

Case 07-M-0548 – Energy Efficiency Portfolio Standard

**ENERGY-EFFICIENCY INVESTMENT PORTFOLIO
FOR
MAXIMIZING COST-EFFECTIVE ELECTRICITY AND
GAS SAVINGS BY 2015**

CONCEPTUAL PROGRAM DESIGNS

**Recommendations Prepared for
New York City Economic Development Corporation**

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CONCEPTUAL PROGRAM DESIGNS**

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1. Residential Construction Program

Market segments

Building type	Market
1-4 unit buildings	New construction
	Renovation and rehab
5+-unit buildings	New construction
	Renovation and rehab

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
High-performance windows	X	X	
Insulation	X	X	
Air and duct sealing	X	X	
High-efficiency furnaces and boilers	X	X	
High-efficiency water heating		X	
High-efficiency showerheads and faucets	X	X	X
High-efficiency toilets	X		X
High-efficiency air-conditioning (equipment, sizing, installation)	X		
High-efficiency heat pumps (air- and water-source)	X		
High-efficiency HVAC controls (e.g., programmable thermostats, tied to load control strategies)	X	X	
High-efficiency refrigerator/freezers	X		
High-efficiency clothes washers and dryers	X	X	X
High-efficiency dishwashers	X	X	X
High-efficiency lighting fixtures and lamps	X		
Multifamily building commissioning	X	X	X

Decision-making and supply chain intervention points

Decision-makers

- Owner-occupant buyers (detached, condo)
- Property owners and developers

Supply chain

- Builders
- Supply houses
- Architects, engineers, designers
- Installation contractors
- Lenders

- Buyer/seller agents/brokers
- Appraisers
- Private inspection agencies

Market intervention strategies and services

Financial

- incentives
 - covering all or most of the incremental design, equipment, and installation costs of high-efficiency technologies
 - paid to buyers, developers, builders, and/or agents
- Efficient rate design (inclining-block electricity and gas rates)
- Energy-efficient mortgages
 - interest-rate buydowns
 - closing-cost discounts

Marketing and business development

- Publicize advantages of high-efficiency properties to potential buyers, agents, developers, lenders
- Outreach throughout supply chain
- Publicity for developers
- Cooperative advertising for supply-chain participants

Information

- Case study development and dissemination throughout supply chain
- Training for architects, engineers, contractors

Technical assistance

- Design assistance professionals to work with design team
- Design incentives for property developers, architects, engineers

Delivery

- Existing supply chain

Quality assurance

- Inspections by program administrator
- Multifamily building commissioning

Geographic scope of efficiency markets targeted:

Downstate

Upstate

Administration

Primary responsibility:	NYSERDA
Coordinating in-state entities:	NYC: NYCEEA Long Island: LIPA Westchester and other counties: TBD
Utility support:	Electric and gas utilities
Other in-state support:	Municipal water authorities
Other coordination:	US EPA/DOE Energy Star Consortium for Energy Efficiency LEED

2. Residential HVAC Program

Market segments

New and replacement purchase and installation of central heating and cooling equipment in 1-4 unit residential buildings

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
High-efficiency gas furnaces and boilers	X	X	
High-efficiency gas water heaters		X	
High-efficiency air-conditioning (equipment, sizing, installation)	X		
High-efficiency heat pumps (air- and water-source)	X		
High-efficiency HVAC controls (e.g., programmable thermostats, tied to load control strategies)	X	X	
Multifamily HVAC system commissioning	X	X	

Decision-making and supply chain intervention points

Decision-making

- Owner occupants (detached, condo)
- Landlords
- Multifamily property management
- Property owners and developers
- State and local housing authorities

Supply chain

- HVAC supply houses
- HVAC contractors
- Vendors
- Wholesalers
- Manufacturers

Market intervention strategies and services

Financial

- incentives
 - covering all or most of the incremental equipment, and installation costs of high-efficiency technologies

- paid to buyers, contractors, vendors, distributors
- bonuses (or minimum requirements) for proper sizing and installation of central heating and AC systems (airflow and refrigerant charge)
- bonuses (or minimum requirements) for high-efficiency controls (e.g., programmable setback thermostats, possibly tied to load control)
- matching “buydowns” of price premiums with manufacturers

Marketing and business development

- Publicize advantages of high-efficiency equipment and installation to prospective purchasers
- Direct outreach throughout supply chain
- Cooperative advertising with participating supply-chain trade allies

Information

- Documentation of cost and performance of high-efficiency equipment and dissemination to prospective buyers and throughout supply chain
- Training in proper sizing and installation protocols for contractors

Technical assistance

- Equipment sizing and installation assistance to purchasers and contractors

Delivery

- Existing supply chain

Quality assurance

- Inspections by program administrator

Geographic scope of efficiency markets targeted:

Statewide

Administration

Primary responsibility:	NYSERDA
Coordinating entities:	NYC: NYCEEA Long Island: LIPA Westchester and other counties: TBD
Utility support:	Electric and gas utilities
Other coordination:	US EPA/DOE Energy Star Consortium for Energy Efficiency Gas Appliance Manufacturers Association Association of Heating and Air-Conditioning Manufacturers

3. Retail Products and Appliances Program

Market segments

Residential and small business retail purchases of electrical and electronic products and appliances

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
High-efficiency lamps and fixtures	X		
High-efficiency refrigerators/freezers	X		
High-efficiency clothes washers	X	X	X
High-efficiency clothes dryers	X		
High-efficiency dishwashers	X	X	X
High-efficiency gas stoves/ranges	X		
High-efficiency electronics	X		
High-efficiency room air-conditioners	X		

Decision-making and supply chain intervention points

Decision-making

- Owner occupants (detached, condo)
- Landlords
- Multifamily property management
- Property owners and developers
- State and local housing authorities
- Public and private purchasing agents

Supply chain

- Appliance (“white good”) retailers
- Lighting supply houses
- Hardware stores
- Grocery stores (for high-efficiency lamps)
- Electronics retailers
- Wholesalers
- Manufacturers

Market intervention strategies and services

Financial

- incentives

- covering all or most of the incremental costs of high-efficiency products and appliances
- paid to buyers, retailers, and/or distributors
- bonuses to retailers and/or distributors for superior high-efficiency product sales share, floor display, stocking
- matching “buydowns” of price premiums with manufacturers

Marketing and business development

- Publicize advantages of high-efficiency products and appliances to mass market purchasers
- Direct outreach throughout supply chain
- Cooperative advertising with participating supply-chain trade allies
- Floor displays for retailers

Information

- Documentation of cost and performance of high-efficiency products and appliances, and dissemination to mass market and throughout supply chain

Technical assistance

- High-efficiency product and appliance sales training to retailers

Delivery

- Existing supply chain

Quality assurance

- Inspections by program administrator

Geographic scope of efficiency markets targeted:

Statewide

Administration

Primary responsibility:	NYSERDA
Coordinating entities:	NYC: NYCEEA Long Island: LIPA Westchester and other counties: TBD
Utility support:	Electric and gas utilities
Other coordination:	US EPA/DOE Energy Star Consortium for Energy Efficiency American Refrigeration Institute Northeast Energy Efficiency Partnerships

4. Residential Retrofit Program

Market segments

Existing 1-4 unit housing

Existing 5+ unit housing

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
Early retirement and high-efficiency replacement of gas furnaces and boilers	X	X	
Early retirement and high-efficiency replacement of electric and gas water heaters	X	X	
Early retirement and high-efficiency replacement of room and central air-conditioning (with proper central-system sizing and installation)	X		
High-efficiency HVAC controls (e.g., programmable thermostats, tied to load control strategies; boiler controls)	X	X	
Multifamily HVAC system commissioning	X	X	
Early retirement and high-efficiency replacement of refrigerators/freezers	X		
Early retirement and high-efficiency replacement of clothes washers	X	X	X
Early retirement and high-efficiency replacement of lamps and fixtures	X		
Insulation	X	X	
Air and duct sealing	X	X	
High-efficiency showerheads and faucets	X	X	X
High-efficiency toilets	X		X

Decision-making and supply chain intervention points

Decision-making

- Owner occupants (detached, condo)
- Tenant and condo associations
- Landlords
- Multifamily property management
- Property owners
- State and local housing authorities

Supply chain

- High-efficiency product, appliance, and HVAC distributors
- Insulation and air-sealing contractors
- HVAC contractors
- Electrical contractors
- Plumbers
- Lenders

Market intervention strategies and services

Financial

- Incentives
 - covering all or almost all of the installed costs of high-efficiency products and appliances
 - paid to owners, occupants, tenant/condo associations, installation contractors
- Attractive financing terms
 - combined with financial incentives covering part but not all of efficiency retrofit cost
 - structured to provide immediate, positive cash flow on end user contribution toward efficiency investment
 - Extended term beyond simple payback of customer investment
 - On-bill energy-service charge to recover customer contribution
 - Discounted or zero interest rate

Marketing and business development

- Geographically targeted, community-wide initiatives organized and promoted neighborhood by neighborhood
- Joint marketing campaign carried out by utilities, civic associations, local government, non-government organizations
- Direct outreach to all decision-makers

Information

- Clear documentation of costs and performance of recommended efficiency technologies and practices
- Research, analyze, and document successful case studies

Technical assistance

- Efficiency technologies for each property recommended by certified energy specialists on staff or under contract to program administrator

Delivery

- Direct installation of recommended technologies by contractors managed by program administrator
 - At time of initial project assessment for 1-4 unit buildings

- After project assessment by separate contractors pursuant to follow-up work orders

Quality assurance

- Contractor payment subject to inspection by program administrator

Geographic scope of efficiency markets targeted:

City borough

County

Utility service area

Administration

Primary responsibility:

NYC: NYCEEA

Long Island: LIPA

Westchester and other counties: TBD

Coordinating in-state entities:

NYSERDA, NYPA; housing authorities

Utility support:

Electric and gas utilities

Other in-state support:

Municipal water authorities

5. Commercial/Industrial Construction Program

Market segments

All nonresidential new construction, expansion, renovation, and rehabilitation, including office, retail, educational, hospital, government, warehouse, food service and mixed-use buildings and facilities

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
High-performance windows	X	X	
Insulation	X	X	
Air and duct sealing	X	X	
High-efficiency furnaces and boilers	X	X	
High-efficiency water heating		X	
High-efficiency toilets	X		X
High-efficiency unitary and central cooling equipment (equipment, sizing, installation)	X		
High-efficiency heat pumps (air- and water-source)	X		
High-efficiency HVAC controls (e.g., energy-management systems, tied to load control strategies; economizers)	X	X	
High-efficiency refrigeration (e.g., reach-in coolers)	X		
High-efficiency lighting designs, fixtures, lamps, and controls	X		
Integrated design (sizing HVAC equipment to match lower lighting load, matching motor size to loads)	X	X	X
High-efficiency motors and drives (e.g., variable frequency drives)	X	X	X
High-efficiency cooking equipment	X	X	
Building commissioning	X	X	X

Decision-making and supply chain intervention points

Decision-makers

- Property owners and developers

Supply chain

- Architects, engineers, designers
- Builders

- Contractors
- Lenders
- Buyer/seller agents
- Private inspection agencies

Market intervention strategies and services

Financial

- incentives
 - covering all or most of the incremental design, equipment, and installation costs of high-efficiency technologies
 - structured to encourage greater comprehensiveness and deeper savings, with both fixed prescriptive incentives and customized incentives for site-specific and comprehensive applications
 - paid to buyers, developers, builders, and/or agents
- Efficient rate design (inclining-block electricity and gas rates)

Marketing and business development

- Publicize advantages of high-efficiency properties to potential buyers, agents, developers, lenders
- Outreach throughout supply chain
- Publicity for developers
- Cooperative advertising for supply-chain participants

Information

- Case study development and dissemination throughout supply chain
- Training for architects, engineers, contractors

Technical assistance

- Design assistance professionals to work with design team
- Design incentives for property developers, architects, engineers

Delivery

- Existing supply chain

Quality assurance

- Inspections by program administrator
- Building commissioning

Geographic scope of efficiency markets targeted:

Downstate

Upstate

Administration

Primary responsibility:	NYSERDA
Coordinating in-state entities:	NYC: NYCEEA Long Island: LIPA Westchester and other counties: TBD
Utility support:	Electric and gas utilities
Other in-state support:	Municipal water authorities
Other coordination:	US EPA/DOE Energy Star Consortium for Energy Efficiency LEED

6. Commercial/Industrial Equipment Program

Market segments

All non-residential and multifamily new and replacement equipment purchase and installation

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
High-efficiency furnaces and boilers	X	X	
High-efficiency water heating		X	
High-efficiency toilets	X		X
High-efficiency unitary and central cooling equipment (equipment, sizing, installation)	X		
High-efficiency heat pumps (air- and water-source)	X		
High-efficiency HVAC controls (e.g., energy-management systems, tied to load control strategies; economizers)	X	X	
High-efficiency refrigeration (e.g., reach-in coolers)	X		
High-efficiency lighting fixtures, lamps, and controls	X		
High-efficiency motors and drives (e.g., variable frequency drives)	X	X	X
High-efficiency cooking equipment	X	X	
Equipment commissioning	X	X	X

Decision-making and supply chain intervention points

Decision-makers

- Property owners and developers
- Property managers

Supply chain

- Architects, engineers, designers
- Contractors
- Vendors
- Distributors
- Manufacturers
- Lenders

Market intervention strategies and services

Financial

- incentives
 - covering all or most of the incremental design, equipment, and installation costs of high-efficiency technologies
 - structured to encourage greater comprehensiveness and deeper savings
 - paid to buyers, engineers, vendors, distributors
 - bonuses (or minimum requirements) for proper sizing and installation of central heating and AC systems
 - bonuses (or minimum requirements) for high-efficiency controls (e.g., programmable setback thermostats, possibly tied to load control)
 - matching “buydowns” of price premiums with manufacturers

Marketing and business development

- Publicize advantages of high-efficiency properties to potential buyers, lenders
- Outreach throughout supply chain
- Cooperative advertising for supply-chain participants

Information

- Case study development and dissemination to decision-makers and throughout supply chain
- Training for engineers, contractors, vendors, wholesalers

Technical assistance

- Design assistance professionals to work with decision-makers, engineers, contractors

Delivery

- Existing supply chain

Quality assurance

- Inspections by program administrator
- Equipment commissioning

Geographic scope of efficiency markets targeted:

Statewide

Administration

Primary responsibility:	NYSERDA
Coordinating in-state entities:	NYC: NYCEEA Long Island: LIPA Westchester and other counties: TBD
Utility support:	Electric and gas utilities
Other in-state support:	Municipal water authorities

Other coordination:

US EPA/DOE Energy Star
Consortium for Energy Efficiency
Northeast Energy Efficiency Partnerships
National Electric Motor Association
American Refrigeration Institute
Gas Research Institute

7. Large/Medium Commercial/Industrial Retrofit Program

Market segments

Nonresidential electricity and gas accounts above XX kW and/or XX therms/year, including office, retail, educational, hospital, government, warehouse, manufacturing and mixed-use buildings and facilities

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
Early retirement and high-efficiency replacement of gas furnaces and boilers	X	X	
Early retirement and high-efficiency replacement of electric and gas water heaters	X	X	
Early retirement and high-efficiency replacement of unitary and central air-cooling (with proper sizing and installation)	X		
High-efficiency HVAC controls (e.g., energy management systems, tied to load control strategies; boiler controls; economizers)	X	X	
Retro-commissioning	X	X	X
Early retirement and high-efficiency replacement of lighting design, fixtures, and lamps	X		
Insulation	X	X	
Air and duct sealing	X	X	
High-efficiency showerheads and faucets	X	X	X
High-efficiency toilets	X		X
High-efficiency refrigeration (e.g., reach-in coolers)	X		
Early retirement and high-efficiency replacement of motors	X		
High-efficiency motor drives and controls (e.g., variable frequency drives)	X	X	X
Compressed-air leakage reduction	X		
High-efficiency cooking equipment	X	X	

Decision-making and supply chain intervention points

Decision-making

- Property owners

- Landlords
- Property managers

Supply chain

- High-efficiency equipment vendors and distributors
- Insulation and air-sealing contractors
- Mechanical contractors
- Electrical contractors
- Plumbers
- Lenders

Market intervention strategies and services

Financial

- Incentives
 - structured so that customer's contribution toward the installed costs of high-efficiency equipment provide 12 to 18 month simple payback
 - paid to owners, managers, and/or installation contractors
- Attractive financing terms
 - combined with financial incentives
 - structured to provide immediate, positive cash flow on end user contribution toward efficiency investment
 - Extended term beyond simple payback of customer investment
 - On-bill energy-service charge to recover customer contribution
 - Discounted or zero interest rate

Marketing and business development

- Targeted to specific building and industry market segments
- Joint marketing campaign carried out by utilities, business associations, economic development agencies
- Direct outreach to all decision-makers

Information

- Clear documentation of costs and performance of recommended efficiency technologies and practices
- Research, analyze, and document successful case studies

Technical assistance

- Efficiency technologies for each property recommended by certified energy specialists on staff or under contract to program administrator

Delivery

- installation of recommended technologies by contractors engaged by customer

Quality assurance

- Contractor payment subject to inspection by program administrator

Geographic scope of efficiency markets targeted:

City borough
County
Utility service area

Administration

Primary responsibility:	NYC: NYCEEA Long Island: LIPA Westchester and other counties: TBD
Coordinating in-state entities:	NYSERDA, NYPA
Utility support:	Electric and gas utilities
Other in-state support:	Municipal water authorities

8. Small Commercial/Industrial Retrofit Program

Market segments

Nonresidential electricity and gas accounts with annual billing determinants below XX kW, kWh and/or XX therms/year, including office, retail, educational, hospital, government, food service, manufacturing and mixed-use buildings and facilities

End use efficiency technologies

Technology	Targeted Resource Savings		
	Electricity	Gas	Water
Early retirement and high-efficiency replacement of gas furnaces and boilers	X	X	
Early retirement and high-efficiency replacement of electric and gas water heaters	X	X	
Early retirement and high-efficiency replacement of unitary and central air-cooling (with proper sizing and installation)	X		
High-efficiency HVAC controls (e.g., energy management systems, tied to load control strategies; boiler controls; economizers)	X	X	
Early retirement and high-efficiency replacement of lighting design, fixtures, and lamps	X		
Insulation	X	X	
Air and duct sealing	X	X	
High-efficiency showerheads and faucets	X	X	X
High-efficiency toilets	X		X
High-efficiency refrigeration (e.g., reach-in coolers)	X		
Early retirement and high-efficiency replacement of motors	X		
High-efficiency motor drives and controls (e.g., variable frequency drives)	X	X	X
Compressed-air leakage reduction	X		
High-efficiency cooking equipment	X	X	

Decision-making and supply chain intervention points

Decision-making

- Property owners
- Landlords
- Property managers

Supply chain

- High-efficiency equipment vendors and distributors
- Insulation and air-sealing contractors
- Mechanical contractors
- Electrical contractors
- Plumbers

Market intervention strategies and services

Financial

- Incentives
 - structured so that customer's contribution toward the installed costs of high-efficiency equipment provide 12 to 18 month simple payback
 - paid to owners, managers, and/or installation contractors

Marketing and business development

- Geographically targeted, community-wide initiatives organized and promoted neighborhood by neighborhood
- Joint marketing campaign carried out by utilities, business associations, economic development agencies
- Direct outreach to all decision-makers

Information

- Clear documentation of costs and performance of recommended efficiency technologies and practices
- Research, analyze, and document successful case studies

Technical assistance

- Efficiency technologies for each property recommended by certified energy specialists on staff or under contract to program administrator

Delivery

- Direct installation of recommended technologies by contractors managed by program administrator
 - After project assessment by separate contractors pursuant to follow-up work orders

Quality assurance

- Contractor payment subject to inspection by program administrator

Geographic scope of efficiency markets targeted:

City borough

County

Utility service area

Administration

Primary responsibility: NYC: NYCEEA
Long Island: LIPA
Westchester and other counties: TBD

Coordinating in-state entities: NYSERDA, NYPA
Utility support: Electric and gas utilities
Other in-state support: Municipal water authorities