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May 25, 2016

VIA ELECTRONIC FILING

Mr. Joel H. Peck, Clerk
c/o Document Control Center
State Corporation Commission
Tyler Building – First Floor
1300 East Main Street
Richmond, Virginia 23219

RE: ***Ex Parte: In the matter of receiving input for evaluating the establishment of protocols, a methodology, and a formula to measure the impact of energy efficiency measures***

Case No. PUE-2016-00022

Dear Mr. Peck:

Enclosed for filing in the above-captioned proceeding are the Comments of the Southern Environmental Law Center, Appalachian Voices and the Chesapeake Climate Action Network ("Environmental Respondents"). This filing is being completed electronically, pursuant to the Commission's electronic document filing system.

If you should have any questions regarding this filing, please call me at (434) 977-4090.

Sincerely,

Cale Jaffe

cc: Parties on Service List
Commission Staff

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

COMMONWEALTH OF VIRGINIA, *ex rel.* STATE CORPORATION COMMISSION	)	
Ex Parte: In the matter of receiving input for evaluating the establishment of protocols, a methodology, and a formula to measure the impact of energy efficiency measures	)	Case No. PUE-2016-00022

COMMENTS OF SOUTHERN ENVIRONMENTAL LAW CENTER, APPALACHIAN VOICES, AND CHESAPEAKE CLIMATE ACTION NETWORK

Pursuant to the Commission's Scheduling Order of March 30, 2016, the Southern Environmental Law Center ("SELC"), Appalachian Voices, and the Chesapeake Climate Action Network, by counsel, (hereinafter "Environmental Respondents") file these comments in the above-captioned proceeding. Environmental Respondents consulted with Optimal Energy, Inc. ("Optimal") in the preparation of these comments. Optimal is a full-range energy efficiency consulting firm that has provided services to investor-owned and municipally-owned utilities, program administrators, state and federal energy offices, regulatory commissions, and advocacy groups. Environmental Respondents and Optimal Energy have worked together to present expert testimony to the Virginia State Corporation Commission ("SCC" or the "Commission") in more than a dozen dockets in recent years, with an emphasis on improving efficiency programs in the Commonwealth to address the needs of all stakeholders in a cost-effective and balanced fashion. Building on that experience and mindful of lessons learned from prior DSM dockets, Environmental Respondents offer the following comments to help the Commission establish and implement evaluation, measurement, and verification ("EM&V") protocols in Virginia.

I. INTRODUCTION

EM&V protocols are vital for ensuring that demand-side management ("DSM") programs are cost-effective and provide value. A well-designed EM&V process will guide cost recovery and planning, protect ratepayers from fraud, inefficient, or ineffective programs, and identify opportunities to improve programs and maximize their benefit to customers. EM&V protocols can also create an objective evaluation process, allowing regulators to determine savings from DSM programs and calculate costs and benefits. While specific EM&V protocols may vary between states, uniformity and consistency within a given jurisdiction is essential.

The comments below identify ways in which clearer EM&V protocols and expectations can address many of the concerns that the Commission has articulated in recent dockets concerning utility-sponsored DSM programs. These comments also address: (1) the objectives and scope of uniform EM&V protocols to determine the savings from energy efficiency measures and the costs of these savings; (2) appropriate levels of independence, stakeholder input, oversight, and management of EM&V planning and implementation; and (3) consistency in cost/benefit tests and calculations and how these may be improved by better EM&V protocols. Taken together, these comments chart a path towards maximizing the overall ratepayer value of EM&V efforts.

II. REVIEW OF RECENT VIRGINIA DSM CASES

Establishing a clear procedure for EM&V protocols is necessary to provide consistency in terms of predicting and measuring savings and cost-effectiveness. Through Final Orders issued in recent DSM dockets, the Commission has identified concerns with proposed efficiency

programs and the anticipated benefits to ratepayers. As shown below, clearly established EM&V protocols would remedy many of these concerns.

For example, in the docket for Dominion Virginia Power's 2011 energy efficiency portfolio, PUE-2011-00093, the Commission questioned the reasonableness of the Company's assumptions related to the "actual usage conditions for CFL bulbs, baseline technology assumptions, and overall cost effectiveness for the Residential Lighting Program."[1] Without confidence in the cost-effectiveness results, the Commission could not find the proposed programs in the public interest. Accordingly, the Commission rejected "the continuation and expansion of the Residential Lighting Program."[2] In a subsequent DSM docket two years later, PUE-2013-00072, baseline assumptions underlying the use of Standard T12 (115 W) fluorescent lighting fixtures led the Commission to find that the Company could have overestimated the proposed DSM program's projected energy savings.[3] Here the Commission addressed this concern by reducing the proposed programs' five-year cost cap "by an amount equal to 50 percent of the Company's planned O&M expenses for the Non-Residential Lighting Systems & Controls Program."[4]

In both of these cases, clear baselines (derived either from EM&V protocols or Technical Reference Manuals) would have alleviated the identified failings and would have allowed for expansion of the programs. This, in turn, would have produced greater savings for customers. Going forward, the Commission's EM&V protocols could specify these requirements and the

[1] Order, Application of Va. Elec. & Power Co. For Approval to Implement New Demand-Side Management Programs and for Approval of Two Updated Rate Adjustment Clauses, PUE-2011-00093, at 11 (Apr. 30, 2012).

[2] *Id.*

[3] Final Order, Petition of Virginia Elec. & Power Co. For Approval to Implement New Demand-Side Management Programs and for Approval of Two Updated Rate Adjustment Clauses, PUE-2013-00072, at 9-10 (Apr. 29, 2014).

[4] *Id.* at 11.

timing of EM&V plans—at the time when a DSM docket is first pending before the Commission— to guarantee that EM&V planning is adequate and will support program goals.

Moreover, protocols should establish that in future cases, utilities must incorporate EM&V results when planning new, expanded, or continued programs. For example, in PUE-2015-00089, the Commission found that Dominion failed to reference EM&V results from prior dockets when using the average coincident and non-coincident peak savings per participant for continuation of the AC Cycling Program.[5] Instead, the Company reused savings estimates from when it originally modelled the program. Establishing protocols that identify appropriate use of EM&V results and sources will provide the Commission and ratepayers with additional, supplementary evidence to support a utility's planning assumptions.

The above examples document discrete instances where uniform EM&V protocols would have ensured that utilities performed all assumptions and analyses in a consistent, transparent, and credible manner. Looking ahead, an adequately independent EM&V process will produce more reliable DSM portfolios in Virginia. That reliability, in turn, will allow utility-sponsored DSM programs to expand, which in turn can delay the need for more capital-intensive generation projects, provide a hedge against volatile fuel prices, and deliver bill savings to all customers.

III. SCOPE OF EM&V UNIFORM PROTOCOLS

A consistent and transparent approach to establishing EM&V protocols should include an independent EM&V process, the accuracy of the results, and the consistent reliability of results from docket to docket. Accordingly, this section of our comments focuses on the broad subject areas that a future docket to establish EM&V guidelines or regulations should consider:

[5] Final Order, Petition of Virginia Elec. & Power Co. For Approval to Implement New Demand-Side Management Programs, for Approval to Continue a Demand-Side Management Program, and for Approval of Two Updated Rate Adjustment Clauses, at 9-10 (Apr. 19, 2016).

1. Establishing an organizational framework that ensures appropriate evaluator independence and stakeholder input, and supports efficient decision-making and engagement in EM&V planning, implementation, review, approval, and reporting;

2. Defining and ensuring appropriate levels of accuracy, consistency, and transparency in all EM&V activities;

3. Maximizing the ratepayer value of EM&V efforts and resources; and

4. Establishing procedures for important regulatory issues such as savings claims verification, cost recovery, and cost-effectiveness analysis.

A. Establishing a Framework to Ensure Appropriate Independence and Stakeholder Input

Any EM&V protocols must address structural organization and decision-making issues to clarify the roles and responsibilities of all appropriate parties. Proper EM&V requires an appropriate level of independence from the utilities proposing to implement the programs, so that all stakeholders have a role in EM&V planning. Giving all stakeholders "skin in the game" in the EM&V process helps guarantee credible final results. Equally important, an independent EM&V process increases the likelihood that all stakeholders will support the findings, both positive and negative.

There is significant, nationwide precedent for independent EM&V evaluations. In fact, approximately 80% of states use independent consultants and contractors to conduct energy-efficiency evaluations.[6] Further, a number of models throughout the U.S. address levels of independence and third party oversight. For example, in many states, while the program administrators directly contract with independent evaluation firms and pay for EM&V with

[6] *See* State and Local Energy Efficiency Action Network (2016). SEE Action Guide for States: Energy Efficiency as a Least-Cost Strategy to Reduce Greenhouse Gases and Air Pollution and Meet Energy Needs in the Power Sector. Prepared by: Lisa Schwartz, Greg Leventis, Steven R. Schiller, and Emily Martin Fadrhonc of Lawrence Berkeley National Laboratory, with assistance by John Shenot, Ken Colburn and Chris James of the Regulatory Assistance Project and Johanna Zetterberg and Molly Roy of U.S. Department of Energy. *Available at:* http://www4.eere.energy.gov/seeaction/system/files/documents/pathways-guide-states-final0415.pdf.

ratepayer funds, there are third party processes to oversee and/or audit the EM&V work. This ensures appropriate levels of independence and participation in the EM&V planning process to allow for consensus among stakeholders.

In some cases, stakeholder bodies or other third parties directly contract for and retain all oversight and management of evaluators. For example, in some states the staff of the public utility commission or another regulatory body directly is responsible for EM&V.[7] In other states, the program administrators contract and provide day-to-day management of EM&V, but the public utility commission's staff hires an independent EM&V auditor to both participate in all EM&V planning and performance and render final decisions and approval of all work products.[8] Other jurisdictions rely on a collaborative body of stakeholders to directly plan, oversee, and manage EM&V efforts, while program administrators act as the fiscal agent to contract and pay for the EM&V.[9] This collaborative model, of course, has a significant advantage over other approaches in that it brings all stakeholders to the table and increases the likelihood that final EM&V results will be broadly accepted as legitimate.

Regardless of which model Virginia adopts, issues that should be addressed in establishing EM&V protocols include, but are not limited to:

1. Roles and responsibilities of all key players, including program administrators, evaluators, regulators, Commission Staff, and non-program administrator stakeholders;

2. Definition and organization of any formal body (or bodies) to solicit and hire an independent EM&V contractor, guide and develop EM&V plans, oversee and manage all EM&V activities, and appropriate roles and procedures to resolve disputes or make final decisions around draft and final EM&V products; and

[7] Pennsylvania, Vermont and the District of Columbia Sustainable Energy Utility use this model. Much of California's EM&V is managed by the California Energy Commission.

[8] Examples of this model include Maryland, Missouri, Ontario, and to some extent, Arkansas.

[9] Examples of this model include Connecticut, Massachusetts and Rhode Island, where various energy advisory councils directly select and oversee all EM&V efforts. These councils effectively represent formal stakeholder collaboratives and include numerous non-utility parties.

3. Guidelines around transparency and distribution of all key draft and final work products and reports, and appropriate opportunities for comment and revisions.

Regardless of the final model, Virginia must address these structural issues in an EM&V framework in an efficient, clear way that produces an appropriate level of quality assurance, independence, and oversight. Ultimately, an EM&V framework should yield widespread trust and support of EM&V efforts.

B. *Ensuring Accuracy, Consistency, and Transparency*

EM&V protocols must create a framework to ensure appropriate levels of accuracy, consistency, and transparency. To achieve these results, state regulatory guidelines must establish appropriate methodologies, standards of statistical precision, and reporting requirements. That said, protocols must be flexible and should not mandate explicit methods for specific types of evaluations. Rather, protocols should offer general policy and procedural guidance that encourages the use of best practices while allowing for flexibility to maximize the benefits of EM&V efforts, considering the necessary trade-offs between precision and level of resources and effort. Protocols should also take advantage of regional, national, and international resources, such as the Northeast Energy Efficiency Partnerships ("NEEP") EM&V Forum and the International Protocols for Measurement, Verification and Performance ("IPMVP"). These well-established standards will allow Virginia to move forward quickly on EM&V without reinventing the proverbial wheel.

To ensure accuracy in EM&V reports, Virginia's regulatory guidance on EM&V should address the following factors:

1. Definitions of key terms and guidelines about how those terms are used, *e.g.*, distinctions between evaluation, measurement, and verification functions;

2. Establishment of procedures and policies to guide selection of baselines from which to estimate efficiency savings;

3. Definition of cost-effectiveness procedures and major inputs, such as which tests to use and what costs and benefits to include in analyses;

4. Establishment of statistically precise targets, where reasonable, balancing available resources and the levels of impact and uncertainty;

5. Guidance around use of joint evaluations and services across territories or markets, and the leveraging and use of appropriate secondary data from outside Virginia, when appropriate;

6. Application and use of load shapes, definitions of peak coincidence periods, and other issues related to the level of granularity desired in EM&V activities, across sectors, programs, market segments, and measures;

7. Guidance around key methodologies to create a common understanding of the types of methods and studies appropriate for different programs or markets (*e.g.*, when to rely on things like billing analysis vs. engineering estimates, use of consistent weather zones and normalization, etc.); and

8. Reporting procedures and timing, including distribution and/or filing of all draft and final work products that ensures appropriate transparency of methods and findings.

Importantly, Virginia's regulatory guidelines must also establish minimum standards that will support participation in the PJM capacity market (Reliability Pricing Model, or RPM). PJM specifically allows demand response and energy-efficiency resources in the RPM auction. Virginia's EM&V protocols should help Virginia ratepayers maximize any available market revenue streams.

C. Maximizing Ratepayer Value

A nearly infinite amount of data can be collected to assess the impacts of DSM programs. Requiring more detailed, granular evaluations and increasing the frequency of studies are always possible. But the additional data collected comes at a cost. EM&V protocols must balance the

inherent trade-offs between the benefits of ever-more-precise EM&V results and the cost (often to ratepayers) to develop those results. The focus, as always, should be maximizing overall ratepayer value while protecting the ratepayer's investment in efficiency. Flexibility is necessary to accommodate unique circumstances and to allow stakeholder input on EM&V planning and investment decisions.

In addition to understanding a program's savings impacts and cost-effectiveness, another important aspect of EM&V is "process evaluation," which attempts to assess the overall effectiveness of program designs and implementation procedures. A related but somewhat distinct aspect of process evaluation is market research and assessment. This research most often focuses on customers and should improve understanding of barriers to DSM participation by customers. Overcoming these barriers, of course, will help all stakeholders identify opportunities for DSM program improvements. The EM&V protocols must include regulatory guidance on the need and manner of incorporating process and market evaluations. Again, the focus here is on using EM&V to protect ratepayers' investments in the DSM programs.

Key issues that should be addressed include, but are not limited to:

1. Guidelines around overall EM&V budgets (typically expressed as a percentage of program spending);

2. Guidance regarding allocation of EM&V funding across functional areas (impact/process/market) as well as by sector and program;

3. Guidance around timing of EM&V studies that addresses trade-offs between available resources and the desire for impact precision and appropriate investment in process and market assessment. For example, should impact evaluations be conducted every year for every program, once per program plan cycle, only for the largest and/or most uncertain impact areas?

4. Guidance to capture economies of scale in EM&V. For example, guidelines should address issues of statewide versus utility-specific evaluations, opportunities to look at

programs and markets across territories that may result in cost savings or improved accuracy, appropriate use and leveraging of secondary data that may be available from neighboring states or regions, etc.

5. Procedures that ensure consistency and compliance with PJM capacity market requirements, the Clean Power Plan, or other markets and regulations outside Virginia that will directly or indirectly benefit ratepayers.

In sum, a vitally important function of EM&V is to create an objective and structured feedback loop to program planners, designers, and implementers that will result in ongoing improvements to DSM programs. That is, EM&V creates an iterative process, where each generation of DSM programs leads to greater long-term benefits and ever-increasing efficiency gains.

D. Establish Procedures to Guide Savings Claims Verification and Cost Recovery

In addition to establishing an appropriate structure and EM&V planning and decision-making process, and ensuring that ratepayers get the maximum value and benefit from EM&V resources, the protocols should directly address key regulatory issues around policies for applying EM&V results. The issues on how to *apply* the EM&V results include: 1) how to claim and verify savings; 2) how to calculate cost-effectiveness; and 3) how to consider cost recovery factors such as savings goals and net loss revenue calculations.

Issues that should be addressed in this portion of the protocols include, but are not limited to:

1. Reliance on net-versus-gross savings impacts and the policy, planning and regulatory use of EM&V net and gross findings;

2. Policies on prospective deeming of savings impacts, assumptions, or algorithms versus the retroactive application of EM&V findings[10];

[10] Whether or when it is appropriate to use EM&V findings retroactively may vary depending on the specific use of the findings.

3. Development and use of a Technical Reference Manual ("TRM") to estimate, track, and verify annual energy savings from energy efficiency measures, and procedures for updates and modifications to the TRM to incorporate new EM&V findings. If a TRM is developed and maintained for purposes of defining how annual energy savings are estimated, policy issues around its application and modifications must be established; and

4. Clear definitions of all key variables or terms to guide impact evaluation and cost-effectiveness analysis. For example, the protocols should identify energy savings and costing periods, define peak or critical peak demand periods and how these should be applied, use of measure lives, etc.

These final aspects of EM&V are essential for developing a common framework on how to use EM&V results. Establishing this framework in advance will help avoid potential future disagreements about what the results mean, which will also reduce end-of-program litigation over net loss revenue calculations. An agreed-upon framework will also ensure that adequate data is collected from the outset to support all necessary regulatory findings and decisions in a timely and cost-efficient manner.

IV. ESTABLISH A FORMULA TO CALCULATE LEVELIZED COST OF SAVED ENERGY ("LCSE") FOR ENERGY EFFICIENCY MEASURES

House Bill 1053 and Senate Bill 305 require the Commission to evaluate the establishment of uniform EM&V protocols that, among other things, provide "a formula to calculate the levelized cost of saved energy" for efficiency measures. Further, the Commission's Scheduling Order in this docket requests specific input concerning "appropriate formulae for developing the cost of saved energy resulting from energy efficiency programs and appropriate inputs for such formulae." While the comments above focus on the appropriateness and benefits of development of EM&V protocols, we also provide some more specific comments in response to this request from Commission.

We caution the Commission that over-reliance on Levelized Cost of Saved Energy ("LCSE") as a primary metric for efficiency programs is problematic for a number of reasons.

While LCSE can provide some useful information, it is an incomplete representation of the value of efficiency investments and, accordingly, is subject to misuse. We recommend that the primary cost-effectiveness test should be the Total Resource Cost ("TRC") test, which more comprehensively considers the entire costs and benefits to all Virginia ratepayers from investment in efficiency. We also recommend close consideration of the Utility Cost test, which puts the precise question facing a utility before the Commission: whether it is cheaper to roll out a portfolio of DSM programs or to select an alternative option, such as accelerated construction of new company-owned generation resources or increased purchases from merchant power providers.

The primary reason that the LCSE can be misleading is that efficiency programs provide a variety of economically quantifiable benefits to the Virginia economy that are not captured in the LCSE metric. Typically, LCSE calculations simply compare the entire costs of efficiency programs against only a single benefit—kWh savings—while ignoring all other benefits. As a result, a program that may be very cost-effective in aggregate can still have a high LCSE, above current electricity market prices and/or retail rates. An efficiency program with an LCSE greater than the cost of electricity might nevertheless be a cost-effective investment, as explained below.

Consider a program that addresses residential cooling and building shell improvements. This program will provide some electric energy (kWh) savings and benefits. However, because cooling is highly coincident with system peak loads, it will also provide substantial peak demand (kW) capacity benefits to ratepayers. In addition, if the home is heated by gas, then the shell improvements (and perhaps controls as well such as a smart thermostat) will also provide substantial gas avoided-cost benefits. A traditional LCSE analysis does not reflect these peak capacity and natural-gas savings.

A possible solution to this problem would be to calculate a "net LCSE" that compares the net investment costs after subtracting other non-kWh benefits. This approach provides a net LCSE that can be directly compared against kWh supply costs to provide an understanding of whether the program or measure is cost-effective. In the event that a measure offers large electric capacity or gas benefits—or potentially other quantified benefits—these savings should be captured in any comparison between cost per kWh and LCSE. At a minimum, we recommend that any LCSE metrics be reported along with TRC test or Utility Cost test cost/benefit ratios.

The table below provides an illustrative example of net and gross LCSE calculations for a typical home energy services program, which would provide single-family residential customers with: 1) a home energy assessment; 2) rebates for installing recommended measures for lighting, appliances, and heating/cooling equipment; and 3) rebates for shell measures such as air sealing and insulation. For the purposes of preparing this table, a fifteen-year measure life was assumed.

Table 1. Example Gross vs. Net Levelized Cost of Saved Energy Calculation

		Inputs for Gross LCSE	Inputs for Net LCSE
	Total Program Costs	$87,000,000	$87,000,000
Savings	**Energy (kWh)**	44,400,000	44,400,000
	Capacity (kW)	7,800	7,800
	Gas (MMBTU)	140,800	140,800
Benefits	**Total Program Benefits**	$109,000,000	$109,000,000
	Energy Benefits	$36,800,000	$36,800,000
	Capacity Benefits	$20,000,000	-$20,000,000
	Gas Benefits	$52,200,000	-$52,200,000
	Net Program Costs	$87,000,000	$14,800,000
	TRC Benefit-Cost Ratio	1.25	1.25
	LCSE	$0.19	$0.03

As can be seen in Table 1, this DSM program overall is cost-effective based on a TRC test benefit-cost ratio of 1.25. Nonetheless, under a traditional LCSE metric ("Gross LCSE") it has a levelized cost of saved energy of 19 cents/kWh. This is substantially higher than current market supply costs, and would lead many readers to think this program is a poor investment despite it passing the TRC test. The second column, however, shows the "net LCSE" calculation, which takes into account the additional benefits that accrue from this program. Specifically, it credits the electric capacity benefits and the gas benefits against the program cost, to show the net cost of only the kWh savings. Under this approach, the cost of 3 cents/kWh is more directly comparable to traditional electric supply costs, and readers are less likely to misinterpret the program as being too costly. By acknowledging the real-world, tangible benefits that accrue from this DSM program, the net LCSE analysis recognizes that the true cost would be less than one-sixth of the gross LCSE value.

V. CONCLUSION

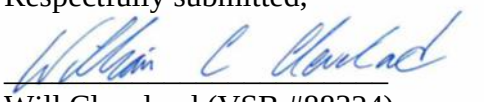
We thank the Commission for the opportunity to provide these comments. As explained above, the most important factor is to establish an objective and independent process to oversee and guide EM&V planning and implementation. Utilities sponsoring DSM programs should not have undue control and management of EM&V planning, implementation, or final outcomes. To give the Commission and all stakeholders confidence in the final EM&V results, independence is crucial.

Moreover, developing a robust EM&V program is absolutely vital for expanding DSM resources in Virginia. As highlighted by the specific examples from DSM cases in Virginia (PUE-2011-00093, PUE-2013-00073, and PUE-2015-00089), strong EM&V protocols can address concerns that the Commission has identified and allow for the approval of more cost-effective programs. EM&V requirements can also supplant cost caps as a primary mechanism for

protecting ratepayers. After all, cost caps might limit the amount of ratepayer dollars spent on a given efficiency program, but they do not necessarily ensure that ratepayer money is well-spent. Effective EM&V requirements, on, the other hand, do ensure that the money is well-spent. EM&V helps judiciously target program dollars to where they can deliver the best results.

If done right, EM&V can deliver on the greatest promise of energy efficiency programs—the ability to meet customer needs at a far lower cost than *any* generation-side resource.

Respectfully submitted,



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ON BEHALF OF
ENVIRONMENTAL RESPONDENTS

DATED: May 25, 2016

CERTIFICATE OF SERVICE

I hereby certify that the following have been served with a true and accurate copy of the foregoing via first-class mail, postage pre-paid:

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DATED: May 25, 2016

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