

OUTDOOR ADVANCED LIGHTING SYSTEM WORKSHEET

January 1, 2018 through December 31, 2018

ComEd® Energy Efficiency Program offers advanced lighting system incentives for intelligent lighting control systems that optimize the performance of a network of efficient light fixtures and sensors. Advanced lighting systems have three components:

- High-efficiency fixtures and sensors tied to a central control system
- A central control system that can be accessed from a computer or mobile device, show real-time status of the lighting system and generate detailed reports about the system’s performance. Control strategies such as occupancy sensors, dimming and zone control are selected by the user and programmed into the control system.
- A minimum two (2) week post-installation measurement and verification period, in which energy data is captured to verify reductions in usage (optional).

Advanced lighting system incentives may be used to replace an existing lighting system or to install a new system where none exists. Incentives also are available for customers that wish to install an intelligent control system for use with existing fixtures. Incentives are available through two options, as shown below.

OPTION ONE
→ NEW T8/T5 or LED fixtures @ \$0.50 watt reduced
+
→ NEW lighting control system @ \$0.18 watt controlled
.....
OPTIONAL
→ Measurement & verification @ \$0.10 kWh saved above target
+
→ Use NALCTP-certified contractor on installation team @ \$1,000

OPTION TWO
→ Keep existing fixtures <i>or</i> install new or retrofitted fixtures that don't meet Option One*
+
→ NEW lighting control system, measurement & verification @ \$0.07 kWh saved above baseline
.....
OPTIONAL
→ Use NALCTP-certified contractor on installation team @ \$1,000

* May be eligible to apply through the Outdoor Lighting Incentives Worksheet

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DIRECTIONS: Please save a copy of this form to your computer by selecting "FILE/SAVE AS" before entering text and numbers. Then fill in your information electronically and select "SAVE." Note that this form requires Adobe Reader® version 11.0 to function properly. Download the most recent version of Adobe Reader® at <http://get.adobe.com/reader>.

A pre-approval application is required; review instructions on the standard and custom incentives pre-approval and final application form. Wait for pre-approval before starting your project.

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

OPTION 1 - ADVANCED LIGHTING SYSTEM WITH NEW, HIGH-EFFICIENCY FIXTURES AND CONTROL SYSTEM

To receive the incentives available under Option 1, the following requirements must be met, in addition to all measure-specific specifications:

1. Option 1 incentives are applicable only to new high-efficiency T8/T5 and LED fixtures which meet the specifications below. All other fixtures not meeting the specifications may be eligible for Option 2 incentives.
2. A majority of total new system wattage must meet the fixture specifications detailed below.
3. IECC 2015 lighting power densities should be used to determine baseline conditions for projects where there is no existing lighting system.
4. A minimum two (2) week post-installation measurement and verification (M&V) period is only required to receive the \$0.10 kWh M&V bonus. Please see specifications for M&V requirements.

SECTION I: FIXTURES

New T8/T5 Fluorescent Fixture with Electronic Ballast

SPECIFICATIONS

1. Fixtures must be installed with a control system which meets the control system specifications described on page 8 of the worksheet to receive this incentive.
2. Manufacturer's specifications for new fixtures, lamps and ballasts must be submitted with pre-approval and final applications.
3. Fixtures must contain all new components and be unopened at time of purchase.
4. Fixtures must be pre-approved by the ComEd Energy Efficiency Program as "efficient" fixtures (generally, with a fixture efficiency $\geq 85\%$).
5. T8/T5 lamps must have a CRI ≥ 80 .
6. Ballasts must meet the following specs:
 - High frequency ($\geq 40/50$ kHz)
 - Power factor (PF) ≥ 0.90
 - UL or ETL listed
 - Warranted against defects for 5 years
 - Ballast should have a total harmonic distortion (THD) $\leq 20\%$ at full light output

EQUIPMENT TYPE and DEFINITION	UNIT	INCENTIVE
New T8/T5 Fluorescent Fixture with Electronic Ballast Installation of a new lighting system containing T8/T5 fixtures with T8/T5 lamps and electronic ballasts.	Reduction in connected watts	\$0.50 per watt reduced

→ If you are installing new T8/T5 fixtures to replace an existing lighting system, complete the watt reduction worksheet on the following page.

Company Name:

Watt Reduction Worksheet for New T8/T5 Fixtures Replacing an Existing Lighting System

Use this worksheet or attach an itemized project plan. (See example in red.)

TYPE OF EQUIPMENT TO BE REPLACED	QUANTITY OF EQUIPMENT TO BE REPLACED	WATTAGE OF EQUIPMENT TO BE REPLACED	TOTAL WATTAGE OF OLD EQUIPMENT	TYPE OF NEW FIXTURE TO BE INSTALLED (MODEL NUMBER)	QUANTITY OF NEW EQUIPMENT	WATTAGE OF NEW EQUIPMENT	TOTAL WATTAGE OF NEW EQUIPMENT	DIFFERENCE (OLD WATTAGE MINUS NEW)
<i>example: 250W metal halide</i>	<i>100</i>	<i>295</i>	<i>29,500</i>	<i>example: LED ARV2-12/480/8CPT4</i>	<i>100</i>	<i>120</i>	<i>12,000</i>	<i>17,500</i>

SUBTOTAL OLD WATTAGE MINUS NEW

EQUIPMENT TYPE	(A) INCENTIVE PER UNIT	(B) UNIT	(A x B) INCENTIVE
New T8/T5 Fluorescent Fixtures with Electronic Ballast	\$0.50 per watt reduced	Watts reduced (from worksheet above): _____	
SUBTOTAL			\$

→ If you are installing new T8/T5 fixtures where no lighting system exists, complete the watt reduction worksheet on the following page. Use IECC 2015 lighting power densities to determine baseline conditions.

Watt Reduction Worksheet for New T8/T5 Fixtures - No Existing Lighting System

Use this worksheet or attach an itemized project plan.

AREA OF ILLUMINATED SPACE (SQ. FEET)	IECC 2015 LIGHTING POWER DENSITY (W/SQ. FOOT)	TOTAL WATTAGE OF BASELINE	TYPE OF NEW FIXTURE TO BE INSTALLED (MODEL NUMBER)	QUANTITY OF NEW EQUIPMENT	WATTAGE OF NEW EQUIPMENT	TOTAL WATTAGE OF NEW EQUIPMENT	DIFFERENCE (OLD WATTAGE MINUS NEW)

SUBTOTAL OLD WATTAGE MINUS NEW

EQUIPMENT TYPE	(A) INCENTIVE PER UNIT	(B) UNIT	(A x B) INCENTIVE
New T8/T5 Fluorescent Fixtures with Electronic Ballast	\$0.50 per watt reduced	Watts reduced (from worksheet above): _____	
SUBTOTAL			\$

LED Fixtures

SPECIFICATIONS

1. Fixtures must be installed with a control system that meets the specifications listed on page 8 of the worksheet to receive this incentive.
2. Manufacturer's specifications for new fixtures must accompany pre-approval and final applications.
3. Fixtures must be on the DesignLights™ Consortium (DLC) Qualified Products List available at <http://www.designlights.org>.
4. Linear types A and B LED tubes are not eligible for standard incentives but may be eligible for instant discounts from participating distributors; visit ComEd.com/InstantDiscounts for details.

EQUIPMENT TYPE and DEFINITION	UNIT	INCENTIVE
LED Fixture Installation of a new outdoor lighting system containing LED fixtures.	Reduction in connected watts	\$0.50 per watt reduced

→ If you are installing new LED fixtures to replace an existing lighting system, complete the watt reduction worksheet on the following page.

Watt Reduction Worksheet for New LED Fixtures Replacing an Existing Lighting System

Use this worksheet or attach an itemized project plan. (See example in red.)

TYPE OF EQUIPMENT TO BE REPLACED	QUANTITY OF EQUIPMENT TO BE REPLACED	WATTAGE OF EQUIPMENT TO BE REPLACED	TOTAL WATTAGE OF OLD EQUIPMENT	TYPE OF NEW FIXTURE TO BE INSTALLED (MODEL NUMBER)	QUANTITY OF NEW EQUIPMENT	WATTAGE OF NEW EQUIPMENT	TOTAL WATTAGE OF NEW EQUIPMENT	DIFFERENCE (OLD WATTAGE MINUS NEW)
<i>example: 2-lamp 4-ft T12</i>	100	72	7,200	<i>example: LED ARV2-12/480/8CPT4</i>	120	44	5,280	1,920
SUBTOTAL OLD WATTAGE MINUS NEW								

EQUIPMENT TYPE	(A) INCENTIVE PER UNIT	(B) UNIT	(A x B) INCENTIVE
LED Fixture	\$0.50 per watt reduced	Watts reduced (from worksheet above): _____	
SUBTOTAL			\$

→ If you are installing new LED fixtures where no lighting system exists, complete the following watt reduction worksheet. Use IECC 2015 lighting power densities to determine baseline conditions.

Watt Reduction Worksheet for New LED Fixtures – No Existing Lighting System

Use this worksheet or attach an itemized project plan.

AREA OF ILLUMINATED SPACE (SQ. FEET)	IECC 2015 LIGHTING POWER DENSITY (W/SQ. FOOT)	TOTAL WATTAGE OF BASELINE	TYPE OF NEW FIXTURE TO BE INSTALLED (MODEL NUMBER)	QUANTITY OF NEW EQUIPMENT	WATTAGE OF NEW EQUIPMENT	TOTAL WATTAGE OF NEW EQUIPMENT	DIFFERENCE (OLD WATTAGE MINUS NEW)
SUBTOTAL OLD WATTAGE MINUS NEW							
EQUIPMENT TYPE	(A) INCENTIVE PER UNIT	(B) UNIT	(A x B) INCENTIVE				
LED Fixture	\$0.50 per watt reduced	Watts reduced (from worksheet above): _____					
SUBTOTAL							\$
SECTION I SUBTOTAL							\$

SECTION II: CONTROL SYSTEM AND STRATEGIES

Control System

SPECIFICATIONS

1. Manufacturer's specifications must accompany pre-approval and final applications.
2. The control system must be new and meet the following criteria:
 - System must be DLC listed and meet requirements below
 - System must control new or existing T8/T5 or LED fixtures that meet the applicable specifications set forth in Section I – Fixtures on this worksheet
 - System must have a graphical user interface that is accessible from a computer and/or mobile device
 - System must have network interoperability (e.g., BACNet MS/TP, Zigbee, etc.)
 - To receive M&V bonus, system must have the ability to generate reports that show details such as energy consumption, demand, fixture on/off time, fixture light level (percentage), etc.
 - System must have the ability to show the “real-time” status of the light fixtures (e.g., on/off, dimmed, etc.)
 - All installed sensors must be tied to the central control system
3. The installed control system must apply at least one control strategy. The following is a list of suggested control strategies.

Please check all control strategies being implemented.

- Occupancy sensors with timeout setting controls – Occupancy sensors are installed using passive infrared and/or ultrasonic technology. Sensors should have adjustable timeout settings.
- Dimming (continuous or step) – Fixtures dimmed to light levels less than 70%. Dimming settings are managed by the central control system.
- Daylight harvesting – Photocells are installed to control exterior fixtures; sensors should assess amount of ambient light and adjust fixtures to meet facility illumination requirement.
- Photo controls – Photocells are installed to control exterior fixtures.
- Zone control – At least two (2) zones in a facility with different profiles.
- Scheduling – Lighting is managed based on shifts, operating hours, seasonal changes, etc.
- High-end trimming – Setting a maximum light allowance at less than 100 percent light output.
- User set preference/occupant profiles
- Other (specify): _____

EQUIPMENT TYPE and DEFINITION	UNIT	INCENTIVE
Installation of a new control system with new or existing fixtures that meet applicable fixture specifications. Control system must apply at least one control strategy.	Per watt controlled	\$0.18 per watt controlled

→ Please complete the watts controlled worksheet for new control system on the following page. If you need more room than what is available, you may attach a separate sheet.

Equipment Installation by NALCTP-certified Electrician or Contractor

SPECIFICATIONS

1. To qualify for this incentive, the advanced lighting system must be installed by a qualified team in which at least one (1) member is certified by the National Advanced Lighting Controls Training Program (NALCTP) to install, tune, commission and maintain advanced lighting control systems. A list of NALCTP-qualified electricians and contractors can be found at www.nalctp.org/Illinois.
2. The NALCTP-certified electrician or contractor must be listed as such at www.nalctp.org/Illinois.
3. Timesheets or other proof which indicate a NALCTP-certified electrician or contractor was part of the team that installed the control system must be furnished upon request.

DEFINITION	UNIT	INCENTIVE
Control system installation team includes at least one (1) NALCTP- certified electrician or contractor	NALCTP-certified installation	\$1000
NALCTP INSTALLATION SUBTOTAL		\$
TOTAL INCENTIVE REQUESTED (SECTIONS I and II)		\$

SECTION III: MEASUREMENT AND VERIFICATION (OPTIONAL)

Energy Savings Documented through Measurement and Verification (M&V)

SPECIFICATIONS

Additional incentives are available for verifying the kilowatt-hour (kWh) savings above the calculated target kWh through a trend report generated by the advanced lighting control system. Please complete and submit this worksheet page with the M&V data file after the M&V has been collected.

1. Submit a detailed description of the existing lighting controls with the pre-approval application.
2. The required M&V data file must be provided and the information must be submitted according to the following requirements:
 - Minimum two (2) week period of M&V collection during normal facility operation, which does not include holiday breaks, facility shutdowns or other periods of non-standard operation; depending on the project, the ComEd Energy Efficiency Program team may request a longer M&V period
 - Minimum 15 minute kW interval readings
 - M&V should be provided in a .csv, .xlsx, or .xls file (pdf data files will not be accepted)

EQUIPMENT TYPE and DEFINITION	UNIT	INCENTIVE
Advanced lighting system that achieves kWh savings above a calculated target kWh	Per measured kWh	\$0.10 per kWh above target

A pre-approval application is required; review instructions on the standard and custom incentives pre-approval and final application form. Wait for pre-approval before starting your project.

OPTION 2 – LIGHTING CONTROL SYSTEM ON EXISTING OR NEW FIXTURES THAT DO NOT MEET THE FIXTURE SPECIFICATIONS IN OPTION 1

Use this section to apply for incentives for energy savings resulting from the installation of a control system on existing or new fixtures that do not meet the specifications for fixtures described in Option 1. Note that other ComEd Energy Efficiency Program standard incentives may be available for fixtures that do not meet the Option 1 fixture specifications; see the outdoor and garage lighting incentives worksheet at ComEd.com/BizIncentives for lighting fixture replacement and retrofit incentives.

To receive the incentives available under Option 2, the following requirement must be met, in addition to all measure-specific specifications:

1. A minimum two (2) week post-installation measurement and verification (M&V) period is required. See specifications for M&V below.

Control System

SPECIFICATIONS

1. Manufacturer's specifications must accompany pre-approval and final applications.
2. The control system must be new and meet the following criteria:
 - System must be DLC listed and meet requirements below
 - System must control existing lighting fixtures
 - System must have a graphical user interface that is accessible from a computer and/or mobile device
 - System must have network interoperability (e.g., BACNet MS/TP, Zigbee, etc.)
 - System must have the ability to generate reports that show details such as energy consumption, demand, fixture on/off time, fixture light level (percentage), etc.
 - System must have the ability to show the “real-time” status of the light fixtures (e.g., on/off, dimmed, etc.)
 - All installed sensors must be tied to the central control system
3. The installed control system must apply at least one control strategy. The following is a list of suggested control strategies.

Please check all control strategies being implemented.

- Occupancy sensors with timeout setting controls – Occupancy sensors are installed using passive infrared and/or ultrasonic technology. Sensors should have adjustable timeout settings.
- Dimming (continuous or step) – Fixtures dimmed to light levels less than 70%. Dimming settings are managed by the central control system.
- Daylight harvesting – Photocells are installed to control exterior fixtures; sensors should assess amount of ambient light and adjust fixtures to meet facility illumination requirement.
- Photo controls – Photocells are installed to control exterior fixtures.
- Zone control – At least two (2) zones in a facility with different profiles.
- Scheduling – Lighting is managed based on shifts, operating hours, seasonal changes, etc.
- High-end trimming – Setting a maximum light allowance at less than 100 percent light output.
- User set preference/occupant profiles
- Other (specify): _____

→ **Please complete the tables on the following page. If you need more room than what is available, you may attach a separate sheet.**

Energy Savings Documented through Measurement and Verification (M&V)

SPECIFICATIONS

1. An M&V data file generated by the installed lighting control system must be provided and the information must be submitted according to the following requirements:
 - Submit a detailed description of the existing lighting controls with the pre-approval application.
 - Minimum two (2) week period of M&V collection during normal facility operation, which does not include holiday breaks, facility shutdowns or other periods of non-standard operation; depending on the project, the ComEd Energy Efficiency Program team may request a longer M&V period
 - Minimum 15 minute kW interval readings
 - M&V should be provided in a .csv, .xlsx, or .xls file (pdf data files will not be accepted)
2. Submit M&V data file and any other supporting documentation with your final application for incentive.

DEFINITION	UNIT	INCENTIVE
Energy savings resulting from installation of a control system on existing or new fixtures	Per measured kWh	\$0.07 per kWh

Incentive Calculation

INCENTIVE	Annual energy savings in kWh (D -E)		X \$0.07 =
PAYBACK PERIOD (YEARS)	$\frac{\text{Total project cost}}{\text{Estimated annual energy savings (in dollars)}}$		=
(F) REQUESTED INCENTIVE TOTAL			\$

Equipment Installation by NALCTP-certified Electrician or Contractor

SPECIFICATIONS

1. To qualify for this incentive, the advanced lighting system must be installed by a qualified team in which at least one (1) member is certified by the National Advanced Lighting Controls Training Program (NALCTP) to install, tune, commission and maintain advanced lighting control systems. A list of NALCTP-qualified electricians and contractors can be found at www.nalctp.org/Illinois.
2. The NALCTP-certified electrician or contractor must be listed as such at www.nalctp.org/Illinois.
3. Timesheets or other proof which indicate a NALCTP-certified electrician or contractor was part of the team that installed the control system must be furnished upon request.

DEFINITION	UNIT	INCENTIVE
Control system installation team includes at least one (1) NALCTP- certified electrician or contractor.	NALCTP-certified installation	\$1000
NALCTP INSTALLATION SUBTOTAL		\$
TOTAL INCENTIVE REQUESTED		\$