

2011-2012 Lighting Systems & Controls

Instructions for completing the NE&C LIGHTING Rebate Worksheet

General Note:

1. This application is for new high efficiency lighting fixtures, systems and controls.
2. Cutsheets/specifications including photo metric tables must be submitted and reviewed by the utility to verify compliance with technical requirements.
3. Proof of Purchase includes invoice(s) indicating the size, type, manufacturer, model or part number, purchase date, and vendor of the efficient equipment are required for payment of rebates.
4. The rebate, in conjunction with all other sources of funding, cannot exceed the total project cost.

Eligibility Requirements:

1. Each lighting efficiency measure must meet the efficiency and technical specifications found in Table A. Fixture efficiency ratings can be found on fixture photometric reports, and is the total % lamp lumen output in the 0 to 90 degree range for direct fixtures and 0 to 180 degree range for direct/indirect found in the Zonal Lumen Summary
2. Lighting efficiency requirements are intended to reduce the lighting system's energy demand and consumption while delivering quality lighting in accordance with IES recommended lighting guidelines.
3. Each fixture or system must operate a minimum of 1000 hours of use annually or per hours specified in measure
4. When replacing ballasts, follow manufacturer's installation and wiring guidelines
5. Minimum watts for prescriptive control measures is the average total watts controlled per controller.
6. The rebate offer is not valid unless signed and dated by the Utility Representative. The Customer accepts the Utilities rebate offer and agrees to the Terms and Conditions of the Utility by signing in the pre-approval offer block.
7. Outdoor lighting will be considered as a custom measure & must pass benefit cost test to be eligible for an incentive.

Proposed Lighting System - Pre-Installation Requirements

1. Review eligibility requirements.
2. Review specifications for the proposed equipment to confirm it meets the minimum efficiency requirements, if available.
3. Complete the lighting or lighting controls rebate worksheet as described below.
4. Fill out a separate line for each unique combination of proposed Measure Code, Fixture Code (see Table B) and hours of operation.
5. Fill out a separate line for each lighting control measure including control description, quantity of fixtures controlled, and hours of reduction for each device proposed (refer to Table A for measure code and rebate amount).
6. Hours of operation are the estimated annual hours that the particular fixture(s) actually operate. Try to be as specific and accurate as possible. Note that fixture operating hours are not necessarily the same as the facility operating hours.
7. Add up the Total Rebate columns for each of the two tables. The Rebate Total boxes cannot exceed the total equipment costs.
8. Add the Lighting Total and the Control Total in the Grand Total box. The front of the application is to be filled out by the utility.

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Explanation of how to fill out table:

NE&C LIGHTING REBATE WORKSHEET							
Item	Measure Code	Fixture Code	Fixture Description	Quantity of Fixtures (A)	Annual Hours of Operation	Per Unit Rebate \$ (B)	Total Rebate (\$)
<i>Ex.</i>	31	3F32EEL	3L4T8EE/EEE	34	4,200	\$15	\$510
	<i>See Table A</i>	<i>See Table C</i>	<i>See Table C</i>	<i>Amount of fixtures to be installed</i>	<i>From Customer or Utility Representative</i>	<i>See Table A</i>	<i>A x B</i>

Explanation of how to fill out table:

LIGHTING CONTROLS REBATE WORKSHEET								
Item	Lighting Control Measure Code	Lighting Control Description	Quantity (A)	Lighting Fixture Code	Quantity of Fixtures	Annual Hours of Reduction	Per Unit Rebate \$ (B)	Total Rebate (\$)
<i>Ex.</i>	61	Occ. Sensor	6	3F32EEL	12	1,050	\$50	\$300
	<i>See Table A</i>	<i>See Table A</i>	<i>Amount of controls to be installed</i>	<i>New fixtures that will be controlled – Table C</i>	<i>Quantity of fixtures being controlled</i>	<i>From Customer or Utility Representative</i>	<i>See Table A</i>	<i>A x B</i>

Post-Installation

Utility Representative must verify that:

1. The new energy efficient lighting fixtures, systems and controls types have been installed and are energized.
2. The lighting fixtures, systems and controls match the manufacturer's information represented on the rebate application. If the lighting fixtures, systems and controls have changed from what was approved for the initial rebate offer, the substituted equipment specifications must be submitted and reviewed by the utility to verify compliance with technical requirements and approved before a rebate is considered.
3. Proof of Purchase has been submitted. This includes invoice(s) indicating the size, type, manufacturer, model or part number, purchase date, and vendor of the efficient equipment. Other forms of payment such as AIA Certificates of Payment may also be acceptable.
4. The Utility Representative & Customer have signed & dated the post installation inspection block on the rebate form.

Measure Specific Documentation Requirements

1. All lighting fixtures and controls require an invoice showing fixture manufacturer, model, and number of lamps, ballast specifications (if applicable), fixture quantities and costs.

LED Specific Documentation Requirements

1. LED prescriptive incentives are only provided on qualified LED fixtures listed on Energy Star's, Designlights or the utilities' websites. For fixtures not listed on the websites, manufacturers are encouraged to submit the required LED fixture information to either Energy Star for categories shown on their website or to DesignLights for categories shown on their website. For LED products without categories the manufacturer shall submit their LED fixture information including the required test information shown on Designlights' website to their utility for review. For more information see www.energystar.gov and www.designlights.org.

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Fluorescent Ballasts and Installation Guidelines

For customers participating in New Hampshire's new equipment and construction lighting rebate program, the following equipment specifications and installation guidelines are recommended. These guidelines are not requirements for receiving rebates, but have been compiled to help inform our customers so they achieve the energy savings calculated under our programs and maintain quality installations.

1. Must meet all applicable current Federal and State efficiency standards.
2. Total harmonic distortion (THD) of 20% or less. THD is a measure of the distortion of an electrical wave form (sinusoidal wave) expressed as a percentage. Excessive THD may cause adverse effects to the electrical system and may interfere with electronic equipment.
3. UL Listed, National Electrical Code Section 410.
4. Power factor \geq 90% (considered high power factor devices). Power factor is a measure of the effectiveness with which an electrical device converts volt-amperes to watts.
5. Lamp Current Crest Factor (LCCF) is the ratio of peak lamp current to the RMS (average) lamp current. Lamp manufacturers require a LCCF of less than 1.70 in order to achieve full lamp life.
6. For outside or cold weather operation, ballasts with a 0 degree F rating should be used. Indoor operation ballast is typically rated for 50 degree F operation.
7. Ballast shall operate at a frequency above 40,000 Hz.
8. Ballast shall meet (FCC 47 CFR Part 18 Non-consumer) for EMI/RFI ensuring suitability for commercial and industrial installations.
9. Ballasts should be installed with the appropriate lamp size and number of lamps that the ballast was designed for to maintain the above specifications and project savings.

Examples:



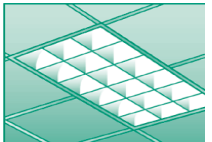

- a. A two (2) lamp fixture should have a 2 lamp High Performance / Reduced Wattage (HP/RW) ballast installed, not a 3 lamp ballast. A three (3) lamp ballast can power 2 lamps; but will draw more energy, could have higher harmonic distortion, and may affect lamp life.
 - b. HP/RW ballasts designed to power 4', 3' or 2' HP/RW T8's lamps are most efficient when powering the 4' HP/RW T8's. That ballast will use more energy and have higher harmonics when used with 3' or 2' lamps rather than a ballast designed specifically for 3' or 2' lamps.
10. Manufacturer should provide a minimum 3 year warranty, or preferably a 5 year warranty. Some manufacturers will also provide a labor cost reimbursement for defective ballasts requiring replacement while under warranty.

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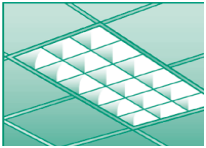
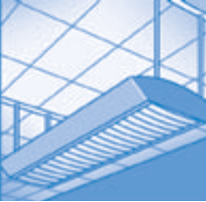
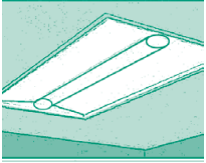
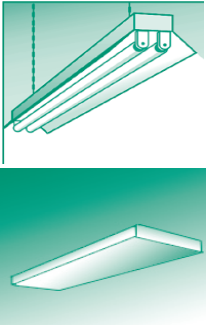
Lighting Fixtures and Systems - Efficiency Improvement Opportunities

This table lists the rebates available for energy efficient lighting improvements. All new fluorescent fixtures must have High Performance or Reduced Wattage (HP/RW) lamp & ballast systems or a T5 lamp and ballast systems to be eligible for fluorescent rebate.




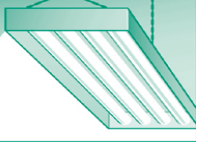
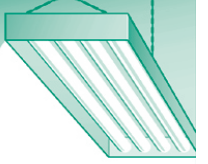
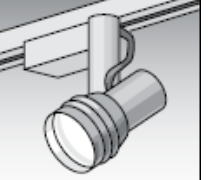
Table A: New Construction Lighting Systems

Product Code	Measure Description for New Fixtures	Per Fixture Incentive	Eligibility Criteria	
10 ♦	Fluorescent Fixtures with High Performance or Reduced Wattage (HP/RW) lamp & ballast systems or a T5 lamp and ballast system.	\$10	Each new fixture is composed of a ballast and 1, 2, 3 or 4 lamps. Only one incentive may be counted per fixture. Only fixtures with HP/RW 4'T8 or 4' T5 lamps are eligible. This also applies when HP/RW ballasts are used with non 4' lamps (2', 3', U bents, cold apps.).	
30A ♦	High Efficiency 2 lamp Prismatic Lensed Fluorescent Fixtures 2x2 or 2x4	\$20	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).	
30B ♦	High Efficiency 2 lamp Parabolic Fluorescent Fixtures 2x2 or 2x4	\$25	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; - 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	\$25	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).	





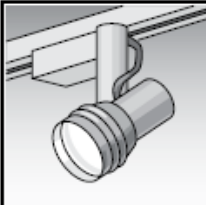
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Product Code	Measure Description for New Fixtures	Per Fixture Incentive	Eligibility Criteria	
31 ♦	High Efficiency 3 lamp Fluorescent Fixtures 2x4	\$15	Overall fixture efficiency must be \geq : - 83% for 2x4 prismatic lensed fixture with three T-8 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.	
33 ♦	High Efficiency Indirect Low Glare Pendant Fluorescent Fixtures Note: Advanced glare reducing diffuser fixtures are designed to redistribute direct lumens via a refractor (glare reducing lens) to fill the entire volume of space with light without glare or the cave effects of traditional downlights.	\$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. Ceiling finish must be white and unobstructed	
34 ♦	Advanced Recessed Fluorescent Fixtures 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 or T-5 lamps, or one T-5HO lamp.	
41 ♦	Industrial/Commercial Fluorescent Fixtures – 4 ft. and 8 ft. Fixtures	\$20	Overall fixture efficiency must be \geq : - 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 \leq 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 are 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.	

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Product Code	Measure Description for New Fixtures	Per Fixture Incentive	Eligibility Criteria	
44 ♦	Clean Room Rated Fluorescent Fixtures 1x4 or 2x4	\$30	Overall fixture efficiency must be \geq : -75% for Clean Room fluorescent fixture up to three T-8 or T-5 lamps. To be eligible for incentives, fixtures must be installed in a clean room rated environment.	
21	Compact Fluorescent Fixture	\$10	To be eligible for incentives, all fixtures must be hard-wired and have ballasts with <33% THD. Retrofit kits, screw-in adaptors and exit signs are not eligible. ** This code only applies to small C&I accounts (Demand < 200 kW) **	
23	Dimmable Compact Fluorescent Fixture	\$15	To be eligible for incentives, all fixtures must be hard-wired and have electronic dimming ballasts with <33% THD. All long tube CFL or Biax fixtures are eligible under this measure category.	
56 ♦	High Intensity Fluorescent Fixtures (HIF) for Low Bay Applications (\leq 210W)	\$30	Minimum wattage is 104 Watts, Maximum wattage is 210 Watts. T8 systems used for low bay interior fixtures must have HPT8 lamps with High Ballast Factor ballast or T-5's systems. Fixtures must meet a min. fixture efficiency of 88% unless the application has a special lens or fixture requirement. Recommended mounting height \geq 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.	
57 ♦	High Intensity Fluorescent Fixtures (HIF) for High Bay Applications ($>$ 210W)	\$50	Minimum wattage is greater than 207 Watts. T8 systems used for high bay interior fixtures must have HPT8 lamps with High Ballast Factor ballast or T-5's systems. Fixtures must meet a min. fixture efficiency of 88% unless the application has a special lens or fixture requirement. Recommended mounting height \geq 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.	
70	Metal Halide Specialty Lighting Fixtures with Electronic Ballast	\$35	Metal Halide Specialty Fixtures maybe track, recessed or surface mounted and used for high quality display type lighting. Fixtures range from 20 to 100 watts. Must be approved by UL or similar agency.	

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Product Code	Measure Description for New Fixtures	Per Fixture Incentive	Eligibility Criteria	
80	LED Downlight Fixtures Hard Wired or GU-24 base	\$30	This incentive only applies to hardwired or GU-24 base LED fixtures on Energy Star's list. (for more information see www.energystar.gov)	
82A	LED Cooler, Freezer Case or Refrigerated Shelving Fixtures – 3' & 4' Fixtures	\$15	Eligible LED Cooler and Freezer Case fixtures are required to be listed on Energy Star or DesignLights Consortium websites. (for more information see www.energystar.gov and www.designlights.org)	
82B	LED Cooler, Freezer Case or Refrigerated Shelving Fixtures – 5' & 6' Fixtures	\$30	Eligible LED Cooler and Freezer Case fixtures are required to be listed on Energy Star or DesignLights Consortium websites. (for more information see www.energystar.gov and www.designlights.org)	
83	LED Low Bay Fixtures Garage fixtures	\$100	Only LED Low Bay fixtures installed in 8,760 hour applications are eligible for this incentive and must be listed on Energy Star or DesignLights Consortium websites. (for more information see www.energystar.gov and www.designlights.org)	
84	LED Track Heads	\$35	LED track heads fixtures hardwired installations only, replacement lamps not eligible. Eligible fixture are required to be listed Energy Star or DesignLights Consortium websites. (for more information see www.energystar.gov and www.designlights.org)	


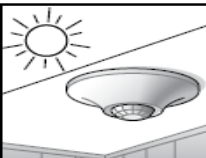




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Product Code	Measure Description for New Fixtures	Per Fixture Incentive	Eligibility Criteria	
◆			<p>The ◆ denotes 4ft straight linear tube T8 lamps and ballasts must meet the Consortium for Energy Efficiency's High Performance/Reduced Wattage (HP/RW) T8 specifications except where otherwise noted. For eligibility requirements and a list of eligible lamps and ballasts, log onto CEE's web site at www.cee1.org. Log onto the NH Electric Utilities' website for the list of 30 watt lamps also considered HP/RW T8 lamps.</p> <p>Note:</p> <p>2 ft, 3ft and 4ft non standard linear T8 lamps including U bents when used in combination with CEE's High Performance/Reduced Wattage (HP/RW) T8 Ballast Specifications are considered HP/RW systems.</p> <p>2 ft and 3 ft, T8 lamps must have a minimum efficacy of 75 mean lumens per watt, a CRI > 80 and an average rated life of 24,000 hours at 3 hours per start.</p> <p>4 ft -30 watt U-bent T8 lamps must have a minimum efficacy of 79 mean lumens per watt, a CRI > 80 and an average rated life of 18,000 hours at 3 hours per start.</p> <p>2 ft, 3 ft and 4 ft 30 watt U-bent T8 ballasts must meet the CEE's High Performance T8 Ballast Specifications.</p> <p>2 ft – reduced wattage biax lamps must have a minimum efficacy of 94 mean lumens per watt, a CRI > 80 and an average rated life of 20,000 hours at 3 hours per start. Ballasts must meet the CEE's High Performance T8 Ballast Specifications.</p>	

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Table A: (continued) New Construction Lighting Controls

Please note that only one incentive control strategy will be approved per fixture/area. Also consider using CEE qualified program start parallel wired ballasts for all appropriate control measure codes to ensure longer lamp life over instant start ballasts.

Measure Code	Measure Description	Per Control Incentive	Eligibility Criteria	Min Controlled Wattage	
61	Remote Mounted Occupancy Sensor	\$50	Ceiling mounted control with no manual "ON" overrides. Comply with manufacturer's coverage recommendations.	110	
62	Daylight Dimming System (DDS-FL)	\$25 (per fixture)	Must have continuous dimming or adjust to a minimum of 4 levels. Typical lamping is either a 30 watt or 32 watt T8 lamp or a T5 system.	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%.	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)	\$45	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	\$25 (per fixture)	Ballasts must be automatically controlled based on occupancy. Systems with manual "ON" or override switches are not eligible. Sensors to be mounted on individual fixtures only.	110 (per fixture)	