



The International Performance Measurement and Verification Protocol

The International Performance Measurement and Verification Protocol (IPMVP) is the widely referenced framework for ‘measuring’ energy or water savings. It is especially used in energy performance contracts where savings must be reported to a client and may form the basis of a payment to an ESCO. IPMVP presents common terminology and defines full disclosure, to support rational discussion of often contentious M&V issues. It documents the state of the art, but does not specify project design since it is a high level framework. An M&V engineer is still needed to apply IPMVP principles to the ‘measurement’ of savings for each energy efficiency project.

A primary purpose of IPMVP is to publish current good M&V practise, as reassurance for the public about savings reports. For example, it explains the need to adjust raw differences in energy use for changes in conditions between baseline and savings reporting periods. Performance contracting industry growth in the USA was facilitated by the publication of the IPMVP. Its global use has similarly helped the EPC industry worldwide.

IPMVP is currently in its fourth edition and is freely available at www.evo-world.org under the Products tab. The latest edition of IPMVP is available in French and English, with older editions in 10 languages. IPMVP has been cited in many places, as listed on EVO’s website under the Resources tab. EVO trains and certifies people with appropriate qualifications and proven knowledge of IPMVP, as described under the Services tab. EVO also provides other resources for the M&V community.

IPMVP is prepared in three Volumes:

Volume I Concepts and Options for Determining Energy and Water Savings

Volume I defines terminology and suggests good practices for documenting the effectiveness of energy or water efficiency projects that are implemented in buildings and industrial facilities. These terms and practices help managers to prepare M&V Plans, which specify how savings will be measured for each project. The successful M&V Plan enables verification by requiring transparent reports of actual project performance. The Preface of Volume 1, 2007, summarizes its contents, and is quoted below.

Volume II Indoor Environmental Quality (IEQ) Issues

Volume II reviews IEQ issues as they may be influenced by an energy efficiency project. It highlights good project design and implementation practices for maintaining acceptable indoor conditions under an energy efficiency project. It advises on means of measuring IEQ parameters to substantiate whether indoor conditions have changed from the conditions of the baseline when determining savings.

Volume III Applications

Volume III contains specific application guidance manuals for Volume I. The two current applications manuals address **new building construction** (Part I) and

renewable energy additions to existing facilities (Part II). This Volume is expected to be an area of continued development as more specific applications are defined, or country-specific sections are contributed.

IPMVP Volume 1, 2007 - Preface

The International Performance Measurement and Verification Protocol (IPMVP) Volume I is a guidance document describing common practice in measuring, computing and reporting savings achieved by energy or water efficiency projects at end user facilities. The IPMVP presents a framework and four measurement and verification (M&V) Options for transparently, reliably and consistently reporting a project's saving. M&V activities include site surveys, metering of energy or water flow(s), monitoring of independent variable(s), calculation, and reporting. When adhering to IPMVP's recommendations, these M&V activities can produce verifiable savings reports.

The IPMVP is intended to be used by professionals as a basis for preparing savings reports. Each user must establish its own specific M&V Plan that addresses the unique characteristics of the project. The IPMVP is not a standard and thus there is no formal compliance mechanism for this document. Adherence with the IPMVP requires preparation of a project specific M&V Plan that is consistent with IPMVP terminology. It must name the IPMVP Option(s) to be used, metering monitoring and analysis methods to be used, quality assurance procedures to be followed, and person(s) responsible for the M&V.

IPMVP Volume I Chapters are organized as follows:

1. Introduces IPMVP and EVO. Chapter 1.4 is a Users Guide to help different types of readers understand common ways of applying the document.
2. Defines M&V, and lists eight uses for M&V techniques.
3. Lays the foundation of M&V by defining the underlying Principles of good M&V. The balance of the document summarizes common industry methods for implementing these fundamental Principles.
4. Defines the IPMVP Framework and its four Options. It presents the basic methodologies and adjustments to energy or water measurements needed to properly report savings. Tables 1 and 3, and Figure 3 summarize the Options and offer guidance in choosing amongst them for each application.
5. Lists the topics that should be contained in an M&V Plan and gives guidance on design decisions needed to make the M&V activity cost effective for all users of the savings reports.
6. Defines a means of specifying the use of IPMVP and of claiming adherence with it.
7. Presents key information that should be included in each savings report.
8. Lists many additional issues that commonly arise in M&V design or reporting.
9. Lists definitions of all italicized words in the document.
10. Provides a list of references and some useful other resources.

Appendix A provides 12 example applications of IPMVP, in varying levels of detail. It refers to EVO's website for detailed examples of M&V Plans and Savings Reports.

Appendix B summarizes basic uncertainty quantification techniques to guide decisions about the level of rigour suitable for each M&V process.