

Incorporating International Performance Measurement and Verification Protocols and Six Sigma Strategies into Energy Efficiency Program Evaluation

Robert J. Mowris, P.E., Robert Mowris & Associates, Olympic Valley, CA
Ean T. Jones, B.S., Robert Mowris & Associates, Olympic Valley, CA
Anne M. Blankenship, B.S., Robert Mowris & Associates, Olympic Valley, CA
Steve Kromer, Efficiency Valuation Organization (IPMVP), Oakland, CA

IPMVP

Given the increased emphasis by government agencies on energy efficiency programs to meet projected increases in electricity and natural gas usage over the next decade, there is a clear need for more rigorous evaluation protocols based on the International Performance Measurement and Verification Protocols (IPMVP).¹ The California Public Utilities Commission Energy Efficiency Policy Rules require IPMVP for program evaluations. The IPMVP is also required by other government agencies including the United States Department of Energy Federal Energy Management Program, the New York State Energy Research and Development Authority, the US Green Building Council Leadership in Energy and Environmental Design, and the World Bank. Lawrence Berkeley National Laboratory recommends IPMVP for evaluating energy efficiency programs consistent with the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change.

Six Sigma

Six Sigma strategies help corporations improve value by reducing defects from an industry average of 3.5 sigma (22,750 defects per million) to six sigma (3 defects per million).² Some regulated products such as air conditioners have an energy efficiency defect rate of 58% and a 2.05 sigma level due to improper installation. A sigma level of 2.3 is typical of non-competitive companies. Six Sigma strategies can be used to improve regulated products and public benefit programs. Regulated products such as air conditioners and appliances can be improved by ensuring energy efficiency performance metrics are valued and verified at critical steps in the market chain. Public benefit programs can be improved by incorporating Six Sigma strategies into program evaluation studies. Six Sigma strategies can also be used to improve codes and standards programs and laboratory testing procedures.

How to Incorporate IPMVP and Six Sigma in Program Evaluations

IPMVP and Six Sigma can be used to evaluate energy efficiency programs and to improve energy efficiency performance labels regulated by the US Federal Trade Commission and energy efficiency testing methods established by the American Refrigeration Institute, American National Standards Institute, and the American Society for Testing Materials. The IPMVP provides simplified check lists and a “tool kit” to evaluate programs. IPMVP and *Six Sigma* strategies can be incorporated into energy efficiency program evaluations to guide process evaluations, measure frequency of defects, analyze when and where defects occur, and improve and control program process so problems don't recur. This poster provides examples of how to use IPVMP and Six Sigma in program evaluations.

¹ See *International Performance Measurement & Verification Protocols*, DOE/GO-102000-1132, October 2000.

² *Six Sigma*. January 2000. M. Harry and R. Schroeder.