



To: Secretary Rosemary Chiavetta, Pennsylvania Public Utility Commission

Cc: Chairman's Office
Vice Chairman's Office
Commissioners' Office
Jan Freeman, Executive Director
Karen Oill Moury, Director of Regulatory Operations
Bohdan R. Pankiw, Chief Counsel
Robert F. Young, Deputy Chief Counsel
Paul T. Diskin, Director, Technical Utility Services
Darren D. Gill, Deputy Director, Technical Utility Services

Re: **Docket Number M-2012-2289411**- Joint Recommendations for Improved Targeting of Energy Efficiency Improvements in Multifamily Affordable Properties for Phase II of Pennsylvania's Act 129 Energy Efficiency and Conservation Program

Date: April 17, 2012

The undersigned organizations represent **a broad coalition of national and state energy efficiency experts and service providers, affordable housing advocates, providers, investors and managers, and supporters of low-income consumer rights**. We write to urge the Public Utility Commission to consider how best to meet the energy efficiency needs of residents of **multifamily affordable homes** as planning for Phase II of Pennsylvania's Act 129 Energy Efficiency and Conservation Program (EE&C) begins.

Energy efficiency upgrades in multifamily rental housing are a cost-effective means to reduce energy consumption, maintain housing affordability, and create healthier, more comfortable living environments for moderate- and low-income families. Despite these multiple benefits, many residential energy efficiency utility programs focus their limited funding dollars on weatherization and upgrades to single-family houses. Commercial programs typically target office buildings and businesses with a strong focus on lighting and air-conditioning upgrades and system improvements.

There are more than 140,000 affordable multifamily apartments throughout the state of Pennsylvania. These apartments are financed through various federal and state housing programs and are home to families and elderly individuals with incomes less than 60% of the area median income. Owners of these properties have a contractual obligation to maintain the property as affordable.

Energy efficiency improvements in these buildings will supplement the benefits which are provided directly to low-income ratepayers (which should continue through existing low-income utility programs) and otherwise benefit low- and moderate-income residents through reduced utility costs and increased affordable housing opportunities. In properties where owners pay the utility bill, energy efficiency improvements will lower operating costs, reducing the need for owners to raise rents. All Pennsylvania taxpayers will benefit through reduced demand on the state's energy system and increased economic output.

Phase II of Pennsylvania’s Act 129 EE&C programs should include increased emphasis on the importance of implementing energy efficiency upgrades in multifamily affordable homes.

There is an increasing need to focus energy efficiency improvements in older, multifamily buildings. 80% of Pennsylvania’s multifamily affordable homes were built 20 years ago or earlier. The vast majority of this housing stock has not received any weatherization services. Implementing energy efficiency programs for multifamily buildings will allow the utilities to reach an underserved market and achieve significant new energy savings.

There has been increasing synergy and alignment between the energy efficiency goals of utilities and the energy efficiency needs of older, multifamily buildings.

Several states including New Jersey, Maryland, and Massachusetts¹ have recently implemented multifamily-specific energy efficiency programs using ratepayer funding to ensure that low-income utility customers benefit. These programs include: dedicated funding and meaningful goals for energy efficiency improvements in multifamily affordable housing and sufficient means to ensure that the renters benefit from the improvements by requiring an extension of affordability by the owner in exchange for participation in the programs.

Assist owners of multifamily affordable housing in accessing resources for energy efficiency upgrades by creating a “one-stop shop”.

Owners of multifamily properties often must apply separately to a utility’s residential and commercial programs, as a building could have a mix of master meters (requiring participation in the commercial utility program) and individual tenant meters (requiring participation in the residential utility program). Further, an electric utility’s program might address lighting and appliances, but may do nothing to address inefficient heating plant or the building envelope. A gas utility’s program would not, by definition, address lighting and plug loads, thus forcing the owner to apply to two separate companies to address the whole building. As a result of these and other barriers, most owners of affordable multifamily housing find it extremely difficult to access utility energy efficiency programs.

If utilities revised their programs so that multifamily owners could achieve true *one-stop shopping* and obtain services that address the full range of efficiency needs, more multifamily buildings would be weatherized and low income ratepayers would secure additional energy savings.

One means of such “one stop shopping” is illustrated in Massachusetts where a successful re-design of the utility programs for affordable multifamily housing was launched called the Low-Income Multifamily Retrofit Energy Program (LIMFREP). More than \$20 million is administered by electric and gas utilities in collaboration with the MA Dept. of Housing and Community Development, public housing authorities, community development corporations, non-profit owners, tenant organizations, and community action program agencies. Eligible buildings include existing low-income multifamily buildings (5 or more units) owned by public housing authorities or non-profits. Priority is given to high energy use buildings and buildings undergoing rehabilitation (See attached one pager for more information about this program.)

Identify workable financing mechanisms for utilities and owners of multifamily affordable housing.

Multifamily affordable housing owners are unlikely to have access to significant upfront capital to make energy efficiency upgrades. Energy efficiency programs that limit the need for upfront capital from the

¹ See for example PSE&G’s Residential Multifamily Housing Program in New Jersey, the Low-Income Multifamily Retrofit Energy Program in Massachusetts, and the Multifamily Energy Efficiency and Housing Affordability program in Maryland.

owner are more likely to succeed in this sector. This challenge can be addressed in a number of ways including, but not limited to:

- The Pennsylvania Housing Finance Agency (PHFA) and Community Development Financial Institutions can make bridge loans to owners of multifamily affordable housing to cover the cost of energy efficiency upgrades. These loans would be repaid by utility rebates and other incentives. This approach would require utilities to provide documentation that the incentives will be available if the owners install the energy efficiency measures.
- The utilities could work directly with lending institutions to leverage low interest financing for energy efficiency measures in multifamily affordable housing. One idea is for the utility companies to provide a “grant” to a Community Development Financial Institution which would, in turn, guarantee certain energy consumption reductions to the utility. Similarly, the utility could provide a grant to PHFA which could use the funding for incremental reductions in energy consumption by low income households.

Leverage additional energy savings through non-mechanical measures, administrative efficiencies, and other approaches.

Targeting resources most effectively is necessary to maximize energy savings from the multifamily affordable housing stock. 80% of Pennsylvania’s multifamily affordable homes were built 20 years ago or earlier.² The vast majority of this housing stock has not received any weatherization services. Realizing the potential energy savings in this sector requires a new level of investment.

One cost-effective approach to achieve additional energy savings is investing in non-mechanical building shell measures such as air sealing and insulation. This is common practice in multifamily utility incentive programs in other states, including New Jersey, Maryland, and Massachusetts, and is necessary for achieving long-term energy savings. In Maryland, air sealing and insulation of a 118-unit multifamily building saved nearly 700,000 kWh and had a Savings to Investment Ratio³ of 4.9 (See data below).

Homes for America’s Concord Apartments in Cecil County, MD- Energy Efficiency Improvements and Savings

Costs of MEEHA Eligible Items

ECM	Energy Conservation Measure Description	kWh saved	therms saved	Avg Useful Life	Estimated Cost of ECM	Estimated Annual Savings	Simple Payback	S.I.R.	DOE CER
1	Air Sealing and Insulation Attics	685,169	0	20	\$80,850	\$23,133	3.5	4.9	96.6
2	Duct Sealing	697,754	0	20	\$82,261	\$67,518	1.2	14.0	96.7
3	Apt Weatherization	493,602	0	20	\$55,440	\$58,245	1.0	17.9	101.5
5	Programmable Thermostats	55,932	0	10	\$19,800	\$6,600	3.0	2.8	32.2
6	Common Area Lighting	177,737	0	10	\$30,145	\$20,973	1.4	5.9	67.2
7	Apt Bulb Replacement Program	84,746	0	9	\$3,000	\$10,000	0.3	25.5	321.9
A1	Incremental Insulation R38 to R49	6,711	0	20	\$5,500	\$3,762	1.5	11.6	13.9
A4	Apt Lgt Fixture A, B, C	147,622	0	10	\$20,466	\$17,720	1.2	7.4	82.2
A6	Showerhead Replacement	0	4,233	10	\$7,920	\$4,870	1.6	5.2	56.0
A7	Ladybug Shower Reducer	0	3,387	10	\$5,940	\$3,896	1.5	5.6	59.7
All Measures =		2,349,274	7,620	13.90	\$311,322	\$216,717	1.6	10.1	88.6

² According to National Housing Trust’s analysis of HUD’s low income multifamily database.

³ For every dollar invested in an energy improvement, this is the number of dollars that will be saved over the life of the improvement in today’s dollars.

Reducing program administrative costs will also result in more benefit dollars being invested in energy saving measures and additional reductions in energy use for Pennsylvania ratepayers. In other states, utilities and public utility commissions have realized significant administrative efficiencies by partnering with the state housing finance agency.

PHFA has extensive experience in multifamily financing and construction. PHFA can leverage its skills and relationships to help the utilities effectively serve the multifamily affordable housing sector. PHFA's contributions, as part of a partnership with the utilities, could include:

- Helping the utilities connect with owners of the properties in PHFA's portfolio which, by definition, qualify for the 60% of median income test referenced above. PHFA has multiple contacts with multifamily owners, including its annual inspections of these properties, and/or its already existing financing on affordable multifamily housing;
- Experience administering weatherization services in multifamily housing as a subgrantee of the Weatherization Assistance Program;
- Assistance in marketing and outreach to a pipeline of multifamily new construction and rehabilitation projects;
- Help leverage other financial resources from existing programs;
- Financial underwriting and loan processing expertise;
- Construction review and administration; and
- Affordable housing expertise and knowledge.

Utilities and public utility commissions in states such as New Jersey and Maryland are partnering with their respective state housing finance agencies to administer multifamily energy efficient improvement programs with great success.

By way of example, New Jersey's largest utility, PSE&G, has implemented an innovative multifamily housing energy retrofit program in partnership with the New Jersey Housing and Mortgage Finance Agency (NJHMFA). PSE&G's Residential Multifamily Housing Program provides upfront interest-free financing and grant incentives to cover the cost of eligible energy efficiency improvements. In 2009, PSE&G developed the multifamily retrofit program with an initial investment of \$19 million. The program quickly became fully subscribed. In December 2011, PSE&G proposed investing another \$20 million in the program to address the backlog of applicants on the waiting list. The expansion was subsequently approved by the New Jersey Public Utility Commission. An additional 7,000 apartments are expected to receive upgrades as a result of the increased investment. In part because of the partnership with NJHMFA, program administrative costs have remained fairly low at approximately 12% of the program budget. (See, e.g., attached paper describing PSE&G's collaboration with NJHMFA).

Utilize the existing mandates of Act 129 to achieve these goals.

One means of setting aside funding for multifamily properties may be through the 10% government/non-profit carve out required by 66 Pa. C.S. § 2806.1(b)(1)(i)(B). It is essential that this mandate continue to incentivize the governmental and non-profit sectors to seek weatherization opportunities. In our view, PHFA, community development and non-profit institutions owning and/or administering federal or state regulated multi-family housing serving low or moderate income households should be targeted for receipt of these energy reduction benefits which are presently required to be provided. Furthermore, the Commission should provide clear guidance insuring that properties with long term affordability restrictions

qualify under the carve out regardless of ownership status, i.e., whether the owner is nonprofit or for-profit is irrelevant as long as the property has long term use restrictions dedicated for affordable housing.

We appreciate the opportunity to comment on Act 129 EE&C programs.

We look forward to continuing to work with the Commission to improve EE&C programs in order to directly benefit residents of affordable rental housing in Pennsylvania.

Sincerely,

ACTION-Housing
Amani CCDC
American Council for an Energy-Efficient Economy
Bone Energy Services
The Community Builders
Community Legal Services
Energy Consortium Collaborative (ECC)
Energy Coordinating Agency
Federation Housing, Inc.
Homes for America
Housing Alliance of Pennsylvania
Housing and Neighborhood Development Service (HANDS)
Medical Mission Sisters
National Church Residences
National Consumer Law Center on Behalf of Its Low-income Clients
National Housing Trust
Pennsylvania Association of Housing and Redevelopment Agencies
Pennsylvania-Delaware Affordable Housing Management Association
Pennsylvania Housing Finance Agency
Pennsylvania Utility Law Project
Pennsylvania Weatherization Providers Task Force
Philadelphia Association of Community Development Corporations
Philadelphia LISC
Professional Affordable Housing Management Association (Based in Pennsylvania)
Project H.O.M.E.
RC_x Building Diagnostics
Regional Housing Legal Services
Stewards of Affordable Housing for the Future
Trek Development Group
Tri-County HDC, Ltd.
Volunteers of America

For more information about these comments, please contact:

Dave Evans
Pennsylvania Housing
Finance Agency
Assistant Executive Director
of Multifamily Housing
PO Box 8029
Harrisburg, PA 17105-8029
717-780-3928
devans@phfa.org

Harry S. Geller
Pennsylvania Utility Law
Project
Executive Director
118 Locust Street
Harrisburg, PA 17101
717-232-2719
hgellerpulp@palegalaid.net

Todd Nedwick
National Housing Trust
Assistant Director, Public
Policy
1101 30th Street, NW
Suite 400
Washington, D.C. 20007
202-333-8931 x128
tnedwick@nhtinc.org

MA's Utility-Funded Low-Income Multifamily Energy Retrofit Program



MA's "ONE STOP SHOP" SIMPLIFIES UTILITY-FUNDED RETROFITS FOR AFFORDABLE MULTIFAMILY OWNERS

Multifamily Energy Retrofits: The Need

Wasteful energy use can pose a significant threat to maintaining affordable rental housing. Energy efficiency upgrades in rental housing are a cost-effective approach to lowering operating expenses, maintaining affordability for low-income households, reducing carbon emissions, and creating healthier, more comfortable living environments for low-income families.

Unfortunately, most energy efficiency retrofit programs are not well suited to address the multifamily housing sector- home mostly to low- and moderate-income families.¹ Utility-funded energy efficiency programs, for example, are a significant source of resources for residential energy retrofits that remain largely untapped by the multifamily sector. U.S. ratepayer-funded electric efficiency budgets totaled over \$5.4 billion in 2010.² While nationwide data is unavailable, most utility-funded programs typically focus first on single-family and small rental properties rather than multifamily properties (5 units or more).³ If multifamily energy retrofits are to occur at scale, utilities will need to develop energy efficiency programs that address the unique nature of the multifamily sector.

The Massachusetts Model: Owners Seek Streamlined Process to Achieve Whole Building Energy Retrofits

In 2009, the owners and operators of affordable multifamily housing in Massachusetts- community development corporations (CDCs), public housing authorities (PHAs), and the state's Department of Housing and Community Development (DHCD)- convinced the state's utility companies and other key stakeholders that the existing utility energy

At A Glance: MA's Utility-Funded Affordable Multifamily Retrofit Program



Key Players: Administered by utilities in collaboration with the MA Dept. of Housing and Community Development, public housing authorities, community development corporations, non-profit owners, tenant organizations, and community action program agencies.

Eligible Housing: Existing low-income multifamily buildings (5 or more units) owned by public housing authorities or non-profits. Priority given to high energy use buildings and buildings undergoing rehabilitation.

Financing/Funding Sources: Grants from utilities pay 100% of project costs. Spending caps exist for total project and individual measure costs. Leveraging of other funding sources, including state and federal energy efficiency programs, is encouraged.

Eligible Measures: Whole building energy assessment determines cost-effective measures. Program administrators develop comprehensive upgrade recommendations based on the energy audit.

Contracting Procedures: Utility program administrators identify qualified contractors. Flexibility is provided to allow owners to use existing vendors who meet certain qualification standards.



National Housing Trust

1101 30th Street, NW, Suite 400
Washington, D.C. 20007
202-333-8931 | www.nhtinc.org



National Consumer Law Center

7 Winthrop Square, 4th Floor
Boston, MA 02110
617-542-8010 | www.nclc.org

efficiency programs did not work for affordable multifamily buildings. At the time, owners of multifamily properties often had to apply completely separately to a utility's residential and commercial programs, as a building could have a mix of master meters (requiring participation in the commercial utility program) and individual tenant meters (requiring participation in the residential utility program). Further, an electric utility's program might address lighting and appliances, but do nothing to address inefficient heating plant or the building envelope, while a gas utility's program would not address lighting and plug loads, thus forcing the owner to apply to two separate companies to address the whole building. As a result of these and other barriers, most owners of affordable multifamily housing gave up trying to access the utility programs.

The utilities agreed to consider revising their programs so that multifamily owners could achieve true one-stop shopping and obtain services that would address the full range of efficiency needs in these buildings. A successful re-design of the utility programs for affordable multifamily housing was launched in the first quarter of 2010, the Low-Income Multifamily Retrofit Energy Program (LIMFREP).

Screening Process Prioritizes Cost-Effective Retrofit Measures in High Need Low-Income Buildings

The LIMFREP has a website (www.leanmultifamily.org) where interested owners can learn about program requirements and offerings, as well as apply for services. To be eligible, a building must be owned by a PHA, non-profit, or non-profit controlled entity, and 50% of the tenants must have incomes at or below 60% of median income. The program provides owners with an energy benchmarking tool, WegoWise, which applicants must use, as priority is given to buildings with above-average energy usage per square foot. Applications are reviewed by a screening committee that includes representatives of the CDCs, PHAs, and LEAN (Low-Income Energy Affordability Network).

Once the screening committee approves a particular project, the LIMFREP conducts a building assessment, often including both an appliance audit that primarily covers refrigerators and lighting loads and a separate, comprehensive assessment that covers the building envelope, mechanical systems and motors, and ventilation. The work is often done at no cost to the owner, although sometimes an owner contribution is provided.

Generally, the energy efficiency work is performed by contractors who are vendors in the existing utility-funded energy efficiency programs, and the multifamily owner is not free to choose the contractor. However, the owner's preferred contractor may be used if the contractor meets all of the program's requirements, particularly where the owner is engaged in a larger project that includes renovations beyond energy efficiency measures.

Owners who either are not eligible for this new program (e.g. less than 50% of their tenants meet the income eligibility rules) or who have a low priority can still separately apply to the utility programs available for market-rate multifamily housing. There is also a separate utility-funded program for new construction.

From the program's inception in March 2010 through mid-January 2011, 175 applications had been received representing close to 10,000 low-income multifamily units. Actual work on buildings began in September 2010. Since that date, 3,000 units have been completed, and 4,000 to 5,000 units are in the queue for work to be completed in 2011. The electric utility-funded budget for 2011 is \$14 million, and the gas budget is \$8.5 million.

NHT is grateful for the support of the Doris Duke Charitable Foundation, the Energy Foundation, and the Kresge Foundation.

NHT and NCLC thank John Wells of Action for Boston Community Development for his contribution to this policy brief.

References

¹ On average, renters' incomes are roughly half of homeowners': \$31,000 vs. \$61,000 annually. Energy Foundation, "U.S. Multifamily Energy Efficiency Potential by 2020," prepared by the Benningfield Group.

² Institute for Electric Efficiency, "Summary of Ratepayer-Funded Electric Efficiency Impacts, Expenditures, and Budgets (2009 - 2010)."

³ National Consumer Law Center, "Up the Chimney: How HUD's Inaction Costs Taxpayers Millions and Drives Up Utility Bills for Low-Income Families."

The Collaborative Program Design and Delivery Strategies Behind the Development, Regulatory Approval, and Successful Implementation of PSE&G's Residential Multifamily Housing Program.

Elaine Bryant, PSE&G, Newark, New Jersey
Susan Lacey Ringhof, PSE&G, Newark, New Jersey

Abstract

In 2010 Public Service Electric and Gas Company (PSE&G) began offering the Residential Multifamily Housing Program to its customers as part of its Energy Efficiency Economic Stimulus (EEE Stimulus) Initiative, approved by the New Jersey Board of Public Utilities (NJBPU) in 2009. The program was funded at \$19 million for 2010 and is available to multifamily housing located in PSE&G's electric and/or natural gas service territory. PSE&G's service territory includes many of New Jersey's urban areas and has a high proportion of multifamily housing. The program is based on a free on-site Investment Grade Audit of the multifamily facility along with significant subsidies for the installation of cost-effective energy efficiency measures. Customers repay their share of the program installation costs over a period of 10 years, on their PSE&G utility bill, interest free. PSE&G offers the program to all eligible residential multifamily housing, with priority given to New Jersey Housing and Mortgage Finance Agency (NJHMFA) financed affordable housing projects.

The PSE&G/NJHMFA collaboration to develop and deliver a successful program to a customer segment often financially unable to undertake energy efficiency improvements is both unique and compelling. Because NJHMFA manages in excess of 500 multifamily projects, its knowledge of this customer segment and access to building owners/property managers has ensured that the PSE&G program is fully subscribed. This paper will focus on the collaborative design/delivery strategy behind the development, regulatory approval, and successful launch of PSE&G's Residential Multifamily Housing Program.

The Collaborative

PSE&G partnered with NJHMFA in the design and development of its Residential Multifamily Housing Program. The collaboration grew from a roundtable discussion between the New Jersey Governor's staff, regulators, NJHMFA, and PSE&G to address the unique needs of multifamily affordable housing projects. PSE&G and NJMHFA left that meeting with a commitment to work together to design a program tailored to a customer segment that often has deteriorated facilities, limited cash flow, and lacks capital for infrastructure improvements.

NJHMFA's primary goal in addressing energy efficiency opportunities in their financing portfolio was to relieve the continuous upward pressure on rental rates by reducing the operating costs associated with the housing projects. The run-up in energy prices, followed by the worst recession since the great depression, had forced building owners to defer basic maintenance in order to mitigate rental rate increases. In addition to lowering operating costs, NJHMFA wanted to ensure that addressing energy efficiency opportunities did not increase owner debt.

As PSE&G and NJHMFA began working together on a new multifamily program design, it was decided that the existing PSE&G Hospital Efficiency Program would provide the design skeleton for the new program and would be modified to address the unique characteristics of affordable housing

projects. Most of the original hospital program design was a good fit for the multifamily market and could be leveraged to develop a targeted multifamily program based on a proven program design. Since the hospital sector, including its facility structures and financial organization, differs significantly from the multifamily housing sector, the Hospital Program design was modified to address the unique characteristics of multifamily housing. For example, since one of the goals of the new multifamily program was to pay for energy efficiency improvements with energy savings, the Hospital Program repayment schedule was extended from 3 years to 10 years for the Multifamily Housing Program. Further, because NJHMFA had some concerns about the multifamily project owners' ability to take on new debt associated with the energy efficiency project repayments, extending the repayment period to 10 years addressed that concern also. During the planning stage, NJHMFA had identified 75 master metered affordable housing developments in PSE&G's electric and/or gas service territory. These ranged from garden apartments to high rises and contained over 12,000 individual rental units. After NJHMFA completed their underwriting analysis of this portfolio, which included cash-flow as well as mortgage repayment history, they recommended that 36 of those projects be initially targeted by the PSE&G program. In phase two of recruitment, NJHMFA identified another 92 individually metered projects that could be solicited for program participation if the program was not fully subscribed.

NJHMFA continued its interest in, and support of, the program throughout the regulatory process that resulted in program approval. NJHMFA supported PSE&G's program filing and was a Party to the filing proceeding and to the Stipulation of Settlement Agreement with the NJBPU that provided funding for PSE&G's portfolio of energy efficiency programs. They participated in settlement discussions and provided clarifying language to ensure that the program as approved would meet the design goals. Throughout the program implementation process, NJHMFA has maintained an active role for all NJHMFA financed projects participating in the program. This includes the review of Investment Grade Audit reports and contractor bids for the installation of the energy efficiency measures, attending customer/building owner meetings and participation at on-site inspections of the participating facilities. This ongoing collaboration ensures that the building owners are in compliance with both NJHMFA standards as well as PSE&G program requirements; while adding additional levels of customer support and informational sources to the program participation process.

Assessing the Marketplace

PSE&G's service territory includes many of New Jersey's urban areas and has a high proportion of multifamily housing units. These buildings typically face thin operating margins and constrained ability to increase rents which leads to deferred maintenance, poor building conditions, ongoing deterioration, and energy inefficiency which in turn further erodes operating margins and the ability to retrofit an inefficient building. High energy costs during the 2005-2008 timeframe and the subsequent economic recession during the years 2008 through 2010 have exacerbated these conditions.

According to U.S. census data, 53% of all dwelling units located within PSE&G urban areas are single family dwellings and 17% of all housing stock contains 3-4 dwelling units. Approximately 29% of all housing stock is multifamily housing with greater than 4 units per building. In New Jersey as a whole, there are about 500,000 multifamily housing rental units representing approximately 16% of the total number of residential units in the State as well as 26% of all dwelling units in New Jersey's central cities. Although there is significant opportunity for energy efficiency retrofits and energy savings in this building stock, this market sector consistently has been overlooked and underserved by existing energy efficiency programs. Most energy efficiency programs delivered in the State over the last 10-20 years have been targeted to single family residences and commercial buildings. The significant opportunity

coupled with very low penetration of energy efficiency retrofits supported the need for an affordable multifamily housing program in PSE&G's service territory in order to reach and serve this customer segment.

Market Barriers

PSE&G's Multifamily Housing Program was designed to address market barriers and obstacles which often prevent or impede affordable multifamily housing from taking advantage of energy efficiency programs. The affordable housing multifamily sector was targeted because of its relatively high energy usage, aging mechanical equipment, the facilities' general lack of available capital for infrastructure improvements, and the need to preserve the affordability of these buildings and the housing they provide. It was also an opportunity to demonstrate the advantages of an innovative partnership between the utility and a State agency. The State of New Jersey is also looking for innovative ways to reduce greenhouse gas emissions and be energy efficient in all building sectors. Preserving and improving existing affordable housing is an essential step in addressing the State's affordable housing needs while also promoting sustainability and sound land use planning.

Affordable housing multifamily sector buildings exhibit some market barriers that are common to both residential and commercial rental buildings including the first cost bias and the lack of access to capital. While it is not always the case, there is a perception that energy efficient measures are more costly than conventional ones. When this is the case, first cost almost always dominates the decision criteria. PSE&G incentives either eliminate or sharply reduce first cost premiums and the on-bill financing converts a capital cost into an expense item that can be paid for over time. The affordable housing sector's general lack of capital for infrastructure improvements was a market barrier identified by NJHMFA that was addressed directly through this program. The developments targeted by this program have the additional need to balance the cost of building maintenance and repair and energy efficiency improvements with the need to maintain affordable rental rates. This program also provides an effective mechanism for overcoming the initial costs of energy efficiency not only by providing a substantial incentive, but by financing all construction costs and providing the building owner the option of paying for the upgrades over time on the PSE&G utility bill.

In addition to those barriers common to most rental buildings, these projects had not been targeted by the energy efficiency programs that had been available in New Jersey for nearly a decade. There was a general lack of awareness or blindness to the urban multifamily market and no conception of how to find the opportunities. The project owners themselves were also unaware of how to procure or manage the construction of energy efficiency services

To address the lack of knowledge regarding energy efficiency, the program provides full turn-key support to the customer throughout the program participation process. Key to the success of moving the projects forward into the construction and installation phase are the engineering analysis and preparation of bid-ready documents that are provided to customers by the engineering firms who conduct the Investment Grade Audit data gathering and analysis. These additional services ensure that all eligible Energy Conservation Measures (ECMs) have been fully screened and vetted for cost-effectiveness, and at the same time provide the customer with the technical assistance needed to efficiently solicit contractor bids.

Access to building owners of multifamily housing has been a market barrier to successfully marketing energy efficiency retrofits to this sector. Typically, the multifamily affordable housing sector is overlooked by traditional energy efficiency programs due to a lack of access to the properties and their owners and the perception, often correctly so, that this sector lacks the capital to make energy investment upgrades. PSE&G's Multifamily Housing Program addresses this market barrier in two

ways: first, its partnership with NJHMFA allows the program to easily identify and target eligible multifamily facilities, and second, providing an Investment Grade Audit at no cost to the customer allows the building owner to understand the opportunity to improve their building's operation and cash flow. This two-pronged approach brings much needed access to free on-site energy audits, energy efficiency knowledge, advice, and ongoing program support all with the NJMHFA "seal of approval".

The multifamily housing market segment often has older, deteriorated facilities, limited cash flow, and lacks capital for infrastructure improvements. These buildings typically face thin operating margins and constrained ability to increase rents which leads to deferred maintenance, poor building conditions, ongoing deterioration, and energy inefficiency which in turn further erodes operating margins and the ability to retrofit an inefficient building. This program was designed to overcome these barriers and to make energy efficiency upgrades available and affordable for this market sector.

Program Offerings

PSE&G's Multifamily Housing Program is designed to increase energy efficiency and reduce carbon emissions of multifamily housing developments. Building owners receive an Investment Grade Audit of their building(s) at no cost, incentives, and up-front financing for the cost of eligible energy efficiency installations. The Multifamily Housing Program Investment Grade Audit and inspection services are provided through qualified audit and engineering professionals employed by PSE&G and hired through a competitive bid process. All cost-effective ECMs identified by the Investment Grade Audit as having a simple payback of 15 years or less may be eligible for installation under the program. The energy efficiency measures recommended by the Investment Grade Audit may include lighting, HVAC, humidification, ventilation, windows, doors, motors, and other energy consuming equipment. The program will buy-down project costs by 7 years, but to not less than 2 years. Remaining costs will be provided by PSE&G and repaid through interest free on-bill financing (through the PSE&G utility bill), or in one lump sum (if the customer chooses) after the final inspection.

The program provides a three-step payment process to eliminate the building owner's need to secure a loan to fund the capital investment in energy efficiency upgrades before the project begins. Coupled with on-bill financing and generous repayment terms, the customer is able to afford the energy efficiency investment, while at the same time recognizing the associated energy efficiency benefits immediately upon installation, before repayments begin. The full cost of energy efficiency upgrades (including engineering, the energy audit and cost of construction) are covered through a combination of PSE&G's buy-down/grant and 0% on-bill repayment/financing. The PSE&G on-bill payment option is a critical component to the success of the Multifamily Program. This feature provides the participant with a manageable repayment solution and acts as an additional incentive for program participation. Incentive payments to program participants can be made in these three stages or "progress payments": 1) execution of contract, 2) job 50% complete, and 3) after final inspection.

The customer will have 10 years to repay their contribution to the project. This will serve to guarantee immediate energy savings and utility bill relief to the most-in-need projects. The 10 year repayment period is considered a low risk option since the NJHMFA financed affordable housing projects are likely to be in operation for at least 10 more years. Should the property be sold before the end of the repayment period, the remaining balance shall be payable upon transfer of the property.

The program is offered to residential multifamily housing where natural gas and/or electricity are provided by PSE&G. The multifamily housing facility must have 5 or more units and may be either master metered or individually metered for utility services. High rise and low-rise facilities, affordable and market rate housing and urban rehabilitation projects identified by municipalities in PSE&G's

service territory are eligible. However priority for program participation is given to the NJHMFA funded affordable housing projects.

Program delivery typically occurs in 4 steps:

- 1) **Step One:** Investment Grade Audit of Multifamily Building(s). The PSE&G program contractors perform a detailed Investment Grade Audit and prepare a customized audit report that includes a list of recommended ECM upgrade options. PSE&G and NJHMFA review the potential ECM upgrades with the customer.
- 2) **Step Two:** Engineering Analysis of Project. Based on the Investment Grade Audit results, an engineering analysis is performed, measures payback and cost effectiveness screening is conducted, and a set of approved ECMs is selected for the project. The program contractor then prepares bid-ready documents for the customer to facilitate the preparation of a project Scope of Work, which will be used to obtain contractor cost estimates for ECM installation.
- 3) **Step Three:** Scope of Work/Contractor Bids. The project owner prepares a Scope of Work for use in soliciting contractor bids. NJHMFA projects will follow the NJHMFA bidding practices. PSE&G/NJHMFA and the customer review the contractor bids/costs and select the contractor(s). At this time, the first progress payment can be issued to the customer.
- 4) **Step Four:** Measures Installation and Inspections. When 50% of the ECMs have been installed, PSE&G verifies the progress through an on-site inspection. Upon the completion of a successful inspection, a second progress payment is issued. When the project is 100% complete, the final inspection takes place. If the inspection is successful and approved, the final progress payment is determined and issued. If the final costs are less than the original estimate, the final payment will be adjusted down to reflect the actual costs. If the final costs are more than the original estimate, the final payment will not be adjusted and will be paid according to the original estimate. Project is now complete and customer repayments begin.

An additional benefit of the on-site inspection process is that customers are provided with another level of quality control. The program provides for independent inspections for the measures installation work performed at both the 50% and 100% completion phases. These inspections are provided by the same engineering firms that performed the original Investment Grade Audit and provide value-added services to the customer to ensure that the ECMs contracted and paid for are indeed installed, and in accordance with manufactures specifications.

Customer Solicitation

Although all residential multifamily housing in PSE&G's electric and/or gas service territory was eligible for program participation, the program was targeted initially to affordable housing developments within NJHMFA's portfolio. During the planning stage NJHMFA had identified 75 master metered affordable housing developments in PSE&G's electric and/or gas service territory. During implementation planning, NJHMFA decided to limit participation in the PSE&G program to those projects that could pass NJHMFA underwriting analysis which qualified 36 projects targeted for the initial marketing phase. Projects that could not pass the underwriting analysis were directed to programs created to take advantage of federal stimulus funding. NJHMFA's input to program design was key to defining the level of project support that the affordable housing projects would need to participate in the program.

The initial group of 36 multifamily projects identified by NJHMFA, and targeted for the program were master metered facilities. This approach eliminated the split incentive market barrier as an issue during the initial program implementation. It enabled the program to quickly subscribe as the building

owners paid the utility bills and could provide all necessary energy usage information for the dwelling in a cohesive fashion. For the proposed second phase of program solicitation, NJHMFA identified a pool of 92 individually metered projects.

NJHMFA provided access to NJHMFA financed multifamily projects in need of energy efficiency upgrades and worked with PSE&G to market the program to those projects. NJHMFA also performed an underwriting review for each project to ensure the building owners qualified for program participation and would be able to repay their share of the project cost. This collaboration provided customer identification and project qualification, at no or low cost, resulting in a pipeline of solid customer leads and program applicants. PSE&G contacted the NJHMFA financed projects via a joint PSE&G/NJHMFA direct mail letter as well as joint email solicitations. In addition, some project owners heard of the program through word-of-mouth or through conference presentations, requested additional program information, and applied for the program. Since the initial response to the program was sufficient to commit all available program funding, no additional marketing has been required and the planned second phase has not been implemented. Applications that cannot be funded, as well as any applications that continue to come in, are placed in queue and notified that the program is currently fully committed and that they are on a waiting list.

Once program applications were received, PSE&G reviewed and prioritized them according to receipt date and whether they were NJHMFA funded or not. Projects were then assigned to one of PSE&G's program contractors to perform the Investment Grade Audit and present the results to both the customer and NJHMFA. Throughout the program participation process; Investment Grade Audit review, installation contractor solicitation, RFP/contract review and measures installation, NJHMFA remained an active participant. This collaborative approach to program design and delivery provides the program with a mechanism for consistent input and feedback as well as customer access, which has been invaluable in serving this customer sector.

PSE&G's Multifamily Housing Program addresses a specific market sector with a "whole project" approach to energy efficiency. The program addresses all eligible ECMs for each project and compiles a project-specific portfolio of ECMs based on overall cost-effectiveness. While there are other energy efficiency programs offered to residential, commercial and industrial New Jersey customers, there are no comparable programs offered specifically to the New Jersey residential multifamily housing sector.

Current Program Participation

PSE&G's Multifamily Housing Program was received with great interest by the target market and became fully subscribed very quickly after program launch. A total of 128 NJHMFA financed projects were targeted for program recruitment. As of the end of the third quarter (Q3) of 2010, approximately 60 project applications had been received. Also at the end of Q3, 19 projects had undergone Investment Grade Audits, 1 had begun contractor bid solicitation and 4 more projects were in the process of having audits performed. The 23 projects are comprised of 131 buildings and 4,484 rental units.

Due to program demand and limited program funds in 2010 (the budget is capped at \$19 million), the program application waiting list continues to grow. In addition to the 23 projects in progress, another 6 NJHMFA projects, a total of 1,670 dwelling units, are on hold pending funding availability. These are a mix of Section 8, handicapped and low income senior projects, for buildings ranging in height from 2-17 stories. In addition, there are 24 non-HMFA financed project applications, a total of 2,061 units, on the program waiting list. They represent a mix of affordable, Section 8, tax credit, senior and low income public housing, buildings ranging in height from 2-22 stories. Applications continue to come in program driven by word-of-mouth.

The Multifamily Housing program addresses various building types, from single story to high rise. Because the majority of projects have been master metered, most of the buildings that have participated in the program have been mid and high-rise. However, there have been a few projects with garden apartments and townhouses, but even those had shared common heating systems. Generally, the low-rise projects benefit from improvements to the thermal envelope; more insulation, better air sealing of exterior walls, floors and ceilings. Mid and high-rise buildings have a much smaller proportion of exterior “skin” to attack, so improvements to insulation packages are difficult or impossible to achieve. Because of the nature of the building stock, improvements are more focused on mechanical systems. The program always considers the feasibility of the replacement of boilers and chillers, but those replacements are not necessarily always cost effective on their own and if included in a project must be balanced with low cost measures to ensure that the project as a whole meets cost effectiveness requirements. However, improvements to the existing equipment are almost always worth considering, especially variable frequency drives for motors and pumps.

In low-rise buildings, there are fewer common areas and correspondingly fewer opportunities for lighting improvements. In these building types lighting opportunities tend to be limited to providing compact fluorescent lights (CFLs) to residents with the hope that they will use them instead of incandescent bulbs. In mid and high-rise buildings there are ample opportunities to replace common area lights (especially hallways and stairwells) with either higher efficiency fluorescents bulbs and ballasts or light-emitting diode (LED) lights, including LED tube lights that can replace fluorescent bulbs within existing fixtures.

Ventilation issues are the most complex issues in multi-story buildings. In some instances, buildings are over-ventilated and waste energy by discharging conditioned air beyond what is necessary for a healthy environment. In other instances, buildings are under-ventilated and improvements to the systems that would make for a healthier indoor environment require additional energy consumption. Almost all of the buildings need improvements in balancing the ventilation system from one apartment to another and from one floor to another. Constant airflow regulators (CARs) are typically recommended to adjust the exhaust rate in individual apartments to balance the ventilation for the overall building. The program has also found great opportunity to save energy by recommending the installation of energy recovery ventilators (ERVs), which capture exhausted conditioned air and pass it through a heat exchanger, which minimizes the energy needed to condition air that is supplied to common areas of the building.

While the program is not designed to save water, low-flow showerheads and faucet aerators save hot water and, thus, energy. These recommendations are inexpensive, low-tech and always have a quick payback period. Aside from the value of the funding itself, the audit process is important for helping to prioritize the needs of the projects and clarifies the cost effectiveness of each measure that is considered.

Lessons Learned

While the program was being designed, the planning team used retrofit data from multifamily projects in another state as the basis for the estimate of project costs. Since the number and type of buildings that might participate in PSE&G’s program was not fully understood, the program estimated a cost per individual residential unit from the data. As the Multifamily Housing Program implementation progressed, it became clear that actual program investments per unit would be higher than the original estimate of \$3,353 per unit. At present, with incomplete data, the investment per unit is estimated to be about 26% higher at \$4,237 per unit. This is driven by the number and type of energy savings measures and the advanced project management required to bring these projects to fruition.

The PSE&G program has found that on average, ECMs fall into 4 payback categories.

1. First are those with “quick payback periods” typically with payback of 1-5 years. Measures having quick payback periods include:
 - CFLs for apartment lighting,
 - low-flow showerheads and aerators,
 - domestic hot water (DHW) recirculation controls and/or mixing valves,
 - energy/heat recovery ventilation systems, and
 - variable frequency drives (VFDs) for pumps.
2. Next are those with “moderate payback periods” of 6-10 years. Moderate payback period measures include:
 - LED lighting in hallways and stair towers,
 - fan coil upgrades in apartments,
 - thermostat and control valve upgrades, air sealing, and
 - insulation upgrades.
3. Measures with “marginal payback periods” of 11+ years include new boilers and new chillers.
4. Lastly, some measures fall into the category of “variable payback periods” having a wide range of payback from -5 to +15 years. Measures with variable payback periods vary greatly dependent upon the particular multifamily building characteristics. For example, ventilation improvements such as constant airflow regulators (CARs), duct sealing, and new fans have variable paybacks. Ventilation issues often have a large impact on comfort, health and safety. In some instances, ventilation improvements result in significant energy savings, while in others, ventilation improvements result in an energy penalty. Similarly, appliance replacements have wide variations of payback because appliances are subject to routine periodic replacement and it is difficult to survey the age and efficiency of all appliances in a large apartment building.

Program findings have shown that not all Investment Grade Audit recommended ECMs are approved for financing. This is due to two factors: first, the total project cost must meet cost effectiveness screening criteria, and second, there may be structural or health and safety related conditions present in the building that prevent the installation of some ECMs. In the case of the later, those conditions are cited in the Investment Grade Audit report and are required to be addressed by the building owner prior to consideration for inclusion in PSE&G’s program.

While the collaboration with NJHMFA had many benefits, there were downsides as well. Two bureaucracies involved at nearly every stage of the program weighed heavily on the ability to expedite customer participation through the program to the commitment stages before funding approval expired. While it was critical to ensure that program processes and approvals did not impede program delivery timelines, both PSE&G and NJHMFA needed to meet their internal requirements for fiduciary responsibility and regulatory "prudence" and this meant that both organizations reviewed Investment Grade Audit results, approved engineering scopes of work, contractor bids, customer repayment agreements and other program milestone documents in order to provide their input and approvals. This process was cumbersome at times as NJHMFA internally had several levels of review/approvals which needed to take place, including a second and final underwriting review. Their organizational structure required involvement of their property field expert, program manager, property management division, financing division, regulatory division and, at times, their governing board. This multilevel review/approval matrix sometimes impacted the turnaround times for program milestones. In order to address the issue, PSE&G and NJHMFA held frequent calls to resolve specific issues and to document processes so that all parties understood timeframes for making the required document reviews. While the collaborative was fundamental to the program design and initial launch, and it continues to work on

and improve the review processes; program implementation is more time consuming with two sets of project reviews and approvals. This is challenging because the timing for dual review was not built into the original program design.

Conclusion

The collaborative approach to the design and implementation of PSE&G's Multifamily Housing Program has proved to be a success for all program stakeholders, as well as an overall model for energy efficiency program design. The partnership with the New Jersey Housing and Mortgage Finance Agency (NJHMFA) in the design and development of the program proved to be a critical path to buy-in from State regulators leading to program funding. In addition, program recruitment was simplified and expedited by the use of NJHMFA housing data and building owner contact information and NJHMFA's program endorsement. This minimized program marketing costs and ensured successful recruitment of qualified participants. NJHMFA performed underwriting upfront for all eligible NJHMFA funded properties to assess their ability to take on additional financial risk in the repayment of the owner's portion of the energy efficiency measures costs. This effort eliminated properties at financial risk from program solicitation, thus providing a necessary pre-screening for the pool of program applicants. While in-depth program evaluation will need to take place to accurately assess the benefits derived from participation in PSE&G's program, it is anticipated that the owner's share of the cost of the energy efficiency upgrades should be significantly offset by the cost-savings recognized as a direct result of those energy efficiency upgrades.

Throughout the program participation process, NJHMFA has remained engaged with Investment Grade Audit reviews, energy efficiency installation contractor solicitation, and monitors program progress and installations for the NJHMFA affordable housing projects. While PSE&G has been providing energy conservation programs for well over two decades, and is a recognized source for energy conservation information to its customers, NJHMFA's support and ongoing involvement brings an additional level of credibility to the program and lends itself to program acceptance by hard to reach multifamily facility owners. This ongoing collaboration ensures that the building owners are in compliance with both NJHMFA standards as well as PSE&G program requirements; while adding an additional level of customer support and reliable information to the program participation process.

The PSE&G/NJHMFA collaboration to develop and deliver a successful program to a customer segment often financially unable to undertake energy efficiency improvements is both unique and compelling and has proven to be an innovative, effective approach to reaching this customer segment.