

**ES. EXECUTIVE SUMMARY FOR  
NON-RESIDENTIAL LARGE COMPREHENSIVE INCENTIVE PROGRAM AREA (NR5)**

**ES.1 INTRODUCTION**

This volume presents results of a comparative analysis of non-residential large comprehensive incentive 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 NR5A 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 ten on-residential large comprehensive incentive programs for this program area study (“NR5 Programs” and “NR5 Study,” respectively). The NR5 Programs are listed in Exhibit NR5-E1 below and presented in the body of this report.

**ES.2 KEY CATEGORY THEMES**

Three crosscutting themes cut across the programs analyzed for this NR5 report.

**Programs that target the large non-residential market share many characteristics, even if those programs appear to follow very different program models.** Common features include:

- focus on implementation of custom efficiency measures and projects that do not lend themselves well to a prescriptive rebate approach;
- encouragement of comprehensive projects that go beyond single measures and common efficiency practices;
- use of incentive strategies that encourage and allow for custom and comprehensive projects;
- inclusion of technical engineering review as part of the incentive approval process, and
- requirements for proof of project installation.

**Program managers drive program design features around their understanding of a common set of challenges associated with the large non-residential market.** These challenges include:

- reducing uncertainty in savings estimates;
- minimizing risks of gaming and fraud;
- managing costs of measurement and verification;

- keeping application requirements simple and manageable yet effective enough for detailed tracking, verification, and payment;
- distributing funds equitably and evenly throughout the program year;
- minimizing free riders/maximizing net impacts; and
- supporting the private sector ESCO and energy efficiency services market.

**Successful approaches are those that seek to meet these challenges directly.** These include:

- ensuring that program staff have the level of expertise necessary to deal with sophisticated end users and energy service companies;
- using comprehensive and integrated tracking systems to manage workflow and identify potential problems early;
- developing an approach to M&V in which applicants are kept honest while the rigor and use of sampling are focused on cost-effectively reducing overall uncertainty at the program level;
- setting incentive levels and strategies to maximize net not gross impacts;
- leveraging the extensive marketing efforts of the private sector; and
- conducting thorough evaluations that address process, impact, and net-to-gross issues.

### **ES.3 BEST PRACTICES SUMMARIES**

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 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 from detailed interviews of program managers and thorough review of all relevant secondary sources such as program filings and evaluations. Exhibit NR5-E2 presents the list of best practices developed from the analysis of NR5 programs. Exhibit NR5-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 separately when complete.

**Exhibit NR5-E1**  
**NR5 Programs: Non-Residential Large Comprehensive Incentive Programs Reviewed**

<b>Program Name</b>	<b>Implementer/s</b>	<b>Abbreviation for NR5 Report</b>
Non-residential Standard Performance Contract	CA IOUs Statewide	CA SPC
Energy \$mart™ C/I Performance	NYSERDA	NYSERDA C/I Performance
Energy Opportunities	United Illuminating	UI Energy Opportunities
Power Smart	BC Hydro	BC Hydro Power Smart
Custom Efficiency (Colorado)	Xcel Energy (Colorado)	Xcel (CO) Custom Efficiency
Custom Services	Northeast Utilities (CL&P)	NU Custom Services
Energy Initiative	National Grid	NGrid Energy Initiative
Energy Shared Savings	WP&L (Alliant) Wisconsin	WP&L Shared Savings
Business Energy Services	Efficiency Vermont	Eff Vermont BES
Commercial & Industrial Custom Retrofit	SMUD	SMUD C&I Custom

**Exhibit NR5-E2**

**Summary List of Best Practices for Non-Residential Large Comprehensive Incentive Programs**

<b>Best Practice</b>
<b>Program Theory and Design</b>
<ul style="list-style-type: none"><li>• Anticipate and tackle large non-residential market challenges directly</li><li>• Link the mix of program features to policy objectives and resource constraints</li><li>• Develop a sound program plan, if possible have a clearly articulated program theory</li></ul>
<b>Program Management</b>
<ul style="list-style-type: none"><li>• Develop and maintain clear lines of responsibility and communication</li><li>• Use well-qualified engineering staff</li><li>• Motivate field staff and efficiency service providers</li><li>• Maintain consistency in personnel over time</li><li>• Delegate responsibility based on risk versus reward</li></ul>
<b>Reporting and Tracking</b>
<ul style="list-style-type: none"><li>• Integrate all program data, including measure-level data, into a single database</li><li>• Integrate or link with other appropriate systems such as cross-program databases, customer information systems (CIS) and marketing or customer relationship management (CRM) systems</li><li>• Use automated or otherwise regularly scheduled notification to achieve close monitoring and management of project progress</li><li>• Utilize electronic workflow management and web-based communications</li><li>• For programs with proactive marketing efforts, track program prospects early and drive program intervention around major equipment-related events</li><li>• Balance the level of tracking against resource availability</li></ul>
<b>Verification, Measurement, and Quality Control</b>
<ul style="list-style-type: none"><li>• Require <i>post</i>-inspections and commissioning for all large projects and projects with highly uncertain savings</li><li>• Require <i>pre</i>-inspections for large projects with highly uncertain baseline conditions that significantly affect project savings</li><li>• Conduct either in-program measurement or measurement through an impact evaluation on the very largest projects and those that contribute most to uncertainty in overall program savings</li><li>• Tailor measurement rigor, including the use of sampling, to each project's contribution to the cumulative uncertainty in estimated savings for the program overall</li><li>• Limit the use of multi-year, in-program measurement of savings</li><li>• Carefully consider tradeoffs associated with in-program M&amp;V versus ex post impact evaluation</li><li>• If in-program M&amp;V is utilized exclusively (as opposed to independent impact evaluation), results should be periodically aggregated and summarized to produce realization rates and lessons learned</li><li>• Consider using third-party M&amp;V contractors to oversee or conduct M&amp;V</li><li>• Tie staff performance to independently verified results</li></ul>

<b>Best Practice</b>
<b>Program Participation Process</b>
<ul style="list-style-type: none"> <li>• Keep the application process and forms from being overly complex and costly to navigate while at the same time not being over-simplified</li> <li>• Tailor the degree of formality and extent of program rules and requirements to the size of the program, the size of the market being addressed, and the level of expertise of in-house staff</li> <li>• Provide technical assistance to help applicants through the process</li> <li>• Develop a cadre of trade allies who can then assist customers through the process</li> <li>• Try to maintain some availability of program funds throughout most of the program year</li> </ul>
<b>Incentive Approaches</b>
<ul style="list-style-type: none"> <li>• Use incremental costs to benchmark and limit payments</li> <li>• Set incentive levels to maximize <i>net</i> not <i>gross</i> program impacts</li> <li>• Adjust incentive levels based on market demand</li> <li>• Limit or exclude incentive payments to known free riders</li> </ul>
<b>Marketing and Outreach</b>
<ul style="list-style-type: none"> <li>• Use the program's website to broadly inform the market and attract participation</li> <li>• Leverage the extensive marketing efforts of the private sector, particularly of ESCOs</li> <li>• Keep energy efficiency service providers well informed about program features and changes through seminars, training sessions, trade shows, and annual meetings of key groups</li> <li>• Market energy efficiency options directly to large end users at the earliest decision-making stages of major equipment or facility modifications</li> <li>• Use personal marketing, where cost effective, to identify and address customer-and industry-specific barriers and customer issues</li> <li>• Develop and disseminate case studies of key technologies and segment applications</li> <li>• Conduct on-going training of account managers and other marketing staff to keep abreast of the latest efficiency technologies and practices</li> </ul>
<b>Program Evaluation</b>
<ul style="list-style-type: none"> <li>• Conduct both process and impact evaluations routinely</li> <li>• Stagger the timing of process and ex post impact tasks so that process evaluations can be conducted and results communicated on a relatively real-time basis</li> <li>• Involve impact evaluators in projects that may require pre-installation measurement</li> <li>• Include estimation of free-ridership and spillover</li> <li>• Develop realization rates by end use or measure type &amp; utilize these to improve savings estimates over time</li> </ul>

**Exhibit NR5-E3**  
**Summary of Best Practices Rationale for Non-Residential Large Comprehensive Incentive Programs**

Best Practice	Rationale
<b>Program Theory and Design</b>	
Anticipate and tackle large non-residential market challenges directly	The large non-residential market poses unique challenges because the end users and suppliers are very sophisticated and the projects implemented are often very complex. As a result, certain key challenges, such as gaming, are virtually inevitable in this market and should be expected and planned for whether a program is new or mature.
Link the mix of program features to policy objectives and resource constraints	Prioritizing objectives and taking stock of resource constraints helps clarify choices among competing design choices.
Develop a sound program plan, if possible, have a clearly articulated program theory	Even a relatively simple statement of program logic can reveal gaps in program focus or effort and assure that everyone involved knows what the program seeks to accomplish and why.
<b>Program Management</b>	
Develop and maintain clear lines of responsibility and communication	Programs with multiple entities involved, such as technical support contractors, must ensure that lines of responsibility and communication protocols are clear. Whatever the mix of responsibilities, the process should appear integrated and seamless to participants.
Use well-qualified engineering staff	Projects in large facilities are often extremely complex and unique to individual sites. A high level of engineering expertise is needed to assess project validity, estimate or measure savings, and assure proper implementation.
Motivate field staff and efficiency service providers	Field personnel are critically important to successful program operation in large C&I markets. It is important to have a motivated pool of marketing and engineering talent to prospect for projects and ensure a smooth participation experience.
Maintain consistency in personnel over time	Many of these efficiency projects can take several years to implement from the initial project prospecting to final installation. High staff turnover inhibits timely implementation of the program process as new staff must come up the learning curve on what are often complex projects.

Best Practice	Rationale
Delegate responsibility based on risk versus reward	Delegation should be based on balance of risk and rewards associated with the individual projects or administrative function (i.e., low-risk tasks to more junior or less technical employees, high-risk tasks and decisions to upper management). Risks and rewards are often tied to the size of a project, the type of project, and the level of uncertainty associated with project savings.
<b>Reporting and Tracking</b>	
Integrate all program data, including measure-level data, into a single database	The size of these programs and their generally high level of cost-effectiveness make comprehensive data tracking and integration necessary and worthwhile. Experience shows that taking early short cuts that involve utilizing balkanized and non-standardized project tracking systems is counter-productive.
Use automated or otherwise regularly scheduled notification to achieve close monitoring and management of project progress	Programs should utilize regular check-in and progress milestones to ensure that project status is known on a timely basis. New automated notification procedures may be helpful in managing this process for large programs.
Utilize electronic workflow management and web-based communications	Electronic application processing and web-based communication can help to improve project turnaround, reduce administrative costs, and maintain an electronic history of project correspondence.
For programs with proactive marketing efforts, track program prospects early and drive program intervention around major equipment-related events	Projects should be identified and tracked at the concept stage to ensure that resources are directed at opportunities early enough in the customer's design and decision-making process to influence adoption of high-efficiency technologies and practices.
Balance the level of tracking against resource availability	There is a legitimate tradeoff between the level of detail tracked, the extent of data entry burden, and the amount of time available from staff who are otherwise busy conducting program activities. A comprehensive tracking system that staff does not have adequate time to support is of little value.
<b>Verification, Measurement, and Quality Control</b>	
Require post-inspections and commissioning for all large projects and projects with highly uncertain savings	Post-inspections are critical for large projects. Very large and complex projects should also require some level of commissioning to establish that the new equipment or process is not only installed but also operating and functioning as designed. Invoices should be required and reviewed for all projects.

Best Practice	Rationale
Require pre-inspections for large projects with highly uncertain baseline conditions that significantly affect project savings	Savings cannot be reliably estimated for some types of projects on purely an ex post basis. Pre-inspections are an important part of developing defensible savings for projects such as complex compressed air and industrial process retrofits.
Conduct either in-program measurement or measurement through an impact evaluation on the very largest projects and those that contribute most to uncertainty in overall program savings	Measurement for the largest projects is usually cost justified given these projects' contribution to overall savings and the size of the associated incentive checks. Pre-measurement should be utilized for large, complex measures that cannot otherwise be reliably quantified with only ex post data.
Tailor measurement rigor, including the use of sampling, to each project's contribution to the cumulative uncertainty in estimated savings for the program overall	Fitting the rigor of M&V to match the type of project is an effective way to lower overall M&V costs. Allocating more time and resources to M&V on unfamiliar projects and those with highly uncertain savings provides important quality control. Using sampling techniques within or across an individual applicant's sites is more cost-effective than requiring a census, while still providing high levels of reliability and a check on gaming.
Limit the use of multi-year, in-program measurement of savings	Experience shows that it is difficult in practice for program administrators, third-party energy services providers, and end users to maintain the institutional memory and financial motivation necessary to develop, submit, and review detailed measurement reports for more than a year or two. Multi-year measurement of impacts for resource planning can be accomplished through program-level retention studies.
Carefully consider tradeoffs associated with in-program M&V versus ex post impact evaluation	For some, M&V is an important defining characteristic of a program itself. Other program managers have concluded that in-program measurement is overly burdensome to administration and takes too many resources away from other program implementation activities. Hybrid approaches also may be effective (e.g., program evaluators working with program staff to design and implement measurement plans on representative samples of projects).



Best Practice	Rationale
If in-program M&V is utilized exclusively (as opposed to independent impact evaluation), results should be periodically aggregated and summarized to produce realization rates and lessons learned	Site-specific M&V can provide a wealth of important knowledge and lessons learned but only if realization rates are developed for the individual sites and the results across sites are aggregated and included in segmentation analyses. Program implementers are often skilled at site-specific engineering and measurement analyses but have less experience with, and motivation to design, cross-site and statistically aggregated analyses.
Consider using third-party M&V contractors to oversee or conduct M&V	Utilization of firms specializing in program-related M&V was repeatedly cited as very effective in the success of the reviewed programs. Contracting out the M&V task for an entire program can allow program participants to be free from the responsibility and financial burden of M&V, achieve consistency in M&V procedures, and produce results more cost-effectively. However, these advantages should be weighed against the potential disadvantage of taking the M&V function out of the private market. Many ESCOs prefer to conduct their own M&V and consider it an important private market function.
Tie staff performance to independently verified results	Tying performance reviews and bonuses of program staff to verified savings as reported through an independent M&V or impact evaluation process is likely to increase project quality and the accuracy of initial savings estimates. Marketing staff, in particular, should have any financial incentives tied to savings that are independently verified.
Program Participation Process	
Keep the application process and forms from being overly complex and costly to navigate while at the same time not being over-simplified	Large comprehensive incentive programs require more significant levels of site-specific application data than do other types of programs because the measures implemented are often site specific and savings are very sensitive to baseline conditions. Nonetheless, data requirements and associated forms should be well designed to ensure they focus on the most critically needed savings and verification inputs and do not overburden applicants.
Tailor the degree of formality and extent of program rules and requirements to the size of the program, the size of the market being addressed, and the level of expertise of in-house staff	Large programs in large service territories with large numbers of applicants and turnover among in-house staff tend to require more detailed and formal program rules and application rigor. On the other hand, there are excellent examples of how small programs have used in-house staff expertise to achieve excellent program effects through informal processes.
Provide technical assistance to help applicants through the process	Technical expertise should not be limited to the program application and review process but also should be offered to applicants to help them prepare their applications correctly the first time.

Best Practice	Rationale
Develop a cadre of trade allies who can then assist customers through the process	Because trade allies typically assist multiple customers participating in large C&I programs, developing a strong trade ally infrastructure can help program administrators to increase the ease of customer participation over time.
Try to maintain some availability of program funds throughout most of the program year	Maintaining funds throughout most of the program year gives trade allies the confidence that they can sell the benefits of participation without concern that their customers will make a decision to install a project based on the program only to find out that funds are unavailable. It also provides customers with the confidence that they can apply for the program at the appropriate point in their decision-making process, rather than feeling pressured to apply quickly simply to reserve funds.
Incentive Approaches	
Use incremental costs to benchmark and limit payments	Limiting payments so that they do not exceed a pre-determined portion of average or customer-specific incremental cost estimates is critical to avoiding grossly overpaying for savings.
Set incentive levels to maximize net not gross program impacts	Free riders dilute the market impact of program dollars. Payback floors and increasing incentives with increasing payback levels are one approach. Another is to tie incentive levels to individual measures or types of measures that are known to have extremely high or low naturally occurring adoption levels.
Adjust incentive levels based on market demand	When program funds are severely over or under subscribed, adjusting incentive levels may be necessary. However, incentive levels should not be based strictly on market demand and should not be altered in patterns that appear random to market participants.
Limit or exclude incentive payments to known free riders	When program administrators are incented and permitted to simply exclude known free riders, scarce program funds can instead be utilized on projects that provide net benefits.

Best Practice	Rationale
<b>Marketing and Outreach</b>	
Use the program’s website to broadly inform the market and attract participation	Because the large non-residential market is made up of a small population of well informed customers and efficiency service providers, driving prospective participants to a comprehensive program website is often effective without significant other investments in traditional advertising.
Leverage the extensive marketing efforts of the private sector, particularly of ESCOs	The large non-residential market typically receive significant private sector marketing attention with respect to energy efficiency prospecting. In this market, ESCOs and other service providers that believe the program will help close deals are natural and effective marketing partners.
Keep energy efficiency service providers well informed about program features and changes through seminars, training sessions, trade shows, and annual meetings of key groups	To keep private sector marketing efforts effective, it is important to provide outreach and offer training on both on-going program details and periodic program updates.
Market energy efficiency options directly to large end users at the earliest decision-making stages of major equipment or facility modifications	Identifying large equipment and facility changes early helps ensure efficiency opportunities are appropriately considered and maximizes chances of program influence. Utilization of sales or related tracking systems helps prevent projects from becoming lost opportunities.
Use personal marketing, where cost effective, to identify and address customer- and industry-specific barriers and customer issues	One-on-one marketing can be cost effective with large non-residential customers and offers the opportunity to tailor efficiency project promotion to specific business environments, requirements, and challenges. Emphasize non-energy benefits, where appropriate.
Develop and disseminate case studies of key technologies and segment applications	Large customers, particularly industrial, can be very risk averse with respect to new technologies. At the same time, they are very concerned about staying competitive and keeping up with industry trends. Case studies help to facilitate the diffusion of new ideas and practices.
Conduct on-going training of account managers and other marketing staff to keep abreast of the latest efficiency technologies and practices	Keeping up with the latest technical information is critical to maintaining credibility among large end users and their service providers.

Best Practice	Rationale
<b>Program Evaluation</b>	
Conduct both process and impact evaluations routinely	Large customer programs and markets are very dynamic and require regular assessment in order for program managers and policy makers to continuously improve them. They are also often the largest programs in an administrator's portfolio and hence require close monitoring.
Stagger the timing of process and ex post impact tasks so that process evaluations can be conducted and results communicated on a relatively real-time basis	Because of the long project installation lag after program participation in these programs, it is important to free process evaluation tasks to be conducted during or just after the program year so that results can be utilized to improve program processes for the subsequent program year.
Involve impact evaluators in projects that may require pre-installation measurement	Although final ex post savings measurements must by definition lag project installations, which can extend well beyond the program signup year, it is useful to involve impact evaluators during project review so that any necessary pre-installation measurements can be agreed upon and carried out.
Include estimation of free-ridership and spillover	Although measuring free-ridership and spillover can be challenging, there is usually critically important knowledge gained about program effectiveness through these analyses. Although there is legitimate concern over unproductive debates, ceasing measurement may be the wrong approach because free-ridership and spillover measurement often provide the most actionable and practically useful information in an evaluation. It is important, however, for parties to agree upfront on how results will be used, particularly with respect to any performance rewards or penalties for program administrators.
Develop realization rates by end use or measure type and utilize these to improve savings estimates over time	Because savings from custom measures are intrinsically difficult to estimate, it is important to use ex post measurement of savings to develop realization rates by end use, measure type, or other key segments, so that program managers can make appropriate adjustments to their ex ante savings calculations. Ex post results should be well documented to clearly indicate the specific parameters or operating assumptions to revise so that systematic biases can be identified and corrected.