Rebuild Massachusetts

Final Report for Rebuild Grant R101314
Ending December 31, 2004

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PROGRAM RESOURCES AND GOALS

Rebuild Massachusetts (RBMA) is a voluntary program that brings together the public and private sector in a partnership to help communities be more environmentally and economically sound through smarter energy management.

Project Leader is Eileen McHugh who coordinates state level partners, DOER's outreach strategy, and oversees project progress. She also performs community partnership outreach and recruitment, is the operational liaison with NEEC and partner utilities, coordinates technical assistance to community partners and tracks and reports project status.

The Executive Committee Group that serves as the planning committee includes DOE's Region 1 representative, Peregrine Energy Group, the Massachusetts Department of Housing and Community Development, the Division of Capital Asset Management and utility and community partners.

Key resource links include:

- DOER's Energy Conservation Improvement Program that provides bond funded assistance for capital improvements, rehabilitation, and construction for public schools and performance contracting.
- Energy Efficiency Programs administered by investor owned utilities partnering with RBMA.
- Rebuild America Business Partners who provide technical workshops/seminars.

The program supports reuse/rehabilitation in schools, municipalities, and public housing. Outreach includes coordinating existing resources by identifying development opportunities to increase community-wide incorporation of energy and water efficiency in buildings and neighborhoods where other public and private investments are occurring.

The target audience includes community leaders, facility managers, municipal planners/administrators, housing authorities, business managers, buildings/grounds directors, and school superintendents. Priority target sectors include municipalities, public agencies, school systems, and public and subsidized housing.

The program received federal assistance funding of $125,000 that funded professional time provided by NEEC (Peregrine Energy Group), and $230,000 in kind support from Massachusetts Electric, NSTAR, Keyspan and Western Massachusetts Electric. Utility support is implemented in their respective service territories. In the case of Massachusetts Electric, support also included sponsorship of two High Performance School Building Seminars offered across their service territory.

The program mission is to advocate for and support the adoption and institutionalization of energy efficiency into community-based planning and investment as an integral part of 'day-to-day' decisions.

PROGRAM STRATEGY

RBMA supports partnership communities using energy efficiency and renewable energy to improve their communities. Our goal is to help communities with energy solutions to their needs that extend beyond the primary building retrofits.

Our strategy is to increase community-wide incorporation of energy and water efficiency in buildings and neighborhoods where other public and private investments occurred and facilitate energy efficiency improvements for municipal, school and multi-family residential buildings directed by the local partnerships. DOER identified, stimulated, and supported active local partners including, municipalities, K-12 public school systems, and public and subsidized housing.

DOER assists and supports local partnerships with their efforts to plan and implement energy efficiency improvements within their communities, stimulated the formation of, and provide strong ongoing support to local projects under the RBMA umbrella.

Support during this grant period that ended December 31, 2004 included:

- Provide technical assistance to local partnerships to review action plans,
- Publish a quarterly Rebuild Massachusetts Newsletter of statewide activities from local partnerships as replicable models to stimulate the adoption of energy efficiency as a standard part of the community planning process and reinvestment strategy.
- Foster a systemic and replicable approach to energy management and efficiency within the local partnerships and municipalities, rather than an ad hoc, "single building" approach. As part of this effort, the Rebuild Program produced and published several manuals that are available on the RBMA web site at http://www.mass.gov/doer/rb-ma/rebuild.htm.
- Organize technical workshops with local and national partners.
- Organize meetings with individual partners and utility partners to assess needs and coordinate resources.
- In conjunction with the 10th Canadian Conference on Building Science & Technology – Peregrine Energy Group Co-authored a paper with Ken Neuhauser of CSG entitled *Dynamic Interactions and Competing Objectives in Multifamily Green Building Design.* Deliverable will include a link or reference to the paper when it is published for the RBMA website: for Clean Energy States Alliance and paper entitled Multifamily Green Building Design.

COMMUNITY OUTREACH AND MARKETING OVERVIEW

DOER is the agency that establishes the state's energy efficiency goals. RBMA is the umbrella State program under which DOER provides state level field support to promote energy efficiency.

RBMA initiates meetings with existing and new partnerships to describe the available assistance and to assess their current viability and goals. The Program continues to support these partners in accordance with their own strategy and the goals of RBMA. Specific activities reported under individual partners.

A detailed, targeted approach, coupled with the statewide network developed through the Executive Committee's knowledge of projects evidencing the need and potential to expand, generates leads for new community alliances. This comprehensive approach identifies municipalities in which, 1) action has already taken place, 2) have current or potential projects in all three target sectors, or 3) have the potential for municipal-wide energy management planning. It supports RBMA mission of fostering self-sufficient, action oriented partnerships with the potential to institutionalize change in their community.

The Program is able to quickly form and assist partnerships towards accelerating locally defined energy efficiency improvements for municipal, institutional and multi-family residential buildings by focusing on municipalities that have demonstrated commitment to action. The municipal-wide approach allows RBMA to capitalize available resources by grouping various efforts, thus increasing the ability to affect a higher number of buildings per partnership. This tactic is an efficient strategy to achieve the maximum effectiveness of program resources. RBMA enhances this method through association with organizations working within the target sectors.

The RBMA website (at www.mass.gov/doer) includes information about the program, partners, and tools for the job including Energy Management Basics for Municipal and State Planners and Managers in Massachusetts and Strategic Energy Management: A Self Assessment Tool. In addition, the site contains a RBMA Newsletter (published quarterly), links to other resources, plus information about utility incentives, how to form a partnership, Energy Smart Schools and program partner contact information.

Ultimately, the outreach and marketing strategy to stimulate local action is built around direct presentations to potential champions identified through the initial targeting and outreach process. The funded RBMA staff continues to meet with and provide initial organizing assistance to the identified leads. The formation of local RBMA partnerships that proceed further are reinforced in writing and by public announcement in order to highlight and strengthen the partner's commitments.

LEAD PARTNERS

Northeast Energy Efficiency Council, Inc. (NEEC)

NEEC, represented by Peregrine Energy Group (PEG), is a lead RBMA partner. It provides technical and logistical assistance for RBMA and staffing for the Rebuild Boston Energy Initiative. NEEC's contribution for grant number R101314 is $12,750. The basis of valuation is staff contribution of 134 hours of professional time to RBMA provided by Peregrine Energy Group. The time is valued at $95 per hour. NEEC's staff contribution during the grant period included:

- Initial feasibility study of web-based Energy Information System. This included approximately $5,000 in time contributed by J Kallio in addition to Peregrine Energy staff time.

- Research computer sleep programs offered by the EPA for school computers. (20 hrs beyond partial support from Rebuild and US DOE FEMP programs)
- Develop and present an integrated energy and health workshop at the Association of Energy Engineers Annual Conference (20 hrs beyond partial Rebuild support)
- Additional hours for the Cape Light Compact benchmark of county facilities in Barnstable, assist with the scope of work development for energy efficiency improvement, and assist with the application and certification for EnergyStar labels on two court houses (with support from by Barnstable County about $13,000)
- For the Boston Housing Authority (BHA) provide technical support beyond available Rebuild resources for BHA's energy performance contracts, green building design, and integrated energy and health initiatives (205 hours beyond partial Rebuild support)

PEG's primary role is to provide support to local partnerships to define and plan energy management needs and coordinate implementation resources. PEG assists DOER with on-going program planning, outreach and market strategy development. PEG is also a lead partner in the Rebuild Massachusetts Public Housing Energy Efficiency Project.

Massachusetts Department of Housing and Community Development (DHCD)

Stan Kruszewski, of the DHCD is a lead partner for the Rebuild Massachusetts Program and manages the Rebuild America Public Housing Energy Efficiency Project. This project is targeted to small and medium sided Authorities, Authorities with both state and federally assisted public housing and Authorities at which adjacent municipal facilities or public schools make conservation and co-generation collaborations feasible.

DHCD provides regulatory supervision for the two-hundred and thirty-five local Public Housing Authorities (PHA) in Massachusetts. The agency provides operating and utility subsidies, subject to appropriation, to approximately one third of the housing authorities. When Authorities undertake performance contracts, DHCD helps finance the conservation improvements by maintaining utility subsidies, if any, at current levels for the life of the performance contract in order to provide sufficient cash flow from which utility savings can be drawn.

DHCD also provides grants from Commonwealth issued bond funds, subject to annual bond cap limitations of less than $60 million, for public housing capital improvements, modernization, and development. In 2002, Massachusetts authorized a $350 million bond bill for capital improvements; the authorization for this round included $50 million for energy-related improvements that typically include components with longer paybacks than feasible in performance contracts and measures installed as part of a larger modernization project.

Results will be reported on the PHEEP report.

Massachusetts Division of Capital Asset Management (DCAM)

DCAM is the primary state agency responsible for building design, construction, and major renovations of the Commonwealth's buildings. DCAM provides professional services to state agencies, including oversight of performance contracting. Recognizing that state facilities have a significant impact on resource use and related energy and water budgets, DCAM works to reduce these impacts and save resources wherever possible

DCAM's "Conservation Team" ensures that Commonwealth facilities attain practicable goals in sustainable design and construction as well as achieve optimal levels of energy and water efficiency for existing, renovated, and new buildings.

DCAM's Performance Contracting program provides necessary energy and water system upgrades without requiring up-front capital from the State. Energy Service Companies guarantee a net positive cash flow to the Commonwealth through reduced utility bills. Currently active projects (in contract period) yield annual savings of approx. $12 million. Performance contracting projects allow DCAM to promote innovative and renewable technologies, such as installation of a biomass heating plant at Mount Wachusett Community College and a fuel cell at Cape Cod Community College.

Snapshots of their program results can be found at, http://www.mass.gov/cam/statewide/sw-energyconserv06.html.

REBUILD MASSACHUSETTS RESULTS

Funding and Cost Share:

GRANTEE	EXPIRES	TOTAL OBLIGATED	TOTAL PAID	UNPAID BALANCE	REPORTED COSTS	UNCOSTED BALANCE
Division of Energy Resources	12/31/2004	$125,000	$125,000	$0	$125,000	$0
DOER Cost Share		$156,400	$156,400	$0	$156,400	
NEEC Cost Share		$12,750	$12,750	$0	$12,750	
Keyspan*		$50,000	$50,000	$0	$50,000	
NGRID (Mass. Elec.)*		$75,000	$75,000	$0	$75,000	
NSTAR*		$75,000	$75,000	$0	$75,000	
Northeast Utilities (Western Mass. Elec.)*		$30,000	$30,000	$0	$30,000	

* Compilation of Energy Efficiency Program Statistics reported to DOER by Program Administrators.

Milestones.

		Planned	Completed
1	Chair and Organize Steering Committee Meetings	3	3
2	Municipal Partnerships: Belmont, Newton (revitalized partnership)	2	2
3	Public Housing Partnerships: Fall River Housing Authority; Watertown Housing Authority	1	2
4	Economic Redevelopment Partnerships	1	1
5	Workshops: Technical Outreach	1	2
6	Workshops: Smart Schools	1	2
7	Attend National and Regional Rebuild Conferences	2	2
8	Attend Northeast Regional SEP conference	1	1

Building Sector	Completed Square Feet (sq. ft.)	Total Annual Cost Savings ($)	Total Annual Energy Savings (MMBtus)	Total Energy Efficiency Investment ($)
Public Schools				
State Energy Conservation Improvement Program	1,194,411	$196,728	23,888	$793,188
Barnstable/CLC	272,154	$95,254	5,443	$353,800
Public Housing-BHA	2,130,750	$2,650,132	171,446	$18,303,856
Municipal Buildings				
Medford	54,745	$9,816	1,095	$71,169
Barnstable County	127,331	$20,310	560	$196,000
Results Total	3,779,391	2,951,930	201,872	19,522,013

PARTNERSHIP RESULTS

Utility Partners

Local partnership projects are able to take advantage of financial assistance for installed energy efficiency improvements through the utility companies' energy efficiency programs. This support is an important component of the program's initiative for community level implementation of energy efficiency and energy management.

On the community level, RBMA works with the local stakeholders and the utility program managers to support the local partnership goals. The Program provides technical assistance to help the local partnership determine opportunities and devise strategies to reach their long and short-term goals. RBMA emphasizes a comprehensive, community-wide approach that optimizes the available incentives.

Individual utility commitments is part of the following overall Compilation of Energy Efficiency Program Statistics reported to DOER by Program Administrators for the Commercial and Industrial Sector (under which most municipalities and school departments fall).

Customer Sector	**Program Expenditures**		**Program Savings**		
C&I	**Million $**	**% of Total**	**Annual (million kWh)**	**Lifetime**	**Lifetime % of Total**
Retrofit	$43.6	38.8%	108	1,595	46.5%
New Construction	$26.0	23.2%	53	856	25.0%
Product & Services	$2.4	2.1%	7	120	3.5%
Info. & Education	$0	0.0%	0	0	0.0%
Other	$0	0.0%	0	0	0.0%
Subtotal	**$72.0**	**64.1%**	**168**	**2571**	**75.0%**
Total	**$1,113.4**	**100.0%**	**241**	**3427**	**100.0%**

State legislators approved continued system benefit charge program funding at a slightly lower level for energy efficiency projects and a higher rate for renewable energy. The major benefit for energy efficiency services has been the consolidation of multiple utility companies and coordination of associated system benefit charge services. Utility system benefit charge programs are now more consistent and easier to work with than before. In addition, the State's utility companies have worked hard to identify opportunities to help support public sector customers.

As a general rule, energy efficiency program managers attempt to balance the level of investments made in individual building sectors on a first come first serve basis. Program plans and funding levels are slowly decreasing over time for standard efficiency investments under the current legislative guidelines. See individual partners for further commitments.

As part of their RBMA commitment and larger regional commitment, NGRID (Massachusetts Electric Company) organized and sponsored several High Performance School Building Seminars in Massachusetts, Rhode Island, and Connecticut that cut across both state and service territory boundaries.

State, Municipal, K-12 School, Housing Authority Partners

The Energy Conservation Improvement Program

DOER administers the Energy Conservation Improvement Program (ECIP) to increase the energy efficiency of public schools by providing grants for capital improvements that reduce energy consumption and greenhouse gas emissions.

The grants are an effective tool to prevent the waste of public funds on needlessly high utility bills – public school systems realize cost savings for many years through this program. The typical ECIP project will reduce school systems energy costs for up to ten years, and the program-wide Internal Rate of Return on Investment, when combining state and local shares, is 22%.

ECIP provides energy conservation incentives and assured cost recovery for municipal schools by offering capital upgrade grants to public schools. Grants are used to fund approved capital energy conservation improvements that result in certain required levels of payback savings. DOER requires a combined payback of six years or less; however, the agency does retain the option of funding measures with a longer payback period if doing so will result in a more comprehensive project.

DOER currently provides funding for certified energy audits to identify projects eligible for ECIP funding. All funded improvements are required to have a minimum operational lifetime of twice the length of the payback period, so that each dollar of funding results in a minimum of two dollars in energy savings. Information gathered in the course of these audits is used to support applications to ECIP and as a basis for the school department's Request for Proposal. ECIP grants fund a portion of the total project costs and all applicants are required to make every attempt to leverage other non-state funds, such as those that may be available through utility incentive programs.

A 22% rate of return was calculated using those projects already approved for ECIP funding, aggregating their energy savings, and accepting a standard ten-year life cycle. The $4.159 million in state and local investment for projects will realize nearly $8.6 million in avoided energy costs, providing a net benefit of $4.4 million.

Results for period ending December 31, 2004:

	Completed Square Feet (sq. ft.)	**Total Annual Cost Savings ($)**	**Total Annual Energy Savings (MMBtus)**	**Total Energy Efficiency Investment ($)**
State funded audits*				$56,400
Attleboro High School	200,000	$28,801	4,000	$100,000
Boston Public Schools*	80,000	$21,162	1,600	$100,000
Holyoke Peck Middle School	175,300	$32,000	3,506	$150,000
Lynnfield Public Schools	165,100	$24,148	3,302	$100,000
Pentucket Regional	260,000	$25,200	5,200	$150,000
Southeastern Regional High School	254,200	$26,706	5,084	$100,000
Wareham Public Schools	59,811	$38,711	1,196	$93,188
Total	**1,194,411**	**$196,728**	**23,888**	**$849,588**

* Portion of Division of Energy Resources Cost Share. Additional cost share from state funded audits of $56,400 for participating schools.

Barnstable County/Cape Light Compact

- **Barnstable County Buildings**

  Barnstable County audited the buildings in its courthouse complex to identify which ones require work based on energy usage. Barnstable has received plaques from EPA for three buildings certifying that they are eligible for ENERGY STAR® designation. The County buildings designated as ENERGY STAR® are Superior Courthouse and Deeds and Probate Building in Barnstable and Second District Courthouse in Orleans. All of these are part of the EPA/National Association of Counties Courthouse initiative.

Results

	Completed Square Feet	Total Annual Cost Savings ($)	Total Annual Energy Savings (MMBtus)	Total Energy Efficiency Investment ($)
Results Total	127,331	$20,310	560	$196,000

Energy Fairs

CLC held a successful community wide energy fair that is serving as a model for other communities to replicate. Rebuild participated in Cape Light Compact's Energy Fair held on Martha's Vineyard and developed four new consumer energy saving guides specifically for the event.

The combined results of the two Energy Fairs in Oak Bluffs (May 2004) and Yarmouth (October 2004) are: 800 inefficient dehumidifiers and air conditioners turned-in for ENERGY STAR qualified models, 187 halogen torchieres turned-in, and 1,590 ENERGY STAR qualified lighting products sold. Total savings for the two one-day events: 354,000 kWh annually (equivalent to $49,670)

On December 6, 2004, the Association for Energy Professionals (AESP) gave the Award of Merit in Innovative Marketing to the Cape Light Compact for its success with energy fairs.

CFL School Fundraiser

From February 23 to March 19, 2004, over 300 students from six school groups raised money for their various educational needs through the sale of compact fluorescent light bulbs (CFLs) provided by the Cape Light Compact. The students sold 3,298 bulbs with total sales of $11,931. These motivated students also saved 340,193 kWh annually, equivalent to $95,254.

"Plugging Energy into the Classroom"

Cape Light Compact and Barnstable Cooperative Extension have teamed up with the National Energy Education Program (NEED) to provide 3rd, 4th, and 5th grade teachers with the tools to teach energy topics. The program, "Plugging Energy into the Classroom", provides a web site at http://www.capelightcompact.org/doc.ccml?18,0,110113p,cap94920,0,0,Index,ck_energyedu.ht

ml, educational material, an Energy Education Newsletter, With the help of the NEED project, the Cape Light Compact and the Cooperative Extension promote energy education by creating an effective network of students, educators, business, government, and community leaders to design and deliver objective, multi-faceted energy education programs.

The program provides:

- Ongoing teacher workshops held throughout the year with topics including current energy issues, electricity, magnets and magnetism, renewable energy, fossil fuels, energy efficiency and conservation, and nuclear energy. All workshops are free to 3rd, 4th, and 5th grade teachers on Cape Cod and Martha's Vineyard.

- Free easy-to-use, interactive kits on various energy topics. These are aligned with the Massachusetts frameworks.

- Energy curriculum, ideas, and support

- A network of 3rd, 4th, and 5th grade teachers interested in science education on Cape Cod and Martha's Vineyard

In July 2004, they hosted a National Energy Education Program in Hyannis, Massachusetts. Topics included energy conservation, renewable energy, types of energy, magnetism, electromagnetism, and electrical circuits. Additionally, this partnership was awarded the 'Region of the Year' at the National Youth Awards Program for Energy Achievement.

March 2, 2004 – EPA and DOE's Award for Leadership in Energy Efficiency Award and Excellence in Energy Efficient New Construction

Cape Light Compact was awarded for their participation in Northeast initiatives by the U.S. Environmental Protection Agency (EPA) and the Department of Energy (DOE). Cape Light Compact has been an active sponsor of eight Northeast Energy Partnerships (NEEP) Initiatives including the ENERGY STAR® Appliance and Lighting Initiative as well as the ENERGY STAR® Homes Program since 2001. The Appliance and Lighting Initiative was the recipients of the Leadership in Energy Efficiency Award for Excellence in Energy Efficiency and Environmental Education. The ENERGY STAR Homes program received recognition for Excellence in Energy Efficient New Construction.

The City of Medford

RBMA allocated $20,000 to Medford's Energy and Environmental Office managed by Kim Lundgren. Ms. Lundgren initiated and implements Medford's Climate Action Plan and their Municipal Energy Management Plan. The funds assisted Medford in creating the baseline for their municipal energy use. This is one of many activities in their Action Plan to develop a municipal wide energy management system and implementation strategy for retrofitting the buildings with the highest energy use intensity.

The Rebuild work began with analyzing the energy use for municipal buildings. Grant money was used to fund collection of energy usage data for all municipal buildings. This data was then entered into the EnergyStar® Portfolio Manager for the purpose of benchmarking the buildings. The benchmarking enabled the City to maintain a working database of the energy usage for each building. This program also provided a rating system to score the performance of their buildings. Through this program, the City identified the schools as the most energy intensive users in the City. These results were somewhat unexpected and required the City to develop a new strategy for addressing the energy issues in their buildings. At the time of the benchmarking, two new schools had just opened and three more were slated to open in 2003. Therefore, they had to wait until all five new schools had been running for at least a year to add them to the benchmarking program.[1]

Rebuild Medford began to institute its action plan through establishing their municipal energy management system. Medford has worked with a metering company in an effort to gain control of the school department's energy use. RBMA assisted Medford with analysis of metering data and met with Medford officials and partners to discuss potential savings activities.

This new focus on the schools involves several parties including RBMA (the Division of Energy Resources and Peregrine Energy Group), the Medford Energy & Environment office, the Medford Public School Department, Massachusetts Electric, Keyspan Energy Delivery (Keyspan), and AMR Technologies, Inc. Together we developed a plan to improve efficiency in these buildings and to encourage appropriate maintenance of these buildings. The plan consisted of the following steps:

- Install an Energy Information System (EIS) with AMR Technologies to monitor the daily energy usage of each building.

- Work with RBMA to coordinate utility audits at the High School, the McGlynn, and the Andrews. The Roberts, Brooks, and Columbus will receive walk-through visits by technical experts as well, but not an official audit.

- Based on the audits Rebuild will assist the City in developing an operations and maintenance plan and schedule for each building. Retrofits will be necessary in the high school but not at the newest schools. This is the primary area where costs may accrue, but the amount will be based on the audits and walk through visits of the buildings.

- Train the facility managers and maintenance staff on the upgrades and proper maintenance of the advanced systems in the new schools

- Integrate an energy education curriculum into the current school curriculum to educate the teachers and students on energy and energy efficiency.

[1] Rebuild double checked the energy portfolio summaries for the Medford buildings and found some discrepancies so went back to the original summary data that we reviewed a couple years ago and plugged in current energy prices to come up with a $1.5 million annual utility cost. Potential $3 million to $4.5 million possible ESCO investment with a $375K to $450K annual savings.

To date, the EIS has been successfully installed at Medford High School and the high school has received a detailed audit financed by both Keyspan and Massachusetts Electric. An EIS will be installed at the five new schools starting early in 2005. The EIS has been extremely beneficial in determining the benefits of the various energy efficiency measures. As it is real-time information, it also allows the School Department to test out various measures on a preliminary basis to determine where to reap the most savings.

Because every building has a variable amount of wasted energy that can be avoided through behavioral changes, the City of Medford also used grant money to develop and implement a municipal energy conservation campaign. This campaign included training sessions that explained the importance of energy efficiency in the work place as well as the ease at which it can be achieved. Displays and demonstrations of EnergyStar® features on computers and other office equipment were also conducted. The Energy & Environment Office has also been hosting a very popular Energy Efficiency Fair for two years and is looking forward to its third year in 2005.

Additionally, two other projects have been implemented during the grant period that will impact Medford's energy consumption levels. First, they completed the final lighting retrofit of City Hall, which consisted of replacing 148 lights to more energy efficient ones in various places throughout City Hall. The second project was a lighting project in the Medford Fire Department Headquarters. The retrofit project consisted of replacing 18 lights in the bay of the fire station from mercury vapor to fluorescent. Additionally, three exit signs were converted to the more efficient light emitting diodes. Both of these projects used the Massachusetts Electric small business energy efficiency program.

Finally, starting January 2005, the Medford Public Schools Information Technology Department will be running a pilot test of the EnergyStar® Computer Sleep Initiative, which will allow the network to turn off any computers that are left on for an extended period of time. This will result in significant energy savings. Approximately, 1900 of the 2300 computers within the school department will be included in this program.

Medford's efforts have been the impetus for another project, the 'Municipal Resource Efficiency Program'. Rebuild began this program for strategic energy management by distributing new materials for scoring current status and seven steps for upward movement of current score. The goal is an energy management plan for the school systems with short and long term goals, a maintenance plan, and a capital improvement plan.

Results:

	Completed Square Feet (sq. ft.)	Total Annual Cost Savings ($)	Total Annual Energy Savings (MMBtus)	Total Energy Efficiency Investment ($)
Total	54,745	$ 9,816	1094.9	$ 71,168.50

The City of Newton

Rebuild Newton is identifying and planning their next steps for energy management. RBMA is working with Carol Bock at the Newton Public School Department and David Tannozzini from the Newton Public Buildings Department. The Newton School Department has gathered some baseline information, however this is a tedious time consuming task. RBMA is investigating ways to reduce the effort it takes to gather utility data manually, minimize staff time and reduce data entry mistakes.

The local gas and electric utility companies, NSTAR and Keyspan, provide online data to their customers. This is a recent development and is not available for all accounts. They also provide electronic transfer and payment options for customers with at least ten accounts. RBMA met with NSTAR program representatives and Newton stakeholders to discuss the electronic data transfer and payment of their electric bills. As a result of the meeting, the City of Newton decided to participate in electronic billing.

RBMA is also working with Rebuild America Allied Business Partner, School Dude©. Newton is a user of the School Dude online educational facility management tools, except the Utility Direct tool. Utility Direct tracks and analyzes utility consumption and costs to identify savings opportunities with one drawback – the user must enter data manually. To help Newton (any many other partners) solve this problem, RBMA has implemented a pilot EIS project. The program will facilitate a method to perform data conversion from raw input into a database structure and pre-process it into a form suitable for reporting. The outcome will be the ability of Newton to receive electronic data from their local utilities and convert that data into a form they can use to upload the data into Utility Direct.

The Town of Belmont

The Town of Belmont joined RBMA on March 15, 2004. In April 2001, the town of Belmont initiated the *"Working Vision for Belmont's Future"* goal that includes a commitment to be an environmentally responsible community and ensure the inclusion of green building principles in new construction and renovations. As part of this plan, Belmont is proposing an energy cost reduction of 15% in thirteen municipal buildings by upgrading HVAC and electrical systems. The town is utilizing a type of performance contracting (Energy Management Services) to implement the upgrades.

Belmont has about a $1 million annual utility bill and Medford has a $1.5 million annual utility bill.

The level of proposed investment ranges from $2 million (10 years) to $3 million (20 years) with a $250K to $300K annual savings. Noresco is the company they choose to implement their project. They are reviewing the technical audit with the help of RBMA.

They previously received technical assistance from a Rebuild Business Partner – CitiCapital. The town approached the project from a variety of angles including the best mechanism for financing (e.g., municipal lease, loan, or turnkey agreement). The financial piece of the project seemed to be where many of their questions and energy was focussed. We soon realized that getting all of their detailed questions answered was certainly going to take time and careful planning – a critical financial resource DOER lacked. Gunner Broadwick, of CitiCapital, met with the towns newly formed 'ESCO' Committee. Gunner prefaced the meeting by answering some basic questions via email. He then met with the town's newly appointed ESCO Committee to discuss financial options in more detail (a three-hour meeting). He followed up by providing model agreements.

The following is the two year planned tasks for local technical assistance:

Year One Tasks (already provided)

- Provided educational and technical information for project startup. This included the newly published Energy Management Services Manual
- Reviewed two RFRs from Noresco and Ameresco
- Discussed ESCO concept' with town officials. Attended political meeting with larger town official group to explain the concept of performance contracting
- Analyzed fuel bills for buildings targeted for upgrades
- Review two RFRs from Noresco and Ameresco
- Attended technical review meeting

Ongoing Tasks

- Support negotiations with approved ESCO
- Provide technical support on evaluating ECMs
- Review and comment on final audit
- Review and comment on ESA

Year Two Support

- Support design review and construction management process
- Review proposed drawings and scope of services for consistency with ESCO's initial proposal and savings estimates
- Review commissioning reports/energy management program settings

Support Belmont's M&V phase

- Monthly review of energy bills to flag areas/opportunities to correct or improve individual building energy and water consumption

- Third party reviewer of the annual savings calculations

BHA

The Boston Housing Authority (BHA) has an annual utility bill of over $25 million per year. With program coordination and technical assistance from the Rebuild program, BHA has requested and received significant technical and financial support from their primary utility suppliers. To date NSTAR has invested about $1.8 million in electricity-related upgrades and KeySpan Energy has invested $1.2 million in natural gas-related upgrades. Boston Water and Sewer Commission has been an active partner in these projects, however, the commission does not currently provide direct water and sewer-related upgrade investment support. Following is a summary of the broad level of support BHA has received.

Direct Investments

- Grants and rebates for the additional cost to install high-efficiency equipment
- Grants and rebates to help upgrade first generation efficiency investments (lighting and radiator controls)
- Grants and rebates for whole building upgrades (replacement windows and lighting upgrades)
- Provide gas conversion incentives for BHA heating and DHW system capital improvement projects

Energy Masterplan

- Direct reimbursement for a third party contractor to prepare fuel neutral energy masterplan
- Active participation in the master plan concept development, report review, and next step project development

Energy Performance Contract

- Support RFP development assistance by the energy master plan contractor
- Provide Energy Performance Contract budget development and building priority selection support
- Review and assess long term project investment commitments that overlapped multiple program years
- Provide three years of historic utility data electronically and work with BHA's MIS department to coordinate future electronic data transfer protocols

Pilot project support

- High Rise electric – financial support for two pilot projects to investigate ventilation, air quality, and thermal comfort priorities in five all-electric mid-rise buildings and a proposed heat pump retrofit investigation for a mid-rise development
- Franklin Hill – financial support for a steam system recommissioning pilot project

Operations and Maintenance support

- Building Operator Certification – Provide scholarships for BHA's energy manager and selected staff to attend the Northeast Regional Building Operator training and certification
- Leak detection – assist BHA with database support and transfer of electronic water meter readings taken four times per day to isolate late night water use and potential water leaks

New Construction Support

NSTAR, KeySpan Energy, and the Massachusetts Technology Collaborative (MTC) Green Building program have collectively supported significant energy and environmental upgrades at the Boston Housing Authority's Maverick Gardens Hope VI new construction project in East Boston. A full report on the project is available from MTC. Project support has included:

- Green Building Charrette
- Energy Modeling
- Direct investment incentives – PV, cogen, lighting, motors, heating, ventilation, and air conditioning, and
- Active stakeholder participation

Options reviewed – under consideration or not pursued

- KeySpan fuel conversion construction loan program – KeySpan Energy offers a regulatory approved one-time oil to gas conversion program that allows building owners to finance a gas conversion and related upgrade investments in their buildings through the gas company and pay for the improvements through their utility bill. BHA elected not to pursue this option and used designated capital grant funds instead.
- Utility Energy Services Contract - Federal regulations allow federal facilities (and by extension State and Local facilities) to negotiate comprehensive energy and water efficiency services with their local utility service providers. BHA elected to use the energy performance contract alternative in response to US HUD stipulation that these services must be bid competitively for facilities under their jurisdiction.
- Recommissioning/ Expediter program – RBMA is working with our utility partners to investigate potential building commissioning and recommissioning opportunities through their existing commercial building technical support and Expediter programs. This is still under development.
- Strategic Energy Management Plan – BHA has completed a strategic energy management self-evaluation form (available from Rebuild MA). Areas that BHA identified that need to improve their scores include utility monitoring and reporting and site management staff technical support. BHA and Rebuild MA are investigating opportunities to support these services.
- Direct procurement - Although most utility companies do not generate their own electricity they continue to procure or buy electricity for customers who chose to have the utility company perform this service. As an option, individual or groups of individual building owners and managers can procure electricity or gas directly from a licensed third party wholesaler. At a minimum, public sector facility managers should identify an internal or

reputable third party reviewer to keep an eye on gas, electric, and oil markets. Current market conditions are quite volatile and profit margins appear to be slim so opportunities for greater procurement efficiencies are a challenge to find. The General Services Administration (GSA) has regional and national support staff working on utility procurement issues who have significant experience with utility procurement and can be valuable resources to contact. Rebuild MA is investigating potential opportunities for smaller public housing authorities to aggregate electricity.

RBMA provided direct technical assistance to Boston Housing Authority, including:

- Review for Franklin Hill steam report
- Boston Water and Sewer Commission: monitoring support and review potential metering options
- Review for ESCO projects, state natural gas bills
- Performance Contracting RFP development
- Analysis of HUD "Add-on" subsidy and alternative financing for Maverick Gardens
- Participate in evaluation of responses to Round III performance contracting
- Assisted with Maverick Gardens Hope VI new construction, developed analyses to capture additional HUD subsidies
- Began development with BHA on Energy Information System.
- Assisted BHA with Maverick Gardens in developing energy saving documentation.
- Analyzed energy and water consumption, and wrote summary report of BHA's rounds 1-5
- Reported back on BHA's CLAPHA presentation

Results

	Completed Square Feet (sq. ft.)	Total Annual Cost Savings ($)	Total Annual Energy Savings (MMBtus)	Total Energy Efficiency Investment ($)
Public Housing				
Round 1	723,450	$997,922	123589	$10,972,992
Round II	1,407,300	$1,652,210	47857	$7,330,864
Results Total	2,130,750	$2,650,132	171446	$18,303,856

Fall River Housing Authority

Fall River joined RBMA in November 2003 in anticipation of participating in the Rebuild Massachusetts Public Housing Energy Efficiency Project (PHEEP) as an opportunity to provide quality housing, improve resource efficiency, and share information and skills with not only residents but also the broader community. Future activity will be reported under PHEEP.

The Authority is collaborating with both state and federal stakeholders, as proposed under US DOE's HUD/DOE cooperative agreement, to develop and implement an expanded strategy for energy and water conservation improvements funded through a performance based contract.

Working with HUD, the Massachusetts Department of Housing and Community Develop, and the Division of Energy Resources, the Authority intends to target high priority energy and water efficiency investments to facilitate the aggregation of potential projects as a larger base for energy efficiency improvements.

They finished an energy conservation project in 2003. During that project, they found that resident education was very important – critical to realizing savings. The ESCO that they contracted with provided training/education for the tenants.

In relation to aggregating the various sites in Fall River for future project, they collected 3 years of consumption data including heating-degree days. NGRID has been very helpful through providing the data, educating on current utility housing authority rebate programs and coordinating these offerings with the other projects the HA may want to undertake. Of these other projects, water could be a very large issue. It would be very helpful in moving forward to have a standardized process.

Preliminary figures show at state sites, minimum savings will be $155,209 per year with Watuppa ($29,980/yr in savings) included. Investment over 10 years @ 6% would be $1.1 million. Minus water-efficient equipment would leave a $816k net investment. At federal sites, water efficiency should save a minimum of $176,303 per year. Investment over 12 years @6% would be $1.5 million. Net after water-efficient equipment would be $906k.

Estimated time for the implementation of the measurements is June 2005.

Watertown Housing Authority

The Watertown Housing Authority (KHA) is participating in the Rebuild Massachusetts Public Housing Energy Efficiency Project (PHEEP) as an opportunity to provide quality housing, improve resource efficiency, and share information and skills with not only residents but also the broader community.

The Authority is collaborating with both state and federal stakeholders, as proposed under US DOE's HUD/DOE cooperative agreement, to develop and implement an expanded strategy for energy and water conservation improvements funded through a performance based contract.

Working with HUD, the Massachusetts Department of Housing and Community Develop, and the Division of Energy Resources, the Authority intends to target high priority energy and water efficiency investments to facilitate the aggregation of potential projects as a larger base for energy efficiency improvements

One concern is the limited staff at the HA. Watertown's inventory is predominately state facilities with approximately 50 Fed units. The HA recognizes that this is an opportunity to address some of the improvements. Their current task is getting the three years of consumption data in house. Identifying the tenant's incentive and then communicating it would greatly assist the effective continuation of savings and is seen as another challenge needing to be addressed. Future activity will be reported under the Rebuild Public Housing Energy Efficiency Project.