCO directive that serves consumer protection, none of the Audit Reports include an evaluation of the utility’s calculation of lost revenues or shared savings. The Audit Reports for AEP, Duke, and FirstEnergy say literally nothing about their computation of shared savings or lost revenues. This is especially alarming for FirstEnergy, where during the Audit Period customers were charged more than $172 million for lost revenues even though they should have been charged less than $77 million.[[5]](#footnote-6) The Audit Report for DP&L provides tables showing lost revenues and shared savings for each year, but these tables do nothing more than report the numbers that DP&L charged. There is nothing said about how the figures were calculated, whether the calculations are accurate, whether charges to consumers should be reduced based on the Auditor’s review, or anything else.

Unfortunately for consumers, this is not the first time that this Auditor failed to evaluate lost revenues or shared savings. The same Auditor was hired to audit Ohio energy efficiency programs for 2009, 2010, 2012, and 2013, and none of those audit reports mention shared savings or lost revenues either.[[6]](#footnote-7)

The PUCO should require the Auditor to supplement each of the Audit Reports with a thorough review of each utility’s shared savings and lost distribution revenue calculations, toward concluding whether utilities’ charges are appropriate. This supplement should be performed at no cost to consumers, who should not be required to pay for the Auditor to re-do an Audit.

### 2. The Audit Reports say nothing at all about the vast majority of programs and the potential charges to consumers for those programs.

The Audit Reports cover a five-year period during which customers paid hundreds of millions of dollars for dozens of different energy efficiency programs, plus paid for utility profits and so-called lost revenues. Yet in each of the Audit Reports, the Auditor pays little attention to most of these programs that consumers pay for, instead opting for a “more in-depth examination” of a very small number of programs.

For example, from 2014 to 2018, AEP offered at least nine different programs for residential customers.[[7]](#footnote-8) But the Audit Report for protecting AEP’s consumers analyzes just two things: lighting and home energy reports.[[8]](#footnote-9) The Audit Report for AEP consumers provides no analysis of the other programs, instead simply summarizing the cost and savings from those programs in an appendix with data provided by AEP (*i.e.,* without any apparent adjustments by the Auditor). The other Audit Reports are similar. The Audit Report for FirstEnergy consumers addresses just one residential program, the Customer Action Program.[[9]](#footnote-10) The Audit Report for protecting DP&L consumers looks only at lighting and smart thermostats for residential customers.[[10]](#footnote-11) The Audit Report for protecting Duke’s consumers looks at residential lighting, home energy reports, and demand response.[[11]](#footnote-12) For many of these, the Audit Reports look at the program for a *single year*, even though the Audit is for years 2014 to 2018. And for the remainder of the programs, the Audit Reports state only that the “audit team conducted an initial review of all the savings” reported by the utility and nothing more. *This falls short of the requirements set forth in the PUCO’s RFP that the Auditor review and report on five years of program costs, shared savings, and lost revenues charged to consumers.*

### 3. Despite auditing five years of energy efficiency programs offered by four utilities, the Auditor made no recommended adjustments to the charges that consumers paid—*not a single dollar for a single program for a single year for a single utility*.

Each of the Audit Reports contains the following recommendation:

**Retroactive Savings Adjustments**

None.[[12]](#footnote-13)

It seems simply impossible that every single savings calculation by every utility was correct to the very last kWh for five straight years of charges to consumers. This non-result for consumers seems inexplicable given that the Auditor *did* identify errors and concerns with the utilities’ savings calculations that should have resulted in downward energy savings adjustments (and thus lower charges to customers for shared savings and lost revenues):

* AEP was potentially double-counting savings from its Home Energy Reports and lighting programs, but the Auditor did not make any attempt to quantify this or to make any adjustments to protect consumers.[[13]](#footnote-14)
* DP&L used a 20-year measure life for LED bulbs in 2018, which quadrupled the 4.7-year measure life from 2017, thus inflating the cost-effectiveness of its lighting program, which also increased charges to consumers for shared savings.[[14]](#footnote-15)
* Duke, like AEP, was potentially double-counting savings from its My Home Energy Report program and lighting programs, but the Auditor did not make any attempt to quantify this or to make any adjustments for consumers.[[15]](#footnote-16)
* FirstEnergy’s HVAC savings under the Customer Action Program were not reliable.[[16]](#footnote-17) FirstEnergy’s refrigerator savings calculations were inaccurate both because they counted too many refrigerators and made improper assumptions about Energy Star certification.[[17]](#footnote-18) FirstEnergy’s assumed savings from central air conditioners was four times too high in 2018.[[18]](#footnote-19) FirstEnergy appeared to be overstating its lighting savings by assuming that too many of the bulbs being replaced were incandescent bulbs.[[19]](#footnote-20) But where is the consumer protection from the auditor?

Each of these issues should have resulted in the Auditor recommending a downward adjustment, in the favor of consumers, to the utility’s savings for purposes of calculating charges to consumers for shared savings and lost revenues. Again, the Auditor inexplicably made no recommended adjustments for past performance of the programs. But this is the entire point of the audit: to review the accuracy of the utility’s claimed savings and to make the necessary adjustments to avoid utility overcharging of consumers for energy efficiency programs.

There is no justification for the Auditor’s failure to recommend adjustments to protect consumers in situations where it identified improper calculations.

## B. Savings can and should be calculated *differently* for purposes of meeting mandates versus purposes of calculating shared savings and lost distribution revenues that are charged to consumers.

Under Senate Bill 310, codified as R.C. 4928.662(B), energy efficiency savings “shall be measured on the higher of an as found or deemed basis.” An “as found” basis means that the savings are calculated based on the *actual* product being replaced. For example, if a customer replaces a 15-watt CFL bulb with an 8-watt LED light bulb, the savings would be based on a reduction of 7 watts.

In contrast, “deemed” savings are based on a default *assumption* such as those found in the TRM. If, for example, the TRM provides a default *assumption* that an 8-watt LED bulb replaces a 43-watt halogen bulb, then the savings would be based on a reduction of 35 watts. In this hypothetical, the deemed savings would be greater than the as found savings, so the savings would be calculated using the deemed savings. In other instances, the as found savings might be greater than the deemed savings, in which case the as found savings would be used.

At various points in the Audit Report, the Auditor noted that a particular savings calculation was justifiable because it was consistent with SB 310, which allows energy savings to be based on the higher of an as found or deemed basis. For example, in FirstEnergy’s audit, the Auditor noted that FirstEnergy calculated refrigerator savings using the Ohio TRM (*i.e.*, the “deemed” savings), but noted that because the TRM is outdated, it did not “accurately represent the savings for current refrigerator installations.”[[20]](#footnote-21) In other words, while the law might allow FirstEnergy to use the deemed savings to comply with statutory mandates, some of those savings do not actually exist.

At this point where charges to consumers are at issue, it is important for consumer protection to look more closely at the law. Under R.C. 4928.662(B), “[e]nergy efficiency savings and peak demand reduction ... shall be measured on the higher of an as found or deemed basis,” as discussed above. But the law also provides that these measurements are “[f]or the purpose of measuring and determining compliance with the energy efficiency and peak demand reduction requirements under section 4928.66 of the Revised Code.”[[21]](#footnote-22) In other words, the law applies only when counting savings for purposes of meeting statutory mandates for energy efficiency and peak demand reduction savings. It does *not* apply to the calculation of lost distribution revenues or shared savings.

And importantly, it would not make sense for this statute to apply to lost distribution revenues or shared savings (both of which are PUCO creations that are not required by any statute). Lost distribution revenue charges are (unfortunately for consumers) designed to make a utility whole at consumer expense for revenues its might miss as a result of customers being more efficient. A utility only “loses” revenues if the customer *actually* reduces his or her energy usage.

So coming back to the hypothetical from above, a customer who replaces a 15-watt CFL with an 8-watt LED would, in reality, only save 7 watts per hour from the new bulb. But under the law, the utility would count 35 watts per hour using the deemed savings. Note the utility does *not* actually lose that much revenue because the deemed savings conflict with reality. Lost distribution revenue charges, therefore, must be calculated based on the best available *actual* data, not on the artificial calculation found in the law that is used only for purposes of complying with mandates.

The same logic applies to shared savings that consumers are made to pay. Shared savings is a regulatory mechanism that rewards the utility with profits based on the amount of energy that customers save. If the utility is to be given such a reward (it shouldn’t), the reward should be based on the *actual* savings that customers achieve, not based on the calculation of savings under R.C. 4928.662(B), which is artificial by design.

The Auditor should have addressed this issue for consumers, consistent with the RFP’s requirement that it address each utility’s “computation and recovery of lost distribution revenue and shared savings attributable to its energy efficiency activities during the audit years in question.”[[22]](#footnote-23) For protection of consumers, it should have audited all shared savings and lost distribution revenue calculations to verify that all calculations were based on the best available information of *actual* energy savings resulting from each utility’s energy efficiency and peak demand reduction programs. This would require the use of ex post savings (*i.e.,* savings that are confirmed through the evaluation, measurement, and verification process), and it would require the auditor to assess whether any savings were the result of free ridership (*i.e.,* customers who participated in an energy efficiency program but who would have taken the same action even without the program).

Accordingly, OCC’s above recommendations should be adopted for using the *real* efficiency savings to calculate any amounts due to consumers. It certainly would seem that, despite the Auditor’s unfortunate lack of findings, consumers are owed money by their utilities. But at a minimum, and based on the Audit Reports, the PUCO should implement for consumer protection the following Auditor recommendations and/or take action on Auditor findings, for purposes of the utilities’ shared savings and lost revenues calculations:

* The Auditor recommended that AEP and Duke customers who participated in the Home Energy Reports program be surveyed to determine whether they also purchased efficiency light bulbs under AEP’s programs.[[23]](#footnote-24) This would avoid double-counting.
* The Auditor recommended that AEP customers be surveyed to determine the actual rate at which they install LED bulbs.[[24]](#footnote-25) AEP assumed that 97% of all bulbs were put in service, which the auditor found to be “outdated and likely too high.”[[25]](#footnote-26) Indeed, the Auditor found that AEP has sold 17 million efficient bulbs through its programs, which suggests that some customers must be storing them for future use.[[26]](#footnote-27) It also suggests that some LED bulbs are replacing other efficient bulbs, which would mean that the customer is not actually reducing energy usage.
* The Auditor recommended that DP&L use a 10-year useful life for LED bulbs instead of the 20-year useful life that it used in 2018.[[27]](#footnote-28) This would reduce charges to consumers for shared savings, which are based on part on the assumed useful life of energy efficiency measures.
* The Auditor noted that DP&L distributed 12 million bulbs from 2012 to 2018, which is an average of more than 25 per household.[[28]](#footnote-29) Similar to AEP, this means that some DP&L customers are likely storing them for future use and that some are replacing efficient bulbs with other efficient bulbs. Both of these would reduce savings for purposes of calculating shared savings and lost revenues.
* For FirstEnergy’s Customer Action Program, the Auditor found that all savings were derived using the higher of “as found” and “deemed” under Senate Bill 310.[[29]](#footnote-30) While this is permissible when counting savings to meet statutory mandates, it results in inaccurate lost distribution revenue calculations. The best available actual energy savings numbers should be used for lost distribution revenue charges.
* The Auditor noted that the savings under the Customer Action Program were based on 1,800 survey responses, but the Auditor could not determine how many customers were solicited.[[30]](#footnote-31) Without knowing the survey response rate, it is difficult to ascertain the validity of the 1,800 person sample. The renders virtually all of the Customer Action Program savings unreliable and unsuitable to be used for purposes of calculating lost revenues.
* FirstEnergy assumed 529.3 kWh savings for each central air conditioner, but the Auditor found that actual savings were much lower at 143.9 kWh per unit. With 529 units, this resulted in more than 200,000 kWh of overstated energy savings, thus resulting in higher lost revenue charges to consumers.[[31]](#footnote-32) Lost revenue charges should be adjusted downward to reflect this.

In addition to these adjustments, the PUCO should order the Auditor to perform a complete analysis of each utility’s shared savings and lost distribution revenue charge calculations based on actual, verifiable savings. The Auditor should then be required to supplement the Audit Reports with its findings. Otherwise, customers could be stuck overpaying for shared savings and lost distribution revenues.

# II. COMMENTS ON THE DRAFT TECHNICAL REFERENCE MANUAL

## A. The draft TRM uses an unreasonably low 5% discount rate, which artificially inflates the purported cost-effectiveness of programs, thus making them look better than they really are and driving up costs to consumers.

When a customer participates in energy efficiency, the benefits of that decision accrue over time. For example, if a customer replaces an incandescent bulb with an LED bulb, that LED bulb might last several years, thus saving the customer money over a period of several years. Money is worth more now than in the future (because of inflation, among other things). A discount rate accounts for this by giving more weight to near-term savings than long-term savings. In general, the lower the discount rate, the more beneficial the utility’s programs will appear.

A simple illustrative example demonstrates the math. Suppose a customer installs an energy efficient refrigerator and that the new fridge will save the customer $100 per year for 10 years. Using a 5% discount rate, the customer’s reported savings would be $772.17 in current dollars. Using an 8% discount rate, the customer’s reported savings would be $671.01. The choice of a lower discount rate alone generates an additional $100 in reported savings. When considered in the aggregate (where thousands of customers participate in energy efficiency programs), the difference in reported savings to consumers can be substantial. It is crucial that an appropriate discount rate be used so that savings are not overstated.[[32]](#footnote-33)

Fortunately, the PUCO has already addressed this issue, finding that the appropriate discount rate is the utility’s after-tax weighted average cost of capital.[[33]](#footnote-34) Others, including the United States Environmental Protection Agency,[[34]](#footnote-35) American Council for an Energy Efficient Economy (“ACEEE”),[[35]](#footnote-36) and Lawrence Berkeley National Laboratory[[36]](#footnote-37) have similarly endorsed the weighted average cost of capital as the appropriate discount rate. And AEP Ohio, in its most recent energy efficiency filing (for unmandated efficiency programs), proposed using its weighted average cost of capital (currently 7.921%) as the discount rate for its proposed energy efficiency programs.[[37]](#footnote-38)

The Draft TRM is inconsistent with these sources. Instead of using each utility’s respective weighted average cost of capital, it proposes a 5% discount rate for all net present value calculations.[[38]](#footnote-39) As explained above, using a low discount rate like 5% will artificially inflate the cost-effectiveness of utility programs, making them look better for consumers than they really are. For consumer protection, the PUCO should not adopt this recommendation in the Draft TRM and instead should amend the Draft TRM to use each utility’s respective after-tax weighted average cost of capital.

## B. The TRM should adjust energy savings to account for free riders and non-utility customers.

Energy efficiency programs exist as a way to encourage customers to be more energy efficient than they would be on their own. For example, some customers who might otherwise buy halogen light bulbs will see that there is a utility-sponsored (and customer funded) discount on LED bulbs and buy those instead. Other customers, however, would be energy efficient whether there is a utility program or not. Those customers gladly take the rebate (because everyone likes to save money), but the program itself did not actually cause any energy to be saved (because the customer was going to take the action anyway). To account for this, it is typical for energy savings from energy efficiency programs to be adjusted downward using a “net to gross” ratio.[[39]](#footnote-40) Gross savings are the total savings, and net savings are those that account for free riders. For consumer protection, the Draft TRM should be required to be updated with a default net to gross ratio for each measure.

A similar problem occurs with rebates offered in stores. When a utility offers an in-store instant rebate (for example, a $2 discount on LED bulbs), the store does not typically require the buyer to verify that they are a customer of that particular utility.

A local example might help illustrate the issue. The Lowe’s on Polaris Parkway sometimes offers LED light bulbs with a discount provided through AEP’s energy efficiency programs. This particular Lowe’s location is very close to the City of Westerville, which is not part of AEP’s service territory because it provides municipal electricity to its residents. Westerville residents almost certainly shop at this Lowe’s location (as there is no Lowe’s in the City of Westerville), and they almost certainly purchase LED light bulbs with an AEP discount. Thus, AEP would count those savings, and AEP customers would pay for the rebate plus utility profits on those savings, even though an AEP customer did not purchase the bulb. For consumer protection, the Draft TRM should include a default assumption that a certain percentage of each measure with a point of sale rebate is purchased by a non-utility customer.

# III. CONCLUSION

The Office of the Ohio Consumers’ Counsel appreciates the opportunity to provide comments on behalf of 4 million residential consumers. We respectfully request that the PUCO adopt the consumer-protection recommendations found in these comments to protect consumers from paying too much for energy efficiency.

Respectfully submitted,

 Bruce Weston (0016973)

 Ohio Consumers’ Counsel

 */s/ Christopher Healey*

Christopher Healey (0086027)

Counsel of Record

Angela O’Brien (0097579)

Assistant Consumers’ Counsel

 **Office of the Ohio Consumers’ Counsel**

 65 East State Street, 7th Floor

 Columbus, Ohio 43215

 Telephone [Healey] (614) 466-9571

 Telephone [O’Brien]: (614) 466-9531

 christopher.healey@occ.ohio.gov

angela.obrien@occ.ohio.gov

(willing to accept service by e-mail)

**CERTIFICATE OF SERVICE**

 I hereby certify that a copy of these Comments was served on the persons stated below via electronic transmission, this 1st day of July 2020.

 */s/ Christopher Healey*

 Christopher Healey

 Assistant Consumers’ Counsel

**SERVICE LIST**

|  |  |
| --- | --- |
| Steven.beeler@ohioattorneygeneral.govSteven.darnell@ohioattorneygeneral.govRocco.DAscenzo@duke-energy.comJeanne.Kingery@duke-energy.comLarisa.Vaysman@duke-energy.comAttorney Examiner:anna.sanyal@puco.ohio.gov  | Bethany.allen@igs.comJoe.oliker@igs.comMichael.nugent@igs.com |

1. Independent Audit of the AEP Ohio 2014-2018 Energy Efficiency and Demand Reduction Programs (Nov. 29, 2019) (the “AEP Audit Report”); Independent Audit of the DP&L Ohio 2014-2018 Energy Efficiency and Demand Reduction Programs (Nov. 29, 2019) (the “DP&L Audit Report”); Independent Audit of the Duke Energy Ohio 2014-2018 Energy Efficiency and Demand Reduction Programs (Nov. 29, 2019) (the “Duke Audit Report”); Independent Audit of the FirstEnergy 2014-2018 Energy Efficiency and Demand Reduction Programs (Nov. 29, 2019) (the “FirstEnergy Audit Report”). [↑](#footnote-ref-2)
2. Entry ¶ 1 (Jan. 3, 2019). [↑](#footnote-ref-3)
3. RFP at 1, n. 1. [↑](#footnote-ref-4)
4. RFP, Attachment 1. [↑](#footnote-ref-5)
5. *See* Case No. 13-2173-EL-RDR, Shutrump Testimony, Attachment CLS-1 (June 22, 2020). [↑](#footnote-ref-6)
6. *See* Case No. 12-665-EL-UNC, Report of the Ohio Independent Evaluator, 2009 and 2010 Ohio Efficiency Programs (Aug. 29, 2012); Case No. 14-569-EL-UNC, Report of the Ohio Independent Evaluator, 2012 Ohio Efficiency Programs, Vol. I (Jan. 10, 2019); Case No. 14-569-EL-UNC, Report of the Ohio Independent Evaluator, 2013 Ohio Efficiency Programs (Jan. 10, 2019). [↑](#footnote-ref-7)
7. AEP Audit Report at 14-16. [↑](#footnote-ref-8)
8. AEP Audit Report at 21-26. [↑](#footnote-ref-9)
9. FirstEnergy Audit Report at 21-30. [↑](#footnote-ref-10)
10. DP&L Audit Report at 21-25. [↑](#footnote-ref-11)
11. Duke Audit Report at 18-26. [↑](#footnote-ref-12)
12. AEP Audit Report at 31; DP&L Audit Report at 27 ; Duke Audit Report at 28; FirstEnergy Audit Report at 35. [↑](#footnote-ref-13)
13. AEP Audit Report at 26. [↑](#footnote-ref-14)
14. DP&L Audit Report at 22. [↑](#footnote-ref-15)
15. Duke Audit Report at 25-26. [↑](#footnote-ref-16)
16. FirstEnergy Audit Report at 25. [↑](#footnote-ref-17)
17. FirstEnergy Audit Report at 26. [↑](#footnote-ref-18)
18. FirstEnergy Audit Report at 26. [↑](#footnote-ref-19)
19. FirstEnergy Audit Report at 27-28. [↑](#footnote-ref-20)
20. FirstEnergy Audit Report at 30. [↑](#footnote-ref-21)
21. R.C. 4928.662. [↑](#footnote-ref-22)
22. RFP, Attachment 1. [↑](#footnote-ref-23)
23. AEP Audit Report at 3-4; Duke Audit Report at 26. [↑](#footnote-ref-24)
24. AEP Audit Report at 3. [↑](#footnote-ref-25)
25. AEP Audit Report at 3. [↑](#footnote-ref-26)
26. AEP Audit Report at 26. [↑](#footnote-ref-27)
27. DP&L Audit Report at 27. [↑](#footnote-ref-28)
28. DP&L Audit Report at 22. [↑](#footnote-ref-29)
29. FirstEnergy Audit Report at 19. [↑](#footnote-ref-30)
30. FirstEnergy Audit Report at 22. [↑](#footnote-ref-31)
31. 529 units \* (529.3 kWh – 143.9 kWh) = 203,877 kWh. [↑](#footnote-ref-32)
32. *See In re Protocols for the Measurement & Verification of Energy Efficiency and Peak Demand Reduction Measures*, Case No. 09-512-GE-UNC, Finding & Order, Appendix C, § III (“A significant driver of overall cost-effectiveness of energy efficiency is the discount rate assumption.”). [↑](#footnote-ref-33)
33. *See In re Protocols for the Measurement & Verification of Energy Efficiency and Peak Demand Reduction Measures*, Case No. 09-512-GE-UNC, Finding & Order, Appendix C, § III (“A significant driver of overall cost-effectiveness of energy efficiency is the discount rate assumption.”) [↑](#footnote-ref-34)
34. *See* Understanding Cost-Effectiveness of Energy Efficiency Programs, Best Practices, Technical Methods, and Emerging Issues for Policy Makers at ES-2 (“The [Program Administrator Cost Test] ... should reflect the utility weighted average cost of capital”), *available at* <https://www.epa.gov/sites/production/files/2015-08/documents/cost-effectiveness.pdf>. [↑](#footnote-ref-35)
35. *See* Cost-effectiveness Tests ‘Current Practice’ at 13 (stating that the “Utility WACC” is typically used for the Utility Cost Test), *available at* <https://www.aceee.org/files/pdf/conferences/mt/2009/E2_Price.pdf>. [↑](#footnote-ref-36)
36. *See* Better Buildings Energy Efficiency Cost Effectiveness Tool at 1 (“For a utility, the discount rate typically is assumed to be the weighted average cost of capital – i.e., the weighted average of rates on loans or bonds and payments on equity.”), *available at* <https://www.energy.gov/sites/prod/files/2017/03/f34/bbrp_ee_ce_tool-glossary_2017.pdf>. *See also* Total Resource Cost (TRC) Test and Avoided Costs, Workshop at the Public Utilities Commission of Ohio (recommending use of the weighted average cost of capital for the Utility Cost Test), *available at* <https://www.raponline.org/wp-content/uploads/2016/05/rap-sedano-trcworkshop-2009-08-05.pdf>. [↑](#footnote-ref-37)
37. Case No. 20-585-EL-AIR, Testimony of Jon Williams, Exhibit JFW-1, Page 18 of 26 (June 15, 2020). [↑](#footnote-ref-38)
38. TRM Vol. I at 10. [↑](#footnote-ref-39)
39. *See, e.g.,* California Energy Efficiency Policy Manual at 19 (“Net to Gross (NTG) ratios are used to estimate and describe the ‘free ridership’ that may be occurring within energy efficiency programs....”). [↑](#footnote-ref-40)