

# **An Integrated Portfolio Approach to Evaluating Energy Programs**

## *New York's Experience<sup>1</sup>*

*Paul A. DeCotis, New York State Energy Research and Development Authority, Albany, NY  
Douglas Mahone, Heschong Mahone Group Inc., Fair Oaks, CA*

### **ABSTRACT**

The **New York Energy Smart<sup>SM</sup>** Program presents unique evaluation challenges due to the wide range of program offerings and NYSERDA's need for efficient and effective evaluations with limited resources. In response, NYSERDA has developed an integrated evaluation approach that differs substantially from traditional, program-by-program evaluations. The results, after just over two years of a full complement of evaluation activities and more than five years of results reporting, have exceeded our expectations. The value of this integrated approach in communicating results to decision makers, interest groups, and stakeholders holds promise for illuminating the real benefits of public and utility energy efficiency programs. It is especially valuable to be able to "tell the story" of progress and successes to interest groups that might otherwise oppose public benefits programs. This paper describes the integrated evaluation framework, its benefits and limitations, and shares the experiences of NYSERDA and its evaluation contractors with readers.

### **Introduction**

The **New York Energy Smart<sup>SM</sup>** Program administered by the New York State Energy Research and Development Authority (NYSERDA) offers a myriad of energy efficiency services, research and development (R&D) opportunities, and environmental protection programs funded by a system benefits charge on electricity sales. Because the programs are many and varied, and designed to work symbiotically toward the program's public policy goals, there is a need for the program evaluation to address the entirety of the portfolio. The program is currently evaluated using an integrated framework that includes evaluation of individual program components as well as the entire portfolio.

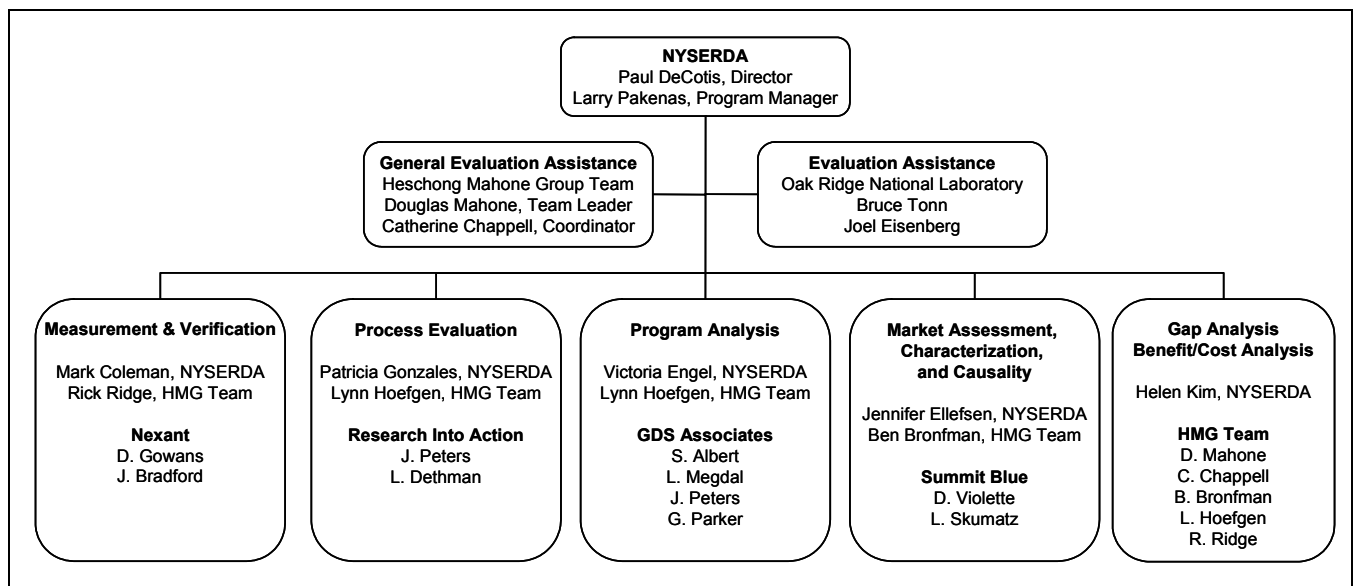
NYSERDA's integrated evaluation framework offers a new model for evaluating programs. It stands in stark contrast to stand-alone individualized program evaluations, where evaluation teams are assembled to address individual programs for specific program years. The integrated evaluation framework described in this paper provides several benefits over more traditional, stand-alone evaluation models, including: (1) its ability to explain varied, yet interrelated, program and portfolio accomplishments; (2) its ability to better communicate and compare the rationales for program approaches and implementation activities; and (3) its facilitation of forward looking and flexible planning for program improvements and new programs. Energy efficiency portfolio managers at utility companies, state agencies, and efficiency organizations can benefit from learning about the advantages and disadvantages of this approach. Furthermore, this paper can help portfolio managers to better understand the strategic value of evaluation as a management and planning tool leading to greater program success – whether such an approach is appropriate for an organization or not.

---

<sup>1</sup> The views expressed in this paper are those of the authors based on their involvement in the integrated portfolio evaluation and may or may not fully represent the views of all of the parties involved in the use of the framework.

## The Evaluation Framework Described

NYSERDA’s evaluation approach provides for general evaluation coordination assistance through independent contractor services, and several specialty evaluation teams including (1) measurement and verification, (2) process evaluation, (3) program analysis – theory and logic, (4) market characterization, assessment, and causality, and (5) economic analysis of benefits, including cost-effectiveness and macroeconomic effects. The Heschong Mahone Group (HMG) was retained to assist the NYSERDA evaluation staff in coordinating the work of the specialty contractors and to conduct its own ad hoc analysis as requested by NYSERDA to support the portfolio evaluation. The evaluation structure, with the lead organizations assigned to each of the major roles, is shown in Figure 1.<sup>2</sup>



**Figure 1:** Evaluation Structure

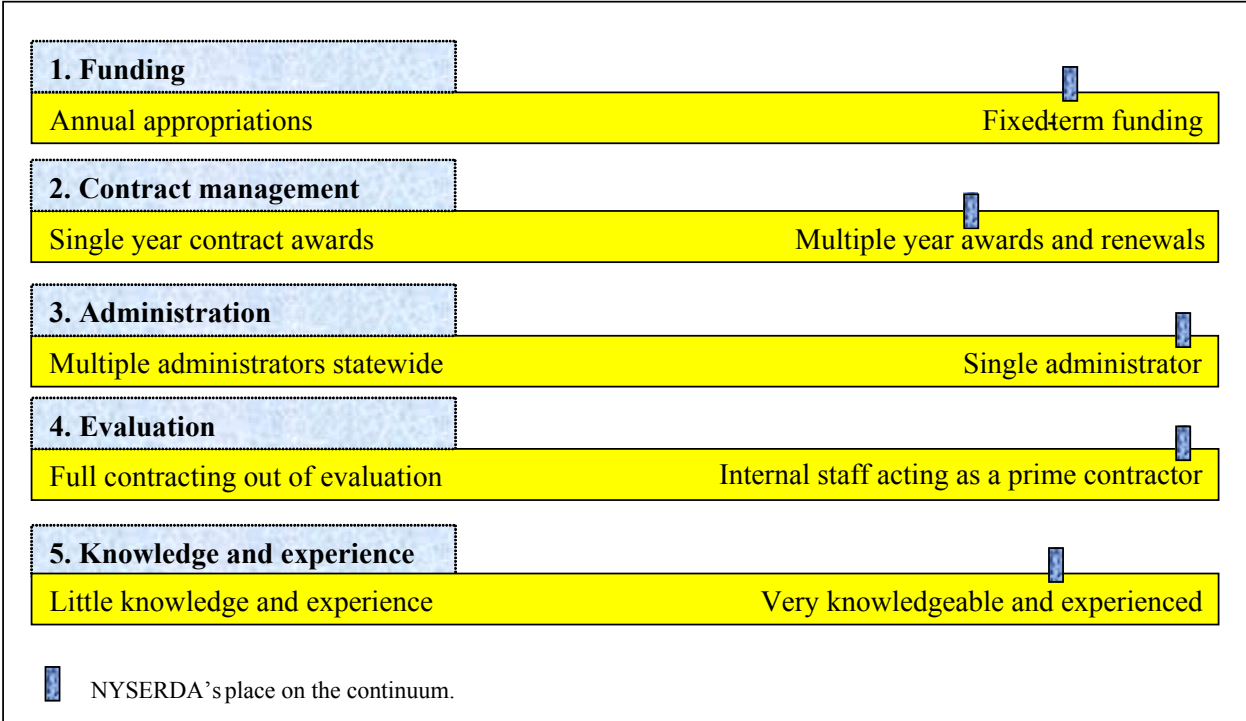
The coordination contractor helps to integrate the findings of the specialty contractors, to coordinate data collection and analysis activities, and to contribute to the assembly of NYSERDA’s Annual Report on evaluation. In addition, HMG has performed overarching studies of the cost-effectiveness of programs, conducted a gap/opportunity analysis, and provided several ad hoc analyses in response to program needs. Each specialty evaluator applies similar methods and approaches to all programs across the portfolio which the team evaluates. The four specialty contractors, shown in the first four boxes of the bottom row of Figure 1, are the prime contractors for each team. Both NYSERDA and HMG assigned a liaison to work closely with each of the specialty contractors. The role of the liaison is to ensure that activities undertaken by specialty contractors do not conflict with or duplicate other contractors’ activities to the extent possible, recognizing that some duplication may be advantageous or unavoidable. The HMG liaisons keep each other informed of all the evaluation activities, which produces a higher level of understanding of the evaluation methods and results. Oak

<sup>2</sup> Not shown in Figure 1, but a critical element of the evaluation framework, is the role of the SBC Advisory Group which serves as the independent program evaluator and Department of Public Service, both of which are consulted on evaluation activities and priorities and are involved in reviewing and commenting on results. The Advisory Group meets three to four times annually and reviews results and progress being made by the programs, as reported through the evaluation, and reports to the Public Service Commission. Figure 1 illustrates the organization and functionality of the evaluation within NYSERDA.

Ridge National Laboratory (ORNL) provides overarching support for the evaluation. In this capacity, ORNL has identified key indicators for measuring program progress and success, developed a methodology for assessing synergy among programs, and completed case studies of selected programs for which success is difficult to quantify. NYSERDA’s evaluation staff serves as the on-site evaluation team contact and liaison, helping coordinate evaluation activities with program implementation staff and contractors. In short, the coordination structure is valuable in keeping the different evaluation activities coherent and integrated.

**Administration and Management of the NYSERDA Portfolio**

It is important to understand the broader context in which this evaluation framework operates. There are at least five primary administrative and management features of the NYSERDA portfolio of efficiency programs that have contributed to its success to date, in both program implementation and evaluation. These are (1) certainty of funding, (2) availability of multiple year implementation and evaluation contract awards, (3) a single central program administrator, (4) housing of the evaluation function within the administrator with third party oversight and independent contractor support, and (5) experienced and knowledgeable staff and contractors. In the range of portfolio possibilities, these features can fall anywhere along a continuum of possible conditions. Figure 2 depicts a continuum, for discussion purposes, which characterizes NYSERDA’s position on each of the five features.



**Figure 2:** Conditions for Success

## **Program and Evaluation Funding**

Funding for both program administration and evaluation can be subject to annual appropriations, creating some uncertainty about program and evaluation activities and persistence. As a result, program activity can vary greatly from year to year, and administrative and evaluation decisions might sacrifice long-term opportunities for short-term convenience. Known funding over some fixed time period provides greater certainty for program implementers and evaluators. Such certainty is necessary for refining efforts to improve their integration as well as ultimate outcomes. NYSERDA's funding was initially established for three years; and just prior to the end of the third year, the program was extended another five years at roughly twice the initial annual funding. This allowed NYSERDA to hire contactors with some certainty for extended periods of time.<sup>3</sup>

The extended contracting period allows implementation contractors time to get programs up and running, which is particularly important for market development and market transformation programs. It also allows evaluation contractors to design multi-year plans for data collection, database design and management, research and analysis, and program coverage – to ensure that every program in the portfolio receives at least some level of evaluation at some time over the program's life. This multi-year, portfolio approach also allows evaluators to develop perspectives on program evolution that are difficult to achieve with “snapshot” evaluations of single programs or program years.

## **Contract Management**

The management of program implementation and evaluation services contracts is critical to a program's success. If contracts can only be entered into for limited services which, once completed, end a contract, the administrator loses a certain amount of continuity and momentum. The more frequently contracts are re-bid, the more time contractors must spend preparing proposals, thereby spending less time on project work and absorbing the risk of losing work. The administrator must also spend more time preparing solicitations, evaluating bids, and letting contracts. If an administrator changes contractors mid-stream during either implementation or evaluation, more time will need to be spent bringing the new contractors up to speed on programs and ongoing activities. This “break” in services can devastate program implementation and evaluation, as many activities, such as data collection for evaluation, are very time sensitive.

The longer-term contract awards for evaluators allow NYSERDA and HMG to develop annual evaluation work plans, to hold annual “all-hands” evaluation integration meetings, and to work more closely with NYSERDA program staffs to share findings and results. Longer term awards also allow the specialty contractors to offer more informed and higher-value suggestions for program improvement, and to establish trusted and respected working relationships with staff.

## **Administration**

With NYSERDA as the statewide administrator<sup>4</sup> of the public benefits program, implementation and evaluation activities can be centralized and more easily coordinated. Program “feel” is the same across regions of the State, program marketing, with little exception, is uniform across the State, and

---

<sup>3</sup> Ninety-seven percent of NYSERDA's contracts are awarded competitively. With some funding certainty, contractors are hired for extended periods of time with the option for renewal, provided that all terms and conditions of the contract and expectations are met.

<sup>4</sup> The New York Power Authority and the Long Island Power Authority also offer public benefits programs of their own that are coordinated to the extent practicable with NYSERDA's programs for a near seamless and more homogeneous program across the State.

evaluation of programs is made easier because all programs and features are the same regardless of the utility service area in which a customer resides. The alternative, at the other end of the continuum, would be a program that differs among various regions of the State – perhaps serving customers unevenly or not at all. Program delivery might differ significantly by region, addressing different market actors with differing incentives and with programs being offered for different periods of time – impeding the ability for any given program to gain any real traction without spending large amounts of money. NYSERDA realizes economies of scale and coordination by having near statewide administration of programs.

## **Evaluation**

NYSERDA's evaluation activities are centrally managed with NYSERDA evaluation staff participating as team members of the various specialty contractors and the general assistance contractors. As shown earlier in Figure 1, NYSERDA staffs are part of each team to facilitate frequent communication and to collect data and information on-site from NYSERDA program staff and their contractors. This is the equivalent of having evaluation contractors residing on-site at NYSERDA. The evaluation function is managed as an independent activity within NYSERDA and evaluation staffs serve as liaisons between program staff and the evaluation contractors. It is this particular feature of the evaluation that provides the foundation for the integrated evaluation framework. Had the evaluation function been contracted out entirely or “handed-off,” to an outside entity, NYSERDA would not realize the benefits that this integration offers.

## **Knowledge and Experience**

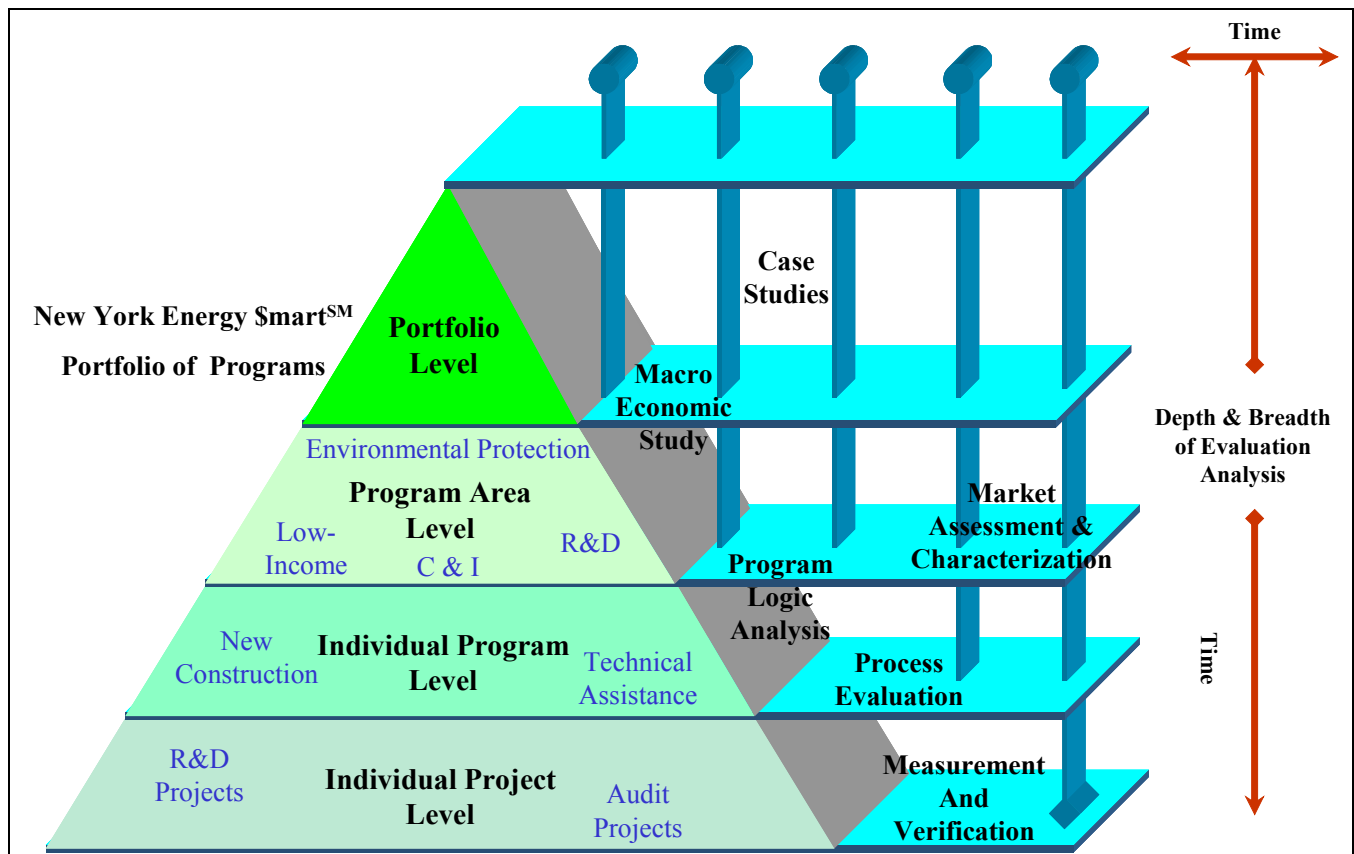
The knowledge and experience of NYSERDA's evaluation contractors are in large part responsible for the large amount of evaluation work completed and the rigor of the evaluation reporting. The learning curve was very steep for contractors brought in to evaluate programs that had already been running for some time. Data collection protocols were already in-place and were very program specific. Some limited evaluation work was already underway but was very uneven across programs. Some critical evaluation work was not yet begun. NYSERDA was administering some 48 programs when evaluation contractors were hired, and each of the assistance and specialty contractors were hired at different times. The potential for failure was great. Were it not for the professionalism, determination, knowledge and experience of the contractors, the integrated portfolio evaluation framework could not have achieved the success that it has. In fact, the framework was new to the evaluators as well – some of whom were associates, competitors, and implementation contractors in other public benefits programs. NYSERDA's evaluation function was nonexistent prior to 1998 and grew gradually over the past five years with very capable staff coming from different backgrounds and educational experiences. The diversity of staff skills and abilities, coupled with their determination to succeed and the knowledge and experience of the evaluation contractors, resulted in a well functioning teaming environment that delivered the benefits that NYSERDA anticipated from the integrated portfolio evaluation.

## **Evaluation Activities Summary**

Each of the specialty evaluation activities described earlier are shown in Figure 3 as they apply to various program levels such as individual projects, individual programs, aggregate program areas, and the portfolio. In planning the evaluation activities, it was important to think about what type of evaluation was most appropriate for which level of program activity. In addition, the timing of

evaluation is important, as programs mature and gain in popularity, evaluation activities are able to change to accommodate a program's increased contribution to the portfolio's overall outcomes.

Case studies, for example, can be conducted of individual projects, programs, areas, or for the entire portfolio. Measurement and verification, being much more detail oriented, is conducted at the individual project level and entails work at the measure level; these results can then be rolled up to the portfolio level. Macroeconomic analysis can be conducted either for the portfolio or program area level – each of which might be very appropriate and valuable in its own right. Analysis of macroeconomic factors at the project level, however, is much less meaningful, and would be difficult to isolate unless the budgets and impacts at the project level were significantly large. Program logic analyses are most appropriate at the program area level or even at the subprogram level. Nonetheless, program theory and logic modules can and should also be developed for the entire portfolio of programs to be most relevant and meaningful to program administrators and the public at large. The portfolio level evaluation provides data and information at a high enough level to “tell the story” in a direct and succinct way for ease of understanding. For NYSERDA, as in most jurisdictions, public benefits programs are authorized by the state legislature and/or regulatory agencies, requiring that evaluation results be presented in ways that are meaningful to government policy makers.



**Figure 3:** Evaluation Activities

In order to carry out this integrated portfolio evaluation approach, NYSERDA recognized that the coordination function was critical. The importance of the coordination function was borne out many times during the evaluation period. For example, each specialty contractor was tasked with developing a work plan for the coming year's evaluation. HMG and NYSERDA identified the programs to be

evaluated during the first year and the programs that could wait until the following year or later.<sup>5</sup> A survey was developed and administered to NYSERDA program staff to assess their beliefs on what evaluation activities were relevant to them. The data from the surveys were analyzed and shared with the specialty contractors. A matrix was developed that listed all of the programs in the portfolio, mapped which programs would be addressed by which specialty contractor, and specified the level of evaluation effort for each program. NYSERDA's on-site evaluation staff liaisons were critical to the success of this effort. HMG was tasked with reviewing the work plans of each specialty contractor to ensure that: the work plans followed the evaluation priorities that were determined at the beginning of the process; data collection activities did not overlap or duplicate one another (*e.g.*, customer sites would not be visited by multiple contractors); and data were collected in a form that all evaluators could use.

The work plans were reviewed by the Advisory Group and several members offered some important refinements. The work plans took a substantial amount of time for both development and review, but provided a blueprint to all contractors. It is strongly believed that the integrated portfolio framework could not have been possible without NYSERDA having a major role in the evaluation.

## **An Assessment of the Integrated Framework**

The integrated portfolio evaluation framework described here is the first time such an approach has been applied to energy programs, to our knowledge. The framework held promise when it was first conceived as a means to deliberately and quickly integrate program evaluation results into program management, and to readily aggregate program results to the portfolio level. The framework's strategic orientation promised:

1. Better integration of evaluation findings with program administration across the portfolio
2. Greater consistency of evaluation approaches among specialty contractors, along with coordinated data collection and sharing of findings among evaluators
3. Continual learning and improvement of evaluation processes and management
4. Improved administrative efficiency with fewer evaluation contracts to manage
5. Improved reporting with the ability to aggregate individual project and program outcomes to the portfolio level

Each of the expected benefits of the integrated framework are discussed and compared to the benefits realized in the following text. In addition, the framework yielded some unexpected benefits and brought to light some issues requiring serious attention.

### **Better Integration of Evaluation Findings**

The first major benefit of this approach has been the high degree of integration afforded by this model. It provides program implementation staff with direct access to the knowledge and know-how of evaluation experts. The evaluators and their findings provide data and insights that can bear on future program concepts, designs, and implementation. The close interaction between evaluators and program administrators benefits the programs, helping them to operate more efficiently and effectively. At the

---

<sup>5</sup> Prior to any evaluation work commencing, NYSERDA sought the guidance of the System Benefits Charge Advisory Group, which serves as the independent program evaluator, and the Department of Public Service (DPS) staff to ensure that their respective needs were met. The Advisory Group and DPS reviewed and collaborated on the development of the evaluation work plan and budgets, evaluation priorities, evaluation contractor selection, and contractor statements of work. In addition, both groups review and comment on evaluation reports prior to their completion.

same time, the ready access to program staff that is afforded the evaluators enables them to better understand how programs are operating, the challenges that they face, and the customers that the programs are working with. Although there was some initial reluctance on the part of program staff to spend the time with and submit to the questions from evaluators due to the administrative responsibilities placed on program staffs, they have come to value the insights and experiences the evaluators have to offer. Much of the initial tension between evaluators and program staffs has dissipated, which is good for both evaluation and program management.

### **Greater Evaluation Consistency and Coordinated Data Collection**

Although all of the evaluators are highly experienced, working with NYSERDA's integrated evaluation approach was new and different for them. Once they became accustomed to applying their methods to numerous programs within the same organization, they began to take advantage of the opportunities for greater consistency in their studies. This extended to the development of samples, data collection instruments, survey forms, databases, analyses and reports. With the passage of time, the evaluators have also been able to institute better coordinated data collection efforts, avoiding unnecessary duplication of effort when similar programs and populations are being surveyed, and using the same data formats and analysis techniques whenever possible. These efficiencies have benefited the overall evaluation effort despite evaluation resources being limited. In many cases, where evaluation contractors would have preferred larger sample sizes and more data, they were able to leverage the data collection efforts between programs to improve the evaluations for all of them.

### **Continual Learning and Improvement**

Because all of the evaluation efforts were on initial two-year contracts, with an option to extend them for a third year, the evaluators have had unprecedented opportunities to learn from their efforts on the initial round of evaluations and to improve their efforts on the second and subsequent rounds of evaluation. Along the way, the evaluators have come to know the programs and their staffs quite well, and have developed a deeper understanding of the interactive effects between programs and markets. Although the initial learning curve was steep for all of the evaluators, now that the investment has been made it is paying off in improved insights and better evaluation results – ultimately leading to better program designs and implementation.

### **Improved Administrative Efficiency**

The cost of administering evaluation contracts is often underestimated by program administrators. Even with highly professional evaluators, the administrators must still manage the month-to-month contracting details, and they have to provide the evaluators with access to program staff and data, review evaluation methodologies and work plans, troubleshoot any difficulties that arise, and review the final evaluation results and reports. Given the large number of programs that NYSERDA administers, these activities would have been overwhelming to NYSERDA staff if there had been separate evaluation contracts for each of the programs. The integrated evaluation approach has reduced the number of evaluation contracts to six, and has extended the timeframe for each of those to two or more years. This has greatly reduced the administrative overhead for evaluation and has allowed NYSERDA's evaluation staff to concentrate on matters of substance in the evaluation process.



## **Improved Reporting**

One of the substantial benefits of the preceding conditions has been a higher level of reporting. Evaluators are able to provide more consistent analysis of program accomplishments, which makes it possible to aggregate results to the sector and portfolio levels in a better and more coherent fashion than was previously possible. Report formats have been standardized and comparisons of evaluation findings between and among programs have been improved. Tracking of program progress and improvements from year-to-year has also been made possible by this evaluation framework. This improved reporting not only helps NYSERDA's oversight and stakeholder groups to better understand how the portfolio and its programs are doing, but it will be especially valuable in informing the policy decisions related to renewing New York's public benefits funding beyond 2006.

## **Unexpected Benefits and Issues Uncovered**

Many of the benefits of the integrated evaluation approach were anticipated, but there have also been some pleasant surprises as well. One has been the developing sense of ownership of the evaluation process among the evaluation contractors. They are beginning to think creatively and proactively about ways to further improve the evaluation of NYSERDA's portfolio. They are working with program staff to improve methods and databases for program tracking that will not only make their evaluation work more efficient in the future, but will also provide better management data for the programs. They are developing a clearer understanding of the constraints faced by program managers, both within NYSERDA and in the marketplace, and this is making their recommendations and critiques more useful and more actionable.

There have also been some issues and concerns raised about this integrated evaluation approach. One of the advantages of the traditional evaluation approach is that the team assigned to evaluate a given program would include all the necessary evaluation specialties under the same contract (*e.g.*, M&V, process, market assessment, etc.). This helped to ensure that evaluators developed an integrated picture of the program. NYSERDA's approach, of course, has the specialties separated out into separate contracts, each of which is assigned to multiple programs. We have had to develop new approaches to integrating the findings of the different specialty contractors assigned to a given program. In addition to the evaluation coordination contractor and NYSERDA staff liaisons, we have instituted evaluation integration meetings which are scheduled two or three times a year. At these meetings, the evaluators meet to discuss their findings and insights program-by-program, and they invite participation by the program staff to help in understanding what they are observing.

Another issue that has been raised is the question of evaluator independence. Some may wonder if the NYSERDA staff and the evaluators work too closely together, and whether this might compromise the ability of the evaluators to ask hard questions or report unfavorable results. It is generally felt that there are sufficient safeguards in place to prevent this from happening. The SBC Advisory Group, assigned by the Public Service Commission and DPS to oversee the evaluation function, have taken pains to make sure that evaluators are not unduly pressured by staff. The evaluators themselves are professionals who have worked for many organizations around the world, and they fiercely protect their independence because it is their stock in trade. Furthermore, the NYSERDA program staff recognize that their stakeholders are relying on the evaluators for candid reporting, and that their programs' future would be jeopardized if evaluation results were seen as compromised or inaccurate. NYSERDA management is proactive in trying to identify potential problems and in heading them off. And, when difficulties arise, NYSERDA management responds to resolve the conflict to ensure that the integrity and independence of the evaluation is not compromised. NYSERDA has used the findings, insights and advice of the evaluators to make many positive changes in its programs and practices, even before they

are published in the final evaluation reports. Because of this, the close working relationship between evaluators and program staffs is considered a positive benefit, rather than a threat to the independence of the evaluations.

## Conclusion

The integrated approach provides many advantages, in addition to the obvious advantage of consistency and integration across programs. For example, an integrated approach helps NYSERDA staff to better understand and “see” the interrelationships between program theory and logic, program design, and how markets are being and might be more effectively served. Further, it helps program implementation staff to be clear about their approaches to addressing market segments and market barriers – it helps related programs to be clear about how they can best coordinate their efforts – and it helps NYSERDA management to better understand how its program offerings relate to one another and to their markets. One key advantage of this evaluation approach is that each of the specialty evaluation contractors has crosscutting responsibilities for the entire **New York Energy Smart<sup>SM</sup>** portfolio rather than concentrating on evaluating a single program. Since the contractors have multi-year contracts with NYSERDA, continuity is gained as contractors develop broad familiarity with program activities and experience directly how programs are being run.

In summary, the integrated portfolio evaluation framework used by NYSERDA to evaluate the **New York Energy Smart<sup>SM</sup>** public benefit program is working well. The approach provides benefits in its ability to demonstrate accomplishments, rationalize program approaches and implementation activities, and plan for program improvements and new programs. Furthermore, the evaluation framework provides the ability to aggregate project and program accomplishments to a portfolio level, making it considerably easier to report portfolio accomplishments to a diverse audience of parties, including policymakers. While the integrated portfolio approach to evaluating programs might not be possible or preferred in many situations, the insights gained and benefits realized from this approach might help program administrators and evaluators continue to improve their operations.

## References

Albert, Scott; Engel, Victoria; Jordan, Gretchen; Megdal, Lori; Peters, Jane. 2004. “Using Program Theory And Logic To Improve Design And Likelihood Of Real Market Change - Experience With A State Public Benefits Program.” *Proceedings of the 15<sup>th</sup> National Energy Services Conference and Exposition*. Jupiter, FL: Association of Energy Service Professionals International.

DeCotis, Paul A.; Winters, Rachel G. 2004. “Governance Strategies for Effective Energy Program Planning And Administration.” *Proceedings of the 15<sup>th</sup> National Energy Services Conference and Exposition*. Jupiter, FL: Association of Energy Service Professionals International.

DeCotis, Paul A.; Winters, Rachel G. 2003. “Portfolio Evaluation: Strategy and Planning Part I.” *14<sup>th</sup> National Energy Services Conference Proceedings*. Lake Worth, FL: National Association of Energy Service Professionals International.

DeCotis, Paul A.; Tonn, Bruce; Pakenas, Lawrence J.; Eisenberg, Joel. 2002. “A Systems-Based Portfolio Evaluation: Diagnostic Benefits and Methodological Challenges.” *2002 ACEEE Summer Study: Teaming for Energy Efficiency Proceedings*. American Council for an Energy Efficient Economy. Washington DC.

Ellefsen, Jennifer; Violette, Dan; Kallock, Bill. 2004. "Causality and Attribution Evaluation for Market Transformation Programs: Integrating Program Implementation with Impact Evaluation." *Proceedings of the 15<sup>th</sup> National Energy Services Conference and Exposition*. Jupiter, FL: Association of Energy Service Professionals International.

Gonzales, Patricia; Barata, Sharyn Barata; Megdal, Lori; Pakenas, Lawrence. 2003. "Portfolio Process Evaluation: An Enhanced Perspective with Cost-Efficient Options." *2003 International Energy Program Evaluation Conference*. Seattle, Washington.

Kim, Helen; Ridge, Richard; DeCotis, Paul; Pakenas, Larry. 2005. "Benefit-Cost Analysis of a Portfolio of Energy Efficiency Programs: B/C Ratios Calculated at the Program, Sector, and Portfolio Levels." *2005 International Energy Program Evaluation Conference*. Brooklyn, NY.

Mahone, Douglas; DeCotis, Paul A.; Kim, Helen; Chappell, Cathy. 2004. "A Revolutionary Approach to Evaluation: NYSERDA's Portfolio Model." *2004 ACEEE Summer Study on Energy Efficiency in Buildings: Breaking Out of the Box*. Washington, DC: American Council for Energy Efficient Economy.

