Third-Party Delivered Energy Efficiency Coalition
AJW, Inc.
May 25, 2016

State Corporation Commission
Document Control Center
P.O. Box 2118
Richmond, Virginia 23218

THE THIRD-PARTY DELIVERED ENERGY EFFICIENCY COALITION'S EVALUATION, MEASUREMENT, AND VERIFICATION (EM&V) COMMENTS ON THE VIRGINIA STATE CORPORATION COMMISSION'S SCHEDULING ORDER

I. INTRODUCTION AND BENEFITS OF ENERGY EFFICIENCY

The Third-Party Delivered Energy Efficiency (TPDEE) Coalition welcomes the opportunity to submit comments in regards to the State Corporation Commission's (SCC) March 30, 2016 Scheduling Order (Case No. PUE-2016-00022):

> *The Commission will conduct an evaluation to consider the establishment of: (i) uniform protocols for measuring, verifying, validating, and reporting the impacts of energy efficiency measures; (ii) a methodology for estimating annual kilowatt savings for such energy efficiency measures; and (iii) a formula to calculate the levelized cost of saved energy for such energy efficiency measures (collectively, "Objectives").*

Energy efficiency is a proven, low-cost means of reducing carbon dioxide (CO_2). Through energy efficiency, potentially wasted electricity use can be cost-effectively redeployed to where it can address new or growing demands—thereby eliminating the need for investment in new generation. Energy efficiency also provides many public benefits in addition to reducing greenhouse gases (GHGs). Increased utilization of energy efficiency measures creates jobs across the manufacturing, construction, financial, environmental, energy, and technological supply chains. Additionally, by reducing wasteful energy expenditures, facilities as diverse as hospitals and manufacturing facilities can become more cost-effective, making them more competitive and increasing their ability to sustain and increase budget resources available to hire and retain employees.

Because of its untapped energy efficiency resource potential, Virginia is well-positioned to tap into this large and growing energy efficiency industry. Virginia currently ranks higher than other Southeastern states for energy efficiency potential due to its relatively modest existing efficiency programs, older building stock, and a conventional regulatory structure, which can undervalue efficiency programs and fail to provide full recognition of the potential of this resource.[1] The Lawrence Berkeley National Laboratory (LBNL) recently estimated that the U.S.

[1] Synapse Energy Economics, *Regulatory Policies to Support Energy Efficiency in Virginia* (October 2014). Available at http://www.synapse-energy.com/sites/default/files/Regulatory%20Policies%20to%20Support%20Energy%20Efficiency%20in%20Virginia%2014-110.pdf

average "total cost of saved energy" by customer-funded utility energy efficiency programs across all sectors is $46/MWh (or $0.046/kWh), based on an analysis of programs in 20 states from 2009-2013.[2] In comparison, the average price of electricity in Virginia is $92.70/MWh (or $0.0927/kWh).[3]

Measurement and verification (M&V) methodology varies by necessity depending on the type of energy efficiency program or project that is being verified. Residential appliance replacement incentives, whole-campus performance contract projects, and industrial process efficiency projects each have well-established, but unique M&V protocols. To provide meaningful support for energy efficiency projects, a state must allow projects to use an accepted M&V protocol that is most appropriate given the nature of the project. The comments below will outline some commonly accepted industry protocols that could be included as part of Virginia's uniform protocols for measuring, verifying, validating, and reporting the impacts of energy efficiency measures.

II. BACKGROUND ON THE THIRD-PARTY DELIVERED ENERGY EFFICIENCY COALITION

The Third-Party Delivered Energy Efficiency (TPDEE) Coalition welcomes the opportunity to submit comments in regards to the State Corporation Commission's (SCC) March 30, 2016 Scheduling Order (Case No. PUE-2016-00022).

The TPDEE Coalition is comprised of three important segments of the market-driven energy efficiency sector: energy service companies (ESCOs), industrial energy efficiency (IEE) entities, and above-code energy efficiency facilitators. The participating ESCOs and organizations include:

- AECOM
- Ameresco
- Energy Systems Group
- Honeywell
- Ingersoll Rand/Trane
- Johnson Controls, Inc.
- Schneider Electric
- Siemens
- United Technologies
- National Association of Energy Service Companies (NAESCO).

Industrial energy efficiency companies and organizations that provide or promote industrial efficiency activities include:

---

[2] Lawrence Berkeley National Laboratory, *The Total Cost of Saving Electricity through Utility Customer-Funded Energy Efficiency Programs*, p. 11 (April 2015), *available at* https://emp.lbl.gov/sites/all/files/total-cost-of-saved-energy.pdf; Advanced Energy Economy Institute, *Competitiveness or Renewable Energy and Energy Efficiency in U.S. Markets*, p. 13.

[3] Energy Information Administration

- ABB
- Danfoss
- Eaton
- General Electric
- Ingersoll Rand/Trane
- Institute for Industrial Productivity
- Lutron
- National Electrical Manufacturers Association
- Rockwell Automation
- Schneider Electric
- Siemens

This Coalition and its members have been active on energy efficiency issues in the Commonwealth of Virginia and met with state officials at the Department of Environmental Quality (DEQ), Department of Natural Resources (DNR), and Department of Commerce (Commerce) regarding the Clean Power Plan and other issues related to energy efficiency. TPDEE measures and projects complement and support the objectives of the Commonwealth by reducing electricity demand, helping Virginia achieve energy savings, reducing CO_2 emissions, and serving as a significant resource for meeting power system capacity requirements. Importantly, TPDEE projects and approaches can provide states greater flexibility in meeting regulatory compliance goals through low-cost GHG abatement measures.

III. TPDEE APPROACHES AND MEASURES

The following section provides descriptions of three different types of TPDEE projects that have benefitted the Commonwealth of Virginia:

Performance Contracting: Performance-based contracting (PC) for energy savings provides a one-stop procurement process that enables building owners to use savings from avoided energy consumption to pay for new energy-efficient equipment and services. PC is regarded as a turnkey mechanism to undertake and complete energy savings projects without reliance on upfront capital funds from the customers. PC projects are developed and installed by ESCOs, and tend to be focused on achieving significant energy reductions (typically between 15-30% and in some cases 30-60%) through comprehensive energy retrofit projects usually at multi-building facilities. Approximately 85% of ESCO revenue comes from a combination of what is commonly known as the "MUSH" market (municipalities, universities, schools, hospitals) and the federal buildings market.

Growing rapidly in the past few decades, the U.S. ESCO sector is now a mature industry that provides energy efficiency savings via market-based, third-party delivered and verified projects. The energy savings guarantee is unique to PC – federal and state laws require ESCOs to guarantee that improvements will generate sufficient energy cost savings to pay for the project over the term of the contract. The guarantee is an integral aspect of PC as the ESCO bears the

financial risk for the performance of the project. To accomplish this, rigorous measurement and verification (M&V) is regularly conducted on all installed energy conservation measures (ECMs) and retrofitted buildings in a project. Lawrence Berkeley National Laboratory (LBNL) has estimated that an additional 17 billion square feet is immediately available in "ESCO-addressable" buildings, which represents the near-term untapped market potential for PC.

Industrial Energy Efficiency: The industrial sector, which includes manufacturing, mining, construction, and agriculture, accounts for roughly one-third of all end-use energy demand in the United States and remains the largest energy user in the U.S. economy. Studies have estimated that there is the potential to cost-effectively save 18-20% of industrial energy use. Reductions in industrial energy consumption of this magnitude, whether delivered through ratepayer or private-sector initiatives, create an enormous opportunity to contribute to state energy efficiency efforts. Importantly, savings associated with private-sector delivered IEE can provide benefits under any approach adopted by states, significantly reduce emissions of GHGs, and provide states with low-cost compliance options that can contribute in a meaningful way to federal regulatory compliance.

To help meet their energy efficiency policy goals, states are increasingly looking to tap the large cost-effective resource potential in U.S. industry. IEE, delivered through the use of an energy management system and participating in the Department of Energy's Superior Energy Performance (SEP) program is one possible method to measure and verify private-sector delivered IEE savings. Organizations that implement and certify their facilities under this program will meet the target-setting, reporting, monitoring, and verification requirements for an approvable compliance pathway. Ensuring that the nation's industrial sector (and manufacturing base in particular) remains competitive by encouraging the elimination of wasteful energy spending is a key public policy goal that can bolster local economies, create jobs, and make states attractive destinations for industry.

Above-code Certification: Above-code certification is a proven strategy to achieve energy efficiency in buildings. Above-code certification provides third-party verification that a building or portfolio of buildings has achieved savings in electricity over the baseline applicable building code. Examples of above-code certification include ENERGY STAR, developed by EPA and Leadership in Energy and Environmental Design (LEED), overseen by the U.S. Green Building Council.

Above-code building certification systems can be used in new construction and existing buildings. They generally include minimum requirements along with a suite of credits and projects earn more points for deeper efficiency gains. These systems together with ongoing performance monitoring are effective tools for achieving whole building energy efficiency. They provide integrated improvements across building systems: building envelopes, lighting, hot water, heating ventilation and air conditioning (HVAC), including strategies and equipment efficiencies. LEED certification establishes minimum energy efficiency requirements based on ENERGY STAR or improved design efficiency beyond the American Society of Heating,

Refrigerating, and Air-Conditioning Engineers (ASHRAE) standard baselines. Each project receiving above-code certification goes through well-established and rigorous processes and documentation. Above-code building certification is an attractive compliance measure because it increases the electricity efficiency of buildings, which represent 70% of retail electricity use in the United States.

Appropriate evaluation, measurement, and verification (EM&V) is critical in achieving greater market activity in all TPDEE projects and helping the Commonwealth reduce the carbon intensity of the power sector more quickly and cost-effectively.

IV. The Coalition Urges the SCC to Recommend Current Practices and Industry-Standard Protocols as part of its Uniform Protocols

As a general matter, we support and promote the following EM&V principles: EM&V should (1) ensure that savings from energy efficiency are quantifiable and verifiable; (2) balance the accuracy and reliability of results with the associated costs of EM&V; (3) avoid excessive interference with existing practices that are already robust, transparent and effective; and (4) recognize that EM&V is routinely evolving to reflect changes in markets, technologies and data availability. We encourage the SCC to list all of the major protocols used by TPDEE projects, including IPMVP, Federal Energy Management Program (FEMP) M&V Guidelines, and the Department of Energy (DOE) Superior Energy Performance Measurement and Verification Protocol for Industry.

TPDEE approaches encompass a variety of voluntary projects that are performed at different types of buildings and which use robust industry-standard protocols to measure and verify the energy savings. Below, PC is described in greater detail to illustrate the rigorous nature of the work and the verification. Similar procedures are followed on a number of TPDEE projects, including industrial energy efficiency projects and above-code certification projects.

PC is named for the contractual performance guarantee made by the ESCO that the project, once installed, will deliver the expected energy savings. The guaranteed energy savings delivered via this contractual arrangement necessitates a high degree of proof of savings. To accomplish this, rigorous M&V using industry-standard protocols (e.g. International Performance Measurement and Verification Protocol (IPMVP)) is conducted on all installed ECMs and retrofitted buildings in a project. ESCOs and their customers rely upon the use of well-established, industry-standard protocols implemented by experienced professionals.

Prior to the installation of any ECMs under a PC, the ESCO performs an investment grade audit (IGA), which includes extensive evaluations of how and when energy and water are used at the project site. The IGA provides measure-specific and time of day information needed for the detailed engineering and cost estimates upon which the ESCO bases the savings guarantee. Once the project ECMs are installed, their performance is measured and compared with the savings estimated by the IGA. Annual reconciliation reports, often reviewed and approved by

third-party consultants on behalf of the customer, are used to compare actual and guaranteed savings. Savings shortfalls, if any, are usually remedied by having the ESCO repair a piece of malfunctioning equipment or having the ESCO supply additional retrofits. Once the guarantee period of the contract is complete, ongoing persistence of savings may be ensured by on-site inspections to determine that equipment remains in place, and is properly maintained and operated. The results of PC M&V are highly standardized and therefore highly replicable and can be easily and efficiently audited.

The typical rigor of M&V performed under a PC is entirely consistent with the level of rigor that the SCC would require. M&V procedures provide performance data for each ECM, building, and project—data which can then be aggregated by states and can provide standardized, replicable, and auditable information regarding avoided electricity consumption. The high degree of accuracy provided by PC M&V protocols can provide states with certainty regarding the CO_2 reductions associated with PC projects.

Industrial energy efficiency projects also use existing condition baselines. As an example, a manufacturing facility that implement a strategic energy management program under the International Organization for Standardization (ISO) 50001 may participate in the Department of Energy's Superior Energy Performance (SEP) program. The SEP program uses independently verified data to establish a baseline of energy consumption. Then, the facility (1) tracks progress of energy performance improvement (including electricity); (2) accounts for variables such as weather and production using regression analysis; and (3) calculates cumulative and annual improvements on many different metrics.

We encourage the SCC to distinguish between energy efficiency programs and projects, which require diverse implementation of M&V in the marketplace. In fact, EM&V is a term that has typically been associated with ratepayer efficiency *programs*, while efficiency *projects* conduct M&V. We believe that recognition of the industry-standard protocols is a very important part of EM&V guidance. Virtually all ESCO projects are done under IPMVP or the FEMP M&V guidelines. Many of these projects are implemented to satisfy Congressionally-mandated energy use reduction goals, with project savings monitored by FEMP and national labs.

EM&V must balance "the need for rigor and accuracy with the effort and cost associated with quantification and verification."[4] We believe that the EM&V guidance should list all of the major protocols used by TPDEE projects, including IPMVP, Federal Energy Management Program (FEMP) M&V Guidelines, and the Department of Energy (DOE) Superior Energy Performance Measurement and Verification Protocol for Industry.

V. The Coalition Requests that the SCC Embrace Flexibility among Various Energy Efficiency Approaches

[4] EM&V guidance. Page 7.

Third-Party Delivered Energy Efficiency Coalition
AJW, Inc.
May 25, 2016

We strongly urge the SCC to consider multiple baselines that may be used by all efficiency programs and projects. For example, while a common practice baseline (CPB) may be an appropriate baseline for a ratepayer-funded energy efficiency program that relies on rebates and incentives on specific pieces of equipment within the context of a particular state or local building code, and pays incentives to the program administrator based on the actual accomplishments of its programs, it is not appropriate for all efficiency activities. Using the local CPB as the basis for calculating the emissions reductions for efficiency means that a state is mandating a political, rather than a scientific, methodology for calculating energy savings and emissions reductions. TPDEE projects focus on whole building approaches that reduce energy savings from its current operating baseline. For example, a TPDEE project that occurs at a campus of buildings may include hundreds or thousands of individual energy ECMs. TPDEE projects currently use internationally recognized M&V protocols. Thus, the current operating baseline implemented by ESCOs in accordance with industry-standard protocols should be an acceptable regulatory baseline in the SCC's recommendations.