MEMORANDUM

TO: **IL TRM TECHNICAL ADVISORY COMMITTEE**

FROM: KEITH CRONIN, PROJECT LEAD; SAM DENT, TECHNICAL LEAD

SUBJECT: IL TRM VERSION 15.0:
COMPARISON EXHIBIT OF NON-CONSENSUS TRM UPDATE ISSUES - DRAFT

DATE: **SEPTEMBER 18, 2026**

Cc: CELIA JOHNSON, SAG

This memo documents positions provided for the following issue for which consensus was not reached during the Version 15.0 update cycle:

1. **Impacts of the Clean Lighting Act (HB2363)**
    i. Non-consensus on the adjustment of baseline conditions for commercial lighting measures, submitted by VEIC.

These issues are summarized below, followed by a Comparison Exhibit summarizing the key differences in opinion within the Technical Advisory Committee (TAC) and/or Stakeholder Advisory Committee (SAG). An Appendix is also providing containing the relevant Technical Reference Manual measure '4.5.4 LED Bulbs and Fixtures'.

Impact of the Clean Lighting Act (HB2363)

Issue #1 Summary

During the Version 15.0 TRM update process, VEIC identified language in the Clean Lighting Act (HB2363) as potentially impacting the savings baselines for some commercial lighting measures and raised the potential impact in the Workpaper Check-in Technical Advisory Committee (TAC) call on April 21, 2026. The pertinent language in the Act that would affect measure baselines is as follows:

> *"beginning January 1, 2027, no person shall sell, offer to sell, or distribute in the State as a new manufactured product a pin-base type compact fluorescent lamp or a linear fluorescent lamp" (Sec. 21.8(d)).*

As per the current v14 Illinois Technical Reference Manual (TRM), section '4.5.4 LED Bulbs and Fixtures' provided in Appendix A, since 1/1/2026 no savings have been claimed for LED lamps, except via direct install programs. However, many of the remaining commercial fixture measures, for example Linear Replacement Lamps (TLEDs), LED Troffers and Ambient fixtures, use linear fluorescent lamps as the baseline.

The Act also includes the following language:

> *"Nothing in this Section shall be interpreted to limit the ability of a utility to offer energy efficient lighting, rebates, or lamp recycling services, or to claim persisting energy savings based on fluorescent technology resulting from such programs, through its energy conservation and optimization plans approved by the Illinois Commerce Commission under Section 8-103B of the Public Utilities Act" (Sec. 21.8(f)).*

VEIC highlighted the lack of clarity in the interpretation of this additional language, and stakeholders highlighted the significant potential impact on portfolio savings if fluorescent lighting baselines were no longer viable – essentially ending the continued support of many of the LED fixture measures. VEIC opted to table further discussion on the topic until after utility program plans for 2027 were issued, expected June 1, 2026.

On June 11, 2026, VEIC convened a working group to discuss interpretations of the Act and how such interpretations may impact commercial lighting measure baselines. Working group members were unable to explicitly provide detail on the origin or legislative intention of the language relating to 'persisting energy savings', though it was noted such language was critical for the passage of the Act. Positions stated by working group members about the intent of the Act and its impact on utility energy savings claims varied by a wide margin; some stakeholders argued that there should be no impact at all on the TRM or the ability of programs to claim savings with linear fluorescent baselines, while others argued that the language refers only to the permissible continuation of savings through early replacement or direct install programs (i.e. retrofitting existing fluorescent fixtures with LEDs), and that ongoing lifetime savings of LED fixtures installed in past years should continue to be claimed, but that programs relating to purchases of new LED fixtures in place of new less efficient alternatives (e.g. through mid stream, retail or new construction) should now end.

As a next step, the group agreed to a VEIC proposal to collect written statements from interested parties to assess whether consensus might be reached in time to update commercial lighting measures for TRM version 15.

To collect written statements, VEIC posed the following questions:

> **For projects installed on or after January 1st, 2027, should fluorescent technology continue to serve as the prospective baseline for any commercial lighting measures, and if so, on what basis?**
>
> **Please explain how your recommended technical treatment relates to the savings-preservation language in Sec. 21.8(f), without offering a legal conclusion, and in particular to distinguish between (i) the preservation of persisting savings from prior installations, (ii) the continued provision of rebates, recycling, and lawful targeted lighting services, and (iii) the eligibility of new prospective savings claims after the sales prohibition takes effect.**

See Comparison Exhibit 1 below for Stakeholder responses.

There is agreement from all sides that program designs involving early replacement and direct install of LEDs replacing existing fluorescent lamps should be able to continue to claim savings.

However, with no clear agreement and significant differences in the Act's reach beyond that, the TAC is seeking clarity on whether the Act should impact the baseline, and therefore ability of the programs to continue support for, LED fixture measures that are delivered through other program delivery channels (e.g., Midstream, Retail, etc.).

There are additional market considerations that the TAC will need to consider, for example the potential for continued purchasing of fluorescent fixtures either out of State or online, the sell through of remaining stock inventory and the uncertainties on the enforcement of the Act. To further inform the TAC and to assess how the market responds to the fluorescent ban, stakeholders have committed to performing market evaluations early in 2027.

VEIC proposes delaying any baseline changes in the TRM in v15 (effective through 2027) while this additional evaluation is performed and to allow clarity on the Act's intent be provided by the Illinois Commerce Commission. This will allow informed discussion and resolution within the TAC in 2027 to inform v16 (2028) TRM updates.

Comparison Exhibit: Issue #1

Illinois Statewide TRM Version 15.0 Update: Comparison Exhibit of Non-Consensus Issues		
Policy Question: For projects installed on or after January 1st, 2027, should fluorescent technology continue to serve as the prospective baseline for any commercial lighting measures, and if so, on what basis?		
Position	**Rationale**	**Supporting Stakeholders**
VEIC	VEIC proposes that no changes be made to commercial lighting measures in TRM v15 in response to the Clean Lighting Act. This would preserve measures as they are for 2027. Data could be collected early in the 2027 TRM update cycle to evaluate how the market is responding to the fluorescent lighting sales ban directed by the Act. Once the TAC has received direction from the Illinois Commerce Commission on the extent and detail of the Act's language, the TAC will then determine the appropriate impact to baselines in the TRM going forward.	
ComEd	Yes, the baseline must remain unchanged. Applying the plain language of the statue and reading its provisions as a whole so that all sections operate harmoniously-consistent with well-established tenets of statutory interpretation-supports this conclusion. The law is clear that nothing, including the prohibition on new sales of fluorescent lighting, is to limit using that baseline. 415 ILCS 5/21.8 (f). The prohibition on the future sales of fluorescent lamps establishes a change in market availability, not a change in the baseline used for calculating or assessing energy savings. Section 21.8(f) expressly preserves the utility's ability to claim persisting savings, which confirms the Legislature's intent not to modify or disrupt the potential to achieve savings. Accordingly, when the two statutory provisions are read together, the result is straightforward: new sales of pin-based type compact and linear fluorescent lamps are now prohibited but utilities will still use fluorescent lamps as the baseline (in the IL-TRM) for calculating energy savings. Interpreting the sales prohibition to alter the baseline would conflict with the express preservation of persisting savings in Section 21.8(f) and would fail to give effect to all provisions of the statute. Although the Clean Lighting Act will influence future market adoption, Illinois continues to have a substantial installed base of linear fluorescent lighting. Recent (2024) statewide baseline research found that linear fluorescent lighting remains prevalent across the Illinois nonresidential sector. The study found that more than 90% of nonresidential facilities contain linear lighting systems and well over half (63%) of those facilities remain fluorescent (43% T8 fluorescent and 20% T12 fluorescent). The study projects new savings opportunities related to LED Linear Lamps to persist well past 2030. While the Clean Lighting act passed after this study was completed, these findings suggest that a meaningful portion of the market continues to operate fluorescent systems and supports the continued existence of early replacement opportunities. Consequently, a transition in product availability does not necessarily indicate that the appropriate TRM baseline has already shifted to LED. Questions regarding increased free ridership resulting from the legislation are more appropriately addressed through evaluation and net-to-gross processes. Stakeholders acknowledged that the TRM Working Group is not responsible for establishing net-to-gross assumptions. Even then, though, the law must be followed. The law is clear that nothing [in the Clean Lighting Act], including increased free ridership or changes to the net-to-gross assumptions resulting from the prohibitions of the Clean Lighting Act, can limit a utility claiming savings for its EE portfolio from energy savings based on fluorescent technology. Therefore, concerns regarding market effects are inappropriate for this venue, and ultimately, are not to be taken into account at all, when following the law.	

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Policy Question: For projects installed on or after January 1st, 2027, should fluorescent technology continue to serve as the prospective baseline for any commercial lighting measures, and if so, on what basis?		
Position	**Rationale**	**Supporting Stakeholders**
Ameren Illinois	Fluorescent technology should continue to serve as the prospective baseline for applicable commercial lighting measures installed on or after January 1, 2027. The Clean Lighting Act expressly preserves the ability of utilities to claim energy savings based on fluorescent technology through Illinois Commerce Commission-approved energy efficiency plans. Section 21.8(f) states that "nothing in this Section shall be interpreted to limit the ability of a utility to ... claim persisting energy savings based on fluorescent technology." This language demonstrates a clear legislative intent to preserve fluorescent-based savings claims notwithstanding the Act's restrictions on the sale and distribution of certain fluorescent lamps. Ameren Illinois maintains a distinction between the statutory prohibition on the sale of certain fluorescent lamps and the continued existence of fluorescent technology as a baseline condition. The Act does not prohibit the possession, operation, maintenance, or continued use of existing fluorescent systems, nor does it state that fluorescent technology can no longer be recognized as a baseline for energy efficiency purposes. Consequently, fluorescent systems are expected to remain in operation throughout the commercial sector well beyond January 1, 2027. Additionally, commercial customers and distributors are expected to maintain inventories of fluorescent lamps and related replacement components through normal stocking practices and purchases made prior to the sales prohibition. These inventories will continue to support ongoing operation of fluorescent systems after 2027 and reinforce the reasonableness of retaining fluorescent baseline assumptions. Further, while the Act restricts sales within Illinois, it does not eliminate the availability of fluorescent products from suppliers located outside the state. Commercial customers, particularly those operating across multiple states, may continue to obtain fluorescent products through national procurement channels and cross-border purchases. As a result, the sales prohibition should not be treated as a de facto efficiency standard requiring an immediate baseline shift. Consistent with longstanding TRM practice, baseline assumptions should reflect actual market conditions and realistic customer alternatives. Because fluorescent technology will remain present, operable, and reasonably available through existing inventories, stocking practices, and out-of-state procurement channels, fluorescent technology should continue to serve as the prospective baseline unless and until there is clear evidence that such baseline conditions no longer represent a realistic customer alternative.	
Guidehouse	There are still several important technical questions that would benefit from additional research before making a decision on baseline treatment in the TRM. In particular, there is uncertainty around the future availability of fluorescent products through existing inventory and cross-border purchases, as well as the impacts on baseline assumptions, savings estimates, and NTG values. We recommend reviewing existing research, including the IL baseline study, and considering whether additional research is needed to better understand market availability, early replacement dynamics, and resulting savings impacts. We also note that Illinois previously used transition-period approaches during implementation of EISA lighting requirements, which may provide useful context for the current discussion. Given the remaining uncertainties, we believe a research-based approach is the most appropriate path forward.	
Office of the Illinois Attorney General	For projects installed on or after January 1, 2027, fluorescent technology may continue to serve as the baseline exclusively for lighting measures that are early replacement and direct install. While the statute prohibits the sale, offer of sale, or distribution of new pin-base type compact fluorescent lamps and linear fluorescent lamps, it does not prohibit the ability of a utility to offer energy efficient lighting. 415 ILCS 5/21.8 (c)-(d), (e) 8. Replacement of fluorescent technology qualifies as energy efficient lighting if it is early replacement and direct install,	

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Position	**Rationale**	**Supporting Stakeholders**
	and, as such, fluorescent technology may continue to serve as the baseline under these limited circumstances. Fluorescent technology as the baseline for savings does not qualify as energy efficient lighting under any other circumstances.	
Natural Resources Defense Council	NRDC takes the position that the Illinois Clean Lighting Act should change the assumed baseline for various approaches to promoting commercial LED bulbs and fixtures. In particular, it should make the baseline for "time-of-sale" or "time-of-natural-replacement" situations a standard new LED technology that meets the law's minimum efficiency requirements. The rationale is that any customer who was planning to purchase a bulb or fixture absent utility program influence would have to purchase an LED. That said, NRDC also believes that there are conditions under which it would be appropriate to assume a fluorescent baseline for the purpose of calculating savings. A fluorescent baseline would be appropriate in cases in which the customer would not have replaced an existing lamp or fixture but is influenced by a utility program to do so – i.e., "early replacement" situations. Generally speaking, this position would suggest that midstream or other point-of-purchase rebate programs would have an LED baseline and that direct install program installations where the existing lamp is fluorescent would have a fluorescent baseline as an early replacement measure. The exception to this practice would be if evaluation can show that a portion of purchases through midstream or other point-of-purchase channels are (A) early replacements that are (B) caused by the rebate the utility offers. NRDC believes that this position is consistent with the statute, including the language that states that "nothing in this Section shall be interpreted to limit the ability of a utility to offer efficient lighting, rebates, or recycling services, or to claim persisting savings based on fluorescent technology resulting from such programs, through its energy conservation and optimization plans approved by the Illinois Commerce Commission…", for the following reasons: • Utilities would still be permitted to offer efficient lighting rebates; they would just be more limited in the scenarios in which such offers would generate substantial savings. Even in the time-of-sale market, there may be savings potential associated with the most efficient LED technology and/or products with controls that provide additional savings. • The reference to claiming savings relative to fluorescent technology is with regards to "persisting savings." With the passage of Illinois' 2026 Clean and Reliable Grid Affordability Act (CRGA), utility savings goals are no longer expressed in terms of "persisting savings", and the changes to Section 8-103B of the Public Utilities Act under CRGA were not accompanied by any changes to the Clean Lighting Act language. Thus, one could reasonably argue that the language does not apply to CRGA's incremental annual savings goals. • Even if CRGA had not passed, NRDC interprets the purpose of the language to mean that savings from LED products rebated prior to passage of the Clean Lighting Act could not be retroactively changed (e.g., changing the multi-year stream of savings from an early replacement of a lamp in 2024 so that it is providing less savings in 2030 – or whenever an assumed baseline shift would have been assumed to happen) rather than to allow claiming of savings indefinitely into the future relative to a baseline precluded by law. • The language references savings claimed through "plans approved by the Illinois Commerce Commission." NRDC views this qualifying language as important, as it requires an ICC check on what kinds of programs would be appropriate. We find it hard to believe that the ICC would find it prudent for utilities to spend ratepayer dollars on rebates for products that customers would have to buy without utility influence (let alone for such rebates to lead to large volumes of extremely low cost savings which ratepayers would pay for again in the form of increased returns on equity on EE spending). • Under the interpretation that utilities could indefinitely claim savings relative to a fluorescent for all time-of-natural-replacement purchases of LEDs, utilities could offer midstream programs that provided extremely low rebates – even lower than past midstream	

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Position	**Rationale**	**Supporting Stakeholders**
	rebates for TLEDs – and claim savings for every single LED lamp purchased in the market (which would be a much larger number than in the past because the law requires that all sales would have to be LED). Utilities may argue that is not what they plan to do, but their legal interpretation of the statute would allow it. It is hard to imagine that being the legislative intent.	

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Position	**Rationale**	**Supporting Stakeholders**
ComEd	The law does not make the distinctions presented by VEIC; rather, it is clear that nothing shall limit utility savings relative to fluorescent lamps, regardless of installation (prior, current, or future) time periods. The IL-TRM may not be updated based on the prohibitions in the Clean Lighting Act, and there are no other reasons to update the baselines, now or in the future.	
Ameren Illinois	Ameren Illinois' recommended technical treatment recognizes three related but distinct concepts reflected in Section 21.8(f). First, persisting savings from prior installations should continue to be recognized for the duration of their established measure lives. Second, the statute contemplates the continued provision of lighting rebates, recycling services, and other lighting-related program offerings, indicating that fluorescent technology remains relevant within energy efficiency programs following implementation of the sales prohibition. Third, with respect to new prospective savings claims, the sales prohibition does not necessarily eliminate fluorescent technology as a reasonable baseline assumption. Existing fluorescent systems will remain in operation for many years, customers are likely to maintain inventories through normal stocking practices, and fluorescent products may continue to be available through national procurement channels and out-of-state suppliers. As a result, fluorescent technology may continue to represent a realistic customer alternative and baseline condition after January 1, 2027. Accordingly, baseline assumptions should continue to be based on actual market conditions and realistic customer options rather than on the existence of the sales prohibition alone.	
Office of the Illinois Attorney General	Fluorescent technology may continue to serve as the baseline for measures installed before January 1, 2027 for the purposes of persisting savings. Utilities may not continue to provide rebates, recycling, or targeted lighting services using fluorescent technology as the baseline after January 1, 2027 except under the limited circumstances described in the previous response. New savings may be claimed after the sales prohibition is effective under the limited circumstances described in the previous response. Additionally, the AG offers the following question: May a mechanism similar to the midlife adjustment that was developed for the phase-out of T12 technologies be utilized to navigate the phase-out of fluorescents?	

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Position	**Rationale**	**Supporting Stakeholders**

APPENDIX A: TRM Characterization

4.5.4 LED Bulbs and Fixtures

DESCRIPTION

This characterization provides savings assumptions for a variety of LED lamps including Omnidirectional (e.g., A-Type lamps), Decorative (e.g., Globes and Torpedoes), Directional (PAR Lamps, Reflectors, MR16), Mogul (E39, EX39), TLEDs and fixtures including refrigerated case, recessed and outdoor/garage fixtures.

If the implementation strategy does not allow for the installation location to be known, 100% Commercial targeted programs and 0% Residential targeted programs for LED Fixtures, Mogul LEDs and TLEDs should be used.[1]

This measure was developed to be applicable to the following program types: TOS, NC, EREP, DI, KITS.

If applied to other program types, the measure savings should be verified.

DEFINITION OF EFFICIENT EQUIPMENT

For this characterization to apply, new lamps should meet performance specifications equivalent to EnergyStar Lamps V2.1 Specification, as amended (effective June 2, 2020). EnergyStar no longer lists new lamps as of December 31, 2024. Fixtures must meet current ENERGY STAR[2] specifications where appropriate (Downlights v1.0 Final Specification and Luminaires v2.2 Final Specification) or be listed on the Design Lights Consortium Qualifying Product List.

DEFINITION OF BASELINE EQUIPMENT

The Standard Rx Program will assume a Time of Sale baseline for all one to one replacements, and early replacement for lighting redesign and early retirement for delamping.

For early replacement, the baseline is the existing fixture being replaced.

If the existing fixture is a T12: In July 14, 2012, Federal Standards were enacted that were expected to eliminate T-12s as an option for linear fluorescent fixtures. Through v3.0 of the TRM, it was assumed that the T-12 would no longer be baseline for retrofits from 1/1/2016. However, due to significant loopholes in the legislation, T-12 compliant product is still freely available and in Illinois T-12s continue to hold a significant share of the existing and replacement lamp market. From v8.0 on, a midlife adjustment is applied after the remaining useful life of the T12 fixture (calculated as 1/3 of the 40,000 hour ballast life/ hours). This assumes that T12 replacement lamps will continue to be available until then. See 'Early Replacement Measures with T12 baseline' section.

For Time of Sale, refer to the baseline tables at the end of this measure.

General Service Screw Based Lamps and ENERGY STAR fixtures: In 2012, Federal legislation stemming from the Energy Independence and Security Act of 2007 (EIAS) required all general-purpose light bulbs (defined as omni-directional or standard A-lamps) between 40 watts and 100 watts to have ~30% increased efficiency, essentially

[1] Based on ComEd's Instant Discounts program CY2018, CY2019 and CY2020 (Rounds 1 and 2) Purchaser Survey analysis. See ComEd Instant Discounts Enduser Survey TRM Updates.xlsx. For Residential installations, hours of use assumptions from '5.5.6 LED Downlights' should be used for LED fixtures and '5.5.8 LED Screw Based Omnidirectional Bulbs' should be used for LED bulbs.

[2] In the event that the ENERGY STAR program is ended, the last effective ENERGY STAR specification should continue to be used through the effective period of this TRM.

phasing out standard incandescent technology. In 2012, the 100 w lamp standards went in to effect followed by the 75 w lamp standards in 2013 and 60 w and 40 w lamps in 2014.

Additionally, an EISA backstop provision was included that would require replacement baseline lamps to meet an efficacy requirement of 45 lumens/watt or higher beginning on 1/1/2020.

However, in December 2019, DOE issued a final determination for General Service Incandescent Lamps (GSILs), finding that this more stringent standard was not economically justified. However, in May 2022 DOE reversed this decision by issuing a Final rule for both the broadened General Service Lamp definition as well as the implementation of the 45 lumen per watt backstop. DOE stated that it will use its enforcement discretion to minimize impacts on the supply chain and effectively allow companies to continue the manufacture and import of noncompliant bulbs through the remainder of 2022, and allow retailers to continue selling them with limited enforcement until July 2023.

As of 1/1/2026, no savings are claimed for screw based LED lamps or ENERGY STAR fixtures due to the EISA backstop unless installed via direct install programs. Direct Install programs where it can be shown that the LED is replacing working inefficient lighting should continue to use the existing inefficient lighting as baseline and assume a measure life of 2 years.

DEEMED LIFETIME OF EFFICIENT EQUIPMENT

For interior fixtures, and Mogul LEDs, the lifetime is the life of the product, at the reported operating hours (lamp life in hours divided by operating hours per year – see reference table "LED component Costs and Lifetime"), capped at 15 years (GDS Measure Life Report, June 2007).

For exterior fixtures, the lifetime is the life of the product, at the reported operating hours (lamp life in hours divided by operating hours per year), capped at 25 years. Default lifetimes are assumed to be 16 years for Dusk-to-Dawn (4303 hours) applications, or 25 years for Dusk-to-Business-Close Year Round (1609 hours) and Dusk-to-Business-Close Seasonal (<1000 hours).[3]

For lamps and LED Downlight Fixtures with a baseline impacted by the EISA backstop as indicated in tables below the measure life is assumed to be two years for direct install programs.

For lamps not impacted by the EISA backstop, the lifetime is calculated as the rated lifetime of the product (actual if available, otherwise assume 20,000 hours for Omnidirectional, 17,000 hours for decorative and 25,000 for directional lamps based on average rated life of lamps on the ENERGY STAR Qualified Products list (accessed 6/16/2020)) divided by the reported operating hours, capped at 10 years.[4]

DEEMED MEASURE COST

Wherever possible, actual incremental costs should be used. Refer to reference table “LED component Cost & Lifetime” for defaults.

LOADSHAPE

Loadshape C06 - Commercial Indoor Lighting

Loadshape C07 - Grocery/Conv. Store Indoor Lighting

Loadshape C08 - Hospital Indoor Lighting

Loadshape C09 - Office Indoor Lighting

Loadshape C10 - Restaurant Indoor Lighting

Loadshape C11 - Retail Indoor Lighting

Loadshape C12 - Warehouse Indoor Lighting

[3] Exterior fixture measure lives are based upon review of the typical rated life of the fixtures, divided by the hours of use assumption and applying a derating factor of 15% to account for potential impacts from external installation (as proposed in a Guidehouse EUL methodology recommendation for Street Lights).

[4] Based on recommendation in the Dunsky Energy Consulting, Livingston Energy Innovations and Opinion Dynamics Corporation; NEEP Emerging Technology Research Report, p 6-18.

Loadshape C13 - K-12 School Indoor Lighting
Loadshape C14 - Indust. 1-shift (8/5) (e.g., comp. air, lights)
Loadshape C15 - Indust. 2-shift (16/5) (e.g., comp. air, lights)
Loadshape C16 - Indust. 3-shift (24/5) (e.g., comp. air, lights)
Loadshape C17 - Indust. 4-shift (24/7) (e.g., comp. air, lights)
Loadshape C18 - Industrial Indoor Lighting
Loadshape C19 - Industrial Outdoor Lighting
Loadshape C20 - Commercial Outdoor Lighting
Loadshape C60 – Non-Residential Agriculture Lighting – 6 Hours
Loadshape C61 – Non-Residential Agriculture Lighting – 8 Hours
Loadshape C62 – Non-Residential Agriculture Lighting – 12 Hours
Loadshape C63 – Non-Residential Dairy Long Day Lighting – 17 Hours
Loadshape C64 – Non-Residential Agriculture Lighting – 24 Hours

COINCIDENCE FACTOR

The summer peak coincidence factor for this measure is dependent on the location type. Values are provided for each building type in the reference section below.

Algorithm

CALCULATION OF SAVINGS

ELECTRIC ENERGY SAVINGS

$$\Delta kWh = ((Watts_{base} - Watts_{EE})/1{,}000) * Hours * WHF_e * ISR * (1 - Leakage)$$

Where:

$Watts_{base}$ = Input wattage of the existing (for early replacement) or baseline system. Reference the "LED New and Baseline Assumptions" table for default values.

$Watts_{EE}$ = Actual wattage of LED purchased / installed. If unknown, use default provided below:

For ENERGY STAR rated lamps the following lumen equivalence tables should be used:[5]

Omnidirectional Lamps - ENERGY STAR Minimum Luminous Efficacy = 80Lm/W for <90 CRI lamps and 70Lm/W for >=90 CRI lamps.

Minimum Lumens	Maximum Lumens	LED Wattage (WattsEE)	Baseline (WattsBase)	Delta Watts (WattsEE)	Impacted by EISA Backstop
120	309	4.0	25	21.0	No
310	399	4.0	25	21.0	Yes
400	749	6.6	29	22.4	Yes
750	899	9.6	43	33.4	Yes
900	1,399	13.1	53	39.9	Yes
1,400	1,999	16.0	72	56.0	Yes
2,000	2,999	21.8	150	128.2	Yes

[5] See file "LED Lamp Updates 2021-06-09" for details on Guidehouse lamp wattage calculations based on equivalent baseline wattage and LED wattage of available ENERGY STAR product

Minimum Lumens	Maximum Lumens	LED Wattage (WattsEE)	Baseline (WattsBase)	Delta Watts (WattsEE)	Impacted by EISA Backstop
3,000	3,299	28.9	200	171.1	Yes
3,300	3,999	28.9	200	171.1	No
4,000	5,000	35.7	300	264.3	No

Decorative Lamps - ENERGY STAR Minimum Luminous Efficacy = 65Lm/W for all lamps

Bulb Type	Minimum Lumens	Maximum Lumens	LED Wattage ($Watts_{EE}$)	Baseline ($Watts_{Base}$)	Delta Watts (WattsEE)	Impacted by EISA Backstop
Omni-Directional 3-Way	1,100	1,999	14.7	100	85.3	Yes
	2,000	2,700	22.6	150	127.4	Yes
Globe (medium and intermediate bases less than 750 lumens)	150	309	3.0	25	22	No
	310	349	3.0	25	22	Yes
	350	499	4.7	40	35.3	Yes
	500	574	5.7	60	54.3	Yes
	575	649	6.5	75	68.5	Yes
	650	1,000	8.2	100	91.8	Yes
Globe (candelabra bases less than 1050 lumens)	150	309	3.5	25	21.5	No
	310	349	3.5	25	21.5	Yes
	350	499	4.4	40	35.6	Yes
	500	574	5.5	60	54.5	Yes
Decorative (Shapes B, BA, C, CA, DC, F, G, medium and intermediate bases less than 750 lumens)	160	299	2.6	25	22.4	No
	300	309	4.3	40	35.7	No
	310	499	4.3	40	35.7	Yes
	500	800	5.8	60	54.2	Yes
Decorative (Shapes B, BA, C, CA, DC, F, G, T candelabra bases less than 1050 lumens)	120	159	1.5	15	13.5	No
	160	299	2.7	25	22.3	No
	300	309	4.2	40	35.8	No
	310	499	4.2	40	35.8	Yes
	500	650	5.5	60	54.5	Yes
Decorative (Shape ST)	250	309	6.5	40	33.5	No
	310	499	6.5	40	33.5	Yes
	500	999	8.8	60	51.2	Yes
	1000	1500	10.0	100	90.0	Yes
Decorative (Shape S)	50	75	1.0	11	10.0	No
	100	120	1.2	15	13.8	No

Bulb Type	Minimum Lumens	Maximum Lumens	LED Wattage ($Watts_{EE}$)	Baseline ($Watts_{Base}$)	Delta Watts (WattsEE)	Impacted by EISA Backstop
	120	309	2.25	25	22.8	No
	310	340	2.25	25	22.8	Yes

Directional Lamps - ENERGY STAR Minimum Luminous Efficacy = 70Lm/W for <90 CRI lamps and 61 Lm/W for >=90CRI lamps.

For Directional R, BR, ER, PAR, MR and MRX lamp types. Note the Center Beam Candle Power (CBCP) methodology described below the default table is the preferred methodology for PAR, MR and MRX lamps and should be used where data allows. Defaults for use when this information is not available are provided below:

Bulb Type	Minimum Lumens	Maximum Lumens	LED Wattage ($Watts_{EE}$)	Baseline ($Watts_{Base}$)	Delta Watts (WattsEE)	Impacted by EISA Backstop
Reflector lamp types with medium screw bases (PAR20, PAR30(S,L), PAR38, R40, etc.) w/ diameter >2.25" (*see exceptions below)	400	649	7.0	50	43	Yes
	650	899	10.7	75	64.3	Yes
	900	1,049	13.9	90	76.1	Yes
	1,050	1,199	13.8	100	86.2	Yes
	1,200	1,499	15.9	120	104.1	Yes
	1,500	1,999	18.9	150	131.1	Yes
	2,000	3,299	27.3	250	222.7	Yes
	3,300	4,200	27.3	250	222.7	No
Reflector lamp types with medium screw bases (PAR16, R14, R16, etc.) w/ diameter <2.25" (*see exceptions below)	280	309	4.6	35	30.4	No
	310	374	4.6	35	30.4	Yes
	375	600	6.4	50	43.6	Yes
*BR30, BR40, or ER40	650	949	9.3	65	55.7	Yes
	950	1,099	12.7	75	62.3	Yes
	1,100	1,399	14.4	85	70.6	Yes
	1,400	1,600	16.6	100	83.4	Yes
	1,601	1,800	22.2	120	97.8	Yes
*R20	450	524	6.0	40	34.0	Yes
	525	750	7.1	45	37.9	Yes
*MR16	250	309	3.8	20.0	16.2	No
	310	324	3.8	20.0	16.2	Yes
	325	369	4.8	25.0	20.2	Yes
	370	400	4.9	25.0	20.1	Yes

For PAR, MR, and MRX Lamps Types:

For these highly focused directional lamp types, it is necessary to have Center Beam Candle Power (CBCP) and beam angle measurements to accurately estimate the equivalent baseline wattage. The formula below

is based on the Energy Star Center Beam Candle Power tool.[6] If CBCP and beam angle information are not available or if the equation below returns a negative value (or undefined), use the manufacturer's recommended baseline wattage equivalent.[7]

$$\text{Wattsbase} = 375.1 - 4.355(D) - \sqrt{227{,}800 - 937.9(D) - 0.9903(D^2) - 1479(BA) - 12.02(D * BA) + 14.69(BA^2) - 16{,}720 * \ln(CBCP)}$$

Where:

D = Bulb diameter (e.g. for PAR20 D = 20)

BA = Beam angle

CBCP = Center beam candle power

The result of the equation above should be rounded DOWN to the nearest wattage established by Energy Star:

Diameter	Permitted Wattages
16	20, 35, 40, 45, 50, 60, 75
20	50
30S	40, 45, 50, 60, 75
30L	50, 75
38	40, 45, 50, 55, 60, 65, 75, 85, 90, 100, 120, 150, 250

Additional bulb types:

Bulb Type	Minimum Lumens	Maximum Lumens	LED Wattage ($Watts_{EE}$)	Baseline ($Watts_{Base}$)	Delta Watts (WattsEE)	Impacted by EISA Backstop
Dimmable Twist, Globe (less than 5" in diameter and > 749 lumens), candle (shapes B, BA, CA > 749 lumens), Candelabra Base Lamps (>1049 lumens), Intermediate Base Lamps (>749 lumens)	120	309	4.0	25	21.0	No
	310	399	4.0	25	21.0	Yes
	400	749	6.6	29	22.4	Yes
	750	899	9.6	43	33.4	Yes
	900	1,399	13.1	53	39.9	Yes
	1,400	1,999	16.0	72	56.0	Yes

Hours = Average hours of use per year are provided in the Reference Table in Section 4.5 for each building type. For Mogul LEDs, use fixture annual operating hours. If unknown, use the Miscellaneous value.

WHFe = Waste heat factor for energy to account for cooling energy savings from efficient lighting are provided below for each building type in the Referecne Table in Section 4.5. If unknown, use the Miscellaneous value.

[6] ENERGY STAR Lamps Center Beam Intensity Benchmark Tool and Calculator

[7] The Energy Star Center Beam Candle Power tool does not accurately model baseline wattages for lamps with certain bulb characteristic combinations – specifically for lamps with very high CBCP.

ISR = In Service Rate -the percentage of units rebated that actually get installed.

=100% if application form completed with sign off that equipment is not placed into storage.[8] If sign off form not completed, assume the following ISR assumptions, if program survey data is not available:

Type	Lifetime In Service Rate (ISR)[9]
LED Bulbs	97.6%[10]
Mogul LEDs	97.9%[11]
LED Fixtures (Energy Star Fixtures)	97.9%[12]
Efficiency Kits	92.4%[13]

Type	Weighted Average 1st year In Service Rate (ISR)	2nd year Installations	3rd year Installations	Final Lifetime In Service Rate
TLEDs	83.1%[14]	8.1%	6.8%	98.0%

Leakage = Adjustment to account for the percentage of program bulbs that move out (and in if deemed appropriate)[15] of the Utility Jurisdiction.

Midstream (TOS) Lighting programs = Use deemed assumptions below:[16]

[8] Illinois evaluation of PY1 through PY3 has not found that fixtures or lamps placed into storage to be a significant enough issue to warrant including an "In-Service Rate" when commercial customers complete an application form.

[9] In Service Rates now represent the lifetime In Service Rates with the second and third year installations discounted by the Real Discount Rate of 0.46%. Lifetime ISR assumptions for efficiency kits are based upon Residenital direct mailed kits. For all other programs Tthe 98% Lifetime ISR assumption is based upon the standard CFL measure in the absence of any better reference. This value is based upon review of two evaluations:
'Nexus Market Research, RLW Analytics and GDS Associates study; "New England Residential Lighting Markdown Impact Evaluation, January 20, 2009' and 'KEMA Inc, Feb 2010, Final Evaluation Report:, Upstream Lighting Program, Volume 1.' This implies that only 2% of bulbs purchased are never installed. The second and third year installations are based upon Ameren analysis of the Californian KEMA study showing that 54% of future installs occur in year 2 and 46% in year 3.

[10] Based on ComEd's Instant Discounts program CY2019 and CY2020 (Rounds 1 and 2) Purchaser Survey analysis. See ComEd Instant Discounts Enduser Survey TRM Updates.xlsx

[11] Based on survey data from participants in AIC's 2022 Midstream Lighting channel. See AIC Midstream Lighting – Mogul ISR Calculations.xlsx

[12] Based on ComEd's Instant Discounts program CY2019 and CY2020 (Rounds 1 and 2) Purchaser Survey analysis. See ComEd Instant Discounts Enduser Survey TRM Updates.xlsx

[13] First year ISR is average ISR from CY2018, CY2019 and CY2020 ComEd Small Business Kit participant installation surveys. Please see file "SB Kits Survey Analysis TRMv10 Support.xlsx"

[14] Based on ComEd's Instant Discounts program CY2019 and CY2020 (Rounds 1 and 2) Purchaser Survey analysis. See ComEd Instant Discounts Enduser Survey TRM Updates.xlsx

[15] Leakage in is only appropriate to credit to IL utility program savings if it is reasonably expected that the IL utility program marketing efforts played an important role in influencing customer to purchase the light bulbs. Furthermore, consideration that such customers might be free riders should be addressed. If leakage in is assessed, efforts should be made to ensure no double counting of savings occurs if the evaluation is estimating both leakage in and spillover savings of light bulbs.

[16] Leakage rate is based upon review of PY9-CY2021 evaluations from ComEd.

	ComEd:	0.31%
	Ameren:	0%[17]
All other programs		= 0%

Mid Life Baseline Adjustment

Early Replacement Measures with T12 Baseline

For early replacement measures replacing existing T12 fixtures the full savings (as calculated above in the Algorithm section) will be claimed for the remaining useful life of the T12 fixture. This should be calculated as follows:

RUL of existing T12 fixture = $(1/3 * 40{,}000)/Hours$

A savings adjustment should then be applied to the annual savings for the remainder of the measure life. The adjustment factor to be applied for each T12 installation is 57%.[18]

For example, for an existing 68W T12 fixture in a college is replaced by a 3000 lumen LED 2x2 Recessed Light Fixture (25.4W), a mid life adjustment of 57% should be applied after (1/3 * 40000)/3395 = 3.9 years.

HEATING PENALTY

If electrically heated building:

$$\Delta kWh_{heatpenalty}[19] = (((WattsBase - WattsEE)/1000) * ISR * Hours * -IFkWh$$

Where:

IFkWh = Lighting-HVAC Interation Factor for electric heating impacts; this factor represents the increased electric space heating requirements due to the reduction of waste heat rejected by the efficent lighting. Values are provided in the Reference Table in Section 4.5. If unknown, use the Miscellaneous value.

For example, a 9W LED omnidirectional lamp, 450 lumens, is installed in a heat pump heated mid rise office and sign off form provided:

$\Delta kWh_{heatpenalty}$ = ((29-6.7)/1,000)*1.0*3088* -0.164

= - 11.3 kWh

DEFERRED INSTALLS

As presented above, if a sign off form is not completed the characterization assumes that a percentage of T-LED bulbs purchased are not installed until Year 2 and Year 3 (see ISR assumption above). The Illinois Technical Advisory Committee has determined the following methodology for calculating the savings of these future installs.

[17] Per Ameren staff, all incentivized non-residential LED bulbs and fixtures are required to show proof of being an Ameren customer and thus the leakage is 0%.

[18] The appropriate T12 midlife adjustment factor was developed by the TAC Lighting Working Group. The results of a 2019 ComEd study provided survey response data on the planned replacement upon the burnout of a T12 ballast. This was adjusted by first year NTG to remove first year freeriders and therefore estimate what the non-freerider population would do at the end of T12 life. See "Linear Forecast Workbook_2020.xls" for information on calculation.

[19] Negative value because this is an increase in heating consumption due to the efficient lighting.

Year 1 (Purchase Year) installs:	Characterized using assumptions provided above or evaluated assumptions if available.
Year 2 and 3 installs:	Characterized using delta watts assumption and hours of use from the Install Year, i.e., the actual deemed (or evaluated if available) assumptions active in Year 2 and 3 should be applied. The NTG factor for the Purchase Year should be applied.

SUMMER COINCIDENT PEAK DEMAND SAVINGS

$$\Delta kW = ((Watts_{base} - Watts_{EE})/1{,}000) * ISR * WHF_d * CF$$

Where:

WHFd = Waste Heat Factor for Demand to account for cooling savings from efficient lighting in cooled buildings is provided in Referecne Table in Section 4.5. If unknown, use the Miscellaneous value.

CF = Summer Peak Coincidence Factor for measure is provided in the Reference Table in Section 4.5. If unknown, use the Miscellaneous value.

For example, a 9W LED omnidirectional lamp, 450 lumens, is installed in a mid rise office and sign off form provided:

ΔkW = ((29-6.7)/1,000)* 1.0*1.3*0.6
= 0.017 kW

FOSSIL FUEL SAVINGS

Heating Penalty if fossil fuel heated building (or if heating fuel is unknown):

$$\Delta Therms = ((Watts_{Base} - Watts_{EE})/1000) * ISR * Hours * -IFTherms$$

Where:

IFTherms = Lighting-HVAC Integration Factor for gas heating impacts; this factor represents the increased gas space heating requirements due to the reduction of waste heat rejected by the efficient lighting. Values are provided in the Referecne Table in Section 4.5. If unknown, use the Miscellaneous value.

For example, a 9W LED omnidirectional lamp, 450 lumens, is installed in a mid rise office and sign off form provided:

ΔTherms = ((29-6.7)/1,000)*1.0*3088* -0.016
= - 1.10 therms

WATER IMPACT DESCRIPTIONS AND CALCULATION

N/A

DEEMED O&M COST ADJUSTMENT CALCULATION

For fixture measures, the individual component lifetimes and costs are provided in the reference table section below.[20]

For lamps no O&M costs should be applied.

[20] See IL LED Lighting Systems TRM Reference Tables_2018.xlsx for breakdown of component cost assumptions.

REFERENCE TABLES

LED Bulb Assumptions

Wherever possible, actual incremental costs should be used. If unavailable assume the following incremental costs:[21]

Bulb Type	Year	LED	Incandescent	Incremental Cost
Omnidirectional	2017	$3.21	$1.25	$1.96
	2018	$3.21		$1.96
	2019	$3.11		$1.86
	2020	$2.70		$1.45
Directional	2017	$6.24	$3.53	$2.71
	2018+	$5.18		$1.65
Decorative and Globe	2017	$3.50	$1.60	$1.90
	2018+	$3.40	$1.74	$1.66

LED Fixture Wattage, TOS Baseline and Incremental Cost Assumptions[22]

LED Category	EE Measure Description	$Watts_{EE}$	Baseline Description	$Watts_{BASE}$	Incremental Cost
LED Downlight Fixtures* Impacted by EISA Backstop – apply 2 year measure life (or 8 years if IQ)	LED Recessed, Surface, Pendant Downlights	17.6	Baseline Recessed, Surface, Pendant Downlights	54.3	$27
LED Interior Directional	LED Track Lighting	12.2	Baseline Track Lighting	60.4	$59
	LED Wall-Wash Fixtures	8.3	Baseline Wall-Wash Fixtures	17.7	$59
LED Display Case[23]	LED Display Case Light Fixture	4 per ft	Baseline Display Case Light Fixture	36.2 per ft	$11/ft

[21] Baseline and LED lamp costs are based on field data collected by CLEAResult and provided by ComEd. See ComEd Pricing Projections 06302016.xlsx for analysis. Given LED prices are expected to continue declining assumed costs should be reassessed on an annual basis and replaced with IL specific LED program information when available.

[22] Watt assumptions for efficient measures are based upon the average wattage of each fixture type/lumen range from the Design Light Consortium (DLC) Qualifying Product Lists alongside past Efficiency Vermont projects and PGE refrigerated case study. Watt, lumen, lamp life, and ballast factor assumptions for baseline fixtures are based upon manufacturer specification sheets. Baseline cost data comes from lighting suppliers, past Efficiency Vermont projects, and professional judgment. Efficient cost data comes from 2012 DOE "Energy Savings Potential of Solid-State Lighting in General Illumination Applications", Table A.1. See "LED Lighting Systems TRM Reference Tables_2018.xlsx" for more information and specific product links. For v15 a temporary 14% efficacy improvement is applied to all DLC categories to account for the new DLC rating v6.0. During the 2026 update cycle there was not sufficient numbers of fixtures rated at this standard to allow category specific updates, therefore a standard efficacy improvement was applied consistent with the 14% average described on the DLC website. A more comprehensive review will be performed in 2027.

[23] LED Case Lighting is based on an average of DLC Horizontal and Vertical Lighting less than 80 W. This filter was intended to exclude vaportight fixtures from the average. The horizontal and vertical averages, provided by Guidehouse in 5/2020, were 4.1 W/ft and 3.7 W/ft, respectively.

LED Category	EE Measure Description	$Watts_{EE}$	Baseline Description	$Watts_{BASE}$	Incremental Cost
	LED Undercabinet Shelf-Mounted Task Light Fixtures	4 per ft	Baseline Undercabinet Shelf-Mounted Task Light Fixtures	36.2 per ft	$11/ft
	LED Refrigerated Case Light, Horizontal or Vertical	4 per ft	Baseline Refrigerated Case Light, Horizontal or Vertical (per foot)	15.2 per ft	$11/ft
	LED Freezer Case Light, Horizontal or Vertical	4 per ft	Baseline Freezer Case Light, Horizontal or Vertical (per foot)	18.7 per ft	$11/ft
LED Linear Replacement Lamps	T8 LED Replacement Lamp (TLED), < 1200 lumens	7.5	F17T8 Standard Lamp - 2 foot	15.0	$13
	T8 LED Replacement Lamp (TLED), 1200-2400 lumens	12.0	F32T8 Standard Lamp - 4 foot	28.2	$15
	T8 LED Replacement Lamp (TLED), > 2400 lumens	21.7	F32T8/HO Standard Lamp - 4 foot	41.8	$13
LED Troffers	LED 2x2 Recessed Light Fixture, 2000-3500 lumens	19.6	2-Lamp 32w T8 (BF < 0.89)	57.0	$53
	LED 2x2 Recessed Light Fixture, 3501-5000 lumens	30.0	3-Lamp 32w T8 (BF < 0.88)	84.5	$69
	LED 2x4 Recessed Light Fixture, 3000-4500 lumens	26.2	2-Lamp 32w T8 (BF < 0.89)	57.0	$55
	LED 2x4 Recessed Light Fixture, 4501-6000 lumens	36.9	3-Lamp 32w T8 (BF < 0.88)	84.5	$76
	LED 2x4 Recessed Light Fixture, 6001-7500 lumens	45.2	4-Lamp 32w T8 (BF < 0.88)	112.6	$104
	LED 1x4 Recessed Light Fixture, 1500-3000 lumens	16.8	1-Lamp 32w T8 (BF <0.91)	29.1	$22
	LED 1x4 Recessed Light Fixture, 3001-4500 lumens	27.0	2-Lamp 32w T8 (BF < 0.89)	57.0	$75
	LED 1x4 Recessed Light Fixture, 4501-6000 lumens	35.3	3-Lamp 32w T8 (BF < 0.88)	84.5	$83
LED Linear Ambient Fixtures	LED Surface & Suspended Linear Fixture, <= 3000 lumens	15.4	1-Lamp 32w T8 (BF <0.91)	29.1	$10
	LED Surface & Suspended Linear Fixture, 3001-4500 lumens	24.6	2-Lamp 32w T8 (BF < 0.89)	57.0	$52

LED Category	EE Measure Description	$Watts_{EE}$	Baseline Description	$Watts_{BASE}$	Incremental Cost
	LED Surface & Suspended Linear Fixture, 4501-6000 lumens	34.4	3-Lamp 32w T8 (BF < 0.88)	84.5	$78
	LED Surface & Suspended Linear Fixture, 6001-7500 lumens	43.8	T5HO 2L-F54T5HO - 4'	120.0	$131
	LED Surface & Suspended Linear Fixture, > 7500 lumens	79.5	T5HO 3L-F54T5HO - 4'	180.0	$173
LED High & Low Bay Fixtures	LED Low-Bay Fixtures, <= 10,000 lumens	45.4	3-Lamp T8HO Low-Bay	157.0	$42.88
	LED High-Bay Fixtures, 10,001-15,000 lumens	78.2	4-Lamp T8HO High-Bay	196.0	$31.94
	LED High-Bay Fixtures, 15,001-20,000 lumens	103.9	6-Lamp T8HO High-Bay	294.0	$61.17
	LED High-Bay Fixtures, 20,001-30,000 lumens	150.4	8-Lamp T8HO High-Bay	392.0	$51.11
	LED High-Bay Fixtures, 30,001-40,000 lumens	202.2	750 Watts Metal Halide	850	$113.60
	LED High-Bay Fixtures 40,001-50,000 lumens	268.6	1000 Watts Metal Halide	1080	$166.55
	LED High-Bay Fixtures >50,000 lumens	389.2	1500 Watts Metal Halide	1610	$283.67
LED Agricultural Interior Fixtures	LED Ag Interior Fixtures, <= 2,000 lumens	11.3	1-Lamp 32w T8 (BF <0.91)	29.1	$18
	LED Ag Interior Fixtures, 2,001-4,000 lumens	26.1	2-Lamp 32w T8 (BF < 0.89)	57	$48
	LED Ag Interior Fixtures, 4,001-6,000 lumens	39.6	25% 217 Watt EISA Inc, 75% 3L T8	121.0	$57
	LED Ag Interior Fixtures, 6,001-8,000 lumens	52.4	25% 292 Watt EISA Inc, 75% 4L T8	159.0	$88
	LED Ag Interior Fixtures, 8,001-12,000 lumens	74.5	200W Pulse Start Metal Halide	227.3	$168

LED Category	EE Measure Description	$Watts_{EE}$	Baseline Description	$Watts_{BASE}$	Incremental Cost
	LED Ag Interior Fixtures, 12,001-16,000 lumens	99.9	320W Pulse Start Metal Halide	363.6	$151
	LED Ag Interior Fixtures, 16,001-20,000 lumens	126.1	350W Pulse Start Metal Halide	397.7	$205
	LED Ag Interior Fixtures, > 20,000 lumens	170.0	(2) 320W Pulse Start Metal Halide	727.3	$356
LED Exterior Fixtures	LED Exterior Fixtures, <= 5,000 lumens	24.1	100W Metal Halide	113.6	$97
	LED Exterior Fixtures, 5,001-10,000 lumens	50.5	175W Pulse Start Metal Halide	198.9	$123.81
	LED Exterior Fixtures, 10,001-15,000 lumens	83.2	250W Pulse Start Metal Halide	284.1	$134.35
	LED Exterior Fixtures, 15,001-30,000 lumens	141.5	400W Pulse Start Metal Halide	454.5	$196.16
	LED Exterior Fixtures, 30,001-40,000 lumens	222.7	750 W Metal Halide	850	$238.18
	LED Exterior Fixtures, 40,001-50,000 lumens	280.4	1000 W Metal Halide	1080	$319.31
	LED Exterior Fixtures, > 50,000 lumens	513.9	1500 W Metal Halide	1610	$1094.74
LED Mogul Base HID Replacement Lamps (if unknown, assume Type B)	LED Mogul Base HID Replacement Lamp, <= 5,000 lumens	27.2	100W Metal Halide	100 (Type A) 113.6 (Type B)	$68
	LED Mogul Base HID Replacement Lamp, 5,001-10,000 lumens	56.1	175W Pulse Start Metal Halide	175 (Type A) 198.9 (Type B)	$60
	LED Mogul Base HID Replacement Lamp, 10,001-15,000 lumens	88.6	250W Pulse Start Metal Halide	250 (Type A) 284.1 (Type B)	$129
	LED Mogul Base HID Replacement Lamp, 15,001-30,000 lumens	123.7	400W Pulse Start Metal Halide	400 (Type A) 454.5 (Type B)	$156
	LED Mogul Base HID Replacement Lamp, 30,001-40,000 lumens	207.0	750 W Metal Halide	750 (Type A) 850 (Type B)	$446
	LED Mogul Base HID Replacement Lamp, > 40,000 lumens	258.8	1000 W Metal Halide	1000 (Type A) 1080 (Type B)	$629

LED Fixture Component Costs & Lifetime[24]

		EE Measure				Baseline			
LED Category	EE Measure Description	Lamp Life (hrs)	Total Lamp Replacement Cost	LED Driver Life (hrs)	Total LED Driver Replacement Cost	Lamp Life (hrs)	Total Lamp Replacement Cost	Ballast Life (hrs)	Total Repla C
LED Downlight Fixtures	LED Recessed, Surface, Pendant Downlights	50,000	$30.75	70,000	$47.50	2,500	$8.86	40,000	$1
LED Interior Directional	LED Track Lighting	50,000	$39.00	70,000	$47.50	2,500	$12.71	40,000	$1
	LED Wall-Wash Fixtures	50,000	$39.00	70,000	$47.50	2,500	$9.17	40,000	$2
LED Display Case	LED Display Case Light Fixture	50,000	$9.75/ft	70,000	$11.88/ft	2,500	$6.70	40,000	$5
	LED Undercabinet Shelf-Mounted Task Light Fixtures	50,000	$9.75/ft	70,000	$11.88/ft	2,500	$6.70	40,000	$5
	LED Refrigerated Case Light, Horizontal or Vertical	50,000	$8.63/ft	70,000	$9.50/ft	15,000	$1.13	40,000	$8
	LED Freezer Case Light, Horizontal or Vertical	50,000	$7.88/ft	70,000	$7.92/ft	12,000	$0.94	40,000	$6
LED Linear Replacement Lamps	T8 LED Replacement Lamp (TLED), < 1200 lumens	50,000	$5.76	70,000	$13.67	30,000	$6.17	40,000	$1
	T8 LED Replacement Lamp (TLED), 1200-2400 lumens	50,000	$8.57	70,000	$13.67	24,000	$6.17	40,000	$1
	T8 LED Replacement Lamp (TLED), > 2400 lumens	50,000	$8.57	70,000	$13.67	18,000	$6.17	40,000	$1
LED Troffers	LED 2x2 Recessed Light Fixture, 2000-3500 lumens	50,000	$78.07	70,000	$40.00	24,000	$26.33	40,000	$3
	LED 2x2 Recessed Light Fixture, 3501-5000 lumens	50,000	$89.23	70,000	$40.00	24,000	$39.50	40,000	$3
	LED 2x4 Recessed Light Fixture, 3000-4500 lumens	50,000	$96.10	70,000	$40.00	24,000	$12.33	40,000	$3
	LED 2x4 Recessed Light Fixture, 4501-6000 lumens	50,000	$114.37	70,000	$40.00	24,000	$18.50	40,000	$3
	LED 2x4 Recessed Light Fixture, 6001-7500 lumens	50,000	$137.43	70,000	$40.00	24,000	$24.67	40,000	$3
	LED 1x4 Recessed Light Fixture, 1500-3000 lumens	50,000	$65.43	70,000	$40.00	24,000	$6.17	40,000	$3
	LED 1x4 Recessed Light Fixture, 3001-4500 lumens	50,000	$100.44	70,000	$40.00	24,000	$12.33	40,000	$3
	LED 1x4 Recessed Light Fixture, 4501-6000 lumens	50,000	$108.28	70,000	$40.00	24,000	$18.50	40,000	$3
	LED Surface & Suspended Linear Fixture, <= 3000 lumens	50,000	$62.21	70,000	$40.00	24,000	$6.17	40,000	$3

[24] Note that some measures have blended baselines (T12:T8 18:82). All values are provided to enable calculation of appropriate O&M impacts. Total costs include lamp, labor and disposal cost assumptions where applicable, see IL LED Lighting Systems TRM Reference Tables_2018.xlsx for more information.

		EE Measure				Baseline			
LED Category	EE Measure Description	Lamp Life (hrs)	Total Lamp Replacement Cost	LED Driver Life (hrs)	Total LED Driver Replacement Cost	Lamp Life (hrs)	Total Lamp Replacement Cost	Ballast Life (hrs)	Total Repla C
LED Linear Ambient Fixtures	LED Surface & Suspended Linear Fixture, 3001-4500 lumens	50,000	$93.22	70,000	$40.00	24,000	$12.33	40,000	$3
	LED Surface & Suspended Linear Fixture, 4501-6000 lumens	50,000	$114.06	70,000	$40.00	24,000	$18.50	40,000	$3
	LED Surface & Suspended Linear Fixture, 6001-7500 lumens	50,000	$152.32	70,000	$40.00	30,000	$26.33	40,000	$6
	LED Surface & Suspended Linear Fixture, > 7500 lumens	50,000	$183.78	70,000	$40.00	30,000	$39.50	40,000	$6
LED High & Low Bay Fixtures	LED Low-Bay Fixtures, <= 10,000 lumens	50,000	$90.03	70,000	$62.50	18,000	$64.50	40,000	$9
	LED High-Bay Fixtures, 10,001-15,000 lumens	50,000	$122.59	70,000	$62.50	18,000	$86.00	40,000	$9
	LED High-Bay Fixtures, 15,001-20,000 lumens	50,000	$157.22	70,000	$62.50	18,000	$129.00	40,000	$11
	LED High-Bay Fixtures, 20,001 – 30,000 lumens	50,000	$228.52	70,000	$62.50	18,000	$172.00	40,000	$14
	LED High-Bay Fixtures, 30,001-40,000 lumens	50,000	$294.00	70,000	$62.50	15,000	$82.00	40,000	$14
	LED High-Bay Fixtures, 40,001-50,000 lumens	50,000	$324.00	70,000	$62.50	15,000	$88.00	40,000	$14
	LED High-Bay Fixtures, > 50,000 lumens	50,000	$382.00	70,000	$62.50	15,000	$96.00	40,000	$20
LED Agricultural Interior Fixtures	LED Ag Interior Fixtures, <= 2,000 lumens	50,000	$41.20	70,000	$40.00	1,000	$1.23	40,000	$2
	LED Ag Interior Fixtures, 2,001-4,000 lumens	50,000	$65.97	70,000	$40.00	1,000	$1.43	40,000	$2
	LED Ag Interior Fixtures, 4,001-6,000 lumens	50,000	$80.08	70,000	$40.00	1,000	$1.62	40,000	$2
	LED Ag Interior Fixtures, 6,001-8,000 lumens	50,000	$105.54	70,000	$40.00	1,000	$1.81	40,000	$2
	LED Ag Interior Fixtures, 8,001-12,000 lumens	50,000	$179.81	70,000	$62.50	15,000	$63.00	40,000	$11
	LED Ag Interior Fixtures, 12,001-16,000 lumens	50,000	$190.86	70,000	$62.50	15,000	$68.00	40,000	$12
	LED Ag Interior Fixtures, 16,001-20,000 lumens	50,000	$237.71	70,000	$62.50	15,000	$73.00	40,000	$13
	LED Ag Interior Fixtures, > 20,000 lumens	50,000	$331.73	70,000	$62.50	15,000	$136.00	40,000	$20

		EE Measure				Baseline			
LED Category	EE Measure Description	Lamp Life (hrs)	Total Lamp Replacement Cost	LED Driver Life (hrs)	Total LED Driver Replacement Cost	Lamp Life (hrs)	Total Lamp Replacement Cost	Ballast Life (hrs)	Total Repla C
LED Exterior Fixtures	LED Exterior Fixtures, <= 5,000 lumens	70,000	$73.80	70,000	$62.50	15,000	$58.00	40,000	$10
	LED Exterior Fixtures, 5,001-10,000 lumens	70,000	$124.89	70,000	$62.50	15,000	$63.00	40,000	$11
	LED Exterior Fixtures, 10,001-15,000 lumens	70,000	$214.95	70,000	$62.50	15,000	$68.00	40,000	$12
	LED Exterior Fixtures, 15,000-30,000 lumens	70,000	$321.06	70,000	$62.50	15,000	$73.00	40,000	$13
	LED Exterior Fixtures, 30,001-40,000 lumens	70,000	$546.00	70,000	$62.50	15,000	$82.00	40,000	$14
	LED Exterior Fixtures, 40,001-50,000 lumens	70,000	$722.00	70,000	$62.50	15,000	$88.00	40,000	$14
	LED Exterior Fixtures, > 50,000 lumens	70,000	$870.00	70,000	$62.50	15,000	$96.00	40,000	$20
LED Mogul Base HID Replacement Lamps	LED Mogul Base HID Replacement Lamp, <= 5,000 lumens	50,000	$108.00	70,000	$62.50	15,000	$40.00	40,000	$9
	LED Mogul Base HID Replacement Lamp, 5,001-10,000 lumens	50,000	$99.00	70,000	$62.50	15,000	$39.00	40,000	$9
	LED Mogul Base HID Replacement Lamp, 10,001-15,000 lumens	50,000	$179.00	70,000	$62.50	15,000	$50.00	40,000	$11
	LED Mogul Base HID Replacement Lamp, 15,001-30,000 lumens	50,000	$210.00	70,000	$62.50	15,000	$54.00	40,000	$14
	LED Mogul Base HID Replacement Lamp, 30,001-40,000 lumens	50,000	$514.00	70,000	$62.50	15,000	$68.00	40,000	$14
	LED Mogul Base HID Replacement Lamp, > 40,000 lumens	50,000	$707.00	70,000	$62.50	15,000	$78.00	40,000	$14

MEASURE CODE: CI-LTG-LEDB-V20-270101

REVIEW DEADLINE: 1/1/2028