Energy · Quality · Controllability℠

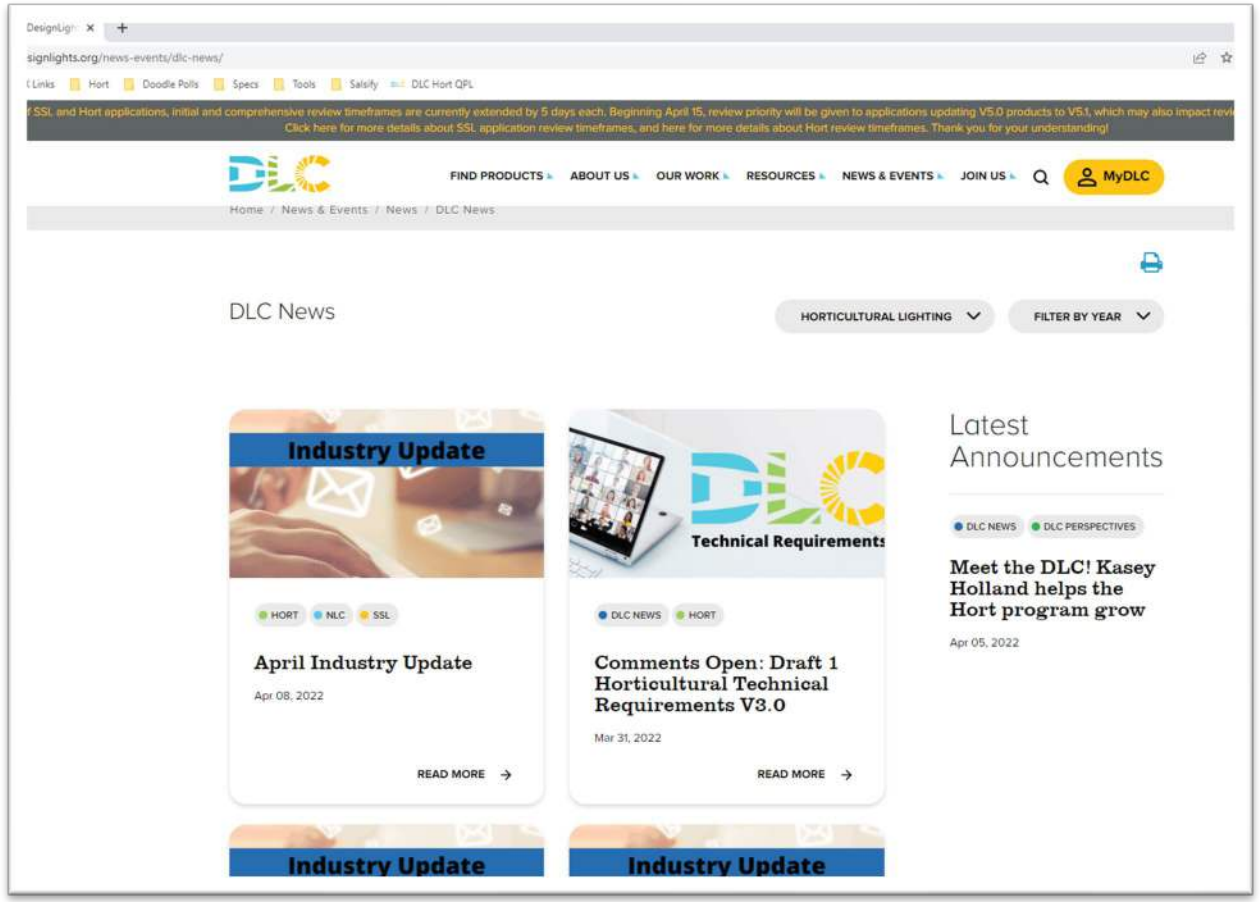
SSL V6.0 & LUNA V2.0 Draft 1 Release Webinar

4/15/25

Welcome!

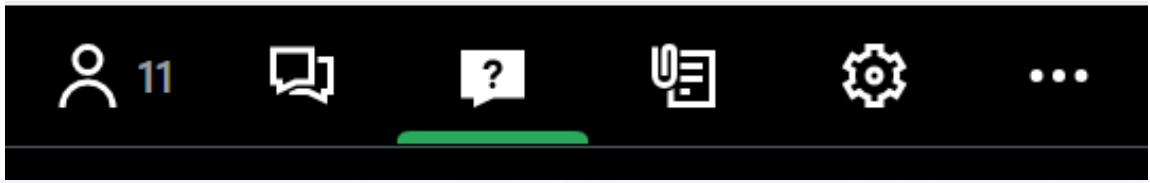
- **Slides and recorded webinar will be posted** on the *DLC News & Events* page at https://designlights.org shortly after today's presentation

- All attendees are automatically muted



Webinar Orientation

- **Questions will be held until the end during a live Q&A**
  - **Use the Question pane (not Chat) to submit for Q&A**



Energy · Quality · Controllability

The DesignLights Consortium is an independent, nonprofit organization providing decision makers with data and resources on quality lighting, controls, and integrated building systems to reduce energy, carbon, and light pollution.

Presenters

Leora Radetsky
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Technical Manager

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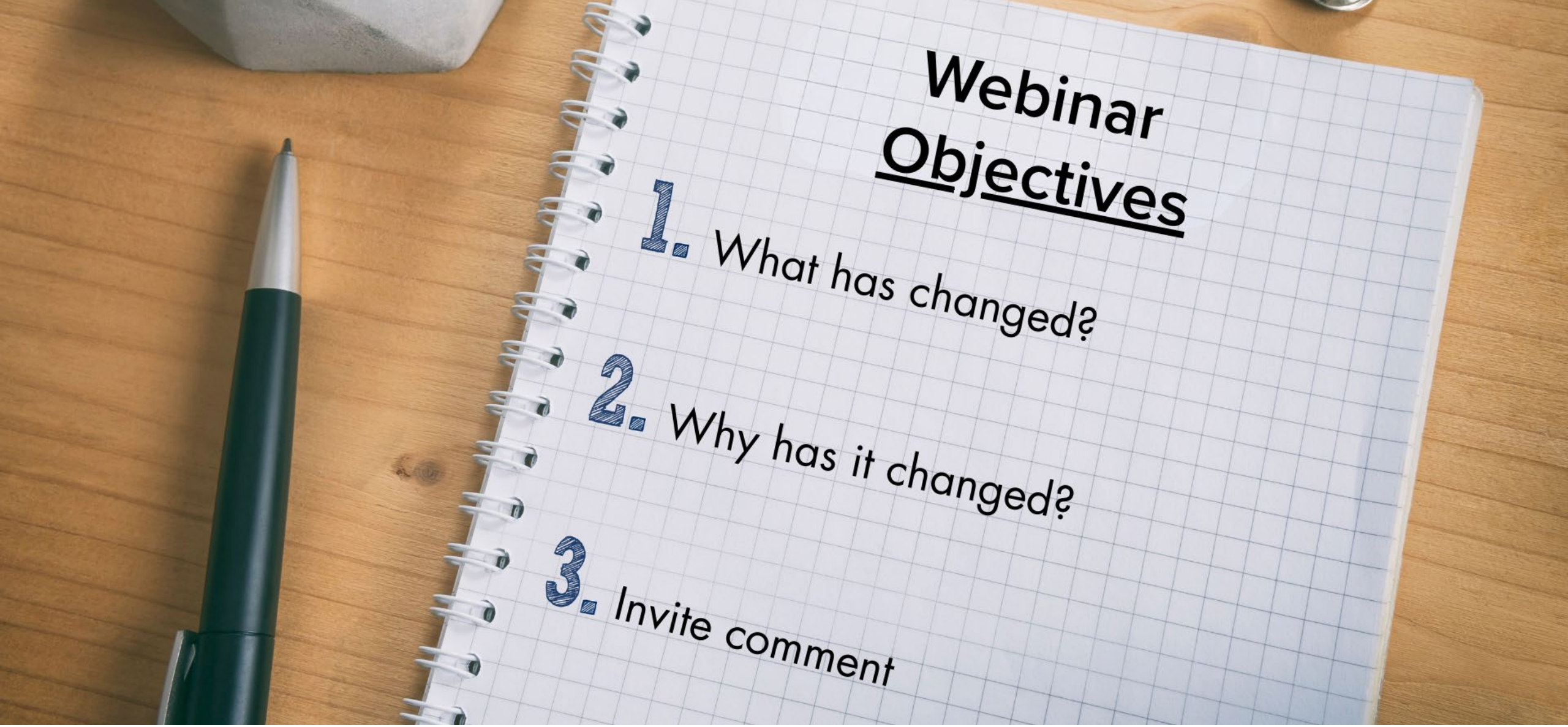
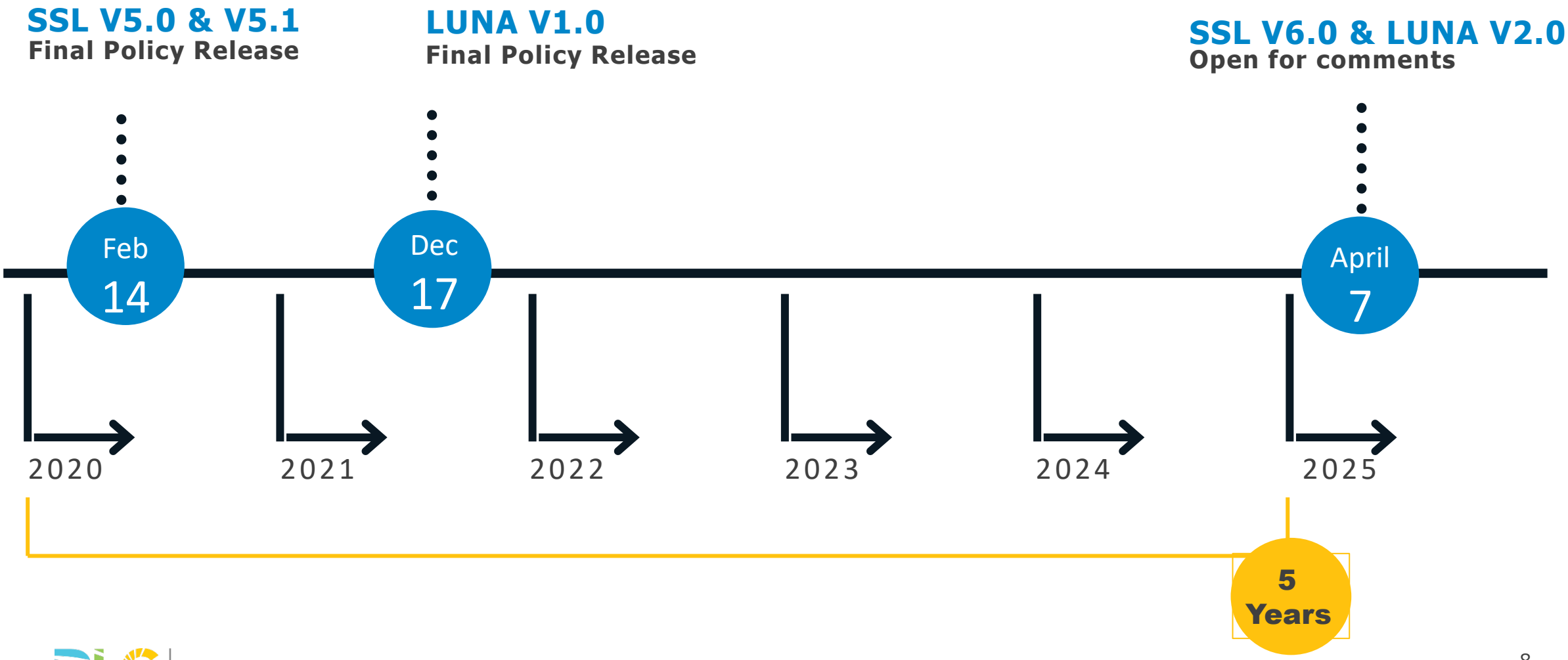
Project Manager

Agenda

	3:00 – 3:15	Introduction
Document Sections	3:15 – 3:25	Eligibility
	3:25 – 3:27	Solar Powered Luminaires
	3:27 – 3:32	Efficacy & Output
	3:32 – 3:35	Sustainability
	3:40 – 3:45	Quality of Light
	3:45 – 3:50	Controllability & Field Adjustability
	3:50 – 3:55	Premium
	3:55 – 3:57	FACT & Color Tuning
	3:57 – 3:59	Lifetime
	4:00 – 4:05	LUNA V2.0
	4:05 – 4:07	Equivalent Sourcing
	4:07 – 4:10	Additional Reporting
	4:10 – 4:25	Q&A
	4:25 – 4:30	Review


Webinar
Objectives
1. What has changed?
2. Why has it changed?
3. Invite comment

History: SSL & LUNA Technical Requirements

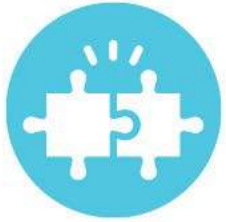


SSL V6.0 & LUNA V2.0 Goals

Advance energy efficiency and support decarbonization

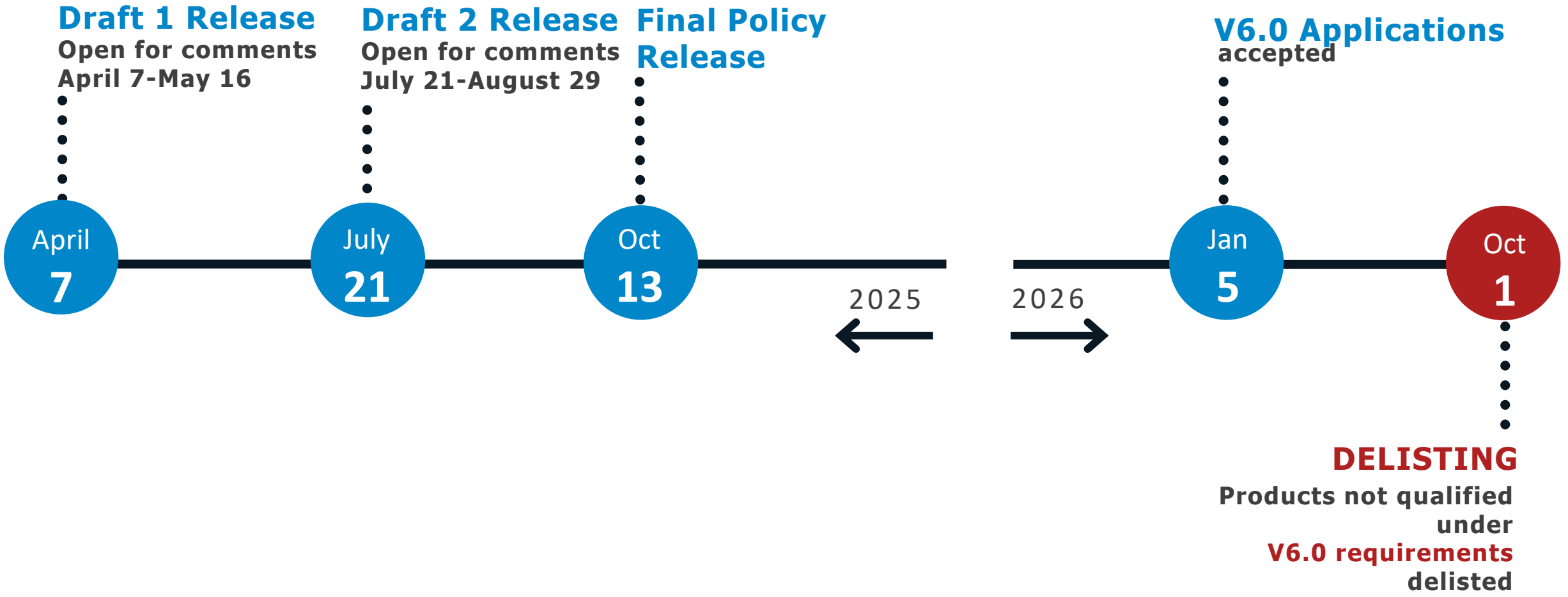
Strengthen the SSL QPL by expanding eligibility

Drive greater adoption of controls

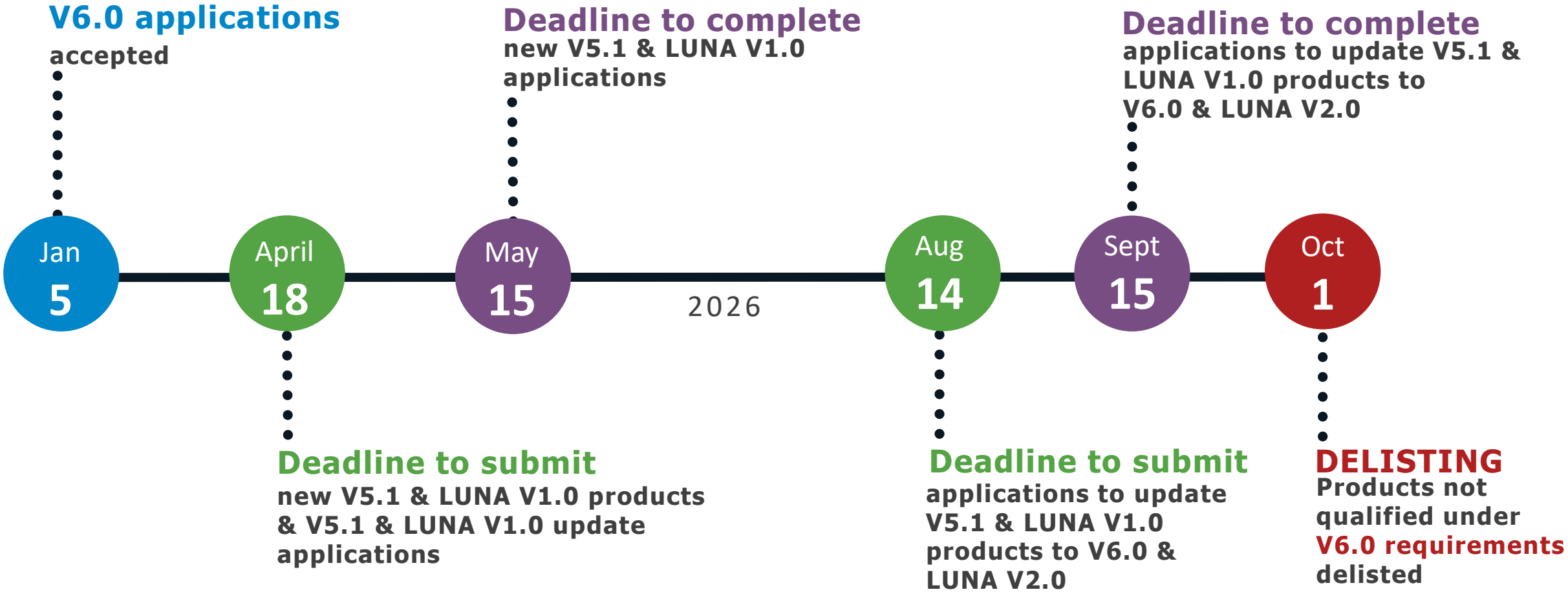


Mitigate light pollution

SSL V6.0 & LUNA V2.0 – Release Timeline

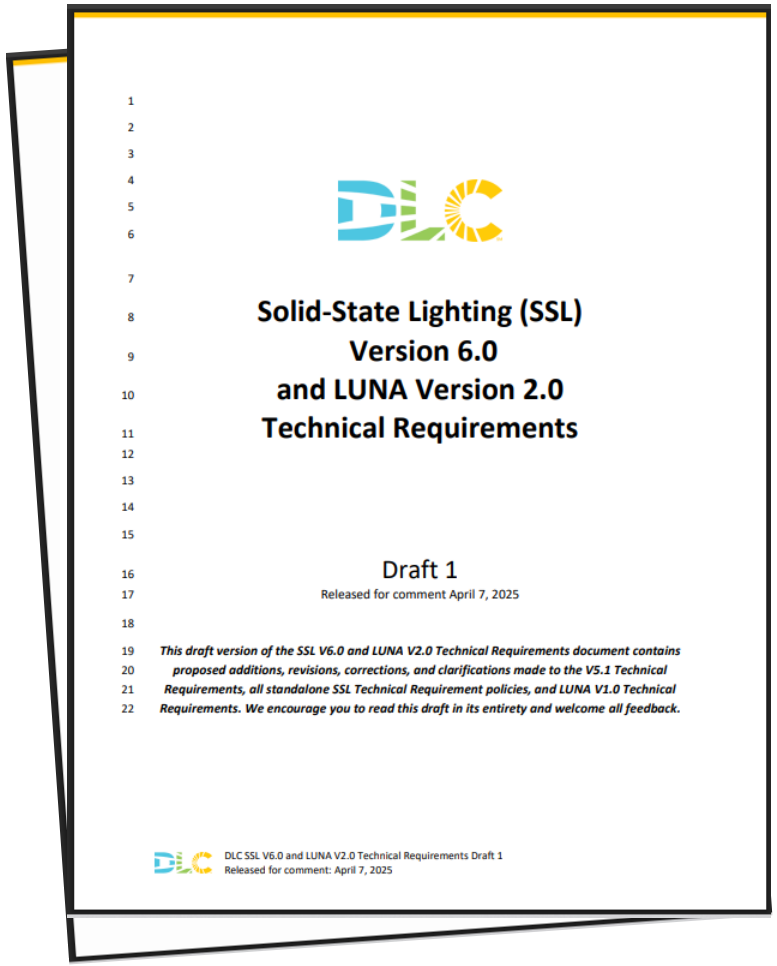


SSL V6.0 & LUNA V2.0 – Application Timeline



SSL V6.0 & LUNA V2.0 Draft 1 Overview

Draft 1 Overview



Solid-State Lighting (SSL)
Version 6.0
and LUNA Version 2.0
Technical Requirements

Draft 1
Released for comment April 7, 2025

This draft version of the SSL V6.0 and LUNA V2.0 Technical Requirements document contains proposed additions, revisions, corrections, and clarifications made to the V5.1 Technical Requirements, all standalone SSL Technical Requirement policies, and LUNA V1.0 Technical Requirements. We encourage you to read this draft in its entirety and welcome all feedback.

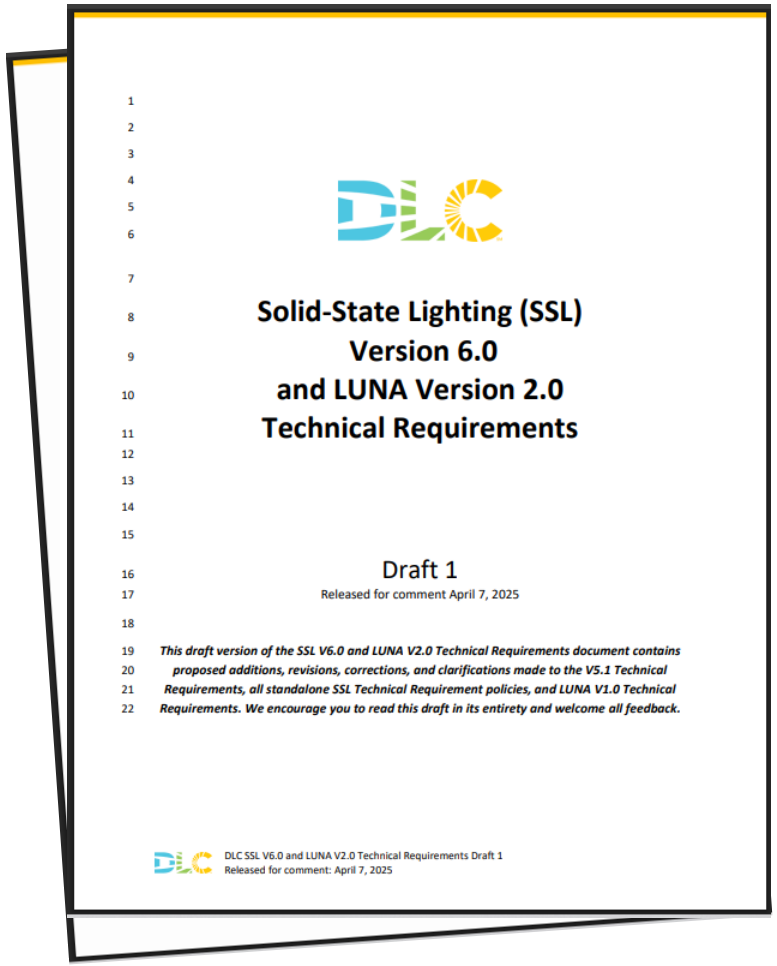
DLC SSL V6.0 and LUNA V2.0 Technical Requirements Draft 1
Released for comment: April 7, 2025

Draft 1 is a comprehensive Technical Requirements document that proposes additions and revisions to the following:

- SSL V5.1 Technical Requirements
- LUNA Technical Requirements
- All standalone SSL Technical Requirement policies (e.g. Technical Requirement Tables, Warranty, Lifetime, Testing constraints, Power quality and more)

Link: SSL V6.0 and LUNA V2.0 Draft 1

Draft 1 Overview



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DLC SSL V6.0 and LUNA V2.0 Technical Requirements Draft 1
Released for comment: April 7, 2025

We welcome all feedback!

Table 1 provides a high-level summary of the proposed changes in draft 1.

Draft 1 Overview

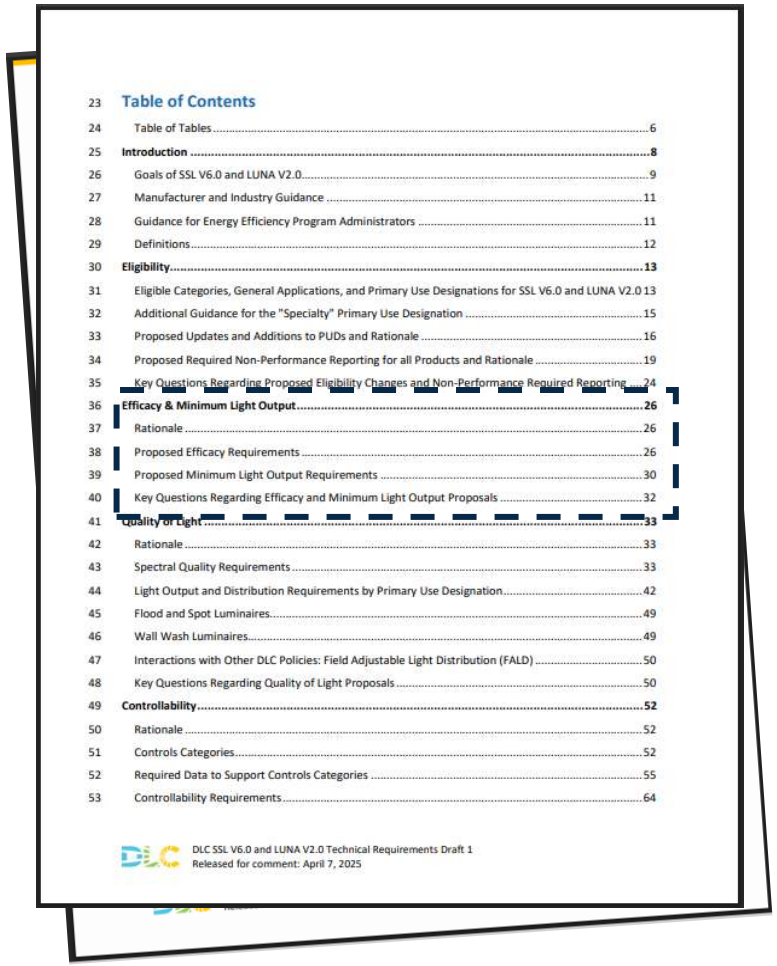


Table of Contents

DLC SSL V6.0 and LUNA V2.0 Technical Requirements Draft 1
Released for comment: April 7, 2025

Efficacy & Minimum Light Output .....

★ Rationale .....

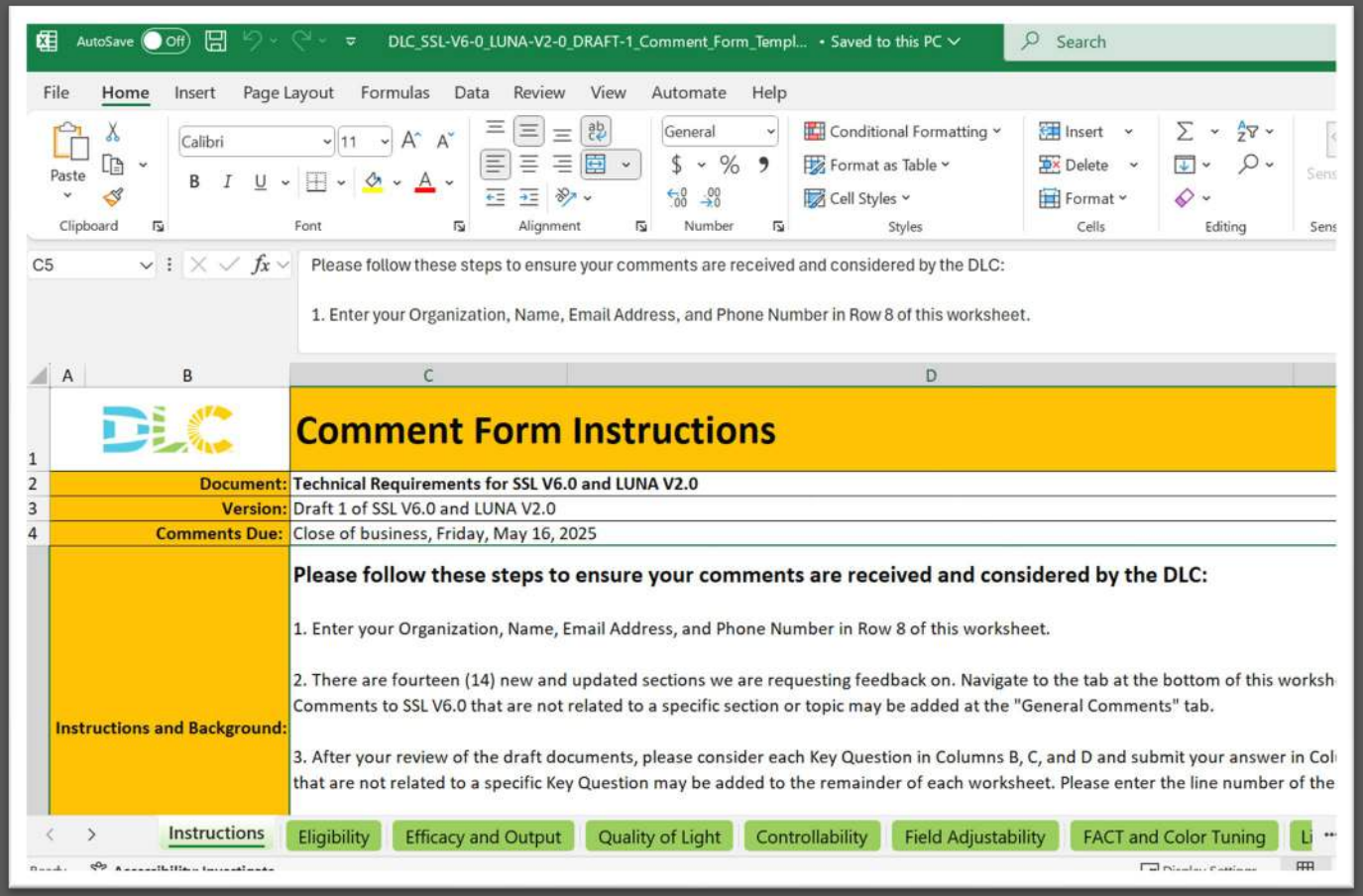
Proposed Efficacy Requirements .....

Proposed Minimum Light Output Requirements .....

★ Key Questions Regarding Efficacy and Minimum Light Output Proposals .....

- Draft 1 sections with new or proposed requirement changes include "**Rationale" and/or "Key Questions**" subsections.
- There are 14 sections in Draft 1 with "**Key Questions**" seeking your input.
- **Any and all feedback is welcome and appreciated!**

All feedback is received and considered!



#	Key Questions
1	The DLC is requiring all qualified products listed to be continuously dimmable down to at least 20%. What feedback, if any, do you have about this proposal?
2	Are there any Driver Types missing in Table 19 or Table 20?
3	Are there any Integral Sensor Types missing in Table 19 or Table 20?
4	Are there any Driver and Integral Controller Types missing in Table 22?
5	Are there any Integral Sensor Functions and Technologies missing in Table 22?
6	Are there any Controls Ready receptacle types missing in Table 18?

Comments on this draft policy are **due May 16, 2025**, and should be emailed to comments@designlights.org using the comment form.

Draft 1: Eligibility

NEW Primary Use Designations (PUDs) - Outdoor

Excerpts from Table 2

Category	General Application	Primary Use Designation (PUD)	Change Type
Outdoor	All Output Levels	Outdoor Zero-Uplight Wall-Mounted Luminaires	Terminology Change Cutoff → Zero-Uplight
Outdoor	All Output Levels	Outdoor Uplight-Emitting Wall-Mounted Luminaires	Terminology Change Semi-Cutoff → Uplight-Emitting
Outdoor	Low Output	Turtle Lighting Zero-Uplight Pole/Arm-Mounted Area and Roadway Luminaires	New PUD
Outdoor	Low Output	Turtle Lighting Zero-Uplight Wall-Mounted Area Luminaires	New PUD
Outdoor	Low Output	Turtle Lighting Zero-Uplight Bollards	New PUD
Outdoor	All Output Levels	Architectural Flood and Spot Luminaires	Combined with Landscape/Accent Flood and Spot Luminaires
Outdoor	All Output Levels	Hazardous Environment Area Luminaires	Converted Specialty
Outdoor	All Output Levels	Sports Floods	Converted Specialty

NEW Solar Powered Luminaire Category

Excerpts from Table 2

General Application	Primary Use Designations
Low Output	• Pole/Arm-Mounted Area and Roadway • Pole/Arm-Mounted Decorative • Zero-Uplight Wall-Mounted Area • Uplight-Emitting Wall-Mounted Area • Bollards • Fuel Pump Canopy • Architectural Flood and Spot Luminaires • Stairwell and Passageway • Sports Flood • Hazardous Environment Area Luminaires • Turtle Lighting Zero-Uplight Wall-Mounted Area (Low Output Only) • Turtle Lighting Zero-Uplight Pole/Arm-Mounted Area and Roadway (Low Output Only) • Turtle Lighting Zero-Uplight Bollards • Specialty: _____
Mid Output	
High Output	
Very High Output	

- All requirements for products in the Outdoor category apply
- Additional required reported fields

New Primary Use Designations (PUDs) - Indoor

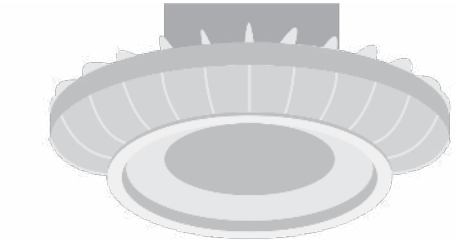
Excerpts from Table 2

Category	General Application	Primary Use Designation (PUD)	Change Type
Indoor	Linear Ambient	Direct Linear Strip Luminaires	New PUD
Indoor	High-Bay	Hazardous Environment High-Bay Luminaires	Converted Specialty
Outdoor	High-Bay	Indirect High-Bay Luminaires	Converted Specialty
Outdoor	Low-Bay	Hazardous Environment Low-Bay Luminaires	Converted Specialty

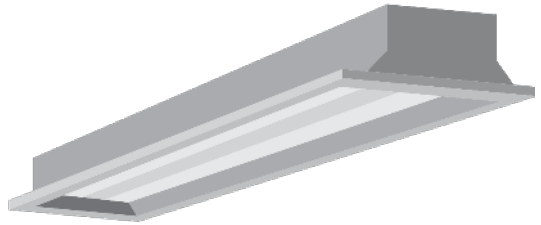
Draft 1: Primary Use Designation Changes

Converted Specialty PUDs

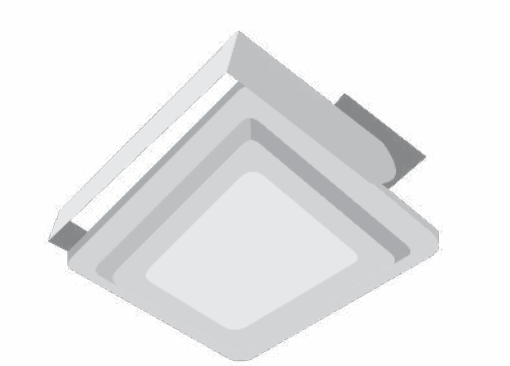
Sports Floods



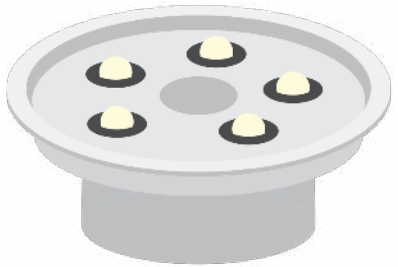
Hazardous Environment High-Bay



Hazardous Environment Low-Bay

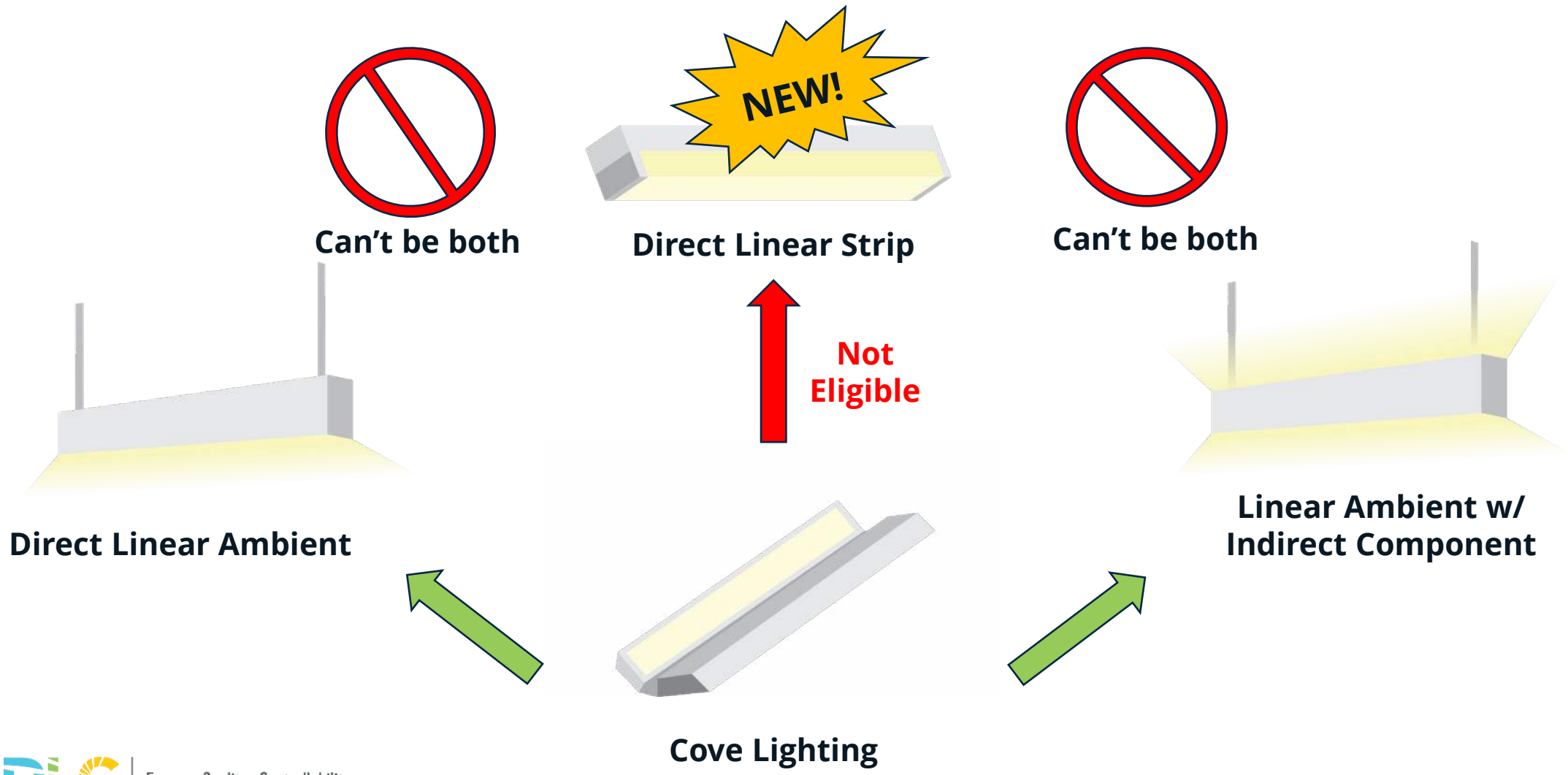


Hazardous Environment Area Luminaires



Indirect High-Bays

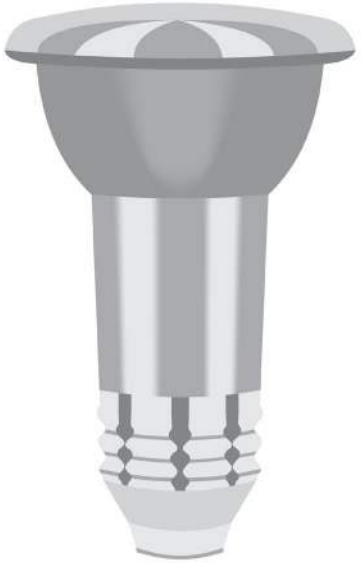
Delineated Linear Ambient

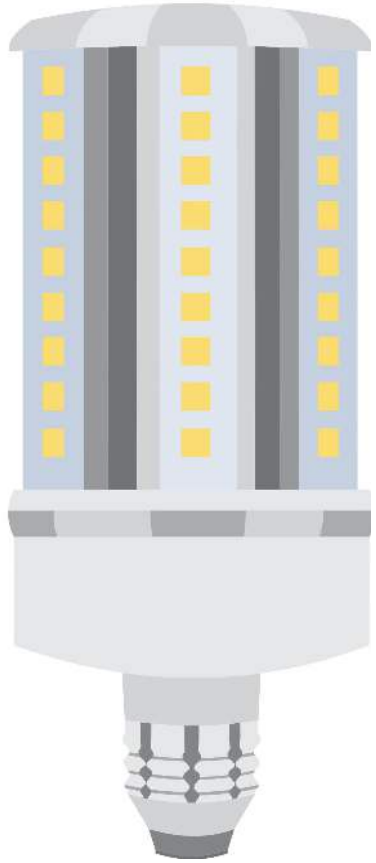


Adding medium screw-base lamps

Assessing value in new lamp types in SSL V6.0

- Categories previously covered by ENERGY STAR (A, R, BR, etc.)
- Medium screw-base LED replacement lamps for HID



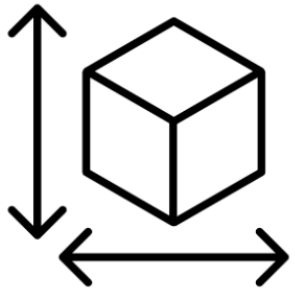


Adding downlights

- Assessing value for new PUDs to include **integrated downlights** and **integrated retrofit kits**

Draft 1: Non-Performance Related Reporting

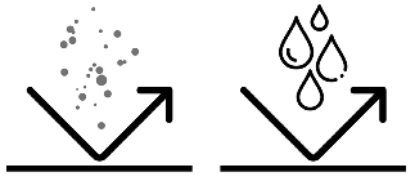
Non-Performance Reporting



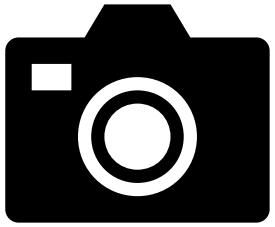
Dimensions

Form Factor

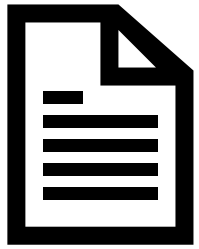
Mounting Options



Environmental Protection



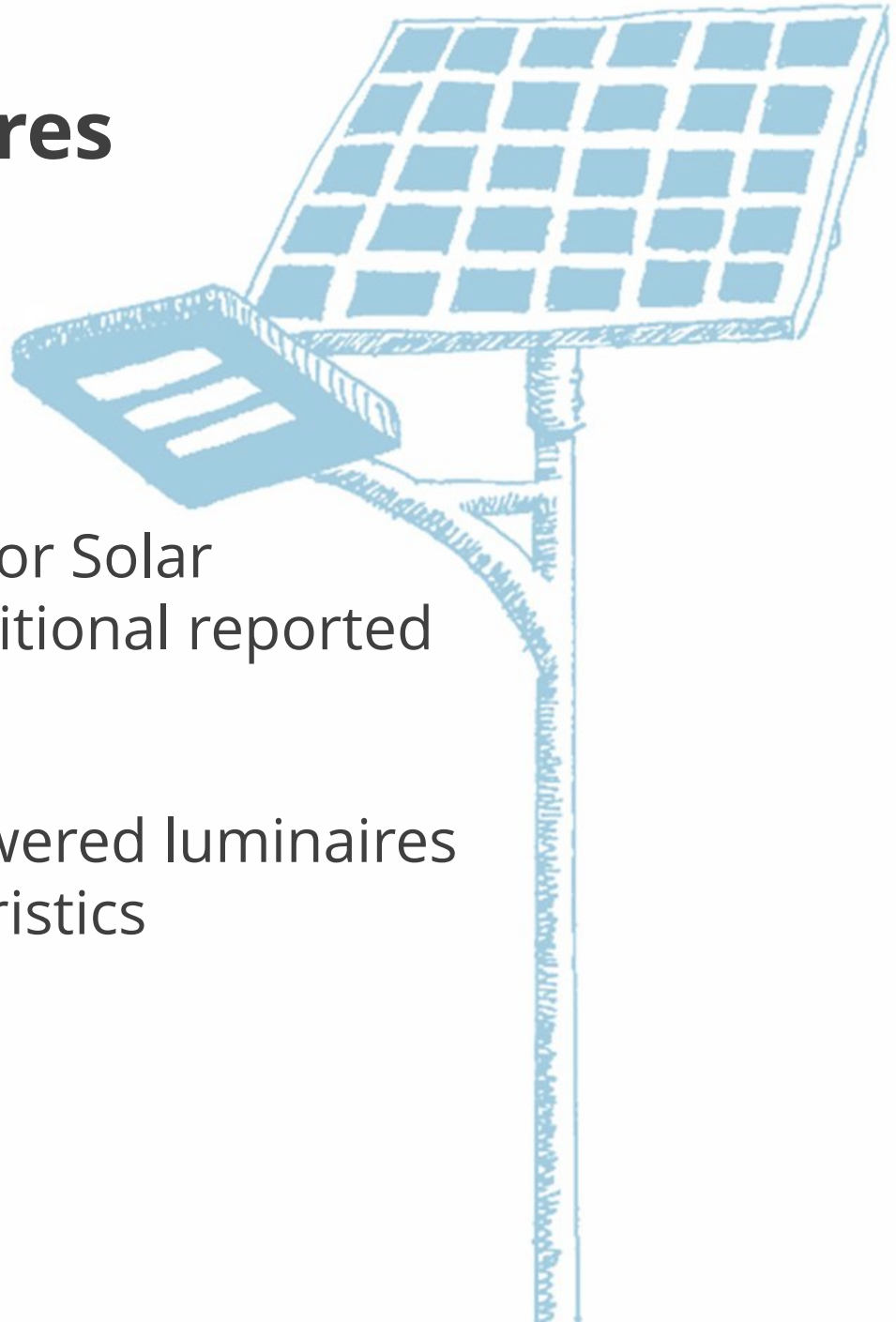
Product Images



Spec Sheets

Draft 1: Outdoor Solar Powered Luminaires

Outdoor Solar Powered Luminaires Overview



Requirement

Introduce Category for Outdoor Solar Powered Luminaires with additional reported characteristics

Goals

Support adoption of solar powered luminaires and reporting of key characteristics

Additional Reporting for Outdoor Solar Powered Luminaires

Excerpts from Table 31

Reported Field	Options
Configuration	Integrated 
	 Separate Components
	Luminaire Only 
Grid Connection	Off Grid
	Hybrid
Battery Type	$LiFePO_4$
	Lead Acid
	NIMH
	NMC
	Lead Crystal

Other Reported Values

- PV Wattage
- Recommended Install Height
- Battery Capacity
- Battery Lifetime
- Solar Panel Lifetime

Draft 1: Efficacy

Efficacy Overview and Goals

Requirement

Propose to increase standard efficacy (lm/W) thresholds by an average of 17% (range of 4%-29%)

Goals

Continue to save energy by setting thresholds that keep pace with technological advancements, ensuring that DLC represents the most efficient products on the market

Standard Efficacy Thresholds: Indoor

Excerpts from Table 5

Category	General Application	V5.1 Threshold (lm/W)	V6.0 Threshold (lm/W)
Indoor Luminaires and Retrofit Kits	Troffer	110	120
	Linear Ambient	115	125
	High Bay	120	140
	Low Bay	115	130
	Case Lighting	95	110
	Interior Directional	80	95

Standard Efficacy Thresholds: Outdoor

Excerpts from Table 5

Category	General Application	PUD	V5.1 Threshold (lm/W)	V6.0 Threshold (lm/W)
Outdoor Luminaires and Retrofit Kits	All	Pole/Arm-Mounted Area and Roadway	105	130
		Pole/Arm-Mounted Decorative		115
		Outdoor Zero-Uplight Wall-Mounted Area		125
		Outdoor Uplight-Emitting Wall-Mounted Area		130
		Bollards		120
		Parking Garage		120
		Fuel Pump Canopy		135
		Architectural Flood and Spot Luminaires		130
		Stairwell and Passageway		130
		Sports Flood		115
		Hazardous Environment Area		115

Standard Efficacy Thresholds: Lamps

Excerpts from Table 6

Category	General Application	V5.1 Threshold (lm/W)	V6.0 Threshold (lm/W)
Linear Replacement Lamp (Bare Lamp)	All	120	130
Mogul-Base LED Replacement Lamp (In Luminaire)	Outdoor	105	130
	High-Bay	120	140
	Low-Bay	115	130
Four Pin-Base Lamps (Bare Lamp)	Vertically and Horizontally Mounted	85	95
	2G11 Base	120	125

Efficacy Thresholds by Amber LED Technology

Excerpts from Table 7

Amber LED Technology	Minimum efficacy Threshold (lm/W)
de-Amber	30
pc-Amber	70
Filtered-Amber	95

Efficacy Allowances for Low CCT Products

Excerpts from Table 37

Performance Metric	Allowance
CCT ≤ 2700k	8%
CCT ≤ 2200k	10%
CCT ≤ 2000k	20%
CCT ≤ 1800k	25%

Maximum total allowance of 15%, except for 2000K and 1800K products, which have a maximum allowance of 25%

Premium Efficacy Thresholds

Requirement

20 lm/W above standard thresholds (allowances apply)*

Goals

Differentiate **the most energy efficient products** to enhance energy savings

*V5.1 Premium efficacy is set at 15 lm/W over Standard

Draft 1: Sustainability

Sustainability Overview

Requirement Optional reporting of third party verified certifications

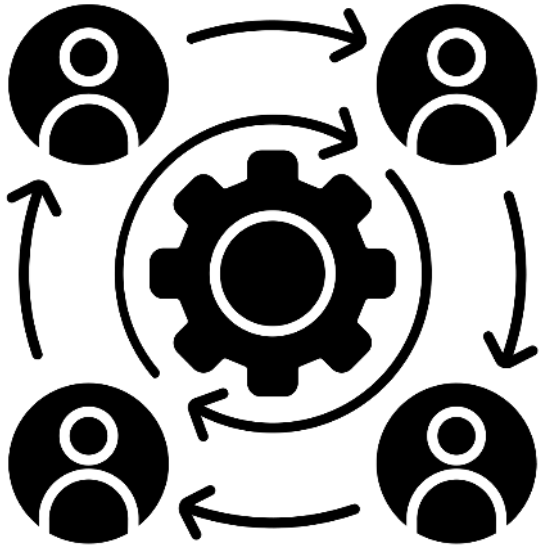
Goals Promote lighting sustainability efforts and encourage lifecycle data collection

Draft 1: Quality of Light

Quality of Light Goals

Details in Table 10

Better support the mitigation of light pollution in outdoor applications



Align with market needs and industry standards

Quality of Light – Chromaticity

Details in Table 10

Outdoor eligible CCT maximum set at **5000 K or less**

*Indoor and LUNA-eligible outdoor products may also include the following LED-based options:

1) 1800 K and 2000 K
2) Direct emission (de-) Amber
3) Phosphor converted (pc-) Amber
4) Filtered Amber (outdoor LUNA-eligible products only)

Amber and NWL CCTs must report color rendition and maintenance values, but no thresholds are proposed

Quality of Light – Chromaticity

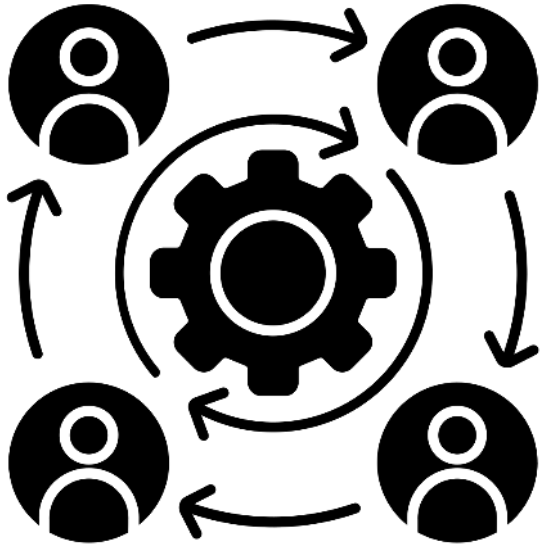
Details in Tables 11 & 12

Category	General Application	Primary Use Designation (PUD)	Eligible CCT Range and Amber LED Technologies for DLC Standard Qualification*
Indoor Luminaires	All	All	1800 K – 6500 K de-Amber pc-Amber
Outdoor Luminaires (including Solar-powered)	Low – Very High Output	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	1800 K – 5000 K de-Amber pc-Amber filtered-Amber
		Outdoor Pole/Arm-Mounted Decorative Luminaires	1800 K – 5000 K de-Amber pc-Amber filtered-Amber
		Outdoor Zero-Uplight Wall-Mounted Area Luminaires	1800 K – 5000 K de-Amber pc-Amber filtered-Amber
		Outdoor Uplight-Emitting Wall-Mounted Area Luminaires	2200 K – 5000 K

Tables 11 and 12 detail the CCT range and Amber technologies eligible for each PUD

Quality of Light – Color Maintenance

Details in Table 10



Draft 1 proposes to require reporting of CS4 and CS7 values per ANSI/IES TM-35-19.

No thresholds are proposed.

Draft 1: Controllability

Controllability Rationale:

Why

Better support incentive programs for integral controls and controls-ready luminaires

What

Required reporting of controls product variations within individual Product IDs

How

Collect specific driver and controls information through Controls Options Tables

Controllability

Existing Control Features Fields

- Integral Controls
- Dimming Capability and Range
- Integral Control Capability
- Sensor Type
- SSL V5 Wired Communication Protocol
- SSL V5 Wireless Communication Protocol
- Wired Communication for a Single Control Point
- Wired Communication Between Multiple Control Points
- Wireless Communication Between Multiple Control Points
- Minimum Dimming Level
- Integral Control Receptacle Standard
- Field Adjustable Light Output
- White-Tunable
- Warm-Dimming
- Field Adjustable Light Distribution

Controls Options Tables

Controls Categories

Controls Categories

Category	Indoor	Outdoor	Notes
1	Luminaire Only		
1A		Luminaire with Photocell Only	Non-Networked
1B		Luminaire with Photocell and Part Night Dim	Non-Networked
2	Controls Ready Luminaire Only		Integral Receptacle
3	Luminaire with Occupancy Sensor		Non-Networked
4	Luminaire with Occupancy Sensor + Daylight Sensor		Non-Networked
4A		Luminaire with Occupancy Sensor + Photocell	Non-Networked
5	Luminaire with Networked Controller		
6	Luminaire Level Lighting Control (LLLC)		Integral networked controller and sensor

Controls Options Tables

- **Collected at Application Level**
  - **1 Controls Options Table -> Multiple Product IDs**

INDOOR									
1	2	3	4	5	6	7	8	9	10
Application ID	Controls Option Code	Driver Type	Integral Controller Type	Controls Ready Receptacle Type	Integral Sensor Function	Integral Sensor Technology	Sensor Max Mounting Height (ft)	NLC Product ID	Controls Ready Accessory Model Numbers (optional)

OUTDOOR										
1	2	3	4	5	6	7	8	9	10	11
Application ID	Controls Option Code	Driver Type	Integral Controller Type	Controls Ready Top Receptacle Type	Controls Ready Bottom Receptacle Type	Integral Sensor Function	Sensor Technology	Sensor Max Mounting Height (ft)	NLC Product ID	Controls Ready Accessory Model Numbers (optional)

Draft 1: Field Adjustable

Field Adjustable Rationale:

Why

Better align with industry practice and encourage use of lower output and CCTs.

What

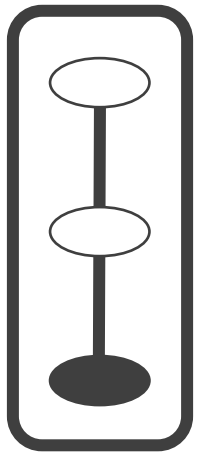
Define 'Field Adjustable' as changes made at time of installation, local to the luminaire.

How

Three FA Types: FALO (output), FACT (color temp), FALD (distribution)

Field Adjustable Light Output (FALO)

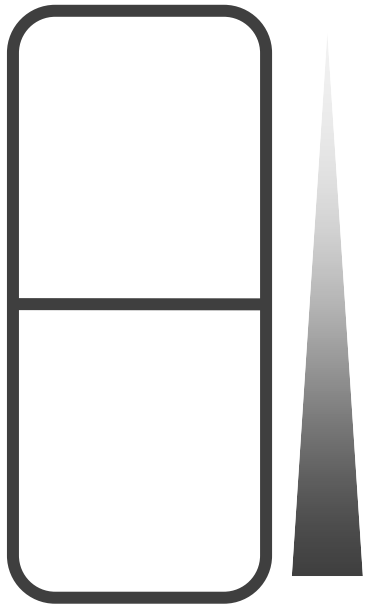
Splitting Field Adjustable Light Output from dimming



Lumen Output

Propose that products ship at lowest wattage setting

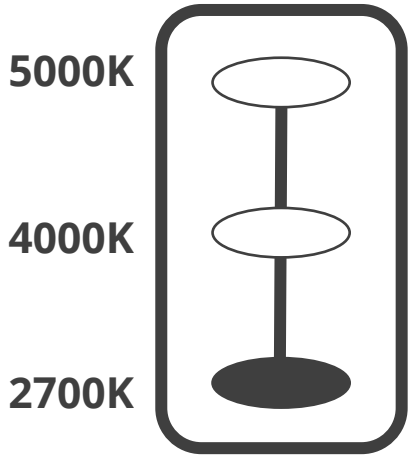
Field Adjustable Light Output



Dimming

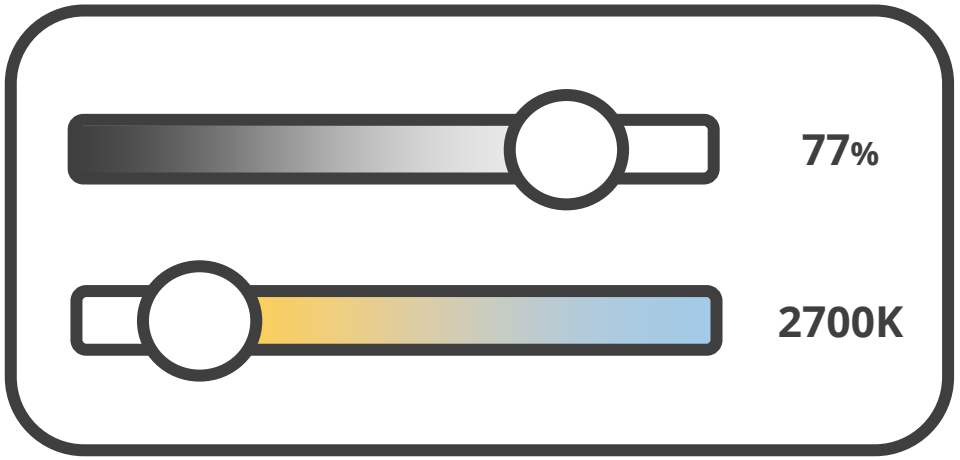
Field Adjustable Correlated Color Temperature (FACT)

Splitting FACT from color-tuning



Color Temperature

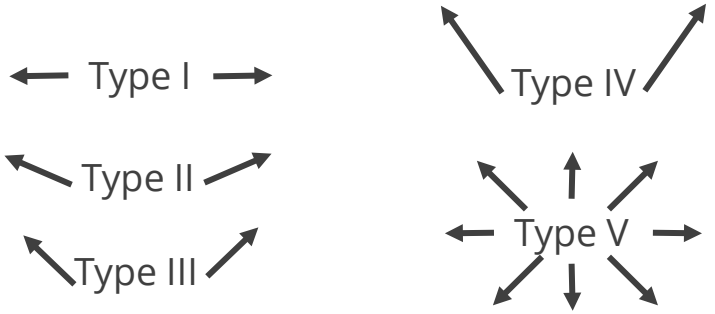
Propose that products ship at lowest CCT setting



Field Adjustable Light Distribution (FALD)

Field Adjustable Light Distribution

- Display
  - Type
  - Range
    - Indoor: degrees
    - Outdoor: IES + NEMA Distribution Types



IES Distribution Types

Beam Spread (deg)	NEMA Type	Description
10-18	1	Very Narrow
18-29	2	Narrow
29-46	3	Medium Narrow
46-70	4	Medium
70-100	5	Medium Wide
100-130	6	Wide
130+	7	Very Wide

SSL V6 Draft 1 Webinar Series: Controls and Field Adjustable

Wednesday,
April 30,
2pm EDT

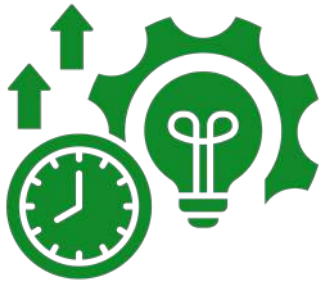
Controls Webinar

Draft 1: Premium

Goals for Premium in Draft 1

Details in Table 30

1. Improve the value of V6.0 Premium listings for members



2. V6 Premium will enable an industry shift to better controlled LED lighting solutions

   – Today, V5.1 Premium QPL listings make up over 50% of the QPL.

Draft 1 Premium Efficacy

Details in Table 30

Goal

Differentiate **the most energy efficient products** to enhance energy savings

Premium Requirement

+20 lumens per watt over V6 Standard efficacy requirements*

*V5.1 Premium efficacy is set at +15 lpw over Standard

Draft 1 Premium Controllability

Details in Table 30

Goals

Greater energy savings & better integration with control systems

Premium Requirement

- Continuous dimming* to 10% or lower
- Digital drivers required (e.g. DALI-2, D4i)
- Controls categories 2,5,6 only

*V5.1 already requires continuous dimming

DLC LISTED PREMIUM™

Draft 1 Premium Discomfort Glare

Details in Table 30

Goal

Support glare mitigation while understanding metric trade-offs

Premium Requirement

Troffers maintain UGR thresholds from V5.1

*Removes V5.1 Premium UGR requirements from several PUDs

Draft 1 Premium Chromaticity

Details in Table 30

Goal Installed lighting is more uniform

Premium Requirement Stricter limits on variation within color temperature bins (3000K, 4000K, etc)

V5.1 Premium Chromaticity requirements are not being changed

Draft 1 Premium Lumen Maintenance

Details in Table 30

Goal

Extend product lifetime and therefore savings from initial investment

Premium Requirement

L90 ≥ 36,000 hours
(Standard L70 ≥ 50,000 hours)

V5.1 Premium lumen maintenance requirements are not being changed

Draft 1: Color Tuning and Field Adjustable CCT

Draft 1 Color Tuning and FACT

Goals

Better support incentives for color tunable products and industry changes in product designs

Requirement

- Add eligibility for full-color tunable products
- Rename "white tunable" to "CCT tunable"

V5.1 already provides eligibility pathways for "CCT-tunable" and "warm-dimming" color tuning products

Draft 1: Lumen Maintenance & Driver Lifetime

Lumen Maintenance & Driver Lifetime Goals

Goals

Extend product lifetime to support utility needs to ensure savings from initial investment and reduce maintenance costs

Requirement

- Maintain lumen maintenance thresholds
- Implement driver lifetime requirements for all listings

Lumen Maintenance & Driver Lifetime

Excerpts from Table 28

Metric	DLC Standard	DLC Premium
Lumen Maintenance	2200 K – 6500 K: L70 ≥ 50,000 hours De-Amber, pc-Amber, 1800 K-2000 K: L70 ≥ 36,000 hours	(In addition to L70 thresholds) 2200 K – 6500 K: L90 ≥ 36,000 hours de-Amber, pc-Amber, 1800 K-2000 K: not eligible for Premium
Driver Lifetime	≥ 50,000 hours	

V5.1 Premium driver lifetime requirements will be required for all V6 listings, Lumen Maintenance values are not changed

LUNA V2.0

LUNA V2.0:

Details in Table 32 and 34

Requirement

Expand product eligibility and simplify testing and controls requirements

Goals

Support adoption of high-quality, energy-efficient lighting that mitigates light pollution

DLC LUNA™

LUNA V2.0: Turtle Lighting luminaires

Details in Tables 33 and 35

Requirement

Turtle Lighting PUDs have de-Amber LEDs, zero uplight, limits on total light output and high-angle light

Goals

Support adoption of high-quality, Amber LED turtle lighting products

Expanding product eligibility in LUNA V2.0

Lamps

image courtesy of Current

Retrofit Kits

Selectable CCT

image courtesy of Current

SSL V6 Draft 1 Webinar Series:
Amber Specifications in SSL V6.0 & LUNA V2.0

Wednesday,
April 23,
2pm EDT

Amber/LUNA Webinar

Energy · Quality · Controllability℠

Draft 1: Alternately Sourced Equivalent Components

What you see on the QPL is what you get

Qualified Product(s)

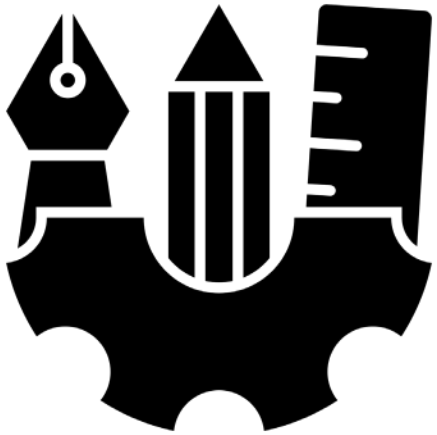
Alternate LEDs

Alternate Drivers

Alternate LEDs and drivers must perform within existing performance tolerances and provide subcomponent testing to validate alternates meet DLC thresholds

Draft 1: Additional Reporting

Additional Reporting



Supporting revised IES standards

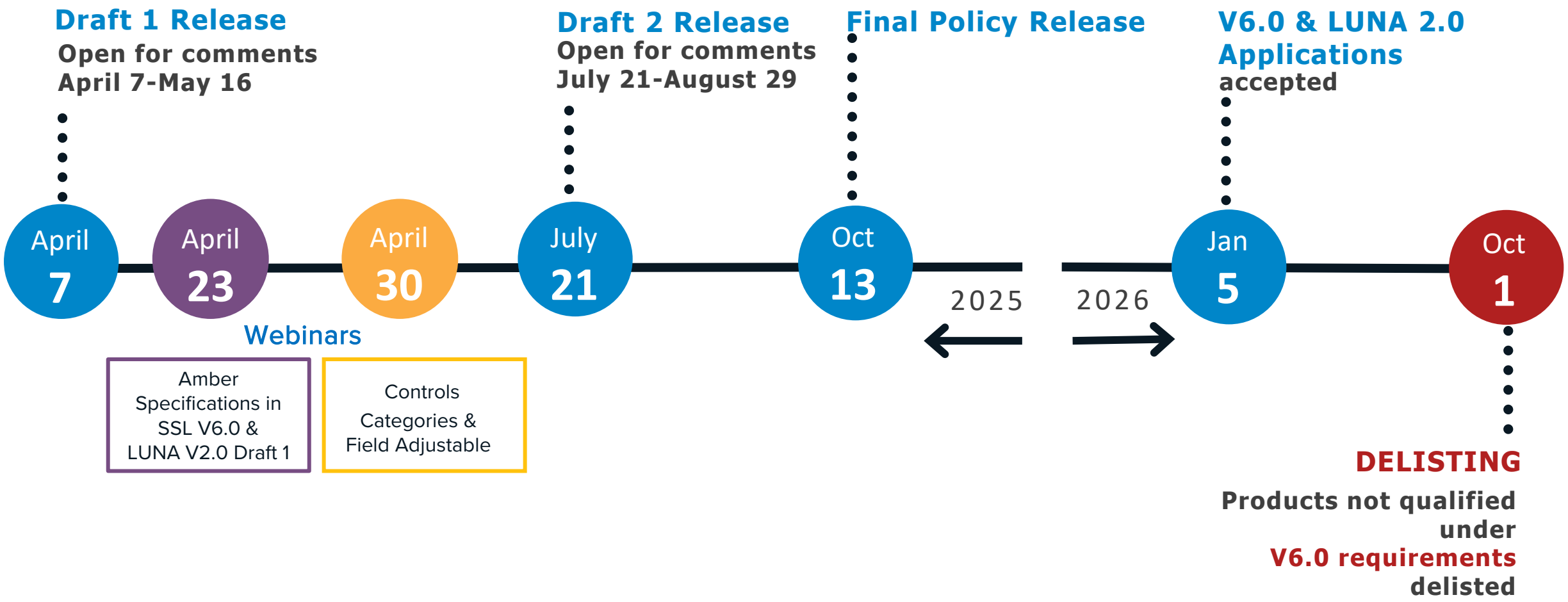
No longer allowing LM-79-08

All LM-79 test reports must be PDFs

Q&A

Wrap Up

SSL V6.0 & LUNA V2.0 – Release Timeline



Thank you for attending the SSL V6.0 & LUNA V2.0 Draft Release Webinar!

Amber/LUNA Webinar

Controls Webinar