POWER SMART PRODUCT INCENTIVE PROGRAM

Product Performance Criteria

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Product Performance Criteria

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OVERVIEW

The Power Smart Product Incentive Program ("Program") is intended to provide incentives for simple retrofits with energy-efficient products. This document establishes the minimum acceptable technical and product requirements for the Program.

All products eligible for incentive funding under the Program are listed and identified in the BC Hydro e.Catalog. Manufacturers confirm that their products meet these minimum guidelines and based on their declaration, their product is added to the list of eligible products in e.Catalog.

In the future, new products will be evaluated and if they meet Program requirements, they will be added to the Program's product list. This document will be modified as Program updates occur.

LIGHTING

GENERAL SPECIFICATIONS FOR ELIGIBLE LIGHTING PRODUCTS

- The objective of the Power Smart Product Incentive Program is to provide incentive for simple retrofits where one product is removed and replaced with another more energy-efficient product. It is not intended to involve situations where a lighting design is necessary.
- All products must be listed in the BC Hydro e.Catalog to be eligible for incentives.
- When retrofitting a luminaire, a lamp from e.Catalog must be used in order to qualify for a Program incentive.
- All products shall be new, of current manufacture and CSA approved or certified by an accredited independent organization such as Warnock Hersey or Underwriters Laboratory (UL) as required by the current Canadian Electrical Code with the exception of lamps without an integral ballast or power supply.
- Average lighting levels and measurements of the same shall comply with Illuminating Engineering Society of North America (IESNA) recommended practice and Worker's Compensation Board (WCB) regulations. BC Hydro will **not** monitor lighting levels but reserves the right to occasionally check levels and design quality. Lighting levels before and after the retrofit must meet the requirements of the end user and be to the satisfaction of all approving authorities having jurisdiction for specific applications.
    - *In specific applications, the Contractor or Supplier must make the end user aware where there is a potential reduction in light levels, and confirm that the lighting levels will meet the minimum regulatory requirements.*
      These applications include but are not limited to:
        - *Reduced number of lamps in retrofit luminaire;*
        - *Conversions from 2-lamp, 8' T12 high output lamps to 4-lamp, 4' T8 lamps with low power input ballast*
        - *Conversions from High Pressure Sodium lamps/luminaires to Metal Halide lamps/ luminaires*
        - *It is the end users responsibility to ensure that the light levels meet the minimum regulatory requirements.*
- All retrofitted luminaires shall be suitably identified with appropriate labeling, listing the rerated parameters.
- In delamping situations, the customer/contractor shall remove the unused T12 sockets from the luminaire. If new T8 sockets are provided, they should be centered in the fixture as far as is practical.
- In redesign situations, removing existing luminaire means disconnection and total removal of the luminaire. Where removals require extensive, costly labor or lifting equipment, the luminaires can remain in location, but be total disconnected from the electrical circuit/ distribution. Note that light levels should meet IES and WorkSafe BC standards.

- In any installation, in the event of abnormally high product failure rates within the first year of operation (in excess of 5%) BC Hydro reserves the right to reject specific products from the Program and from e.Catalog. Where applicable, products shall be constructed of individually replaceable compatible lighting components, such as ballasts, starters, capacitors, sockets and lamps so as not to invalidate any of the components' warranties.
- Lighting retrofits shall be designed for optimum energy efficiency. All eligible products shall be represented by an authorized local representative or distributor, who is capable of providing after sales service. Manufacturers must have an approved local representative in B.C. with authority from the manufacturer to handle warranty claims and after sales support.
- BC Hydro reserves the right to request manufactures to provide independent laboratory results certifying the parameters such as lamp life, lumen output , input watts etc are as specified by the manufacturer and at the cost of the manufacturer

In addition to the General Specifications for the products, each of the eligible products are warranted by the Suppliers to meet the following minimum requirements:

HALOGEN INFRARED LIGHTING

The Program incentive applies to the replacement of incandescent or standard halogen lamps by lesser wattage Halogen Infrared (HIR) lamps.

- It is the responsibility of the customer and/or installing contractor to ensure that the chosen HIR lamps are suitable for the specific application, and in full compliance with the building codes.
- There is presently no limitation nor restriction for the base type, shape, diameter and wattage of the HIR lamps eligible for incentive.
- HIR lamps shall be a minimum of 3,000 hours.
- HIR lamps shall replace incandescent or standard halogen lamps of equivalent beam distribution, lighting outputs and provide a minimum of 25% reduction in wattage, as suggested by the following table (present table does not include all existing types of HIR lamps).

Present System **Halogen (HAL) / Incandescent (INC)**	*Proposed System** **Halogen Infrared (HIR)**	**Life (Hours)**	**Energy Saved (%)**
PAR 38 lamps			
75W HAL-PAR 38	50W HIR-PAR 38	3,000 vs. 2,000	33%
90W HAL-PAR 38	60W HIR-PAR 38	3,000 vs. 2,000	33%
120W HAL-PAR 38	70W HIR-PAR 38	3,000 vs. 2,000	42%
150W INC-PAR 38	90W HIR-PAR 38	3,000 vs. 2,000	40%
250W INC-PAR 38	100W HIR-PAR 38	3,000 vs. 2,000	60%

PAR 30 lamps			
60W HAL-PAR 30	45W HIR-PAR 30	3,000 vs. 2,000	25%
75W HAL-PAR 30	50W HIR-PAR 30	3,000 vs. 2,000	33%
MR-16 lamps			
35W HAL-MR-16	20W HIR- MR-16	5,000 vs. 4,000	42%
50W HAL-MR-16	35W HIR- MR-16	5,000 vs. 4,000	30%
75W HAL-MR-16	45W HIR- MR-16	5,000 vs. 4,000	40%

Note:

* Lamps have been compared at similar lighting outputs.

T8 LIGHTING

The Program incentive applies only to the replacement of T12 or T8 fluorescent lamps using electromagnetic or hybrid/ electronic ballast with T8 lamps using electronic ballasts. It also applies to replacements of T12 technology complete luminaires with new T8 technology luminaires (T8 lamps and electronic ballasts).

Following are the technical criteria for T8 lamps and electronic ballasts:

- It is the responsibility of the customer and/or installing contractor to ensure that the retrofit luminaires are CSA certified or approved by an accredited third party laboratory for the specific application, and in full compliance with the building codes.
- All makes and models of T8 lamps are eligible.
- Color rendering index (CRI) shall be 78 minimum. There is no restriction on lamp color temperature.
- The configuration of T12 U-tubes to T8 U-tubes is permitted under the PIP program.
- Energy saving (ES) T8 lamps represent all makes of T8 technology lamps with nominal wattage lesser than the industry standard. For example, in the 4-foot T8 range ES lamps could be anything lesser than 32W, respectively: 30, 28 and 25W. Note that ES T8 lamps usually have some limitations (such as min. 60^0F operating temperature and restricted dimming abilities) that have to be considered when choosing the suitable retrofit measure for the given application.
- T8 lamps may be remote tandem mounted as recommended by the ballast manufacturer (usually up to 20 feet).
- Electronic ballasts shall have a 5-year warranty.
- Ballasts shall be dedicated only for T8 systems and shall be high frequency electronic type. Ballasts shall operate lamps between 20 kHz and 60 kHz.
- Instant Start electronic ballasts shall have **low power input for 2 to 4 lamp ballasts** (low power input means the ballast is a low ballast factor). The input wattage shall not exceed (for 120/277V ballasts):

	Maximum Input Watts for Number of Lamps (standard efficiency)			
		Low Power Instant Start Electronic Ballast		
Lamp Length	**1 lamp**	**2 lamp**	**3 lamp**	**4 lamp**
2 foot	18W	29W	47W	56W
3 foot	26W	42W	60W	78W
4 foot	32W	51W	76W	98W
8 foot	65W	102W	N/A	N/A

- High efficiency electronic ballasts shall provide a minimum 3W energy savings over comparable standard efficiency electronic ballasts of similar ballast factor.

	Maximum Input Watts for Number of Lamps (High Efficiency Low BF)			
		Low Power Instant Start Electronic Ballast		
Lamp Length	**1 lamp**	**2 lamp**	**3 lamp**	**4 lamp**
2 foot	15W	26W	44W	53W
3 foot	21W	40W	57W	75W
4 foot	25W	49W	74W	97W

	Maximum Input Watts for Number of Lamps (High Efficiency Normal BF)			
Lamp Length	**1 Lamp**	**2 Lamp**	**3 lamp**	**4 lamp**
2 foot	15W	30W	45W	56W
3 foot	23W	42W	68W	84W
4 foot	29W	56W	85W	108W
8 foot	62W	108W	N/A	N/A

- Note: *Instant Start* ballasts are not recommended in applications where the lamps are turned on and off frequently (i.e. with occupancy sensors) because they may shorten lamp life. Programmed Start ballasts are recommended for these applications.
- Above mentioned maximum input wattages do not apply for 347V ballasts.
- Ballasts selected must appropriately match the quantity of lamps that they will be used with.
- Ballast power factor shall be 0.95 minimum (lead or lag).
- Normal Ballast Factor ballasts have a ballast factor of between 0.85 and 1.00, as per ANSI C82.11.
- Low Ballast Factor ballasts shall have a ballast factor between 0.70 and 0.85.
- High Ballast Factor ballasts shall have a ballast factor higher than 1.10.
- High Ballast Factor Instant Start ballasts for T8 lamps are only accepted for T12HO retrofits
- Standard Normal Ballast Factor and High Ballast Factor Instant Start ballasts for T8 lamps are only accepted for T12VHO and HO retrofits

Minimum MLPW (mean system efficacy) for T8 lamps and electronic ballasts		IS	PS
4’	T8 (32W)	80	77
	T8HO (44W)	77	70
8’	T8 (59W)	88	
	T8HO (86W)	82	78

- Above minimum MLPW does not apply to T8HO 8’ 1 lamp system.
- For the standard ballast, Total harmonic distortion (THD) limits for the electronic T8 ballast shall not exceed 20% at either rated 5% above and 5% below nominal primary voltage. For high efficiency electronic ballasts, THD shall be less than 10%.
- Programmed Start ballasts are eligible for incentives. Rapid Start non-dimming ballasts are not eligible for incentives as they are currently replaced by Programmed Start ballasts.
- Incentive applies to new T8 luminaires at any mounting type provided the ballasts are meeting the technical criteria specified above.

T8 DIMMING BALLASTS

- Dimming T8 ballasts (rapid or program start) are allowed for incentives only when controlled by individual or group photosensors/ photocells for daylight harvesting.
- Dimming ballasts can be step or continuous dimming with a reduction in input power of at least 50%.
- Dimming T8 Ballasts shall have the following minimum specifications:
  - a Lamp Crest Factor of 1.7 or less per ANSI C82.11-1993.
  - comply with FCC 47CFR Part 18 Non-Consumer for EMI and RFI and shall tolerate voltage and frequency variations of "10% while operating at 60Hz,120V, 277V and 347V input.
  - a power factor greater than .95 for the primary lamp at full output.
  - reduced harmonics (THD <20%)
  - operate without visible flicker through the operating dimming range. All lamps shall remain on at minimum light levels.
  - be compatible with power line carrier systems.
  - operate fixed or continuous level control and/or daylight harvest dimming control with at minimum the use of integral or external photocell controls.

COMPACT FLUORESCENT LIGHTING

The Program incentive applies to the following:

- Hardwired retrofit kits or new luminaires, or
- Screw-in compact fluorescent lamps complete with ballast for wattages up to and including 42 watts.
- Screw-in high-wattage compact fluorescent lamps complete with ballast for wattages above 42 watts.
- Screw-in induction lamps complete with ballast for wattages above and including 20W

- Compact fluorescent manufacturers must have International Organisation for Standardisation (ISO) 9001 certification.
- Colour rendering index (CRI) for all compact fluorescent lamps (including the screw-in and the induction/ electrodeless types) shall be 80 minimum.

- For lamps used in indoor applications, lamps shall start and operate reliably at temperatures down to +10°C throughout their rated lives. For outdoor applications, low temperature ballasts shall be suitably rated for cool temperature applications, minimum -28°C and maintain 95% of rated lumen output.
- Induction lamps shall be ULC or CSA listed and suitable for indoor or outdoor use
- Screw-in up to 42W compact fluorescent lamps and induction lamps
    - must be Energy Star approved.
    - Dimming (continuous or 3-way step) and/or Normal power factor screw-in compact fluorescent lamps under 42W are eligible for an incentive.
    - Life rating of lamps greater and equal to 13W shall be a minimum of 8000 hours. Life rating of lamps less than 13W shall be a minimum of 8000 hours unless Energy Star approved. Life rating of induction lamps shall be a minimum of 15,000 hours.
    - Candle type and candelabra socket lamps lower and equal to 9W do **not** need to meet the 8000 hour requirement, or be Energy Star Approved. The same will apply to GU-10 socket integral lamps lower and equal to 13W.
- High-wattage CFL lamps (exceeding 42W)
    - shall have an efficacy of minimum 60 lm/W and lumen depreciation of maximum 10% from initial output at 1,000 hours and maximum 80% from initial output at 40% rated life.
    - shall be operated by external or integral (screw-in combinations), high power factor (>0.90) and/or low THD (<10%) electronic ballasts. Lamps, ballast and screw-base integral combinations should have end-of-life protection
        - It is required that CFL luminaires, hardwired retrofit kits and CFLs over 42W be operated by high power factor ballasts (>0.90) to limit stress to the electrical distribution system and to avoid possible power factor penalties to the owner.
- Permanent or “hard-wired” types of luminaries
    - shall be complete with integral replaceable ballast thermally protected with a high power factor (> 0.90). Where multiple lamps are used, ballasts may be the multi-lamp type. It shall be possible to reconnect multiple ballasts individually to achieve multi-level switching within individual fixtures.
    - New luminaires and retrofit kits using CFL units with GU-24 sockets are considered “hard-wired” luminaires types. This rule applies for the 1-piece GU-24 units (lamp and integral ballast) and for the 2-piece GU-24 units (4-pin CFL lamp and separate ballast with GU-24 socket and 4 pin connectors). Normal power factor GU-24 lamps and full units are eligible for an incentive.
- Hardwired retrofit kits for the conversion of existing incandescent luminaires shall have permanent mounting features, with thermally protected high power factor ballasts. All attachments shall be by mechanical means and not dependent upon tape or adhesives. All displaced incandescent lamp sockets shall be permanently removed.
- Major hardware shall identify this kit as a retrofit type, with make/model number and nominal lamp rating. Kit components are not to be modified in a manner so as to invalidate CSA approval for the intended function.
- A lamp replacement table is included to illustrate the expected lamp wattages from incandescent/mercury vapour to CFL. Refer to *Table 1: Lamp Replacement Guideline.*

SCREW-IN COLD CATHODE LIGHTING

The Program incentive applies to the following:

- Screw-in compact cold cathode lamps complete with ballast for low wattages (3 to 8 watts or more).
- Screw-in cold cathode lamps are eligible for incentives when displacing incandescent lamps (15 -40W or more).
- Life rating of lamps shall be a minimum of 18,000 hours.
- There is no restriction on the lamp color temperature, but the color rendering index (CRI) shall be 80 minimum.
- Products shall be ULC or CSA listed and suitable for indoor or outdoor use

HIGH INTENSITY DISCHARGE LIGHTING

The Program incentive applies to both interior and exterior lighting systems for new and retrofitted luminaires.

- Pulse start metal halide and high pressure sodium luminaries are eligible for incentives when displacing incandescent, halogen, mercury vapor or standard/ probe metal halide luminaires of higher wattage.
- Pulse Start Metal Halide retrofit kits are eligible for an incentive if they replace incandescent or standard HID technology of higher wattage.
- Lamps and ballasts must be of the current commercial production.
- Pulse start metal halide fixtures installed under the Program should be totally enclosed on interior installations or use a protective shroud to contain an arc tube rupture. This requirement also applies to ceramic metal halide lamps.
- All HID ballasts shall have a ballast factor of 0.95 minimum and a high power factor (0.90 minimum).
- HID ballasts must have a 2-year warranty.
- High / Low ballast and switching system included in new luminaires will also be eligible for incentives under HID luminaires.
- A lamp replacement table is included to illustrate the expected lamp wattages from incandescent/mercury vapour to pulse start metal halide or high pressure sodium. Refer to *Table 1: Lamp Replacement Guideline.*

ENERGY-EFFICIENT METAL HALIDE LAMP

The Program incentive applies to the replacement of the:

- 175W metal halide lamp with the 150W energy saving metal halide lamp. No ballast change is required for the lamp.
- 250W metal halide lamp with the 225W energy saving metal halide lamp. No ballast change is required for the lamp.
- 400W metal halide lamp with the 360W energy saving metal halide lamp. No ballast change is required for the lamp.

PULSE START/ CERAMIC METAL HALIDE LAMPS

The Program incentive applies to the replacement of the:

- 75W and 90W Halogen PAR38 incandescent lamps with the 25W, PAR 38 integrated ceramic metal halide lamp and ballast unit
- 175W metal halide lamp in overlit areas with 100W pulse start metal halide
- 175W metal halide lamp with the 125W/150W pulse start metal halide lamp.
- 250W metal halide lamp with the 150W/175W/200W pulse start metal halide lamp
- 400W metal halide lamp with the 320W pulse start metal halide lamp
- 400W metal halide lamp in overlit areas with the 250W pulse start metal halide lamp
- 1000W metal halide lamp with the 750W/775W/875W pulse start metal halide lamp
- 150W high pressure lamp with the 100W pulse start metal halide lamp and ballast
- 200W/250W high pressure lamp with the 175W pulse start metal halide lamp and ballast

- 400W high pressure lamp with the 320W/350W pulse start metal halide lamp and ballast
- 1000W high pressure lamp with the 750W/875W pulse start metal halide lamp and ballast

For the replacements above, except for the integrated lamps, the appropriate ballast must be used with the retrofitted lamp.

LOW/ HIGH-BAY FLUORESCENT LUMINAIRES

The Program incentive applies to the replacement of the low/high-bay luminaires that use incandescent or HID technology with new high efficient fluorescent luminaires.

- The Low/High-bay fluorescent luminaire conversion must save a minimum of 80 input watts/luminaire .
- It is the responsibility of the customer and/or installing contractor to ensure that the new luminaires are CSA certified or approved by an accredited third party laboratory for the specific application, and in full compliance with the building codes.
- Accepted lamps for low/high-bay fluorescent luminaires are: T8, T5, T5HO and CFL. Ballasts shall be high power factor electronic and suitable for the lamp type.
- High-bay fluorescent luminaires shall be capable of multiple switching.
- Luminaires to be provided with optimal heat dissipation for electronic ballasts.

T5 FLUORESCENT LUMINAIRES

The Program incentive applies to the replacement of luminaires that use T12 and T8 fluorescent or incandescent technology with new high efficient fluorescent luminaires complete with T5 lamps and electronic ballasts. Self ballasted T5 retrofit kits are eligible only when retrofitting selected T12 luminaires.

For T12 luminaires (any mounting):

- T12 fluorescent luminaires with 4 lamps can be replaced with new T5 fluorescent luminaires/ or combinations of retrofit kits equipped with:
  - up to two T5 standard lamps (ex: 14W lamp for 2ft-long luminaires, 28W for 4ft-long luminaires)
  - up to one T5HO lamp (ex: 24W lamp for 2ft-long luminaires, 54W for 4ft-long luminaires).
  - one TT5 lamp (bi-ax) of 40W or 50W – for 2-foot luminaires. This selection does not apply to T5 retrofit kits.

For T8 luminaires (whole fixture):

- T8 fluorescent luminaires with 4 lamps can be replaced with new T5 fluorescent luminaires equipped with:
  - up to two T5 standard lamps (ex: 14W lamp for 2ft-long luminaires, 28W for 4ft-long luminaires)
  - one T5HO lamp (ex: 24W lamp for 2ft-long luminaires, 54W for 4ft-long luminaires).

For Incandescent luminaries:

- Incandescent luminaires greater than 100W can be replaced with new T5 fluorescent luminaires equipped with:
  - up to two T5 standard lamps (ex: 14W lamp for 2ft-long luminaires, 28W for 4ft-long luminaires)
  - up to one T5HO lamp (ex: 24W lamp for 2ft-long luminaires, 54W for 4ft-long luminaires).

Following are technical criteria for T5 retrofits:

- All T5 lamps are eligible
- New T5 luminaires have to have an efficiency of minimum 70% to qualify for product incentives.
- All T5/ TT5/ T5HO luminaires or retrofit kits have to be equipped with electronic ballasts of instant or program start technology.
- Electronic ballasts shall have a 5-year warranty.
- Ballasts shall be dedicated for T5/ TT5/ T5HO systems and shall be high frequency electronic type. Ballasts shall operate lamps between 20 kHz and 60 kHz.

HID HIGH / LOW SWITCHING SYSTEM

The Program incentive applies to High / Low switching system as an add on item. High / Low switching system included in new luminaires will also be eligible for incentives under HID luminaires.

- High / Low switching system shall be a complete system to allow the controller switching of High Intensity Discharge (HID) luminaires, including Metal Halide, Pulse Start Metal Halide and High Pressure Sodium, from full ballast power input in High mode to 50% or less ballast power input in Low mode.
- Input for lighting control shall be accomplished by manual or automated controls, light level photosensor or occupancy sensor control.
- High / Low switching system shall start all lamps in high mode during initial start-up and shall restrict system from switching modes during initial lamp warm-up cycle.
- High / Low switching shall be accomplished with zero or no lamp strobing or drop out.
- Where photosensor control is used to initiate High / Low switching system, controls shall have adjustable sensitivity.
- Where occupancy sensor control is used to initiate High / Low switching system, sensors shall be a Passive Infrared (PIR) type, designed for narrow pattern detection zone and oriented downward toward the floor or target area.
- High / Low switching systems shall be a complete system ready for wiring and installation. System shall include mounting and come with all components including any; contactors, low voltage relays, isolated relay contacts, power packs, interfaces, control mounting boxes, manual switches and photosensors as required to interface with high / low switching ballasts to provide fully functional control of HID luminaires.
- Sensors shall have advanced signal-processing, integrated circuitry to provide high immunity to RFI and EMI influences. Low voltage photosensors shall be powered by a self contained low-voltage power pack.
- High / Low control systems shall be manufactured by luminaire manufacturer or system approved by ballast and luminaire manufacture for interface with luminaire ballast.
- High / Low control systems and all components shall have a minimum five year manufacturers warranty from the date of installation

HIGH INTENSITY DISCHARGE LIGHTING FOR ORNAMENTAL STREET LIGHTING

The Program incentive applies to street and roadway lighting systems for new and retrofitted luminaires.

- High intensity discharge luminaires are eligible for incentives when displacing mercury vapor, metal halide or high pressure sodium luminaires of higher wattage.

- Optical improved HPS retrofit kits are eligible for an incentive if they retrofit high pressure sodium luminaires of higher wattage.
- All new replacement energy efficient luminaires or (optical improved) retrofit kits will be flat lens.
- Any new replacement luminaires and/or retrofit kits should be minimum 15% more efficient that the one it replaces.
- The replacing energy efficient new/ retrofitted luminaires have to provide a suitable lighting output meeting the required IESNA and/or any federal, provincial or municipal codes that apply.

The Program incentive applies to the replacement of the following high intensity discharge streetlights (including retrofit kits):

- 100W HPS unit with the 70W energy efficient unit completed with flat lens.
- 150W HPS unit with the 100W energy efficient unit completed with flat lens.
- 200W HPS unit with the 150W energy efficient unit completed with flat lens.
- 250W HPS unit with the 150W or 200W energy efficient unit completed with flat lens.
- 400W HPS unit with the 250W energy efficient unit completed with flat lens.
- 100W MH unit with the 70W or 75W energy efficient HPS or MH unit with flat lens.
- 150W MH unit with the 100W energy efficient HPS or MH unit with flat lens.
- 175W MH unit with the 150W energy efficient HPS or MH unit with flat lens.
- 250W MH until with the 150W energy efficient HPS or 175W energy efficient MH unit with flat lens.
- 175W MV unit with the 100W energy efficient HPS or MH unit with flat lens.
- 250W MV unit with the 150W energy efficient HPS or MH unit with flat lens.
- 400W MV unit with the 250W energy efficient HPS or MH unit with flat lens.

INDUCTION LUMINAIRES FOR INDOOR AND OUTDOOR LIGHTING APPLICATIONS

The program incentive applies to the replacement of interior and street/ area luminaires that use induction (electrodeless) technology.

- Induction luminaries or retrofit kits are eligible for incentives when displacing mercury vapour, metal halide or high pressure sodium high intensity discharge (HID) luminaires of higher wattage
- The luminaire conversion must save a minimum of:
  - 50W if the replaced HID lamp is under 175W
  - 100W if the replaced HID lamp is greater than or equal to 175W
- The ballast must have a power factor greater than 0.95
- The ballast must have a total harmonic distortion of less than or equal to 20%
- The induction lamp and ballast must be rated for an operating ambient temperature of between -20°C and +40°C or better
- Induction lamp and ballast must have at least a 5-year maintenance warranty
- Manufacturers of induction luminaires must be able to provide IES photometric data for their products

- It is the responsibility of the customer and/or installing contractor to ensure that the new luminaires are CSA certified or approved by an accredited third party laboratory for the specific application, and in full compliance with the building codes

LIGHTING CONTROLS

The Program incentive applies to the following lighting controls:

- Timers (switch plate mounted)
- Photocells with timers – exterior high intensity discharge (HID) lighting only
- Photocells for daylight harvesting – close and open loop, group/ field or individual/ luminaire installed. Photocells to be of the appropriate type (and installation procedure) for the application. Initial calibration and continuous maintenance is required when installing photocells.
- Occupancy/motion sensors – hardwired only with or without an override mechanism.

LED EXIT SIGNS

The Program incentive applies to the following retrofits that are applicable under this Program:

- All new LED exit signs and retrofit kits
- LED conversion kits comprising 2 screw-in lamps with diffuser or 1 bar with diffuser for existing signs. Options to purchase LED single lamps are available, however two are required per sign.
- Options are available for conversions from either existing incandescent or CFL exit signs.

To be eligible for an incentive, the retrofit must:

- Meet Energy Star guidelines,
- Comply with CSA standards C22.2 No. 9.0 and C860; (Note if the retrofitted sign cannot comply it must be replaced),
- Have a minimum of 1-year warranty.

For new exit signs a maximum of 2.0 input watts is allowed and for new self powered exit signs a maximum of 3.5 input watts is allowed.

LED conversion kits shall be permanently mounted within the housing with any unused incandescent lamp sockets and any diodes removed or disabled. Any necessary stand-by DC lamps may remain. Retrofit kits shall be identified as such, including lamp wattage. Retrofit kits shall include a replacement diffuser, to ensure correct luminance levels are maintained. The existing high density, red diffuser, designed to diffuse the high brightness of the incandescent source, must be replaced with a less dense diffuser designed for use with the LED source.

LED REPLACEMENTS TO INCANDESCENT LAMPS AND LUMINAIRES

The Program incentive applies to:

- LED direct replacements for MR Halogen Dichroic lamps. Wattage as follows:
  - Less than 5 W LED lamps to replace MR halogen (or HIR) lamps of less or equal than 35W
  - LED lamps equal or higher than 5W are allowed for MR halogen (or HIR) lamps higher than 35W
- LED replacements for all screw-base, incandescent/ halogen lamps, or new LED luminaires when replacing incandescent/ halogen luminaires that provide light (exceptions may apply to string/ tape types). Wattage as follows:
  - maximum 5 W LED lamps to replace maximum 50W incandescent/ halogen lamps
  - LED lamps higher than 5W are allowed for incandescent/ halogen lamps higher than 50W

For LED string/ tape types and LED seasonal lights see the LED LIGHT STRINGS AND TAPES paragraph.

Following are technical criteria for LED lamps:

- LED MR16 lamps can be standard 2 pin MR16 GX 5.3 base (12V AC/DC) or GU10 (120V) screw-in base.
- Screw-in replacements LED lamps shall have screw-in or pin base similar with the replaced incandescent/ halogen lamps.
- Screw-in replacements LED retrofit kits shall have screw-in or pin connectivity similar with the replaced incandescent/ halogen lamps.
- For LED luminaires, or direct replacement LED lamps, the total input wattage has to include the losses to the source.
- LED lamps can be white or coloured.
- It is the responsibility of the customer and/or installing contractor to ensure that the new lamps meet the current Canadian Electrical Code requirements.
- Under working conditions as specified by manufacturers, LED lamp unit will have an average rated lamp life of 50,000 hours or a minimum of 20,000 hours with 70% maintained lumen output

LED LINEAR REPLACEMENT FOR FLUORESCENT LAMPS

The program applies to:

- 4 foot LED linear (tubular) lamps/ retrofit kits for direct replacements of T12 and T8 fluorescent lamps in fluorescent luminaires.
- LED replacements for linear fluorescent lamps are basically a rectilinear LED array, mounted in a tubular format, typically with bi-pin bases that are compatible with standard fluorescent lamp holders. LED replacements could require bypassing the existing fluorescent ballast and wiring the LED lamps to a line voltage (e.g., 120-V or 277-V) circuit.

Following are technical criteria for LED linear direct replacements:

- It is the responsibility of the customer and/or installing contractor to ensure that the retrofit kits/ new luminaires meet the current Canadian Electrical Code requirements.
- Lighting levels after the retrofit must meet the requirements of the end user and be to the satisfaction of all approving authorities having jurisdiction for specific applications. As LED linear replacements often provide much lower outputs than fluorescents it is recommended to use this energy measures in over lit situations
- Have CSA or ULC certification
- Have acceptable thermal management control for the LED modules.
- Have a color appearance similar to the fluorescent technology (i.e., CCT 3000 K–6500 K),
- Under work conditions as specified by manufacturers, LED modules will have:
  - Maximum 18W total input power per 4 ft LED lamp
  - over 50,000 hours average rated lamp life
  - a minimum warranty of 1 year

LARGE WATTAGE LED LUMINAIRES FOR INDOOR AND AREA LIGHTING

The Program incentive applies to:

- Complete large wattage (higher than 5W) LED direct replacements of HID (Mercury Vapour, Metal Halide, High Pressure Sodium) technology for indoor and outdoor area applications.
- LED Retrofit kits or new LED luminaires can be:
  - Low/high pole/ stand/ bollard or surface mounted for area/ parking lighting
  - Low/high bay surface or recessed mounted for warehouses, parking garages and other applications that require reliable low maintenance lighting

- Suggested LED direct replacements of HID technology: 50W to 400W

Following are technical criteria for LED indoor and outdoor luminaires:

- It is the responsibility of the customer and/or installing contractor to ensure that the retrofit kits/ new luminaires meet the current Canadian Electrical Code requirements.
- Lighting levels after the retrofit must meet the requirements of the end user and be to the satisfaction of all approving authorities having jurisdiction for specific applications.
- LED retrofit kits or new luminaires to be provided with LED modules/ kits, optical/ reflector installations, protective lenses, integral connectivity wiring, mounting accessories, power supply/ driver and controls as per the manufacturer specifications. New or retrofitted LED luminaires to be sealed and suitable for outdoor wet locations as required by electrical code.
- Have CSA or ULC certification
- Have acceptable thermal management control for the LED modules.
- Under work conditions as specified by manufacturers, LED modules will have an average rated lamp life of:
  - over 50,000 hours for white light or amber LEDs
  - a minimum warranty of 1 year

LED LIGHT STRINGS AND TAPES

The program applies to:

- LED string/ tape luminaires used for accent or decorative lighting.
- LED string/ tape types are not direct lamp replacement, and are approved for incentives only when replacing incandescent luminaires. New LED string/ tape types replacing luminaires with one or more lamps have following wattage criteria, per lamp wattage basis.
  - maximum 5 W LED lamps to replace maximum 50W incandescent/ halogen lamps
  - LED lamps higher than 5W are allowed for incandescent/ halogen lamps higher than 50W
    For example: when a LED tape replaces a 4-10W lamp luminaire, the maximum LED wattage should be 5W.
- Seasonal LED strings must be Energy Star ® approved as listed on the Office of Energy Efficiency's website.
- Seasonal LED string lights of any style/ shape or colour. Seasonal LED strings can replace existing incandescent strings regardless bulb's wattage (from minilights- 0.5 W to C9 -9W)
- Seasonal LED strings used for outdoor applications must have an indication on the packaging noting that LED lights can be used outdoor. Please follow manufacturers' recommendations.

- Seasonal LED screw-in bulbs. Have to meet the maximum wattage criteria as above:
  - maximum 5 W LED lamps to replace maximum 50W incandescent/ halogen lamps
  - LED lamps higher than 5W are allowed for incandescent/ halogen lamps higher than 50W

All string/ tape and seasonal LED products must respect the same technical LED criteria as listed above for LED replacements to incandescent lighting.

LED COMMERCIAL AND ARCHITECTURAL SIGNS

The Program incentive applies to:

- direct replacements for commercial neon signs of the linear or channel letters type and for architectural linear neon or cold cathode luminaires.
- replacements for commercial fluorescent signs. LED replacements modules will be considered as replacing individual rows of fluorescent lamps. Calculations will consider the linear length of the modules as a multiplication of the length of fluorescent rows times the number of rows.
  For example: for a fluorescent sign size 4'x9' containing 2 x 8'- T12 lamps, incentives will be based on a total LED linear length of 16'.
- direct replacements for commercial incandescent, dynamic message centres.

Following are technical criteria for LED signs

- It is the responsibility of the customer and/or installing contractor to ensure that the new lamps meet the current Canadian Electrical Code requirements.
- LED retrofit kits for commercial signs to be provided with LED modules, integral connectivity wiring, mounting accessories, power supply/ driver and controls as per the manufacturer specifications. New or retrofitted tubes or case sign to be sealed and suitable for outdoor wet locations as required by electrical code.
- Under work conditions as specified by manufacturers, LED modules will have an average rated lamp life of:
  - over 50,000 hours, for red, orange and yellow/ amber
  - over 20,000 hours, for green, blue and white
  - and a minimum warranty of 1 year

LED SCOREBOARDS

The Program incentive applies to:

- Direct screw-in replacements for commercial scoreboards using incandescent lamps. For screw-in direct replacements of incandescent lamps, maximum wattage criteria applies:
  - maximum 5 W LED lamps to replace maximum 50W incandescent/ halogen lamps
  - LED lamps higher than 5W are allowed for incandescent/ halogen lamps higher than 50W
- Complete LED replacements of incandescent scoreboards technology, including LED front panel retrofitting.

All LED Scoreboards have to respect the technical criteria listed above for LED Signs.

LED REFRIGERATED LIGHTING

The program applies to:

- LED luminaires used for refrigerated lighting for enclosed, front window door, product displays in grocery stores, and convenience stores.
- Refrigerated LED luminaires are direct replacements for T8 and T12 HO refrigerated lighting systems.

Following are technical criteria for refrigerated LED lighting systems:

- It is the responsibility of the customer and/or installing contractor to ensure that the new lamps meet the current Canadian Electrical Code requirements.
- Retrofit kits for refrigerated LED Lighting systems have to be designed for this type of application and be provided with LED modules, integral connectivity wiring, mounting accessories, power supply/ driver and controls as per the manufacturer specifications.
- Under work conditions as specified by manufacturers, LED modules will have:

- an average rated lamp life over 50,000 hours
- minimum 70 CRI
- a minimum warranty of 1 year

INCANDESCENT / MERCURY VAPOUR LAMP REPLACEMENT GUIDE

The following table is intended to illustrate the expected wattages for lamp changes from incandescent/mercury vapour lamps to either compact fluorescent, metal halide pulse start or high pressure sodium lamps.

Table 1: Lamp Replacement Guideline

Lamp Replacement Guideline

Existing Lamp			Potential Replacement Lamp								
			Compact Fluorescent			Metal Halide Pulse Start			High Pressure Sodium		
Lamp Wattage	Fixture Wattage	Mean Lumen Output	Lamp Wattage	Fixture Wattage	Mean Lumen Output	Lamp Wattage	Fixture Watts	Mean Lumen Output	Lamp Wattage	Fixture Watts	Mean Lumen Output
Standard Incandescent											
40 watt	40	415	9 watt	10	500						
50 watt	50	545	11 watt	13	680						
60 watt	60	900	15 watt	18	900						
75 watt	75	1,200	20 watt	23	1,200						
100 watt	100	1,600	25 watt	33	1,530				35 watt	46	2,000
150 watt	150	2,400	34 watt	41	2,100	39 watt	57	2,800			
200 watt	200	3,600	42 watt	48	2,720	50 watt	68	3,200	50 watt	66	3,600
250 watt	250	3,750	50 watt	60	3,870						
300 watt	300	6,000	80 watt	90	5,400	70 watt	90	5,400	70 watt	95	5,450
500 watt	500	9,500				150 watt	190	10,000	100 watt	138	8,500
620 watt	620	11,000				175 watt	208	11,200			
750 watt	750	15,000				250 watt	288	16,600	150 watt	188	14,000
1000 watt	1000	24,000				350 watt	400	27,000	250 watt	295	27,000
1500 watt	1500	31,000				400 watt	456	30,000	310 watt	365	33,000
Typical Rated Avg. Lamp Life 1,000 to 2,000h											
Mercury Vapour											
50 watt	63	1,260	20 watt	23	1,200						
75 watt	95	2,250	34 watt	41	2,100				35 watt	46	2,000
100 watt	125	3,400	50 watt	60	3,870	50 watt	68	3,200	50 watt	66	3,600
175 watt	210	7,400	105 watt	115	6,900	100 watt	125	7,000	100 watt	138	8,500
250 watt	290	10,500				150 watt	190	10,000	150 watt	188	14,000
400 watt	450	19,000				320 watt	365	22,000	200 watt	250	19,800
700 watt	775	33,600				400 watt	456	30,000	310 watt	365	33,000
1000 watt	1100	45,000							400 watt	465	45,000
Typical Rated Avg. Lamp Life 24,000hrs											

Notes:

1. The lumen output values shown in table are intended as a guideline only. These values are an average of various manufacturers published data. It is not to be relied on for detail design.

2. The lumen output of all the lamps will vary depending on the exact lamp selected.

3. A lighting designer should be consulted to ensure the correct application of lamps is selected to meet the required lighting levels, lamp life, colour rendition etc..

4. The lighting output values shown are **mean** not initial lumens.

Standard Wattage and Lumen Output for Various Lamp Styles

Compact Fluorescent			Metal Halide Pulse Start			High Pressure Sodium		
Lamp Wattage	Fixture Wattage	Mean Lumen Output	Lamp Wattage	Fixture Wattage	Mean Lumen Output	Lamp Wattage	Fixture Wattage	Mean Lumen Output
9 watt	10	500	39 watt	57	2,800	35 watt	46	2,000
11 watt	13	680	50 watt	68	3,200	50 watt	66	3,600
15 watt	18	900	70 watt	90	5,400	70 watt	95	5,450
18 watt	21	1,100	100 watt	125	7,000	100 watt	138	8,500
20 watt	23	1,200	150 watt	190	10,000	150 watt	188	14,000
25 watt	33	1,530	175 watt	208	11,200	200 watt	250	19,800
34 watt	41	2,100	250 watt	288	16,600	250 watt	295	25,000
42 watt	48	2,720	320 watt	365	22,000	310 watt	365	33,000
50 watt	60	3,870	350 watt	400	27,000	360 watt	414	42,800
65 watt	75	4,200	400 watt	456	30,000	400 watt	465	45,000
80 watt	90	5,400	750 watt	810	60,000	600 watt	660	81,000
105 watt	115	6,900	1000 watt	1075	96,000	750 watt	810	99,000
						1000 watt	1100	112,000
Typical Rated Avg. Lamp Life 6,000 to 10,000hrs			Typical Rated Avg. Lamp Life: <= 150 W: 9,000 to 12,000hrs > 150W : 15,000 to 20,000 hrs			Typical Rated Avg. Lamp Life 24,000hrs		

CONTROLS AND SENSORS

VENDING MACHINE CONTROLLER

The vending machine controller (VMC) is an energy control device for refrigerated vending machines that provides a simple and cost-effective way to reduce electrical loads. Using an occupancy sensor, the VMC turns off the machine when no one is nearby.

Technical Requirements For Vending Machine Controller

- Optimal VMC occupancy sensor positioning is key to minimize false or insufficient triggering that could impact energy savings or product sales.
- Each vending machine must be connected to a separate vending machine controller. Powering more than one vending machine through one vending machine controller will result in voided warranty and a potential fire hazard.
- To be eligible under the Power Smart program, Vending Miser brand products must be revision 10 or newer.
- It is essential that the vending machine controller does not face any reflective surfaces, even for example a glass door housing a fire extinguisher, as the sensor may sense constant occupancy and run the vending machine fully on 24/7. If this occurs on a defective vending machines it may create a safety hazard.
- The following vending machine end use applications will **not** be eligible for incentives:
  - Indoor Locations: Inside specific 24-hour facilities that have vending machines will not be retrofitted due to the relative constant activity that result in low savings. These are 24-hour convenience stores and employee break rooms in 24-hour operations, hospital cafeterias etc.
  - Outdoor Locations: Within 60’ of a public street or where the VMSC would be subject to direct weather contact.
  - Vending machines that contain perishable goods.
  - Sited machines that do not have a wall behind it or a wall that is not suitable for mounting the vending machine controller (such as glass.)

CO SENSOR

The Program incentive applies to a CO Sensor control system on exhaust fan system used in underground parkades.

PARKING LOT CONTROLLER

The parking lot controller is a device which controls electricity going to outdoor plugs thereby allowing effective management of electricity use for heating car engine blocks in cold weather.

Technical Requirements For Parking Lot Controller

- All parking lot controllers must include outside temperature control.
- The controllers must be rated for exterior use with satisfactory operation from -40˚C (-40˚F) to +40˚C (+104˚F).
- Minimum product warranty shall be one year from the date of installation.
- All controllers shall be new and CSA or UL approved or certified by an accredited independent organization to conform to CSA Standards for the intended application.
- Controller components shall not contain hazardous components.
- Any subsequent significant reduction in controller quality and/or performance may result in excluding this product from the list of eligible vendors.

POWER MANAGEMENT SOFTWARE FOR COMPUTER WORKSTATIONS

The Program incentive applies to software which:

1. reduces the on-time of computers and their monitors or screens.
2. may be deployed by means of a LAN network and/or by individual workstation installation
3. end users may not alter power save features
4. is not free
5. is proven to work as confirmed by third-party or BC Hydro pilots, and at BC Hydro's discretion

EFFICIENT POWER BARS FOR COMPUTER WORKSTATIONS

The Program incentive applies to efficient power bars used for commercial computer workstations:

Technical Requirements For Timer Based Smart Power Bars:

- The timer based power bar must use digital timer and not mechanical controls.
- The timer power bar must be programmable.
- The timer power bar must include a digital LED screen.
- These power bars are not recommended to shut down computers or control equipment.

Technical Requirements For Current Sensor Smart Power Bars:

- Include Safe Passive Current Sensor based switching.
- The current sensor power bar must automatically switch off peripheral plug load from it's control plug outlet.
- The current sensor power bar must prohibit false switching for example by incorporating resistor-capacitor circuit filters.
- Computers should be plugged into the colour coded (often coloured red) power bar sockets where they will be left powered on.

Additional Technical Requirements For Efficient Power Bars:

- The smart power bar must be CSA, cUL or UL approved.
- The smart power bar must have a 3-prong grounded plug outlet.
- The smart power bar must offer electrical 3-way surge protection as follows: (1) Live to neutral (2) live to ground and (3) neutral to ground.

HVAC

ADJUSTABLE SPEED DRIVE

An adjustable speed drive (ASD) is an add-on for an HVAC fan or pump with a 10 HP and greater motor.

In regards to installation requirements, the ASD supplier must visit the site and recommend the appropriate ASD drive, filters and line/load reactors suitable for the existing motor to avoid premature motor failure.

ASD incentives are for fan and pump applications on HVAC distribution systems. The maximum fan size is 100 hp. The installation of an ASD on a HVAC fan or pumps is eligible for a rebate only if throttling devices, such as inlet vanes, bypass dampers and throttling valves, are removed or permanently disabled.

HVAC OCCUPANCY SENSOR

The Program incentive applies to the HVAC occupancy sensor control for a packaged terminal air conditioning unit or a heat pump unit, with built-in electric resistance heater.

REFRIGERATION

LOW TEMPERATURE VERTICAL DISPLAY CASE

Replace an existing open low temperature vertical display case with a new low temperature vertical display case equipped with glass or acrylic doors, new electronically commutated fan motor(s) (ECM), T8 lamps, and electronic ballasts. Additional separate rebates cannot be claimed for new ECM fan motor(s) or T8 lamps and electronic ballasts. New case length must be equal or shorter than the original case. The rebate is limited to low temperature vertical display cases with a case temperature below –18°C (0°F). The rebate for this measure applies to self-contained or remote cases. Rebate is based on the linear footage (horizontal length) of the cases installed.

ADDING GLASS DOORS TO LOW TEMPERATURE VERTICAL DISPLAY CASE

Install glass or acrylic doors on existing low temperature open vertical display cases to reduce the loss of cold air and infiltration of warm air. The rebate is limited to low temperature vertical display cases with a case temperature below –18°C (0°F). The rebate for this measure applies to self-contained or remote cases. Rebate is based on linear footage (horizontal length) of the doors installed..

ANTI-SWEAT HEATER (ASH) HUMIDISTAT CONTROL FOR VERTICAL DISPLAY CASE

Install a device that reduces the operation of the anti-sweat heaters by at least 50% (from 100%) for the glass door and door frame. Technologies that reduce or turn off anti-sweat heaters based on simple timing or by sensing humidity or condensation qualify. Timer must not be equipped with a “hold-on” feature. This rebate does not apply to the Special Doors with No Anti-Sweat Heat Controls (ASH) measure. The rebate for this measure applies to remote cases only. Rebate is based on the number of doors controlled.

EFFICIENT EVAPORATOR FAN MOTOR (ECM) FOR DISPLAY CASE OR WALK-IN (LOW OR MEDIUM TEMPERATURE)

Applicable to existing shaded pole or permanent split capacitor evaporative fan motor on low or medium temperature display cases and fan coil system of low or medium temperature walk-ins. The rebate for this measure applies to remote cases and remote walk-ins only. Rebate is a fixed amount per motor installed. The existing fan motor must be replaced by an electronically commutated motor(s) (ECM) with the following efficiencies:

Existing Configuration	Retrofit ECM Efficiency
Parallel rack systems > ¼ HP	> 75% efficiency
Walk in coolers (low and medium temperature)	> 70% efficiency
Reach-in refrigerated cases (Low and medium temperature)	> 65% efficiency

NIGHT COVERS FOR OPEN VERTICAL DISPLAY CASE (LOW OR MEDIUM TEMPERATURE)

Install a cover on an otherwise open low or medium temperature vertical display case to decrease infiltration of warm air into the case at night. The case manufacturer must have no objections to the use of such front covers. It is recommended that film type covers have small, perforated holes to decrease moisture buildup.

The rebate for this measure applies to self-contained or remote cases. Rebate is based on linear footage (horizontal length) of night cover installed.

NIGHT COVERS FOR OPEN LOW TEMPERATURE HORIZONTAL DISPLAY CASE

Install a cover on an otherwise open horizontal display case to decrease infiltration of warm air into the case at night. The case manufacturer must have no objections to the use of such covers. It is recommended that film type covers have small, perforated holes to decrease moisture buildup. The rebate is limited to low temperature horizontal display cases with a case temperature below –18°C (0°F). The rebate for this measure applies to remote cases only. Rebate is based on linear footage (horizontal length) of night cover installed.

STRIP CURTAINS FOR WALK-INS (LOW OR MEDIUM TEMPERATURE)

Install new strip curtains on doorways of low or medium temperature walk-ins. The rebate for this measure applies to self-contained or remote walk-ins. Rebate is based on square footage of strip curtain installed.

COMPACT REFRIGERATOR

For classification as a compact refrigerator it must have a volume not exceeding 7.75 cu. ft. and overall height no greater then 38in. It must pass the CAN/CSA C300-00 test standard and in addition meet the most recent Energy Star Guidelines. The compact refrigerator must not be used in any food preparation locations in accordance with appropriate standards.

BARE SUCTION PIPE INSULATION

Pipe insulation must meet the below criteria:

- Temperature of refrigeration is required to be below 2°C
- Insulation material must be flexible, closed-cell polyethylene foam with a maximum thermal conductivity of 0.27 Btu-in/hr-ft^2-F
- The minimum insulation thickness is 1 inch
- Maximum pipe diameter: 1.5 inches
- Incentive is only available for insulating existing bare refrigeration suction pipes

COMMERCIAL KITCHEN

EFFICIENT ELECTRIC PRESSURELESS STEAMER

This incentive applies towards the replacement to energy efficient electric steamers (fuel switching applications are not eligible). Used or rebuilt equipment is not eligible. Customers must provide proof that the appliance is Energy Star® rated.

EFFICIENT CONVECTION OVEN

This incentive applies towards the replacement to energy efficient electric convection ovens (fuel switching applications are not eligible). Customers must provide proof that the appliance meets ASTM F1496 tested with 70% or greater energy efficiency.

EFFICIENT INSULATED HOT FOOD HOLDING CABINET

This incentive applies towards the replacement to energy efficient commercial electric hot food holding cabinets. This measure does not include cook and hold equipments. All measures must be electric hot food

cabinets that are fully insulated and have solid doors in half sizes (internal volume less than or equal to 10 ft^3). Used or rebuilt equipment is not eligible. Customers must provide proof that the appliance meets a maximum idle energy rate of 20 W/ft^3.

ADD DEMAND VENTILATION CONTROLS TO EXHAUST HOODS

This incentive applies towards the retrofit to demand ventilation controls for dedicated (single zone) commercial kitchen exhaust and make-up air systems. The control system must be used in conjunction with variable speed fan motor controls.

COMMERCIAL APPLIANCE

ENERGY STAR COMMERCIAL DISHWASHER

This incentive applies towards the replacement of an existing standard efficiency commercial dishwasher to an energy efficient commercial dishwasher. Used or rebuilt equipment is not eligible. Only eligible for buildings with electric hot water heaters. Customers must provide proof that the new appliance is Energy Star® rated.

OTHERS

LOW-E CEILING

The Program incentive applies to a foil faced radiant barrier ceiling material rated for ice arena applications. The emissivity rating must be between 0.03-0.05 (tested to ASTM #E408) with a temperature rating from –60F to 180F and has the approved Building Code flame rating.

BRINE PUMP PONY MOTOR

The brine pump pony motor is an add-on product used in ice arenas and curling rinks to reduce energy consumption. The Program incentive applies to the following:

- 5HP brine pump pony motor added to a 15HP brine pump
- 7.5HP brine pump pony motor added to a 20HP brine pump or 25HP brine pump
- 10HP brine pump pony motor added to a 30HP brine pump

SYNCHRONOUS BELTS

The Program incentive applies to the replacement of a Vbelt with a synchronous belt. Synchronous belts (also called timing, positive-drive, or high-torque drive belts) are toothed and require the installation of mating toothed-drive sprockets. Synchronous belts offer an efficiency of about 98% and maintain that efficiency over a wide load range.

LIVESTOCK WATERER

Energy Efficient Livestock Waterers

- These must have a minimum 2” of R10 Insulation.
- These must have electrical heater elements of $\leq$ 350W.
- Each energy efficient livestock waterer should be $\leq$ 50 US gallons (190L) in water holding capacity.

Energy Free Livestock Waterers

- These must have a minimum of 3.5” of R25 Insulation.
- Each energy free livestock waterer should be $\leq$ 50 US gallons (190L) in water holding capacity.