



State Commission Staff Surge Call: Energy Efficiency Evaluation, Measurement, and Verification

August 27, 2018

NARUC convened a state staff "surge" call in August 2018 to explore staff questions around energy efficiency (EE) evaluation, measurement, and verification (EM&V) processes. The discussion focused on setting baselines, who performs EM&V analyses, and who identifies and approves EE measures. EM&V documents EE baselines, efficiency actions/measures, and energy savings. State commissions have an important role overseeing customer-funded EE programs at regulated utilities, with commission staff looking closely at EM&V and other program data to make determinations about program effectiveness. Steve Schiller from the Lawrence Berkeley National Lab served as a guest moderator for a conversation with staff from Georgia, Illinois, Maryland, Michigan, and Washington about how EM&V works at different commissions. Steve began the call by defining a few key terms. Some additional definitions are provided from the U.S. Environmental Protection Agency's 2008 [report](#) on EE cost-effectiveness and the 2017 [National Standard Practice Manual](#).

- Baseline: an estimate of what energy consumption would have been in the absence of an efficiency action.
- Technical reference manual (TRM): a document state program administrators use to set baselines and establish and document estimated energy savings from specific measures and other calculations for planning efficiency programs and conducting evaluations.
- Evaluation, measurement, and verification: The process of determining and documenting the results, benefits, and lessons learned from an energy efficiency program. The term "evaluation" refers to any real time and/or retrospective assessment of the performance and implementation of a program. "Measurement and verification" is a subset of evaluation that includes activities undertaken in the calculation of energy and demand savings from individual sites or projects.
- Total resource cost test (TRC): a cost-effectiveness test that measures the net direct economic impact to the utility service territory, state, or region.
- Utility cost test (UCT): a cost-effectiveness test that measures whether the benefits of an EE resource will exceed its costs from the perspective of only the utility system. The UCT includes all costs and benefits that affect the operation of the utility system and the provision of electric and gas services to customers.
- Ratepayer impact measure (RIM): a cost-effectiveness test that measures the impact on utility operating margin and whether rates would have to increase to maintain the current levels of margin if a customer installed energy efficient measures.
- Participant cost test (PCT): a cost-effectiveness test that measures the economic impact to the participating customer of adopting an energy efficiency measure.
- Societal cost test (SCT): a cost-effectiveness test that measures the net economic benefit to the utility service territory, state, or region, as measured by the TRC test, with additional indirect added benefits such as environmental benefits.

Georgia

The Georgia Public Service Commission sets and approves EE budgets, with Georgia Power responsible for management. Georgia's EM&V process runs on a three-year cycle, with the most recent assessments filed in August 2018. The 2018 results inform current programs already planned for 2019 and factor into



N A R U C

National Association of Regulatory Utility Commissioners

future EE programs filed in Georgia Power's 2019 integrated resource plan (IRP) for implementation between 2020 and 2022. Georgia Power can file a request for new EE measures with the commission within the three-year cycle, with the utility's TRM used as the main screening mechanism for filing. The TRM's current baselines are based on a combination of the 2009 energy conservation code, current Georgia building code, Georgia-specific building profiles and weather data, and International Standards Organization (ISO) standards for lighting.

Georgia Power calculates a per-measure and portfolio TRC, but the commission does not require each individual measure to pass the TRC test. The state sets aside \$2 million for low-income programs, divided evenly between single-family and multi-family homes. Reports also include calculations of the PCT, RIM, and SCT, but only the TRC is used for program evaluation. EM&V reports are reviewed by commission staff, consultants, and Georgia's demand-side management working group.

Illinois

The Illinois Commerce Commission has three responsibilities in overseeing EE programs: (1) determining whether utilities have met savings goals, (2) reviewing the prudence and reasonableness of EE expenditures, and (3) updating Illinois's statewide manual for technical EE potential. To produce EM&V reports, each regulated utility holds a contract with an independent evaluator. Contracts include independence provisions that enable the commission to terminate the contract if it determines the evaluator is not acting independently. Similar contracts are in place between utilities and the state's TRM administrator. Commission staff are also included on correspondence between the evaluator and the utility to assure independence.

In making baseline determinations, utilities and EE implementers use their best judgment. The TRM, based on codes or standards, sets specifies baselines for individual prescriptive measures and program types. For certain measures like residential LED lighting, the TRM allows for a grace period based on the delay in clearing retail inventory and the operating life of halogen lamps. For early replacement measures, a dual baseline approach may be used.

Illinois utilities have cumulative annual savings goals. An efficiency stakeholder advisory group (SAG) discusses whether savings can be claimed using below-code baselines for prescriptive measures. Statute defines Illinois's TRC test: it is basically an SCT, requiring the use of a societal discount rate, quantifiable societal benefits, and reasonable estimates of financial costs likely to be imposed by future regulations.

In assessing success, the commission considers the cost-effectiveness of a program and whether it overcomes efficiency barriers or reaches targeted customer segments. The overall portfolio must be cost-effective, but individual measures and low-income programs do not. State law mandates minimum spending requirements for utilities to direct to low-income programs based on low-income load. Cost-effectiveness results are reported annually and the decisions to cut or add measures are left up to utilities. Measures are typically cut for being expensive to promote relative to potential savings.

Maryland

In Maryland, 2018 is the first year of the next three-year planning cycle. Every three years, the Public Service Commission prepares a strategic guidance plan for the next program cycle. The commission reviews programs on a semi-annual basis each April and October. Regulated utilities must meet a goal of 2 percent reduction of electricity per year compared to a 2016 baseline. Goals are measured at the gross



N A R U C

National Association of Regulatory Utility Commissioners

wholesale level based on first-year savings. EE costs are recovered annually through a surcharge on customer bills. The state convenes an EM&V work group comprised of commission staff, utilities, contractors, energy office staff, and the consumer advocate.

EM&V is conducted by a statewide evaluator under contract with the regulated utilities. The commission also has an independent contractor who verifies the statewide evaluator's results. Evaluations are completed each year with a cost-effectiveness analysis based on net savings from residential and commercial programs. Portfolios must be cost-effective.

The annually updated mid-Atlantic TRM serves as the guiding document for incremental costs and savings, hours of use, and load shapes. The statewide evaluator is permitted to deviate from the TRM if they provide an exemption memo to the commission. Often, the deviation is then addressed by changes in the next annual TRM update. A measure can qualify for an incentive if it is shown to be more efficient than the federal baseline. Statute requires the commission to consider the TRC and SCT as primary tests, but all major California Standard Practice Manual tests are conducted.

Michigan

Michigan's Public Service Commission regulates fifteen electric and six gas utilities with energy waste reduction (EWR) plans. In lieu of a TRM, the state maintains a database of deemed values updated annually with national codes and standards. The EWR Collaborative stakeholder group reviews the database for corrections and updates and can propose new measures. Michigan has adopted residential and commercial 2015 IECC energy codes and national appliance standards as a baseline. At the last EWR Collaborative meeting, the group discussed adopting ISO standards, with a tentative plan to adopt them by 2020. The state incorporates new appliance standards as an updated baseline on a case-by-case basis, allowing up to one year lag time. Michigan has a calibration process for EM&V measures, with the EWR Collaborative selecting a small handful of measures every year for further examination and specific EM&V.

In general, utilities hire third parties to conduct evaluations. The commission does not have an evaluation budget, but staff get insight from state-contracted EE administrators in charge of running certain utility programs. State law requires a UCT test, with utilities also reporting TRC. Like other states, the portfolio must be cost-effective, but low-income programs do not need to be. The commission assumes low-income programs will account for 10 percent of EE budgets based on census data. Utilities provide program-level cost-effectiveness tests and calculate the avoided supply cost of energy demand, capacity, transmission, and distribution. Staff typically takes a hands-off approach to utility management of EE programs, but may encourage utilities to pursue certain goals in the two-year planning process.

Washington

The Washington Utilities and Transportation Commission regulates three utilities. The Northwest Power and Conservation Council produces overarching guidance for the region. EM&V is done on a two-year cycle, with utilities developing TRMs and setting goals in integrated resource plans based on Council guidance. The Council defines baselines, using either energy code or standard practice, whichever is higher. An advisory group comprised of utility staff, commission staff, large industrial customers, and the consumer advocate can recommend changes to TRMs.



N A R U C
National Association of Regulatory Utility Commissioners

The commission asks utilities to do adaptive management by considering new technologies and incorporating them sooner than the next two-year cycle. Advisory groups weigh in on these decisions. Utilities report UCT and TRC tests, with the commission using TRC in evaluation. The Commission measures cost-effectiveness at the portfolio level using data from a utility-hired third party, overseen by commission and utility staff. Commission staff can make adjustments to EM&V reports to improve decision-making in the current cycle and inform changes in the next cycle.

This call was made possible by the U.S. Department of Energy under cooperative agreement DE-OE0000818. Please address questions to Kiera Zitelman, NARUC Senior Program Officer, at kzitelman@naruc.org.