

Public Utilities Commission of Ohio
Case No. 16-0743-EL-POR

Direct Testimony of Chris Neme
(Public Version)

Submitted on behalf of
the Natural Resources Defense Council

September 13, 2016

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Exhibit List

- Exhibit CN-1 Companies' Confidential Response to OCC Set 1, RPD-11, Supp. Attachment 1.
- Exhibit CN-2 Chris Neme's Non-Confidential Work Papers.
- Exhibit CN-3 Companies' Confidential Response to NRDC Set-1, RPD-16.
- Exhibit CN-4 Companies' Confidential Response to ELPC Set-1, RPD-6.
- Exhibit CN-5 Excerpts of Lazar, Jim and Xavier Baldwin, "Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements", Published by the Regulatory Assistance Project, August 2011.
- Exhibit CN-6 Companies' Response to OCC Set-1, RPD-020, Attachments 1-3.
- Exhibit CN-7 Companies' Response to NRDC Set-1, INT-8.
- Exhibit CN-8 Companies' Response to NRDC Set-1, INTs-4 & 5.
- Exhibit CN-9 Companies' Response to NRDC Set-2, INT-42, Attachment 1.
- Exhibit CN-10 Companies' Confidential Response to ELPC Set 1, RPD-5, Attachment 1.
- Exhibit CN-11 Companies' Response to NRDC Set-1, INT-19.

Exhibit CN-12 Chris Neme's Confidential Work Papers.

Exhibit CN-13 Chris Neme's Curriculum Vitae.

I. INTRODUCTIONS AND QUALIFICATIONS

Q: Please state your name, employer and business address.

A: My name is Chris Neme. I am a co-founder and Principal of Energy Futures Group, a consulting firm that provides specialized expertise on energy efficiency and renewable energy markets, programs and policies. My business address is P.O. Box 587, Hinesburg, VT 05461.

Q: Please describe your educational background.

A: I received a Master of Public Policy (“MPP”) degree from the University of Michigan (Ann Arbor) in 1986. That is a two-year, multi-disciplinary degree focused on applied economics, statistics and policy development. I also received a Bachelor’s degree in Political Science from the University of Michigan (Ann Arbor) in 1985. My first year of graduate school counted towards both my Masters’ and Bachelor’s degrees.

Q: Please summarize your business and professional experience.

A: As a Principal in Energy Futures Group, I play major roles in a variety of energy efficiency consulting projects. Recent examples include:

- Representing NRDC in consultations with utilities and other parties, in both Illinois and Michigan, on efficiency program and portfolio design, cost-effectiveness screening, evaluation, shareholder incentive structures and other related topics;
- Serving as an appointed expert representative on the Ontario Energy Board’s Evaluation and Audit Committee for natural gas demand-side management;

- Serving on the Management Committee and leading strategic planning and program design for a team of firms, led by Applied Energy Group, that was hired by the New Jersey Board of Public Utilities to deliver the electric and gas utility-funded New Jersey Clean Energy Programs;
- Serving on a five-person drafting committee for development of a new National Standard Practice Manual for cost-effectiveness screening of energy efficiency measures, programs and portfolios;
- Helping the National Association of Regulatory Utility Commissioners and the Michigan Public Service Commission staff assess the relative merits of alternative approaches to defining savings goals for utility efficiency programs (focusing on lifetime rather than just first year savings); and
- Drafting policy reports for the Regulatory Assistance Project on a variety of energy efficiency and related regulatory policy issues such as whether 30% electric savings is achievable in ten years, the history of efforts across the United States to use geographically targeted efficiency programs to cost-effectively defer transmission and distribution system investments, the history of bidding of efficiency resources into the PJM and New England capacity markets, and other topics.

Prior to co-founding Energy Futures Group in 2010 I worked for 17 years for the Vermont Energy Investment Corporation (“VEIC”), the last 10 as Director of its Consulting Division managing a group of 30 professionals with offices in three states. Most of our consulting work involved critically reviewing, developing and/or supporting the implementation of electric, gas, and multi-fuel energy efficiency programs for clients across North America and beyond. As a

member of VEIC's Senior Management Team, I also helped launch Efficiency Vermont in 2000 – a then-new statewide "efficiency utility" VEIC was selected to operate – and became intimately familiar with a myriad of issues associated with the day-to-day delivery of energy efficiency programs. I also helped shape the New England ISO's rules for inclusion of demand resources in its Forward Capacity Market and led the development of VEIC's first bids of peak savings from efficiency programs into that market.

During my career in energy efficiency I have worked in numerous jurisdictions to develop or review energy efficiency potential studies, develop or review Technical Reference Manuals ("TRM") of deemed savings assumptions (including the Ohio TRM), support utility-stakeholder "collaboratives", negotiate or support development of efficiency program performance incentive mechanisms, and review or develop efficiency programs. All told, I have worked on these and/or other efficiency policy and program issues for clients in more than 30 states and provinces as well as parts of Europe. I have also led courses on efficiency program design, published widely on a range of efficiency topics and served on numerous national and regional efficiency committees, working groups and forums. A copy of my curriculum vitae is attached as Exhibit CN-13.

Q: Have you previously filed expert witness testimony in a proceeding before the Public Utilities Commission of Ohio (the "Commission")?

A: Yes. Four years ago I filed and defended testimony on First Energy's limited bidding of efficiency resources into the PJM capacity market (Docket 12-1230-EL-SSO). I also filed and defended testimony before the Commission in 1990 regarding options, including efficiency programs, for complying with acid rain legislation.

64 **Q: Have you been an expert witness on energy efficiency matters before other regulatory**
65 **commissions?**

66 A: Yes, I have filed expert witness testimony on more than 30 other occasions before similar
67 regulatory bodies in nine other states and provinces, including the neighboring jurisdictions of
68 Michigan, Illinois and Ontario, during the past few years.

69

II. TESTIMONY OVERVIEW

Q: Please briefly summarize the main elements of the Ohio Edison Company's, The Cleveland Electric Company's, and the Toledo Edison Company's ("FirstEnergy" or "the Companies") proposed 2017-2019 Energy Efficiency and Peak Demand Reduction Plans (the "Proposed Plans").

A: The Companies' Proposed Plans address a variety of issues related to the development and deployment of a variety of efficiency programs. I would summarize the most important elements of the Proposed Plans as follows:

1. They propose to achieve 800,000 MWh of new electricity savings – across the three Companies – each year.¹ That goal is consistent with one of the agreements in the Third Supplemental Stipulation and Recommendation filed on the Companies' Fourth Electric Security Plan ("ESP IV Stipulation").²
2. A commitment to achieve that level of savings by expanding the Companies' previous portfolios of efficiency programs to reflect "best practices" from other utilities in Ohio and nationally. This is also consistent with language in the ESP IV Stipulation.³
3. An increase in potential financial incentives for the Companies' shareholders, most notably from an increase in the "shared savings" cap from the current \$10 million to \$25

¹ The 800,000 MWh annual goal is subject to adjustment based on the volume of customer opt outs. If current levels of opt outs continued, it would [REDACTED] to an average of a little more than [REDACTED] of about [REDACTED]. Exhibit CN-1.

² *In the Matter of the Application of The Cleveland Electric Illuminating Company, Ohio Edison Company, and The Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Electric Security Plan*, Docket No. 14-1297-EL-SSO, Third Supplemental Stipulation and Recommendation at 11 (December 1, 2015); *See also* Opinion and Order at 23 to 24, 94, 119 (March 31, 2016).

³ *Id.*, ESP IV Stipulation at 11; Opinion and Order at 68.

million. That proposed increase is also consistent with language in the ESP IV Stipulation.⁴

4. A range of assumptions regarding the different efficiency programs and measures the Companies plan to promote. Those assumptions are derived from a range of sources, including the now six-year-old Ohio Technical Reference Manual, the Pennsylvania TRM and internal Company sources.

Q: Are the Proposed Plans beneficial for the Companies' customers?

A: The Companies' customers would certainly be better off with the reactivated and expanded programs laid out in the Proposed Plans than without them. That said, the Proposed Plans also contain several shortcomings. As a result, they will likely provide substantially fewer benefits than the programs could – or should – produce.

Q: Does your testimony address these shortcomings?

A: Yes. The purpose of my testimony is to highlight three inter-related concerns regarding the Companies' Proposed Plans:

1. That their proposed shared savings mechanism appears designed to minimize risk and maximize profits for the Companies' shareholders rather than to reward the Companies for good performance in efficiency program design and delivery;
2. That many aspects of the programs in the Proposed Plans do not represent "best practice" in efficiency program planning; and

⁴ *Id.*, ESP IV Stipulation at 11-12; Opinion and Order at 68-69, 94-95.

- 106 3. That the Companies' savings assumptions are insufficiently supported, insufficiently
107 vetted and, at least in some cases, highly problematic for determining whether they will
108 meet their savings goals and/or for determining the magnitude of any shared savings to
109 which their shareholders should be entitled.

110 **Q: What are the implications of these concerns?**

111 A: If these concerns are not addressed through required revisions to the Companies' Proposed
112 Plan, there will be several adverse effects. At the most fundamental level, such adverse effects
113 are likely to include:

- 114 • The Companies' customers being encouraged to invest in outdated efficiency measures
115 rather than in state-of-the-art, newer technology;
- 116 • The Companies' programs collectively producing lower levels of energy savings than
117 they would under a more effective plan to meet the 800,000 MWh annual savings goal;
- 118 • The Companies' customers experiencing higher future energy bills than they otherwise
119 would under a better designed plan;
- 120 • The Companies' customers forgoing a variety of other potential benefits; and
- 121 • The Companies shareholders earning unreasonably high profits for their efforts (another
122 adverse effect for their customers).

123 **Q: Why would the Companies' programs collectively produce lower levels of savings than**
124 **they should?**

125 A: As I discuss in more detail later in my testimony, the Companies' Proposed Plans suggest
126 that they will get an average of approximately 17% of their annual savings from their three
127 Customer Action Programs (from residential, small business and large business) and their
128 Mercantile Customer Program. The sole purpose of those programs is to document savings that
129 customers are producing on their own, without the Companies' direct, active involvement.⁵
130 Those savings would occur regardless of whether the Companies count them. If the Companies
131 endeavored to achieve their collective 800,000 MWh annual savings target with less emphasis on
132 these "programs" and instead shifted their focus to programs that produce additional new cost-
133 effective savings caused by the utility itself, the total savings experienced in the Companies'
134 service territory would increase.

135 In addition, as I also discuss in more detail in Section III.C, the Companies appear to be using
136 some outdated assumptions regarding annual savings and/or the life of savings for several key
137 measures in their portfolio. Correcting these assumptions would spur additional "real" cost-
138 effective savings to meet the Companies' 800,000 MWh annual savings target.

139 **Q: Why would the Companies' customers face higher energy bills?**

140 A: If an efficiency program is determined to be "cost-effective," that means its total cost is
141 lower than the alternative total cost of supplying more electricity (and/or other fuels) to meet a
142 less efficient load. Thus, if the Companies' Proposed Plans produce lower levels of new, cost-
143 effective energy savings than an alternative plan would produce, then, by definition, the total
144 energy costs borne by its customers will be higher than under the alternative plan.

⁵ Proposed Plans, Attachment A, Section 3 at 24, 40, 42, 53, 55, 65 (Program Descriptions) (for example, see the description of the Residential Customer Action Program on Attachment A, page 24 – "The program captures energy savings and peak demand reductions achieved through actions taken by customers outside of utility-administered programs").

145 It is worth noting that the Companies have estimated that – even excluding their Customer
146 Action and Mercantile Customer “programs” – their efficiency programs will provide an average
147 of about \$1.50 in Total Resource Cost (“TRC”) lifecycle benefits for every dollar in costs
148 incurred by the utilities and their customers in procuring energy savings. In other words, the
149 efficiency savings that their programs are causing cost about one-third less than the alternative
150 cost of electricity supply. In total, the Companies’ TRC cost-effectiveness analysis suggests that
151 their programs (again excluding Customer Action and Mercantile Customer “programs”) would
152 produce more than \$275 million in bill savings for their customers relative to the alternative cost
153 of electricity supply.⁶ Moreover, that estimate [REDACTED] that will also
154 result from a number of electric efficiency measures,⁷ appears to exclude the effects
155 [REDACTED] for electric energy
156 and electric capacity,⁸ and appears to incorrectly base [REDACTED]
[REDACTED]⁹ Thus, even a modest percentage increase in
158 real, new savings from a better plan could produce tens of millions of dollars of additional
159 energy bill savings.

160 In addition, a more robust efficiency program portfolio could lay a better foundation for
161 acquiring additional energy savings in the future, potentially enabling less costly compliance
162 with future carbon emissions regulations such as those proposed under the U.S. Environmental
163 Protection Agency’s Clean Power Plan.

⁶ As estimated using the TRC test. *See* Proposed Plans, Attachment A, Appendix C-4; *see also* Exhibit CN-2.

⁷ Exhibit CN-3. Part (d) states that [REDACTED].

⁸ Exhibit CN-4.

⁹ The Companies used [REDACTED] (*see* Exhibit CN-3). However, because
[REDACTED]. (Exhibit CN-5). The Errata the Companies provided for
their Proposed Plans on June 17, which [REDACTED]
[REDACTED]
[REDACTED]

Q: Can you elaborate on why it is important to consider the implications for meeting future Clean Power Plan regulations in determining the reasonableness of the Companies' Proposed Plans?

A: On August 3rd, 2016, U.S. EPA released the final Clean Power Plan, which sets individual state targets for carbon dioxide emissions from existing power plants. While the final rule no longer includes energy efficiency as one of the core “building blocks” upon which the emissions targets are set, energy efficiency is nonetheless prominently featured as a key *compliance option* for states.¹⁰ As U.S. EPA articulates:

[t]he Clean Power Plan puts energy efficiency front and center because it is an important, proven strategy widely used by states that can substantially and cost-effectively lower carbon dioxide emissions from the power sector. And while the final state goals don't include energy efficiency as a building block, this does not limit the ability of states to use energy efficiency to meet their clean power goals.¹¹

Additional opportunities exist for Ohio with the Clean Energy Incentive Program (“CEIP”), an optional program that U.S. EPA created alongside the Clean Power Plan that provides additional incentives for early investment in energy efficiency in low-income communities.¹² The program offers a two-to-one match for state energy efficiency savings in order to jump-start these efforts in low-income communities.

Thus, by making investments to increase energy efficiency in the homes (especially low-income homes), businesses and manufacturing facilities of their customers, the Companies' Proposed Plans have the potential to reduce carbon pollution, thereby lowering future costs of complying

¹⁰ U.S. EPA Fact Sheet, *Energy Efficiency in the Clean Power Plan*, available at <https://www.epa.gov/sites/production/files/2015-08/documents/fs-cpp-ee.pdf>.

¹¹ *Ibid.*

¹² U.S. EPA Fact Sheet, Proposed Rule About Design Details of the Clean Energy Incentive Program (CEIP) Under the Clean Power Plan, available at <https://www.epa.gov/sites/production/files/2016-06/documents/fs-ceip-proposal-061616.pdf>.

with federal carbon emission requirements. That will have the effect of providing bill savings beyond the more traditional avoided energy, avoided capacity and avoided T&D benefits that are more commonly considered when assessing the benefits of efficiency programs.

Put simply, the Companies have a tremendous opportunity to start to prepare for these upcoming carbon reduction requirements, and take advantage of programs like the CEIP, through their utility-run energy efficiency portfolios.

Q: You suggest that there will be additional benefits, beyond bill savings, that customers would also forgo as a result of the Companies' Proposed Plans producing less real, new savings than it could. What are those additional benefits?

There are several:

- Risk reduction. Efficiency investments also generally reduce risk for electricity consumers, such as the risk of exposure to future fuel price volatility. There is value to reductions in risk. Indeed, since the early 1990s Vermont regulators have required the application of a 10% downward adjustment to efficiency costs as a proxy for this benefit when screening efficiency programs for cost-effectiveness.¹³ There is no comparable accounting for this benefit in the Companies' analyses.
- Non-energy benefits. Efficiency investments also often provide a variety of non-energy benefits, such as improved comfort, improved health and safety, improved building

¹³ State of Vermont Public Service Board, Investigation into Least-Cost Investments, Energy Efficiency, Conservation, and Management of Demand for Energy, Docket No. 5270 Board Decision Adopting (as Modified) Hearing Officer's Report and Proposal for Decision (April 16, 1990), available at <http://psb.vermont.gov/sites/psb/files/projects/EEU/screening/5270final.pdf>.

203 durability, and improved business productivity. Again, these benefits appear to not be
204 captured in the Companies' analyses.

205 • Job creation and economic development. Efficiency programs can also have a positive
206 net impact on local job creation and economic development.¹⁴

¹⁴ See, e.g., Laitner, John A. "Skip," *The Long-Term Energy Efficiency Potential: What the Evidence Suggests*, ACEEE Report Number E121 (January 2012). (<http://aceee.org/sites/default/files/publications/researchreports/e121.pdf>).

III. ISSUES WITH THE COMPANIES' PROPOSED SHARED SAVINGS MECHANISM

Q: What is your view regarding whether utility shareholders should profit from the offering of efficiency programs?

A: I am a long-time supporter of policies to provide financial incentives for well-designed and well-delivered efficiency programs. In my experience, efficiency program administrators perform better – with significant benefits for their customers – when they are given the opportunity to earn financial incentives for good performance. That may be particularly true for utilities who could otherwise have a financial disincentive to effectively procure energy savings. That said, the benefits to consumers of offering utilities financial incentives for efficiency programs will only be realized if the incentive mechanism is structured properly.

Q: What, in your view, constitutes a properly structured utility shareholder incentive mechanism?

A: There are many layers to that “onion.” I will focus on only the most fundamental principle here: the mechanism should reward good or exemplary performance relative to what should be expected from a proposed level of budget and effort. Critically, rewards should not be provided for poor or mediocre performance. Put another way, there should be some uncertainty as to whether the utility will earn incentives in any given year. Otherwise, the mechanism becomes more of an entitlement than a vehicle for rewarding performance.

Q: Is the Companies' proposed shared savings mechanism consistent with that fundamental principle?

A: No.

229 **Q: Why not? What are its shortcomings?**

230 A: There are several problems with the Companies' proposed shared savings mechanism:

- 231 1. The Companies' shareholders would have the ability to earn their maximum shared
232 savings percentage even if the utilities fell well short of their planned savings target.
233 Specifically, the savings threshold after which shareholders can begin to earn money is
234 [REDACTED] the savings the Companies have forecast for their Proposed Plans.¹⁵ The
235 savings level at which each utility Company can maximize its "shared savings"
236 percentage is [REDACTED] the forecast plan savings level. This renders the mechanism
237 more of a low-risk entitlement than a reward for performance.
- 238 2. Nearly one-quarter of the Utility Cost Test ("UCT") net benefits which the Companies
239 are forecasting under their Proposed Plans will come from efficiency investments and
240 savings that *the utility will have had no material role in producing*.¹⁶
- 241 3. The calculation of UCT net benefits in which the Companies' Proposed Plans suggests
242 that shareholders are entitled to "share" excludes all programs that are not cost-effective.
243 While that may have been intended to encourage the development of programs that are,
244 indeed, cost-effective,¹⁷ this approach has some adverse unintended consequences.
245 Specifically, it puts all responsibility for programs that fail cost-effectiveness screening

¹⁵ The percentage [REDACTED] for each of the three Companies (*see* Exhibit CN-1). The percentages are [REDACTED]

¹⁶ This is the portion of cost-effective program UCT net benefits resulting from Customer Action Programs across all sectors and the Mercantile Customer Program (*see* Exhibit CN-6). It may be a conservative estimate since the Companies have indicated they will also claim any savings from the Energy Special Improvement District program, but has not estimated the savings that program may produce.

¹⁷ See Commission's discussion of this issue in Docket No. 14-1297-EL-SSO, Opinion and Order at 68-69.

on consumers and does not provide an incentive to minimize the extent to which some programs fail cost-effectiveness screening.

I lay out in detail these concerns with the structure of the shared savings mechanism in the following sections.

A. Shared Savings Earned on Under-Performing Portfolio

Q: What is the Companies' proposal regarding the "trigger point" at which it could begin to earn shared savings?

A: FirstEnergy proposes that each individual subsidiary Company begin to earn shared savings as soon as it exceeds its statutory annual and cumulative savings targets.¹⁸ That is consistent with the structure of the Companies' past shared savings mechanisms.¹⁹ However, as noted above, the Companies' statutory savings targets for the 2017-2019 plan years²⁰ are well below what they committed to save under the ESP IV Stipulation and have forecasted to save under their Proposed Plans.

Q: What is the problem with applying the same "trigger point" that is currently in Ohio statute?

A: If the Companies were only planning and budgeting to meet the statutory target, then exceeding that target would represent a successful outcome that should, indeed, be rewarded. However, in the ESP IV Stipulation, the Companies negotiated and committed to a portfolio

¹⁸ Proposed Plans, Attachment A at 99-100.

¹⁹ *In the Matter of the Application of The Cleveland Electric Illuminating Company, Ohio Edison Company, and The Toledo Edison Company for Approval of Their Energy Efficiency and Peak Demand Reduction Program Plans for 2013 through 2015*, Docket No. 12-2190-EL-POR, Opinion and Order at 12-17 (March 20, 2013).

²⁰ This is assuming that the currently-frozen annual statutory targets resume on January 1, 2017. *See* Ohio Revised Code 4928.66 (A)(1)(a).

savings target that exceeds the statutory target in the Ohio Revised Code.²¹ The Companies designed and budgeted for their programs to save more than 800,000 MWh annually (subject to adjustments for opt-outs), which exceeds the Ohio Revised Code statutory target by an average of more than █████ across the three subsidiary Companies.²² In that context, if the Companies only just meet their statutory targets, this should be considered under-performance and should not merit any shareholder rewards.

It is worth noting that the Companies have proposed that their shared savings cap be dramatically increased, from the current \$10 million to \$25 million per year after-tax.²³ The Companies base this proposal on the Commission's March 31, 2016 Opinion and Order in the ESP IV case.²⁴ That same Order endorsed the savings target of 800,000 MWh that the Companies' 2017-2019 Proposed Plans have been designed to meet.²⁵ If both the Companies' savings target and shared savings cap are to be increased substantially, it is unreasonable to expect the "trigger point" for shared savings to remain unchanged.

B. Inappropriate Inclusion of Savings the Companies Had No Material Role in Producing

Q: What is the Companies' proposal with regards to the savings they can count towards their savings targets and include in their shared savings calculations?

A: The Companies suggest that all savings from all of the programs in the Proposed Plans count toward both the annual savings targets and the calculation of shared savings, with the exclusion T&D projects and projects that receive funding from the Universal Service Fund which will not

²¹ See Docket No. 14-1297-EL-SSO, ESP IV Stipulation at 11; *see also* Ohio Revised Code 4928.66 (A)(1)(a).

²² See Exhibit CN-1.

²³ Proposed Plans, Attachment A at 100.

²⁴ Docket No. 14-1297-EL-SSO, Opinion and Order at 68-69, 94-95;

²⁵ *Id.* at 23 to 24, 94, 119

be included in the portfolio's adjusted net benefits.²⁶ The programs that the Companies intend to count toward shared savings include a variety of "programs" whose savings the Companies will have had no material role (or no active role) in producing, such as their various "Customer Action Programs" and their Mercantile Customer Program.

Q: How large a role do these programs play in the Companies' Proposed Plans?

A: Together, the three Customer Action Programs and the Mercantile Customer Program account for only about 2% of the total budget,²⁷ but about 17% of total annual MWh savings over the three-year plan period.²⁸ Their impact on shared savings is larger. Combined, they account for about 23% of the UCT net benefits that the Companies estimate the Proposed Plans will produce and which would be "shared" with customers under the Companies' proposed shared savings mechanism.²⁹ And these values may be conservative estimates. They do not include impacts from the Energy Special Improvement District ("ESID") initiative for which the Companies have not yet estimated any savings or UCT net benefits in their Proposed Plan, but whose impacts they appear to be reserving the right to include in future shared savings calculations,³⁰ even though they do not appear to have plans to play a material role in the production of savings from ESIDs.³¹

Q: Aren't the Companies permitted, by law, to count savings from programs like their Customer Action and Mercantile Customer Programs?

²⁶ *Id.*

²⁷ Proposed Plans, Attachment A, Appendix B-1.

²⁸ Proposed Plans, Attachment A, Appendix B-2.

²⁹ See Exhibit CN-6; see also Exhibit CN-2.

³⁰ See Exhibit CN-7.

³¹ See Exhibit CN-8.

302 A: As I understand it, the Companies are permitted by law to count such savings towards their
303 statutory savings targets. I am not contesting that point. However, I am unaware of any
304 provision in law that specifies whether savings from such programs should be counted in shared
305 savings calculations.

306 **Q: Are you suggesting that the savings and benefits from these programs should be**
307 **excluded from shared savings calculations?**

308 A: Yes.

309 **Q: Why?**

310 A: Three related reasons:

- 311 1. It would be bad policy to reward utility shareholders for actions they did not
312 influence;
- 313 2. It violates the concept, committed to in the Proposed Plans and negotiated by the
314 Companies in their recent ESP IV Stipulation, of embracing “best practices” for
315 efficiency programs;³² and
- 316 3. It would provide a significant incentive for the Companies to increase focus on
317 programs that merely document savings that the Companies did not have a material
318 role in producing – and lessen focus on other programs that are actively designed to
319 provide new, cost-effective benefits to customers.

320 **Q: Can you elaborate on why it would be bad policy?**

³² See Docket No. 14-1297-EL-SSO, ESP IV Stipulation at 11; Opinion and Order at 68.

321 A: The Companies' shareholder incentive mechanism is called "shared savings." But if the
322 utility has no role in producing savings, there is no grounds for "sharing." Put another way,
323 utility shareholders should not be rewarded for actions that the Companies had no material role
324 in producing. I cannot imagine what policy grounds there would be for thinking otherwise.

325 **Q: How would the Companies' proposed shared saving structure violate the principle of**
326 **embracing "best practices" in efficiency programming?**

327 A: The Companies' Customer Action Programs, for example, are the antithesis of "best
328 practice" because they do not produce any new savings. They merely document what customers
329 have already produced on their own. No other jurisdiction with which I am familiar counts such
330 savings towards utility savings targets, let alone rewards shareholders for the utility doing no
331 more than documenting their existence. The ESID is problematic for similar reasons.

332 **Q: Why would including savings from such programs in shared savings calculations create**
333 **incentives to increase focus on such "programs" and lessen focus on other programs that**
334 **actually provide benefits to customers?**

335 A: The savings from the Companies' three Customer Action and Mercantile Customer
336 "programs" collectively have a UCT benefit-cost ratio of 25 to 1.³³ In contrast, the UCT benefit-
337 cost ratio of the other cost-effective programs in the Proposed Plans is 2.7 to 1.³⁴ In other words,
338 the Customer Action and Mercantile Customer "programs" provide about *nine times* as much net
339 benefits to "share" under the Companies' proposed "shared savings" mechanism as their other
340 programs. That is not surprising since the Companies spend very little substantive program

³³ See Exhibits CN-2 and CN-6.

³⁴ *Id.*

341 dollars to produce them. All they have to do is conduct studies to estimate what their customers
342 are doing on their own.³⁵

343 Put simply, every kWh of savings documented through the Customer Action Programs allows
344 each utility to expend less effort to capture savings from other programs. The only real, new
345 savings that produce any benefits (relative the baseline of what would have happened anyway)
346 will come from these other programs. As a result, any incentive to maximize documentation of
347 Customer Action Program savings will have adverse economic, environmental and economic
348 development impacts relative to a plan and policy that did not allow such savings to be included
349 in the determination of shareholder incentives.

350 C. Excluding Programs Failing UCT Screening from Shared Savings Calculation

351 **Q: What is your concern regarding the Companies' proposal to include only the impacts of**
352 **cost-effective programs in their calculation of shared savings?**

353 A: I have a couple of concerns. First, as noted above, it is a form of "cherry-picking." In short,
354 it means that the Companies' shareholders would receive a portion of the economic *benefits* of
355 programs that are cost-effective, but shoulder none of the *burden* of programs whose costs are
356 greater than the direct electric bill savings that they produce but which may be pursued for other
357 important policy reasons (e.g. supporting low-income customers). That is inequitable. Second,
358 it means that the Companies would have no incentive to improve or even to efficiently deliver
359 programs that are expected to fail cost-effectiveness screening.

³⁵ The data collected from such an inquiry may be interesting to gauge customer uptake and trends, but does not rise to the level of being a "program," let alone one that represents "best practice" or is worthy of rewarding through a shareholder incentive mechanism.

360 **Q: How big of an issue is this? What are the implications for the Companies' shareholder**
361 **incentive earnings?**

362 A: Excluding programs that fail UCT cost-effectiveness screening from the shared savings
363 calculation has the effect of increasing UCT net benefits by about 2.4% – or about \$15 million –
364 across all the Companies over the three-year plan period.³⁶ If the Companies reach the highest
365 incentive tier in which their shared savings percentage would be 13% – which, as discussed
366 above, is almost a foregone conclusion given their proposed shared savings structure – that
367 would translate to approximately \$2 million in shareholder incentives.

368

³⁶ See Exhibits CN-2 and CN-6.

IV. FALLING SHORT OF “BEST PRACTICE” COMMITMENT

Q: Would it be reasonable for the Commission and other parties to expect the Companies’ Proposed Plans to be consistent with industry “best practices”?

A: Yes, subject to any legal or regulatory constraints that would preclude adoption of best practices. Absent such constraints, it would be a disservice to customers for a utility to adopt “just adequate,” “mediocre,” or “poor” practices.

Q: Have the Companies suggested in the Proposed Plans that they have fully embraced “best practices”?

A: In the ESP IV Stipulation and Order, the Companies agreed to expand program offerings to include best practice ideas from utility peers in Ohio and nationally.³⁷ Consistent with this commitment, the Companies make repeated reference to the concept of “best practices” in the Proposed Plans. For example, they suggest in their discussion of the criteria and process that it used to select programs that it began with a review of options that included “best practices from utility peers in Ohio and nationally” and that program designs were evaluated and finalized based, in part, on whether they involved best practice approaches.³⁸ In their discussion of program planning, the Companies also suggest that expanding program offerings “to include best practice and other ideas identified through benchmarking and stakeholder input” was one of two

³⁷ Docket No. 14-1297-EL-SSO, ESP IV Stipulation at 11; Opinion and Order at 68.

³⁸ Proposed Plans, Attachment A at 19.

386 “cornerstones” of their Proposed Plans (the other being reactivating and continuing their prior
387 programs).³⁹

388 **Q: Despite the language noted above, in the introductory summary to this testimony, you**
389 **state that many aspects of the Companies’ Proposed Plans “do not represent ‘best practice’**
390 **in efficiency program design.” Can you give some examples?**

391 A: Yes, I can offer several:

392 • **Significant emphasis on Customer Action and Mercantile Customer “programs”.**

393 As I discussed earlier, these are programs whose savings and related economic benefits
394 the Companies will have had no material role in producing. In that sense, they are the
395 antithesis of best practice. At least in the case of the Customer Action “programs,” the
396 Companies have discretion as to whether (or how much) to include them in their
397 Proposed Plans.

398 • **Continued promotion of compact fluorescent light bulbs (“CFLs”).** CFLs are
399 becoming an outdated technology. Light Emitting Diode (“LED”) technology is quickly
400 supplanting it. LEDs generally produce higher quality light, can better meet certain
401 customer needs (e.g. dimming), last longer and even produce slightly greater savings.
402 And as shown in Figure 1 – extracted from a recent presentation by the Connecticut
403 electric utilities – the price of LEDs has dropped dramatically, to the point where they are
404 comparable to CFL prices for key product categories. It is worth noting that the
405 combination of superior performance and dropping prices led General Electric to recently

³⁹ Proposed Plans, Attachment A at 81.

announce that it was discontinuing the manufacturing of coiled CFLs for the U.S. market.⁴⁰ Ikea switched to selling only LEDs in its stores in September 2015.⁴¹ Moreover, no currently qualified ENERGY STAR CFL will meet the new federal STAR specification that goes into effect on January 2, 2017. That is also reflected in the information provided in Figure 1.

Figure 1: Comparison of Residential Lighting Products⁴²

	Halogen	CFL	LED	LED	LED
					
CURRENT STATE					
Lighting Technology	Halogen	CFL	LED	LED	LED
ENERGY STAR Certified	No	Yes	No	No	Yes
Color Temperature (Kelvins)	2900 K	2700 K	3000 K	2700 K	2700 K
Average Life (hours)	1,000	10,000	5,000	20,000	25,000
Dimmable	Yes	No	No	No	Yes
Lumen Output (Lumens)	785	900	750	800	800
Wattage (watts)	43	14	9	10	9
Watt Equivalence	60	60	60	60	60
Initial Retail Price	\$1.07/bulb (4 pack)	\$1.74/bulb (4 pack)	\$1.99/bulb (2pack)	\$1.99/bulb (4 pack)	\$4.99/bulb (4 pack)
Price After Incentive		\$0.99/bulb (4 pack)		\$0.99/bulb (4 pack)	\$1.49/bulb (4 pack)
FUTURE STATE POST 1/1/2017	≤ \$1.00	\$1.74/bulb (4 pack)	Unknown	\$1.75/bulb	Displaced by Value Line LEDs
ENERGY STAR Certified	No	No	No	Yes	Yes
Price Source					

Thus, it is not surprising that numerous utilities and/or states have already stopped promoting CFLs or are planning to do so starting in 2017.⁴³ Prior to drafting their

⁴⁰ U.S. Dept. of Energy, *What Today's Lighting Efficiency Proposal Is And What It Isn't* (February 12, 2016), available at <http://energy.gov/articles/what-today-s-lighting-efficiency-proposal-and-what-it-isn-t>

⁴¹ *Id.*

⁴² Pernia, Jesus and Stan Mertz, *Connecticut & National Lighting Market Update*, presented at Connecticut Energy Efficiency Board retreat (June 22, 2016).

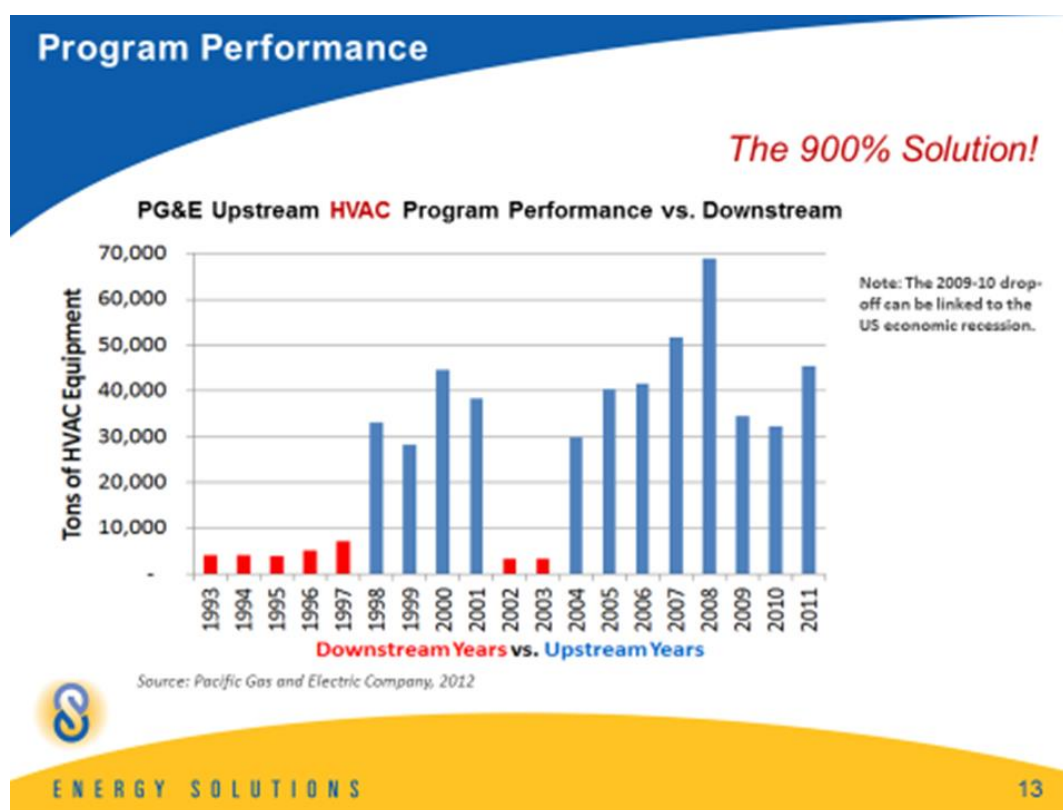
Proposed Plans, the Companies received feedback from stakeholders that it too should eliminate CFLs from its programs and shift exclusively to promoting LEDs. However, fully half of the Companies' 2017 residential light bulb participation is forecast to be CFLs; a significant fraction is even forecast for as late as 2019.⁴⁴

- **Lack of definitive commitment to midstream and/or upstream approaches to promote non-lighting efficiency measures.** One of the more promising innovations in efficiency program design in recent years is the adoption of midstream or upstream incentives. Under this approach, financial incentives are provided to retailers, vendors, distributors or even manufacturers of efficient products rather than to the end use consumers. This approach has several advantages. Most importantly, it often leads to much higher market penetration rates for efficient equipment. That can be seen in Figure 2 below, which shows that a commercial cooling equipment upstream incentive program (blue bars) run by Pacific Gas and Electric in California for over a decade achieved nine times the level of participation that its former "downstream" customer rebate program design (red bars) achieved. Interestingly, when the program design was changed back to a customer rebate after four years of the upstream model, participation plummeted again. After two years of that much lower participation rate, the upstream incentive approach was re-initiated and participation skyrocketed again.

⁴³ Examples include: Commonwealth Edison in Illinois (presentation by Roger Baker, Commonwealth Edison, to the March 28, 2016 Illinois Stakeholder Advisory Group meeting regarding its next three year plan to be filed in the Fall of 2016 and covering the period June 1, 2017 through May 31, 2020 , available at http://ilsagfiles.org/SAG_files/Meeting_Materials/2016/March_29-29_2016_Meeting/PY10-12_Program_Strawman_ComEd_March_SAG_v2.pdf); and New Jersey (Applied Energy Group, *Energy Efficiency and Renewable Energy Program Plan, Summary of Proposed Program Modifications for Fiscal Year 2017* (May 31, 2016)), available at http://www.njcleanenergy.com/files/file/public_comments/Summary%20of%20FY17%20Program%20Changes.pdf)

⁴⁴ Proposed Plans, Attachment A, Appendix C-2.

433 **Figure 2: Upstream vs. Downstream Incentive Approaches**⁴⁵



434

435 Similarly impressive results have been achieved for other products and in other states.⁴⁶

436 These types of increases in market penetration happen for several reasons. First, it is

437 generally easier to inform and work with a relatively small number of strategic market

438 actors who influence (through their own stocking and sales practices) the purchases of

439 thousands of end use customers. Second, because the cost of products is typically

440 marked up at every step in the supply chain, a financial incentive paid to a distributor will

441 cover a higher fraction of the incremental cost of a product (making it easier to persuade

442 the distributor to stock and promote it) than the same financial incentive paid to an end

⁴⁵ Hanna, James, et al., *The 900% Solution: Supercharging HVAC Efficiency Portfolios*, Presentation at the 2012 ACEEE Summer Study (informal session) (August 16, 2012).

⁴⁶ See, e.g. Parsons, Jennifer, *Energize Connecticut Upstream Residential HVAC Program*, presented at the ACEEE National Conference on Energy Efficiency as a Resource (September 22, 2015), available at http://aceee.org/sites/default/files/pdf/conferences/ee/2015/Jennifer_Parsons_Session4A_EER15_9.22.15.pdf.

use customer. Third, upstream incentives are easy to set up in ways that eliminate the need for filling out of rebate forms and/or other paperwork that “downstream” players often dislike. Upstream incentives are also typically easier and can be less expensive to administer. The Companies were encouraged by stakeholders to adopt more upstream approaches. NRDC, in particular, suggested that the Companies put in place an upstream incentive for efficiency residential circulator pumps.⁴⁷ Though the Companies did add efficient circulator pumps to the list of residential efficiency measures it will promote, it has not committed to an upstream incentive approach for this or any other measure. In fact, it is forecasting that it will have only five circulator pump participants per year per Company – 15 in total. An upstream program would likely see participation dramatically higher than that – perhaps even as much as 100 times greater.

- **Lack of clear commitment to coordination of program delivery with gas utilities.**

Many efficiency measures save both electricity and gas. For example, insulation measures can both reduce summer electric cooling loads and winter gas heating loads. In addition, a number of electric and gas measures are most effectively promoted together. As a result, there are several potential advantages to joint or at least coordinated design and delivery of electric and gas efficiency programs. First, it enables clearer messaging to consumers about efficiency opportunities and ways to address them. Second, it reduces transaction costs for customers interested in participating in programs (e.g. one utility or efficiency service provider to call instead of two, one appointment to set up instead of two, one set of paperwork to complete instead of two, etc.). Finally, it can reduce each utility’s costs to administer and deliver programs because those costs are

465 shared. Several leading jurisdictions have demonstrated that joint delivery can be quite
466 successful.⁴⁸ However, there is very little evidence in the Companies' Proposed Plans
467 indicating attention to this opportunity. Indeed, I found only one reference in the entire
468 Proposed Plans to efforts to coordinate with Natural Gas Distribution Companies
469 (NGDCs) – in a suggestion that the Companies will “pursue opportunities” to coordinate
470 providing audits (through its Energy Efficient Homes Program) with the NGDCs.⁴⁹
471 There are a variety of other residential and business program areas where coordination
472 and/or joint program delivery could be advantageous.

⁴⁸ Nowak, Seth, Marty Kushler and Patti White, *Successful Practices in Combined Gas and Electric Utility Energy Efficiency Programs*, ACEEE Report U1406 (August 2014), available at <http://aceee.org/research-report/u1406>.

⁴⁹ Proposed Plans, Attachment A at 33.

V. PROBLEMS WITH SAVINGS ASSUMPTIONS

Q: Please summarize the basis for the Companies' savings, measure life and other assumptions.

A: The Companies use a mix of sources for their assumptions.⁵⁰ Many appear to be taken directly from the Ohio TRM or the Pennsylvania TRM. Many others are purported to be adjustments to values in the Ohio or Pennsylvania TRMs. And many others originate from a variety of other sources which the Companies lump into a category called "Company Assumption."

Q: Have you reviewed all of the Companies' assumptions?

A: No. I have selectively reviewed only a few of them. I would suggest that it is unreasonable to expect a full vetting of savings assumptions to occur in the context of a proceeding like this one.

Q: Why is that?

A: Thorough reviews of TRMs typically take at least several months; often more. And such reviews can cost on the order of \$200,000 or more. That level of time and resources is often not available in cases like these. Moreover, TRM reviews generally require significant collaboration, including a lot of "back and forth" discussion between the contractor performing the review, the utility and other parties to better understand the rationale for current assumptions

⁵⁰ For the source of the Companies' measure savings assumptions, see Proposed Plans, Attachment A, Appendix C-1. *See also* Exhibit CN-9.

492 and possible alternatives. Such informal “back and forth” is not possible in a contested
493 proceeding like this one.

494 **Q: Did the limited review of assumptions that you did undertake raise any concerns?**

495 A: Yes. It raised both some bigger picture policy issues as well as some specific concerns about
496 individual assumptions.

497 **Q: What are the bigger picture policy concerns?**

498 A: I have two related concerns:

- 499 1. There does not appear to be a venue in which the reasonableness of planning assumptions
500 can be vetted. Many states now have statewide TRMs with prescribed and
501 institutionalized annual processes for updating assumptions. No such processes exist in
502 Ohio. Indeed, the current Ohio TRM is now six years old⁵¹ – i.e. woefully outdated.
- 503 2. There are no related policies in place regarding when one can deviate from the Ohio
504 TRM. The absence of such rules opens the door for the Companies and other utilities to
505 “cherry-pick” assumptions that best match their objectives rather than those that are most
506 objectively appropriate.

507 **Q: What specific concerns about individual assumptions did you identify?**

508 A: I have identified three:

- 509 1. Related to the assumed savings for recycled refrigerators;

⁵¹ *In the Matter of Protocols for the Measurement and Verification of Energy Efficiency and Peak Demand Reduction Measures*, Docket No. 09-512-GE-UNC, VEIC Draft TRM (August 2010); Commission Findings and Order at 33 (July 2013).

510 2. Related to the assumed measure life for residential CFL lamps; and

511 3. Related to the measure life for residential LED lamps.

512 Given the very limited nature of my review, it would not be surprising if there were many other
513 measures for which the assumptions being used by the Companies are problematic.

514 **Q: Please elaborate on your concern regarding the reasonableness of the Companies’**
515 **assumed savings for recycled refrigerators.**

516 A: The Companies assume that the average recycled refrigerator will provide annual savings of
517 1376 kWh.⁵² That is considerably higher than assumed and/or found in other jurisdictions.⁵³
518 Moreover, it is 35% higher than the Companies’ own most recent evaluation of their Appliance
519 Recycling program (1020 kWh).⁵⁴

520 **Q: What would be the implications of changing the Companies’ assumption to the result of**
521 **their most recent evaluation for just this one measure?**

522 A: The result would be a [REDACTED] in annual savings of about [REDACTED] of the total
523 portfolio annual savings goal. It would also mean a [REDACTED] in UCT net benefits of roughly

⁵² Proposed Plans, Attachment A, Appendix C-1 at 1.

⁵³ For example, a recent Commonwealth Edison evaluation found that its Illinois program had average gross savings of 853 kWh per refrigerator (available at http://ilsagfiles.org/SAG_files/Evaluation_Documents/ComEd/ComEd_EPY7_Evaluation_Reports/ComEd_PY7_FR_Evaluation_Report_2016-02-17_Final.pdf). In addition, the current Michigan Efficiency Measures Database (MEMD) estimates annual savings to be 1135 kWh per refrigerator (a copy of the most recent MEMD can be found at http://www.michigan.gov/mpsc/0,4639,7-159-52495_55129---,00.html). The 2016 Pennsylvania TRM suggests default savings levels that average (across the seven utilities in the state) about 1066 kWh per refrigerator.

⁵⁴ *In the Matter of the Application for the Energy Efficiency and Peak Demand Reduction Portfolio Status Report of The Toledo Edison Company and The Cleveland Electric Illuminating Company and Ohio Edison Company*, Case No. 16-0941-EL-EEC, Application, Appendix C, ADM Associates, Appliance Turn-In Program: Evaluation, Measurement and Verification Report, 2015 Participants at 21 (May 12, 2016).

524 [REDACTED] over the three-year plan period.⁵⁵ At the highest shared savings percentage tier,
525 that would represent a [REDACTED] in shareholder incentives of about [REDACTED].

526 **Q: Please elaborate on the nature of your concern regarding the Companies' CFL measure**
527 **life assumption.**

528 A: The Companies appear to be assuming that CFLs promoted through its Energy Efficient
529 Products program have a savings life of seven years.⁵⁶ While that might have been reasonable a
530 few years ago, it is no longer appropriate. Federal efficiency standards under the Energy
531 Independence and Security Act (EISA) that will go into effect in 2020 will effectively require all
532 new general service screw-based lamps to be as efficient as CFLs. Since the average baseline
533 lamp being replaced by a CFL has a life that is much shorter than that of CFLs (or LEDs), that
534 means that savings from new standard CFLs installed this year (or next year, or the year after
535 that) will all effectively end in 2020. Put another way, rather than seven years as the Companies
536 are currently using, the appropriate measure life for a standard CFL installed in the 2017, 2018
537 and 2019 portfolio years should be assumed to be three years, two years and one year,
538 respectively.

⁵⁵ This estimate was developed by comparing: (A) the net present value of the benefits for the measure under the Companies' assumptions about avoided costs (*see* Exhibit CN-10), per unit savings and measure life (based on Proposed Plans, Attachment A, Appendix C-1) and participation rates (based on Proposed Plans, Attachment A, Appendix C-2); to (B) the net present value with only the per unit savings changed as suggested in my testimony (*see* Exhibit CN-12). Note that this estimate, like other estimates of measure specific net benefits provided later in this testimony, is approximate because it was developed using a simplifying assumption that savings occur evenly across all twelve months of the year. In reality, the savings profile of refrigerators, lighting and some other end uses have some seasonal variation which can affect the value of savings because avoided energy costs also vary seasonally. However, sensitivity analyses suggest that this simplifying assumption would not have a major impact for the measures I analyzed.

⁵⁶ Proposed Plans, Attachment A, Appendix C-1 at 2 of 8.

539 This is precisely the approach recommended by the national “Uniform Methods Project,” a
540 national effort designed to bring best practice consistency to energy savings estimation and
541 evaluation:

542 *Bulbs expected to be in use in 2020 and beyond will be affected by the EISA backstop*
543 *provision mentioned in Section 1. The life cycle savings of CFLs, therefore, should either*
544 *terminate for any remaining years in the expected life beginning in mid-2020, or be*
545 *substantially reduced after 2020 to account for the backstop provision. Similarly, the life*
546 *cycle savings for LEDs should incorporate this upcoming baseline change.*⁵⁷

547 It is also the approach that the current Illinois TRM takes with respect to standard CFLs:

548 *A provision in the EISA regulations requires that by January 1, 2020, all lamps meet*
549 *efficiency criteria of at least 45 lumens per watt, in essence making the baseline*
550 *equivalent to a current day CFL. Therefore the measure life (number of years that*
551 *savings should be claimed) should be reduced once the assumed lifetime of the bulb*
552 *exceeds 2020.*⁵⁸

553 With respect to CFLs installed in interior locations, the Illinois TRM goes on to say that:

554 *The expected measure life (number of years that savings should be claimed) for bulbs*
555 *installed June 2012 – May 2015 is assumed to be 5.2 years. For bulbs installed June*
556 *2015 – May 2016, this would be reduced to 5 years and then for every subsequent year*
557 *should be reduced by one year.*⁵⁹

558 **Q: What would be the implications of changing the Companies’ measure life assumption**
559 **for standard CFLs from seven years to three, two or one year (depending on the year of**
560 **installation during the plan period)?**

⁵⁷ Dimetrosky, Scott, Katie Parkinson and Noah Lieb, *Methods for Determining Energy Efficiency Savings for Specific Measures, Chapter 21: Residential Lighting Evaluation Protocol*, The Uniform Methods Project, published by the National Renewable Energy Laboratory (February 2015), available at <http://energy.gov/sites/prod/files/2015/02/f19/UMPCChapter21-residential-lighting-evaluation-protocol.pdf>.

⁵⁸ Illinois Statewide Technical Reference Manual for Energy Efficiency, *Residential Measures, Final*, Version 5.0, Volume 3 at 205 (February 11th, 2016, effective June 1st, 2016), available at http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Final/IL-TRM_Effective_060116_v5.0_Vol_3_Res_021116_Final.pdf.

⁵⁹ *Id.*

561 A: Changing the measure life assumption would not change the annual savings level. However,
562 it would have an important effect on UCT net benefits calculations used for estimates of shared
563 savings. If all CFLs promoted by the Companies through the Residential Energy Efficient
564 Products program were standard CFLs, the impact of this measure life change would be about a
565 [REDACTED] in net benefits across all the Companies over the three-year plan.⁶⁰ That
566 would translate to about a [REDACTED] in shared savings for the Companies' shareholders
567 under the [REDACTED] shared savings tier.

568 There are two clarifications that should be made about these estimates. First, they assume that
569 all CFLs promoted by the Companies are standard, rather than specialty, CFLs. This is
570 important because specialty products – e.g. dimmables, three-ways, candelabra-based products,
571 etc. – are not covered by the 2020 EISA standards. Thus, assuming longer measure lives for
572 those products is appropriate. Put another way, my estimates of reductions in UCT net benefits
573 and shareholder incentives resulting from a lowering of CFL measure lives would need to be
574 lowered by the percent of CFL savings the Companies are expected to get from specialty CFLs.
575 The Companies have not forecast the proportion that would be specialty products.⁶¹

576 Second, I have only computed the impact for CFLs moved through the Companies' Residential
577 Energy Efficient Products program. Similar adjustments would need to be made to standard
578 CFLs forecast to move through all other residential and business efficiency programs, including
579 the Customer Action Programs (in the event my recommendation to exclude savings from such

⁶⁰ This estimate was developed by comparing: (A) the net present value of the benefits for the measure under the Companies' assumptions about avoided costs (*see* Exhibit CN-10), per unit savings and measure life (based on Proposed Plans, Attachment A, Appendix C-1) and participation rates (based on Proposed Plans, Attachment A, Appendix C-2); to (B) the net present value with only the per unit measure life changed as suggested in my testimony (*see* Exhibit CN-12).

⁶¹ *See* Exhibit CN-11.

programs was not implemented). I would expect that to be a non-trivial additional downward adjustment to total portfolio UCT net benefits and shareholder incentives.

Q: Please elaborate on the nature of your concern regarding the Companies' LED lamp measure life assumption.

A: It is essentially the same concern as I just described for CFLs. There is just one small complication for LEDs. LEDs are slightly more efficient than CFLs. Thus, while the 2020 baseline change to a level equal to CFLs effectively means that no CFL savings should be assumed to continue after that date, the effect on LEDs is to eliminate only the large majority of savings after 2020. Put another way, the Companies should not be able to claim 37 kWh of annual savings for 15 years for LED lamps as the Proposed Plans propose.⁶² Rather, for LED lamps installed in 2017, 2018 and 2019, they should be able to claim the 37 kWh for three years, two years and one year, respectively, and then claim about 6 kWh (i.e. about 16% of the initial 37 kWh) for the remainder of the LED life which takes place post-2020.⁶³

The Illinois TRM explains this "mid-life baseline adjustment" as follows:

During the lifetime of a standard Omnidirectional LED, the baseline incandescent/halogen bulb would need to be replaced multiple times. Since the baseline bulb changes over time (except for <300 and >2600+ lumen lamps) the annual savings claim must be reduced within the life of the measure to account for this baseline shift.

For example, for 60W equivalent bulbs installed in 2014, the full savings...should be claimed for the first six years, but a reduced annual savings (...[initial first year energy

⁶² Proposed Plans, Attachment A, Appendix C-1 at 2 of 8.

⁶³ Note that I am not necessarily endorsing the 37 annual kWh assumption put forward by the Companies. I have not reviewed the reasonableness of that assumption. I use it here as a default to illustrate the impact of just changing the assumed life of full LED savings.

savings] ...multiplied by the adjustment factor in the table below) claimed for the remainder of the measure life.⁶⁴

Minimum Lumens	Maximum Lumens	LED Wattage (WattsEE)	Delta Watts 2014-2019 (WattsEE)	Delta Watts Post 2020 (WattsEE)	Mid Life adjustment (made from June 2020) to first year savings
1490	2600	37.2	34.8	8.3	23.8%
1050	1489	23.1	29.9	5.1	17.1%
750	1049	16.4	26.6	3.6	13.5%
310	749	9.6	19.4	2.1	10.8%

As you can see from the Illinois table, the portion of initial LED savings that no longer applies after 2020 varies by lamp light output level. The average remaining savings across the four categories shown is 16%, representing an 84% reduction from pre-2020 annual savings levels.

Q: What would be the implications of changing the Companies' assumptions about the life of their annual savings estimates for standard LEDs – i.e. reducing savings levels by about 84% post-2020?

A: This would not change the annual savings levels for the 2017, 2018 and 2019 program years. However, it would have a substantial effect on UCT net benefits calculations used for estimates of shared savings. If all LEDs promoted by the Companies through the Residential Energy Efficient Products program were standard LEDs, the impact of this measure life change would be about a [REDACTED] in net benefits across all the Companies over the three-year plan.

⁶⁴ Illinois Statewide Technical Reference Manual for Energy Efficiency, *Residential Measures, Final*, Version 5.0, Volume 3 at 261.

615 That would translate to about a [REDACTED] in shared savings for the Companies'
616 shareholders under the [REDACTED] shared savings tier.⁶⁵

617 As with the CFL example discussed above, there are two clarifications that should be made about
618 these estimates. First, my estimates of reductions in UCT net benefits and shareholder incentives
619 resulting from a reduction in the life LED savings would need to be lowered by the percent of
620 LED savings the Companies are expecting to get from specialty LEDs. Second, I have only
621 computed the impact for LEDs moved through the Companies' Residential Energy Efficient
622 Products program; similar adjustments would need to be made to standard LEDs forecast to
623 move through all other residential and business efficiency programs, including the Customer
624 Action Programs (in the event my recommendation to exclude savings from such programs was
625 not implemented).

⁶⁵ This estimate was developed by comparing: (A) the net present value of the benefits for the measure under the Companies' assumptions about avoided costs (*see* Exhibit CN-10), per unit savings and measure life (based on Proposed Plans, Attachment A, Appendix C-1) and participation rates (based on Proposed Plans, Attachment A, Appendix C-2); to (B) the net present value with only the per unit measure life changed as suggested in my testimony (*see* Exhibit CN-12).

VI. RECOMMENDATIONS

Q: Please summarize the recommendations you have for improving the Companies’

Proposed Plans to address the concerns you have raised.

A: I offer the following recommendations to the Commission:

1. Changes to the Companies’ Proposed Shared Savings Mechanism

a. Make the annual savings level at which the Companies trigger earning of any shared savings equal to each Company’s share of the 800,000 MWh goal (adjusted for opt-outs) that was established in the ESP IV Stipulation and to which they committed in their Proposed Plans.

The shared savings “tiers,” compliance percentages and incentive percentages would all be pegged to that goal, such that the maximum 13% shared savings for Tier 5 would be earned once a Company had achieved at least 115% of its portion of a 920,000 MWh (adjusted for opt outs) savings level.

b. Exclude from any shared savings calculations the savings (and costs) associated with all Customer Action Programs, the Mercantile Customer Program, the ESID program and any other programs whose savings the Companies will have had no material role in producing.

c. Require that the impacts of all non-cost effective programs be included in the shared savings calculation.

2. Changes to Portfolio and Program Designs to Reflect Best Practices

a. Eliminate all standard CFLs from all efficiency programs; they should be replaced with standard LEDs.

b. Require that, starting in 2017, the Companies jointly use midstream or upstream incentive approaches to promoting at least two different non-lighting efficiency measures. Efficient circulator pumps would be one good option; there are many others (particularly HVAC and water heating measures). If such “tests” of the concept prove effective, then the Companies should be required to apply this best practice approach to other measures during the 2017 to 2019 plan period.

c. Require that the Companies commit, wherever feasible, to joint delivery with gas utilities of all aspects of at least their Energy Efficient Homes and Low Income Energy Efficiency programs.

3. Changes to Savings Assumptions

a. Require that the utilities adjust their refrigerator recycling annual savings assumption to 1020 kWh.

b. In the event that the Commission does not fully adopt the recommendation in VI.2.a to eliminate all standard CFLs from the Companies’ Proposed Plans, make clear that the Companies will not be able to claim any benefits beyond 2020 for standard CFLs, to account for the impacts of 2020 federal lighting efficiency standards, in their computation of shared savings.

c. Make clear the Companies will need to reduce their estimated savings for standard LEDs to 6 kWh per year post-2020 (for all such products installed during the 2017 to 2019 plan period), to account for the impacts of 2020 federal lighting efficiency standards, in their computation of shared savings.

667 d. Commit to a docketed process to solicit stakeholder comment and update the Ohio TRM by
668 mid-2017.

669 e. Commit to adopting a process for subsequent annual updates to the Ohio TRM by mid-2017.

670 f. Commit to adopting clear guidelines regarding when the Ohio TRM must be used and when
671 or under what conditions deviation from its assumptions is permissible.

672 **Q: Does this conclude your testimony?**

673 A: Yes.

CERTIFICATE OF SERVICE

I certify that a copy of the foregoing Direct Testimony of Chris Neme (Redacted Version), filed on behalf of the Natural Resources Defense Council has been served via electronic mail upon the following counsel of record, this 13th day of September, 2016:

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Summary: Testimony of Chris Neme (Redacted Public Version) electronically filed by Mr. Robert Dove on behalf of The Natural Resources Defense Council