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Savings through energy efficiency

Welcome

2011 Trade Ally Open House
Sponsored by Mass Save

Mass Save Energy Efficiency Program Administrators

berkshire gas

Columbia Gas of Massachusetts
A NiSource Company

nationalgrid
THE POWER OF ACTION

New England Gas Company

NSTAR

Unitil

Western Massachusetts Electric
A Northeast Utilities Company

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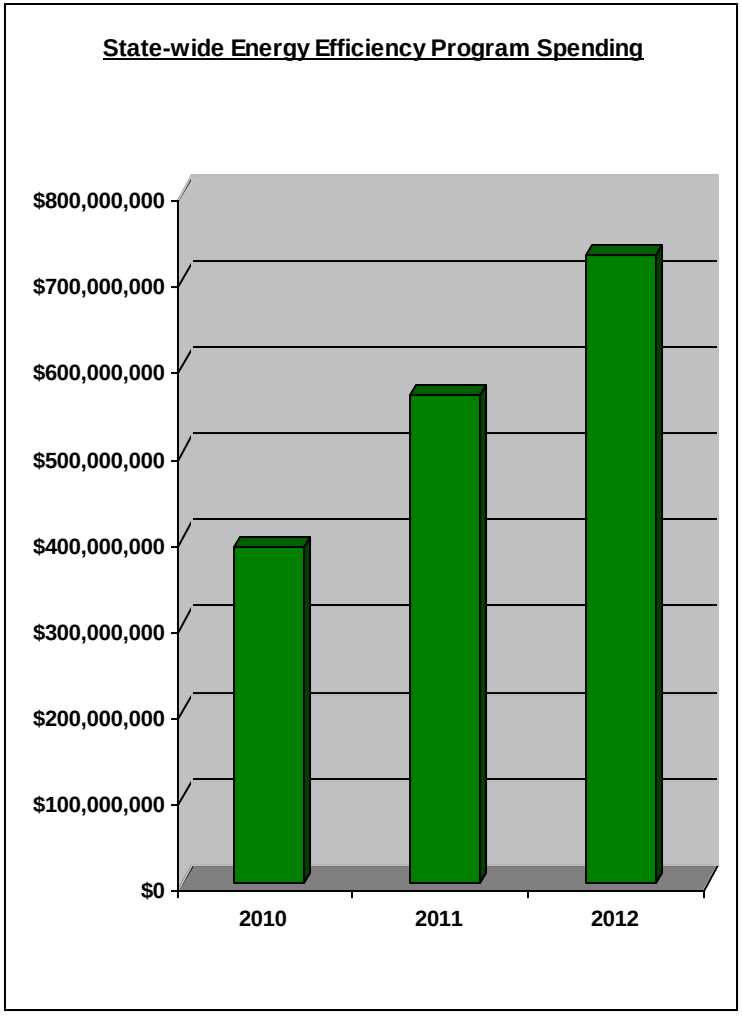
Agenda

Welcome- Thank You

- Mission, Vision, Strategies & Engagement Goals/ Budgets
- Program Overview
- CHP
- Gas/ Electric Integration Case Study
- Financing
- Formalized Networking

Quick Review

- Green Communities Act signed into law on July 2, 2008 to promote enhanced gas and electric energy efficiency throughout the Commonwealth.
  - Program Administrators to develop state-wide Three Year Plan providing for acquisition of all available cost effective energy efficiency.
- The Three Year Plan reflects:
  - Aggressive – unprecedented – savings goals
  - Gas/electric program integration and seamless delivery across Program Administrators
  - Focus on going “deeper” (more comprehensive) in buildings; and “broader” (more customers participating)



2010 - Year 1 of Three Year Plan

- Thank you for helping Massachusetts businesses in 2010
  - Saved MA businesses approximately $55 million on annual electric and gas bills
  - More than 11,000 businesses participated in business energy efficiency programs
  - Economic benefits of investing almost $150 million

2011 – Working Together to Meet the Continued Growth

- Continued growth of approximately 60%
- This level of growth requires we do some things differently including:
  - Identifying and addressing barriers such as customers' needs for financing
  - Identifying and promoting new technologies such as LEDs and the Massachusetts Technical Assessment Committee
  - Reducing customer and Program Administrator costs by identifying gas and electric savings for projects such as demand control ventilation and air compressors with heat recovery
  - Retro-commissioning and pay-for-performance
  - Continuing to identify and fund good CHP projects
  - Increased incentives for multiple prescriptive apps and greater savings on custom projects

2011 – Working Together to Meet the Continued Growth

- Some tools to help strengthen our relationship, in addition to meeting the Program Administrators here today...
  - Identify your customer's electric or gas company
    - http://db.state.ma.us/dpu/qorders/frmCityUtilities.asp
  - Don't know who to call? Contact us at "efficiency@_____.com"
    - Berkshire Gas: efficiency@berkshiregas.com
    - Cape Light Compact: efficiency@capelightcompact.org
    - Columbia Gas: efficiency@columbiagasma.com
    - Fitchburg Gas & Electric / Unitil efficiency@unitil.com
    - National Grid: efficiency@us.ngrid.com
    - New England Gas: efficiency@sug.com
    - NSTAR: efficiency@nstar.com
    - Western Massachusetts Electric Co: efficiency@wmeco.com
  - Visit www.masssave.com for program applications and other resources such as CHP guidebook

What you can expect today...

- Hear about...
  - robust increases in some incentives
  - New offerings such as financing through Massachusetts Bankers Association
  - Benefits of dual fuel allocation – saving therms and kWh for customers
- Meet representatives from Program Administrators
- We work well together -- need to move to the next level by
  - Continuing to provide excellent customer service
  - Improving efficiency of our customers' operations and facilities
  - Building sustainable businesses benefiting the economy

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2011 Gas Program Highlights

2011 Gas Programs Update

- **Custom**
  - Up to 50% of project costs for retrofit
  - Up to 75% of incremental project cost for New Construction
- **Energy Management Systems**
  - Gas Points added to the form, $225/point
- **High Efficiency Heating and Water Heating Equipment**
  - Prescriptive measures and incentive amounts are largely unchanged from 2010.
  - However a few measures have been eliminated from the prescriptive application and will now be handled as custom measures.
  - Also some new measures have been added, providing additional incentive dollars for additional efficiency in existing categories.
- **Gas Kitchen Equipment:**
  - Incentives are unchanged from 2010.
  - Adding prescriptive electric kitchen equipment measures later in 2011

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EMS / VSD / Cool Choice MotorUp / CHW Advanced Buildings

Marie Meehan, Tumin Chan &
Fran Boucher

Motors and Variable Speed Drives

MotorUp:

- Motor Up is discontinued in 2011. Due to Energy Independence and Security Act of 2007 (EISA) all general purpose motors manufactured in the US must be NEMA Premium Efficiency as of December 2010.

VFDs:

- Customers can still receive an incentive for motor replacement as part of a VFD installation from the Retrofit VFD-Motor Combination incentive.
- The Retrofit VFD and Retrofit VFD-Motor incentives have increased significantly in 2011 and eligibility requirements are the same as 2010.
- New Construction VFD incentive amounts are the same as 2010 however the eligibility requirements have changed since VFDs are now required by code on some larger motors

Cool Choice

- Two Tier Level offering ***greater incentives*** for increased performance !
- ***New*** prescriptive offering for Evaporative-Cooled Air Conditioning Systems
- Expanded prescriptive offering for Ground Source Heat Pump equipment
- Qualifying efficiency levels reflect the nationally recognized **CEE standards**
- Reduced Incentives reflect improved Building Code – IECC 2009

HVAC Chillers

- Code is more stringent equipment must be **more efficient** for the same incentive as last year
- Some size categories have changed
- “Oil Free” compressors may be called Turbocore, Mag Lev or Magnetic bearing - multiple manufacturers

Energy Management Systems

$225/ point for all size buildings

- Building Size Range: 5,000 – 40,000 sq.ft.
  Qualifying Points 16 electric & 4 gas
- Building Size Range: 40,001 – 80,000 sq.ft.
  Qualifying Points 48 electric & 12 gas
- Building Size Range: 80,001 – 200,000 sq.ft.
  Qualifying Points 128 electric & 32 gas

Compressed Air

The Compressed Air incentive merged the 2010 new construction and retrofit incentives

- 15-75 hp
- Load/No Load $100 per hp
- VSD $200 per hp

New incentives for Zero-Loss Condensate Drains

- $125 per drain

Low Pressure Drop Filter Incentives

- $0.80 per standard cfm

Advanced Buildings – New Construction

- Comprehensive suite of **prescriptive** measures that should result in 15% to 25% savings versus code.
- Incentive is **$1.56 / SF** plus free technical support
- STRETCH CODE!! Up to 50 communities in MA that must, by law, comply with Advanced Buildings or CDA for all new construction. These buildings are still eligible for incentives.

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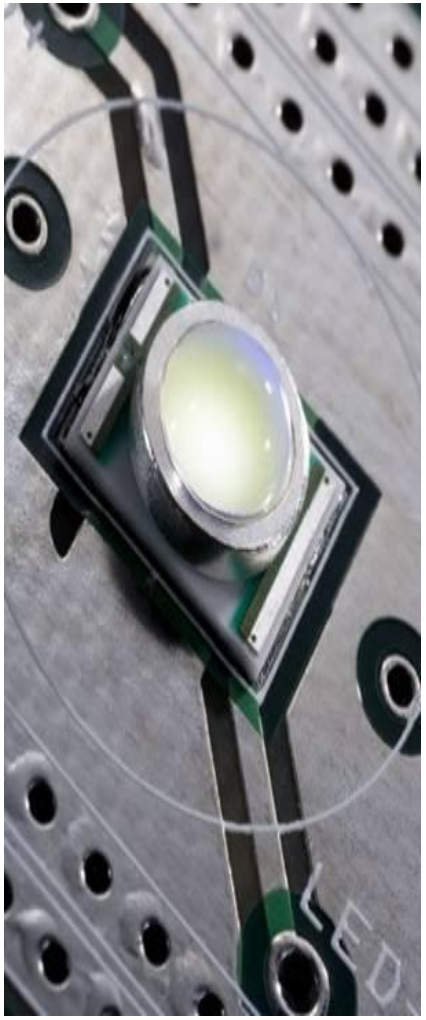
Lighting the Way - 2011 Lighting Updates

Kelly Cota, Tom Coughlin, & Kevin Morley

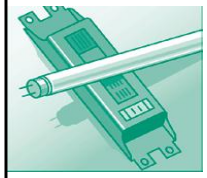
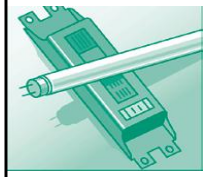
Prescriptive Lighting & Lighting Controls

- **Enhanced** several categories offering ***greater incentives*** for increased performance ! ***Increased incentives across all prescriptive Retrofit Lighting applications***
- **Maintained** Program Offerings and Incentive Levels carried over to 2011 for most lighting systems & controls
- **Performance Lighting:** Decrease in benchmark from 30% to 25%.
- Status of FINAL Mass Save LED Products List



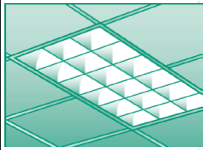
Lighting: Retrofit 2011

Measure Codes 10, 12, and 30A

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
10 *	Re-lamp/re-ballast of existing fixtures with new High Performance /Reduced Wattage (HP/RW) T-8 or T-5 lamps and HP/RW T-8 Electronic Ballasts	$15	Re-lamp/re-ballast of existing fixtures with T-8 or T-5 lamps, each fixture is composed of a ballast and 1, 2, 3 or 4 lamps. Only one incentive may be counted per fixture. Multiple fixtures served by a single ballast are only eligible for one incentive. Consider using reduced wattage 25 & 28 T8 CEE qualified lamps/ballasts. *If you have already received an incentive through another offering (i.e. manufacturers buy down) you may not be eligible to receive this prescriptive incentives*	11	
12 *	Re-lamp/re-ballast of existing fixtures with new High Performance /Reduced Wattage (HP/RW) T-8 or T-5 lamps and HP/RW T-8 Electronic Ballasts	$25	Re-lamp/re-ballast of existing fixtures with **opportunity for increased savings for Measure Code 12 with increased watts saved of more than 23 watts.** . Consider using reduced wattage 25 & 28 T8 CEE qualified lamps/ballasts. *If you have already received an incentive through another offering (i.e. manufacturers buy down) you may not be eligible to receive this prescriptive incentives*	23	
30A *	High Efficiency 2 lamp Prismatic Lensed Fluorescent Fixtures - 2x2 or 2x4	$40	Overall fixture efficiency must be ≥ : - 83% for 2x4 prismatic lensed fixture with two T-8 or T-5 lamps; - 75% for 2x2 prismatic lensed fixture with two T-8 or T-5 lamps (reduced wattage biax lamps are eligible- 28 watts).	27	

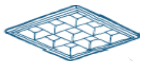
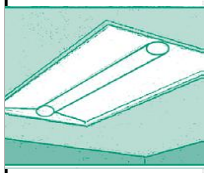
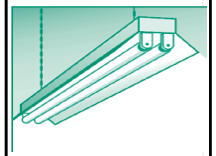
Lighting: Retrofit 2011

Measure Codes 30B, 30C, and 31

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
30B *	High Efficiency 2 lamp Parabolic Fluorescent Fixtures - 2x2 or 2x4	$45	Overall fixture efficiency must be ≥ : - 80% for 2x4 fixture with parabolic louver (2" to 3" deep cells) with two T-8 or T5 lamps; - 80% for 2x2 fixture with parabolic louver (2" to 3" deep cells) with two T-8 or T5 lamps (reduced wattage biax lamps are eligible- 28 watts)	27	
30C *	High Efficiency up to 2 lamp Recessed Indirect/Direct Fluorescent Fixtures - 2x2 or 2x4	$45	Overall fixture efficiency must be ≥ : - 75% for 2x4 recessed indirect/direct fixture with two T-8 or T-5 lamps; - 70% for 2x2 recessed indirect/direct fixture with two T-8, T-5, or T5HO (only reduced wattage biax lamps are eligible- 28 watts)	27	
31 *	High Efficiency 3 lamp Fluorescent Fixtures - 2x4	$35	Overall fixture efficiency must be ≥ : - 83% for 2x4 prismatic lensed fixture with three T-8 or T-5 lamps; - 75% for 2x4 fixture with parabolic louver (2" to 3" deep cells) with three T-8 or T5 lamps; - 70% for 2x4 recessed indirect fixture with three T-8 or T-5 lamps; **Eligible fixtures are limited to 3 lamps with a low power ballast factor < 0.80.**	31	

Lighting: Retrofit 2011

Measure Codes 32, 34, and 41

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
32 *	High Efficiency Recessed Fluorescent 2 lamp Retrofit Kits- 2x2 and 2x4	$45	Overall fixture efficiency must be ≥ : - 80% for 2x4 parabolic retrofit kit and advanced glare reducing diffuser retrofit kit with two T-8 or T-5 lamps; - 80% for 2x2 parabolic retrofit kit and advanced glare reducing diffuser retrofit kit with two T-8 ,T-5, or T-5HO (reduced wattage biax lamps are eligible- 28 watts)	27	
34 *	Advanced Recessed Fluorescent Fixtures 2x2, 1x4 or 2x4	$50	Overall fixture efficiency must be ≥ : - 85% for 2x4 advanced glare reducing diffuser fixture with one or two T-8 or T-5 lamps, or one T-5HO lamp; - 80% for 1x4 advanced glare reducing diffuser fixture with one or two T-8 or T-5 lamps, or one T-5HO lamp. - 80% for 2x2 advanced glare reducing diffuser fixture with one or two T-8, T-5, T-5HO lamps (reduced wattage biax lamps are eligible- 28	33	
41 *	Industrial/Commercial Fluorescent Fixtures –4 ft. and 8ft. Fixtures	$45	Overall fixture efficiency must be ≥ : - 85% for Industrial Reflector fixture with T-8 or T-5 lamps (up to 20% up-light); - 83% for Commercial Grade Wraparound fixture with one or two T-8 or T-5 lamps. - 85% for reflector kits with specular or semi-specular reflectors Reflector Kits for Existing Fixtures includes 2'x2', and 2'x4' reflector troffer kits, 4' and 8' strip channel, and industrial reflector kits. Applies to fixtures installed at or less than 16 feet above the floor. Only one incentive may be counted per fixture. Eight foot and multiple fixtures served by a single ballast are only eligible for one incentive.	23	 

Lighting: Retrofit 2011

Measure Codes 43, 44, 21 and 23

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
43 *	Vapor Tight Fluorescent Fixtures- 4 ft. and 8ft. Fixtures	$75	Overall fixture efficiency must be ≥ : -70% for Vapor Tight fluorescent fixture with one or two T-8, T-5, T-8HO, T-5HO or 3-T8 lamps. Typically installed in garage, warehouse, food prep and other industrial applications.	45	
44 *	Clean Room Rated Fluorescent Fixtures – 1x4or 2x4	$60	Overall fixture efficiency must be ≥ : -75% for Clean Room fluorescent fixture with up to three T-8 or T-5 lamps. To be eligible for incentives, fixtures must be installed in a clean room rated environment.	27	
21	Compact Fluorescent Fixture	$20	To be eligible for incentives, all fixtures must be hard-wired and have electronic ballasts with <33% THD. (Retrofit kits and screw-in adapters not eligible)	35	
23	Dimmable Compact Fluorescent Fixture	$40	To be eligible for incentives, all fixtures must be hard-wired and have electronic ballasts with <33% THD. (Retrofit kits and screw-in adapters not eligible)	35	

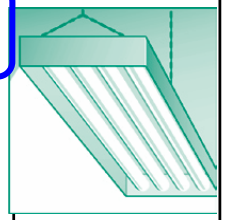
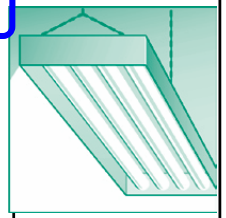
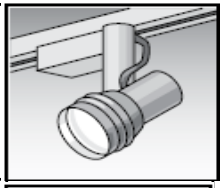
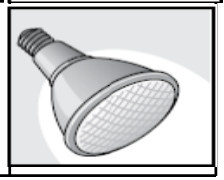
Lighting: Retrofit 2011

Measure Codes 25, 51 and 52

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
25	LED or LEC (Electroluminescence) Exit Fixtures	$20	All materials and assembled units shall comply with all applicable codes and standards including (but not limited to) Federal/State/Local building, fire, and electrical codes, and may require designated egress lighting to comply with such codes. Exit sign retrofit kits are not eligible.	15	
51	Pulse Start Metal Halide Lamp and Electronic Ballast Kits	$70	All kits must include a new matched Pulse Start Metal Halide Lamp and Electronic Ballast installed per manufacturer's specifications and applicable codes. Indoor and Outdoor fixtures are eligible..	50	
52	Pulse Start Metal Halide Fixture withElectronic Ballast	$85	Only New Metal Halide Pulse Start fixtures with Electronic Ballasts are eligible. Retrofit of existing metal halide fixture of less than 200 watts with new fixture is not eligible. Indoor and Outdoor fixtures are eligible.	64	

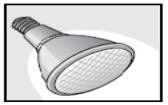
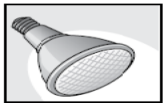
Lighting: Retrofit 2011

Measure Codes 56, 57, 70 and 71

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
56*	High Intensity Fluorescent Fixtures (HIF) for High and Low Bay Applications (less than or equal to 207W)	$90	Minimum wattage is 104 Watts and Maximum wattage is 207 Watts. Minimum fixture efficiency must exceed 80%. Recommended mounting height > 16 feet above the floor. High Intensity Fluorescent fixtures incorporate a number of lamp technologies that include T-8, T-5, T-5HO and compact fluorescent. **Low power ballasts are not eligible**.	70	
57*	High Intensity Fluorescent Fixtures (HIF) for High and Low Bay Applications (greater than 207W)	$150	Minimum wattage is greater than 207 Watts. Minimum fixture efficiency must exceed 80%. Recommended mounting height > 20 feet above the floor. High Intensity Fluorescent fixtures incorporate a number of lamp technologies that include T-8, T-5, T-5HO and compact fluorescent. **Low power ballasts are not eligible.**	95	
70	Metal Halide Specialty Lighting Hard Wired Fixtures with Electronic Ballast	$75	Metal Halide Specialty Fixtures maybe track, recessed or surface mounted and used for high quality display type lighting. Must be approved by UL or similar agency.	55	
71	Integral Metal Halide PAR Replacement Lamp	$20	Install an Integral Metal Halide PAR replacement lamps, not to exceed 25W PAR38 lamp or similar.	27	

Lighting: Retrofit 2011

Measure Codes 80, 81A and 81B

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
80	LED Down Light Fixtures- Hard Wired or GU- 24 base	$60	This incentive only applies to hardwired or GU-24 base LED fixtures rated as a Commercial LED product by Energy Star. (for more information see www.energystar.gov) *If you have already received an incentive through another offering (i.e. manufacturers buy down) you may not be eligible to receive this prescriptive incentives*, pertains to measure codes 81A/81B as well.	25	
81A	Integral LED Directional Replacement Lamps- MR16, PAR16 & PAR20	$20	Eligible LED Directional Integral replacement lamps for these reflector styles: MR16, PAR16 and PAR20. Eligible lamps are required to be listed by Energy Star or Mass Save Interim LED Pre-Qualified list *(for more information see www.energystar.gov or www.masssave.com/business)*	12	 
81B	Integral LED Directional Replacement Lamps - PAR30, PAR38 & Screw Base LED Down Light Retrofit Kits.	$40	Eligible LED Directional Integral replacement lamps for these reflector styles: PAR30S, PAR30L and PAR38. **Also Eligible Screw Base LED Down Light Retrofit Kits**. Eligible lamps are required to be listed by Energy Star or Mass Save Interim LED Pre-Qualified list (for more information see www.energystar.gov or	25	 

Lighting: Retrofit 2011

Measure Codes 82A, 82B and 83

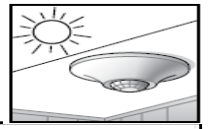
Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	Min Watts Saved	
82A	LED Cooler , Freezer Case or Refrigerated Shelving Fixtures – 3' & 4' Fixture	$40	Eligible LED Cooler and Freezer Case fixtures are required to be listed by Mass Save Interim LED Pre-Qualified list or Design Lights Consortium (for more information see www.masssave.com/business or www.designlights.org). **Please specify quantity of end and/or center mount fixtures.**	14	
82B	LED Cooler , Freezer Case or Refrigerated Shelving Fixtures – 5' & 6' Fixture	$60	Eligible LED Cooler and Freezer Case fixtures are required to be listed by Mass Save Interim LED Pre-Qualified list or Design Lights Consortium ***(for more information see www.masssave.com/business or www.designlights.org). Please specify quantity of end and/or center mount fixtures.***	23	
83	LED Low Bay Fixtures- Garage & Canopy fixtures	$200	Eligible LED Low Bay fixtures are required to be installed in **8,760 hour** applications and be listed by Mass Save Interim LED Pre-Qualified list or Design Lights Consortium *(for more information see www.masssave.com/business or www.designlights.org)*	60	 

Current Status of Interim LED Eligible Products List

Key Points

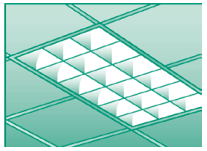
- All LED products as of January 1, 2011 must be submitted to the either Energy Star or DesignLights Consortium (DLC).
- **Energy Star** will review products such as integral lamps, bollards and recessed lighting. www.energystar.gov/index.cfm?c=ssl_res.pt_ssl
- **DLC** will review garage/canopy luminaires, wall packs, street and area lighting, track heads, and case refrigeration. (This list of product types is not meant to be exhaustive, if you have question as to where your product needs to be submitted please contact Energy Star or the DLC.) www.designlights.org/solidstate.manufacturer.overview.php
- All products on the list as of December 31, 2010 **will continue to be eligible for incentives from Mass Save program administrators**, regardless of whether or not they are on the Energy Star or DLC lists for an undetermined period of time.

Lighting Controls: Retrofit/New Construction 2011

Measure Code	Measure Description	Per Control Incentive	Eligibility Criteria	Min Controlled Wattage	
61	Remote - Mounted occupancy	$85	Comply with manufacturer's coverage recommendations. Ceiling mounted control. No manual "ON" overrides	110	
62	Daylight Dimming System (DDSFL)	$30 **(per fixture)**	Must have continuous dimming or adjust to a minimum of 4 levels.	53 **(per fixture)**	
63	Occupancy Controlled Step- Dimming System	$30 **(per fixture)**	Ballast must be automatically controlled based on occupancy. Power consumption in low mode must not exceed 60%.	53 **(per fixture)**	
64A	Wall mounted Occupancy Sensors	$35	Occupancy Sensors must operate as **Automatic On and off**. Sensors are wall mounted devices only. Not eligible if installed in restrooms, locker rooms, stairwells or rooms of greater than 250 square feet	51	
64B	Wall mounted Vacancy Occupancy Sensors	$40	Vacancy Sensors must operate as **Manual ON**, **Automatic off**. Sensors are wall mounted devices only. Not eligible if installed in restrooms, locker rooms, stairwells or rooms of greater than 250 square feet	51	
65	Photocell Sensors (lighting systems on 24/7)	$70	Photocell control for lighting systems that operate on 24 hours a day, 7 days a week (8,760 hours annually)	70	
68	High Bay Fluorescent (HIF) Occupancy Control Systems	$40 **(per fixture)**	Ballasts must be automatically controlled based on occupancy. Systems with manual "ON" or override switches are not eligible. Sensors may be remote mounted or mounted on individual fixtures	110 **(per fixture)**	

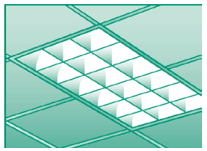
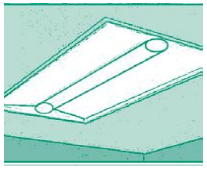
Lighting: New Construction 2011

Measure Codes 10, 30A, 30B and 30C

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	
10 *	High Performance or Reduced Wattage Lamp & Ballast Systems Any new fluorescent fixture with High Performance / Reduced Wattage (HP/RW) 4' T8 or 4' T5 lamps and electronic ballast	$10	Each new fixture is composed of a ballast and 1, 2, 3 or 4 lamps. Only one incentive may be counted per fixture. Multiple fixtures served by a single ballast are only eligible for one incentive. Only HP/RW 4'T8 or 4' T5 lamps are eligible.	
30A *	High Efficiency 2 lamp Prismatic Lensed Fluorescent Fixtures - 2x2 or 2x4	$15	Overall fixture efficiency must exceed: - 83% for 2x4 prismatic lensed fixture with two T-8 or T-5 lamps; - 75% for 2x2 prismatic lensed fixture with two T-8 or T-5 lamps (Biax lamps are not eligible).	
30B *	High Efficiency 2 lamp Parabolic Fluorescent Fixtures - 2x2 or 2x4	$20	Overall fixture efficiency must exceed: - 80% for 2x4 fixture with parabolic louver (2" to 3" deep cells) with two T-8 or T5 lamps; - 80% for 2x2 fixture with parabolic louver (2" to 3" deep cells) with two T-8 or T5 lamps (biax lamps are not eligible).	
30C *	High Efficiency 2 lamp Recessed Indirect/Direct Fluorescent Fixtures - 2x2 or 2x4	$15	Overall fixture efficiency must exceed: - 75% for 2x4 recessed indirect/direct fixture with two T-8 or T-5 lamps; - 70% for 2x2 recessed indirect/direct fixture with two T-8, T-5, or T5HO lamps (biax lamps are not eligible)	

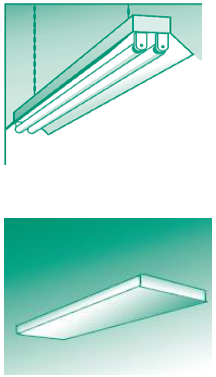
Lighting: New Construction 2011

Measure Codes 31, 33 and 34

31 *	High Efficiency 3 lamp Fluorescent Fixtures -2x4	$15	Overall fixture efficiency must exceed: - 83% for 2x4 prismatic lensed fixture with three T-8 or T-5 lamps; - 75% for 2x4 fixture with parabolic louver (2" to 3" deep cells) with three T-8 or T5 lamps; - 70% for 2x4 recessed indirect fixture with three T-8 or T-5 lamps; **Eligible fixtures are limited to 3 lamps with a low power ballast factor < 0.80.**	
33 *	High Efficiency Indirect Low Glare Pendant Fluorescent Fixtures	$30	Overall fixture efficiency must exceed: - 80% for an Indirect pendant fixture with two T-8 or T-5 lamps or one T-5HO lamp. Fixtures may have a down-light component of no greater than 45%. Fixtures with a down-light component must incorporate glare limiting louvers or a perforated cover shielding the lamps. Fixtures must be installed at a lighting power density 10% below current building codes. Ceiling finish must be white and unobstructed	
34 *	Advanced Recessed Fluorescent Fixtures – 2x2, 1x4 or 2x4	$35	Overall fixture efficiency must exceed: - 85% for 2x4 advanced glare reducing diffuser fixture with one or two T-8 or T-5 lamps, or one T-5HO lamp; -80% for 1x4 advanced glare reducing diffuser fixture with one or two T-8 or T-5 lamps, or one T-5HO lamp; - 80% for 2x2 advanced glare reducing diffuser fixture with one or two T-8, T-5, T-5HO lamps (biax lamps are not eligible).	

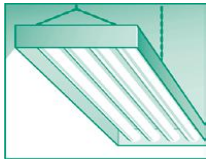
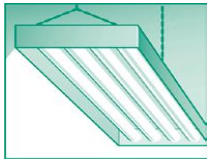
Lighting: New Construction 2011

Measure Codes 41 and 44

41 *	Industrial/Commercial Fluorescent Fixtures – 4 ft. and 8ft. Fixtures	$20	Overall fixture efficiency must exceed: - 85% for Industrial Reflector fixture with T-8 or T-5 lamps; - 83% for Commercial Grade Wraparound fixture with one or two T-8 or T-5 lamps. Applies to fixtures installed at or less than 16 feet above the floor. Up to 20% up-light as an integral fixture feature. Fixtures with T-8 or T-5 lamps, each fixture is composed of a ballast and 1, 2, 3 or 4 lamps. Only one incentive may be counted per fixture. Eight foot and multiple fixtures served by a single ballast are only eligible for one incentive.	
44 *	Clean Room Rated Fluorescent Fixtures – 1x4 or 2x4	$30	Overall fixture efficiency must exceed: -75% for Clean Room fluorescent fixture with up to three T-8 or T-5, lamps. To be eligible for incentives, fixtures must be installed in a clean room rated environment.	

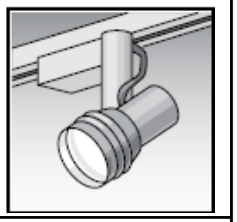
Lighting: New Construction 2011

Measure Codes 56 and 57

56 *	High Intensity Fluorescent Fixtures (HIF) for High and Low Bay Applications (less than or equal to 207W)	$20	Minimum wattage is 104 Watts and Maximum wattage is 207 Watts. Minimum fixture efficiency must exceed 80%. Recommended mounting height > 16 feet above the floor. Minimum fixture efficiency must exceed 80%. High Intensity Fluorescent fixtures incorporate a number of lamp technologies that include T-8, T-5, T-5HO and compact fluorescent. **Low power ballasts are not eligible**.	
57 *	High Intensity Fluorescent Fixtures (HIF) for High and Low Bay Applications (greater than 207W)	$40	Minimum wattage is greater than 207 Watts. Minimum fixture efficiency must exceed 80%. Recommended mounting height > 20 feet above the floor. High Intensity fluorescent fixtures incorporate a number of lamp technologies that include T-8, T-5, T-5HO and compact fluorescent. **Low power ballasts are not eligible**.	

Lighting: New Construction 2011

Measure Codes 80, 84, 82A/B and 83

80	LED Down Light Fixtures- Hard Wired or GU- 24 base	$30	This incentive only applies to hardwired or GU-24 base LED fixtures rated as a Commercial LED product by Energy Star. (for more information see www.energystar.gov) *If you have already received an incentive through another offering (i.e. manufacturers buy down) you may not be eligible to receive this prescriptive incentives,* pertains to measure code 84 as well	
84	LED Track Heads- Hardwired	$20	LED trackheads fixtures hardwired installations only, replacement lamps not eligible. Eligible fixtures are required to be listed by Mass Save Interim LED Pre-qualified list or Design Lights Consortium (for more information see *www.masssave.com/business* and www.designlights.org)	
82A	LED Cooler, Freezer Case or Refrigerated Shelving Fixtures – 3' and 4' Fixtures	$15	Eligible LED Freezer Case fixtures are required to be listed by Mass Save Interim LED Pre-qualified list or Design Lights Consortium (for more information see *www.masssave.com/business* and www.designlights.org) **Please specify quantity of end and/or center mount fixtures – same with 82B.**	
82B	LED Cooler, Freezer Case or Refrigerated Shelving Fixtures – 5' and 6' Fixtures	$30	Eligible LED Freezer Case fixtures are required to be listed by Mass Save Interim LED Pre-qualified list or Design Lights Consortium (for more information see *www.masssave.com/business* and www.designlights.org)	
83	LED Low Bay Fixtures- Garage & Canopy Fixtures	$100	Eligible LED Low Bay fixtures are required to be installed in 8,760 hour applications and be listed by Mass Save Interim LED Pre-qualified list or Design Lights Consortium (for more information see *www.masssave.com/business* and www.designlights.org)	

Performance Lighting

- Performance Initiative – “Code Dependent”
- New Construction or Major Renovation
- “NEW” for 2010 - 2011 open fixture selection, no restriction on type of fixtures.
- LED products required to be listed on either Energy Star, DLC or "Grandfathered" Mass Save LED lists
- Require High Performance Lamps & Ballasts
- Exclude Incandescent & Halogen lamps
- NEW Two Tier Approach added in 2010:
  - Tier 1 at $0.40 per watt saved - minimum 15% LPD (Industrial projects limited to Tier 1 only *includes: garages, warehouse, manufacturing*)
  - Tier 2 at $1.00 per watt saved - minimum **25%** reduction in LPD (watts/sq.ft)

Expanded Device Code List

Device Codes and Rated Lighting System Wattage Table

BX	Biax /Twin Tube Lamp	EE	Energy-Efficient Lamp	STD	Standard Ballast or Lamp
HW	Hard Wire Fixture	ELIG	Electronic Ballast	HO	High Output Lamp
EEMAG	Energy-Efficient Magnetic	LPF	Low Power Ballast Factor < 0.80	VHO	Very High Output Lamp
		HPF	High Power Ballast Factor > 1.0		

Existing Lighting Systems

Device Code	Device Description	Rated Watts
Incandescent Lamps		
1I0015	15W INC	15
1I0020	20W INC	20
1I0025	25W INC	25
1I0034	34W INC	34
1I0036	36W INC	36
1I0040	40W INC	40
1I0042	42W INC	42
1I0045	45W INC	45
1I0050	50W INC	50
1I0052	52W INC	52
1I0054	54W INC	54
1I0055	55W INC	55
1I0060	60W INC	60
1I0065	65W INC	65
1I0067	67W INC	67
1I0069	69W INC	69
1I0072	72W INC	72
1I0075	75W INC	75
1I0080	80W INC	80
1I0085	85W INC	85
1I0090	90W INC	90
1I0093	93W INC	93
1I0100	100W INC	100
1I0120	120W INC	120
1I0125	125W INC	125

Device Code	Device Description	Rated Watts
Halogen/Quartz Lamps		
1T0035	35W HALOGEN LAMP	35
1T0040	40W HALOGEN LAMP	40
1T0042	42W HALOGEN LAMP	42
1T0045	45W HALOGEN LAMP	45
1T0050	50W HALOGEN LAMP	50
1T0052	52W HALOGEN LAMP	52
1T0055	55W HALOGEN LAMP	55
1T0060	60W HALOGEN LAMP	60
1T0072	72W HALOGEN LAMP	72
1T0075	75W HALOGEN LAMP	75
1T0090	90W HALOGEN LAMP	90
1T0100	100W HALOGEN LAMP	100
1T0150	150W HALOGEN LAMP	150
1T0200	200W HALOGEN LAMP	200
1T0250	250W HALOGEN LAMP	250
1T0300	300W HALOGEN LAMP	300
1T0350	350W HALOGEN LAMP	350
1T0400	400W HALOGEN LAMP	400
1T0425	425W HALOGEN LAMP	425
1T0500	500W HALOGEN LAMP	500
1T0750	750W HALOGEN LAMP	750
1T0900	900W HALOGEN LAMP	900
1T1000	1000W HALOGEN LAMP	1000
1T1200	1200W HALOGEN LAMP	1200
1T1500	1500W HALOGEN LAMP	1500

Questions ??

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Custom Measures

2011 Discussion

- **Custom Measures**
- **Technical Assistance**
- **Massachusetts Technical Assessment Committee (MTAC)**

Custom Measures - Electric

- More than 50% of our savings are derived from “Custom Measures”
- Retrofit – Potential for an incentive of up to 80% of the project cost for cost effective solutions
- New Construction – Potential for an incentive of up to 80% of the incremental project cost for cost effective solutions
- Additional incentives may be available for more comprehensive solutions!
- Technical Assistance funds may be available

Custom Measures - Gas

- Retrofit - In general potential for up to 50% of the cost for cost effective solutions
- New Construction – In general potential for up to 75% of the cost for cost effective solutions

Custom

- **We will continue the** comprehensive new construction **program with graduated incentive bonuses for 20% and 25% savings versus code.**
- **We will continue the** comprehensive retrofit program **with graduated incentive bonuses for 15%, 20% and 25% savings versus existing energy consumption.**
  - 15% Energy Savings – Incentive increases by 5% up to 55%
  - 20% Energy Savings – Incentive increases by 10% up to 60%
  - 25% Energy Savings – Incentive increases by 15% up to 65%
- **If customer installs** three prescriptive retrofit **measures in 2011, the customer will receive a 10% kicker on the non-lighting measures**
- **Working on new tools to facilitate the application process**

MA Tech Assessment Committee

- The Massachusetts Technical Assessment Committee (MTAC) has the responsibility for managing a consistent and clearly understandable process by which the energy savings and program eligibility of new technologies can be established on a statewide basis.
- Kevin Keena is leading the effort with assistance from Hale Powell
- Goal is to evaluate promising new technologies
- CI_MTAC@masssave.com
- Residential_MTAC@masssave.com

Closing

- Attention to detail is a must in your applications
- Questions?
- Thank you!

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CHP Program Highlights

CHP as an Electric Energy Efficiency Measure…

- Green Communities Act of 2008 - CHP projects are considered an Energy Efficiency Measure eligible for Incentive Funding by Program Administrators (“Utilities plus Cape Light Compact”)

- Compared to prior marketing-focused Gas Utility Incentive Programs, the Electric Program CHP Incentive has increased but so have the approval requirements

Incentive Requirements

- **Passes Massachusetts' Benefit/Cost Model**
  - **Installed Cost**
  - **CHP System Electric & Thermal Efficiency**
  - **Run hours with on site with use of thermal energy**
  - **Maintenance Costs**
- **60% Combined Electric and Thermal Efficiency (HHV basis)**
  - **A project which barely exceeds the minimum efficiency requirements is unlikely to have a BCR > 1.0**
- **Overall building energy efficiency measures must also be implemented**

CHP Incentives for Qualifying Projects

- 150 kW or less, incentive is $750 per kW
- Over 150 kW, capped at $750 per kW
- Up to 50% of Installed Cost

(May be subject to Program Administrator Budget Limitations)

Application Supporting Details

- Facility Use/Mechanical Description
- Isolate Thermal Loads available for offset by a CHP Unit
  - Seasonal (Space Heating)
  - Daily Profiles of Thermal Loads (i.e. Domestic Hot Water)
  - Constant Loads (i.e. Process)
- Hourly Modeling (Pre- and Post-CHP): Difference (assuming no export) reflects CHP system operation
  - Facility purchased: Fuel consumption, kWh energy and kW demand
- CHP Installed and Maintenance Costs
- CHP System Detail
  - Make/Manufacturer/Type
  - kW Output/Electric and Thermal Efficiency/Thermal Output (type and quantity)
  - Parasitic Loads
  - Methods of Control

Applying for an Incentive

- Prospect Form
  - Basic customer information
  - Summarizes high level billing information and general building HVAC & process equipment
  - Used for prescreening purposes to determine whether to proceed with the more detailed analysis necessary to support an incentive application
- Guidebook for CHP Incentives
- Both documents are available on the Mass Save® website.

http://www.masssave.com/business/building-or-equipment-upgrades/find-incentives/incentive-details-business-custom-retrofit-nstar?q=08e57708-ba3d-4963-8c9f-89d9027d6e39

CHP Prospect: Prescreening

	Utility Consumption Data: Enter in yellow boxes				
Usage Month	**Billing Year**	**Electric,** kWh	**Natural Gas,** therms	**Gal Oil consumption**	**Oil Therms**
Jan					
Feb					
Mar					
Apr					
May					
Jun					
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
	Total				

CHP Prospect: Prescreening (cont'd)

	Enter "X" for all that apply			
	End Uses			
Equipment providing uses	Space Heating	Domestic Hot Water	Space Cooling	Process
Fossil Fuel Fired Central Boiler - Steam				
Fossil Fuel Fired Central Boiler - Hot Water				
Electric Heat				
Rooftop HVAC				
Centrifugal Chiller				
Steam Absorption Chiller				

Summary

- CHP can be a good energy savings opportunity for certain customers
- Careful analysis is necessary to ensure that the facility's thermal and electric load needs and profile is consistent with CHP equipment selection
- The system needs to be properly controlled to minimize thermal dumping and exporting of power
- Obtain early involvement of Program Administrator

For Follow-up Questions

- Follow-up Information

- Kevin Harnett, NSTAR
  - kevin.harnett@nstar.com
  - (781) 441-8367

- Kevin Keena, NGRID
  - kevin.keena@us.ngrid.com
  - (781) 907-1586

Gas/Electric Integration – An Incentive Case Study

Beth Israel Deaconess Medical Center – Center for Life Science Airflow Optimization

Gas/Electric Integration Case Study

The Customer

- Beth Israel Deaconess Medical Center (BIDMC), a teaching hospital of Harvard University
  - excellence in patient care
  - biomedical research
  - teaching and community service.
- BIDMC active participant in energy efficiency program
  - Recent projects primarily lighting, VSDs
  - Focused on mechanical efficiency projects to drive energy costs down further

Gas/Electric Integration Case Study

- Center for Life Science - LEED Gold -18-story-704,000 GSF
  - Research facility
  - Multiple tenants including hospitals and pharmaceuticals.
- Mechanical Systems
  - Highly efficient central plant
  - Extensive sub-metering chillers, boilers, pumping, air-handlers and exhaust fans, etc.
- Conservatively designed for 24/7 Occupancy as baseline
  - High general exhaust and ventilation (ACH) rates
  - Very high airflows and fan energy use
  - Substantial chilled water, preheat, and reheat loads

Gas/Electric Integration Case Study

The Business Arrangement:

- Landlord pays all utilities - steam, electric & gas
  - End uses are sub-metered
  - Utility costs are allocated to tenants based on use of conditioned air and reheat energy, cost of production

The Challenge:

- How do tenants reduce their energy costs under this business arrangement?

Gas/Electric Integration Case Study

The Project:

- Two-phase airflow optimization project (3 flrs, then 2 more)
  - Installed Aircuity Optinet - a laboratory air demand control ventilation control system
    - continuously samples exhaust air for VOCs from a rotating set of lab spaces
    - Lab ventilation rates are reset to lower minimum levels based on actual air quality, instead of more conservative theoretical values.
  - Dramatically reduced airflow rates from a 24x7 average of 12 ACH to 8 ACH occupied, and 6 ACH unoccupied in labs, lower in support areas
    - Resulted in significant reduction of MCFM of conditioned air purchases
    - Lower tenant and landlord operating costs
    - BIDMC funded project based on projected energy savings

Gas/Electric Integration Case Study

- Hurdles and Solutions
  - Capital intensive, significant engineering, equipment investment, and EMS integration required
  - Utility incentives from NSTAR Electric and National Grid Gas were critical
  - BIDMC-hired design engineer/commissioning agent worked with Aircuity and Siemens on all project phases and prepared all incentive applications.
  - NSTAR and NGRID worked closely with BIDMC, landlord to:
    - Collect sub-meter consumption and trend data
    - Project airflow reductions and energy savings and determine incentive dollars
    - Collaboration of all parties essential - landlord's cooperation essential.

Gas/Electric Integration Case Study

- NSTAR and NGRID worked seamlessly to allocate project costs based on electric and gas savings, determined incentive levels based on savings and projects
- NSTAR incentives for the project were paid directly to the landlord as the meter owner, the landlord passed those through to BIDMC.
- Initial project scope for Aircuity installation in labs was expanded to include support area and office ventilation rates
  - NSTAR strongly encouraged expansion of project scope to include implementation of unoccupied mode requiring only controls modifications
    - Resulted in additional electric and gas savings, higher incentive support, at significantly lower cost resulting in more savings realized sooner.

Gas/Electric Integration Case Study

Phase 1 (Floors 4, 6, & 7) Results:

- Project Cost: $387,087
- Expected first year kWh savings: 901,988
- NSTAR Electric incentive: $130,788
- Expected first year therm savings: 73,183
- NGRID Gas incentive: $59,515
- Combined incentive: 49.2% of project cost
- Expected first year savings to BIDMC: $267,216
- First two months savings to BIDMC: $81,810

Phase 2 (Floors 9 & 10):

- Final savings, incentives being determined at this time.

Gas/Electric Integration Case Study

Benefits:

- For BIDMC
  - Substantial cost savings
  - Improved lab safety and monitoring capabilities
  - Expanded scope of work over original project
  - Joint electric and gas incentives significantly reduced project cost
- For Aircuity
  - Joint incentives improved project economics dramatically
  - Strengthens sales case for future potential customer projects
  - Increases utility exposure to their projects
- For NSTAR and National Grid
  - Combined incentives improve economics, help close more projects
  - Allows Customers to do more with their energy efficiency budgets
  - Make progress towards our challenging Energy Efficiency Goals

Gas/Electric Integration Case Study

Benefits:

- For landlord
  - Greater central plant capacity via demand side reductions – in some cases a very real consideration
  - Lower operating costs/sq foot
  - Lower pass-through energy costs lead to better tenant retention, less pressure on lease rates

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Mass Save® Financing

Introduction

- **MA leads the nation in driving energy efficiency**
  - PAs are investing $1.2B in 2011-2012 to drive significant energy efficiency savings
  - We anticipate another $500MM - $700MM in customer investments

- **Massachusetts PAs and Lenders have launched the most extensive energy efficiency financing program in the nation covering the following sectors:**
  - Residential – Owner Occupied & Non-Owner Occupied (Landlord)
  - Commercial & Industrial
  - Multi-Family & Residential Complexes
  - Non-Profits
  - Municipal (Phase II launch)

- **New Mass Save Financing program allows for:**
  - Expansion of energy efficiency financing to multiple segments
  - Common application with streamlined process through all Lenders
  - Competitive underwriting guidelines to allow greater accessibility

Core Program Elements

Component	Mass Save® Financing
Eligible Customer	**Residential** (Owner Occupied & Landlord), **C&I** (incl. Multi-Family & Large Residential Complexes, Non-Profits)
Loan Purpose	Energy Efficiency Upgrades only; cross-selling & packaging of other financial products is allowed
Customer Interest Rate	0.00% (Interest-free)
Funding Entity	Principal (3rd Party Lender); Interest (buy-down by PA)*
Loan Amount	Varies by loan product
Term	Varies by loan product

*Interest buy-down payment is a component of the total incentive package provided to the customer

Product Matrix – Phase I Launch

Sector	Product	Min Loan Amt	Max Loan Amt	Max Term (mo)
Owner Occupied Residential (1-4 units)	Micro	$500	$2,000	24
	Standard	$2,001	$15,000	84
	Extended	$15,001	$25,000	84
Non-Owner Occupied Residential (1-4 units)	Standard	$5,000	$25,000	84
C&I, Multi-family (5+ units), Non-Profits	Standard	$5,000	$25,000	84
	Large	$25,001	$100,000	84

Note:
1. Interest rate charged to customer will be 0.00%. Utility to pre-pay interest expense when loan appropriated.

Mass Save C&I Financing Example

Total Project Cost:	**$ 145,000**	**kWh Savings:**	**300,000**
PA Incentive:	**$ 58,000**	**Monthly Savings*:**	**$ 3,750**
Net Customer Cost:	**$ 87,000**	**Annual Savings*:**	**$ 45,000**

No Financing

Customer Initial Outlay:	**$ 87,000**
Monthly Savings:	$ 3,750
Monthly Payments:	$ 0

- Customer pays full customer contribution out of pocket
- Customer experiences full savings from day 1

Financing – 36 months

Customer Initial Outlay:	**$ 0**
PA Loan Subsidy:	$ 7,900
PA Incentive:	$ 50,100
Total PA Incentive:	$ 58,000
Net Customer Cost:	$ 94,900
Monthly Savings:	$ 3,750
Monthly Payments:	$ 2,400
Financing Period Cash Flow:	$ 1,350

- Customer finances customer contribution
- Customer pays only principle amount
- Energy savings pay for finance cost
- No initial outlay required
- No additional monthly outlay required

*** Savings assumes $0.15/kWh saved**

C&I Process Review

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C&I Loan Process (Abbreviated)

1

Customer submits EE application with pre-approval letter from Lender for financing

PA accepts application and assess project; PA provides Customer with C&I Loan Subsidy Authorization Form

Customer seeks final approval from Lender; Lender notifies PA whether loan is approved

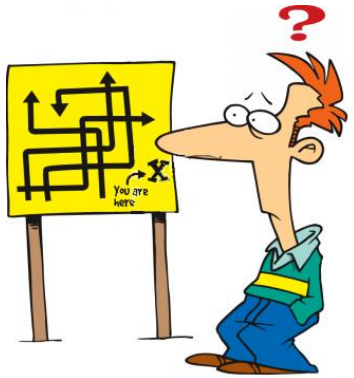
Assumes Lender approves loan

Project commences; post inspection is performed when project finishes

Assumes work qualifies

Customer submits final costs to Lender & PA. PA notifies Lender post inspection approved. Two-party check made in name of Contractor.

Lender gives check(s) to Customer* Customer signs check over to Contractor



2

Utility pre-pays interest to Lender once loan appropriated; PA releases Incentive to Customer

* Two-party check requirement may be waived at PA's request.

Frequently Asked Questions

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FAQ – Mass Save Financing vs. Direct Install Loan Program

Q. Is the Mass Save C&I Financing replacing the Direct Install Loan Program for small business customers?

A. No. The Direct Install Loan Program is still available for Direct Install projects. Mass Save Financing is available for non-Direct Install C&I projects.

FAQ - Eligibility

Q. What is eligibility based on in order for a C&I customer to participate in the Mass Save Financing Program?

A. C&I customers must have their project proposal approved by their Program Administrator and have received a Mass Save C&I Loan Subsidy Authorization Form.

FAQ – Performance Contract

Q. Is there a Performance Contract requirement?

A. No. Mass Save financing is available without a performance contract.

FAQ – Tenants vs. Landlords

Q. Can a Mass Save loan be granted to a tenant (Residential or C&I)?

A. Financing may be available to C&I tenants depending on their lease agreement.

FAQ – Alternative use of Mass Save Financing

Q. Do alternative energy systems count for this program? Are solar panels and related equipment included?

A. No. Financing is only available for energy efficiency projects. However, certain solar water heaters are included.

FAQ – Electric municipal customers

Q. Which municipalities are not eligible to participate? Can non-eligible electric municipal customers participate?

A. Electric municipal customers are unable to participate through their electric provider. Non-eligible electric municipal customers can participate in the Mass Save Financing Program through a participating gas utility for gas measures only. Participating gas utilities include:

- Columbia Gas of Massachusetts
- National Grid Gas
- New England Gas Company
- NSTAR Gas
- Unitil Gas

FAQ – Lender's role

Q. Is the Lender servicing the loan, billing, taking in payments and remitting?

A. The third party Lender is providing the loan to the customer. The Lender will be servicing the loan, billing and taking in payments/remitting.

FAQ – Interest buy down

Q. What are the mechanics of the interest buy down?

A. The PA's will pay the Lender the full interest expense up to a maximum amount equivalent of providing the customer a 0% (interest-free) loan. The interest buy down subsidy is a component of the total incentive provided to a Customer. The interest subsidy is paid by the PA once the Lender appropriates the loan to the Customer.

FAQ – Getting Started

Q. What should I do if my Customer is interested in the Mass Save Financing Program?

A. Have the Customer visit the www.masssave.org website to obtain a list of the participating Lenders. Upon selecting a Lender, the customer should seek a pre-approval letter for their project.

Additional Questions?

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Mass Save Energy Efficiency Program Administrators

berkshire gas

Columbia Gas of Massachusetts
A NiSource Company

nationalgrid
THE POWER OF ACTION

New England Gas Company

NSTAR

Unitil

Western Massachusetts Electric
A Northeast Utilities Company

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