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California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals

APRIL 2006

Prepared for the **California Public Utilities Commission**

by **The TecMarket Works Team**

Under Contract with and Directed by the CPUC's Energy Division, and with guidance from Joint Staff

California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals

{a.k.a. Evaluators' Protocols}

Prepared under direction of the **Energy Division**, with the guidance by **Joint Staff**, for the

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Introduction

This chapter presents and describes the California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals (a.k.a. Evaluators' Protocols, referred to hereafter collectively as the Protocols and individually as Protocol) that are designed to meet California's evaluation objectives.

This document is to be used to guide the efforts associated with conducting evaluations of California's energy efficiency programs and program portfolios launched after December 31, 2005. The Protocols are the primary guidance tools policy makers will use to plan and structure evaluation efforts and that staff of the California Public Utilities Commission's Energy Division (CPUC-ED) and the California Energy Commission (CEC) (collectively the Joint Staff), and the portfolio (or program) administrators (Administrators) will use to plan and oversee the completion of evaluation efforts. The Protocols are also the primary guidance documents evaluation contractors will use to design and conduct evaluations for programs implemented after December 31, 2005. This chapter provides an introduction to, and overall guidance for, the use of specific Protocols presented in later chapters of this document.

The Protocols are significantly grounded in the *California Evaluation Framework* of June 2004[1] (*Evaluation Framework)*. The Protocols reference the *Evaluation Framework* and other documents that provide examples of applicable methods. The requirements for conducting evaluation studies, however, are always those stated in the Protocols, which take precedence over other evaluation guidance documents, unless otherwise approved or required by the CPUC. That is, these Protocols are the primary evaluation guidance documents for all types of evaluations presented in these Protocols, however this is not to be construed as limiting the ability of the CPUC or the Joint Staff to evaluate items in addition to or beyond those identified in these Protocols or to use evaluation processes and procedures beyond those presented in these Protocols. While these Protocols are the key guiding documents for the program evaluation efforts, the CPUC and the Joint Staff reserve the right to utilize additional methodologies or approach if they better meet the CPUC's evaluation objectives and when it serves to provide reliable evaluation results using the most cost-efficient approaches available. In addition, the Protocols should be considered a "living" document that may need to be updated and revised from time to time as standard evaluation approaches evolve and as Joint Staff and Administrators gain experience using the Protocols. The CPUC will determine when an update is necessary and what process will be used to complete any updates that the agency deems necessary. Protocol users should always confirm that they are referring to the most recently CPUC-approved and -adopted version, which can be found on the CPUC website.

[1] TecMarket Works, *The California Evaluation Framework* (Southern California Edison Company, 2004). The report can be obtained on the CALMAC Web site at: http://www.calmac.org/search.asp. Enter "California Evaluation Framework" and download the 500-page reference document as an Adobe .pdf file.

Most of the Protocols are designed to function within an evaluation planning process that focuses on the evaluation needs within a given program cycle. This planning process is described in a other documents adopted by the ALJ and the CPUC, and most directly at part of what are known as the Process Protocols.

The Protocols cover several types of evaluation efforts. The evaluation types covered include the following: direct and indirect impact {including the associated measurement and verification approaches (M&V)}, market effects, emerging technology, codes and standards and process evaluations. In addition, the Protocols provide specific guidelines for conducting effective useful life studies and how evaluation samples should be selected. The primary goal of this document is to specify **minimum** acceptable evaluation approaches and the operational environments in which evaluations are conducted. The primary purpose of the Protocols is to establish a uniform approach for:

- Conducting robust and cost-efficient energy efficiency evaluation studies;
- Documenting ex-post evaluation-confirmed (i.e. realized) energy efficiency program and portfolio effects;
- Supporting the performance bases for judging energy efficiency program and portfolio achievements; and
- Providing data to support energy efficiency program and portfolio cost-effectiveness assessments.

The Protocols may have other uses such as providing support for improving ex-ante energy and demand savings estimates.

This document includes a separate Protocol for each of the following categories:

- Impact Evaluation - Direct and Indirect Effects
- Measurement and Verification
- Process Evaluation
- Market Effects Evaluation
- Codes and Standards Program Evaluation
- Emerging Technology Program Evaluation
- Sampling and Uncertainty Protocol (for use in determining evaluation sampling approaches) Reporting Protocol (to guide evaluation data collection and reporting)
- Effective Useful Life Protocol (used to establish the period over which energy savings can be relied upon)

The Protocols also include information on the type of evaluation-related information and support needed from program administrators and implementers in order to conduct the evaluation efforts. The purpose of each of the listed Protocols is described below.

Impact Evaluation Protocol: The Impact Evaluation Protocol prescribes the minimum allowable methods to meet a specified level of rigor that will be used to measure and document the program or program component impacts achieved as a result of implementing energy efficiency programs and program portfolios. Impact evaluations estimate net changes in

electricity usage, electricity demand, therm usage and/or behavioral impacts that are expected to produce changes in energy use and demand. Impact evaluations are limited to addressing the direct or indirect energy impacts of the program on participants, including participant spillover impacts. However, while the Protocols provide for the assessment of participant spillover, these results are not to be counted toward program or portfolio energy savings goal accomplishments, and as such are to be distinctly and separately identified in any impact reporting.[2] The impact evaluation studies are also not expected to document program influences on the operations of a market or the program's impacts on non-participants. Program-induced changes that affect non-participants or the way a market operates are addressed in the Market Effects Evaluation Protocol. Results from the impact evaluations will support a cost-effectiveness assessment at the program and portfolio level.

Measurement and Verification (M&V) Protocol: The M&V Protocol is designed to prescribe how field measurements and data collection will be conducted to support impact evaluations, updates to ex-ante measure savings estimates and process evaluations.

Process Evaluation Protocol: The Process Evaluation Protocol is designed to support Administrator (i.e. Investor Owned Utility or IOU) efforts to conduct evaluations that both document program operations and provide the basis for improving the operations or cost-effectiveness of the programs offered within the portfolio.

Market Effects Evaluation Protocol: The Market Effects Evaluation Protocol is designed to guide evaluations conducted to document the various market changes that affect the way energy is used within a market and estimate the energy and demand savings associated with those changes that are induced by sets of program or portfolio interventions in a market.

Codes and Standards Program Evaluation Protocol: The Codes and Standards Program Evaluation Protocol is designed to guide evaluation approaches for codes and standards programs.

Emerging Technology Program Evaluation Protocol: The Emerging Technology Program Evaluation Protocol is designed to guide evaluation approaches for emerging technology programs.

Effective Useful Life Protocol: The Effective Useful Life Protocol is designed to guide evaluation approaches for establishing the effective useful life of program measures, including approaches for evaluating measure retention and technical degradation of measure performance. The effective useful life of a measure is the period of time over which program-induced energy impacts can be relied upon.

[2] The Protocols prescribe minimum requirements for how to conduct and report evaluations. The Performance Basis Protocol takes precedence with regard to including savings toward program or portfolio goals and performance measurement. The most recent CPUC decision will always take precedence and be used for the interpretation and application of the Protocols.

Sampling and Uncertainty Protocol: The Sampling and Uncertainty Protocol is designed to prescribe the approach for selecting samples and conducting research design and analysis in order to identify, mitigate and minimize bias in support of the Protocols identified above.

Reporting Protocols: The Reporting Protocol prescribes the way in which evaluation reports are to be delivered and the way information is to be presented in those reports.

Evaluation Support Information Needed from Administrators: The Protocol document also includes a chapter on the types of information Administrators shall provide to contractors conducting evaluation studies covered by the Protocols.

The four primary types of Evaluation Protocols that cover the majority of California's program offerings are the Impact, M&V, Market Effects and Process Protocols. These are supported by the Sampling and Uncertainty Protocol. However, there are two types of programs that are different enough in their scope and intended results that they require a separate Evaluation Protocol (Codes and Standards and Emerging Technology). As such, two Evaluation Protocols are directed to a specific type of program (Codes and Standards and Emerging Technology), while the remaining Protocols either operate to establish a minimum set of allowable methods for a specific type of evaluation or in support thereof. Any program, program component or set of programs could be included within each of these types of evaluations. The difference lies not in which programs are eligible for which types of evaluations, but in the purpose of and outputs from each of these evaluation types.

The outputs from an impact (and its associated M&V efforts) evaluation are program or program component net energy, demand or behavioral impacts from program participation. Those from a market effects evaluation are energy and demand impacts created by market changes caused by a program or set of programs. While a process evaluation produces the documentation and assessment of program processes, and recommendations to improve them. A program could easily be included in all three types of evaluations. For example, a single program of great significance with respect to the overall portfolio might be directly assessed using impact and process evaluations and also be included in a market effects evaluation for all programs operating in a given market sector.

While it is important to know what is in these Protocols (above), it is also important to know what is not included in these Protocols. These Protocols do not cover the evaluation or research approaches for the following types of programs, efforts or activities:

- Low-income program evaluations;
- Market research for program design, planning or operations;
- Technical, market or other types of potentials studies;
- Meta-evaluations or comparative studies using evaluation study results;
- Demand response programs;
- Renewable energy programs;
- On-site or distributed generation or combined heat and power programs;
- Green house gas or pollution reduction studies;
- Cost-effectiveness methods, approaches or procedures;

- Forecasting methods, approaches or procedures; and
- Public Interest Energy Research (PIER) evaluation efforts.

While it is expected that the Protocols will need to be updated from time to time, it is also expected that new Protocols may need to be added to this document as the need for different types of information evolves. For example, California may need to establish Protocols for crediting greenhouse gas reductions resulting from the energy efficiency program portfolios or for addressing demand response programs that are currently outside the scope of the Protocols.

How The Protocols Were Developed

The Protocols were developed over two different but overlapping three-month timelines involving a number of activities, including presentations to the public and the receipt of public comments and recommendations. The Impact, M&V, Process, Market Effects, Sampling and Reporting Protocols were developed first, and followed by the development of the Codes and Standard, Emerging Technology, and Effective Useful Life Protocols. All of the Protocols were developed using the following approach:

1. The consulting team that the CPUC-ED contracted to develop the Protocols (TecMarket Team) assembled and reviewed comments from previous Protocol and performance basis workshops and comments received during the development of the *Evaluation Framework*;
2. Using the *Evaluation Framework*, previous comments and discussions with the Joint Staff, draft concept Protocol outlines were developed. These concepts were then discussed within a series of meetings with the Joint Staff leading to the development of a set of draft concept Protocols;
3. The draft concept Protocols were presented in public workshops. During the workshops, the attending public was requested to comment on the draft concept Protocols. These comments were recorded and summarized in workshop notes and used to inform Protocol development. At this time, the draft concept Protocols were also placed on the CPUC website for additional public review. An announcement was sent to the CPUC Energy Efficiency service lists advising the public of the workshops and the draft concept Protocol postings. These efforts allowed both attendees and non-attendees of the workshop to review the draft concept Protocols and provide comments;
4. Following the workshop, the TecMarket Team collected comments from both workshop attendees and non-attendees. These comments were distributed to and reviewed by the Joint Staff and the TecMarket Team and used to guide the draft Protocol development efforts;
5. The TecMarket Team developed a set of draft Protocols under the direction of CPUC-ED staff and in consultation with the Joint Staff. The draft Protocols were provided to the Joint Staff for review and comment in order to identify concerns and issues that needed to be addressed in the final draft Protocols. Upon reviewing the draft Protocols, the Joint Staff requested modifications to the Protocols;

6. The TecMarket Team modified the draft Protocols consistent with direction provided by CPUC-ED staff, in consultation with Joint Staff, and provided them to the CPUC-ED project manager for final review and editing;
7. The CPUC-ED project manager submitted the draft Protocols to the ALJ for review and acceptance;
8. The ALJ, in consultation with the CPUC-ED project manager and Joint Staff, reviewed and accepted the final Protocols.
9. The ALJ adopted these Protocols via a Ruling, per the authority delegated her by the CPUC.

In addition to the process outlined above, the first set of Protocols developed (Impact, M&V, Process, Market Effects, Sampling and Reporting) went through an additional round of public review and comment, Joint Staff review and commentary, and CPUC-ED project manager approval and editing process before they were provided in final form to the ALJ for review and acceptance.

How the Protocols Work Together

The Protocols are designed to support the need for public accountability and oversight, the need for program improvements (especially cost-effectiveness improvements) and the documentation of effects from publicly funded or rate-payer funded energy efficiency programs provided in California. The individual Protocols are designed to work together to achieve these goals.

The Impact Evaluation Protocol is meant to guide the design of evaluations that provide reliable ex-post participant-focused net program impacts. These net impacts include peak demand (kilowatts (kW) of electricity), energy (kilowatt-hours (kWh) of electricity and therms of natural gas) and behavioral impacts. The Protocol is focused such that program level impacts can be summed to estimate impacts at the Administrator portfolio level. The Protocol also allows for impact estimates at the program component delivery level (e.g., direct install, participant rebate and information distribution) or at the technology level (e.g., CFLs, motors, HVAC tune-up and refrigerators) when the specific evaluation is meant to acquire these metrics.

The Impact Evaluation Protocol does not operate in isolation from the other Protocols. The M&V Protocol supports impact evaluations and can often serve in a feedback or support role for process evaluations if coordinated to do so. Similarly, the Sampling and Uncertainty Protocol is designed to support impact evaluations, as well as M&V, and process and market effects evaluations by assuring that the sampling designs provide unbiased estimates based on the information needs associated with each evaluation effort. Finally, the Reporting Protocol is designed to support all of the evaluation activities by detailing the information that must be reported for each type of evaluation. The entire evaluation process is facilitated by the additional identification of the information Administrators need to provide the evaluation contractors.

The Protocols, and the evaluations conducted under them, support several efforts. For example, many of the evaluation results, especially the impact evaluation results and the verification aspects of the M&V Protocol, are designed to support program performance assessment,

including the performance-based metrics associated with ex-post energy savings and verification of installed measures.

The following diagram provides an overview of how the Protocols work in relationship to each other and the organizations that are responsible for using the Protocols to conduct evaluation research.

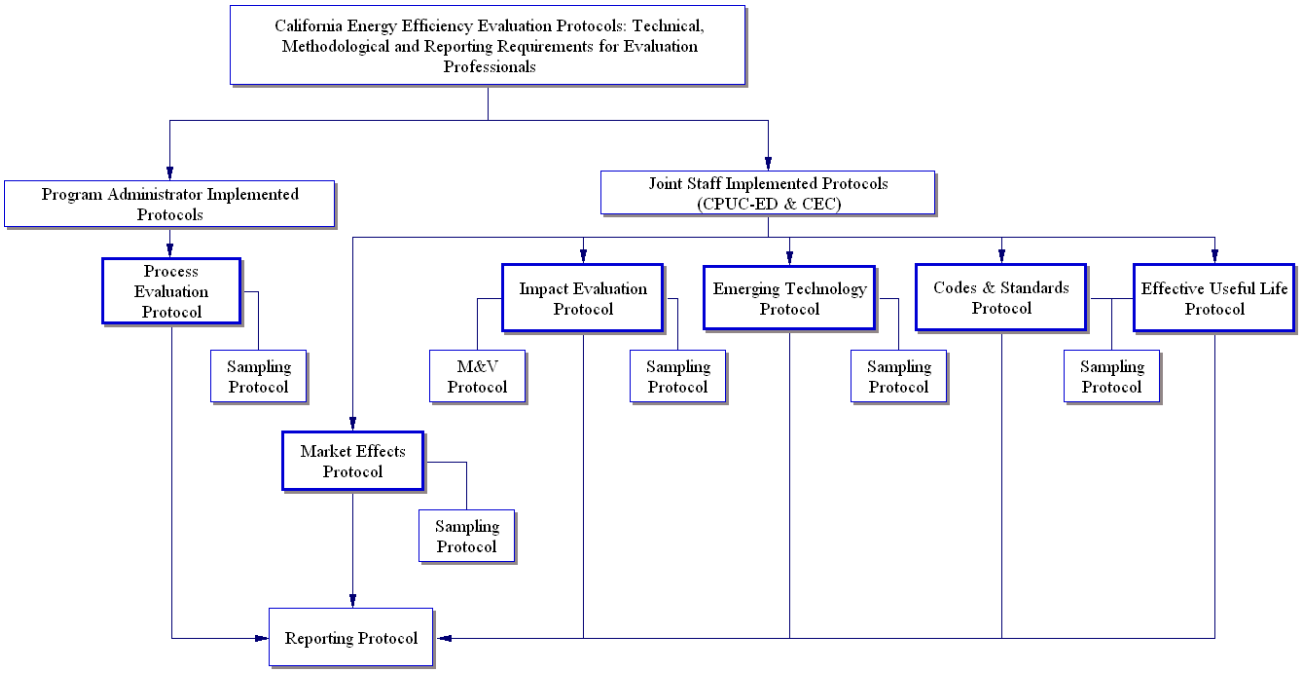

Figure 1. Operational Overview of How the Protocols Relate to Each Other

Note: The Process Evaluation Protocol is a guidance document and is less instructive than the other Protocols that are more prescriptive in design. While the Process Evaluation Protocol does contain required reporting and planning activities, it designates that the key decisions on what, when and how to evaluate are the responsibility of the Administrators.

How the Protocols Meet CPUC Goals

The primary evaluation-related goal of the CPUC is to assess net program-specific energy impacts or the market level impacts of the portfolio of energy efficiency services and to compare these results with the assigned energy savings goals. Similarly, the CPUC must be assured that when an evaluation is conducted it can rely on the findings of that research to accurately reflect the energy benefits available to the citizens of California in exchange for the resources spent. As a result, the following goals are incorporated into the operations of the Protocols:

- To identify the annual energy and peak demand impacts associated with each program offered, for which there are expected savings, over the period of time the program measures are projected to provide net participant energy impacts. This will almost always be for a longer period of time than the program funding cycle;

- To identify the annual energy and peak demand impacts associated with major program delivery mechanisms (e.g., direct install approaches, incentive and rebate approaches, and education, marketing and outreach programs) over the period of time the program measures are projected to provide net participant energy impacts;
- To estimate the annual energy and peak demand impacts associated with each Administrator's portfolio projected over the period of time the program services are expected to provide net energy impacts;
- To compare the evaluation results across programs, types of programs (program groups) and program portfolios to assess their relative performance and cost-effectiveness;
- To identify under-performing program or program components , so they may be improved or withdrawn from the portfolio of services;
- To understand the potential of programs and program services to cost-effectively increase the supply of energy resources for California citizens;
- To understand how programs or program operations can be modified to improve their performance and the overall performance of the portfolios;
- To inform future updates to ex-ante energy and peak demand savings estimates for program planning purposes;
- Provide timely information to improve program design and selection for future program cycles;
- To be able to tailor the evaluation approaches and budgets to meet the need for reliable energy impact and market effects information while minimizing evaluation costs and reducing risks of making poor efficiency supply decisions; and
- To use an objective and transparent evaluation process that assesses the impacts from all types of programs that are expected to provide efficiency resources in California.

The Energy Action Plan, the Energy Efficiency Policy Manual and other related CPUC documents have established aggressive goals for energy efficiency in California. Throughout these guidance documents, it is explicitly recognized that investments in energy savings are uncertain and, hence, carry some risk. The guidance documents emphasize the need for "reliable" savings estimates. Efforts to define "reliable" lead to quantification. To quantify and manage these risks, one must include all relevant and cost-effective sources of information on the performance of the investment and the underlying uncertainty in these data.

To the greatest extent possible, the Joint Staff will seek to allocate evaluation resources to reduce uncertainty in the estimates and evaluations of achieved gross and net savings. The criteria for allocating evaluation resources will be influenced by risk considerations associated with a program's designs and operational characteristics, the expected energy savings, the need to minimize uncertainty in the assessment process and the cost to quantify and manage these risks. The overarching theme in the management of the evaluation effort should follow the IQM risk principle: Identify, Quantify and Manage. This principle is based on the recognition that all estimated savings from energy efficiency and conservation programs (as well as estimated energy and capacity from traditional supply-side resources) include some uncertainty and,

consequently, risk. In the past, planners, evaluators and other staff have often relied on single-point savings calculations (e.g., average kWh savings) that were subsequently discounted, based on professional judgment. Risk was not quantified, therefore it could not be effectively managed. By explicitly identifying factors that induce or affect uncertainty and by taking steps towards quantifying that risk, the Joint Staff can make more informed decisions on how to effectively manage the evaluation efforts and reduce the overall risk associated with the efficiency portfolio.

Use of the Evaluation Results to Document Energy Savings and Demand Impacts

There are several Protocol-guided evaluations that provide net energy impacts that will be used to understand program, portfolio and/or statewide energy savings. These are:

- The direct program impact evaluations that document the energy savings associated with the actions taken through program participation, such as when a rebated motor is installed or when a high-efficiency cooling system is upgraded;
- The indirect program impact evaluations that document the behavioral change, and in some cases the energy savings associated with the behavioral changes made as a result of program activities, such as when training is provided to customers. For example, when a customer installs an energy-efficient technology due to exposure to a training program and without any other program assistance;
- Evaluations conducted according to the Codes and Standards Program Evaluation Protocol that provide the net energy impacts associated with a code or standard change; and
- The market effects evaluations that document the net effects of one or more programs on the operations of a market and applies energy savings estimates to these program-induced market changes.

All of these impacts will be assessed for statewide energy and demand impacts. However, for the purposes of crediting individual programs or Administrator program portfolios with energy impacts, only the first three categories of net energy impacts documented in the evaluations will be counted, and not those from market effects evaluations. The evaluations in the first three categories will derive program-specific net energy impacts and will be used to sum up to the investor-owned utility (IOU) portfolio impacts and used to derive the statewide program impacts.

The Evaluation Identification and Planning Process

The program evaluation planning process shall begin with a high-level assessment of the need to evaluate a program or program component. This assessment will consider, among other factors, the importance of the savings to the portfolio and the uncertainty regarding the ex-ante savings estimates. Based on this assessment, the Joint Staff will decide whether each program or program strategy must comply with the Protocols or whether it will be required to comply only with the CPUC's program reporting requirements.

For those programs that will receive a Protocol-guided evaluation, the next series of issues should be addressed to determine if Protocols that cover multiple types of programs or a program-specific Protocol should be used. These focus on specific types or characteristics of programs. If the program is focused on emerging technologies, then the Emerging Technology Program Evaluation Protocol must guide the evaluation. If it is a Codes and Standards Program, then the evaluation must be guided by the Codes and Standards Program Evaluation Protocol. Other types of program evaluations will be guided by the Protocols designed for a wide variety of resource and non-resource programs.

The next question to address is whether the program or program strategy is expected to obtain *direct* energy or demand savings. Producing savings *directly* means that the link between the program activity and the savings is clear, straightforward and relatively fast. These types of programs are often referred to as resource or resource acquisition programs. An example of such a program is an incentive program, such as a single-family rebate program, that offers incentives to residential customers to install efficient equipment. For each participant who receives an incentive, there is the clear expectation that there will be savings based upon the program's direct results in obtaining equipment installations. Information and education programs are examples of programs that do not provide such direct impacts. For these programs, there is a more tenuous link between the program activities and any eventual savings. That is, a training program may or may not result in any savings and the savings that are achieved are not direct. Savings obtained from providing training services depend upon that program inducing some form of behavior change (such as purchase and installation behavior or participation in a more direct efficiency program). This would be *indirect* savings. If a program is one that provides savings *indirectly*, then its evaluation must be guided by the Indirect Impact Evaluation Protocol that explicitly addresses the need to link program-induced behavioral changes to eventual energy and demand impacts. Some programs may intend to produce energy savings by providing behavior change information or education for which an impact evaluation of energy savings is not needed by the CPUC. These evaluations would follow the Indirect Impact Evaluation Protocol and quantify behaviors changed or actions taken, but not move to the step of allocating energy savings to those efforts. Joint Staff will determine which Evaluation Protocols to apply to which programs as part of their evaluation planning efforts.

If the program is defined as one that *directly* produces energy and demand impacts, it must be determined whether it will be guided by the Impact Evaluation Protocol,[3] the M&V Protocol or both. Programs assigned to the M&V Protocol only (not assigned an impact evaluation) will be those for which savings are expected to be relatively small and certain (reliable).

A program with a combination of large and/or uncertain savings must be guided by the Impact Evaluation Protocol. If such programs do not cover any measures that should be specifically evaluated in order to update the Database for Energy Efficiency Resources (DEER) an impact evaluation at the program or program-strategy level (rather than at the technology level) must be planned. However, if the program or program strategy covers measures that should be evaluated

[3] The Impact Evaluation Protocol contains the Indirect Impact Protocol and three others related to estimation of direct savings: the Gross Energy Impact, Gross Demand Impact and Participant Net Impact Protocols. The Impact Evaluation Protocol also often "calls for" the M&V Protocol that provides requirements for M&V-related activities within the impact evaluation methods.

in order to update DEER, it must determined whether there is a *sufficient* number of these measures on which to base a technology-level assessment. If so, evaluators shall develop a measure-level plan to evaluate these technologies, as well as plan an impact evaluation at the program or subprogram level.

If there is an *insufficient* number of a particular measure within a single program, a determination needs to be made whether there is a sufficient number of the measure across the program strategies being addressed within a program group to allow for an evaluation. If so, the evaluator shall develop a measure-level plan to evaluate these technologies. Note that measure-level plans should always be nested within the overall impact evaluation for the program or program strategy. Ultimately, the evaluator must account for all the energy and demand impacts for a given program or program strategy.

Figure 2 illustrates the high-level overview of the program evaluation planning process for programs, program strategies and measures.

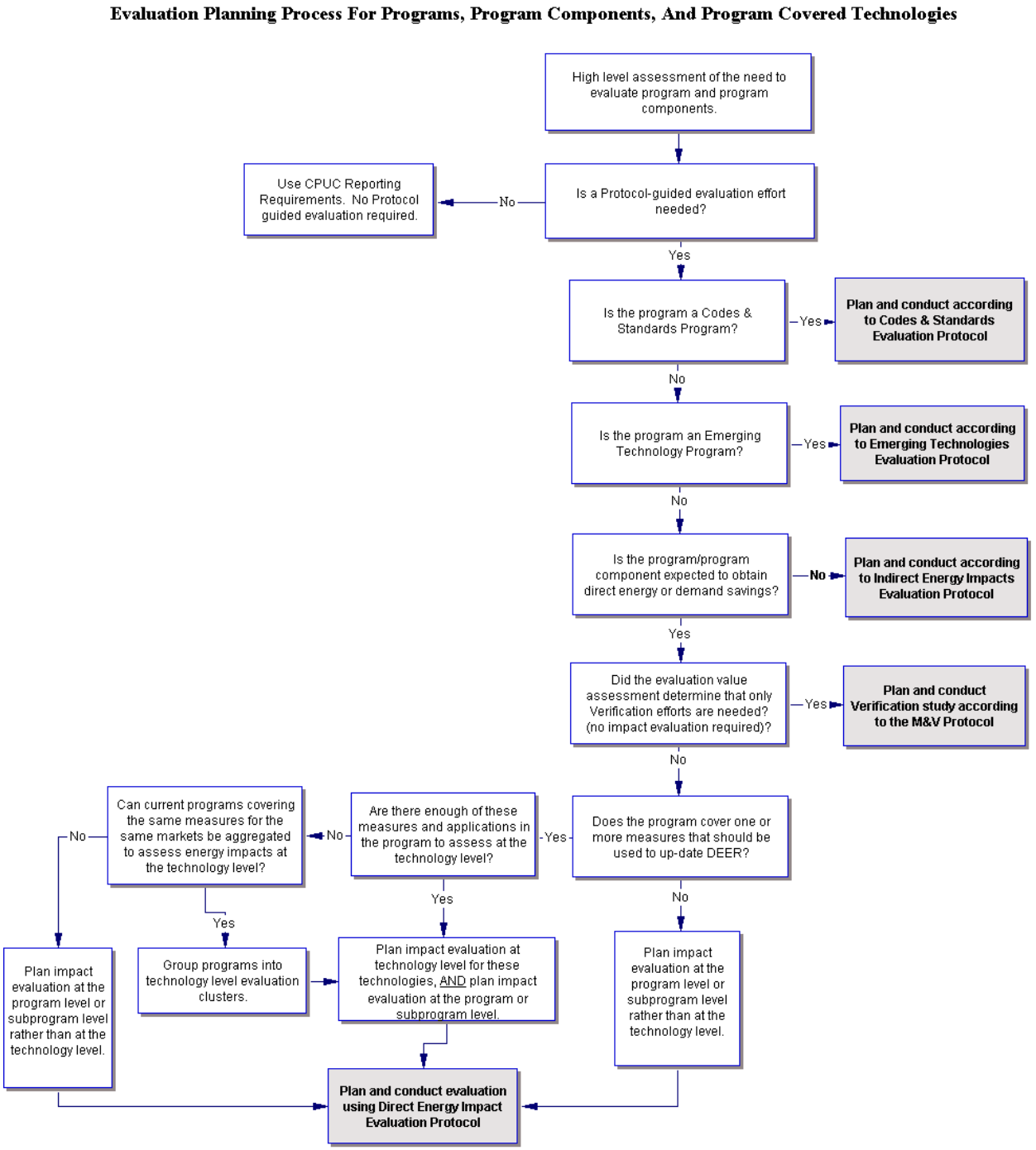

Figure 2. The Program Evaluation Planning Process for Programs, Program Components and Program-Covered Technologies

The procedure is much less structured for determining when to conduct a market effects study. Figure 3 provides a diagram of the related decision process. In this process, the Joint Staff will examine the mix of programs and strategies within the Administrator portfolios and the markets in which they are operating. Markets will be selected for Market Effects Evaluation when the

Joint Staff finds that such an evaluation would provide valuable information for directing program improvements and/or for better assessing the complete impacts from the portfolio of programs. Markets may be selected for a Market Effects Evaluation due to a preliminary assessment that there are substantial investments in that market across programs where potential market effects (including non-participant spillover) could be measured or need to be tracked and/or assessed. Markets can also be selected for a Market Effects Evaluation when one or more programs operating in that market are best evaluated at the market-level due to their overlapping nature or overlapping goals to change how a market operates (sometimes called market transformation goals).

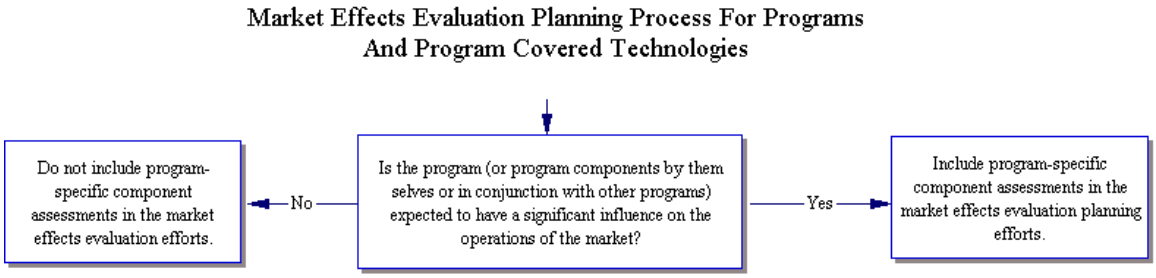

Figure 3. The Market Effects Evaluation Planning Process

Evaluation Rigor and Budgets

The process of setting evaluation priorities and budgets for each type of evaluation effort is as follows:

Impact Evaluations

For impact studies, the Joint Staff will review the Administrator's portfolios and programs and establish evaluation groupings. These groupings will consist of multiple programs having common characteristics that provide evaluation efficiencies in the contracting, supervision and implementation of the evaluation efforts. The groupings will typically include similar types of programs (e.g., residential rebates, commercial rebates, information and education, and marketing and outreach) or markets, so that the evaluation contracts will focus on similar types of programs and program evaluation efforts.

Once the evaluation groups are structured, the Joint Staff will decide which programs (or program components) will receive verification-only analysis, direct impact evaluation or indirect impact evaluation.[4] Each of these will be assigned minimum rigor level requirements along with a budget based on a number of factors listed in the *Evaluation Framework* including:

- The amount of savings expected from each program in the group;
- Whether the programs are expected to grow or shrink in the future;

[4] See the Impact Evaluation Protocol herein for further description of these different types of evaluations and the various protocols and rigor levels within them.

- The uncertainty about expected savings and the risk programs pose to achieving portfolio savings goals; and
- How long it has been since the last evaluation and how much the program has changed in the interim.

In setting the level of rigor and the evaluation budgets for the program groups and the individual programs within each group, the Joint Staff will conduct an evaluation needs assessment to assign a level of evaluation rigor to each program or program component. Based on the analysis and criteria listed above, the Joint Staff will establish appropriate evaluation budgets across the program evaluation groups. These budget levels will be used in the development of Request for Proposals (RFPs) to conduct the evaluation efforts. They will also serve to communicate to evaluation contractors how evaluation efforts will be structured.

From this effort, the Joint Staff will provide a high-level evaluation plan that presents the overall evaluation goals and approaches selected for the program groups. The plan will be updated annually as the evaluations proceed, as the need for information changes and as adjustments to the evaluation rigor or approach are identified. The plans will be presented to the public for review and comment each year prior to their implementation in a public workshop to solicit comments and recommendations from interested stakeholders. Once public comments have been obtained, the plan will be finalized and used to support the evaluation bidding and contracting process.

Once an evaluation is launched, the Joint Staff will monitor evaluation efforts and their progress to ensure that evaluation approaches meet or exceed the evaluation rigor assigned, in order to obtain the most reliable evaluation results within the available budgets.

Process Evaluations

For process evaluations, Administrators are responsible for setting evaluation priorities, budgets, evaluation timing and conducting the evaluation effort. These activities are presented to the CPUC-ED, the CEC and the public via an annual portfolio/program evaluation plan and a public workshop. See the Process Evaluation Protocol for additional details.

Market Effects Evaluations

The Joint Staff is responsible for identifying markets for which market effects evaluations will be conducted. These studies will be planned and budgeted individually in accordance with the information and data reliability needs of the Joint Staff.

Codes and Standards and Emerging Technology Program Evaluations

These two program types require evaluations different enough in their goals and objectives, approaches for accomplishing goals and operational characteristics that this document contains Protocols specifically designed for them. While these two types of programs will be evaluated per their respective Protocols, they may also have other types of evaluation efforts applied, such as process or market effects evaluations.

Evaluation Budgets

Each program group evaluation will have a budget cap within which to carry out a variety of evaluation activities. Efforts to maximize reliability will be carried out within the budget constraints and inevitably involve a number of tradeoffs regarding precision and identifying, mitigating and minimizing potential bias. Additional information and guidance on establishing evaluation budgets is provided in the *Evaluation Framework*[5].

Recommendations for Using the Protocols

The Protocols provide guidance and requirements for planning and conducting California's energy efficiency program evaluations. The Protocols should be used by the Joint Staff and Administrators to structure the evaluation process and associated activities. Joint Staff involved in program evaluation efforts should have an expert understanding of the Protocols. Evaluation staff within Administrator organizations should have the same level of understanding of the Protocols as appropriate to activities in which they have responsibility. All evaluation contractors should be required to have an expert understanding of the Protocols that will directly affect the studies and the methodological approaches they must conduct. It is also recommended that all of these involved parties have a working knowledge of the contents of the *Evaluation Framework* as applicable for the areas in which they work.

When a conflict exists between the *Evaluation Framework* or other reference documents and the Protocols, the Protocols will take precedence unless otherwise approved by the CPUC-ED.

The Detailed Evaluation Work Plan

All program evaluations are required to have a detailed evaluation work plan. In many cases the program evaluation work plans will be clustered within evaluation groupings. However, even within these groupings, there must be a detailed evaluation work plan structured at the program (and in some cases at the program component) level that identifies how the program will be evaluated and the steps to be taken to conduct the evaluation. The evaluation work plan shall include the following components to support an assessment of the adequacy and approach of the evaluation effort:

- Cover page containing the names of the program(s), Administrators and evaluation contractors, date of the evaluation work plan and the program tracking number(s) for program(s) covered in the plan;
- Table of Contents;
- High-level summary overview of the programs and the evaluation efforts;
- Brief description of the program(s) being evaluated including a high level presentation of the program theory. If the program does not have a formal program theory, the evaluation plan should incorporate a brief presentation of the evaluation-assumed program theory so that the Joint Staff may understand the sequence of events leading from program actions and activities to desired results (direct or indirect energy impacts);

[5] TecMarket Works, 74-79.

- Presentation of the evaluation goals and the detailed researchable issues to be addressed in the evaluation. (These will also be presented and discussed in the evaluation reports;)
- Description of how the evaluation addresses the researchable issues, including a description of the evaluation priorities and the use of assigned rigor levels to address these priorities;
- A discussion of the reliability assessment to be conducted, including a discussion of the expected threats to validity and sources of bias and a short description of the approaches planned to reduce threats, reduce bias and increase the reliability of the findings and minimize bias and uncertainty;
- Task descriptions of the evaluation efforts;
- Description of the analysis activities and approaches to be taken:
    - For energy acquisition and procurement programs, include a description of the approach that will be used to estimate kW, kWh and therm impacts for each year over the EUL of program-covered measures, including a description of the approach to be used to adjust the expected impacts for the persistence of the impacts;
    - For information or education programs, include a discussion of the approach that will be used to estimate the actions or behaviors taken and/or knowledge gained that is expected to lead to energy impacts;
    - For process or operational assessments, include a description of the approach used to identify changes that can be expected to improve the cost-effectiveness of or participant satisfaction with the program;
- Description of the M&V efforts (impact evaluations only) including:
    - Reference to International Performance Measurement and Verification Protocol (IPMVP) option[6], if used;
    - Detailed description of the option-specific approach; and
    - Description of any deviations from the IPMVP option, if any;
- Description of the sampling rationale, methods and needed sample sizes.
- Discussion of the specific Performance Basis Metrics that will be reported in the draft and final evaluation plan;
- A definition of the terms "participant" and "non-participant" as it applies to the evaluation being conducted;
- Detailed description of the information that will be needed from the IOUs or from the program-reporting database maintained at the CPUC-ED in order to conduct the evaluation and an estimate of the date that the information will be needed. This same information will be included in evaluation-related data requests;

[6] More information on the IPMVP can be found in the *Evaluation Framework* (148-149), or at the IPMVP Web site at www.ipmvp.org.

- Evaluation activities timeline for the program cycle, including identification of deliverables and deliverable due dates. This should also include early, mid-stream and late cycle feedback deliverables and deliverable dates. (These dates must be coordinated with the information needs of the Joint Staff and their program-portfolio assessment needs schedule;)
- Total program budget, total evaluation budget and a task-level evaluation budget for the study; and
- Contact information for the lead Administrator, lead program manager and evaluation manager, including addresses, telephone numbers, fax numbers and e-mail addresses.

The evaluation work plan should be written in a style and with enough detail that it can be clearly understood by Administrators, policy makers and evaluation professionals, and replicated by other evaluation contractors.

Confidentiality Issues

Confidentiality is an essential part of the evaluation process and is included in this section to set a baseline for how information will be treated within the evaluation efforts. The following aspects of confidentially are incorporated into all evaluations conducted under the guidance of the Protocols.

1. All evaluation contractors will be required to sign confidentiality agreements in order to conduct evaluations funded through the Protocols. These agreements will be incorporated into all evaluation contracts. For impact, market effects, codes and standards, emerging technology and M&V studies, the agreements will be incorporated into contracts awarded by the CPUC or the CEC as appropriate. For process evaluations, the individual Administrators issuing the process evaluation contracts are responsible for incorporating confidentiality agreements. However, evaluation information, including customer-specific information, can be shared across evaluation contractors within the same evaluation team and across teams. However, this data is to be protected from exposure beyond the evaluation teams and all contractors must sign confidentiality agreements prior to the receipt of customer-specific information.

2. All customer-specific information will be treated as confidential and safeguarded from public disclosure. Evaluation contractors are granted access to participant and customer specific information maintained by the Administrators as needed to conduct the evaluation efforts, however, no evaluation contractor will allow participant or customer specific information to be released to individuals or organizations beyond their research team, unless specifically permitted in writing by each customer for which information is to be released. All memoranda, letters, e-mails, reports and databases that are developed or used in the evaluation efforts that contain participant-specific or customer-specific information, whether an individual, a firm or business or an organization, are covered by this confidentiality requirement.

Contacting the Customer

A critical component to the success of any evaluation effort is the maintenance of a supportive relationship between the customer and the many different types of organizations that influence the evaluation effort. IOU representatives, CPUC-ED, CEC, evaluation contractors and others involved in the evaluation efforts need to be diligent in making sure that customers and participants are not over-contacted in support of them. Whenever possible, customer contact initiatives should be coordinated to avoid over-contact. Customer requests to be excluded from evaluation efforts should be respected. Customer complaints associated with evaluation efforts should be reported to the CPUC-ED and the associated Administrator within 48 hours of receipt.

Before customers are contacted by evaluation contractors, their representatives or subcontractors, the prime evaluation contractor will notify the Administrators of the need to do so and work to agree on an approach and timeline that may change from study to study. All final customer contact approaches and contact Protocols should specify customers to be contacted (as an attachment), reasons for the contact, information to be collected, the method of contact and the associated timeline.

Administrators will inform the appropriate individuals within their organizations of any related customer contact.