

# SWLG021

Comprehensive Lighting Measure Package



# Measure Package Developers/Presenters



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# Scope

- ▶ This measure package covers most lighting products currently included in the California Public Utility Commission (CPUC) approved Modified Lighting Calculator (MLC).
- ▶ The measure cases are a catalog of eligible LED lighting fixtures, lamps, and retrofit kits based on fifty-two (52) product classes. These are covered by the following standards as applicable:
  - *Design Lights Consortium (DLC)*
  - *Energy Star for lamps (Energy Star Lamps)*
  - *Energy Star for luminaries (Energy Star Fixtures)*
- ▶ This measure package covers deemed AR, NR and NC lighting measures delivered through Direct Install and Downstream Incentive programs to all sectors and customer groups.
- ▶ The offerings in this measure package are eligible in all Commercial, Industrial, Non-Residential, and Residential building types for most interior and exterior applications. Parking Garages are also eligible.

## Product Classes Categories

- ▶ Energy Star Lamp
- ▶ Energy Star Fixture
- ▶ DLC Indoor Fixture
- ▶ DLC Indoor Retrofit
- ▶ DLC TLED
- ▶ DLC Outdoor Fixture
- ▶ DLC Outdoor Retrofit

# Energy Star Lamp

- ▶ A Lamp
- ▶ Candelabra
- ▶ Globe
- ▶ MR16
- ▶ Reflector



# Energy Star Fixture

- ▶ Downlight Solid State Retrofit
- ▶ Downlight Surface Mount
- ▶ Downlight Recessed
- ▶ Downlight Pendant





## DLC Indoor Fixture

- ▶ 1x4 Luminaires for Ambient Lighting of Interior Spaces
- ▶ 2x2 Luminaires for Ambient Lighting of Interior Spaces
- ▶ 2x4 Luminaires for Ambient Lighting of Interior Spaces
- ▶ Direct Linear Ambient Luminaires
- ▶ Linear Ambient Luminaires with Indirect Component
- ▶ Low Bay for Commercial and Industrial
- ▶ High Bay for Commercial and Industrial



## DLC Indoor Retrofit

- ▶ 1x4 Integrated Retrofit
- ▶ 2x2 Integrated Retrofit
- ▶ 2x4 Integrated Retrofit
- ▶ 1x4 Linear Retrofit Kits
- ▶ 2x2 Linear Retrofit Kits
- ▶ 2x4 Linear Retrofit Kits





## DLC TLED (T8 Four-Foot)

- ▶ Replacement Lamps (Type A and Type A/B)
- ▶ Internal Driver (Type B and Type A/B)
- ▶ External Driver (Type C)



# DLC Outdoor Fixture

- ▶ Parking Garage Luminaires (Low, Mid and High Output)
- ▶ Architectural Flood and Spot Luminaires (Low, Mid, High and Very High Output)
- ▶ Bollards (Low Output)
- ▶ Fuel Pump Canopy Luminaires (Low, Mid and High Output)
- ▶ Outdoor Full-Cutoff Wall-Mounted Area Luminaires (Low, Mid and High Output)
- ▶ Outdoor Non-Cutoff & Semi-Cutoff Wall-Mounted Area Luminaires (Low, Mid and High Output)
- ▶ Outdoor Pole/Arm-Mounted Area and Decorative Luminaires (Low, Mid and High Output)
- ▶ Outdoor Pole/Arm-Mounted Area and Roadway Luminaires (Low, Mid, High and Very High Output)



## DLC Outdoor Retrofit

- ▶ Retrofit Kits for Outdoor Pole/Arm-Mounted Area and Roadway (Mid Output)
- ▶ Retrofit Kits for Outdoor Pole/Arm-Mounted Area and Roadway (High Output)
- ▶ Retrofit Kits for Outdoor Pole/Arm-Mounted Area and Roadway (Very High Output)



# Scope Not Included

- ▶ Landscape/Accent Flood and Spot Luminaires
- ▶ Stairwell and Passageway Luminaires
- ▶ Specialty: Sports Flood
- ▶ Wall-Wash Luminaires
- ▶ Display Case Luminaires
- ▶ Track or Mono-Point Directional Luminaires
- ▶ Horizontal Refrigerated Case Luminaires
- ▶ Vertical Refrigerated Case Luminaires
- ▶ High-Bay Aisle Luminaires
- ▶ Retrofit Kits for Large Outdoor Pole/Arm-Mounted Area and Roadway Luminaires
- ▶ Retrofit Kits for Outdoor Full-Cutoff Wall-Mounted Area Luminaires
- ▶ Retrofit Kits for Outdoor Pole/Arm-Mounted Decorative Luminaires
- ▶ Retrofit Kits for Direct Linear Ambient Luminaires
- ▶ Retrofit Kits for High-Bay Luminaires for Commercial and Industrial Buildings
- ▶ Retrofit Kits for Low-Bay Luminaires for Commercial and Industrial Buildings

## Scope Not Included Cont.

- ▶ Replacement Lamps (UL Type A), Internal Driver (UL Type B) Lamps, External Driver (UL Type C) Lamps
  - *T5 Four-Foot*
  - *T5HO Four-Foot*
  - *T8 Eight-Foot*
  - *T8 Two-Foot*
  - *T8 Three-Foot*
  - *2G11 Base Replacement Lamps*
- ▶ Mogul (E39) Base

# Baseline

- ▶ Standard Practice (SP) baselines were established in support of the MLC and are currently approved by the CPUC. The CPUC directed the development of SP baselines for the following scenarios:
  1. *Current industry SP for NR and NC measure application types (MAT). This SP represents typical product choices and installations for lighting projects currently occurring outside of an EE program.*
  2. *Future SP for all MATs. CPUC direction requires second baselines in AR MATs and subsequent years of NR/NC to consider the anticipated improvements of fixture performance into the future.*
- ▶ To estimate current SP, several product datasets published in the DLC and Energy Star product databases were collected and analyzed. The total number of data records were reduced using the following process:
  1. *DLC “Parent” Fixtures*
  2. *California Title 20 Compliant Energy Star Lamps and Fixtures*
  3. *Limiting for products qualified in 2020 or later*
  4. *Trimming of Outliers*

## Baseline Cont.

- ▶ The standard practice baseline reflects the 25th percentile of listed products within a particular product class, filtered as described above. Incremental annual improvements in baseline performance were developed where an increasing trend in efficacy was observed and where there were sufficient quantities of qualified/listed products for a given year.
- ▶ **NOTE:** Products must meet minimum efficacy eligibility requirements specified in this measure package. The minimum efficacy is the 75<sup>th</sup> percentile of listed products within a particular product class.



# Operationalizing

- ▶ Willdan is seeking upfront review and approval of all measure permutations within the measure package. This would eliminate the need for CPUC review when additional permutations are exposed within the eTRM (within the same Measure Package version).
  - ▶ Process: Obtain CPUC approval that exposing existing data permutations within a measure package revision would not trigger CPUC review/approval of said update. This will allow measure permutations to be exposed on an “as needed” basis within an existing measure package revision without requiring additional CPUC review.
- ▶ Willdan will be splitting the lighting measure package into more than one measure package defined by different product classes; currently, we expect the number of measure packages to be between 5-7. The measure packages would be identical in narrative and savings methodology, which includes all support tables that would be used to define a specific permutation.
- ▶ The expected measure packages will consist of the following categories:
  - *Energy Star Products, Exterior Lighting, High/Low Bay, Interior Ambient, Interior Retrofits, Parking Garage, TLEDs*

# Open Ended Items

- ▶ Preponderance of Evidence (POE)

- *Awaiting CPUC guidance on additional requirements from current Measure Package POE*

- ▶ Standard Practice Efficacy Analysis

- *It is expected to develop a Standard Practice efficacy analysis on a biannual basis*

- ▶ Existing vs. Projected Measure Package Overlap

- *There should not be two measure packages with overlapping scope. A notice will be given to the market regarding any end day and effective day transitions*

# Questions

# Product Classes

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