

2017 Retrofit Specifications

Table of Contents	
Specification	Page
HVAC Specifications	Pages 2 - 4
Motor, Drive & Pump Specifications	Page 5
Food Service / Misc. Specifications	Pages 6 - 8
Refrigeration Specifications	Pages 9
Lighting Specifications	Page 10 - 14
Custom Specifications	Page 15

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HVAC Specifications

Measure	Definition	Specifications
Unitary and Split Air Conditioning Systems and Air Source Heat Pumps	<p>New unitary air conditioning units or air source heat pumps that meet or exceed the qualifying cooling efficiency shown in the Program Application are eligible for credit. They can be either split systems or single package units. Evaporative coolers and water source heat pumps do not qualify under this measure, but may qualify for a custom incentive.</p>	<p>The efficiency of split systems is based on an ARI reference number. All packaged and split system cooling equipment must meet Air Conditioning, Heating, and Refrigeration Institution (AHRI) standards (210/240, 320 or 340/360), be UL listed, use a minimum ozone-depleting refrigerant (e.g., HCFC or HFC). All required efficiencies are based on the Consortium for Energy Efficiency (CEE) high-efficiency commercial air conditioning and heat pump specifications (www.cee1.org). A manufacturer’s specification sheet indicating the system efficiency must accompany the application. Disposal of the existing unit must comply with local codes and ordinances.</p>
Water Cooled Chiller	<p>New or replacement water-cooled chiller (centrifugal, scroll/helical-rotary, reciprocating)</p>	<p>Eligible chillers have a rated kW/ton for the integrated part load value (IPLV) at Standard Air-Conditioning, Heating and Refrigeration Institute (AHRI) conditions that is less than or equal to the qualifying efficiency indicated on the HVAC worksheet. The chiller efficiency rating must be based on AHRI Standard 550/590-2011 for IPLV conditions and not based on full-load conditions. The chiller must be Nationally Recognized Testing Laboratory (NRTL) listed and use a minimum ozone-depleting refrigerant. Use the AHRI net capacity value to determine the chiller tons. A manufacturer’s specification sheet with the rated kW/ton-IPLV or COP-IPLV must accompany the application. NPLV ratings are NOT accepted.</p>
Air Cooled Chiller	<p>New or replacement air-cooled chiller. All sizes, reciprocating or screw.</p>	<p>Eligible chillers have a rated kW/ton for the integrated part load value (IPLV) at Standard Air-Conditioning, Heating and Refrigeration Institute (AHRI) conditions that is less than or equal to the qualifying efficiency indicated on the HVAC worksheet. The chiller efficiency rating must be based on AHRI Standard 550/590-2011 for IPLV conditions and not based on full-load conditions. The chiller must be Nationally Recognized Testing Laboratory (NRTL) listed and use a minimum ozone-depleting refrigerant. Use the AHRI net capacity value to determine the chiller tons. A manufacturer’s specification sheet with the rated kW/ton-IPLV or COP-IPLV must accompany the application. NPLV ratings are NOT accepted.</p>
VSD for HVAC	<p>Variable-speed drives (VSDs) installed on existing HVAC or non-HVAC fans or pumps and air compressors are eligible for this incentive.</p>	<p>This applies to variable-speed drives (VSDs) installed on existing HVAC or process fans or pumps up to 200 horsepower. The installation of a VSD must accompany the permanent removal or disabling of any flow control devices such as inlet vanes, bypass dampers, and throttling valves. This measure does not apply to chillers.</p>

HVAC Specifications

Measure	Definition	Specifications
Room Air Conditioners	Room air conditioning units are through-the-wall (or built-in) self-contained units that are 2 tons or less.	There are two eligible efficiency levels as listed by the CEE (www.cee1.org). However, only the Super Efficient Home Appliance (SEHA) Tier 1 standard qualifies for a rebate. The minimum requirements and eligible equipment are listed in the CEE high-efficiency room air conditioning specifications (www.cee1.org). These units are with and without louvered sides, without reverse cycle (i.e., heating), and casement. The qualifying efficiencies are provided in Table 1. Disposal of existing unit must comply with local codes and ordinances.
Ground Source Heat Pump	New or replacement ground source heat pumps.	Cooling EER is the efficiency at standard (ARI/ISO) conditions of 77°F entering water for closed-loop models and 59°F entering water for open-loop systems.
Water Source Heat Pump	New or replacement water source heat pumps.	Cooling EER is the efficiency at standard (ARI/ISO) conditions of 86°F entering water.
Package Terminal AC and Heat Pump Units (PTAC/PTHP)	Package terminal air conditioners and heat pumps are through-the-wall self contained units that are 2 tons (24,000 Btuh) or less.	Only units that have an EER greater than or equal to 13.08 (0.2556 * capacity in Btuh / 1000) qualify for the incentive. All EER values must be rated at 95 °F outdoor dry-bulb temperature.
HVAC Occupancy Control	Occupancy sensors that automatically switch an AC unit off for specific spaces (e.g. classrooms, conference rooms, multifunction rooms, etc.) when not in use.	The area served by the proposed HVAC occupancy sensors must be conditioned by a dedicated unitary AC or heat pump unit (i.e. the AC unit controlled by the occupancy sensor must not serve any other spaces that require conditioning when the occupancy sensor dictates unoccupied mode). The installed occupancy control must be capable of turning off the compressor and room fan during unoccupied mode. This incentive is not available for spaces already controlled by outside air demand control ventilation systems.
Hotel Guest Room Energy Management System	Incentives are available for sensors that control HVAC units for individual hotel rooms. Key cards that indicate occupancy also qualify. Sensors controlled by a front desk system are not eligible.	Sensors must be controlled by automatic occupancy detectors or key cards. During unoccupied periods the default setting for controlled units should differ by at least five degrees from the operating set point. The incentive is per guestroom controlled, rather than per sensor, for multi-room suites. Replacement or upgrades of existing occupancy-based controls are not eligible for an incentive.

HVAC Specifications

Measure	Definition	Specifications
Programmable Thermostat	Thermostat which is designed to adjust the temperature according to a series of programmed settings that take effect at different times of the day.	Incentives are available for programmable thermostats that meet ENERGY STAR® criteria and replace any non-programmable thermostat to automatically adjust the temperature at pre-selected times. To meet ENERGY STAR standards, Thermostats must be capable of maintaining two separate programs for weekdays and weekends and up to four temperature settings for each program. A current list of ENERGY STAR qualified thermostats may be found at www.energystar.gov . Incentive is per thermostat.
Window Film	High performance films offer exceptional resistance to attack by chemicals and abrasion, making them good candidates for a wide range of applications.	Incentives are available for window film having an east, west, or southern exposure and a minimum 5-year manufacturer’s warranty. Film must be applied to clear double-pane glass or lesser performing glazing. The installed window film must have a Solar Heat Gain Coefficient (SHGC) value of ≤ 0.39 and a U-value of ≤ 0.72 . The space upgraded with the glazing must be cooled by equipment using a vapor-compression refrigeration cycle; spaces cooled by evaporative cooling or absorption chillers are not eligible. To convert Shading Coefficient (SC) to SHGC, multiply SC x 0.87. If SC is given in percent form, convert it to decimal form before multiplying.
High Performance Glazing	Windows that reduce heat transfer, thereby cutting the energy loss.	Incentives are available for high performance glazing having an east, west, or southern exposure and a minimum 5-year manufacturer’s warranty. Glazing must replace clear double-pane glass or lesser performing glazing. The new glazing must have a Solar Heat Gain Coefficient (SHGC) value of ≤ 0.39 and a U-value of ≤ 0.57 . The space upgraded with the glazing must be cooled by equipment using a vapor-compression refrigeration cycle; spaces cooled by evaporative cooling or absorption chillers are not eligible. To convert Shading Coefficient (SC) to SHGC, multiply SC x 0.87. If SC is given in percent form, convert it to decimal form before multiplying.
Qualifying Room Air Conditioning Units		
Size (Btuh)		SEHA Tier 1 (EER)
<8,000 (<.67 tons)		11.2
8,000 - 13,999 (.67 - 1.2 tons)		11.3
14,000 - 19,999 (1.3 - 1.7 tons)		11.2
$\geq 20,000$ (>1.7 tons)		9.8

Motor, Drive & Pump Specifications

Measure	Definition	Specifications
Efficient Motor	Three-phase AC induction motors, from 1 to 250 horsepower, of open drip-proof (open) and totally enclosed fan-cooled (closed) classifications. Rewound motors do not qualify.	<p>Incentives cover the motor’s nominal full-load efficiencies, tested in accordance with IEEE (Institute of Electrical and Electronics Engineers) Standard 112, method B, that exceed NEMA Premium® efficiency levels. The actual motor efficiency must be equal to or exceed the minimum qualifying motor efficiency.</p> <p>The application must include the manufacturer’s performance data sheet that shows motor type, horsepower, model number and efficiency rating. Customers should consider matching RPMs of the existing pump or fan when installing energy-efficient motors that inherently have higher speeds (less slip), which may affect electric energy use.</p>
Variable Speed Drive	Variable speed drives (VSDs) installed on existing HVAC or non-HVAC (process) fans or pumps that result in an energy savings.	<p>The VSD installation must accompany the permanent removal or disabling of any throttling devices such as inlet vanes, bypass dampers and throttling valves. The rated motor horsepower is ≤ 250 HP and there is a minimum of 1,200 operating hours per year. The incentive applies only to VSDs installed with automatic feedback control technology. For motors larger than 100 HP, pre- and post-logging/monitoring to calculate energy savings will be required.</p> <p>The incentive does not apply to redundant, back-up, stand-by and all motors expected to operate less than 1,200 operating hours per year; the replacement of an existing VSD and multi-speed motor; VFDs on chillers and new air compressors (see HVAC section). Non-qualifying projects may qualify for custom incentives.</p>
Pool Pump VSD	Programmable variable-speed or multiple-speed systems that vary swimming pool and spa pump speed to minimum flow rates, resulting in a reduction in pumping power.	Pool must operate 12 months per year. The horsepower of the pump that is replaced or the new pump, whichever is smaller, determines the incentive.

Food Service / Miscellaneous Specifications

Measure	Definition	Specifications										
Pre-Rinse Sprayer	New or replacement pre-rinse spray valve with a flow rate of 1.6 gallons per minute or less.	The incentive covers pre-rinse spray valves with a flow rate of 1.6 gallons per minute or less, and with a cleanability performance of 26 seconds per plate or less, based on American Society for Testing and Materials (ASTM) standard test method. The measure is only applicable for systems with electric storage water heaters.										
Steam Cooker	Installation of steam cooker that is ENERGY STAR listed.	<p>The commercial steam cooker shall have a tested heavy load potato cooking energy efficiency of > 50% utilizing ASTM Standard F1484.</p> <table border="1"> <thead> <tr> <th>Pan Capacity</th> <th>Idle Rate (watts)</th> </tr> </thead> <tbody> <tr> <td>3-pan</td> <td>400</td> </tr> <tr> <td>4-pan</td> <td>530</td> </tr> <tr> <td>5-pan</td> <td>670</td> </tr> <tr> <td>≥ 6-pan</td> <td>800</td> </tr> </tbody> </table>	Pan Capacity	Idle Rate (watts)	3-pan	400	4-pan	530	5-pan	670	≥ 6-pan	800
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Combination Oven	Installation of a qualifying combination oven.	The oven shall meet or exceed a heavy load cooking energy efficiency of > 60% utilizing ASTM Standard F1639.										
ENERGY STAR Convection Oven	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 Convection Oven specification. Used or rebuilt equipment is not eligible. Credit is per convection oven.										
ENERGY STAR Electric Griddle	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 Electric Griddle specification. Used or rebuilt equipment is not eligible. Credit is per electric griddle.										
ENERGY STAR Electric Vat Fryer	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 Electric Vat Fryer specification. Used or rebuilt equipment is not eligible. Credit is per electric vat fryer.										
ENERGY STAR Hot Holding Cabinet	Installation of new or replacement units that are ENERGY STAR listed.	This measure does not include cook and hold equipment. All measures shall be electric hot food holding cabinets that are fully insulated and have solid doors in full, three-quarter and half sizes respectively. Qualifying cabinets shall not exceed the maximum idle energy rate of 20 Watts per cubic foot in accordance with the ASTM Standard F2140 test method as stated in ENERGY STAR . Cook and hold equipment and units < 1/2 size may be eligible and should be applied for as a custom incentive.										
Beverage and Snack Machine Controls	The beverage machine is assumed to be a refrigerated vending machine that contains only non-perishable bottled and canned beverages. The snack machine is non-refrigerated.	Controller for both types of systems must include a passive infrared occupancy sensor to turn off fluorescent lights and other vending machine systems when the surrounding area is unoccupied for 15 minutes or longer. For the beverage machine, the control logic should power up the machine at 2-hour intervals to maintain product temperature and provide compressor protection.										

Food Service / Miscellaneous Specifications

Measure	Definition	Specifications
ENERGY STAR Dishwasher - Under Counter	Installation of a new or replacement ENERGY STAR under counter dishwasher.	Qualified models meet all ENERGY STAR Version 2.0 Commercial Dishwasher specifications. For High Temp, requirements are idle energy rate is ≤ 0.50 kW and water consumption is ≤ 0.86 GPR. For Low Temp, requirements are idle energy rate is ≤ 0.50 kW and water consumption is ≤ 1.19 GPR. Used or rebuilt equipment is not eligible. Credit is per dishwasher.
ENERGY STAR Dishwasher - Door Type	Installation of a new or replacement ENERGY STAR door type dishwasher.	Qualified models meet all ENERGY STAR Version 2.0 Commercial Dishwasher specifications. For High Temp, requirements are idle energy rate is ≤ 0.70 kW and water consumption is ≤ 0.89 GPR. For Low Temp, requirements are idle energy rate is ≤ 0.60 kW and water consumption is ≤ 1.18 GPR. Used or rebuilt equipment is not eligible. Credit is per dishwasher.
ENERGY STAR Dishwasher - Single Tank Conveyor	Installation of a new or replacement ENERGY STAR single tank conveyor dishwasher.	Qualified models meet all ENERGY STAR Version 2.0 Commercial Dishwasher specifications. For High Temp, requirements are idle energy rate is ≤ 1.50 kW and water consumption is ≤ 0.70 GPR. For Low Temp, requirements are idle energy rate is ≤ 1.50 kW and water consumption is ≤ 0.79 GPR. Used or rebuilt equipment is not eligible. Credit is per dishwasher.
ENERGY STAR Dishwasher - Multi-Tank Conveyor	Installation of a new or replacement ENERGY STAR multi-tank conveyor dishwasher.	Qualified models meet all ENERGY STAR Version 2.0 Commercial Dishwasher specifications. For High Temp, requirements are idle energy rate is ≤ 2.25 kW and water consumption is ≤ 0.54 GPR. For Low Temp, requirements are idle energy rate is ≤ 2.00 kW and water consumption is ≤ 0.54 GPR. Used or rebuilt equipment is not eligible. Credit is per dishwasher.
ENERGY STAR Refrigerated Beverage Vending Machine	ENERGY STAR beverage vending machines qualify for an credit.	Qualifying machines can be found at www.energystar.gov
ENERGY STAR Commercial Clothes Washer - Front Loaded	New or replacement ENERGY STAR front loaded electric commercial clothes washer.	New and replacement washer must meet ENERGY STAR criteria and must have a MEF of ≥ 2.2 (ft ³ /kWh/cycle). If replacing, existing washer must have an MEF of < 2.2 (ft ³ /kWh/cycle). Commercial Clothes Dryers are not eligible for this incentive. Credit is per commercial clothes washer.

Food Service / Miscellaneous Specifications

Measure	Definition	Specifications
ENERGY STAR Commercial Clothes Washer - Top Loaded	New or replacement ENERGY STAR top loaded electric commercial clothes washer.	New and replacement washer must meet ENERGY STAR criteria and must have a MEF of ≥ 2.2 (ft ³ /kWh/cycle). If replacing, existing washer must have an MEF of < 2.2 (ft ³ /kWh/cycle). Commercial Clothes Dryers are not eligible for this incentive. Credit is per commercial clothes washer.
Network Power Management Software	PC management software enables network administrators to override computer "on," "standby," "sleep" and "off" power modes and put all networked computers on low power settings during appropriate hours.	The software installed must automatically control the power settings of networked personal computers at the server level. Software must be capable of managing power consumption for each individual PC and must be capable of reporting energy saving results. A report directly from the network energy management software that verifies the number of PC's that are being controlled by the system must be supplied.
Plug Load Occupancy Sensor	Installation of passive infrared and/or ultrasonic detectors for plug load office equipment.	Plug-load sensors must control electricity using equipment in offices or cubicles, including lighting, shared copiers, and/or printers.
Commercial Kitchen Demand Ventilation Controls	Control System that varies the exhaust rate of kitchen ventilation based on the energy and effluent output from the cooking appliances.	System includes the installation of commercial kitchen demand ventilation controls that vary the ventilation based on cooking load and/or time of day. This involves installing a temperature sensor in the hood exhaust collar and/or an optic sensor on the end of the hood that sense cooking conditions which allows the system to automatically vary the rate of exhaust to what is needed by adjusting the fan speed accordingly. A VSD must be installed on the exhaust fan, and if applicable, on the make-up air unit.
ENERGY STAR Heat Pump Hot Water Heater	New or replacement ENERGY STAR heat pump water heater.	Must meet ENERGY STAR criteria with an energy factor ≥ 2.0 and first hour rating (FHR) ≥ 50 gallons per hour.
High-Efficiency Electric Hot Water Heater	New or replacement high-efficiency electric hot water heater.	New hot water heater must be ≥ 40 gallons and have an energy factor ≥ 0.93 .
High-Efficiency Ice Maker	Installation of ice machines that generate 60 grams (2 oz.) or lighter ice cubes, flaked, crushed, or fragmented ice. Only air-cooled machines qualify (self-contained, ice making heads, or remote condensing).	The machine must have a minimum capacity of 101 lbs. of ice per 24-hour period (per day). The minimum efficiency required is per ENERGY STAR or Consortium for Energy Efficiency (CEE) Tier 2. (Qualifying model numbers can be found at www.energystar.gov or www.cee1.org .) A manufacturer's specification sheet must accompany the application that shows rating in accordance to ARI standard 810.

Refrigeration Specifications

Measure	Definition	Specifications
Strip Curtains on Walk-in Coolers and Freezers	New strip curtains or clear plastic swinging doors must be installed on doorways of walk-in boxes and refrigerated warehouses.	This measure is NOT available for display cases or for replacing existing strip curtains that have useful life left. The incentive is calculated on square footage of doorway.
Anti-Sweat Heater Controls	Installation of relative humidity sensors for the air outside of the display case and controls that reduce or turn off the glass door (if applicable) and frame anti-sweat heaters at low-humidity conditions.	Technologies that can turn off anti-sweat heaters based on sensing condensation (on the inner glass pane) also qualify. The incentive is calculated on the total horizontal linear case footage.
Electronically Commutated (EC) Evaporator Fan Motor (Refrigerated Cases or Walk-ins)	Replacement of an existing standard-efficiency shaded-pole evaporator fan motor in refrigerated display cases or fan coil in walk-ins.	The replacement unit must be an Electronically Commutated Motor (ECM). This measure cannot be used in conjunction with the evaporator fan controller measure.
Evaporator Fan Controls	Installation of controls in medium temperature walk-in coolers. The controller reduces airflow of the evaporator fans when there is not refrigerant flow.	Must control a minimum of 1/20 HP where fans operate continuously at full speed. Must reduce fan motor power by at least 75% during the off cycle. Not applicable if any of the following conditions apply: <ul style="list-style-type: none"> Compressor runs all the time with high duty cycle. Evaporator fan does not run at full speed all the time. Evaporator fan motor runs on poly-phase power. Evaporator fan does not use off-cycle or time-off defrost.
LED Refrigeration Case Lighting	Replacing fluorescent refrigerated case lighting with LED source illumination.	Fluorescent lamps, ballasts, and associated hardware are typically replaced with pre-fabricated LED light bars and LED driver units.
Solid Door Freezer, ENERGY STAR	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 specification. Cases with remote refrigeration systems are not eligible. Incentive is per freezer.
Glass Door Freezer, ENERGY STAR	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 specification. Cases with remote refrigeration systems are not eligible. Incentive is per freezer.
Solid Door Refrigerator, ENERGY STAR	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 specification. Cases with remote refrigeration systems are not eligible. Incentive is per freezer.
Glass Door Refrigerator, ENERGY STAR	Installation of new or replacement units that are ENERGY STAR listed.	Must meet ENERGY STAR Version 2.0 specification. Cases with remote refrigeration systems are not eligible. Incentive is per freezer.
Automatic Door Closer for Walk-in Coolers and Freezers	These closers save energy by reducing the infiltration of warm outside air into the refrigerated case itself.	This measure is for installing an auto-closer to the main insulated opaque door(s) of a walk-in cooler and freezer. The auto-closer must firmly close the door when it is within one inch of full closure.

Lighting Specifications

All lighting projects are expected to comply with the Illuminating Engineering Society of North America (IESNA) recommended lighting levels or the local code.

Measure	Definition	Specifications
Fluorescent Lighting Retrofit	Retrofitting existing T12 lamps and magnetic ballasts with T8/T5 (standard, reduced-wattage or high-performance) lamps and new electronic ballasts.	T8/T5 lamps must have a color rendering index (CRI) ≥ 80 more. For lamp with color temperatures $\geq 4500\text{K}$, 2950 minimum lamp lumens are allowed. The electronic ballast must be high frequency ($\geq 20\text{kHz}$), UL listed, have a power factor (PF) ≥ 0.90 and warranted against defects for 5 years. Ballasts for 4-foot lamps must have total harmonic distortion (THD) $\leq 20\%$ at full light. Ballasts for 2- and 3-foot lamps must have a THD $\leq 32\%$ at full light output. High-performance installed lamps and ballasts must qualify for the Consortium for Energy Efficiency (CEE) high-performance or reduced-wattage specifications. A list of qualified lamps and ballasts can be found at www.cee1.org . A manufacturer's specification sheet must accompany the application.

NOTE ON LED LIGHTING: The Kentucky Power Commercial Incentive Prescriptive Custom Program is promoting the use of nationally recognized specifications for LED lighting set forth by ENERGY STAR® and DesignLights® Consortium (DLC). If LED products do not meet the prescriptive specification, they may be considered for a custom incentive at the discretion of the Program on a case by case basis. While it is recognized that not all LED installations can be optimally designed within the prescriptive specifications, it is the desire of the program to promote and ensure the installation of high-quality and long lasting LED products. As such, if a prescriptive measure is available for a specific product, but not all of the prescriptive performance specifications can be met, the product may be considered for a custom incentive. The incentive calculated through the custom program will be capped at 75% of the prescriptive incentive amount. Custom requirements for all products are:

- Proof of a ≥ 3 year warranty
- Manufacturer specification sheets
- Lighting Facts Label (if available)
- LM-79 test documents (if available)
- LM-80 test documents (if available)
- Address and contact information of facility where product has been installed for 6 months or more.

If the LED product applied for meets the ENERGY STAR or DLC requirements and it is not a prescriptive measure, it may be eligible for the custom incentive. Specification sheets, testing information, product references, and proof of a 3 year warranty must be submitted with the completed custom application to be considered for a custom incentive. Submittal (in the process of review) to ENERGY STAR or DLC may be sufficient for qualifying as a prescriptive measure.

The decision to move forward with an LED lighting installation is determined by the customer and Kentucky Power does not require the manufacturer to submit a testing report, nor does Kentucky Power approve or endorse any specific LED equipment or technology.

Lighting Specifications

Table 1
DLC Criteria for LED Lighting

Application Type	Minimum Light Output	Zonal Lumen Density	Minimum Luminaire Efficacy	Allowable CCTs (ANSI C78.377-2008)
Refrigerated Case Lighting	Center-mounted: ≥ 100 lm/ft End mounted: ≥ 50 lm/ft	$\geq 95\%$ $0^\circ - 80^\circ$	35 lm/W	2700K, 3000K, 3500K, 4000K, 4500K and 5000K
Parking Garage Luminaires	2,000 L	$\geq 20\%$ $60^\circ - 70^\circ$, $\geq 15\%$ $70^\circ - 80^\circ$	56 lm/W	$< 6500K$
Outdoor Pole / Arm Mounted Area and Roadway Luminaires	1,000 L	$= 100\%$ $0^\circ - 90^\circ$, $< 10\%$ $80^\circ - 90^\circ$	50 lm/W	$< 6500K$
Outdoor Pole / Arm Mounted Decorative Luminaires	1,000 L	95% $0^\circ - 90^\circ$	40 lm/W	$< 6500K$
Outdoor Wall Mounted Luminaires (Wall Packs)	300 L	$= 100\%$ $0^\circ - 90^\circ$, $< 10\%$ $80^\circ - 90^\circ$	40 lm/W	$< 6500K$

Table 2

Measure	Definition	Specifications
LED Exit Signs	Replace or retrofit an existing incandescent or compact fluorescent exit sign with a high-efficiency electroluminescent, photo luminescent, T1 cold cathode or light-emitting diode (LED) exit sign.	All new exit signs or retrofit exit signs must be UL924 or ETL listed, have a minimum lifetime of 10 years, and have an input wattage ≤ 5 Watts per face.
LED Recessed Downlight	Replacing incandescent lamps or fixtures greater than or equal to 40W with LED recessed downlight luminaires.	The LED recessed downlight must have a minimum efficacy of 35 lumens per Watt and must be $\leq 18W$. The product must meet ENERGY STAR version 1.1 criteria. LED lamps with ANSI sockets will qualify based on the July, 2009 ENERGY STAR specification. See www.energystar.gov for more information. LED downlight luminaires over 18 Watts may qualify for custom incentives.
LED Lamp	Replacing incandescent lamps 20-100 watts qualify with LED integral lamps (screw-in base lamps or pin-type replacement lamps, such as MR-16s).	Lamp wattage must be < 20 watts and have a minimum efficacy of 35 lumens per watt. It is recommended to install lamps that meet ENERGY STAR specification of 3/22/10 Version 1.1.
LED "Open" Sign	Replacing an existing neon "open" sign with an LED "open" sign.	LED "open" signs are eligible under this category. LED open signs must replace an existing neon open sign. LED drivers can be either electronic switching or linear magnetic, with the electronic switching supplies being the most efficient. The on-off power switch may be found on either the power line or load side of the driver, with the line side location providing significantly lower standby losses when the sign is turned off and is not operating.
LED Channel Signs	Retrofitting or replacing incandescent, HID, argon-mercury or neon-lighted channel letter signs with LED channel signs.	Replacement signs cannot use more than 20% of the input power of the sign that is being replaced. Maximum letter height determines credit.

Lighting Specifications

Table 2 (continued)		
Measure	Definition	Specifications
Interior Controls: Occupancy Sensors	Installing passive infrared, ultrasonic detectors or fixture-integrated sensors.	All sensors must be hard-wired and control interior lighting fixtures. The credit is per Watt controlled. Please provide an inventory of the controlled fixtures with the Pre-Approval Application and Final Application.
Interior Controls: Daylighting Sensor Controls	Installing new daylight sensor controls in spaces with reasonable amounts of sunlight exposure and areas where task lighting is not critical.	The controls can be on/off, stepped, or continuous (dimming). The on/off controller should turn off artificial lighting when the interior luminance meets the desired indoor lighting level. Daylight sensor controls are required to be commissioned in order to ensure proper sensor calibration and energy savings. Credit is per watt controlled.
Interior Controls: Bi-Level Stairwell/Hall/ Garage Fixtures	Replacing existing two-lamp 4-foot T12 fixtures with hardwired two-lamp 4-foot T8 fluorescent fixtures with electronic ballasts and manufacturer integrated occupancy sensors. Used in areas where code requires lighting 24 hours a day (such as stairwells, halls, and garages).	Fixtures with manual override capabilities are not eligible. During occupied periods, the fixture should operate at full light output. During unoccupied periods, the fixture should operate at lower light output and wattage. This measure is not eligible for a credit for occupancy sensor or T12 to T8 conversion.
New T8/T5 Fluorescent Fixtures with Electronic Ballast	Replacing one or more existing fixture with new fixtures containing HP LW T8 or T5 lamps and electronic ballasts. Only new fixtures are eligible for incentives with this measure. Retrofit kits are not considered to be new fixtures. This measure can be used in highbay and lowbay fluorescent applications. A Pre-Approval Application is required for this measure.	The T8 or T5 lamps must have a color rendering index (CRI) ≥ 80 . The electronic ballast must be high frequency (≥ 20 kHz), UL listed, and warranted against defects for 5 years. Ballasts must have a power factor (PF) ≥ 0.90 . Ballasts for 4-foot lamps must have total harmonic distortion (THD) $\leq 20\%$ at full light output. For 2- and 3-foot lamps, ballasts must have THD $\leq 32\%$ at full light output. High output T5/T8 lamps also qualify for this credit. Specifications for the new fixtures, lamps and ballasts must accompany the final application.
New LED Fixtures	Replacement or retrofit of an existing interior/ exterior lighting system with a new lighting system containing LED fixtures (project does not have to be a one-for-one replacement). This measure can be used in highbay and lowbay fluorescent applications. A Pre-Approval Application is required for this measure.	Manufacturer's specification for new fixtures must accompany Pre-Approval and Final Applications. Applications for LED retrofits must include documentation from the LED product manufacturer that clearly defines compatibility of the LED product with the fixture being retrofitted. Documentation from the manufacturer must include the model of the LED retrofit kit, the project name and/or project location, the fixture model or type being retrofitted and that the retrofit kit is compatible with the existing fixture. Note: This measure does not apply to LED exit signs, channel signs, open signs or refrigerated display case lighting. Incentives for those measures can be found in other sections of this application. This measure does not apply to T8 linear LED tubes.
Interior, Exterior or Parking Garage Screw-Base LED Replacement	This measure applies to the retrofit of high wattage HID or incandescent interior, exterior or parking garage light fixtures to screw-base replacement LED lamps.	There are two levels of incentive for this measure depending on HID wattage. Please provide information confirming existing lamp wattage. The direct screw-base replacement LED lamp must be listed on the DesignLights Consortium Qualified Products List available at http://www.designlights.org . The retrofit lamp must be UL listed and must not impact existing UL listing. Documentation from the manufacturer that clearly defines compatibility of the LED product with the fixture being retrofitted must accompany the application. Total replacement wattage must be lower than existing wattage to ensure savings.

Lighting Specifications

Table 2 (continued)		
Measure	Definition	Specifications
Bi-Level Parking Lot Fixture	This measure consists of the replacement of an HID fixture with a SMART LED Bi-Level Fixture.	Fixture is integrated with occupancy sensor that allows the light to switch between high and low levels based on the presence of vehicle or pedestrian traffic. Switching between high and low light levels based on occupancy maintains sufficient light for security and way-finding while maximizing energy savings. New fixture maximum wattage must be 110W or less. The LED lighting must meet the DesignLights Consortium (DLC) specification (designlights.org) listed in Table 1 above. Specifications may change as industry standards are updated.
Bi-Level Wall Pack Fixture	This measure consists of the replacement of an HID fixture with a SMART LED Bi-Level Fixture.	These fixtures are intended for use in areas where high lighting levels are required when occupied, but are actually unoccupied for the majority of the time. These fixtures employ a motion sensor-type lighting switch to provide lower levels of light while unoccupied, and full illumination while occupied. Fixtures can also incorporate a fully integrated LED night light for illumination during low-output mode. New fixture maximum wattage must be 110W or less. The LED lighting must meet the DesignLights Consortium (DLC) specification (designlights.org) listed in Table 1 above. Specifications may change as industry standards are updated.
Time Clocks for Lighting	Installing time clocks on interior and exterior lighting.	Clocks must control on/off schedule of lighting equipment and must protect scheduled events from interruptions with a three-hour back-up system during power outages. Astronomical time clocks (where on-off times are in accordance with sunrise and sunset) are required for outdoor lighting when photocells are not in use.
Photo Cells	Installing photo cells on exterior lighting to switch outdoor lights on at dusk and off at dawn.	Photo cells must control the on/off schedule of lighting equipment based upon the safety guidelines that determine the appropriate foot candle requirements for the area being controlled by photo cell.

*Eligibility of products listed by other DLC utility sponsors and subscribers will be approved if the required specifications for the other DLC utility sponsors or subscribers are at least as stringent as the required specifications listed by the DLC.

Default Fixture Wattage Reference Table

This table is to be used as a reference for determining the wattage of baseline (existing) fixtures. Wattages for all new (proposed) fixtures should be referenced from the new product specifications. This table is made up of the most common fixtures but does not include all fixture types. T12 fixtures are listed with energy-saving (ES) magnetic ballasts and standard magnetic ballasts.

There are many factors that affect the input wattage of a fixture: ballast factor, lamp quality, system voltage, etc. The more information that is provided about your project, the more accurate the incentive and energy savings calculations can be. If there is any doubt as to which fixture type is correct, the conservative wattage will be used. To ensure that the wattages used in incentive calculations are as accurate as possible, [pictures are recommended for all of the fixture types listed below in Blue](#).

T12								
NUMBER OF LAMPS PER FIXTURE	2-FT 20W LAMPS	3-FT 30W LAMPS	4-FT 34W U-LAMPS	4-FT 40W U-LAMP(S) WITH ES MAGNETIC BALLASTS (STANDARD MAGNETIC BALLASTS)	4-FT 34W LAMP(S) WITH ES MAGNETIC BALLAST	4-FT 34W LAMP(S) WITH STANDARD MAGNETIC BALLAST	4-FT 40W LAMP(S) WITH ES MAGNETIC BALLAST	4-FT 40W LAMP(S) WITH STANDARD MAGNETIC BALLAST
1	28	37	43		40	50	48	57
2	56	74	72	85 (96)	68	80	82	94
3	62	111	115		110	130	122	147
4	112	148			139	160	164	182
6	146				216	236	258	282
8					288			

T12 8-FT								
NUMBER OF LAMPS PER FIXTURE	60W LAMP(S) WITH ES MAGNETIC BALLAST	60W LAMP(S) WITH STANDARD MAGNETIC BALLAST	75W LAMP(S) WITH ES MAGNETIC BALLAST	75W LAMP(S) WITH STANDARD MAGNETIC BALLAST	HO 95W LAMP(S) WITH ES MAGNETIC BALLAST (STANDARD)	HO 110W LAMP(S) WITH ES MAGNETIC BALLAST (STANDARD)	VHO 185W LAMP(S) WITH MAGNETIC BALLAST	T12 VHO 215W LAMP(S) WITH MAGNETIC BALLAST
1	62	75	91	100	104 (112)	132 (145)	205	230
2	123	128	158	173	207 (227)	237 (257)	380	450
3	203	210		237	311 (380)	369 (392)	585	680
4	246	256	316	346	414 (454)	474 (514)	760	900

T8								
NUMBER OF LAMPS PER FIXTURE	2-FT 17W LAMPS	3-FT 25W LAMPS	4-FT 32W U-LAMPS	4-FT RW 25W LAMP(S)	4-FT RW 28W LAMP(S)	4-FT 32W LAMP(S)	8-FT 59W LAMP(S)	8-FT HO 86W LAMP(S)
1	16	23	28	24	26	32	62	85
2	32	46	56	44	50	59	124	160
3	48	69	89	66	74	88	186	
4	64	92		90	99	114	248	320
5						148		
6		134		134		175	328	
8						224		

T5				
NUMBER OF LAMPS PER FIXTURE	2-FT 14W LAMPS	2-FT 24W HO LAMPS	4-FT 28W LAMPS	4-FT 54W HO LAMPS
1	18	27	32	62
2	34	52	64	117
3	52	79	96	179
4	68	104	128	240
6			192	360
8			256	468

Custom Incentives Specifications

All Applications Require a Pre-Approval Application

Instructions for Custom Project Energy Savings Calculations

Custom project incentives are based on first year kWh savings and average on-peak demand savings. Electricity savings must result from efficiency improvements. The term Peak Hours is defined as the time between December 1st and February 28th on weekday, non-holidays, between the hours of 7:00 AM and 9:00 PM. If a measure is covered under prescriptive and does not qualify for the prescriptive incentive, it can not be applied for as a custom project.

Custom applications must be accompanied by detailed engineering calculations that document the annual total energy savings and on-peak demand savings.

The following serves as guidelines for the minimum required documentation. Please see the Policy and Procedure Manual for additional detail.

Energy Savings Calculator

Provide calculations documenting the predicted energy consumption of the existing (or baseline) and proposed system using appropriate analytical tools and clearly stated assumptions. Calculations may be performed by “hand,” but spreadsheet analysis or more rigorous modeling is preferred. All analysis should be provided in electronic format. All assumptions such as operating hours, existing and proposed equipment operational details must be presented. Engineering algorithms and procedures from recognized technical organizations such as ASHRAE, SMACNA, ANSI, etc. must be used. Use rated performance factors tested under accepted procedures specified by recognized rating agencies such as AHRI, ANSI, ASTM, etc. Provide an explanation when equipment performance rating conditions vary from standard conditions.

In support of the calculations, extensive documentation must be submitted that provides the basis for the savings estimates. The documentation must provide information on the equipment operating schedule, daily and seasonal load profile, and baseline AND energy efficient equipment performance at the operating loads. Typical documentation for custom projects often includes:

- Baseline/existing and proposed equipment make and model number including operating voltage and rated full load amps.
- Existing equipment condition and age.
- Engineering or architectural drawings and “equipment schedule” sheets.
- Component specification sheets that include part load efficiency or performance factors.
- Spreadsheet calculations or input/output files and results from system modeling or other engineering analysis using accepted engineering algorithms and practices.
- Log sheets, trend logs from a building management system, or other operating documentation that are often necessary to document operating hours and equipment loading, and used as a basis for the calculations (in some cases, short-term monitoring may be required to document the load profile).
- Control sequence of operations that are necessary where controls play a part in the savings equation.

Additional documentation, other than that described in the Application, may be required for program participation. Larger projects may also require pre and post project sub-metering, or monitoring of loads and/or power input as part of another measurement and verification activity to demonstrate the actual energy savings realized.

Baseline for Custom Analytics

Where equipment is replaced prior to the end of its rated service life in order to achieve energy savings, the existing equipment performance may be used as the baseline in the energy savings calculations. Where equipment is replaced due to failure or for other reasons (such as obsolescence or a need for more capacity), the baseline performance used in the savings calculation should be either the minimum performance that would be required by code for that equipment type and application (where a code applies) or the performance of the equipment that would have been selected as the customer’s “standard practice” when a code does not apply.