



STATE TECHNICAL FORUM ON EE/RE
Call #3 Summary – December 16, 2004
Measurement and Verification: Implications for Quantifying
Emissions Impact

Participants: 38 state officials participated in the call (see the attached participant list)

Key Issues Discussed:

- Pros and cons of using independent contractors for 3rd party M&V of efficiency projects
- Differences in M&V requirements in states with capped emissions and states that include EE/RE in the State Implementation Plan (SIP)
- Approach for selecting the base case in estimating savings
- Role and approach for discounting to reflect reliability and normalizing savings to account for weather
- Approaches for quantify avoided emissions from EE/RE – emission factors Vs. modeling
- Ownership of the allowances/credits awarded EE/RE projects

Summary of Presentations & Discussion:

I. EE/RE Measurement and Verification: General Considerations (See PowerPoint presentation & EPA Draft M&V Guidance, Steve Keach, PQA)

Definition of Terms:

- ***M&V:*** developing a defensible estimate of energy efficiency savings
- ***Quantification:*** Estimating the emissions avoided due to EE/RE projects

II. Third Party Verification for EE Programs – NY’s Approach to M&V (See PowerPoint presentation, Larry Pakenas, Karl Michael, Rachel Winter, Brian Henderson, NY State Energy Research & Development Authority)

A. ***M&V*** is designed to substantiate energy savings from the NY Energy Smart program, which is a portfolio of 30-35 energy efficiency programs in various sectors that combines resource acquisition (direct purchase of energy efficiency such as air conditioning efficiency improvements) and market transformation (programs to increase the demand and supply of efficiency such as education of architects and builders so they can become EE advocates.) Programs are funded by a system benefits charge on electricity ratepayers, and NYSERDA is the SBC program administrator. Third party verification was developed in 2001 to verify the programs’ estimated savings. Data is also used in cost-effectiveness analysis and as information for evaluation and redesign of programs where necessary.

B. ***Quantification of Emissions Impact*** is derived by multiplying the energy savings by emission factors (e.g. NO_x emissions avoided are estimated as 1.5 lbs/kwh). Emissions avoided are not monetized for inclusion in cost-effectiveness of programs. Regulations are under development which would allow the projects to receive ozone season NO_x

allowances for certified reductions through the state's NOx Budget set-aside. Energy Smart Programs would be eligible, and the state has indicated its intent to retire allowances for Energy Smart projects rather than trade them. NYSERDA is also expanding quantification to other non-energy benefits such as water savings, improved comfort, etc. NY is implementing a year-round NOx reduction requirement, therefore the program may eventually be extended to year-round savings and avoided emissions.

C. Challenges:

- Cost and staffing is a major challenge because there are endless opportunities to expand M&V.

D. Benefits:

- Third-party verification has substantiated program savings estimation methods – shown that estimates are very close to actual savings.
- Avoids reliance on self-reporting.
- Can provide 3rd party on-site inspections.
- Have SBC advisory group that interacts directly with independent M&V contractor

E. Lessons Learned:

- Mostly start-up challenges, for instance records on programs were not in state to be used as evaluation databases, Sample sizes required could not be completed in a year as hoped
- On-site visits take time and require development of clear protocols for contractor
- Need to gain staff buy-in on the value of M&V effort

III. Discussion & Questions

A. *How is M&V different for Renewable Energy projects?* In NY, generation and allowances are based on what they actually generate.

B. *If the allowance is tradeable, does it result in any actual reductions?* Since NY is within the NOx Budget for the Ozone Transport Region, EE programs that receive allowances do not generate reductions beyond the state cap for NOx unless they are retired rather than traded in the allowance market. 3% of NY's total NOx budget is set-aside for EE. The EE/RE Budget Set-Aside Program will actually begin when the guidance document is finalized.

C. *Will the M&V for NOx allowances work for the greenhouse gas program?* Regional Greenhouse Gas Initiative (RGGI) is a collaborative effort of the Northeast states to meet a GHG reduction target. The states are in the midst of the same kind of discussions of how to deal with EE/RE and avoided CO2 emissions within context of a GHG cap. NY expects that the M&V program will be transferable.

D. *Does NY use discount or degradation factors in quantification of avoided emissions from efficiency projects?* NY does not discount savings or make adjustments for weather. The verified savings estimates for the first year of the project are used as the

basis for 5 years of savings. TX does use a discount factor and applies weather-normalization to savings and emissions estimates. According to Steve Schiller, consultant, EPA guidance document (currently in draft) does not have a formulaic approach to the questions of the use of a discount, but instead uses a quality assurance approach similar to California. Below is the excerpt from the Draft EPA Guidance on the use of discounting:

4.5 *Discounting*

States may want to develop a graduated scale of discounting based on the accuracy with which various M&V methods capture energy savings and emissions reductions. The discounting rates could vary from zero for the most accurate methods (e.g. continuous sub-metering at the individual circuit level) to significant discounts for the least accurate methods (e.g. straight stipulation based on engineered estimates). This program design feature would allow participants to weigh the benefits of various measurement methods and to select the one that provides the best compromise between burden of measurement and verification stringency and size of award.

However, EPA cautions states that setting discounting rates for certain methodologies too high may discourage program participation. It is up to each state to determine how accurate the measurement and verification protocols should be, but a lack of flexibility or heavy discounts for measurement and verification processes may restrict a program's potential success. Therefore, EPA recommends that states preferring to provide a weighted measurement approach should design one in which preferential measurement and verification technologies are rewarded, rather than less preferred strategies are discounted. This may entail rewarding extra allowances to "best in class" or emerging efficiency and renewable energy actions, but not at the cost of other more standard measures.

In addition, another caution with discounting is that if a sponsor knows that their savings will be discounted; say by 20%, then they may "overestimate" savings by 20%. This potential for gaming is inherent in any discounting strategy.

The EPA in its Acid Rain Program (1995 and 1996) developed the following approach for discounting savings from demand side measures (energy efficiency programs) implemented by utilities.^[1]

Default option - By relying on default (stipulated) savings, allowable savings are restricted: credit is given for only 50% of first-year savings, and limited to one-half of the measure's physical lifetime.

Monitoring option - By monitoring over the life of the measure, one obtains allowance for a greater fraction of the savings and for a longer period of time. Biennial verification in subsequent years 1 and 3

(including inspection) is required, and savings for the remainder of physical lifetimes are the average of the last two measurements. The monitoring option requires a 75% confidence in subsequent-year savings.

Inspection option - By inspecting (confirming) that measures are both present and operating, allowance is allowed for 75% of first-year savings and is limited to one-half of the measure's physical lifetime (with biennial inspections), or 90% of first-year savings for physical lifetimes of measures that do not require active operation or maintenance (e.g., building shell insulation, pipe insulation and window improvements).

In summary, as part of the review process a state may wish to discount the savings and allowances reported by an applicant. The basis for the discount may be somewhat subjective and based on the professional judgment of the reviewer, with the backing of official state guidance. The discounting may be due to specific concerns about the quality of the analyses, the reported (or unreported) accuracy of the analyses, or concern for secondary effects that are not specifically addressed.

IV. Other State Approaches

- A. Texas (Alfred Reyes): Texas is currently relying on self-reporting for M&V and is estimating approximately 0.7 T/day of avoided NOx emissions in the Dallas/Forth Worth area during a peak ozone day. TX plans to submit efficiency savings as part of the State Implementation Plan (SIP) for Dallas and San Antonio areas. Houston is under a cap and trade program and is not eligible for receiving SIP credits from energy efficiency savings.
- B. **Wisconsin Program (Pat Meier & Lloyd Egan)**: Wisconsin is required by law to use a contractor for M&V and uses an approach very similar to NYSERDA. To quantify avoided emissions, they have modeled the regional electricity system (See WI 3rd Party M&V Report_Emissions Factors.pdf, prepared by PA Government Services.) Emission factors were developed based on seasonal peak days and narrow and broad peak periods. Have submitted part of the program (e.g. compact fluorescent light bulb program) for credit in the Dept. of Natural Resources emissions registry. Emissions benefits, however, is not currently the policy driver for the programs or the M&V, but will become increasingly important with the more stringent NOx standard and new fine particulates standards. Economic development and environmental metrics are being added on to show that there is a broader benefit.

(See also: Wisconsin's Approach to Quantifying Emission Reductions: Coordinating the Focus on Energy Program with the Wisconsin Voluntary Emission Reduction Registry presented by David Sumi and Jeff Erickson: PA Consulting Group and Barbara Smith: Division of Energy, Wisconsin Department of Administration)

V. Discussion and Questions

Who owns the credits? Is it considered a taking of property rights to set aside a portion of the generators' allowances for EE/RE? Some WI utilities see state claims to emission credits as a taking of property rights.

In MA, no one raised the issue of property rights during the hearings on the set-aside regulations. If there is a dispute over ownership of the savings and avoided emissions, the entities must settle it before applying for allowances. Credits for EE/RE are included in SIP and utilities can't claim them in TX.

Edward Szumowski(edward.szumoski@state.ma.us) provided the following excerpt from the MA proceedings to amend the states' regulations on Emissions Banking and Trading, 310 CMR 7.18 and 7.19. The state's response to the question relies in part on the EPA 1986 Emissions Trading Policy Statement (ETPS) he referred to during the call:

COMMENT: The commenter stated that according to the proposed revisions, ERCs in the Rate Bank revert to the state after 10 years, while ERCs in the Mass bank do not. The commenter feels this will put unnecessary limitations on the ability of new sources to acquire offsets under this program. Such action would also be a confiscation of a source's certified offsets and, as such, is an unwarranted interference with banked assets.

RESPONSE: The Department disagrees with the commenter. The Department finds this is not a confiscation of banked assets.

The 1986 Emission Trading Policy Statement [ETPS; December 4, 1986; Section III.C. Banking Emission Reduction Credits; 51 FR 43834 43835], which is the basis for offset transactions under 310 CMR 7.00 Appendix A, states,

"...However, the fact that an ERC has been banked does not relieve it from the need to meet all criteria of the specific regulatory program under which it is to be used. Because some trades have special limitations..., banks do not guarantee the validity or specific amount of particular banked ERCs for all the potential uses or for all time. [emphasis added] To provide maximum protection for the environment and sources and to avoid potential legal problems, state banking rules may specify the types of sources eligible to bank ERCs and any additional conditions placed on certifying, holding or using banked ERCs.

State banking rules may establish ownership rights. However, any such rights must be consistent with Clean Air Act requirements,..." [emphasis added]

Further, the Department allows for the conversion of Rate Bank ERCs to Mass Bank ERCs. Mass Bank ERCs do not expire after a set period of time.

Edgar Mercado, EPA, notes that EPA's recent draft guidance on Economic Incentive Programs for Clean Air supersedes the ETPS mentioned above. The Register notice, the draft guidance and background documentation are available at: <http://www.epa.gov/ttn/oarpg/ramain.html>.

Susan Hedman, IL Dept. of Commerce, Susan_Hedman@commerce.state.il.us provided an excerpt from the CAA regarding property rights and allowances (the relevant sentence is underlined). She notes, however, that someone suggesting that allowances and credits are somewhat different and there might be a different interpretation of property rights in connection with credits. Some people argue that credits are property rights because they are "earned."

The difference between a credit and an allowance are summed up in this section of a 1999 CRS report as follows:

Credits are emission reductions that a pollution source has achieved in excess of required amounts. Sources that have earned credits can sell them to others that need additional reductions. Allowances differ from credits in that they represent the amount of a pollutant that a source is permitted to emit during a specified time in the future.

Clean Air Act Section 403(f) - Sulfur Dioxide Allowance Program for Existing and New Units [42 U.S.C. 7651b]

"(f) NATURE OF ALLOWANCES.-An allowance allocated under this title is a limited authorization to emit sulfur dioxide in accordance with the provisions of this title. Such allowance does not constitute a property right. Nothing in this title or in any other provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization. Nothing in this section relating to allowances shall be construed as affecting the application of, or compliance with, any other provision of this Act to an affected unit or source, including the provisions related to applicable National Ambient Air Quality Standards and State implementation plans. Nothing in this section shall be construed as requiring a change of any kind in any State law regulating electric utility rates and charges or affecting any State law regarding such State regulation or as limiting State regulation (including any prudency review) under such a State law. Nothing in this section shall be construed as modifying the Federal Power Act or as affecting the authority of the Federal Energy Regulatory Commission under that Act. Nothing in this title shall be construed to interfere with or impair any program for competitive bidding for power supply in a State in which such program is established. Allowances, once allocated to a person by the Administrator, may be received, held, and temporarily or permanently transferred in accordance with this title and the regulations of the Administrator without regard to whether or not a permit is in

effect under title V or section 408 with respect to the unit for which such allowance was originally allocated and recorded. Each permit under this title and each permit issued under title V for any affected unit shall provide that the affected unit may not emit an annual tonnage of sulfur dioxide in excess of the allowances held for that unit.

A. ***Weather Normalization:*** Participants discussed the importance of normalizing the energy savings data to account for weather, particularly for efficiency programs on heating and air conditioning equipment. Some states, like Texas have developed procedures and directed states to the on-line energy and emissions calculator for EE/RE: ***Texas A&M Univ., Engineering Experiment Station model:*** A publicly available model used to calculate energy and emissions savings from EE/RE projects can be accessed at: <http://ecalc.tamu.edu>.

Other Resources: A participant mentioned that Lynn Price in the Energy Analysis Division of Lawrence Berkeley National Lab has also done modeling on quantification of energy savings. The list of available publications can be found at <http://www.lbl.gov/>.

B. ***Renewable Energy M&V*** – Can RE certificates be split into different parts and allocated to different entities? MA and WI do not allow you to split the characteristics of renewable generation between entities. A report by Center for Resource Solutions on RE certificates addresses the question of splitting RECs. (Regulator’s Handbook on Tradeable Renewable Certificates, 2003 at <http://www.resourcesolutions.org/RegulatorHandbook.htm>. Another view on the issue of ownership rights and double counting is expressed by Environmental Resources Trust, Inc. and can be found at: http://www.ert.net/ecopower/ERT_REC_Position.pdf.

C. ***How do you establish baselines?*** Baselines may vary depending on the type of efficiency project. For instance, the baseline for installation of more efficient lighting depends on the type of application and what would have been installed instead. Building efficiency baseline might be the level of efficiency required by state code.

NEXT Forum Call: Thurs., Jan. 20th, 2:00 PM EST. Renewable Energy Credits and Quantifying RE Emissions Benefits.

If you have any questions or corrections to this summary, please contact Catherine Morris, cmorris@keystone.org.