

Tapping the Commercial Building Performance Market in New York

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ABSTRACT

Interest in enhanced commercial building performance and retrocommissioning (RCx) has grown as recent studies demonstrate its potential among the largest and most cost-effective opportunities for energy and peak demand savings. A number of RCx programs have been launched and different approaches for tapping the significant savings potential are being tested. In New York, a pilot program was begun in 2003 to tap this market across the state, especially in New York City, which has by far the largest concentration of commercial office space in North America, much of it operating at far less than optimal efficiency despite relatively high energy prices.

A major hurdle toward more widespread adoption of optimized building energy performance is the perceived cost of RCx, and convincing key decision-makers of the value of the investment. The New York RCx initiative broke the process into smaller, sequenced phases, beginning with a “scoping study” fully paid by NYSERDA, and then funneling promising projects into a cost-shared technical assistance study to fully investigate the potential savings opportunity and determine project economics. This paper discusses the process of developing the initiative, its success and challenges in attracting building owner/manager and RCx provider attention and participation, and future directions toward building performance improvement, along with observations of interest to efficiency program providers. Market barriers and successes will be identified and presented along with early insight into expanded program offerings expected to more fully mine the substantial energy and peak demand savings potential for large building opportunities.

Introduction

The commercial buildings sector in New York State currently consumes about 73,000 GWh of electricity per year, using 490 trillion BTU of all fuels. This sector has seen the greatest growth rate in electricity consumption over the past decade. While total electricity sales grew by approximately 11% from 1994 through 2003, commercial sector sales grew by almost 24% (NYSERDA 2004). The downstate/metro New York City stock of existing commercial buildings over 100,000 square feet accounts for almost 50% of this statewide total.

The New York City metro region contains more than 650 million square feet of office space, approximately 16.6% of the U.S. total, far in excess of the region’s 6.6% share of the national population (Kelly 2002). In particular, the Manhattan Midtown and Downtown commercial districts comprise over 316 million square feet and 91 million square feet, respectively (Studley Inc. 2005). The top five property managers in New York City manage over 134 million square feet, controlling both a huge amount of floor space and energy usage in

New York, and also with national and global reach. These major players want to be perceived as leaders, therefore providing an opportunity to match or exceed the performance of their more innovative peers is a significant motivator. Recognizing the tremendous opportunity, NYSERDA made the New York City commercial real estate market a key target of its RCx Initiative and will continue to target this segment through initiatives currently under development.

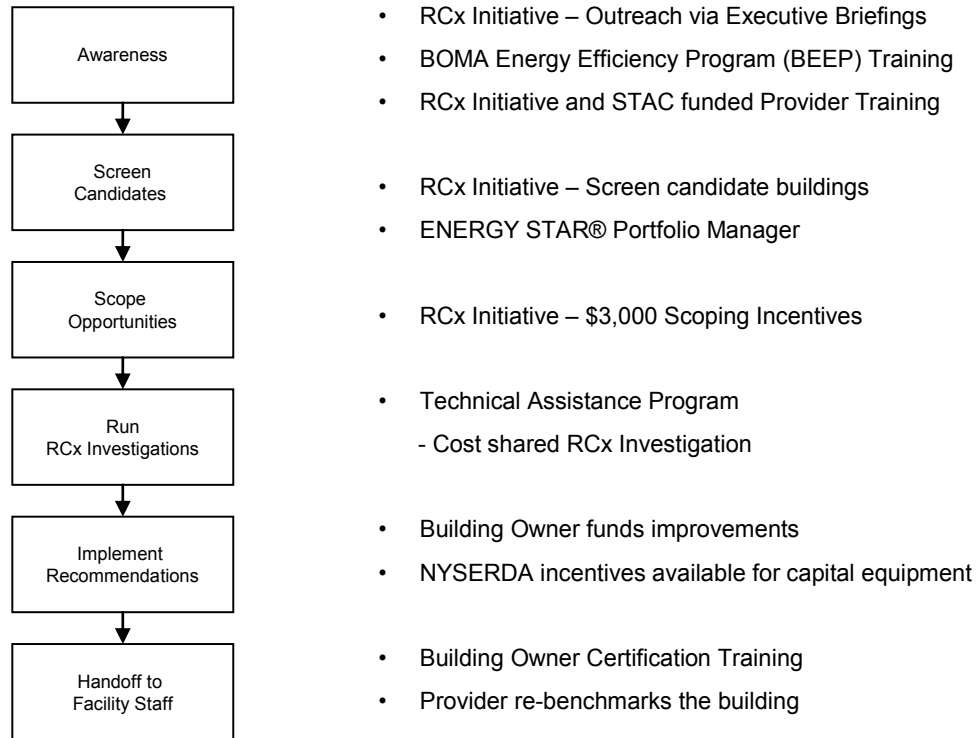
Whole building performance improvement has been recognized as a potential intervention strategy for years, however more recent state initiatives have fostered programmatic activity to tap the significant potential. A 2002 study estimated potential national primary energy savings from RCx to be approximately 865 trillion Btu by 2020. These savings were the second largest of the 38 different energy saving technologies and practices in the residential and commercial sectors examined in the study (Nadel 2002). Experience in other parts of the country has shown that whole building performance initiatives can result in significant energy savings and non-energy benefits including improved occupant comfort and reduced building operations problems, with energy savings in the range of 5 – 15% of total energy use (Mills et al, 2004). A 2003 study of the technical and economic potential for energy efficiency in New York estimated the statewide economic savings potential for whole building energy performance improvements at 1,414 GWh/year with peak demand reduction of 309 MW (NYSERDA 2003).

Evolution of NYSERDA's Programs

NYSERDA has offered several programs aimed toward commercial building performance improvement since beginning to administer the statewide Public Benefits Fund in the mid 1990s, and has been active in supporting a number of broader national initiatives. RCx has been a key strategy in NYSERDA's market transformation efforts targeting existing commercial buildings. From 2000 through 2005, NYSERDA (with support from ACEEE, Portland Energy Conservation Inc., and Sustainable Energy Partnerships) implemented a market transformation program promoting retrocommissioning (RCx) in New York buildings. The first phase of the program, from 2000 through 2002, focused on broad education targeting building owners and service providers, hands-on contractor training, technical assistance, and development of case studies.

Beginning in 2003, the second phase of the project (the RCx Initiative) shifted to a more targeted approach directed to leading building owners and property managers primarily in the downstate region. The RCX Initiative helped to further integrate several program efforts to achieve the desired momentum in retro-commissioning. A presentation of how the various programs address different points in the value chain is presented in Figure 1.

Figure 1. Program Influence along the Value Chain



Building owners, property managers, and leading engineering consulting firms were recruited for participation through Executive Briefings held one-on-one with key targets and meetings of professional societies and business associations. The Executive Briefing covered the basics of RCx, energy and non-energy benefits—including related financial benefits, and the details of the RCx Initiative and other NYSERDA programs supporting RCx. Through the RCx Initiative, NYSERDA offered technical assistance and incentives to cover the cost of an initial building scoping study. The scoping study report assesses energy savings opportunities and serves as an application for further support through NYSERDA’s Technical Assistance program for full RCx. Qualified service providers interested in participating in the Initiative and receiving scoping study incentive funds attended a training session on the required scoping study elements and completion of a report that would meet the TA program requirements. Through the project, NYSERDA engaged several major property owners and managers in the Metro New York City area, including Reckson, Mack-Cali, Marriott, and others responsible for high profile buildings—several of these firms have completed projects which NYSERDA is publicizing as case studies. The program also generated spillover effects in the federal buildings sector in New York and throughout the Northeast region as RCx providers apply the skills and tools they learned through NYSERDA-sponsored training to conduct scoping studies and larger RCx projects.

The RCx Initiative was designed to qualify potential retro-commissioning projects which would benefit from full retro-commissioning investigation cost-shared under NYSERDA’s Technical Assistance Program. The Technical Assistance Program will cost-share up to \$50,000 for studies to analyze and evaluate procedures that reduce energy consumption and costs by

identifying operational efficiency improvements. RCx services funded under this program must be specifically focused on energy efficiency. RCx studies without the potential for significant energy savings are not eligible for funding. Funds may be used for evaluation of facilities only, and may not be used to correct deficiencies found. NYSERDA requires that the Scope of Work submitted along with an application to the Technical Assistance Program include a list of components contained within the building and/or system to be retrocommissioned. This includes identification of the size, type, age and location of all air handlers, pumps, chillers, control points, and other pertinent operations and buildings systems. By using the Scope of Work template developed under the RCx Initiative, providers could be assured that their applications would include detail of interest to the NYSERDA project manager responsible for awarding funding under the Technical Assistance Program.

Toward the broader goal of commercial whole building performance, NYSERDA offers related benchmarking and training initiatives and supports other initiatives that promote improved commercial building performance. In the Schools sector, NYSERDA offers energy benchmarking services through TRC Energy Services, to analyze and rank the energy performance of K-12 schools in New York State. More than 280 schools have taken advantage of this service, where the school's energy use information is run through several models to generate an overall indication of the building's performance and provide a ranking of the school's energy performance compared to other K-12 schools in the state (Coleman & Afshar 2004). The final report includes recommendations as to how schools may proceed to improve building efficiency, and shows available NYSERDA programs to provide financial and technical assistance.

With project funding under the State Technology Advancement Collaborative (STAC), NYSERDA joined with the California Energy Commission and other co-sponsors to research, develop, demonstrate, and deploy new commissioning and retrocommissioning technologies and practices. This effort builds upon the current NYSERDA commissioning initiatives by providing commissioning service providers with new information, methodologies and technical tools to improve and standardize the commissioning process. Rather than developing these tools independently, NYSERDA has leveraged investments made by DOE, California, and others; and is now deploying the newly developed Functional Testing Guide on RCx projects. Further development is underway for a Functional Testing Checklist Tool and Functional Data Analysis Tool, which will both be deployed on New York pilots during early 2006. Initial testing of an Automated Building Commissioning Analysis Tool (ABCAT) is in development by Texas A&M in conjunction with the University of Nebraska. NYSERDA is piloting the tool at the headquarters building for the Dormitory Authority for the State of New York (DASNY), and evaluating use in new construction as a continuous commissioning tool at the Hauptman Woodward Medical Institute in Buffalo, New York.

One of the most important elements needed to achieve persistence of savings through RCx projects is the ability of the building operators to understand how system integration problems have been resolved so as not to revert back to old habits of addressing operational issues on a one-off basis. Building operators who receive effective training will be able to identify and resolve operational issues in their buildings and keep retrocommissioning measures, i.e. equipment setpoints, in tact, as well as be able to use building management systems and on-going commissioning tools to collect and analyze operational data. Therefore, NYSERDA supports building operator training through several venues. NYSERDA is one of six government sponsors and several utility and organizational sponsors of Building Operator Certification

(BOC) training, a nationally recognized competency-based training and certification program for building operators. Operators earn certification by attending training and completing project assignments in their facilities. Training topics include facility electrical, HVAC and lighting systems, indoor air quality, environmental health and safety, and energy conservation. Regional coordination of training activities within New York State are accomplished through outreach and support from Northeast Energy Efficiency Partnerships, Inc.

Education and further promotion of whole-building performance strategies to owners within the commercial real estate sector complements BOC training, and is necessary to increase market pull for building performance services. In 2005, the Consortium for Energy Efficiency (CEE) expanded its commercial buildings effort to further assist energy efficiency organizations with the goal to broaden impact on building performance services. NYSERDA management co-chairs the national CEE Commercial Building Performance Committee, and has joined a CEE sponsored sub-committee to partner with the Building Owners and Managers Association (BOMA) Foundation to promote energy efficiency. The BOMA Foundation has developed an innovative, operational excellence program called the BOMA Energy Efficiency Program (BEEP). In partnership with ENERGY STAR[®], the BOMA Foundation plans to deliver a six-course curriculum concerning no- and low-cost solutions to achieve energy efficiency. NYSERDA will support the promotion of BEEP through co-branding, promoting, and co-hosting training sessions with local BOMA associations and other interested members of the real estate industry and provide information regarding access to technical and financial resources needed to proceed with energy-efficiency projects.

RCx Initiative Findings and Lessons Learned

Through the RCx Initiative's scoping study process, 23 provider firms in New York were qualified to participate in the program, and nineteen projects were submitted for scoping study incentives. In addition to these nineteen projects, five projects were submitted directly to NYSERDA's TA program for full RCx investigation, and several other projects conducted scoping studies without taking advantage of NYSERDA incentives (for example, training session attendees included firms that do work for Federal buildings, and two very good scoping studies were done on NYC Federal buildings, which did not require any subsidies from NYSERDA). The RCx orientation training informed building owners and providers of the benefits of proceeding with a scoping study determination prior to engaging in a detailed retro-commissioning investigation later funded through DOE/FEMP sources.

The RCx Initiative "touched" a significant portion of major NYC building owners and managers. The Executive Briefings and all outreach efforts were targeted toward industry leaders, as well as to high probability and high profile projects, to make them aware of RCx benefits and opportunities. Table 1 shows the listing of several of the largest commercial building owners and managers, and how the project interacted with their properties.

Table 1. Major Building Owner/Managers and Engaged through RCx Initiative

Owner/Manager	Total NYC Portfolio (million sq. ft.)	Properties Involved in NY RCx Initiative
<i>Owners</i>		
Vornado	15.6	Scoping Study done for One Penn Plaza, a 2.5 million s.f. property
Reckson	17.8	Scoping report done for 1350 Avenue of the Americas
Mack-Cali	12.5	Scoping report done on 1 Executive Boulevard, with RCx TA Study done on another building
<i>Managers</i>		
Cushman & Wakefield	54.2	Scoping Studies done for NY Mercantile Exchange and 11 Madison Avenue, both managed by C&W
Hines	7.7	Scoping Study done on Morgan Stanley corporate headquarters building managed by Hines

Table 2 below shows a summary of the buildings submitted through the RCx Initiative, along with their average electricity use, energy cost, and ENERGY STAR[®] scores.

Table 2. RCx Projects in the NYSERDA Initiative

	Average Building Size (sq.ft.)	Average kW/sf	Average Energy \$/sf	Average ENERGY STAR score
NYC Projects	893,594	20.99	3.54	57.83
Upstate Projects	214,583	19.13	1.98	66.00
All Projects	648,253	20.46	3.28	62.46

The scoping studies were generally very high quality. In particular, several providers whose business is focused on Cx/RCx did an outstanding job, while some of the other providers whose principal business is energy auditing or engineering design used the scoping studies more as a traditional energy audit rather than the intended evaluation of RCx opportunities. In some of the cases, the scoping incentive of \$3,000 produced engineering work more equivalent to the work effort of a \$10,000 to \$20,000 study. This was due to the presumption, by providers, that the scoping would lead to further engineering/RCx work for that client and moving forward with RCx investigation activities, while in the building to do scoping, was an investment that would be repaid when the building owner continued with the process. Additionally, providers who are unaccustomed to the utility-driven RCx process, which in most cases requires scoping, are not comfortable providing owners with reports and cost estimates based on generalizations and rules of thumb about energy-saving opportunities. Therefore, they gather specific data about the building, outside the content of scoping, so they are comfortable with their proposed RCx investigation work. The scoping incentives led to deeper RCx investigation work in many cases than would have been done without the scoping incentive. It's also noteworthy to realize that some providers would not have assumed risk for these projects without the scoping incentive.

Interestingly, the ENERGY STAR[®] scores of the buildings that participated were well above the average building score of 50. While the RCx Initiative was trying to attract “low hanging” opportunities, it is interesting that it did not attract lower ENERGY STAR[®]-scored buildings. Perhaps this is because the owner/managers that were engaged were “early adopters”, and pursued projects even with buildings rated generally more efficient. It is also important to note that even buildings with higher scores (70-80) the scoping studies found significant savings potential. Several of the RCx projects are being developed as case studies to promote the concepts to other potential customers:

- **Columbia University** has done RCx investigation with NYSERDA support on two buildings: their Center for Engineering and Physical Science Research (CEPSR) and the Business Law Building. In the CEPSR building, the RCx investigation report identified over \$470,000 in energy cost savings opportunities that Columbia staff are in the process of implementing. In the Business Law building, savings were somewhat less, but the building’s HVAC system can now deliver the expected comfort to building occupants where there had been major problems prior to the RCx process.
- The **New York Mercantile Exchange (NYMEX)**, the world’s largest energy futures marketplace, became interested in RCx as part of their attempt to become certified through LEED for Existing Buildings. As part of developing the “commissioning plan” that is required as a prerequisite for LEED-EB, NYMEX participated in the RCx Initiative and received a scoping study. In addition, NYMEX partnered with NYSERDA and others to host a four day advanced RCx training session for leading RCx providers from the Northeast Region. Through the training process, NYMEX staff, with help from the providers that attended the training, identified RCx measures with almost \$200,000 in energy cost savings.
- **The Marriott Marquis** hotel in New York City’s Times Square is Marriott’s flagship property and one of their largest facilities in the world. Interest in RCx opportunities came as a result of a broad “Marriott RCx Initiative” that was developed by Marriott staff based on RCx work done in some of the Marriott facilities in California. A wide range of chiller plant, steam system and controls operational issues were examined as part of the RCx investigation, and Marriott staff is currently evaluating a number of the recommendations for implementation.

Review of the motivations for participation in the RCx Initiative suggests that energy cost savings often are not the main driver for many RCx projects; comfort issues and opportunities for recognition as a leader can be more important to many building owners and managers. However, it should be mentioned, that as energy prices rise they are increasingly seen as the catalyst for RCx, especially in some building sub-sectors. For example, the City University of New York (CUNY) has said that reducing energy costs was their primary reason for seeking out RCx services. Nevertheless, there is growing interest in green buildings, and the emergence of LEED for Existing Buildings (LEED-EB) with Existing Building Commissioning as a prerequisite is a big driver for interest in RCx. In the presentations of three case study projects at the RCx Summit in February 2006, two of the three were driven by issues other than energy savings: one of the two Columbia University projects was initiated due to comfort issues, and the NYMEX project was initiated due to the interest in achieving LEED-EB certification.

In hindsight, the value of the scoping study incentives toward stimulating whole-building retro-commissioning projects is unclear. The scoping studies were originally intended as a “paid foot-in-the-door” to help stimulate screened projects. For many owners, challenges in the New York market that include an abundance of triple net leases (complicating energy investment paybacks), the high cost of living (decreasing the value of a scoping study incentive), and the fact that many companies have their own trusted engineering firms were enough to either prevent participation in the scoping incentive or in RCx altogether. In the end, the scoping incentives generated interest amongst some RCx providers, but were less effective in “closing the deal” with business owners. For those projects that continued on to full retro-commissioning investigation, the scoping study incentives helped to mitigate some of the provider’s risk by underwriting a portion of their cost to determine cost-effective RCx opportunities. The work effort to complete the scoping study helped to establish a working relationship between the owner and provider, thereby building confidence of the building owner prior to the retro-commissioning project. This in turn served as a structured screening tool both for the program implementer and the building owner/provider.

Future Building Performance Direction in New York

The RCx Initiative results coupled with the idea that facilities in New York City are motivated to leverage building performance projects to support their energy efficiency and demand reduction efforts has led to a wide range of new initiatives that NYSERDA is rolling out for customers around New York State. A number of new NYSERDA Commercial Building Performance initiatives are described below, including a new targeted pilot in the Consolidated Edison service territory under the Building Performance and Financing Program. The early adopters participating in the RCx Initiative have the staff, commitment, and need to further reduce demand.

Building Performance and Financing Program

In addition to the Statewide programs that NYSERDA implements through the System Benefits Fund, in 2005 NYSERDA was also given the responsibility to administer additional energy efficiency and demand reduction programs in the Consolidated Edison (ConEd) electric service territory. NYSERDA’s Implementation Plan for the System-Wide Demand Reduction Program (SWP) in ConEd service territory includes a Building Performance and Financing Program designed to achieve over 4MW of demand reduction through effective RCx projects for large commercial properties in the territory. Under this program, NYSERDA plans to provide incentives to participants to: 1) cover a large portion of RCx services costs, and 2) buy-down implementation costs to achieve a one-year simple payback on recommended measures. Services will be delivered building off the network of qualified RCx service providers which NYSERDA will continue to support and expand. The program shall continue to focus primarily on low-cost and no-cost operation and maintenance opportunities and cost-effective capital measures. The identification of capital measures will target high demand reduction items, such as air handling units, chillers, energy recovery technologies, lighting and controls, and pump improvements.

As a condition for participation, NYSERDA plans to require building owners to assume costs and expenses to achieve 70% of the estimated peak demand savings for their project or

\$10,000 for installing agreed-upon measures that have a simple payback, net of incentives, of one year or less (whichever is less). NYSERDA will still target large commercial projects, but will increase the minimum project size and add a minimum summer peak demand requirement. Thresholds currently being considered are a size of at least 500,000 square feet and a summer peak demand of at least 2MW. Priority will be given to buildings with an energy management system, interval meters, and a high, normalized demand of at least 5 watts per square foot. NYSERDA will encourage the use of the US EPA ENERGY STAR[®] benchmarking software tool, Portfolio Manager, to encourage building owners and service providers to identify buildings that are good targets for participation.

NYSERDA will adopt options and methods from the 2002 International Performance Measurement and Verifications Protocol (IPMVP) and the 2000 Federal Energy Management Program (FEMP) M&V Guideline. These are the same resources NYSERDA uses for measurement and verification in the C/I Performance Program. Both resources outline methods for verifying potential demand reductions for specific efficiency measures. Methods for some measures call for spot measurements and manufacturer data for determining savings. Methods for other measures require more involved approaches such as site trend data or advanced metering. The trend data or metering is used to characterize the equipment baseline performance, then demand savings are determined using either detailed engineering calculations based on post-installation conditions or additional metering, as required. All methods use engineering analysis to translate performance data to savings values. In adopting these protocols, NYSERDA will require more rigorous methods for measures with higher savings and greater variability. If verification reveals the implemented conditions are not met, NYSERDA will recalculate the savings and adjust incentive payments accordingly. NYSERDA also may drop projects from the Program if they do not meet the performance criteria established for any specific phase of the project.

Innovative Opportunities Programs

Under a recent solicitation promoting “Innovative Opportunities” in market transformation programs, NYSERDA allocated \$1.9 million and sought proposals for up to \$500,000 each. This is the fifth time that NYSERDA has offered funding in support of innovative market transformation. This particular solicitation targeted areas of interest including electronics and plug-load management, development of “whole building” performance platforms for commercial buildings, and sector-based approaches to energy efficiency and building performance. The response to this solicitation was overwhelming. Thirty-seven 37 proposals were received, with several proposals addressing building performance needs. Four of the awarded projects described below, will leverage ENERGY STAR[®] benchmarking and other standard practices developed under previous pilot efforts to further leverage building performance strategies in targeted market sectors.

Linkages to Improve Commercial Building Performance. ACEEE and Sustainable Energy Partnerships proposed a project to further promote the adoption and implementation of whole building performance improvements in the New York commercial buildings market. Under this project, NYSERDA will support development of a whole-building performance platform to serve New York building owner/managers, including work toward sharing information through a New

York City specific energy performance database. Effort will be constructed around the opportunities to further deepen NYSERDA's relationships with leading players in the real estate industry market, including the Building Owners and Managers Association (BOMA), and the Real Estate Board of New York (REBNY) and other influential market leaders. A Peer Exchange Network of leading early-adopter owners will be developed to facilitate transfer of knowledge regarding best practices in improved building performance.

Establishing a Building Performance Lab at CUNY. The City University of New York (CUNY) Institute for Urban Systems proposed a project to implement a multi-faceted public education, training, and research facility to direct the widespread adoption of enhanced operational practices and new building performance practices for the New York City commercial real estate market. This project will develop a comprehensive Building Performance Laboratory (BPL) to serve as a public platform for the continuation of market transformation in the commercial buildings sector, including continuing education and long-term workforce development, satellite lab development to support optimization of existing systems, and deployment of new building performance technologies, and research activities related to advanced building operations and high-performance buildings.

The project will establish a permanent institutional base within the City University of New York (CUNY) for the continuation and expansion of work initiated under NYSERDA's RCx Initiative. The institutional base will be called the CUNY Building Performance Lab (BPL) and will coordinate activities through various CUNY campuses and affiliates. The educational objective is to develop a workforce in NYC with the requisite knowledge and skills to implement Enhanced Building Operation on a permanent basis. This workforce encompasses active building operators through their union, practicing professional engineers through several professional associations, service contractor technicians, property managers, and students prospectively entering these lines of work. The activities of the BPL will upgrade skills in the existing industry and provide manpower for its expansion.

Sector-Based Approach to Energy Efficiency within Hospitals and Healthcare Facilities. This project proposed by Ecology and Environment (E&E) plans to develop pilot projects with a cross section of health care facilities with the objective of demonstrating that measurable efficiencies and cost savings can be achieved through a combination of behavioral, operational, managerial and limited capital improvements. Detailed energy surveys will be performed at each facility, with final reports providing information on the baseline energy data, energy use profiles, and a recommended list of energy conservation measures. The pilot will include development of a further honed benchmarking tool for healthcare facilities, which may tend to be smaller buildings with less sophisticated controls. Non-energy benefits will also be gained through improved indoor air quality and building safety procedures.

Self Benchmarking for the High-Tech Sector in New York. This project proposed by Lawrence Berkeley National Lab is designed to further develop and use action-oriented self benchmarking protocols for laboratories, cleanrooms and data centers. These protocols will provide guidance and explicit recommendations on how to improve energy efficiency in these types of facilities. Action-oriented benchmarking allows facilities to develop a more targeted audit for a given, site; compare system efficiency metrics to energy use metrics and thereby

reveal the potential for retro-commissioning various systems and components. The pilot effort will also assist in the development of peak load metrics that can be used to identify opportunities for peak load reduction. The established protocols can then be disseminated through guides and workshops so users can self-benchmark their own facilities, with the potential to reduce energy use in high-tech facilities by 20% or more.

Conclusions

The RCx Initiative moved the market toward a better understanding of RCx and its savings potential, and built capacity to mount new, broader initiatives that are now getting started. New York's program experience has demonstrated the need for a comprehensive whole buildings approach to market transformation; a range of new initiatives are getting underway to fill out the program offerings in the State. A "cradle to grave" approach, with early efforts to develop qualified building operators through effective training, ongoing efforts to enhance the qualifications of facilities staff, development of a large pool of qualified RCx providers to help building management, and sharing of best practices through benchmarking and other information exchange fora, has the best chance of tapping into the very large potential for energy and demand savings in New York (and elsewhere).

The foresight of strategies put forth in Executive Order No. 111, "Green and Clean State Buildings and Vehicles" helped direct the energy efficiency practices of state agencies and other affected entities in New York State. Existing buildings were provided the directive to implement energy efficiency practices with respect to the operation and maintenance of all buildings that they own, lease, or operate including placing priority on evaluating their building stock using the ENERGY STAR[®] Portfolio Manager. The building screening and scoping process outlined in the RCx Initiative provided a structured approach to evaluate building performance and begin the process of identifying RCx opportunities to meet energy and non-energy building performance goals.

While the RCx Initiative identified significant savings opportunities, the implementation of projects and delivery of those savings to date has not been as large as hoped. Decision makers in existing buildings have many competing priorities, and keeping energy savings projects high on their priority list is a real challenge. In many ways, energy efficiency projects involving capital measures are more acceptable as a common practice. Though, these projects often get bogged down in budget cycles and overriding funding needs. RCx can tap into a more accessible O&M budget; however, owners do not typically understand that this is the appropriate funding mechanism to use, or, without an understanding of the energy saving potential through O&M, have in place a sufficient O&M budget.

The small scoping study incentives offered through the RCx Initiative were very helpful in stimulating interest in RCx among both owner/managers and providers, but scoping incentives alone do not drive projects through the full investigation and implementation process; additional program offerings are needed. In a market where RCx and operational optimization is relatively new, there is a need for demonstration projects to show that the expected potential can be achieved, and that it is worth owner/managers investing their own funds to save on energy costs. Building owners and facility managers need to implement successful RCx projects in order to ascertain the immediate benefits and cost-effectiveness of building performance projects. Critical to overcoming concerns about the persistence of benefits is the need to implement continuous

improvement strategies including operator training and updating systems documentation. Successful future program portfolios will include outreach to owners, cost-shared assistance to providers and owners, incentives for implementing recommended improvements, and operator training.

Barriers continue to exist in establishing building performance and RCx as cost-effective strategies to improve energy efficiency and thermal comfort. It is presently unclear how easily or cost-effectively the large potential for savings can be tapped, though the new range of comprehensive program offerings that are presently getting underway should yield answers within the next year or two.

References

- Coleman, Gregory and Cyrus Afshar. 2004. Building Performance Analysis: Energy Benchmarking of New York State Schools. In *Proceedings of the 2004 ACEEE Summer Study on Energy Efficiency in Buildings*. pp. 4.56-65. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Kelly, Hugh F. 2002. The New York Regional and Downtown Office Market: History and Prospects after 9/11. Prepared for the Civic Alliance. August 9. Hugh F. Kelly Real Estate Economics.
- Mills, E., H. Friedman, T. Powell, N. Bourassa, D. Claridge, T. Haasl, and M.A. Piette, 2004. "The Cost-Effectiveness of Commercial Buildings Commissioning: A Meta-Analysis of Energy and Non-Energy Impacts in Existing Buildings and New Construction in the United States." LBNL-56637.
- Nadel, Steven. 2002. Screening Market Transformation Opportunities: Lessons from the Last Decade, Promising Targets for the Next Decade. In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- NYSERDA. 2004. Patterns & Trends: New York State Energy Profiles: 1989-2003. December.
- NYSERDA. 2003. *Energy Efficiency and Renewable Energy Resource Development Potential in New York State, Vol 3., Energy Efficiency Technical Report*. August. Prepared by Optimal Energy, Inc., ACEEE, and Vermont Energy Investment Corporation. Albany, NY: NYSERDA.
- Studley, Inc. 2005. The Studley Report, First Quarter 2005, available at www.studleyreport.com