



*NATIONAL ENERGY EFFICIENCY BEST PRACTICES STUDY*

*VOLUME M – METHODOLOGY*

*Submitted to*

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## 1. INTRODUCTION

The overall goal of the Best Practices Study is to develop and implement a method to identify and communicate excellent programmatic practices in order to enhance the design of energy efficiency programs in California. In particular, program implementers supported through Public Goods Charge (“PGC”) funds will be encouraged to use this Study’s products, along with other resources and their own knowledge and experience, to develop and refine energy efficiency programs.

This Study is intended to be a first, not final, step in a process that would seek to identify and communicate best practices on an on-going or periodic basis. The Study does not expect to produce a census of best practices across all types of programs. Such an approach would be neither practical nor useful given the number of programs that exist; the many differences in policies, goals, and market conditions around the country; the unique needs and market conditions in California; and the importance of encouraging innovation, which by its nature sometimes requires attempting approaches that are not yet proven.

Although a few studies and papers exist in the energy efficiency literature that seek to identify exemplary programs and summarize best practices, none of these efforts have done so in the manner intended by the Project Team, the Project Advisory Committee (PAC), and the CPUC originators of the current Study.<sup>1</sup> Unique aspects of the current Study are its comprehensiveness, its use of a program decomposition approach, and its focus on development of a database and user-driven website.

The large scope and changing nature of energy efficiency programs and energy markets require that a dynamic approach be employed. Like any study of this type, resource and schedule constraints must limit the scope of the effort. In the current Study, data was collected from roughly 90 programs in total across a range of program types.. Thus, readers and users should recognize that the intent is not to cover all types of programs with this first effort and that the depth of coverage will vary even among the program types that are addressed. If the framework and results of the Study prove useful, it is anticipated that future phases of the work can expand the number and types of programs covered.

Because this is one of the first efforts of its type in the energy efficiency program industry, there is a strong methodological focus to the project. The purpose of this chapter is to document and describe the Project Team’s approaches to achieving the Study’s objectives.

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<sup>1</sup> See California Public Utilities Commission Opinion (R.01-08-028), filed August 23, 2001.

## 2. STUDY APPROACH

This section presents the Best Practices Study methodology. Specifically, this section details the benchmarking approach developed for this Study which involves decomposing programs into their components and comparing those program elements across selected programs.

### 2.1 OVERVIEW

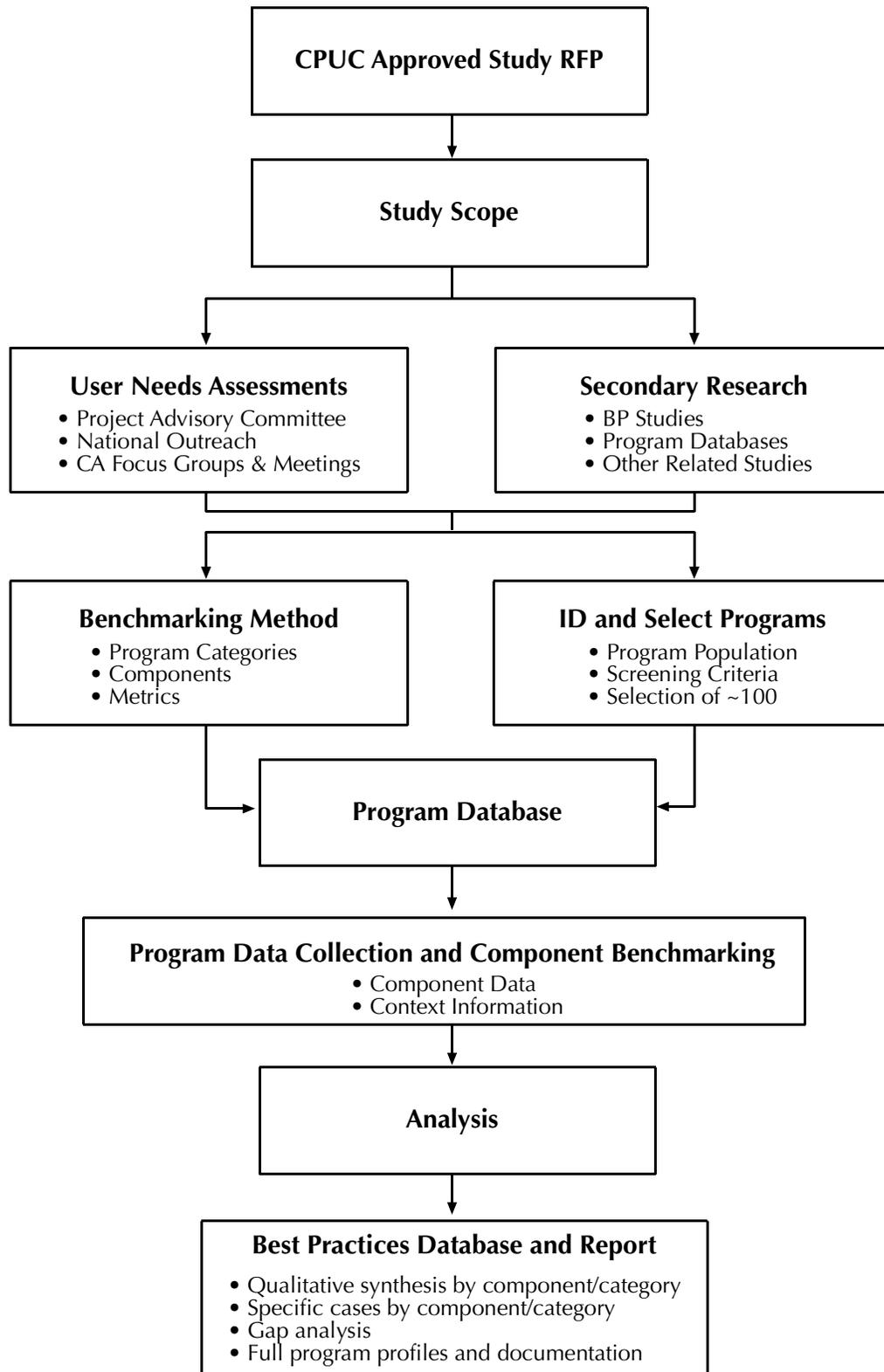
An overview of the Study process is shown in Exhibit M-1. Key aspects of the Study include a user needs assessment, secondary research, development of the benchmarking methods, identification and selection of programs to benchmark, development of the program database, data collection and program benchmarking, analysis, and preparation of the Study's best practices report and final database.

Also as shown in Exhibit M-2, the outcome of a program – as measured by outcome metrics such as \$ per kWh saved, market penetration or sustainability – can be thought to be a function of (a) changeable program elements, (b) changeable portfolio-level design and programmatic policy decisions, and (c) unchangeable social, economic, demographic, climate, and other factors. All of these factors can influence the ultimate success of an energy efficiency program. Some program elements (such as marketing, tracking or customer service) are directly controllable at the program level and can be modified to affect the success of the program. Other elements (such as the program policy objectives and whether the program has a single- or multi-year funding commitment) may not be changeable at the program level but may be changeable at a policy level. Other elements are not changeable and cannot be affected by program managers, implementers, or policy-makers (such as the physical climate or density of the customer base).

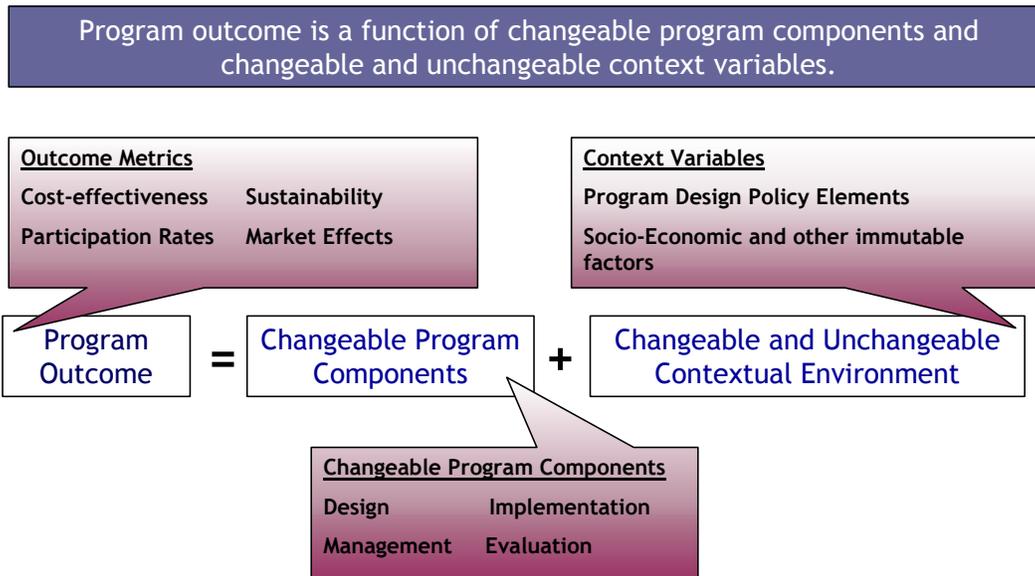
The approach presented here focuses on analyzing programs primarily from the perspective of their changeable program operations. The decomposition model, described in detail in Section 2.3, primarily targets these changeable elements. A method was developed for decomposing programs into components and sub-components in order to systematically identify and compare specific program features of importance to overall program success. The four primary program components are defined as program design, program management, program implementation, and program evaluation. These components and their associated sub-components are briefly summarized below:

- **Program Theory and Design.** Program design provides the initial foundation for a successful program. The program design category includes **program theory**. Good program design begins with good program theory and a complete understanding of the marketplace. Good program structure, policies and procedures are also necessary to translate program design theories and goals into practical and effective management and implementation actions.

*Exhibit M-1*  
*Overview of Energy Efficiency Best Practices Study*



*Exhibit M-2*  
*Relationship Among Program Outcomes, Components, and Context*



- **Program Management.** Program management is the command and control center that drives the implementation process. We decomposed program management into **project management, reporting and tracking, and quality control and verification.** Project management includes the structure and relationship among responsible parties. Reporting and tracking focuses on approaches to identifying and tracking useful and appropriate metrics that can efficiently be translated into reporting effective information. Quality control and verification includes accountability and improvement of processes that are typically carried out through implementation and evaluation activities.
- **Program Implementation.** Implementation is defined by the actual activities carried out in the marketplace to increase adoption of energy efficiency products and practices. We decomposed implementation into **outreach, marketing, and advertising, the participation process, and installation and incentive** mechanisms. Good outreach, marketing and advertising efforts should result in relatively high program awareness, knowledge, and participation levels. The participation process is obviously a critically important element of a program's ultimate success. Standard measures of market penetration and customer satisfaction provide one indication of a program's effectiveness at enrolling and processing customers. Installation and incentives should demonstrate evidence of installation and delivery follow-through on marketing and outreach efforts.
- **Evaluation and Adaptability.** In addition to the design, management and implementation components, this Study asserts that programs should also be analyzed for the effort that has been put into evaluating their effectiveness and their ability to adapt to evaluation findings and changing market conditions. Thus, this Study assesses the adequacy of the evaluation efforts and how programs use evaluation results or other feedback mechanisms to improve over time.

## 2.2 DEFINITION OF TERMS

The list below provides definitions of terms used extensively to describe the Study methodology.

**Benchmarking** - refers to a structured process of comparing and analyzing business practices. A variety of definitions have been put forward by different benchmarking organizations, for example:

- “Benchmarking is the process of identifying, sharing, and using best practices to improve business processes.” Source: American Productivity and Quality Center
- "Benchmarking is simply about making comparisons with other organizations and then learning the lessons that those comparisons reveal". Source: The European Benchmarking Code of Conduct

As practiced, Benchmarking almost always occurs as a collaborative process in which members of the same industry, or participants from different industries, share information. Typically the shared information is about business processes with the intention of identifying excellence and developing an understanding of how excellence is achieved.

**Program Decomposition** – refers to the process of disaggregating programs into underlying subparts to allow for analysis of specific program features of importance to users of the Study. Two levels of decomposition are planned – a primary decomposition into *components* and a secondary decomposition into *sub-components*.

**Program Component** – refers to the first level of the program decomposition, which is further disaggregated into sub-components. The Study decomposes programs into four primary components: program design, program management, program implementation, and evaluation.

**Program Sub-component** – is a further disaggregation of a program component. The program decomposition model consists of the following sub-components:

- Program Theory and Design: No sub-components.
- Program Management: Project Management, Reporting & Tracking, and Quality Control & Verification
- Program Implementation: Outreach/Marketing/Advertising, Participation Process, and Installation & Delivery

These sub-components are further defined in Section 2.3.

**Crosscutting Outcome Metrics** – are the basis for differentiating program performance at the overall program level. Crosscutting metrics include:

- \$ Per kWh and kW saved; Market Penetration, Adoption, and Saturation Rates; and Sustainability/Market Effects

Some crosscutting metrics, such as \$ per kWh saved, are directly quantitative. Other crosscutting metrics, such as sustainability and some market effects, can be more difficult to assess.

**Best Practice** – The term “Best Practice” refers to the business practice that, when compared to other business practices that are used to address a similar business process, produces superior results. Best practices are documented strategies and tactics employed by successful organizations and programs. Note, however, that rarely is an organization or program “best-in-class” in every area. Our focus is not on identifying best programs or best organizations but, rather, best practices that exist within and across programs.

As developed in this Study, Best Practices are identified from in-depth interviews with program managers, thorough review of program documents, analysis of secondary sources, and comparison of program features and outcomes. Programs are compared and best practices developed by program type and program component. The focus of this Study is on best practices that can be generalized and have a high likelihood of transferability to other programs within or across program categories.

**Program Context Characteristics** - the outcome of a program also depends on the context in which it operates. Understanding that context is critical to the analysis process: wherever possible, the Study team analyzed the changeable decomposed program elements in light of a program's less mutable context. To facilitate this process, several contextual elements were identified to include in the data collection process and consider during the analysis. As described later in this section, we divide these characteristics into two categories: program design policy elements, and socio-economic and other immutable factors.

**Program Categories** – are the basis for grouping “like” programs to compare across components and sub-components. Program categories were used in the process of selecting which programs to benchmark and to organize the reports and analyses. Program categories may be defined in any number of ways, for example, as a function of target market (e.g., sector, vintage, segment, end use, value chain, urban/rural); approach (e.g., information-focused, incentive-focused [prescriptive; custom/performance based], etc.); objective (e.g., resource acquisition, market transformation, equity, etc.), and geographic scope (e.g., local, utility service territory, state, region, nation); among other possible dimensions. The program categories developed and used for this study are presented in Section 3.1.

### 2.3 PROGRAM DECOMPOSITION MODEL

As defined above, program decomposition refers to the process of disaggregating programs into underlying subparts to allow for analysis of specific program features of importance to users of the Study. Programs were decomposed at two levels – a primary decomposition into *components* and a secondary decomposition into *sub-components*. The approach utilizes systematic decomposition to define and analyze components and sub-components for each program. The Study team decomposed programs into four components: **program design**, **program management**, **program implementation**, and **evaluation**. Each of these is further decomposed into sub-components as discussed below.

Decomposition into components and sub-components serves several purposes. First, the goal of the project is to identify best practices within specific program elements such as marketing,

tracking systems, participation processes, etc., that are likely to have transferable value to others. Second, the components and sub-components provide the ability to refine programs or to construct new hybrid programs that combine best practices from different program elements. The decomposition provides a uniform approach for program comparison and is well suited to developing new or refining existing programs. These programmatic building blocks also permit cross comparison of program components from multiple sectors, which will help inform best practices.

### **Program Theory and Design Component**

Program design is focused on laying a solid foundation for a successful program. Good program design begins with good program theory and a complete understanding of the marketplace. Baselines are also important when evaluating success, while contingency planning can prevent projects from stalling indefinitely. Program theory and related design elements are subjective in nature and cannot be measured by a quantitative metric such as \$/kWh. However, projects that demonstrate a clear “story” and understanding of the market, and have developed the right linkages and partnerships to successfully target that market are likely to be more successful than programs that lack such characteristics. Like any complex project, successful energy efficiency programs require well thought-out processes and procedures. Programs that clearly articulate the steps involved in implementation as well as clearly delineate management responsibilities and structures have a higher likelihood of succeeding relative to those that do not. Design processes likely to be among the best practices will be those that fully describe the management and organizational structures necessary to optimize program performance and include testing of procedures.

### **Program Management Component**

The project decomposed program management into the following subcomponents:

- **Project Management** – A key function of program management is project management. Project management effectiveness is likely to be correlated with the effectiveness of the management/organizational structure plan developed during program design. Project management represents the ability of the implementer to cost-effectively manage all aspects of the programmatic process by effectively executing the management/organizational plan. Project management effectiveness is especially critical for implementers of large, complex programs or programs with multiple sub-contractors or other partners.
- **Project Reporting & Tracking** – For the purposes of this effort, **tracking** is defined as the systems and units of measurement that provide an indication of program participation, budgets, markets and other program parameters. **Reporting** is defined as the products associated with accessing and utilizing the information in the tracking systems to communicate and improve the program, both internally and externally. Clear concise reports that track, for example, progress towards milestones and current expenses compared to projected levels are invaluable to program managers. Programs that develop standardized, comprehensive, and periodic reports will be more likely to identify problems early than those that lack such systems. In addition, choosing the right unit of measure to track a program can also be a predictor of success.

- **Quality Control and Verification** – We take a broad definition of the term **quality control** meaning it to encompass both the quality control of the program processes as well as the quality control of program equipment or measures. **Verification** is more narrowly defined as ensuring that measures were actually installed, audits were actually performed, etc. Systems for assessing the quality of program delivery and for verifying the accuracy and prudence of tracking data, equipment and payments are key to satisfied customers and successful programs. Programs that lack comprehensive quality control procedures are more likely to suffer from errors (such as tracking and payment) that reduce overall program effectiveness or result in poor customer satisfaction which can reduce participation by word-of-mouth to other potential participants.

### **Program Implementation Component**

Implementation can be broken into a number of subcomponents; the decomposition consists of outreach/marketing/advertising, the participation process and customer service, and installation and delivery mechanisms.

- **Program Outreach/Marketing/Advertising** – Program marketing and outreach approaches are critical to program effectiveness. In theory, measures of marketing costs per participant or participation rate could be used to compare one program to another. To further assess marketing effectiveness, indicators of marketing costs per end user made aware or knowledgeable about a program or service could also be benchmarked. However, such quantitative data is not generally available consistently enough across programs to be broadly useful.
- **Participation Process & Customer Service** – The ease or difficulty of a program’s participation process, and the associated customer service support, can both be critically important indicators of ultimate program success. The participation process and customer service element is comprised of the procedures, forms, communications, and other interactions that occur among prospective and ultimate participants and program implementers. Some programs that may have all of the other attributes of success may be sub-optimal simply because the process of participation is unduly burdensome, or because the customers are not getting high levels of responsiveness from program administrators.
- **Installation & Delivery Mechanisms** – Installation and Delivery picks up the implementation process at its finale and determines to what extent the program’s implementation and design features carry through to the implementation process. Some programs may do well on outreach and marketing but result in few actual installations of efficiency measures or other ultimate indicators of success (e.g., increase in knowledge of efficiency options for trade allies participating in a training program). The effectiveness of any financial incentives is captured under this sub-component.

### **Evaluation and Adaptability Component**

In addition to the design, management and implementation components, the Study team maintains that programs should also be screened for the effort that has been put into evaluating their effectiveness, and for their effectiveness at adapting to evaluation findings and

changing market conditions. For example, programs that are carefully evaluated and adjusted to ensure their effectiveness and that can rapidly adapt to actual and changing market conditions are more likely to be effective. Rigid programs that are designed, managed or implemented in such a way as to make adaptability impossible are more likely to fail. This element was included in the analysis to capture program features that promote adaptability.

## 2.4 CROSS-CUTTING OUTCOME METRICS

The program components and subcomponents provide the breakdown of the various aspects of the program that program implementers can modify and improve to create better programs. The overall outcome of a program, however, is often measured through high-level metrics such as \$ per kWh saved. The Study collected, tracked, and analyzed crosscutting outcome metrics to help determine the impact of different subcomponents on the overall impact of a program. Note, however, that these outcome measures, by themselves, are often poor proxies for programmatic best practices because of the many confounding contextual and other variables that underlie them as well as the significant differences in budget and program impact tracking and measurement in similar programs around the country (for example, see Item 1 of Appendix B – Literature Review). The Study sought to collect data on the following outcome metrics: cost effectiveness (e.g., \$ per kWh saved, TRC, etc.); *net* market penetration rates, participant adoption rates, measure saturation levels, and sustainability/market effects. However, as discussed below, even the simplest of these indicators (\$ per kWh saved) was not consistently available for many programs.

### Cost Effectiveness Indicators (\$/kWh or \$/kW Saved, Benefit-Cost Ratios)

These indicators are very attractive as overall quantitative measures of a program's effectiveness because total program impacts can often be compared with total dollars spent. **Unfortunately, in practice, extreme care and caution must be applied to collecting and assessing this indicator.** A key limitation to the usefulness of these indicators is the extent to which all costs and impacts are properly and consistently accounted for across programs. To take an extreme example, suppose an information program in another region (i.e., outside of California) spends very little money on mass media advertising and then claims all *gross* energy efficiency actions that take place. Suppose also that the reported effects are not *net* effects (i.e., all claimed effects are due to free riders). The program may show a very low \$ per kWh saved when in fact the true figure is very high (theoretically infinite if there are zero net effects). At a minimum, this figure should be tracked on a net, not gross, impact basis; however, not all programs track net effects.

In addition, while cost effectiveness is usually a discrete, quantitative number, it needs to be analyzed within the context of a program's environment and goals. For example, consider two commercial programs: one focused on cost-effectiveness, and another on equity. Sole consideration of cost-effectiveness would imply targeting the largest commercial customers, while equity would imply targeting smaller hard-to-reach customers. Correlating program outcomes to help determine best practice components would depend of the contextual definition of what is "best". Because their objectives are negatively correlated with respect to cost-effectiveness, one would not want to directly compare these programs against each other for this indicator. One could, however, make comparisons relative to other programs with the same objective. Inappropriately using metrics without consideration for cross-purpose goals can result in erroneous comparisons and inaccurate policy conclusions.

## Net Penetration Rates, Participant Adoption Rates, and Measure Saturation Levels

These can be some of the most important indicators of the effectiveness of resource acquisition programs; unfortunately, they are also some of the least well tracked and, surprisingly, often poorly understood. As discussed above under cost-effectiveness, *\$ per unit of net impact* generally provides a more robust indicator of success than does *\$ per unit of gross impact*. Although important and helpful to understanding program effectiveness, net impacts alone do not tell the whole story. Ideally, one wants to be able to examine the rate and level of efficiency adoptions as well. For example, a program may have a reasonable net-to-gross ratio but still have a relatively low (and slow) rate of market penetration. As a result, one program may be more cost-effective than another but also be less likely to result in any significant change in efficiency market share over a given period of time. Key challenges with these indicators are defining and collecting data on the denominator needed for their calculation (e.g., what is the appropriate population or subpopulation that should be used to divide the efficiency actions). Few programs track all of the in-program and out-of-program data needed to measure these indicators.

## Sustainability/Market Effects

Sustainability is an important crosscutting indicator of program effectiveness. Programs that create lasting market effects are more beneficial than those that do not, *all else being equal*. Persistence of savings can also be an element of sustainability. The proportion of evaluation effort placed on examining market change sustainability versus persistence of savings may depend upon the desire for resource acquisition versus market transformation at any point in time in a jurisdiction. More importantly for this project, obtaining hard, empirical evidence of sustainability and market effects is difficult in practice.

### 2.5 PROGRAM CONTEXT CHARACTERISTICS

In addition to the changeable program elements outlined in Section 2.3, the outcome of a program also depends on the context in which it operates. Understanding that context was critical to the analysis process: wherever possible, the Study team tracked and analyzed the changeable decomposed program elements in light of a program's less mutable context. To facilitate this process, the team identified several contextual elements for tracking. These elements can be organized into two broad categories: program design policy elements, and socio-economic and other immutable factors.

#### Program Design Policy Elements

Energy efficiency programs and portfolios are often designed with specific policy objectives in mind, and those objectives can often impact the outcome of the program. For example, programs that target hard-to-reach areas may not exhibit the same rates of participation. The Study tracked and considered these design policy elements:

- **Energy efficiency policy objectives** – policies that emphasize differing goals such as market transformation, resource acquisition, equity, etc. will drive different program designs and program objectives.

- **Market barriers addressed** – programs that seek to mitigate difficult barriers may have poorer performance-related metrics because they attack tough problems in contrast to programs that may have excellent ostensible metrics because of “cream skimming.”
- **Measure mix** – the mix of measures installed in a program can significantly affect a program’s cost-effectiveness. For example, residential program cost-effectiveness can vary several-fold simply as a function of the year-to-year mix of CFL's as compared to other measures.
- **Demand/energy** – the extent of peak demand versus energy focus of the program can, by definition, affect the cost-effectiveness of the indicator in question (e.g., a peak demand oriented program may score poorly on an \$ per kWh metric). This can be considered a part of the measure mix factor listed above.
- **Multi-year policy objectives** – if consistent, they help programs to achieve goals that require medium to long-term market presence and extensive program infrastructure; if inconsistent, they make achievement of such goals more difficult.
- **Multi-year funding levels** – if consistent, they allow programs to set multi-year goals and maintain consistent presence and messages among end-users and supply-side market actors; if inconsistent, they make maintaining a stable market presence more difficult.
- **Program/Market Lifecycle** – where a program or key measure is in its product lifecycle will affect its cost-effectiveness. For example, a program seeking impacts from the last 50 percent of the market to adopt a product that has penetrated the first 50 percent of the market should be expected to be more costly than one attacking a market with a low or insignificant saturation level. There are at least two reasons for this. First, in highly saturated markets, it is more difficult to find the remaining measure opportunities and, second, the remaining market is typically characterized by late majority and laggard organizations that are more resistant to adopting new products and practices. In addition, a program in the first-year of a multi-year plan to impact a market may have poor first-year metrics because of the associated startup costs and the time it takes to create awareness and other program effects.

### **Socio-Economic And Other Immutable Factors**

Beyond program design policy elements, there are many broader socio-economic factors and other immutable factors that can affect the outcome of the program. The Best Practices team has identified the following, though this list is not meant to be all-inclusive:

- **Climate** – for example, HVAC measures are more cost-effective in severe climates than in mild climates because absolute savings are strongly a function of base usage levels.
- **Customer/target market actor mix** – the mix of customers and trade allies often plays a role in cost-effectiveness. For example, a program in a market with larger commercial customers will tend to be more cost effective than an identical program in a market of smaller commercial customers, all other things being equal; similarly, programs with

customer segments with longer full-load equivalent hours will be more cost-effective than those with lower average full-load hours of operation.

- **Customer density** – delivering an energy efficiency program to a relatively dense population base will be less costly than delivering to a sparser population, all other things being equal.
- **Customer Energy Rates** – higher electricity rates should lead to higher levels of measure adoption, all else being equal.
- **Economic Conditions** – willingness to invest in new products and practices changes in response to short-term economic conditions, which may vary across regions.
- **Customer Values** – efficiency program effectiveness can vary as a function of differences in customer values, again, all else being equal.

## 2.6 PROGRAM BENCHMARKING

The proposed program decomposition addresses the research goal of conducting both *process benchmarking* and *performance benchmarking*. An ordinal scoring approach was envisioned for benchmarking that would rely on quantitative cross-cutting metrics, but this nomographic approach had to be set aside in the absence of sufficient quantitative information. Furthermore, such an approach is not feasible when the number of independent variables is greater than the number of observations as is the case with energy efficiency programs. The dearth of reliable empirical data, detailed in Section 4.6, compelled the team to adopt a more qualitative, judgment-based approach to identifying best practices.

### Process Benchmarking

Although both process and performance benchmarking are important, the Study team believed that the nature of energy efficiency programs and associated data limitations makes *process benchmarking* the most valuable product of the project. Process benchmarking is different from performance benchmarking in that the latter does not address why differences exist or affect change. Process benchmarking looks at the processes in detail and addresses why there are differences so that best (and less desirable) practices can be identified and improvements effected. Under this approach, the team analyzed each of the program components and sub-components to identify the set of common or unique best practice characteristics that differentiates the more successful programs. Almost as importantly, in the team's judgment, the Study also sought to ascertain which features are generally unsuccessful or less productive to reduce repetition of ineffective program elements. The energy efficiency industry has over 20 years of lessons learned; unfortunately, many of the lessons regarding implementation ineffectiveness have not been documented. As a result, approaches that have been proven to be ineffective in the past are seen repeated unnecessarily.

### Performance Benchmarking

As defined at the outset of this section, benchmark metrics are the basis for differentiating overall program performance, as well as performance at the component or sub-component level. Some crosscutting metrics, such as \$ per kWh saved, were directly quantitative. Other

crosscutting metrics, such as sustainability, required professional judgment based on the information available to the Study team. As discussed in Section 4.6 and 2.5, these quantitative metrics are not available consistently and reliably enough to produce definitive conclusions about causal relationships between program features and outcome metrics.

## **2.7 PROCESS BENCHMARKING CONSIDERATIONS**

While some metrics are quantitative in nature, most of the underlying information supporting benchmarking is qualitative. The team developed summary and in-depth process benchmarking findings by program category and program component. These best practice matrices formed the heart of the project results. As a first step the team defined, for each sub-component, the critical elements of successful programs. These criteria, described in more detail below, formed the basis for measuring and comparing programs across sub-components.

### **Program Theory and Design**

Successful program design starts with a good program theory. The Study team looked for evidence of a well-thought out and documented program theory that includes buy-in from planners, implementers and other key players. Program theory should address potential barriers to adoption and methods to overcome those barriers. A program's theory and design should also leverage appropriate linkages and partnerships in multiple areas, and should incorporate these linkages and partnerships at the design stage.

Good program structure, policies and procedures begin with a well thought-out "process plan" that describes both the program structure and the associated policies and procedures. The team looked for process plans that clearly illustrated step-by-step participation processes. These processes should be tested for effectiveness and contingencies. The Study team looked for evidence of a program process plan that was both used and updated.

### **Program Management: Project Management**

The Study assumed that basic management skills were already in place and did not include those in this Study's evaluation. However, the team looked for evidence of a clear and reasonable management structure, with clearly defined responsibilities among organizations and individuals. The team looked for an appropriate match between resources, levels of expertise, and tasks.

### **Program Management: Reporting & Tracking**

Best practices in this arena entail the cost-effective tracking of useful and appropriate metrics that can efficiently be translated into reporting information. The tracked variables should generate useful information at appropriate intervals, and this information should be used to maintain program effectiveness.

### **Program Management: Quality Control & Verification**

Successful programs should have a verification process in place that is part of both the implementation and evaluation phases. The precision level of the verification should be balanced against cost to ensure overall cost-effectiveness. Verification should be accompanied by a comprehensive quality control process that addresses both the quality of the

implementation process, as well as that of equipment or measures installed as part of the program.

### **Program Implementation: Outreach, Marketing & Advertising**

In evaluating outreach, marketing and advertising efforts, the Study sought measures of marketing effectiveness such as total marketing costs and marketing costs per participant made aware of the program. Good outreach, marketing and advertising efforts should result in relatively high program awareness, knowledge, and participation levels. The Study looked for evidence of innovative or successful marketing and outreach mechanisms, and assessed the appropriateness of the marketing strategies for the program objectives and targeted populations.

### **Program Implementation: Participation Process**

The participation process is a critically important element of a program's ultimate success. Standard measures of customer satisfaction provide one indication of a program's effectiveness at enrolling and processing customers. Good programs should measure satisfaction with multiple aspects of the participation process, and should collect sufficient information at every stage to support evaluation, tracking and reporting needs. Programs should also check for and limit, to the extent possible, the administrative burden they place on customers (some burdens may be necessary to fulfill good practice requirements for other sub-components such as quality control and verification). The team looked for evidence of successful mechanisms that streamlined the customer participation process, and probed to find out whether the program resulted in many callbacks, reinstalls, and quality control problems. The team also looked for evidence that the participation process encouraged a higher adoption of measures among its targeted participants. The time it takes to make it through the entire participation process, including receiving any incentives, was another indicator the team investigated.

### **Program Implementation: Installation & Delivery**

The Study team reviewed delivery and/or installation objectives and assessed how well those had been met. Successful programs should demonstrate evidence of installation and delivery follow-through on marketing and outreach efforts. The team assessed how installation and delivery problems had been addressed, and evaluated how well a program worked with subcontractors, partners and recruitment resources to ensure a smooth delivery process. The effectiveness of any incentives in inducing measure installations was also assessed here, along with related issues of free ridership and spillover.

### **Program Evaluation: Evaluation & Adaptability**

Good programs should obtain feedback from both participants and non-participants and measure program accomplishments and progress relative to the program design. This is often accomplished through a thorough program evaluation; however, some programs may achieve the equivalent result through activities that are built into the implementation process and carried out by the program manager. The team assessed how programs used evaluation results or other feedback mechanisms to improve over time. The team looked for flexibility and adaptability in the program design and implementation that facilitated readjustments.

### 3. PROGRAM SELECTION

#### 3.1 SELECTION OF PROGRAM CATEGORIES

As defined earlier in this section, a program category is defined in this Study as the basis for grouping “like” programs to compare across components and sub-components. Program categories may be defined in any number of ways, for example, as a function of target market (e.g., sector, vintage, segment, end use, value chain, urban/rural); approach (e.g., information-focused, incentive-focused [prescriptive; custom/performance based], etc.); objective (e.g., resource acquisition, market transformation, equity, etc.), and geographic scope (e.g., local, utility service territory, state, region, nation); among other possible dimensions.

As part of task 3, the team identified a number of criteria that a good program categorization strategy should address:

- Criterion 1. User accessibility:** potential users having a program concept in mind should be able to use the category structure to identify relevant existing programs.
- Criterion 2. Benchmarking compatibility:** programs within a category should be reasonably comparable to each other; categories should be broad enough to include an adequate population of programs for analysis.
- Criterion 3. Potential:** categories should address market segments that offer significant technical and market potential for energy savings.
- Criterion 4. Compatibility with policy guidelines:** e.g., California energy efficiency policy currently stresses resource acquisition, as well as outreach to hard-to-reach populations and business segments.
- Criterion 5. Compatibility with scope directives:** Programs that target low-income, R&D, load management, and infrastructure development were out of the scope of this project.

To keep the project scope within the resource constraints, it was decided to limit the number of program categories to 10 to 20. Ideally, there should be enough categories to separate programs that cannot be meaningfully compared, but not so many categories that too few programs end up in each category. The team identified a number of candidate variables that could potentially serve to categorize programs, including, but not limited to:

- Target Market (e.g., sector, vintage, value chain, end use, segment)
- Programmatic Approach (e.g., information, training, prescriptive incentive, custom/performance-based incentive)
- Program Objective (e.g., resource acquisition, market transformation, equity, cost-effectiveness, etc.)

- Geographic Scope (e.g., local, utility service territory, state, region, nation, urban/rural)

The team selected a program categorization scheme having 17 categories as illustrated in Exhibit M-3. The final scheme separates residential from non-residential programs, and distinguished between incentive programs, information and training programs and new construction programs. Programs were also segregated based on targeted end-use and customer type. A Crosscutting section was also included to address programs, such as mass market advertising, that did not cleanly fall within our other 16 categories.

**Exhibit M-3**  
**Program Categories & Related Codes**

Program Category			Code
<b>Residential</b>	Incentives	Lighting	R1
		Air Conditioning	R2
		Appliance and Plug Load	R3
		Single-Family Comprehensive	R4
		Multi-Family Comprehensive	R5
	Information & Training	Whole House Audit with no/minimal incentive	R6
		General & Other Comprehensive	R7
	New Construction Information & Incentives		R8
<b>Non-Residential</b>	Incentives	Lighting	NR1
		HVAC	NR2
		Refrigeration, Motors, Compressed Air, Process	NR3
		Small Comprehensive	NR4
		Large Comprehensive	NR5
	Information & Training	End-Users	NR6
		Trade Allies	NR7
	New Construction Information & Incentives		NR8
<b>Other</b>	Cross Cutting	O1	

While there are many different ways to categorize energy efficiency programs, the approach selected here met all of the categorization criteria and ensured coverage for a wide variety of program types.

Note, however, that reports were not developed for all 17 categories in the current phase of the Study. This is because a sufficient pool of programs was not found for all categories. In two cases, categories were collapsed for reporting purposes (R6 and R7, NR1 and NR4), while in two other cases the data collection phase of the study did not produce a set of programs that justified stand alone reports (NR3, NR6). As a result, 13 categories are targeted for stand alone reports in the current phase of the Study.

### 3.2 PROGRAM SCREENING AND SELECTION

As noted in Section 1, this Study did not seek to provide a census of best practices across all types of programs. Readers and users should know that the intent was not to cover all types of programs with this first effort and that the depth of coverage varied even among the program types that were addressed. If the framework and results of the current Study prove useful, future phases of the work can expand the number and types of programs that can be covered.

The program screening and selection process utilized a combination of team-nomination, canvassing, secondary sources, and random stratified selection. Using a stage and gate approach, the team narrowed a large set of programs (approximately 400) down to roughly 100 selected programs, so as to have roughly 5 programs for each of the 17 original program categories. The team identified initial candidate programs through primary research, a review of existing secondary sources, and expert nominations. The selection process detailed here was designed to ensure sufficient representation of programs that were already perceived as “good”, while allowing for a random selection of other programs against which to benchmark. The process also allowed for the inclusion of some non-utility California energy efficiency programs as well.

#### Screening Criteria

In order to be considered for inclusion, all programs had to meet a set of screening criteria as described below. These criteria ensured that selected programs fell within the scope of this first phase of the Study while keeping the number of candidate programs manageable.

- **Complete Programmatic Cycle:** programs selected for review typically completed at least one “programmatic cycle.” By programmatic cycle, it is meant that a complete cycle of program design, completed implementation, and documentation of accomplishments was achieved. This period is usually at least one year but may be more or less depending on the program. Programs were excluded that were in-progress in late 2003 (the principal data collection period for this Study) and had no prior completed and documented programmatic cycle.
- **Sufficient Documentation, Preferably Including Ex-Post Evaluation:** a minimum level of documentation is needed to conduct a meaningful review of the candidate programs. Programs were excluded for which sufficient documentation could not be readily obtained. A program should have documentation of its actual accomplishments and actual expenditures. Programs that had ex-post impact and process evaluations were preferred over those that did not, all else being equal.
- **National “Blanket” Programs:** programs that are implemented exclusively on a national scale (such as parts of Compressed Air Challenge or Energy Star) were not considered for analysis. However, local, territory-wide, statewide, or regional implementation of programs that leveraged purely national programs was considered.
- **International Programs:** only programs implemented in the U.S. and Canada were included.

- **Budget Size:** only programs that had an annual budget roughly in excess of \$2 million were targeted for inclusion in this phase of the Study. Future phases may focus more or entirely on smaller programs.
- **Codes and Standards:** programs that focused on codes and standards were not considered in this Study phase. Future phases may focus more or entirely on the codes and standards.
- **Agricultural Programs:** programs that targeted the agricultural sector were not considered in this Study phase. Future phases may focus more or entirely on the agricultural sector.
- **Low-Income Programs:** were excluded from this analysis as they are addressed through their own separate public goods-funded research in California.
- **R&D Programs:** were also excluded because they are addressed through their own separate public goods accounts.

Application of these screening criteria is discussed in more detail below.

### **Program Selection Methodology**

Exhibit M-4 illustrates the complete program screening and selection process. The detailed steps are described below.

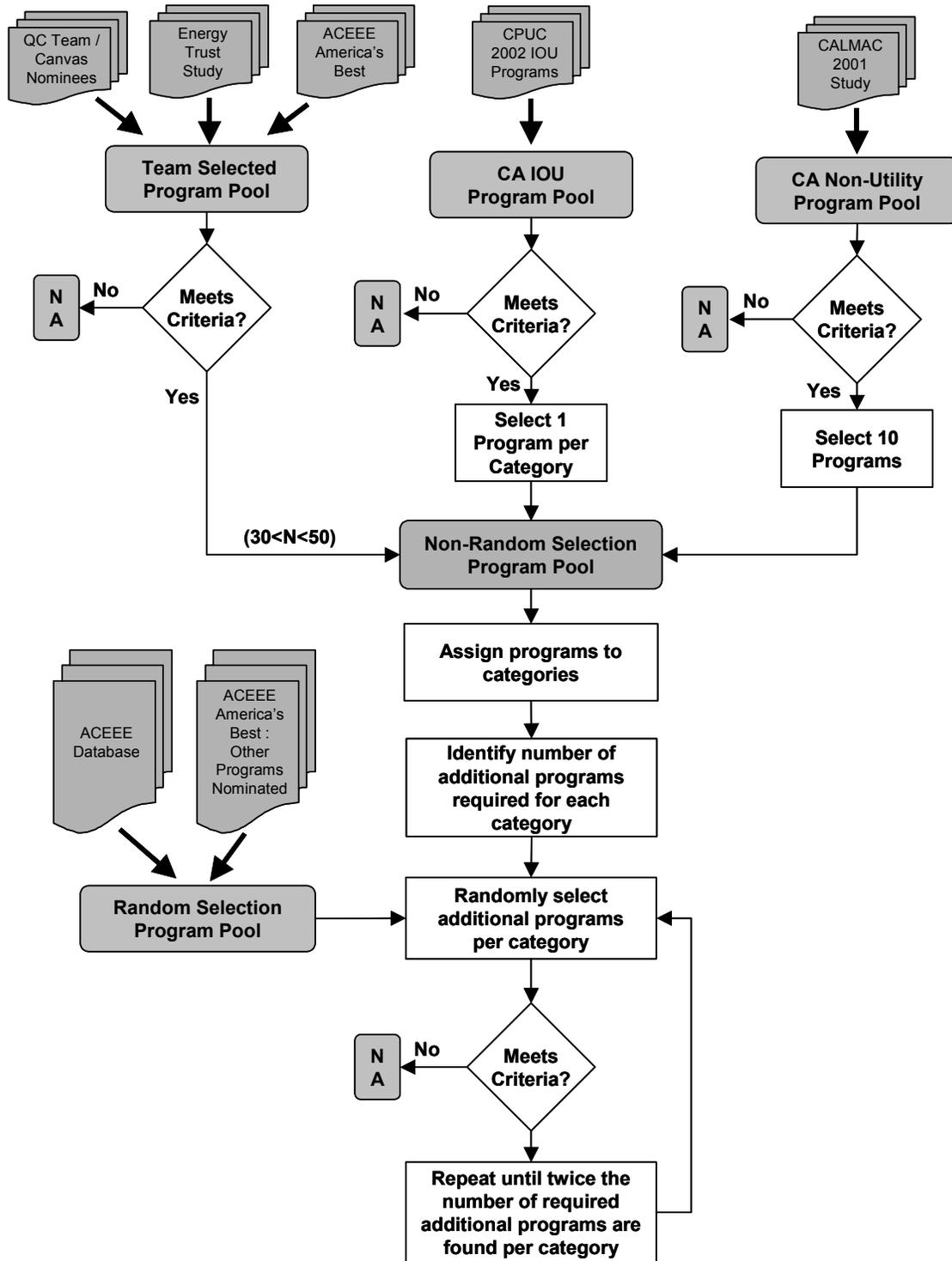
#### **Step 1: Team-Selected Programs**

There is already considerable knowledge and expertise within the industry on what constitutes best practices and programs in energy efficiency. The Study team reviewed numerous secondary sources and gathered input from national experts to develop a preliminary list of programs that have already been identified as exemplary. In particular we reviewed:

- The “Best Practices from Energy Efficiency Organizations and Programs” report to the Energy Trust of Oregon, published in August 2002, in which over 60 programs or practices were nominated;
- The ACEEE Profiles of Leading Energy Efficiency Programs, which identifies and reviews in detail 57 exemplary energy efficiency programs.

Programs from these and other sources (including national expert nominations) were combined into a group of team-selected programs. The team applied the Study screening criteria, and after removing duplicate or redundant programs, the team was left with approximately 30 to 50 programs from this part of the selection process. Each of these programs were assigned to one of the 17 program categories.

**Exhibit M-4  
Program Screening & Selection Process**



## **Step 2: California IOU Programs**

For the purposes of the California gap analysis, at least one California IOU program was needed in each program category. The team applied the screening criteria to the CPUC list of 2002 IOU energy efficiency programs and selected one California IOU program for each of the 17 categories. Programs were selected based on how well they represented their respective category, and on input from the PAC. Because of limitations in scope for this first phase of the Study, all IOU programs were not able to be included in each program category. More IOU programs could be included in future phases of this Study.

## **Step 3: California Non-Utility Programs**

A review of California non-utility programs was included in this analysis. Candidates were identified through the following sources:

- A Global Energy Partners “Summary” Study for the California Measurement Advisory Committee (CALMAC) on the impact of 2001 energy efficiency programs in California;
- CPUC decisions and non-utility program proposals;
- The ACEEE database on energy efficiency programs.

Candidate programs were screened using the standard criteria. Programs that only existed in the current 2002/2003 local programs were screened out from this phase of the Study based on the criteria that they had not completed a programmatic cycle by the data collection phase of this study (late 2003). The team, in conjunction with the PAC, selected 10 programs for inclusion in the analysis. These 10 programs were assigned to their respective program categories. Because of limitations in scope for this first phase of the Study, all non-IOU programs were unable to be included in each program category. More non-IOU California programs could be included in future phases of this Study.

## **Step 4: Random Program Selection**

After completing steps 1 through 3, there were 2-4 programs in each program category. The remaining one to three programs were selected using a stratified random selection approach.

A list of many of the energy efficiency programs in the United States was compiled. This list was not meant to be a complete census of all energy efficiency programs in the United States. Rather, it was designed to be representative and included most major programs.

To this list, approximately 50 programs nominated through two rounds of nominations for ACEEE's Profiles of Leading Energy Efficiency Programs but which did not make it into the list of 57 exemplary programs included in Step 1 above were added.

The completed list of programs was stratified by program category, and then randomly drawn from each category. Each drawn program was screened to ensure it met the standard criteria. The drawing was repeated until there were twice as many eligible programs as needed to complete each program category (the goal was 5 programs per category). Over-sampled programs were used as backup when candidate programs were later found to be unfit.

## Program Selection Challenges

The research team employed a purposefully academic method of program selection to ensure sufficient representation of programs that are already perceived as “good,” while allowing for a random selection of other programs against which to benchmark. The program screening and selection process utilized a combination of team-nomination, canvassing, secondary sources, and random stratified selection. This method worked well in selecting about half the programs for inclusion in the Study, but some of the original targets dropped out of the data collection process. The team sought additional program targets to fill those gaps. These program additions were made based on the program category needs, input from project team members, interviews with program managers and other industry experts, and further review of secondary sources.

The final program count fell short of the initial target of 100 programs for several reasons:

- First, the random selection method yielded many “soft” programs unsuitable for Study (i.e., programs that did not track participation or budgets, did not have measurable impacts, or did not really represent meaningful, discrete programmatic efforts).
- Second, it became clear that the diminishing returns of scouring niches for little-known programs did not justify the cost of the additional time and effort.
- Third, the Study sought to compare and contrast *unique* programs. The Program Screening Database listed fewer unique programs than expected as several programs that appeared to be unique initially proved to be virtually identical to other programs already in the Study.

Finally, it remains difficult to estimate how many good, unique programs exist in the universe of energy efficiency programs. The initial 100 programs targeted may be closer to the actual population than anticipated, resulting in a sample that pushes the bounds of the population.

The challenges of data collection are discussed further in Section 4.6.

## **4. DATA COLLECTION**

Primary and secondary data collection strategies for the Study are presented in this section. Primary data was collected at numerous levels, including needs assessment meetings and interviews with representatives of programs selected for benchmarking. Secondary data was collected through an extensive literature review and web-based research on existing energy efficiency programs.

Each data collection activity fed in sequence to the next data collection activity. For instance, needs assessment meetings were used to gather data on user preferences. That information, in turn, guided the use of the data collection instruments. Data from secondary research sources (e.g., program filings, evaluation studies, etc.) was included as necessary to support and guide each interview with a program representative. The overall data collection strategy is summarized in Exhibit M-5; highlighted tasks are discussed below. The screening database and benchmarking processes are described in detail in Section 2.

### **4.1 NEEDS ASSESSMENT MEETINGS**

The QC Team conducted several needs assessment meetings with prospective users of the Study and Database including third-party implementers in California, California utility program designers and implementers, and CPUC staff. The needs assessment meetings provided broad input into the benchmarking methodology and were used in developing the data collection instruments. They also helped the team identify programs that were reviewed, defined and selected as best practices, and determining the preferred format for project results. There were six needs assessment meetings scheduled, as discussed in further detail below.

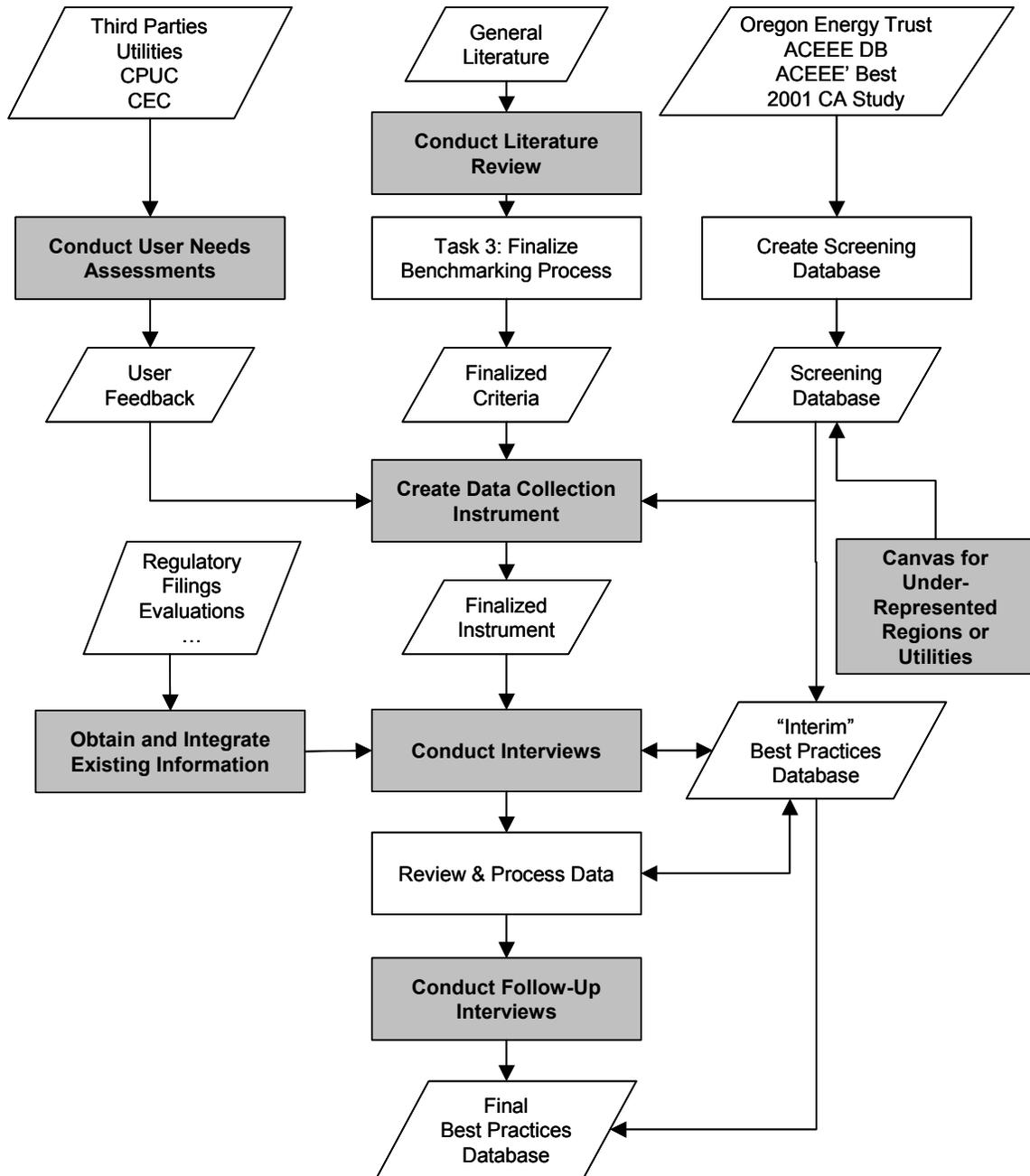
#### **Third-Party Users Needs Assessment Meetings**

A third-party user needs assessment meeting was held at the SoCalGas Energy Resource Center and another at PG&E's Pacific Energy Center in May 2003. The meetings focused on gathering input from potential third-party users of the Best Practices Study and Database. The conceptual model for the database was presented to attendees, followed by a brief discussion of the Study methodology. The discussion was then opened to attendees using the specifications from the Meeting Guide.

#### **Utility Needs Assessment Meetings**

Three meetings, held at PG&E, SDG&E and SCE in May 2003, focused on the needs of utility program designers and implementers. Attendees represented PG&E, SCE, and Sempra (SDG&E and SoCalGas). The discussion centered on the extent and adequacy of existing resources for program design and implementation. The team also looked at how implementers translate their ideas into programs in an effort to understand the most effective ways to develop and communicate the Study products for this audience.

**Exhibit M-5  
Data Collection Strategy**



## **CPUC Needs Assessment Meeting**

This meeting, also conducted in May 2003, focused on the needs and objectives of CPUC staff members as they relate to the Study. The team reviewed the Study and database structure with CPUC staff, then focused the discussion on the planned uses for the tool and on the level of detail desired.

## **Additional Meetings**

In addition to the above meetings, the Team also solicited input from national experts during a panel at the April 2003 ACEEE Conference.

### **4.2 LITERATURE REVIEW**

A number of different studies and databases were reviewed during the development of this study's methodology. This literature review principally focused on the program identification and benchmarking methods needs. Appendix A provides a summary of the literature reviewed.

### **4.3 PROGRAM POPULATION DATA COLLECTION**

Program data was gathered on over 400 energy efficiency programs in the United States and Canada, and were entered into a Program Screening Database. The main data sources for this Database are listed in Exhibit M-6. The level of detail on program data varies from program to program depending on the data source used and the amount of information available publicly for each program. The purpose of this data collection step was to identify and categorize a representative population of programs before the screening and selection process was applied as discussed in Section 3.2.

#### *Exhibit M-6 Sources for Program Screening Database*

- Energy Trust of Oregon Best Practices Study
- ACEEE's America's Best Study
- IOU CPUC Filings
- ACEEE State by State database of programs (20 states)
- California Summary Study of 2001 Energy Efficiency Programs
- DOE EIA list of utility DSM expenditures

The team did not seek complete data in this screening stage, but rather obtained as broad and varied a list of programs as was possible. If a program was selected, the team gathered additional information as described in Section 4.5.

## **Additional Canvas of Program Managers and Administrators**

In addition to the activities described above, the team also conducted a limited canvas of program managers and administrators for regions and utilities not well represented in our screening database. The canvas was designed to reduce the likelihood that programs with best

practices, at the component level, have been overlooked by our initial data collection efforts. This activity took the form of a short survey, which was first faxed to potential respondents, followed-up by phone contact to schedule an interview, or to conduct the interview on the spot.

#### **4.4 DATA COLLECTION INSTRUMENT**

This section presents the core portion of the questions that supported the benchmarking and comparison of programs across the three elements:

- The decomposition of programs into components and subcomponents that address program design, management, implementation and evaluation;
- The cross-cutting outcome metrics that measure a program's overall outcome through quantifiable indicators;
- The changeable and unchangeable contextual environment in which the program operates.

Input from the Users Needs Assessment meetings and the program population data collection informed the development of the detailed data collection instrument that was used to gather information on those programs selected for analysis. Appendix B presents the Best Practices survey instrument that guided in-depth interviews with program staff.

For each of these elements, the team developed a set of analysis questions to obtain and assess information on the various aspects of a program. Answers to these questions were used to systematically characterize program features and assess program performance within and across program categories. The Study team purposefully placed more emphasis on the questions that would assess best practices rather than the development of some scoring formula for determining what is “best.” This is the case for several key reasons:

- First, the team did not want to pre-judge what constitutes best practices. If these could be reduced to formula today, there would be no point in conducting the Study. Instead, the Study focused on maximizing the chances that best practice related information was collected.
- Second, even if it were possible to develop an a priori formal scoring formula for each component in theory, it would be unlikely that the team would be able to collect the requisite data and information necessary to drive the formula in practice. In collecting data for this Study, it was found that most of the quantitative metrics needed for this type of approach were unavailable for most programs.
- Third, in the end, the team was primarily interested in a Study product that emphasized specific practices rather than component scores.

The questions developed for the program decomposition model, crosscutting metrics, and program context formed the core of the data collection instrument and resulting program profiles. The data collection instrument included a number of fields used to track program characteristics and data that could be summarized into discrete categories as well as more open-ended questions.

A set of questions was formulated that was designed to extract information from primary interviews and secondary sources that supported a comparison and evaluation of programs at the subcomponent level. The following should be noted regarding these questions:

- The majority of these questions were asked directly of program managers and other implementers or evaluators, including those questions that are more subjective in nature and call for a qualitative assessment. In the final assessment, the Study considered both the input of program representatives and that of experts on our team.
- Some of these questions were more open-ended attempts to direct the respondents to provide potentially useful information on practices, activities and/or systems that contributed to a program's success or its shortcomings. For a number of subcomponents, a question was also included that allowed the respondent to go beyond the specific program under consideration to draw on their entire career of experience with energy efficiency programs to indicate specific practices that work well or should be avoided.

Complete questions are included in the final data collection instrument shown in Appendix B.

#### **4.5 PROGRAM BENCHMARKING DATA COLLECTION**

After programs were selected for inclusion into the final Best Practices analysis, the Team members gathered additional detailed program information for each item identified in the final program database specification and associated data collection form. Team members gathered program information primarily through interviews with program representatives. The following process was used:

##### **Step 1: Contact Program Representatives**

This initial contact explained to program representatives the purpose of the Study, and asked for the representative's participation, or for a go-ahead to contact members of their organization. Any readily available information such as regulatory filings, procedures manuals, marketing materials, evaluations, etc. were requested and a time and date for an in-depth interview was scheduled.

##### **Step 2: Identify and Review Existing Information**

For programs scheduled for an interview the team reviewed and completed the existing data in the Screening Database and gathered any additional required information through research.

##### **Step 3: Integrate Existing Documentation**

Prior to an interview, all existing information sources were integrated into the Best Practices Database (the database that contains all programs to be benchmarked) and into the data collection instrument. Any data inconsistencies were resolved or flagged.

#### **Step 4: Conduct Interviews**

During the in-depth interviews with program representatives, the team focused on collecting information not found during the initial research. The team also attempted to resolve any data inconsistencies.

In addition to collecting information germane to the program, program representatives were interviewed regarding their general knowledge of program development and tools that they have found useful when conceiving and constructing their own programs. Additionally program managers were queried about some of the best and worst practices they have seen in the industry, in their opinion, in their program area.

#### **Step 5: Update Best Practices Database**

Once the interview was completed, the Best Practices Database was updated and checked to see that the minimum amount of data necessary to keep the program in the Study was obtained. Any missing data or inconsistencies were flagged.

#### **Step 6: Submit Summary Profile to Program Representatives for Review**

The Study team circled back one last time with the program representatives to discuss the final data that was input to the Best Practices Database. A Summary Profile of each program was developed from interview and secondary data sources that focused primarily on the descriptive and factual characterizations of the program components. That Summary Profile (in electronic PDF format) was submitted to program representatives for their review. This review process helped resolve any data discrepancies with the program manager.

Once all interviews were completed, all data in the Best Practices Database was finalized to prepare for the analysis phase of the Study.

### **4.6 DATA COLLECTION CHALLENGES**

In general, willingness to participate in the project and interview was excellent. Most organizations and program managers were very interested in the project and believed there was value to them and their organization in participating. Outright refusals to participate were extremely rare. However, our comprehensive approach to data collection proved an arduous and ambitious task. The quality of the data collected from participating organizations was mixed. For some programs, the team obtained excellent qualitative findings and quantitative data on program costs and benefits. In other cases, qualitative depth and quantitative data was weak. Although data collection progress was quite good, there were several challenges. Note, however, that the type and extent of challenges encountered are generally within the range of what were expected going into the data collection phase of the Study. Specifically, the key challenges were as follows:

- Selected programs included on the original target list did not pan out.
- Programs or organizations that agreed to participate but were unable or unwilling to make time for the interviews within our data collection period.

- Gaps in the information collected despite lengthy interviews (average two+ hours) and mining of all available secondary sources.

Each of these issues is addressed below.

### ***Selected Programs Included On Our Original Target List That Did Not Pan Out***

Despite our extensive efforts to pre-screen programs for inclusion in the project, the team had to drop a number of programs that made it onto the list of targeted programs. As expected, this problem was more extensive for those programs that were randomly selected than for those that were identified by the Team and related secondary sources as high-priority targets. Key reasons for program dropouts include:

- ***The program no longer exists.*** This was not a fatal barrier if reliable ex post cost and savings data were available for a recent program year and the associated program manager could be identified and interviewed. However, in most cases, dead programs lacked available data and program managers to interview.
- ***The program was not really a program*** from the Study perspective but was rather a program element. The most common example of this were cases where an activity was identified as a program but that activity was not tracked separately from the larger actual program within which it occurred. For example, secondary sources indicated that an organization had a “Compressed Air” program but in actuality it was just a target area of a custom incentive or information program. In a few cases the savings associated with the element was tracked, but not the costs. For resource programs, the Study kept the detailed data collection focused on programs with costs and savings data.
- ***The program overlaps too much with other programs on the Study list.*** This was a particular problem in the Northeast where there is extensive convergence in program approaches. Some of this convergence is regulatory driven (e.g., requirements for statewide program consistency in places like Massachusetts), some associated with holding companies (e.g., Northeast Utilities desiring consistency across its Connecticut and Massachusetts distribution companies), some associated with regional initiatives (e.g., implementation of Cool Choice across many utilities in the Northeast), and some simply normal diffusion (e.g., program designers simply sharing design concepts and converging through peer-to-peer communication).

The upshot for the project was that there is less uniqueness in programmatic approaches than were anticipated going into the data collection phase. In general, if it appeared to the team that a program on the list was virtually identical to one for which data had already been collected, the inclination was to drop the program. The team tried to be flexible on this as there may be value in including some programs that appeared very similar but had different levels, performance, or lessons learned.

### ***Programs Or Organizations That Agree To Participate But Are Unable Or Unwilling To Make Time For The Interviews Within Our Data Collection Period***

A few programs and organizations expressed interest in the project and willingness to participate but under challenging terms, generally with respect to schedule. There were a few programs and organizations for which time was at a very high premium. In these cases, it was heard that program managers were stretched to the limit on their core job duties and could not free up time (or will not be permitted to free up time) until early next year. In one particular case a major utility with 10 programs included in the target list requested that the interviews be conducted in February 2004. We extended recruitment and data collection to early 2004 to accommodate this organization.

### ***Gaps In The Information Collected Despite Lengthy Interviews (Average Two Hours) And Mining Of All Available Secondary Sources***

Another challenge that was faced throughout the data collection process was that it was difficult in practice to obtain information on all of the areas covered in the data collection forms for each and every program. This was due to a variety of constraints, particularly the following:

- ***Information simply not available.*** In some cases, the information sought was neither available from secondary sources nor from the individual(s) interviewed. This pertained to both factual and judgmental information. Reasons for these gaps included program managers not having been the original designers of the programs they were running and interviewees not having thought about their programs at the level of decomposition in the Study forms. Other reasons included lack of formal program evaluations and ex post summary of program accomplishments (e.g., costs and impacts).
- ***Shortage of Quantitative Data.*** Considerable effort was required to obtain outcome metrics, where available. The amount of quantitative data collected by the research team varied widely by program. Many programs do not track basic performance indicators that have consistent meaning across markets, such as cost per kWh saved and market penetration, due to the difficulty of collecting this information. Furthermore, the usefulness of cost-effectiveness indicators was limited by differences in how costs and impacts are accounted for across programs. This dearth of comparable quantitative data, while not unexpected, points to an issue that demands attention from the industry. A number of program administrators appear to be under-evaluating their programs. The lack of regular, consistent evaluations compromised the availability of quantitative data and challenged the team's ability to compare empirical, ex post data across programs.
- ***Not enough time to obtain all desired information during interview.*** Despite conducting what were, on average, two hour or longer interviews it was still not possible to ask every question on the data collection form because the expected amount of information was simply overwhelming. This problem was anticipated from the outset of the Study and was a focus of the pre-testing process. The survey instrument was reduced substantially as a result of three-plus hour pretest interviews. Although the forms that resulted from the pre-test were more manageable than the longer initial forms, but the amount of information still exceeded what most interviewees could provide in two hours which was typically the limit of their willingness to participate

(though a number of interviewees have spent up to three or four hours on the phone with the team). This problem was addressed in two ways. First, interviewers used secondary sources wherever possible to complete the descriptive parts of the forms. The team attempted to populate as much of the form as possible from secondary sources. Combining the secondary sources with the interviews allows the team to focus the interviews on gaps in the secondary sources and those parts of the form that could only be addressed through the direct experience of the interviewee. The telephone interviews prioritized obtaining information that was unpublished, i.e., focusing on what is in the interviewee's head. Second, interviewers were forced to use a triage process to obtain the most important lessons learned from the interviewee. While valuable program insights were gathered in interviews, team members often asked only the most essential questions such as "what are the best practices in this area and why, do you think?"

- ***Multi-program scopes for single interviews.*** This is a related problem to the time constraint issues discussed in the previous bullet. In a few cases the interviewer was directed to a single person in an organization for multiple programs in the organizations that were selected for inclusion in the Study. This occurred (1) because a single manager was actually running multiple programs, (2) because a sector-level manager was the "brains" behind several programs and believed the actual program managers would not be able to provide the lessons learned the Study sought, or (3) because the interviewee was covering for other program managers who may have left the organization recently or were otherwise unavailable for the interview. Multi-program interviews had some advantage in that they allowed a strategic, multi-program manager to discuss their overarching program design philosophies and how their individual programs were designed to work together. However, the down side was that it was generally impossible to collect all of the component-specific lessons learned for each program that was selected for inclusion in this project in these types of interviews.
- ***Parts of form are not relevant to some programs.*** As was known throughout the design of the data collection process, the complete range of information targeted in the forms would not be relevant to every program. The forms were designed to capture relevant characteristics and findings for programs across a wide range of strategic and tactical objectives. Thus, parts of the form designed to capture information on one type of program were not be relevant to other types (e.g., the portions of the form with detailed information on a direct installation program was different from the detailed portions for a mass market advertising program). This is, of course, a key reason why the method and forms utilized a decomposition approach – to ensure flexibility and relevance across diverse program types. Gaps associated with strategy and tactical differences were not considered to be a problem, but were identified simply to provide a reminder on this.
- ***Program Managers Often Lack Strategic Perspective.*** The survey instrument solicited both factual information and strategic judgments from program staff and the team learned that a tradeoff existed between gathering factual information and strategic judgment. Program managers, on the front lines of program administration, are well-versed in the workings of the program but often lack a broader strategic perspective that lies with strategic sector or portfolio management. Many day-to-day program managers offered only limited lessons learned and best practices. However, the primary program manager was an appropriate choice for the initial and single point of contact, given resource constraints and the need to collect detailed comparative information.

## **APPENDICES**

## **APPENDIX A - LITERATURE REVIEW**

## **APPENDIX A - LITERATURE REVIEW FOR NATIONAL ENERGY EFFICIENCY BEST PRACTICES STUDY**

This literature review was conducted and compiled in summer 2003.

### ***I. REPORT SUMMARIES***

1. Eto, J., S. Kito, L. Shown, and R. Sonnenblich 1995. **“Where Did the Money Go? The Cost and Performance of the Largest Commercial Sector DSM Programs.”** LBL-38201 Lawrence Berkeley National Laboratory, Berkeley, CA.

This report calculates and compares the total resource cost for 40 of the largest 1992 commercial sector DSM programs. The calculation includes the participating customer's cost contribution to energy saving measures and all utility costs, including incentives received by customer, program administrative and overhead costs, measurement and evaluation costs and shareholder incentives paid to the utility.

The authors conducted exploratory analyses seeking to explain factors that help explain variations in program costs. They found **program type** and **program size** to be statistically significant factors, and their overall regression equations explained about 30% of the variance in the TRC of energy savings. The authors point out that measuring the cost of energy savings is difficult because accounting practices and conventions differ among utilities. In particular, information on participant costs is especially difficult to collect but is important: these costs account for almost a third of the TRC of energy savings. The authors also decided not to adjust the savings estimates because they found that differences in savings evaluation methods were not statistically correlated with changes in program costs, and because any adjustments would have had to be supported with very detailed examinations of assumptions, methods and underlying data.

Overall, the authors found that taken as a whole, the programs have been highly cost effective when compared to the avoided costs faced by the utilities when the programs were developed.

2. Peters, J. 2002. **“Best Practices from Energy Efficiency Organizations and Programs.”** Energy Trust of Oregon. Portland, OR.

This report presents the findings of a survey of best practices for organizational practices and programs in the energy efficiency industry for the Energy Trust of Oregon. The study contacted key informants to obtain over 70 program nominations. These programs were then reduced to 62 programs or practices targeted for further analysis. In the end, 45 programs or practices were summarized and analyzed for transferability to the Energy Trust.

The analysis was purely qualitative. The authors identified a list of key informants in conjunction with the Energy Trust of Oregon. These informants were contacted to compile a list of programs and organizational practices. Each organization or program

manager was then interviewed to obtain a summary of the organization or program. The team was able to complete summaries on 45 programs or administrative practices.

The selected programs or organizations were divided into four categories: organizational practices, residential energy efficiency programs, commercial and industrial energy efficiency programs, and miscellaneous energy efficiency programs. The organizations were screened for best practices in communications, organization structure, performance metrics, subcontracting, measure screening, program delivery, project contracting, project screening, circuit riders, non-profit staffing, contracting procedures and staffing ratio. Each organizational practice was analyzed for transferability to the Energy Trust. The residential programs were screened for best practices in trade allies & community action programs, in financing incentives, education, marketing outreach and quality control. The commercial and industrial programs were screened for best practices in trade allies, financing incentives, application process, marketing outreach and quality control. Finally, the miscellaneous programs were screened for best practices in trade allies and caps, financing incentives, education, marketing outreach and quality control.

The report provides in-depth qualitative summaries of each program or organization, including a discussion of why the program or organization was nominated and an analysis of transferability to the Energy Trust of Oregon. The appendices contain the names of the nominating parties, as well as copies of the survey instruments.

The author points out that many of the programs nominated for best practices have been programs that took time to evolve to their current state and have had time to adapt to a changing environment. They concluded that programs must be designed to respond to current conditions and must have good staff or contractors to make a difference.

3. West, P. 2002. **"Innovative Practices in Renewable Energy - A Review of Domestic and International Experience – Summary."** Energy Trust of Oregon. Portland, OR.

This report summarizes the finding of a review of international renewable energy efforts, conducted for the Energy Trust of Oregon. This qualitative analysis provides 16 individual program case studies and 5 individual administrative case studies, as well as an analysis of common pitfalls and remedies in the promotion of renewable resource programs.

Over 75 programs were initially catalogued. The list was reduced by applying various qualitative criteria:

- Incentives applicable to Oregon
- Technology consistent with the trust's mission
- Low incentives levels per kWh delivered
- High success rate of installations
- Market transformation and repeatability

- Addresses programs experienced elsewhere
- Ensures a wide technology and program mix in final selection

In addition, the authors also took into account industry input and recommendations from the Energy Trust and the Trust's Renewable Advisory Council to select the final cases.

In order to study administrative best practices, the Energy Trust provided a list of 10 administrative practices that were of interests. The authors then found 10 programs consistent with this list and qualitatively selected 5 for analysis.

In conclusion, the authors analyzed the selected programs and administrative agencies to identify major pitfalls to be avoided and remedies to use in developing effective renewable energy programs.

4. York, D. and M. Kushler 2003. "**America's Best: Profiles of America's Leading Energy Efficiency Programs.**" ACEEE Report Number U032. American Council for an Energy Efficient Economy, Washington, DC.

This report summarizes ACEEE 's project to conduct a national review and assessment of current utility-sector energy efficiency efforts in order to identify exemplary programs that might be replicated by those in other jurisdictions. The intent of the project was to provide information about top quality programs and recognize those who are doing an excellent job in their energy efficiency efforts.

ACEEE sought programs of all types: resource acquisition, market transformation, industry collaboratives, and professional education. They also sought programs that served all customer classes and covered a wide variety of end-use technologies.

The programs were selected through solicited nominations from key contacts at public service commissions, utilities, state energy offices and other related organizations, as well as from national experts. In identifying exemplary programs, ACEEE asked the nominators to consider the following factors: **direct energy savings, market transforming effects, evaluation results, qualitative assessment, innovation and reliability**. The nominating panel did not necessarily select programs for awards in all categories of programs received. Rather, the selections were based on recognizing programs for their achievements and that offered excellent models for evaluation and replication.

ACEEE received about 130 nominations for programs. Program categories were not defined ahead of time to encourage submission of a wide variety of program types. As a result the panel received nominations from a wide variety of program types, and decided not to consider K-12 energy education programs as well as RD&D programs.

ACEEE received nominations from programs serving customers in a total of 31 states, and administered by a wide variety of organizations (from utilities to state governments to private businesses). The types of programs nominated also showed wide variation

along three main dimensions: (1) sector served, (2) targeted end-uses, and (3) program services.

ACEEE created two categories of awards: exemplary and honorable mention. In the end it issued awards in 20 categories, and issued exemplary and honorable mentions in some cases to multiple programs in each category.

ACEEE also observed a list of common traits in leading programs, including: using comprehensive approaches, providing customized services, focus tightly on a service or technology, providing financial incentives, using partnerships and collaboratives, and providing effective supporting services.

## 5. **DEEP Survey Instruments Review**

The DEEP survey instruments are aimed to collect general program information such as program status, program objectives, program type and implementing agent, as well as specific and detailed information on program impacts, impact methodologies, program costs, program participation and documentation. The survey instruments break down the programs by sector (residential, commercial, industrial, agricultural and other) and subsectors. It also breaks down measures by end-use type (HVAC, Lighting, Water Heating, Motors, Building Envelope, Refrigeration, Demand Control and Other) and subtypes.

The data collection instruments seek to collect quantitative information on energy and demand effects, free riders and free drivers, utility costs (broken down by financial incentive type, administrative, M&V, planning, shareholder incentives and other), and non-utility costs (participant costs & other costs). The survey instruments are also designed to collect quantitative information on cost effectiveness and customer satisfaction.

The survey instrument is very detailed and comes with a well-documented set of instructions for completing the survey.

## 6. **INDEEP Database Review**

The International Database on Energy Efficiency Programs (INDEEP) is a web-based searchable database of energy efficiency programs to aid utilities and government agencies in designing effective programs. The database, started in 1994 continues to operate and is available at <http://dsm.iea.org/INDEEP/prog/home.asp>.

INDEEP is a worldwide database, open to participation from any interested country. The database compiles simple summaries of participating programs. The programs appear to be cataloged with the following searchable information, where available:

Country

Implementation agency (i.e. utility, government, ESCO, etc.)

Name

Program Status (i.e. pilot vs. full-scale)

Evaluation Status (i.e. ongoing, completed, etc.)

Ongoing/Terminated  
Energy Objectives (energy efficiency, load optimization or fuel switching)  
Energy Source Affected  
Energy Savings  
Participation Rate  
Residential Customer Target  
Non-Residential Customer Target  
Marketing Instruments (i.e. rebates, direct install, gifts, etc.)  
Marketing Method (i.e. direct mail, energy audit, etc.)  
Reason for DSM Activity (i.e. economic development, customer retention, etc.)  
Program Type (i.e. market transformation, load control, appliance standard, etc.)

The results of a search provide program summaries in either text or pdf format, and list key program characteristics if available. The data appear to be dated.

The 4-page INDEEP data collection survey instruments can be found at:  
<http://dsm.iea.org/NewDSM/Work/Tasks/1/Dci.html>

7. Nilsson, H. and Wene, C. 2001. "**Best Practices in Technology Deployment Policies**". Workshop on Good Practices in Policies and Measures, Copenhagen.

This article reports on a project initiated by the IEA to find out if there are some success-factors for projects aiming at developing markets for a more efficient use of energy. The analysis focuses on the deployment of energy efficient technologies (rather than programs) in the European Union, and uses CFL's as a case study. The findings suggest that successful programs have been developed over a long time, combine several policy issues and areas, reflect over their own results and rely on the force of the users (demand-driven).

The report does not compile or provide any specific information on energy efficient programs. The approach is market-based, i.e. looking at changes in demand, volume, cost and price to determine how successfully energy efficient technologies gain hold in a market. As such, it is of limited applicability to the study at hand.

8. Mowris, R. and Associates, 1998. "**California Energy Efficiency Policy and Program Priorities**". Prepared for the California Board for Energy Efficiency.

This report presents the results of a study to review existing, new and proposed energy-efficiency programs in California and other states, in order to develop criteria, methodology and rules to make recommendations to the California Board for Energy Efficiency (CBEE). The analysis selected 170 programs and grouped them into 52 groups of like-programs. To these were added 8 new program concepts. Taken together, these represent 60 program types consisting of 28 programs for the residential sector, 17 for the non-residential sector, and 15 for the new construction sector.

The study then evaluated the programs for recommendation to the CBEE using the CPUC *Adopted Policy Rules for Energy Efficiency Activities*. The study evaluated programs for cost-effectiveness, market transformation, and balanced portfolios. It also developed specific rules to evaluate incentive programs, SPC programs and CPUC activities.

The study then characterized the programs as either being *highly recommended*, *recommended*, *recommended pending cost-effectiveness*, *recommended pending further study*, *merits consideration with redesign*, or *does not meet criteria*. Only one program (Large CIA Downstream Incentives) received a highly recommended citation. Most programs fell into the Recommended category, while a few were recommended pending cost-effectiveness, since a complete cost-effectiveness calculation was not possible due to missing data. Note that the study did not decompose the programs into key elements and evaluate those elements individually.

To facilitate the analysis, Mowris and Associates developed criteria for dividing programs into groups of like programs, and created a program summary template to describe each of the program types. The program categories are further discussed below in Section II.2, and the summary template can be found in the Mowris report.

The final report also contains summaries of recommendations across all programs by administrator area, one and a half page summaries of each program recommendations and reasons for recommendation, and a 3 to 4-page summary for each program type in an Appendix.

9. Wisconsin Powers & Light Company, 2002. "**Assessment of Shared Savings Program: Final Report**". Global Energy Partners, Lafayette, CA.

This report summarizes the results of an analysis of the Wisconsin Shared Savings Program and of a benchmarking review of nationwide Standard Performance Contracting (SPC) programs, to provide a context for understanding the efficacy of the shared savings program in Wisconsin.

As part of the benchmarking study, the authors review and compare SPC programs in California, New York, the Pacific Northwest, Massachusetts, Texas, New Jersey and Colorado. The analysis is qualitative in nature and not necessarily consistent across all states. The report does distill best practices and lessons learned in a few cases, particularly as they apply to the Wisconsin situation. Table 3-5 provides useful summary information on the SPC programs studied in the states mentioned above.

10. Rufo, M., Lee, A., Corfee, K. & Tobiasson, W., 1999. "**Compilation and Analysis of Currently Available Baseline Data on California Energy-Efficiency Markets**". Xenergy, Oakland, CA.

This report presents the results of a study whose objective was to summarize available baseline data on California energy efficiency markets from a wide variety of sources, to support future evaluations. The study entailed benchmarking 92 studies and conducting a gap analysis in the inventory of identified studies and to make recommendations on data collection to facilitate future evaluations.

To conduct the study, the authors defined energy efficiency markets according to primary determinants (sector and vintage of the building or facility) and secondary determinants (which could be end-uses, sectors or activities). The primary determinants used were: residential, non-residential and new construction. The secondary

determinants varied across primary determinants. Taken together, 19 market categories were analyzed. The breakdown is discussed further in section II.2.

The types of information assessed were organized in three categories: (1) how the market is structured and how it functions, (2) energy efficiency products and services and (3) market actors. For each category, the authors studies different baseline characteristics, for a total of 15 unique baseline characteristics. For example, in the market structure and functioning section, the authors looked at characteristics such as distribution channels, market barriers, market size, etc. Likewise, characteristics in the Market Actors category address issues such as behavior, psychographics, etc.

In order to evaluate and score the baseline data available, the authors considered the following criteria: (1) timeliness (i.e. how recently the data was produced); (2) relevance to California; (3) reliability and validity of the data; and (4) completeness. Data elements could receive a score ranging from 0 to 2. Only data elements that met all four criteria receive a score of 2. Data point that met the first two criteria but only one of the third or fourth received a score of 1. All other data sets received a score of 0.

As part of the analysis, the authors conduct an in-depth gap analysis on the data sources they reviewed. To identify gaps, it was necessary to examine each specific market and the extent of information available on each specific baseline characteristic in that market. Using the market categories and baseline characteristics defined above, the authors analyzed the frequencies of studies scoring "2" across categories and characteristics. This then indicated areas lacking good comprehensive information.

11. "**Application for Approval of Energy Efficiency Plan**", 2003. Interstate Power & Light Company, Iowa Utilities Board.

Chapter 5 of this document describes a benchmarking analysis of energy efficiency programs designed and implemented by utilities outside of Iowa, in support of an energy efficiency plan submitted to the Iowa Legislature.

The chapter categorizes programs as residential or non-residential, and further breaks down each category into electric programs, gas programs and fuel independent programs.

The chapter distills key themes that have emerged from the analysis of programs, organized by residential, non-residential, and over-arching themes. The themes are describes in purely qualitative fashion.

Likewise, the benchmarking discussion is also purely qualitative, focusing on discussing, comparing and contrasting several aspects of different programs. The benchmarking analysis looks at end-uses within each segment and categorizes programs according to the following list:

- **Residential – Fuel Independent:** Information Oriented Programs, Bill Credit Programs, Rating Systems, Energy Audits, Weatherization Renovations and Retrofits, Low-Income Programs, Windows Programs, New Construction

- **Residential – Electric:** HVAC, GHP, Lighting, Water Heating, Refrigerators, Appliance Programs.
- **Residential – Gas:** HVAC, Appliances, Water Heating
- **Non Residential – Fuel Independent:** Comprehensive Retrofits, Comprehensive New Construction, School Retrofits and NC Projects
- **Non Residential – Electric:** Load Management, Commercial Prescriptive Rebates, Lighting, HVAC, HVAC Tune Ups, Chiller Programs, Geothermal Heat Pumps, Industrial Compressed Air, Industrial Motors, LED Traffic Lights, Farm Initiatives
- **Non Residential – Gas:** Gas HVAC Training, Gas HVAC Incentives, Commercial Water Heating, Commercial Cooking, Industrial Engines

12. **"California Summary Study of 2001 Energy Efficiency Programs"**, 2003. Submitted to CALMAC by Global Energy Partners, LLC, Lafayette, CA.

This study reviews California's energy efficiency programs in operation during the energy shortage crisis in 2001. The authors analyze all energy efficiency programs to determine the savings potentials, both in kWh and MW, as well as the costs, attributable to energy efficiency programs.

The authors review programs broadly categorized as residential, non-residential and new construction. The report provides detailed information on the programs themselves and on the evaluations of such programs. In particular, Appendix A provides summary information on each program, including program summary, cost and savings information, for a total of 218 programs. The detailed descriptions of each program in Section 3 also provide various specific figures on each program, such as the number of units installed (in some cases) or persistence information. While 218 programs are documented in this report, the authors only performed in-depth analyses for 154 programs.

In addition to the report, there is an Excel Spreadsheet documenting budgeted and spent costs as well as projected and documented savings.

13. **"Multi-Utility Low-Income Energy Efficiency Program Comparison Project"**, 1995. Submitted to the New York Low Income Evaluation Task Force, ULIEEP, by Cambridge Systematics, Inc., Cambridge, MA.

This study reviews and compares the evaluation results of utility energy efficiency pilot programs for the low-income segment in the state of New York. This comparison study uses a decomposition approach to evaluate and compare various elements of these programs. It distinguishes program characteristics (broken into program delivery, marketing, measures offered and administration) from the unchangeable context against which the program are run. In order to compare and contrast various program elements, the study uses a substitution methodology to help determine what changeable program element may contribute to a program's success. For a given program, the authors modify one changeable element of the program while keeping the others constant. They then

recalculate an outcome metric (TRC cost/benefit ratio) to determine whether the change in the program element results in an improved outcome. They then use the results of that analysis to determine whether the program element can impact the outcome of a program, identify elements that contribute to program success and explore program re-design possibilities.

14. Eto, J., E. Vine, L. Shown, R. Sonnenblick and C. Payne 1994. "**The Cost and Performance of Utility Commercial Lighting Programs.**" LBL-34967 Lawrence Berkeley National Laboratory, Berkeley, CA.

This report documents the review of 20 utility-sponsored commercial lighting programs from the Database on Energy Efficiency Programs (DEEP). The programs represent a mix of technologies and financial mechanisms, and account for 15% of total DSM spending in 1991. The authors point out to the absence of consistent data sets and reporting definitions as a barrier to achieving meaningful comparison across different programs. Nonetheless, they observe relationships between program costs and program design choices. For example, they find that the largest programs have been substantially less expensive than the smallest programs. They also find that several of the more costly programs were developed by utilities facing very high avoided costs.

15. "**Business Programs Evaluation: Best Practices Report**" prepared for the Focus on Energy Statewide Evaluation, State of Wisconsin, Department of Administration, Division of Energy, by Kema-Xenergy, March 2003.

This report documents a high-level analysis of best practices for energy efficiency programs, distilled from a review of programs offered by MidAmerican Energy, Xcel Energy, California, NYSERDA and Efficiency Vermont. The programs were reviewed to develop a set of best practices program profiles. The program profiles selected are: prescriptive rebate programs, energy analysis programs, new construction programs for commercial buildings, and specialized programs for niche markets. The programs reviewed are analyzed and compared for the markets they target, the end-uses they target, the delivery strategy or process they use, the promotion process, the financial incentive strategy, the technical assistance strategy, and the measurement and verification process.

The analysis is qualitative in nature and at a very high-level. It is geared specifically to address the needs of the Wisconsin Focus on Energy organization, and as such is of limited value to a nationwide study.

16. Various Non-Energy-Efficiency Best Practices Studies

We also conducted a web-based search of various non-energy-efficiency best practices studies to help assess whether other organizations, government entities or companies have tried to develop a similar methodology to analyze best practice components.

While there are many best practices studies or documents available on the Internet, few use (or at least document) a quantitative approach to analyze Best Practices. The search focused on studies to assess best practices within programs that seek to correct a market

imperfection (for example environmental externalities, renewable resources, mass transit). The following sources were found to have some potentially useful information:

1. National Governors' Association, Center for Best Practices:  
<http://www.nga.org/center/>

Reports on a variety of subjects but no real in-depth quantitative analysis.

2. Preserving Housing: A Best Practices Review:  
<http://www.auditor.leg.state.mn.us/Ped/pedrep/0305all.pdf>

Uses an innovative format for reporting.

3. City of Los Angeles Waste Water Program Best Practices Report:  
<http://www.ci.la.ca.us/cao/WasteWaterStudy>

Provides some quantitative analysis on the impact of implementing recommendations.

4. Best Practices for Comprehensive Tobacco Control Programs:  
[http://www.cdc.gov/tobacco/research\\_data/stat\\_nat\\_data/bestprac-dwnld.htm](http://www.cdc.gov/tobacco/research_data/stat_nat_data/bestprac-dwnld.htm)

## **II. THEMATIC SUMMARIES**

### **1. Program Screening**

All studies use a qualitative approach to screen programs for further analysis. In many cases, an initial list of criteria is developed ahead of time, against which a selection committee qualitatively rates the programs and determines which merit further review. In all cases, a selection committee or the funding agency provides final input as to which programs should be included. The following criteria are frequently used in the initial screening process:

- Transferability to the funding organization or region
- The need to obtain a wide technology and/or program mix in the final selection
- Typical success indicators (i.e. energy savings or participation rate)
- Availability of complete data or evaluation results.

### **2. Program Categorization**

A few studies broadly divide their analysis into both programmatic best practices (where the unit of study is a program), and administrative best practice (where the unit of study is an organization or administrative entity). Programmatic best practices tend to be categorized in extensive detail, whereas administrative best practices tend to be analyzed very qualitatively using a predetermined set of criteria.

Programs are often broken down into two levels, usually first by **targeted sector** and then by **targeted end-use**. Often, a catchall “other” or “miscellaneous” category is created to capture programs that cannot easily fit into a sector/end-use category. In some cases, the second-level breakdown is usually a mix of **end-use, program type and/or program sub-sector**.

The CABD study looks at markets (rather than programs) and divides them into 19 categories. The first level break down is a categorization that distinguishes residential programs, non-residential programs, and new construction programs. The residential programs are subsequently divided by end-use or activity (HVAC, lighting, appliance, shell, and renovation). The non-residential programs are also divided by end-use or activity (HVAC, lighting, motors, refrigeration, office equipment, compressed air, shell, process, comprehensive retrofit, and remodeling or renovation). Finally, the new construction programs are divided into sectors (residential, commercial, industrial and agricultural).

The Mowris study uses by far the most complex method to characterize its programs and divide them into groups of “like programs”. The Mowris study breaks down the programs by CBEE administrator area, then by market segment and delivery strategy, then by end-uses and then by market actors. Note that the purpose of this grouping was to create categories that would be used to make general recommendations to the CBEE. In total, the Mowris study generated 28 types of nonresidential programs, 17 types of residential programs, and 15 types of new construction programs.

Outside of the Mowris study, none of the other studies analyzed go beyond a two-level breakdown. In many cases, the breakdowns appear to have been created after the initial screening of available programs was completed. For instance, ACEEE’s “Profiles of Leading Energy Efficiency Programs” study purposely did not define the program categories eligible for consideration in the nomination process. Nor did it find it necessary to select exemplary programs in all categories of programs received.

### 3. *Dimensions of Analysis*

The Mowris study is the only study that has clearly defined dimensions of analysis to evaluate its programs. As described in the summary above, Mowris and Associates use a set of criteria to evaluate program performance (as a whole) and applies a distinct set of rules to evaluate the criteria for recommendation. In general, the stronger the cost-effectiveness and market transformation plan, the higher the recommendation. Evidence supporting cost-effectiveness and evidence supporting a market transformation plan are also crucial. Note, however, that program elements are not scored individually.

Surprisingly, most of the other studies have not established rigid dimensions of analysis in order to score or select best practices or programs. The Energy Trust of Oregon Best Practices study, for instance, identifies areas of study for each program (for example, it summarizes its residential programs according to trade allies, financial incentives, education, marketing outreach and quality control), but it does not specifically rate each program according to these areas. Rather, it summarizes programs individually and qualitatively. Similarly, the ACEE “Profiles” study does not break down its analysis in the summary to its report. The Wisconsin Shared Savings analysis takes a look at SPC

programs in many states and provides summaries on program structure, M&V, operations & delivery, minimum program size, delivery mechanism and impacts, but those fields are not consistently analyzed across all states.

It appears that in many cases, the initial program screening criteria are the only dimensions of analysis. Once the programs have been screened pass, the analysis becomes purely qualitative. The selection and scoring of programs is based on a consensus by a committee.

#### 4. *Analysis Metrics*

None of the best practices studies reviewed thus far use any sort of formal metrics to score the programs selected. However, in their study of the performance of the largest Commercial Sector DSM programs, Eto et al. identify two variables (program type and program size) as statistically significant when analyzing regression equations for the Total Resource Cost. The **program type** variable distinguishes between direct install and rebates. The **program size** variable is a measure of the annual kWh saved. Note that the authors only find weak (not statistically significant) relationships between the TRC and the presence of shareholder incentives, the economic lifetime of savings, the savings per participant and the avoided costs.

**APPENDIX B – DATA COLLECTION LETTER AND FORMS**

## APPENDIX B – DATA COLLECTION LETTER AND FORMS



### National Energy Efficiency Best Practices Study

The California Public Utility Commission (CPUC) is sponsoring a national study of best practices in energy efficiency.<sup>2</sup> The stated goal of the study is to "establish a Best Practices database and website to assist in designing the most efficient and effective energy efficiency programs." A team of researchers lead by Quantum Consulting has been charged with performing the study, which is scheduled to be published in early 2004.

Your program, *Xcel's Custom Efficiency Program*, has been identified as a candidate for analysis. We have already reviewed publicly available background information on this program, and we would now like to interview you to obtain a deeper understanding of your experience designing, managing, implementing and evaluating this program.

As a first step, we would like to conduct a quick outreach interview (approximately 10 minutes) to verify program information and gather any additional information on secondary sources that we ought to review. Once this review is complete, we will contact you at a mutually agreed upon time to conduct an in-depth interview, scheduled to last approximately 1 to 1½ hours. The purpose of this in-depth interview will be to verify the information collected to date and probe further on lessons learned and best practices.

If you would like further information, please consult the *Frequently Asked Questions* list below. If you have any other questions, or comments, do not hesitate to contact us via phone or email.

Regards,

Mike Rufo  
Sr. Vice President  
Quantum Consulting

Cc: Best Practices at Quantum Consulting

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<sup>2</sup> This study is managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

## **FREQUENTLY ASKED QUESTIONS**

**How will you keep the confidentiality of my data?** We will treat the information you provide with strict confidentiality. While our research team will have access to the raw data we collect as part of the analysis phase, we will only publish synthesized data on lessons learned and best practices. In cases where our published results describe or quantify your specific program(s) or efforts in detail, we will give you the opportunity to review our findings and ultimately approve any published results.

**Will you distribute my contact information?** We realize that you may have concerns regarding the use of your contact information in our final published report. We would like to request that at a minimum, a name and an email address be provided as a contact point for users that want to obtain further information on your program or efforts. We will only provide more complete contact information with your consent.

**How much of my time will this require?** We have and will continue to collect as much information from secondary sources as possible. We would appreciate you pointing us to any other data sources that might facilitate our evaluation of the program and minimize your involvement. Our initial outreach interview should last approximately 10 minutes, and is designed to help us validate our current understanding of the program and have you point us to any data sources we might have omitted. Our in-depth interview is expected to last about 1½ hours, though that will depend on the amount and quality of data we can collect beforehand. We may follow up with one additional contact to clarify or qualify any final data points. Finally, we will provide you with draft results for your review and analysis, and the review of these results should not take more than a half-hour of your time.

**How is this study different from other Best Practices studies?** We realize that you may have participated in a few best practices studies already, and may be somewhat hesitant to participate in yet another one. This study takes a novel approach: it attempts to compare and contrast programs at a detailed level, and extract meaningful information for design of future energy efficiency programs. For example, our study will compare and contrast the tracking and reporting mechanisms of residential lighting incentive programs and extract best practices at that level of the detail. The study will also take a look at the overall outcome and context of a program. We hope that you'll find our approach well worth your time. In addition, a systematically organized database of programs is being developed. In a future phase of this study, this database will be available on-line and will allow users to search for program features and lessons learned of interest.

**How did my program get into your study?** We have selected programs from a variety of sources. In some cases, the selected programs were already recognized as outstanding programs in one or several other best practices studies. In other cases, the programs were nominated by our experts as programs that could provide important lessons or had demonstrated a unique approach. Finally, some programs were selected randomly from a large list of energy efficiency programs across the United States and Canada. In all cases, we expect the selected programs to provide important lessons learned or examples of innovative and successful approaches to promoting energy efficiency.

**Will this study be updated?** This study is expected to be the first step in an ongoing effort to catalog best practices in energy efficiency. In order to keep the results meaningful, our sponsors may decide to update the data on a periodic basis or after major program changes. Future updates are not currently within the scope of this study.

BPID #:

*National Energy Efficiency Best Practices Study*  
**DATA COLLECTION INSTRUMENT**  
OUTREACH CONTACT (Version 5)

## 1. Summary Information

### General Information

Contact Name:		Phone:	
Title:		Fax:	
Company:		E-mail:	
Street Address:			
City:		Interviewer:	
State:		Call Dates:	
Zip Code:		Completion Date:	

### Name of Referring Person/ Organization

Contact Name:		Organization:	
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### Program-Specific Information

Implementing Organization Name:			
Program Name:			
Program ID #		Program Type:	
Selection Method:	<input type="checkbox"/>	Random	
	<input type="checkbox"/>	Team Nominated	Source: <input type="text"/>

## 2. Introduction

Hello, my name is \_\_\_\_\_ and I am calling on behalf of the California Public Utilities Commission and Pacific Gas & Electric. May I please speak with \_\_\_\_\_?

PG&E and the investor owned utilities of California are sponsoring a project to develop a national study of best practices in energy efficiency programs, as a guide for future program design. The unique feature of this project is the intent to identify and compare best practices at the program *component* level. For example, we will be comparing and contrasting outreach and marketing activities across groups of like programs.

To this end, we have selected or nominated approximately 100 programs for review. We are contacting you today because your program, -- **(READ PROGRAM NAME FROM TABLE ABOVE)** --, has been identified as a candidate, and we would like to collect additional information from you. Your input to this research would be

very valuable and, if possible, we would like to solicit your participation. The first step would be an outreach interview (which we can conduct right now) to verify the information we have collected so far and gather additional input from you. This first interview should not last more than 10 minutes. We will then review your input and any materials you point us to, and contact you again for a secondary interview, at your convenience, which should last no more than approximately an hour.

Would you be willing to participate in this process?

<input type="checkbox"/>	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	HESITANT
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*[IF HESITANT:]* Your input to this survey would be invaluable, and would help publicize some of the unique and successful activities you have undertaken in your efforts to design and manage this program. If you are not able to participate right now, we can certainly schedule a date and time that is more convenient for you.

*[IF SCHEDULED:]*

Callback date/time:	
---------------------	--

### 3. Review of Existing Data

We have categorized your program as a – **(INSERT PROGRAM CATEGORIZATION DESCRIPTION HERE)** – program. Is this correct?

<input type="checkbox"/>	YES	<input type="checkbox"/>	NO
--------------------------	-----	--------------------------	----

[IF NO] Flag the program for a change in category and comment:

--

The following is what we understand the main program characteristics and activities to be. Please correct any inaccuracies or provide comments as necessary.

#### 3.1 Implementing Organization

<input type="checkbox"/>	1. Utility	<b>Comments:</b>
<input type="checkbox"/>	2. Non-profit	
<input type="checkbox"/>	3. Government Agency	
<input type="checkbox"/>	4. Private firm	
<input type="checkbox"/>	5. Other (specify):	

#### 3.2 Program Type (Check all that apply)

Incentive		Information & Training	
<input type="checkbox"/>	Prescriptive Rebates	<input type="checkbox"/>	General Education
<input type="checkbox"/>	Custom Incentives/SPC	<input type="checkbox"/>	Mail Audit
<input type="checkbox"/>	Bill Credits/Rate Discounts	<input type="checkbox"/>	Telephone Audit
<input type="checkbox"/>	Services	<input type="checkbox"/>	On-Site Audit

<input type="checkbox"/>	Direct Installation	<input type="checkbox"/>	On-Line Audit
<input type="checkbox"/>	Financing/Loans/Leasing	<input type="checkbox"/>	Design Assistance
<input type="checkbox"/>	Free Measures	<input type="checkbox"/>	Feasibility Studies
		<input type="checkbox"/>	End-User Training
		<input type="checkbox"/>	Trade Ally Training
<input type="checkbox"/>	Other (specify):	<input type="checkbox"/>	Other (specify):
<b>Comments:</b>			

### 3.3 Primary Market Events Targeted

<input type="checkbox"/>	All	<b>Comments:</b>
<input type="checkbox"/>	New Construction/Major Renovation	
<input type="checkbox"/>	Existing Construction - All	
<input type="checkbox"/>	Existing Construction - Retrofit	
<input type="checkbox"/>	Existing Construction – Natural Replacement	
<input type="checkbox"/>	Existing Construction – Early Retirement	

### 3.4 Primary Program Focus

<input type="checkbox"/>	End-User	<b>Comments:</b>
<input type="checkbox"/>	Supply-Side	
<input type="checkbox"/>	Both	

### 3.5 End User Target Markets

[Note: if the end-users are not the primary focus of the program, please check the box below to ensure the program is not classified as an end-user targeted program] (Check all that apply)

<input type="checkbox"/>	End-users are not the primary focus of this program, but the following are the ultimate end-users of the services/products targeted by the program.
--------------------------	---

<input type="checkbox"/>	<b>ALL SECTORS</b>	
	<b>Residential</b>	<b>Commercial</b>
<input type="checkbox"/>	ALL	<input type="checkbox"/> ALL
<input type="checkbox"/>	Single-Family	<input type="checkbox"/> Offices

<input type="checkbox"/>	Multi-Family	<input type="checkbox"/>	Retail
<input type="checkbox"/>	Mobile Home	<input type="checkbox"/>	Restaurant
<input type="checkbox"/>	Low-Income	<input type="checkbox"/>	Public (govt.) Facilities
<input type="checkbox"/>	Other (specify):	<input type="checkbox"/>	Grocery Store
		<input type="checkbox"/>	Health Care
<b>Industrial</b>		<input type="checkbox"/>	Education
<input type="checkbox"/>	ALL	<input type="checkbox"/>	Lodging (Hotels/Motels)
<input type="checkbox"/>	Other (specify 2-digit SIC code(s):	<input type="checkbox"/>	Warehouses
		<input type="checkbox"/>	Other (specify):
<input type="checkbox"/>	Other (specify):		
<b>Comments:</b>			

### 3.6 Customer Sizes Targeted [Commercial & Industrial Only]

<input type="checkbox"/>	Small < 20 kW	<b>Comments:</b>
<input type="checkbox"/>	Medium 20-100 kW	
<input type="checkbox"/>	Large 100-500+ kW	

### 3.7 Supply Side Actors Targeted/Involved

(Check all that apply)

**[Note: if supply side actors are not the primary focus of the program, please check the box below to ensure the program is not classified as an supply-side targeted program]**

<input type="checkbox"/>	Supply-side actors are not the primary focus of this program, but the following actors participate in the program delivery.
--------------------------	---

<input type="checkbox"/>	A/E Firms	<input type="checkbox"/>	Manufacturers	<b>Comments:</b>
<input type="checkbox"/>	Realtors	<input type="checkbox"/>	Wholesalers/Distributors	
<input type="checkbox"/>	Developers	<input type="checkbox"/>	Retailers	
<input type="checkbox"/>	Builders	<input type="checkbox"/>	Energy Service Companies	
<input type="checkbox"/>	Contractors	<input type="checkbox"/>	Non-Profit/ Not-for-Profit Groups	
<input type="checkbox"/>	Trade Associations	<input type="checkbox"/>	Government	

### 3.8 End Use and End Use Technologies

**[Enter specific measures only when the program focuses heavily on specific measures. Otherwise, enter Multiple Measures]**

<input type="checkbox"/>	<b>All Measures</b>	
<b><u>HVAC</u></b>		<b><u>Lighting</u></b>
<input type="checkbox"/>	<i>Multiple Measures</i>	<input type="checkbox"/> <i>Multiple Measures</i>
<input type="checkbox"/>	High Efficiency DX/HP	<input type="checkbox"/> Compact Fluorescents
<input type="checkbox"/>	High Efficiency Chillers	<input type="checkbox"/> Electronic Ballasts
<input type="checkbox"/>	High Efficiency Room/Terminal	<input type="checkbox"/> Reflector Systems
<input type="checkbox"/>	Economizers	<input type="checkbox"/> Efficient Fluorescent Lamps (T-8, T-5, etc.)
<input type="checkbox"/>	Control Systems	<input type="checkbox"/> Lighting Controls
<input type="checkbox"/>	Variable Speed Drives	<input type="checkbox"/> Occupancy Sensors
<input type="checkbox"/>	Occupancy Sensors	<input type="checkbox"/> High Intensity Discharge
<input type="checkbox"/>	Duct Sealing and Balancing	<input type="checkbox"/> Operations and Maintenance
<input type="checkbox"/>	Operations and Maintenance	<input type="checkbox"/> Day lighting
<input type="checkbox"/>	Equipment Testing/Tune-up	<input type="checkbox"/> Other (specify):
<input type="checkbox"/>	Commissioning	
<input type="checkbox"/>	Retro-commissioning	
<input type="checkbox"/>	Space Heating	
<input type="checkbox"/>	Heat Pump	
<input type="checkbox"/>	Other (specify):	<i>(Continued on next page)</i>
<b><u>Water Heating</u></b>		<b><u>Appliances</u></b>
<input type="checkbox"/>	<i>Multiple Measures</i>	<input type="checkbox"/> <i>Multiple Measures</i>
<input type="checkbox"/>	Load Control (Cycling)	<input type="checkbox"/> Refrigerators
<input type="checkbox"/>	High Efficiency	<input type="checkbox"/> Dish Washers
<input type="checkbox"/>	Insulation Blankets	<input type="checkbox"/> Clothes Washers
<input type="checkbox"/>	Low-Flow Showerheads	<input type="checkbox"/> Clothes Dryers
<input type="checkbox"/>	Low-Flow Aerators	<input type="checkbox"/> Office Equipment
<input type="checkbox"/>	Solar Assisted	<input type="checkbox"/> Plug Load
<input type="checkbox"/>	Operations and Maintenance	<input type="checkbox"/> Other (specify):
<input type="checkbox"/>	Other (specify):	
<b><u>Motors</u></b>		<b><u>Building Envelope</u></b>

<input type="checkbox"/>	Multiple Measures	<input type="checkbox"/>	Multiple Measures
<input type="checkbox"/>	High Efficiency	<input type="checkbox"/>	Insulation
<input type="checkbox"/>	Variable Speed Drives	<input type="checkbox"/>	Infiltration Control
<input type="checkbox"/>	Operations and Maintenance)	<input type="checkbox"/>	Glazing and Glazing Control
<input type="checkbox"/>	Other (specify):	<input type="checkbox"/>	Operations and Maintenance
		<input type="checkbox"/>	Windows
		<input type="checkbox"/>	Other (specify):
<b><u>Industrial Process</u></b>		<b><u>Refrigeration</u></b>	
<input type="checkbox"/>	Multiple Measures	<input type="checkbox"/>	Multiple Measures
<input type="checkbox"/>	Compressed Air	<input type="checkbox"/>	High Efficiency
<input type="checkbox"/>	Motors	<input type="checkbox"/>	Controls
<input type="checkbox"/>	Pumps	<input type="checkbox"/>	Variable Speed Compressors
<input type="checkbox"/>	Other, Specify:	<input type="checkbox"/>	Multi-Stage Compressors
		<input type="checkbox"/>	Operations and Maintenance
		<input type="checkbox"/>	Commissioning
		<input type="checkbox"/>	Other (specify):
<input type="checkbox"/>	Other, Specify:		
<b>Comments:</b>			

### 3.9 Best Practices Review Period

We are trying to review programs that have completed a full programmatic cycle<sup>1</sup>, so that we can obtain as much evaluation information as possible. Please indicate the one-year period over which we should be reviewing your program to obtain the most useful and complete picture of program activities.

Best Practices Study data covers program activities	From:		To:	
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## 4. Program Objectives and Description

<sup>1</sup> A complete cycle of program design, completed implementation, and documentation of accomplishments

**Program Synopsis [short summary of Outreach 4.2 Description and 4.1 Goals/Objectives]:**

Please summarize the program’s goals and objectives and provide a general summary description of the program in your own words:

**4.1 Program Goals and Objectives (probe for resource acquisition, market transformation, equity, peak/energy, etc.):**

**4.2 Program Description**

**5. Review of Secondary Sources and Cost-Effectiveness Data**

Our approach for the data collection phase of our study is to complete as much of our data collection as we can by using publicly available secondary source such as evaluation reports and filings. After reviewing those sources, we would conduct an interview with you to obtain additional information and confirm that we have summarized information and data from the secondary sources properly. Although we have begun a preliminary search of readily and publicly available secondary sources that relate to your program, we want to be sure we obtain all of the appropriate secondary sources that are publicly available. First, I’d like to ask you what types of sources are available for this program and then I’d like to have you go over with me which specific studies or reports we should review and how best to obtain them. Which of the following types of sources and data are available for this program:

**Review of Data Sources Located Prior to Outreach**

From our own research so far, we have found the following studies and reports associated with your program and want to confirm whether these are sources that we should use to help us characterize the program prior to conducting our more in-depth interview with you:

**Studies and Reports Already Found:**

Report Name	URL:	OK to Use?
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	<i>http://</i>	<input type="checkbox"/>

What additional sources are available on your program and what is the best way to obtain them:

**Sources Identified by Interviewee:**

<b>Report Name</b>	<b>URL:</b>	<b>Mailed?</b>
	<i>http://</i>	<input type="checkbox"/>

## 6. Follow-up Schedule

This completes the initial outreach interview. Thank you for your time! We will now take a closer look at the secondary data sources we have collected and you have provided, and review the program in-depth. We would then like to contact you again to conduct a more in-depth interview regarding your program, and its various components, such as program design, program implementation, program management and program evaluation and adaptability. Would you like to schedule this follow-up interview now, or would you prefer that we call you at a later date to schedule the interview?

<input type="checkbox"/>	<b>Interview Scheduled</b>	Date:		Time:	
<input type="checkbox"/>	<b>Call Back to Schedule</b>	Date:		Time:	
<b>Comments:</b>          					

*National Energy Efficiency Best Practices Study*  
**DATA COLLECTION INSTRUMENT**  
**In-Depth Interview (Version 10)**

**Confirm/Update Outreach Interviewee/Interviewer Information**

Contact Name:		Phone:	
Title:		Fax:	
Company:		E-mail:	
Street Address:			
City:		Interviewer:	
State:		Call Dates:	
Zip Code:		Completion Date:	

**1. Introduction and Outreach Summary**

Thank you for agreeing to participate in our follow-up in-depth interview. We have reviewed the information collected so far and have developed as complete a picture of your program as possible. We would now like to ask some detailed questions about the general outcome of the program (including lessons learned), some specific questions about various components of your program, and a few questions about the environment in which the program operated. We have already incorporated data from secondary sources into this data collection form, so in some cases we may ask you to simply verify or further comment on data we already have acquired.

OS1. Note any clarifications needed from the outreach interview here, and comments from the respondent:	<input type="checkbox"/> NA
<b>Describe:</b>	

OS2. Review Section 3.9 of the outreach interview, and enter any additional comments or data in the box below:	<input type="checkbox"/> NA
<b>Describe:</b>	

**2. Program Context and Environment**
**Program Context Summary [short summary of PC1 – PC5]:**

PC1. Where is the program in its lifecycle, and how does this relate to the performance of the program in the year under consideration?	<input type="checkbox"/> NA
<b>Describe:</b>	

PC2. Were there any changes in regulatory/policy objectives during the	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
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implementation period or across program years that significantly affected the program's performance?			
<b>Describe:</b>			

PC3. Were there any changes in the funding levels during the implementation period or across program years that significantly affected the program's performance?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PC4. Were there any other unusual circumstances associated with the program year under consideration?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

### 3. Cross-Cutting Metrics Information

<b>Quantitative Data Summary [if participation rate, program costs, savings, NTG or TRC are not available, explain why]:</b>

#### 3.1 Market Definition

MI1. Please define the target market for your program:	<input type="checkbox"/> NA
<b>Describe:</b>	

MI2. If applicable, please describe the units used to track participation in the program. For example, is participation measured based on rebates issued, participants in a training seminar, measures installed?	<input type="checkbox"/> NA
<b>Describe:</b>	

MI3. If applicable, please describe your market share and the associated units used to measure it.	<input type="checkbox"/> NA
<b>Describe:</b>	

#### 3.2 Participation

MI4. Please complete the following table:	
	<b>Selected Year</b> (    )
<b>Participants</b>	
<b>Eligible Customers</b>	

<b>Participation Rate</b>	
<b>Market Share (if applicable)</b>	
<b>Close Rate (if applicable)</b>	
Is detailed participation data available (e.g., by measure and segment)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
List source(s) ID#s with detailed participation data (ID#s link to Appendix)	

### 3.3 Impacts

MI5. Please complete the following table:		
<b>Costs and Savings Breakdown</b>		<b>Selected Year ( )</b>
<b>Costs</b>	<b>Total Program Costs (in \$ thousands)</b>	
	Administrative Costs	
	Incentive Costs	
	Marketing, Outreach, & Information Costs	
	Implementation Costs	
	Verification and Reporting Costs	
	Measurement and Evaluation Costs	
<b>Net Energy Saving</b>	Net Electricity savings (MWh)	
	Net system peak demand savings (MW)	
	Net Winter system peak demand savings	
	Net Gas Savings (Mtherms)	
<b>Gross Energy Savings</b>	Gross Electricity savings (MWh)	
	Gross Summer system peak demand savings (MW)	
	Gross Gas Savings (Mtherms)	

MI6. Is system Summer peaking or Winter peaking?	<input type="checkbox"/> <b>Summer</b>	<input type="checkbox"/> <b>Winter</b>
--	--	--

MI7. Please describe actual activities included in program cost categories used:	<input type="checkbox"/> NA
<b>Describe:</b>	

MI8. Please provide the Net-to-Gross Ratio used to calculate benefits, and describe what is included in the ratio, e.g., free riders, participant spillover, non-participant spillover, realization rate, etc.:		Value
<b>Describe :</b>		

MI9. Describe the Source of Cost Data
---------------------------------------

<input type="checkbox"/>	Forecasted	<input type="checkbox"/>	Actual	<input type="checkbox"/>	Combination	For what year: _____
MI10. Provide the basis for cumulative Savings data						
<input type="checkbox"/>	Forecasted installations	<input type="checkbox"/>	Actual installations	<input type="checkbox"/>	Combination	For what year: _____
MI11. Provide the basis for the per unit savings data						
<input type="checkbox"/>	Estimated	<input type="checkbox"/>	Measured	<input type="checkbox"/>	Combination	For what year: _____

MI12. Did you consider any non-energy benefits when evaluating the program?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

MI13. Fill out the table below on measures of program cost-effectiveness:	Test Value	Discount Rate	Average Measure Life
<input type="checkbox"/> <b>Total Resource Cost test</b>			
<input type="checkbox"/> Utility cost test			
<input type="checkbox"/> Participant test			
<input type="checkbox"/> RIM test			
<input type="checkbox"/> Societal test			

MI14. Fill out the table below on lifecycle program costs:	Value	Unit
<b>Levelized Total Resource Cost:</b>		
Levelized Utility Resource Cost:		
Average measure lifetime (should be same as used in B-C tests):		
Real discount rate:		%

MI15. Is additional detailed impact/evaluation data available (e.g., by measure and segment)?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
List source(s) ID#s with detailed participation data (ID#s link to Appendix)				

### 3.4 Market Barriers

MB1. Has the program achieved any sustainable changes in energy efficiency adoption, or reductions in market barriers? If so, please direct us to the evidence supporting this.	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

MB2. Please describe what market barriers, if any, you are trying to overcome through this program:					
End User	Supply-Side	Barrier	End User	Supply-Side	Barrier

<input type="checkbox"/>	<input type="checkbox"/>	Information or Search Costs	<input type="checkbox"/>	<input type="checkbox"/>	Misplaced or Split Incentives
<input type="checkbox"/>	<input type="checkbox"/>	Performance Uncertainties	<input type="checkbox"/>	<input type="checkbox"/>	Product or Service Unavailability
<input type="checkbox"/>	<input type="checkbox"/>	Asymmetric Information and Opportunism	<input type="checkbox"/>	<input type="checkbox"/>	Externalities
<input type="checkbox"/>	<input type="checkbox"/>	Hassle or Transaction Costs	<input type="checkbox"/>	<input type="checkbox"/>	Non-Externality Pricing
<input type="checkbox"/>	<input type="checkbox"/>	Hidden Costs	<input type="checkbox"/>	<input type="checkbox"/>	Inseparability of Product Features
<input type="checkbox"/>	<input type="checkbox"/>	Access to Financing	<input type="checkbox"/>	<input type="checkbox"/>	Irreversibility
<input type="checkbox"/>	<input type="checkbox"/>	Bounded Rationality	<input type="checkbox"/>	<input type="checkbox"/>	Other, specify:
<input type="checkbox"/>	<input type="checkbox"/>	Organizational Practices or Customs			
<b>Comments:</b>					

### 3.5 General Questions on Outcome Metrics

OM1. Were the observed program outcomes in terms of participation rates, overall cost-effectiveness and market effects in line with your expectations and, if applicable, program theory?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

OM2. Are there any caveats to the outcome metrics of which we should be aware?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

OM3. How well do you think these observed program outcomes compare with those of other programs implemented in similar markets?	<input type="checkbox"/> Better	<input type="checkbox"/> Worse	<input type="checkbox"/> About the same
<b>Describe:</b>			

## 4. Program Component Information

### 4.1 Program Management: Project Management

#### Project Management Summary [Summarize PM1 and PM3]:

PM1. Please describe the organization plan and/or management structure, including roles and responsibilities among in-house staff and contractors.

NA

**Describe:**

PM2. What was the approximate staffing for this program, in terms of Full-Time Equivalent (FTE), including subcontractors, marketing, representatives, apportioned supervision & management:

**Number of FTE's associated with program:**

**Basis/Caveats:**

PM3. Describe the implementation structure:

#### Implementing Organization

Primarily In-house

In-house + significant subcontractors

Primarily Turnkey contractor

#### Turnkey Contractor

Non-profit

Private firm

Government agency

Other

#### Sub-Contractors

Non-profit

Private firm

Government agency

Other

PM4. What *project management* practices, if any, contributed to the success of this program? What practices were not helpful or should be avoided? What are the keys to successful project management in your program area?

NA

**Describe successful practices:**

**Describe practices to be avoided:**

**Describe key practices:**

#### 4.2 Program Management: Reporting & Tracking

##### Report/Tracking Summary [short summary of PR1, PR2]:

PR1. What systems were used for tracking and what metrics or indicators were tracked?	<input type="checkbox"/> NA
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
<b>Describe:</b>	

PR2. How did various parties use the metrics and indicators both during and after program implementation? Probe: Was the tracking and reporting information used to improve or maintain program effectiveness?	<input type="checkbox"/> NA
<b>Describe:</b>	

PR3. Were any innovative or successful reporting and tracking mechanisms employed?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PR4. What <b>reporting and tracking</b> practices, if any, contributed to the success of this program? What practices were not helpful or should be avoided? What are the keys to successful reporting and tracking in your program area?	<input type="checkbox"/> NA
<b>Describe successful practices:</b>	
<b>Describe practices to be avoided:</b>	
<b>Describe key practices:</b>	

#### 4.3 Program Management: Quality Control & Verification

##### Verification/Quality Control Summary [Summarize PQ1, PQ2 and PQ4]:

PQ1. Was there a verification process (to verify measures were installed and operating) in place?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PQ2. What type of verification was performed?	<input type="checkbox"/> NA
<b>Describe:</b>	

PQ3. Why was the verification method selected?	<input type="checkbox"/> NA
<b>Describe:</b>	

PQ4. Was there a quality control process, and, if so, what did it entail (e.g., installation quality, failure rates, implementation quality, adherence to process)?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PQ5. What <i>quality control and verification</i> practices, if any, contributed to the success of this program? What practices were not helpful or should be avoided? What are the keys to successful quality control and verification in your program area?	<input type="checkbox"/> NA
<b>Describe successful practices:</b>	
<b>Describe practices to be avoided:</b>	
<b>Describe key practices:</b>	

#### 4.4 Program Implementation: Participation Process

<b>Participation Process Summary [Concise summary of PP1]:</b>

PP1. Please Describe the participation process and requirements?	<input type="checkbox"/> NA
<b>Describe:</b>	

PP2. What were the key goals and objectives underlying these requirements?	<input type="checkbox"/> NA
<b>Describe:</b>	

PP3. How did the participation process balance necessary participation requirements against ease of participation?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PP4. What <i>participation process</i> practices, if any, contributed to the success of this program? What practices were not helpful or should be avoided? What are the keys to a successful <i>participation process</i> in your program area?	<input type="checkbox"/> NA
<b>Describe successful practices:</b>	
<b>Describe practices to be avoided:</b>	
<b>Describe key practices:</b>	

**4.5 Program Implementation: Outreach, Marketing & Advertising**

**Outreach, Marketing and Advertising Summary [Summarize PO1]:**

PO1. What types of outreach, marketing and advertising methods were utilized for this program?  NA

**Describe:**

Methods Target Market	Direct Mail	Newspaper Ads	Radio/TV Ads	Telemarketing	Bill Inserts	Brochures	Newsletters	Seminars/ Workshops	Shows & Exhibits	Tests/Demonstrations	Other
	Homeowners	<input type="checkbox"/>									
Non-Residential Bldg Owners	<input type="checkbox"/>										
Residential Renters	<input type="checkbox"/>										
Non-Residential Leasers/Renters	<input type="checkbox"/>										
Building Operators/Mgrs	<input type="checkbox"/>										
A/E Firms	<input type="checkbox"/>										
Realtors	<input type="checkbox"/>										
Developers	<input type="checkbox"/>										
Builders/Contractors	<input type="checkbox"/>										
Trade Associations	<input type="checkbox"/>										
Manufacturers	<input type="checkbox"/>										
Wholesalers	<input type="checkbox"/>										
Retailers	<input type="checkbox"/>										
Non-for-Profit	<input type="checkbox"/>										
Government	<input type="checkbox"/>										
Other	<input type="checkbox"/>										
<b>Other Target Market, Specify:</b>											
<b>Other Marketing Methods, Specify:</b>											

PO2. What were the objectives of your outreach, marketing, training and/or advertising strategy?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PO3. Were you trying to change or raise awareness knowledge or attitudes?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			
If so, what levels of awareness or knowledge were achieved?	<input type="checkbox"/> NA		
<b>Describe:</b>			

PO4. Was marketing or training effectiveness measured? How was it tracked/tested?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
<b>Describe:</b>			

PO5. How were messages developed and targeted?	<input type="checkbox"/> NA
<b>Describe:</b>	

PO6. What <i>marketing, advertising and outreach</i> practices, if any, contributed to the success of this program? What practices were not helpful or should be avoided? What are the keys to a successful <i>marketing, advertising and outreach strategy</i> in your program area?	<input type="checkbox"/> NA
<b>Describe successful practices:</b>	
<b>Describe practices to be avoided:</b>	
<b>Describe key practices:</b>	

#### 4.6 Program Implementation: Installation & Delivery

<b>Installation and Delivery Summary [Summarize PI1 – PI5]:</b>

PI1. What were the installation and delivery objectives, e.g., measure- or segment-specific goals, and were they generally met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
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PI2. How were installation and delivery problems, if any, addressed?	<input type="checkbox"/> NA
<b>Describe:</b>	

PI3. What <i>installation and delivery</i> practices, if any, contributed to the success of this program? What practices were not helpful or should be avoided? What are the keys to a successful <i>installation and delivery</i> in your program area?	<input type="checkbox"/> NA
--	-----------------------------

<b>Describe successful practices:</b>
<b>Describe practices to be avoided:</b>
<b>Describe key practices:</b>

PI4. If applicable, what were the incentive levels or options provided to the targeted participants? (Fill out tables below)			<input type="checkbox"/> NA
<b>Describe:</b>			
<b>Incentive Type</b>	<b>Customers</b>	<b>Trade Allies</b>	<b>Manufacturers</b>
Prescriptive Rebates			
Custom Incentives/SPC			
Bill Credits/Rate Discounts		--	--
Services			
Direct Installation		--	--
Financing/Loans/Leasing		--	--
Free Measures		--	--
Other (specify):			
<b>Incentive Levels</b>	<b>Incentive Level 1</b>	<b>Incentive Level 2</b>	<b>Incentive Level 3</b>
	<u>Description:</u>	<u>Description:</u>	<u>Description:</u>
<b>Measure 1:</b>			
<b>Measure 2:</b>			
<b>Measure 3:</b>			
<b>Measure 4:</b>			
<b>Measure 5:</b>			
If incentive levels are too complex or cannot fit in table, request an incentive summary sheet and check box here. Provide link to document with incentive level breakouts below.			<input type="checkbox"/>

PI5. Why were these incentive mechanisms/levels chosen? Is there a rough target percentage of measure incremental cost to be paid by the incentives? Have the incentive levels evolved over time? <b>What are the strengths and weaknesses of these incentive levels?</b>		<input type="checkbox"/> NA
<b>Describe:</b>		

#### 4.7 Program Design: Theory, Linkages & Partnerships

PT1. Was there a documented program theory or program plan, and if so, were you involved in its development? [If there is no "program theory" per se, try to get at the equivalent of a program theory. If respondent is not aware, skip questions as necessary and mark NA]	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
--	------------------------------	-----------------------------	-----------------------------

<b>Describe:</b>
------------------

PT2. How was the program theory developed?			<input type="checkbox"/> Unclear
--	--	--	----------------------------------

<b>Describe:</b>
------------------

PT3. Did the theory get buy-in from planners, implementers and other key players? If yes, how was that achieved?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
--	------------------------------	-----------------------------	-----------------------------

<b>Describe:</b>
------------------

PT4. Was the program theory used and updated as the program was implemented?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
--	------------------------------	-----------------------------	-----------------------------

<b>Describe:</b>
------------------

PT5. What aspects of the <i>program theory</i> , if any, contributed to the success of this program? What aspects were not helpful or should be avoided? What are the keys to developing a successful <i>program theory</i> in your program area?	<input type="checkbox"/> NA
---	-----------------------------

<b>Describe successful practices:</b>
---------------------------------------

<b>Describe practices to be avoided:</b>
--

<b>Describe key practices:</b>
--------------------------------

#### 4.8 Program Design: Structure, Policies & Procedures

PS1. Do you have any documentation of the program process, such as flow charts, process plans, procedure manuals, etc.?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
---	------------------------------	-----------------------------	-----------------------------

<b>Describe:</b>
------------------

PS2. Please describe the program process plan and its key elements:			<input type="checkbox"/> Unclear
---	--	--	----------------------------------

<b>Describe:</b>
------------------

PS3. Was the process plan reviewed and tested?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
--	------------------------------	-----------------------------	-----------------------------

<b>Describe:</b>
------------------

PS4. What aspects of the <i>program process plan</i> , if any, contributed to the success of this program? What aspects were not helpful or should be avoided? What are the keys to developing	<input type="checkbox"/> NA
--	-----------------------------

a successful <i>process plan</i> in your program area?	
<b>Describe successful practices:</b>	
<b>Describe practices to be avoided:</b>	
<b>Describe key practices:</b>	

#### 4.9 Program Evaluation: Evaluation & Adaptability

<b>Evaluation Summary [Summary PE1, PE2]:</b>

PE1. What types of evaluation, if any, were conducted?	<input type="checkbox"/> NA
<b>Describe:</b>	

PE2. What were the key evaluation findings?	<input type="checkbox"/> NA
<b>Describe:</b>	

PE3. In what ways, if any, did the program change and respond to valid evaluation findings or other market and participant feedback?	<input type="checkbox"/> NA
<b>Describe:</b>	

PE4. What aspects of the <i>program evaluation</i> , if any, contributed to the success of this program? What aspects were not helpful or inadequate? What are the keys to developing program adaptability in your program area?	<input type="checkbox"/> NA
<b>Describe successful practices:</b>	
<b>Describe practices to be avoided:</b>	
<b>Describe key practices:</b>	

#### 4.10 Other Program Elements

Are there any other elements of the program not covered by these questions that may have contributed to the outcome, or of which we should be aware?	<input type="checkbox"/> NA
<b>Describe:</b>	

### 5. Summary Lessons Learned & Recommendations

Please summarize what you believe were the most important lessons you learned during the implementation of this program. Include difficulties encountered in program implementation, evaluation, and end use technologies; significant program changes due to evaluation; recommendations for program improvement; and key elements for program success:

Describe what are, in your opinion, the most important elements in the design, management, implementation and evaluation of a program. Please comment on any aspects that were not covered during this interview.

## Appendix I – Documentation

(Include title, author, date published, library number, report availability, summary, and comments)

<b>Report Name</b>	<b>ID#</b>
<i>Evaluation</i>	
<i>Impact</i>	
<i>Process</i>	
<i>Market Effects</i>	
<i>Summaries/Filings of Accomplishments</i>	
<i>Annual Report</i>	
<i>Regulatory Filing</i>	
<i>Program Plan</i>	
<i>Plans and Procedures</i>	
<i>Program Design/Goals</i>	
<i>Program Implementation Plan</i>	
<i>Procedures Manual</i>	
<i>Other</i>	
	_____
	_____

<b>Additional evaluations planned or ongoing:</b>

## Appendix II – Contact Information

### **Program Manager**

Name \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone # \_\_\_\_\_ Fax # \_\_\_\_\_

Email: \_\_\_\_\_

Years of DSM-related  
experience \_\_\_\_\_

### **Program Evaluator**

Name \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone # \_\_\_\_\_ Fax # \_\_\_\_\_

Email: \_\_\_\_\_

Years of DSM-related  
experience \_\_\_\_\_