

2010 Massachusetts Energy Efficiency Programs

July 1, 2010

nationalgrid

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MA Program Administrators



Cape Light Compact

Tel: 1-800-797-6699

efficiency@capelightcompact.org



New England Gas Company

Tel: 1-508-324-7811

efficiency@sug.com.com



Bay State Gas

Tel: 1-800-232-0120

efficiency@baystategas.com



NSTAR

Tel: 1-781-441-8592

efficiency@nstar.com



Berkshire Gas

Tel: 1-800-944-3212

efficiency@berkshiregas.com



Unitil

Tel: 1-888-301-7700

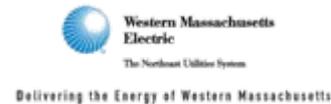
efficiency@unitil.com



National Grid

Tel: 1-800-787-1706/1-800-843-3636

efficiency@us.ngrid.com



Western Massachusetts

Electric Company

Tel: 1-800-835-2707

efficiency@wmeco.com



Green Communities Act

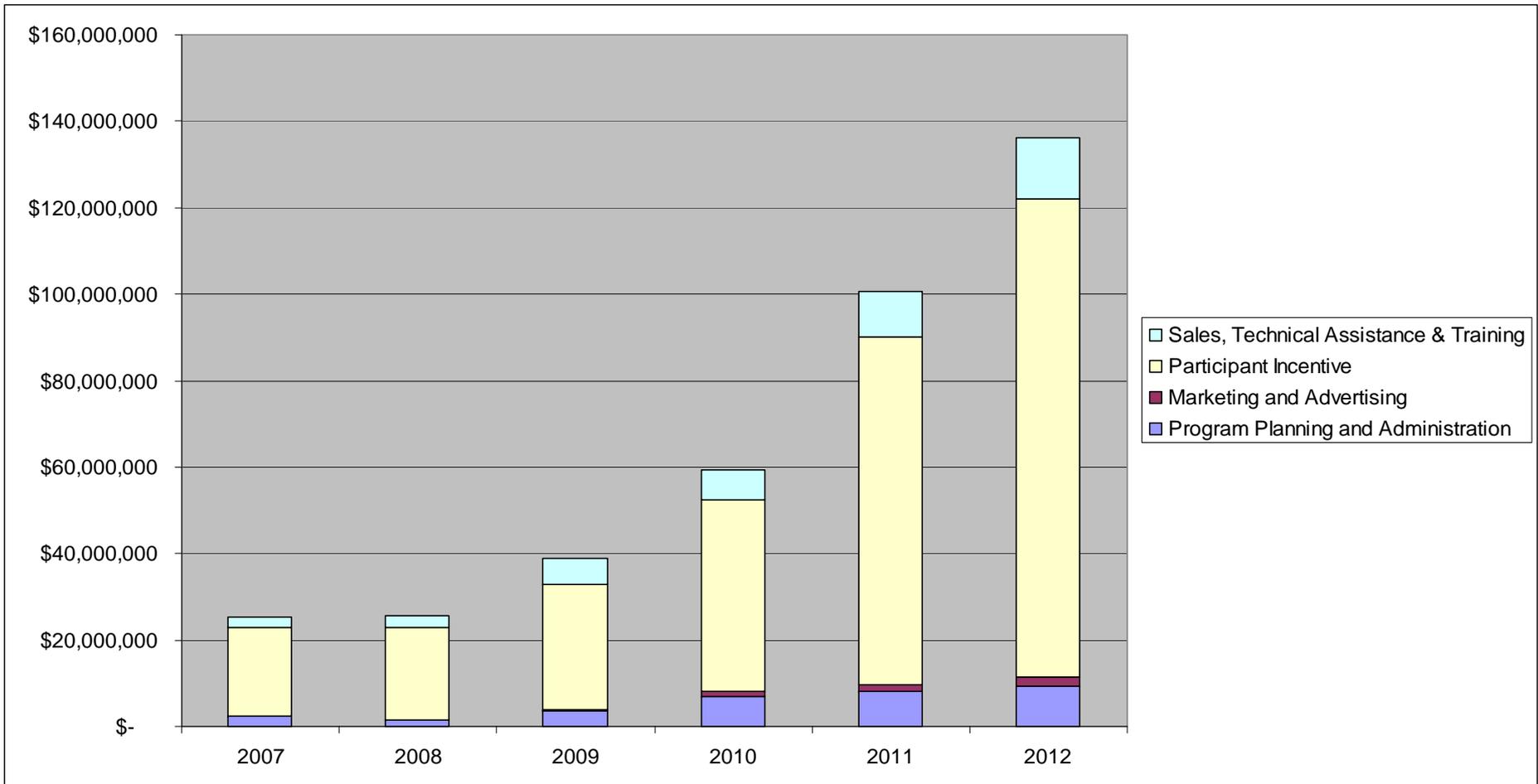
Green Communities Act signed into law on July 2, 2008 to promote enhanced gas and electric energy efficiency throughout the Commonwealth.

- 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
- Required gas/electric program integration and seamless delivery across Program Administrators
- A commitment to go both “deeper” (more comprehensive) in buildings; and “broader” (more customers participating)

Business Electric Program Spending: 2010-2012 = \$300 Million



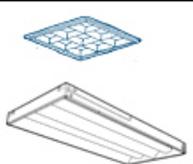
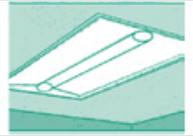
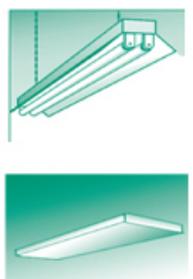
Prescriptive Lighting-1

- Many new LED measures added
- New controls added and clean room measures

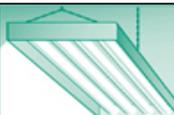
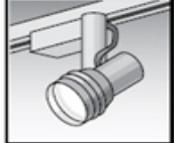
Table 1A: Lighting Systems Eligibility and Incentives:

Product Code	Measure Description	Per Fixture Incentive	Eligibility Criteria	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	\$10	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.	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	\$15	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. Recommend using reduced wattage 25 & 28 T8 CEE qualified lamps/ballasts.	23	
30A *	High Efficiency 2 lamp Prismatic Lensed Fluorescent Fixtures - 2x2 or 2x4	\$25	Overall fixture efficiency must be \geq : - 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).	27	
30B *	High Efficiency 2 lamp Parabolic Fluorescent Fixtures - 2x2 or 2x4	\$40	Overall fixture efficiency must be \geq : - 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).	27	
30C *	High Efficiency up to 2 lamp Recessed Indirect/Direct Fluorescent Fixtures - 2x2 or 2x4	\$40	Overall fixture efficiency must be \geq : - 75% for 2x4 recessed indirect/direct fixture with two T-8 or T-5 lamps; - 75% for 2x2 recessed indirect/direct fixture with two T-8, T-5, or T5HO lamps (Biax lamps are not eligible); - 80% for 2x2 advanced glare reducing diffuser fixture with one or two T-8, T-5, T-5HO lamps (Biax lamps are not eligible).	27	
31 *	High Efficiency 3 lamp Fluorescent Fixtures - 2x4	\$25	Overall fixture efficiency must be \geq : - 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	

Prescriptive Lighting-2

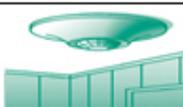
32 *	High Efficiency Recessed Fluorescent 2 lamp Retrofit Kits- 2x2 and 2x4	\$45	Overall fixture efficiency must be \geq : - 85% for 2x4 parabolic retrofit kit and advanced glare reducing diffuser retrofit kit with two T-8 or T-5 lamps; - 85% for 2x2 parabolic retrofit kit and advanced glare reducing diffuser retrofit kit with two T-8 ,T-5, or T-5HO lamps (bi ax lamps and reflector kits are not eligible).	27	
34 *	Advanced Recessed Fluorescent Fixtures 1x4 or 2x4	\$50	Overall fixture efficiency must be \geq : - 85% for 2x4 advanced glare reducing diffuser fixture with one or two T-8 or T-5 lamps, or one T-5HO lamp; - 85% for 1x4 advanced glare reducing diffuser fixture with one or two T-8 or T-5 lamps, or one T-5HO lamp.	33	
41 *	Industrial/Commercial Fluorescent Fixtures - 4 ft. and 8 ft. Fixtures	\$30	Overall fixture efficiency must be \geq : - 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	
43 *	Vapor Tight 4 ft. Fluorescent Fixtures	\$50	Overall fixture efficiency must be \geq : -70% for Vapor Tight fluorescent fixture with one or two T-8, T-5, T-8HO, T-5HO or 3-T8 lamps. To be eligible for incentives, fixtures must be installed in garage or warehouse applications only.	45	
44 *	Clean Room Rated Fluorescent Fixtures – 1x4 or 2x4	\$50	Overall fixture efficiency must be \geq : -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 (long tube CFL or Bi ax fixtures eligible)	\$15	To be eligible for incentives, all fixtures must be hard-wired and have electronic ballasts with <33% THD. All long tube CFL or Bi ax fixtures are eligible under this measure category. (Retrofit kits and screw-in adapters not eligible)	35	
23	Dimmable Compact Fluorescent Fixture	\$30	To be eligible for incentives, all fixtures must be hard-wired and have electronic ballasts with <33% THD. (Retrofit kits and screw-in adapters are not eligible)	35	

Prescriptive Lighting-3

25	LED or LEC (Electroluminescence) Exit Fixtures	\$10	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	\$50	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 with Electronic Ballast	\$70	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	
56 *	High Intensity Fluorescent Fixtures (HIF) for High and Low Bay Applications (less than or equal to 210W)	\$70	Minimum wattage is 111 Watts and Maximum wattage is 210 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.	55	
57 *	High Intensity Fluorescent Fixtures (HIF) for High and Low Bay Applications (greater than 210W)	\$100	Minimum wattage is greater than 210 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.	85	
70	Metal Halide Specialty Lighting Hard Wired Fixtures with Electronic Ballast	\$50	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	\$12	Install an Integral Metal Halide PAR replacement lamps, not to exceed 25W PAR38 lamp or similar.	27	
80	LED Downlight Fixtures- Hard Wired	\$50	This incentive only applies to hardwired LED fixtures on Energy Star's list (for more information see www.energystar.gov)	25	

Prescriptive Lighting-5

Table 1B: Lighting Controls Eligibility and Incentives

Measure Code	Measure Description	Per Control Incentive	Eligibility Criteria	Min Controlled Wattage	
61	Remote Mounted occupancy or photocell sensor (per control)	\$60	Comply with manufacturer's coverage recommendations. Ceiling mounted control. No manual "ON" overrides	110	
62	Daylight Dimming System (DDS-FL)	\$25 (per fixture)	Minimum of 4 fixtures per control unit. Must have continuous dimming or adjust to a minimum of 4 levels.	53 (per fixture)	
63	Occupancy Controlled Step-Dimming System	\$20 (per fixture)	Ballast must be automatically controlled based on occupancy. Power consumption in low mode must not exceed 60%. Minimum of 4 fixtures controlled	53 (per fixture)	
64A	Wall mounted Occupancy Sensors	\$25	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	\$30	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)	\$50	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	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	

Prescriptive HVAC

MINIMUM EFFICIENCY LEVELS/INCENTIVE LEVELS						
HVAC Unit Size			LEVEL 1		LEVEL 2	
Tons	Btuh		Minimum SEER/EER for Incentive	Incentive \$/Ton	Minimum SEER/EER for Incentive	Incentive \$/Ton
Air Cooled Unitary and Split (new condenser and new coil) Air Conditioning Systems						
< 5.4	< 65,000	Split	14.0 SEER & 12.0 EER	\$125	15.0 SEER & 12.5 EER	\$175
< 5.4	< 65,000	Packaged	14.0 SEER & 11.6 EER	\$125	15.0 SEER & 12.0 EER	\$175
≥ 5.4 to < 11.25	≥ 65,000 to < 135,000		11.5 EER	\$80	12.0 EER	\$95
≥ 11.25 to < 20	≥ 135,000 to < 240,000		11.5 EER	\$80	12.0 EER	\$95
≥ 20 to < 63	≥ 240,000 to < 760,000		10.5 EER	\$50	10.8 EER	\$70
≥ 63	≥ 760,000		9.7 EER	\$50	10.2 EER	\$70
Evaporatively Cooled Air Conditioning Systems						
≥ 20	≥ 240,000		14.0 EER	\$80	N/A	N/A
Air Cooled Heat Pump Systems						
< 5.4	< 65,000	Split	14.0 SEER & 12.0 EER & 8.5 HSPF	\$125	15.0 SEER & 12.5 EER & 9.0 HSPF	\$175
< 5.4	< 65,000	Packaged	14.0 SEER & 11.6 EER & 8.0 HSPF	\$125	15.0 SEER & 12.0 EER & 8.5 HSPF	\$175
≥ 5.4 to < 11.25	≥ 65,000 to < 135,000		11.5 EER & 3.4 COP	\$80	12.0 EER & 3.4 COP	\$95
≥ 11.25 to < 20	≥ 135,000 to < 240,000		11.5 EER & 3.2 COP	\$80	12.0 EER & 3.2 COP	\$95
≥ 20	≥ 240,000		10.5 EER & 3.2 COP	\$50	10.8 EER & 3.2 COP	\$70
Water Source Heat Pump Systems						
< 11.25	< 135,000		14.0 EER & 4.6 COP	\$80	N/A	N/A
Ground Water – Water Source Heat Pump Systems (Open Loop)						
< 11.25	< 135,000		18.0 EER & 4.0 COP	\$150	N/A	N/A
Ground Loop – Water Source Heat Pump Systems (Closed Loop)						
< 11.25	< 135,000		15.0 EER & 3.2 COP	\$150	N/A	N/A
ENERGY SAVING CONTROL AND FAN MOTOR OPTIONS (when installed with new qualifying equipment)						
Dual Enthalpy Economizer Controls						
Outside air economizer utilizing 2 enthalpy sensors (1 for outdoor and 1 for return air)					\$250/Unit	
Demand Control Ventilation						
Outside air intake controlled based on CO2 sensor					\$200/Unit	
ECM Fan Motors						
ECM motors installed on fan powered terminal boxes, fan coils or HVAC supply fans on small unitary equipment					\$150/Motor	

Prescriptive Variable Frequency Drive

Retrofit:

- ◆ Prescriptive VFD incentives increased (up to 15%-20%)
- ◆ Covers a variety of applications including pumping systems

Table 2: Variable Frequency Drive Installation Size and Incentives

Horsepower	Incentive	Horsepower	Incentive	Horsepower	Incentive	Horsepower	Incentive
5	\$1,700	15	\$2,300	30	\$3,500	60	\$5,500
7.5	\$1,900	20	\$2,600	40	\$3,800	75	\$6,000
10	\$2,100	25	\$3,100	50	\$4,500	100	\$7,000

Prescriptive Motor & Variable Frequency Drive

NEW application for combined motors and drive.

- ◆ Intended for efficiency opportunities where the existing motor is older and not inverter-duty rated. The new motor must meet NEMA-premium efficiency requirements.

Table 2: Variable Frequency Drive and Motor Installation Size and Incentives

Horsepower	Incentive	Horsepower	Incentive	Horsepower	Incentive	Horsepower	Incentive
5	\$2,000	15	\$2,900	30	\$5,100	60	\$8,600
7.5	\$2,300	20	\$3,600	40	\$5,600	75	\$9,600
10	\$2,400	25	\$4,100	50	\$5,900	100	\$10,200

Prescriptive Compressed Air

RETROFIT

- ◆ Simplified application process to reduce project information requirements and processing

Table 1: Prescriptive High Efficiency Air Compressor Incentives

Horsepower	Incentive per Hp Load/No Load	Incentive per Hp Variable Speed	Incentive per Hp Variable Displacement
≥15 to <25	\$205	\$275	N/A
≥25 to <50	\$180	\$280	N/A
≥50 to <75	\$180	\$210	\$215

Table 2: Storage Incentives

Incentive per Gallon
\$2.75

Prescriptive Energy Management System

RETROFIT

◆ Upgrade your HVAC EMS!

Table 1A: EMS Incentives

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Measure Description		Maximum Unit Incentive Eligible Points	Maximum Number of Points		Minimum Efficiency Incentive Criteria
Energy Management Systems <i>(See Req. 1,2,3 above)</i>					Facility must have electric air conditioning and/or electric/gas heat. EMS to include, if applicable: <ol style="list-style-type: none"> 1. Optimal start/stop 2. 7-day scheduling 3. Economizer or enthalpy control 4. Direct digital temperature control for air handling units.
Conditioned space controlled					
5,000 - 40,000 Sq. Ft.		\$225/pt.	(up to 20 points)		
Total Sq Ft.			Total # of Points		
40,001 - 80,000 Sq. Ft		\$300/pt.	(up to 60 points)		
Total Sq Ft.			Total # of Points		
80,001 <u>Sq.Ft.</u> to <200,000 Sq. Ft		\$200/pt.	(up to 160 points)		
Total Sq Ft.			Total # of Points		

Custom Projects

Covers most everything not prescriptive

Requires detailed engineering studies to determine costs and savings

Pays for a % of total project installed cost

Incentives capped at 1.5 year payback to customer

Retrofit: **Up to 50% of project cost**

New Construction: **Up to 75% of incremental cost**

Gas energy savings is now counted when screening projects to determine if eligible for incentives!

Technical Services for Custom Projects

- **NGrid has 8 in-house Energy Engineers in MA**
- **Coordinates In-depth engineering analysis**
 - Determines actual project costs and energy savings to shows the customer their best options
 - Pre & Post Metering May be Required
 - Power, Flow, Pressures, Temps, etc
- **Service Provided by Independent Consultants**
 - Can be provided by customers engineering firm or through NGrid recommendation
- **What does it cost?**
 - National Grid will typically share the cost 50-50

Special Prescriptive Bonus!

- Three plus prescriptive incentives pays 10% bonus on Non-lighting incentives

Example:

1. Prescriptive Lighting	\$14,567	
2. VFD incentive		\$ 16,500
3. EMS controls		<u>\$ 13,500</u>
Eligible Subtotal		\$ 30,000
Bonus:		\$ 3,000

Special Custom Incentives!

Comprehensive **ELECTRIC** Retrofit:

- Higher Incentives!
- Lower Payback Caps!

Percent Electric Savings	Retrofit: Incentive	New Construction: Incentive	Payback Cap
15%	55%	80%	1 year
20%	60%	85%	1 year
25%	65%	90%	1 year

2010 Stimulus Program!

The incentives will provide a 50% "kicker" to the standard prescriptive incentives!

The stimulus offering will apply to Large Commercial Retrofit for select Lighting measures, VFD/Motors, and Air Compressors!

The program applies to applications:

- submitted by August 1st
- installed by September 30th!

NEW MA Initiative - CHP

Combined Heat and Power (CHP)

- **CHP is an efficient, clean, and reliable approach to generating power and while providing thermal energy**
- **Designed to meet the thermal and electrical base loads of a facility while reducing emissions of greenhouse gases**
- **Needs to pass the Massachusetts' Benefit/Cost Model**
 - Installed Cost per kW
 - CHP System Electric & Thermal Efficiency
 - Run hours with on site- 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

New MA Initiative -CHP

Combined Heat and Power Incentives

- **\$750 per kW for up to 150 kW projects**
- **Over 150 kW, capped at \$750 per kW**
- **Up to 50% of Installed Cost**
- **May be subject to Program Administrator Budget Limitations**

Other Program Updates....

- ◆ **Direct install program for Small/Mid-Sized Businesses (<300 kW) focuses on direct install lighting, refrigeration, and gas measures. Non-direct install measures processed through Retrofit Program.**
- ◆ **Financing**
 - ◆ Included in Three Year Plan and challenge is to find source of outside funds
- ◆ **NGrid has limited on-bill financing available for customers**
- ◆ **GCA allows cities & towns to implement <\$100,000 EE projects without bidding!**

2010 Energy Efficiency Programs

Questions?

Thank You!

- For additional information contact:
 - Kevin Keena, *Lead Energy Engineer*
 - Waltham, MA 781-907-1586