

ES. EXECUTIVE SUMMARY FOR RESIDENTIAL AUDITS PROGRAM AREA (R7)

ES.1 INTRODUCTION

This volume presents results of a comparative analysis of residential audit programs included in the National Energy Efficiency Best Practices Study (“Best Practices Study”). The overall Best Practices Study objectives, scope, and methodology are briefly outlined in Appendix R7A of this report. More details on methods and cross-program findings are provided in separate report volumes.

The Best Practices Study team (“Best Practices Team”) reviewed six residential audit programs for this program area study (“R7 Programs” and “R7 Study,” respectively), each of which focused on or included residential audits and targeted opportunities for retrofits as well as behavioral changes among residential customers in existing homes. Their scope varied widely: from the provision of information only to a more comprehensive approach to help residential customers identify and implement energy efficiency measures, including insulation, lighting, HVAC, appliances, and others. Some programs had energy savings goals; others explicitly excluded such goals to focus exclusively on the provision of information. The mix of program goals and approaches means that programs are not directly comparable, and it is not the goal of this report to judge one program as superior in design or execution to another. Instead, the focus is on identifying best practices from a variety of programs that have audits as a key component. The R7 Programs are listed in Exhibit R7-E1 below and presented in the body of this report. A discussion of the program selection process is provided in Appendix R7A.

ES.2 KEY CATEGORY THEMES

Four key crosscutting issues that affect multiple program components were identified for the R7 Programs.

One of the key differentiating features among R7 programs was the extent to which audits led to implementation of recommended measures. In some cases program managers see this issue as outside the scope of program goals, since some programs were designed to provide information and education only, and program goals were set and their achievement measured in terms of customers contacted and audits conducted. For these programs, direct impacts associated with or attributable to the audits were not expressed as an explicit part of the program goals.

Other programs were more concerned with measuring or estimating energy savings that could be directly attributed to the program. This was done through follow-up telephone surveys or through the direct involvement of a contractor who visited the customer and installed recommended measures (in a few instances on-site audits included direct installation of low-cost measures). This direct link typically led to higher estimated program impacts.

Finally, some audit programs were explicitly seen as feeder programs for the utility (or other agency) rebate programs. The audits identified promising links between customer needs and available programs and encouraged the customer to participate in the program. In this case,

however, the audit program did not share in the impacts from installation of those measures, since the utility attributed them to the rebate program and could not double count the impacts by also assigning them to the audit program.

Program philosophies often were not spelled out in program plans or statements of intent. Sometimes they were articulated by program managers, sometimes they were the result of a sort of evolution, whereby programs were shaped by a combination of formal and informal evaluation, political pressures (explicit or subtle) to provide high-visibility services to residential customers, and inertia. Similarly, and in part because predecessor residential audit programs had been running for such a long time, R7 programs often lacked a detailed description of program flows. (Few of the program managers interviewed had been involved with the design and initial fielding of predecessors to their programs; instead, most had “inherited” a non-documented institutional memory of program flow.)

A suite of well-designed, field-tested audit tools is available to support almost any level of analysis of residential audit programs due to the maturity of these programs. The tools used to gather and analyze audit data from residential customers have grown dramatically in power, ease of use, and quality of presentation, comprising not only traditional on-site audits, but also computer-based and, increasingly, Internet-based applications.

Comprehensive, easily accessible tracking systems are critical to a complete understanding of audit program success. Since the extent to which audit programs can “claim” energy savings often depends on their role as feeders for other residential programs, it is important to track the timing of audits as well as the measures recommended and implemented – preferably with easy-to-use electronic systems. Moreover, the growing role of online audits means that existing tracking systems should be adapted to the task of linking Web site audits directly to customer data in the CIS.

ES.3 BEST PRACTICES SUMMARY

Best practices are identified in this study for each of the four major program components used to organize data collection and analysis. These program components are Program Design (including program theory), Program Management (including reporting and tracking, quality control and verification), Program Implementation (including participation process, incentive strategies, and marketing and outreach) and Program Evaluation. Best practices were developed by analyzing information across programs developed from detailed interviews of program sponsors and administrators, implementing agencies, and implementation or evaluation contractors, and thorough review of all relevant secondary sources such as program filings and evaluations. Clearly, not all best practices will be relevant for all audit programs, since some program components are not applicable for certain types of programs. Exhibit R7-E2 presents the list of best practices developed from the analysis of R7 programs. Exhibit R7-E3 provides the rationales associated with each best practice. The remainder of this report provides detailed analysis and discussion of program features and best practice rationales.

The scope of this study also includes a California gap analysis. A comparison of the best practices presented in this report with the practices employed in California’s Statewide Standard Performance Contract Program is in progress and will be published when complete in a separate document.

Exhibit R7-E1
R7 Programs: Residential Audit Programs In R7 Study

Program Name	Implementer/s	Abbreviation for R7 Report
2002 Home Performance with ENERGY STAR Program	New York State Energy Research Development Association (NYSERDA)	Home Performance with ENERGY STAR
2000 Time-of-Sale Home Inspection Program	Sponsor: Southern California Edison Implementer: GeoPraxis, Inc.	TOS Inspection
2002 Residential Conservation Services (RCS) Audit Program	National Grid	RCS Audit
2002 E+ Energy Audit for Your Home Program	Northwestern Energy	E+ Energy Audit
2002 Residential Energy Advisory Services Program	Sacramento Municipal Utility District (SMUD)	SMUD Audit
2002 California Statewide Home Energy Efficiency Program	Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), Southern California Gas Company (SCG), and San Diego Gas & Electric Company (SDG&E)	CA SW HEES

Exhibit R7-E2
Summary List of Best Practices for Residential Audit Programs

Program Theory and Design
<ul style="list-style-type: none"> • Articulate a program theory that clearly states the target for the program, program timing and the strategic approach whether resource acquisition, market transformation, or referral to other programs • Link the mix of on-site, online, and mail-in audits for each targeted market segment to policy objectives and resource constraints • Adopt a multi-year planning approach when possible • Use a collaborative or coordinated planning approach
Program Management: Project Management
<ul style="list-style-type: none"> • Utilize electronic project management • Make customer follow-up part of the implementation contractor's responsibility • Actively involve leading businesses in the segment targeted for transformation • Use a single prime contractor as the point of contact with the utility • Support program managers with accurate information about market conditions and market segments
Program Management: Reporting and Tracking
<ul style="list-style-type: none"> • Integrate marketing, customer, audit, and impact data • Make the audit recommendations, including energy saving potential, part of the program tracking database • Design the program tracking system to support the requirements of evaluators as well as program staff • Utilize databases that fully integrate audit participation and results with other energy efficiency program information systems • Track vendor activity and measure volume where relevant
Program Management: Quality Control and Verification
<ul style="list-style-type: none"> • Conduct on-site post-installation inspections by a third party where appropriate • Conduct follow-up telephone calls to provide an accurate estimate of the number of measures installed • Use audit tools to check for the reasonableness of savings and payback estimates
Program Implementation: Participation Process
<ul style="list-style-type: none"> • Provide a range of options • Make program participation part of an existing, routine transaction such as the purchase of a home or the installation of a heating or cooling system • Provide vendors with an economic incentive to participate, as well as an easy, simplified participation process where appropriate • Make the audit flow seamlessly into the adoption of recommended measures • Use rebates primarily to support market transformation strategies • It is not necessary to offer free measures for a program to succeed, although installation of low-cost measures does ensure that every audit delivers at least some energy savings • Use incentives to promote a specific technology or target a specific segment

Exhibit R7-E2 (Continued)
Summary List of Best Practices for Residential Audit Programs

Program Implementation: Marketing and Outreach
<ul style="list-style-type: none"> • Provide customers with a single statewide point of contact • Feature links to residential audits prominently on utility Web sites • Combine outreach to vendor partners with mass marketing efforts to raise consumer awareness and demand when appropriate • Use target marketing strategies to ensure that hard-to-reach (HTR) populations are informed about available audit program • Make marketing materials (as well as the audit instruments themselves) multi-lingual • Provide contractors or inspectors used to deliver programs with training and resources to enable them to market effectively • Take advantage of external factors such as heat waves to enhance marketing effectiveness • For mail-based audits, include the audit form with the audit offer and make the offer letter succinct and compelling
Program Evaluation
<ul style="list-style-type: none"> • Integrate impact evaluation and measure verification • Regularly assess program performance and success, such as measuring the level of energy and peak demand savings achieved • Periodically verify that the audit software is correctly calculating potential impacts • Conduct detailed impact evaluations that include measurement routinely, though not annually • Perform market assessments for those programs that have a market transformation component • Conduct process evaluations closer to the time of the audit than the impact evaluation • Conduct evaluations in a timely way, or concurrent with programs • Systematically update measure life every 2-3 years • Engage the implementation team in evaluation process • Present actionable findings to program staff both in real time and at the conclusion of study

Exhibit R7-E3
Summary of Best Practices Rationale for Residential Audit Programs

Best Practice	Rationale
Program Theory and Design	
Articulate a program theory that clearly states the target for the program, program timing and the strategic approach whether resource acquisition, market transformation, or referral to other programs	Sound program theory enables the program administrator to think through likely program outcomes and ensure the strategic and tactical approaches will lead to the desired results.
Link the mix of on-site, online, and mail-in audits for each targeted market segment to policy objectives and resource constraints	
Adopt a multi-year planning approach when possible	For programs that seek to transform a market by influencing the behavior of supply-side market actors with incentives, disruptions in funding can undermine otherwise significant gains. Securing funding for several years is more likely to enable program managers to first induce and then sustain changes in the market.
Use a collaborative or coordinated planning approach	In lieu of a competitive solicitation to select audit programs, such a process would encourage better integration of various audit programs that co-exist within a given state or region.
Program Management: Project Management	
Utilize electronic project management	Best-of-class IT solutions for end-to-end business process automation improve access to information for enhanced productivity and cost savings.
Make customer follow-up part of the implementation contractor's responsibility	Extending the implementation team's scope beyond audits alone should encourage greater emphasis on spurring customers to take action.

Best Practice	Rationale
Actively involve leading businesses in the segment targeted for transformation	Ensuring that for-profit parties are allowed an opportunity to realize benefits beyond those provided solely by the direct program management contract or incentives encourages additional private investments, support of upper management, and the creation of private sector stakeholders who have a long term interest in the success of the program objectives.
Use a single prime contractor as the point of contact with the utility	Coordination within and across programs can also be effectively attained through in-house program management, but using multiple contractors to implement different audit programs makes coordination more difficult.
Support program managers with accurate information about market conditions and market segments	Rigorous market research in advance of program design and continuous program evaluation can help ensure customer and trade ally satisfaction and maximize overall cost effectiveness.
Program Management: Reporting and Tracking	
Integrate marketing, customer, audit, and impact data	This will support tracking the effectiveness of marketing efforts, analysis of audit customer demographics, and extent to which various categories of residential customers (including HTR customers) are successfully reached by the program.
Make the audit recommendations, including energy saving potential, part of the program tracking database	A knowledge not just of what specific measures were recommended, but also what kinds of measures were installed and what kinds were rejected can be very helpful in designing follow-up strategies or marketing approaches for other residential programs.
Design the program tracking system to support the requirements of evaluators as well as program staff	This ensures that the kinds of information sought by each group can be readily obtained from the program database.
Utilize databases that fully integrate audit participation and results with other energy efficiency program information systems	This facilitates management review and tracking the effectiveness of the audit program in directing customers to rebate programs.

Best Practice	Rationale
Track vendor activity and measure volume where relevant	Helpful in assessing relative vendor effectiveness.
Program Management: Quality Control and Verification	
Conduct on-site post-installation inspections by a third party where appropriate	Random inspections of 10 to 20 percent of projects discourage vendors from failing to fully and properly install all rebated measures.
Conduct follow-up telephone calls to provide an accurate estimate of the number of measures installed	This can be done as part of the evaluation function, but should be done in a timely manner to provide program managers with relatively quick feedback on the percentage of audits that lead to action being taken.
Use audit tools to check for the reasonableness of savings and payback estimates	Catching "outliers" through an automated process allows implementation staff to identify shortcomings in the quality of the audit and recommendations.
Program Management: Participation Process	
Provide a range of options	Offering participants a choice of audit paths can hold down the cost per audit.
Make program participation part of an existing, routine transaction such as the purchase of a home or the installation of a heating or cooling system	This makes audits more likely to become a permanent part of the market.
Provide vendors with an economic incentive to participate, as well as an easy, simplified participation process where appropriate	For those programs where vendors are the most important actor in the prospecting and delivery mechanism, success depends on a process that facilitates participation and keeps contractor costs modest.
Make the audit flow seamlessly into the adoption of recommended measures	Linking audit results to specific actions increases the likelihood of installation and associated impacts.
Use upstream or midstream market actor incentives primarily to support market transformation strategies	Vendors face higher costs to modify their business practices.
It is not necessary to offer free measures for a program to succeed, although installation of low-cost measures does ensure that every audit delivers at least some energy savings	Programs with free measures do not have substantially higher installation rates or impacts than do programs without them.

Best Practice	Rationale
Use customer rebates to promote a specific technology or target a specific segment	Rebates may be an appropriate strategy for encouraging greater participation among HTR customers, if that is deemed to be an explicit program goal.
Program Management: Marketing and Outreach	
Provide customers with a single statewide point of contact	Use of an 800 number that can direct customers to the appropriate utility or other organization depending on their location or need makes it easy for consumers to respond to marketing initiatives.
Feature links to residential audits prominently on utility Web sites	Online audit participation improves when links to the online audits are moved to the home page of utility Web site instead of being located several layers down.
Use target marketing strategies to ensure that HTR populations are informed about available audit program	Sending direct mail to targeted markets helps ensure HTR customers have access to audits.
Make marketing materials (as well as the audit instruments themselves) multi-lingual	This will help make audits available to a broader range of potential respondents, including those in the HTR population.
Provide contractors or inspectors used to deliver programs with training and resources to enable them to market effectively	Vendors who deliver program-related service may not have any training or background in marketing, yet their ability to market the program can be crucial.
Take advantage of external factors to enhance marketing effectiveness	Utilities and audit program managers report an upswing in interest following heat waves or energy shortages. Marketing efforts should be tied to such events where possible (and consistent with the program's ability to respond to the demand).
For mail-based audits, include the audit form with the audit offer and make the offer letter succinct and compelling	Participation rates in mail-in audits with compelling offer letters can be as high as 20 percent or more in some segments. The offer part of the letter should be no more than one page. Including examples of audit reports and emphasizing that the results will be truly customized to the unique characteristics of the participant has also been shown to be effective.

Best Practice	Rationale
Program Management: Program Evaluation	
Integrate impact evaluation and measure verification	The verification of measures installed (including comparison of actual installations to those that were recommended) should be a basis for more robust estimates of program impacts. This would also allow evaluators to address persistence issues.
Regularly assess program performance and success, such as measuring the level of energy and peak demand savings achieved	Performance assessment is high priority.
Periodically verify that the audit software is correctly calculating potential impacts	A 2002 study found that audit software over- or under-estimated measure impacts by as much as 50%; moreover, there is always a risk that either the customer or the auditor enters data incorrectly; while internal validation routines will capture most such problems, evaluators should periodically examine a few audits in great detail.
Conduct detailed impact evaluations that include measurement routinely, though not annually	While audit programs have not been required to demonstrate impacts, they will increasingly be called on to do so if emphasis shifts to resource acquisition.
Perform market assessments for those programs that have a market transformation component	By using established indicators to verify the extent of market transformation, program effectiveness can be measured.
Conduct process evaluations closer to the time of the audit than the impact evaluation	While it is appropriate to wait a year before conducting follow-up contacts to determine installed measures, questions regarding customer satisfaction and the effectiveness of program delivery should be addressed using data collected within a few months of the audit.
Conduct evaluations in a timely way, or concurrent with programs	Timely evaluations give real-time feedback to program staff and contribute to program planning.

Best Practice	Rationale
Systematically update measure life effectiveness every 2-3 years	Measure life is a key parameter in estimating the lifecycle benefits of audit-recommended measures and therefore program cost. Measure life studies using a panel of program participants that are visited or interviewed every 2 to 3 years over the study life greatly enhances the accuracy of program assumptions, minimizing customer attrition and allowing the evaluators to better pin point the time at which measures fail.
Engage the implementation team in evaluation process	Involving program staff encourages their buy-in, and encourages them to express research issues and their perspective on program activities.
Present actionable findings to program staff both in real time and at the conclusion of study	Key findings from evaluations should be well-distilled and disseminated (i.e., via workshops, good executive summaries, two-page briefs).