ES. EXECUTIVE SUMMARY FOR RESIDENTIAL MULTI-FAMILY PROGRAM AREA (R5)

ES.1 INTRODUCTION

This volume presents results of a comparative analysis of residential multi-family comprehensive 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 R5A 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 multi-family comprehensive programs for this program area study ("R5 Programs" and "R5 Study," respectively), each of which had the goal of improving the overall efficiency of multi-family buildings, typically defined as having more than four units of housing. Multi-family programs are similar to their single-family comprehensive program counterparts (addressed in Best Practices Volume R4) in that they are designed to improve the overall efficiency of housing, but often must also address concerns related to equity and income, as well as higher potential barriers to participation. Like most comprehensive single-family efforts, these multi-family programs are primarily focused on resource acquisition – achieving a certain level of cost-effective kWh savings through the installation of specific measures. Typically, the cost-effectiveness of individual measures is determined measure by measure, with the most cost-effective being eligible for rebates, incentives or loans through the program.

As programs were identified and staff contacted, it became clear that multi-family comprehensive programs were less common and less evaluated than their single-family counterparts. Many of the multi-family programs in existence are add-ons to single-family programs, managed and implemented in similar ways (with sometimes different incentive structures), making it difficult to pull out the specific best practices that apply to the multi-family components of these programs alone. The dearth of multi-family programs may reflect to some extent the fact that the multi-family sector as a whole has long been considered "hard-to-reach."

The R5 Programs are listed in Exhibit R5-E1 below and presented in the body of this report. A discussion of the program selection process is provided in Appendix R5A.

ES.2 KEY CATEGORY THEMES

Four key crosscutting issues that affect multiple program components were identified for the R5 Programs.

There are major barriers related to financing, split incentives and transaction costs in the multi-family sector. The impact of split financial incentives between landlords and tenants is the most often cited primary barrier to increased efficiency in multi-family buildings. Residents are viewed as unlikely to invest in improvements to property that they do not own. Owners (many of whom are not responsible for paying directly for the energy used by their buildings) are often reluctant to spend money on improvements that offer them no tangible, financial

benefits. While split incentives can represent a daunting barrier to efficiency investment, other barriers (including access to financing and high transaction costs) can also impede program progress. The R5 Programs used a variety of tactics to overcome these barriers, the most common of which was offering incentives to reduce the financial impact of efficiency investments on property owners and directly installing unit-level measures free of charge.

The complexity of multi-family buildings creates technical barriers. The multiple types of buildings represented in the multi-family sector make it difficult for installers to have the expertise to confidently assess and address all related issues. Generalizing the experience and understanding of one building type with that of a very different one can be difficult. Ultimately these technical barriers can affect the accuracy of estimates and create health and safety concerns. The R5 Programs addressed the uncertainty resulting from these technical barriers through inspections, contractor expertise and on-going attention to emerging technical information.

Multi-family programs often emerge from concerns about equity and the impact of rising energy costs on those with limited or fixed incomes – particularly in the hard-to-reach (HTR) multi-family sector. Energy costs can represent a high proportion of total household income for multi-family residents. The R5 Programs addressed equity concerns through lower co-pays for program participants, by accepting higher transaction costs, and by providing additional project management services than might be provided in a rebate-driven single-family program.

Complex implementation structures are not uncommon. Multi-family programs may be supported by multiple funding sources and require the cooperation of multiple program implementers. They can be implemented independent of utility operations or through cooperative arrangements between utilities and local governments, community development corporations, community action organizations, or even the federal government. There are pros and cons to these less-traditional implementation structures. They can be more complex than standard utility programs, making them more difficult to coordinate. But they are also capable of bringing multiple actors together to deliver a more comprehensive program than one organization alone could. This theme is evident in the presence of subcontracts to government entities, cooperation with and outreach to community development corporations, and through the overlap between multi-family programs generally and their low-income program counterparts. The R5 Programs were, for the most part, utility-administered, however several included cooperative efforts with community development corporations and government agencies to identify potential participant buildings and/or offer additional services for low-income residents.

ES.3 BEST PRACTICES SUMMARY

Best practices are identified in the R5 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 project management, reporting and tracking, and quality control and verification), Program Implementation (including participation process and marketing and outreach) and Program Evaluation. Best practices were developed by analyzing information across programs developed from detailed interviews of program managers and thorough review of all relevant secondary sources such as program filings and evaluations. Exhibit R5-E2 presents the list of best practices developed from the

analysis of R5 Programs. Exhibit R5-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 Multi-Family Program is in progress and will be published in a separate document when complete.

Exhibit R5-E1
R5 Programs: Residential Multi-Family Comprehensive Programs Reviewed For R5 Study

Program Name	Implementer/s	Abbreviation for R5 Report
2002 Multi-Family Incentive Program	Austin Energy	Austin Multi-Family
2002 California Statewide Multi-Family 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 Multi-Family
2003 Home Energy Savings Program - Multi-Family Component	The City of Portland/Energy Trust of Oregon, Inc. (Energy Trust)	Home Energy Savings Multi-Family
2002-2003 Apartment & Condo Efficiency Services	Focus on Energy™/Wisconsin Energy Conservation Corporation (WECC)	Focus on Energy Apt & Condo
2002 EnergyWise - Multi-Family Component	National Grid	EnergyWise Multi-Family
2000 Multi-Family Conservation Program	Seattle City Light (SCL)	Seattle Multi-Family

Exhibit R5-E2
Summary List of Best Practices for Multi-Family Programs

Program Theory and Design
• Have a sound program plan and clearly articulated program theory which describe the program logic, niche, resources and ultimate goal • Understand the financial and ownership structure of the local multi-family market and the relationships among the various market actors • Include societal and non-energy benefits in cost-effectiveness calculations • Tailor multi-family programs to the unique needs of the sector
Program Management: Project Management
• Develop and retain institutional knowledge of the multi-family building sector and lessons learned as implementation structures shift over time • Set reasonable, accurate expectations for energy savings and measure performance • Tailor project roles to the unique strengths of each implementation organization
Program Management: Reporting and Tracking
• Base reporting and tracking system design on how information will be used and data needs unique to multi-family programs • Assure that tracking systems are intuitive, straightforward, integrated and comprehensive • Develop systems for long-term strategy and use • Track the key components of multi-family buildings and program participation
Program Management: Quality Control and Verification
• Base quality control practices on a program's vendor relationships, measure types, and project volume • Conduct quality assurance and verification inspections to improve the overall understanding of how multi-family buildings function • Govern post-inspection levels by cost-effectiveness as well as quality assurance considerations • Conduct inspections in a timely manner • Use product specifications in program requirements and guidelines
Program Implementation: Participation Process
• Offer a single point of contact for customers • Offer an attractive mix of eligible measures and integrated program services that include potential program drivers, but tie rebates for the most popular measures to those less likely to be considered and installed • Use a whole-building approach to achieve maximum energy savings • Provide support to building owners throughout the process

Exhibit R5-E2
Summary List of Best Practices for Multi-Family Programs (Continued)

Program Implementation: Marketing and Outreach
• Develop and use a database or other method of tracking the population of multi-family properties and conduct periodic market assessments to update the information • Work with property owners and other market participants to help them succeed according to their objectives, and promote program benefits that align with these objectives • Build relationships with the maintenance and equipment firms responsible for system operations and maintenance • Showcase properties that have completed program upgrades
Program Evaluation
• Use evaluation to assure that energy savings meet expectations and that participants are satisfied with installed measures • Produce a basic report describing program activities, budget and expenditures, estimated savings and lessons learned for un-evaluated program years • Conduct evaluation at the most comprehensive level possible given time and budget constraints • Include estimation of free-ridership and spillover • Use baseline or market characterization studies to inform the program scope and measure mix selected

Exhibit R5-E3
Summary of Residential Multi-Family Comprehensive Programs Best Practices Rationale

Best Practice	Rationale
Program Theory and Design	
Have a sound program plan and clearly articulated program theory which describe the program logic, niche, resources and ultimate goal	A clear statement of program theory and/or program logic makes explicit the underlying assumptions of a program, including what it is expected to accomplish and potential indicators of success. When the underlying assumptions are well understood, those involved in program implementation and delivery are more likely to have a clear understanding of why certain measures are advocated or included. This can lead to quicker identification of program improvements and a better ability to recognize issues related to program success – one component of adaptive management.
Understand the financial and ownership structure of the local multi-family market and the relationships among the various market actors	For multi-family programs, understanding the overarching financial structure within which the sector operates is critical. Working with those likely to be present at the point at which decisions about system upgrade or replacement are made will increase the likelihood of capturing lost opportunities. In multi-family programs these actors may be similar to those targeted in commercial programs and include maintenance contractors, property managers and equipment vendors.
Include societal and non-energy benefits in cost-effectiveness calculations	Non-energy effects can help improve program cost-effectiveness. These benefits and the related program goals should be clearly stated in program plans. To gain support for these programs, include societal and non-energy benefits in cost-effectiveness calculations. Including these benefits can offset the higher costs of working in this sector. If equity is an underlying goal, state this clearly.
Tailor multi-family programs to the unique needs of the sector	Rather than offering a simple add-on to a single-family program component, design program activities to address the specific barriers related to multi-family buildings. Developing on-going relationships with multi-family property owners is important in overcoming these barriers and influencing investment at the point of system replacement.
Program Management: Project Management	
Develop and retain institutional knowledge of the multi-family building sector and lessons learned as implementation structures shift over time	Even in areas where the implementation structure changed significantly, successful programs tapped into the existing expertise and market relationships of previous programs. Retaining and leveraging the institutional knowledge in the program delivery network might mean using the same implementation subcontractor, reaching out to the existing network of trade allies or making program changes gradually.

Best Practice	Rationale
Set reasonable, accurate expectations for energy savings and measure performance	Continued program success in the multi-family sector depends ultimately on satisfaction with measures installed and trust in those delivering the program. Accurate information aligns expectations and outcomes, increasing the likelihood of ultimately satisfied participants.
Tailor project roles to the unique strengths of each implementation organization	The most effective marketing organization may not be the best direct service provider and vice versa. Flexibility in implementation will increase the likelihood that the players involved in program delivery offer the best level of service by allowing the appropriate mixture of utility, non-profit, governmental and for-profit players.
Program Management: Reporting and Tracking	
Base reporting and tracking system design on how information will be used and data needs unique to multi-family programs	Information systems should reflect business processes. Improving basic program operation, the quality of service provided, accountability, organizational decision-making and evaluation are some of the many reasons for these systems. Investments in data tracking should improve one or more of these areas. For multi-family programs, the number of units treated per building should be tracked as well as the number of total buildings. In cases where billing analysis is desired, account numbers and meter numbers for both the building and the unit should be tracked.
Assure that tracking systems are intuitive, straightforward, integrated and comprehensive	Cumbersome or overly complex systems cause program staff to develop "work-around" solutions and duplicate systems to track information they will be held accountable for. While individual solutions developed by program staff may be adequate to meet their own needs, they reduce overall confidence in the primary tracking system. When multiple tracking documents and processes exist, it is difficult to determine accuracy if they conflict.
Develop systems for long-term strategy and use	Several of the utility R5 Programs and their predecessors had been running for more than a decade. Stable, comprehensive systems can provide information and profile buildings for future program efforts that could include replacement offers at the end of measure life, or provision of information on emerging efficiency opportunities that may prove cost-effective in the future.
Track the key components of multi-family buildings and program participation	Tracking all aspects of multi-family buildings (including unit and complex level data) helps assure that all cost-effective measures have been considered for a participating building. Similarly, the high turn-over of residents, the variety of building ownership arrangements and the number of units per complex also present valuable descriptions of the market and help assess the remaining opportunities for energy and demand savings. For example, it may be necessary to track both the number of participating buildings or complexes and the number of individual units treated to get a sense of the true penetration of the program, as well as to assure that the untreated units are reachable later. Similarly, tracking the locations where only common area lighting was installed offers a logical place to start when targeting buildings for unit-level improvements.

Best Practice	Rationale
Program Management: Quality Control and Verification	
Base quality control practices on a program's vendor relationships, measure types and project volume	Standard measures installed by known vendors are likely to need less rigorous quality control and verification than higher risk measures (e.g., those with potential impacts on indoor air quality, or those that represent more cutting-edge technology, like EMS systems).
Conduct quality assurance and verification inspections to improve the overall understanding of how multi-family buildings function	Assuring that measures are installed and operating as expected is particularly important in multi-family buildings given the relative complexity and need for information about what works and doesn't work in different climates, in various building types and with different measure mixes.
Govern post-inspection levels by cost-effectiveness as well as quality assurance considerations	Multi-family projects can be large and have long timelines. Inspecting 100% of jobs is unlikely to be cost-effective, particularly for high volume programs with small impacts per site. A good rule of thumb is 10-30% for small projects and 100% for large projects and problem vendors. When planning for inspection: • Obtain a good random sample representative of all vendors and measure types; • Consider inspecting the first few jobs submitted by a new vendor; • Periodically assess results of inspections to determine if adjustments are needed; • Only tolerate a 100% post-inspection for "problem" vendors on a temporary, probationary basis; and • Use a contractor screening or certification process to encourage the participation of responsible contractors and high-quality installations.
Conduct inspections in a timely manner	Real-time feedback from inspections can uncover problems that can then be corrected in the same program year. Evaluation can detect the same problems, but is generally performed too late to enable course correction mid-program.
Use product specifications in program requirements and guidelines	Contractors should explain all product warranties to their customers and be prepared to respond to incidents of product failure. Requiring contractors to repair and/or replace products that fail before warranty expiration will help assure that contractors use high-quality products and stand by the performance of the products they install.
Program Implementation: Participation Process	
Offer a single point of contact for customers	Multi-family projects, particularly those involving complex system upgrades or long timelines, benefit from having a consistent single point of contact for busy property owners. In many ways, the idea of a single point of contact is similar to the service provided to large utility customers who may have a relationship with their utility representative.

Best Practice	Rationale
Offer an attractive mix of eligible measures and integrated program services that include potential program drivers, but tie rebates for the most popular measures to those less likely to be considered and installed	Program staff in Seattle and Portland acknowledged that rebates for windows were the primary measure of interest to owners. (Building owners are very interested in window upgrades, seeing them as something that can improve their property values.) Seattle Multi-Family and Home Energy Savings Multi-Family leveraged that interest by only rebating windows if all other cost-effective measures had been considered and installed. A note of caution is warranted however: Programs that use this strategy will need to avoid over-paying for measures that come to dominate the market.
Use a whole-building approach to achieve maximum energy savings	Approaching the building as a system allows auditors, project managers and contractors to consider the complex interactions of HVAC and air flow, windows and mechanical systems, and shell issues with air change per hour (ACH) requirements. However, this approach may require more time and hands-on project management. Programs managers interested in pursuing this approach will need to budget for the additional time and expertise required to integrate building systems, model the impact of upgrades and install the measures.
Provide support to building owners throughout the process	Given the high barriers to multi-family retrofit, every effort should be made to assure that owners are given adequate and accurate information throughout the project. Offering a review by a neutral party such as a program consultant or representative can offer credibility to contractor proposals and assure that measures are logical and appropriate.
Program Implementation: Marketing and Outreach	
Develop and use a database or other method of tracking the population of multi-family properties and conduct periodic market assessments to update the information	Multi-family building populations can be difficult to identify, even with utility customer information systems. Developing a population frame, though difficult, provides multiple benefits both in terms of target marketing and tracking program penetration over time. In conducting this research, programs should rely as much as possible on tax records, permit applications, or other existing sources to reduce the overall cost to develop the information.
Work with the property owners and other market participants to help them succeed according to their objectives, and promote program benefits that align with these objectives	Aligning the program activities with the goals of the market participants may mean helping them market their services, providing advanced training, helping improve property values for building owners or any number of strategies to entice participation. In its marketing material, Seattle City Light lists six benefits of program participation, only one of which concerns electricity consumption. The other benefits listed with program information include increased property value, reduced tenant turn-over, increased tenant comfort, reduced maintenance and reduced outdoor noise.
Build relationships with the maintenance and equipment firms responsible for system operations and maintenance	These firms are likely to be involved in the decision-making process at the point of system upgrade or replacement and are uniquely positioned to provide information about options to building owners or others responsible for capital decisions. If they are aware of the program and trust that it will continue to be available they are more likely to search out information on energy efficiency at critical customer purchase points.

Best Practice	Rationale
Showcase properties that have completed program upgrades	Identifying and promoting properties with completed program upgrades can help potential residents choose more efficient buildings and can improve the overall economic value of participation for property owners.
Program Evaluation	
Use evaluation to assure that energy savings meet expectations and that participants are satisfied with installed measures	The critical value offered by evaluation is the opportunity for feedback on and analysis of program strengths and weaknesses. Successful programs incorporate the results of evaluation in a paradigm of continuous improvement.
Produce a basic report document describing program activities, budget and expenditures, estimated savings and lessons learned for un-evaluated program years	This document can offer general information on program activities and milestones to stakeholders and other interested parties. Most of the R5 Programs produced some kind of annual report, however the level of detail varied widely and the programs were often described in combined budget line items that did not reflect functional separation (e.g., combining multi-family and single-family budgets).
Conduct evaluation at the most comprehensive level possible given time and budget constraints	Process evaluations are important for programs in their early years and for those in transition. Impact evaluations are important for all programs, and should be conducted frequently enough to assure savings are being delivered and other program goals are being met.
Include estimation of free-ridership and spillover	Determining the level of free-ridership and spillover can be challenging, but is valuable because of the insight it offers to program cost-effectiveness and the role of the program in the market.
Use baseline or market characterization studies to inform the program scope and measure mix selected	The multi-family market is a complex mix of building sizes, types and ages. Programs informed by the actual characteristics of the market can better target program resources and assure that the market needs the products and services promoted by the program.