Energy · Quality · Controllability℠

NLC V5.2 Draft 1 Technical Requirements

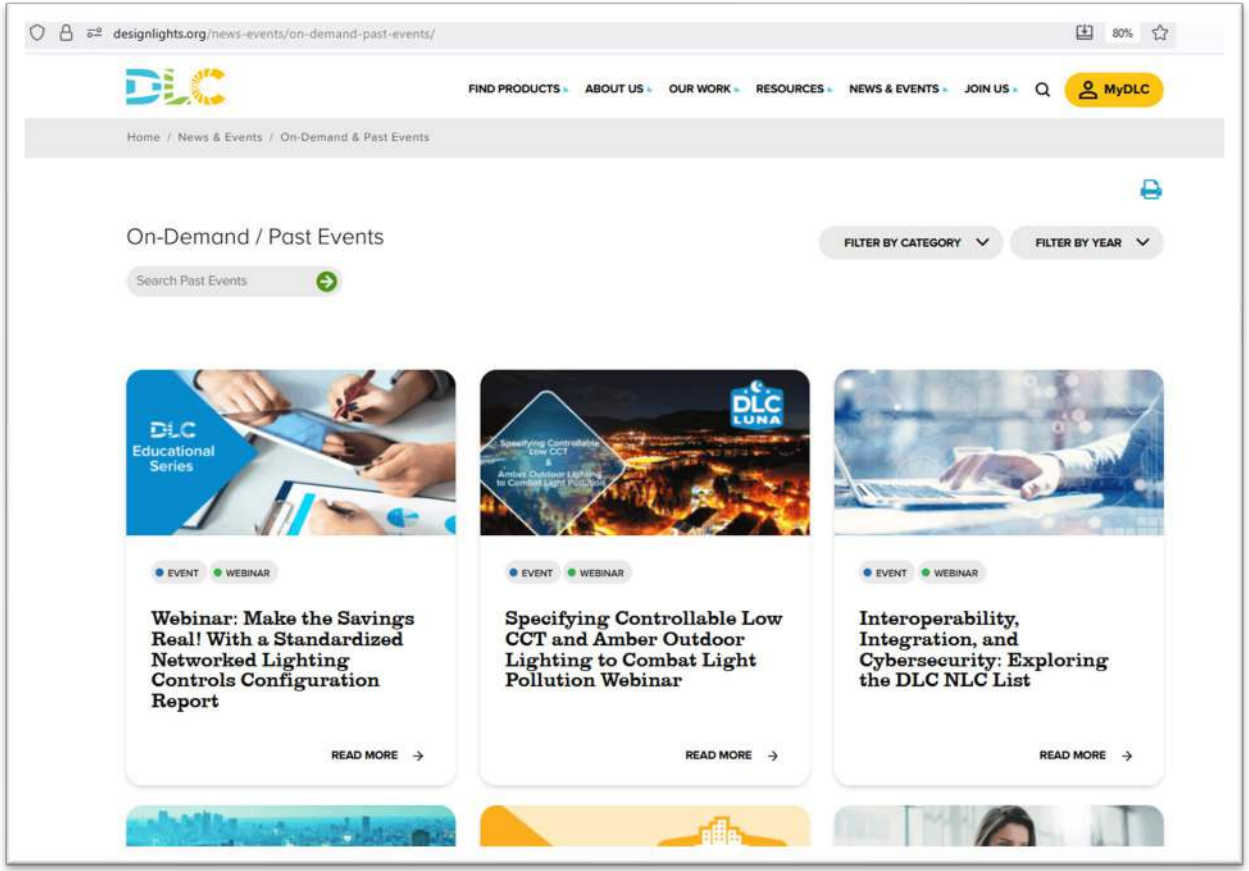
April 8, 2026

designlights.org

Welcome!

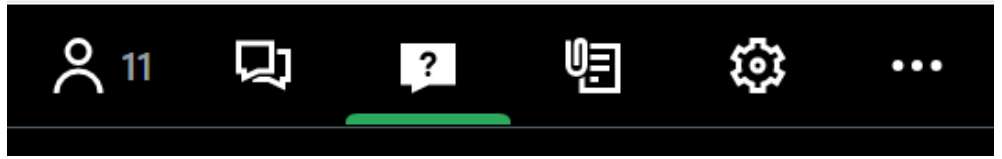
- **Slides and recorded webinar will be posted** on the *DLC News & Events* page at https://designlights.org shortly after today's presentation

- 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**



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.

Agenda

- Welcome, Introductions & Agenda Review
- NLC V5.2 Updates
  - NLC Thermostats
  - ANSI C137.9 Configuration Reporting
- Requirements Reorganization
- DLC Summit
- Review
  - Timeline
  - Submitting Comments
- Q&A

Presenters

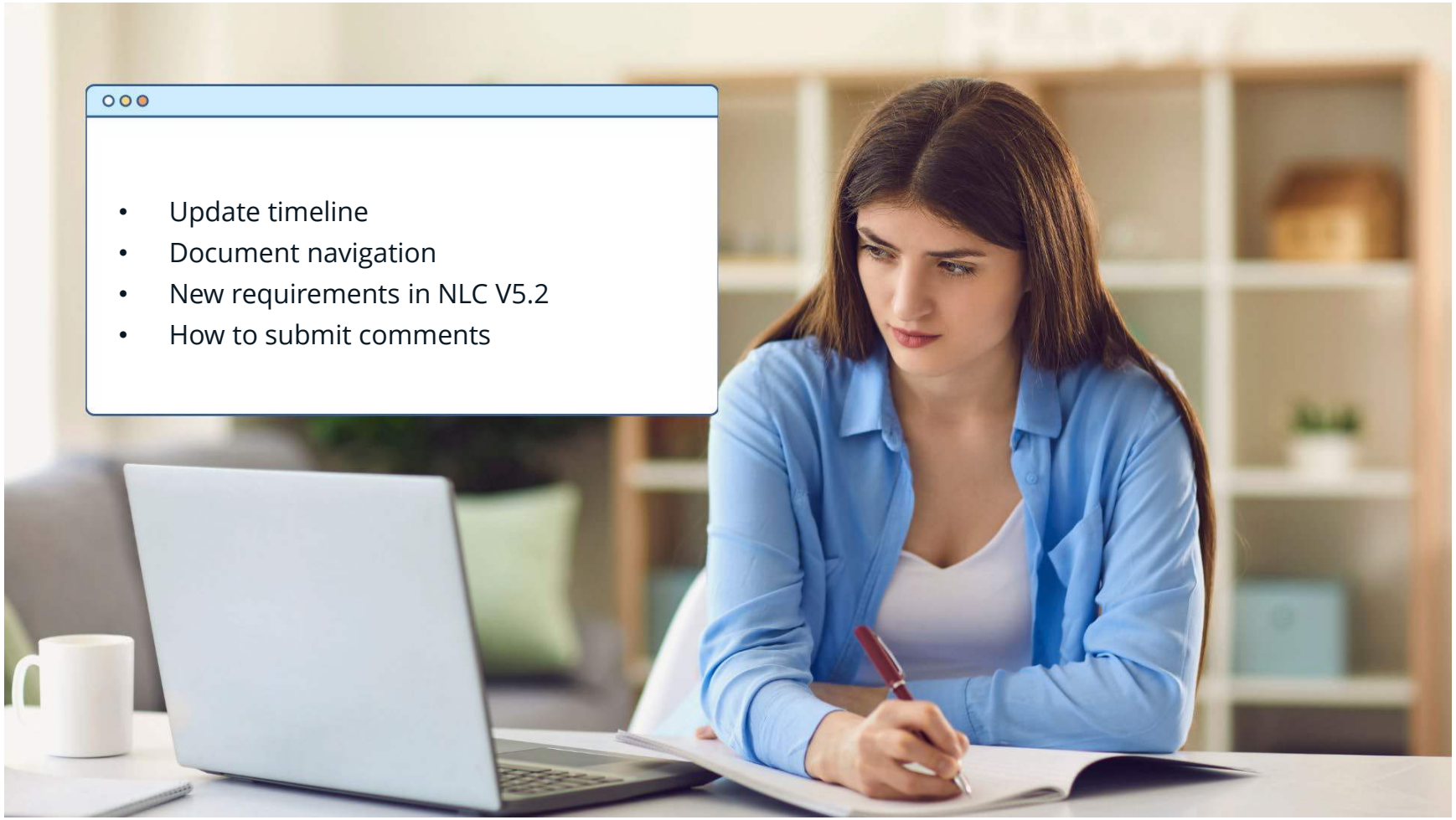
Levin Nock
Senior Technical Manager

Jason Jeunnette
Technical Manager

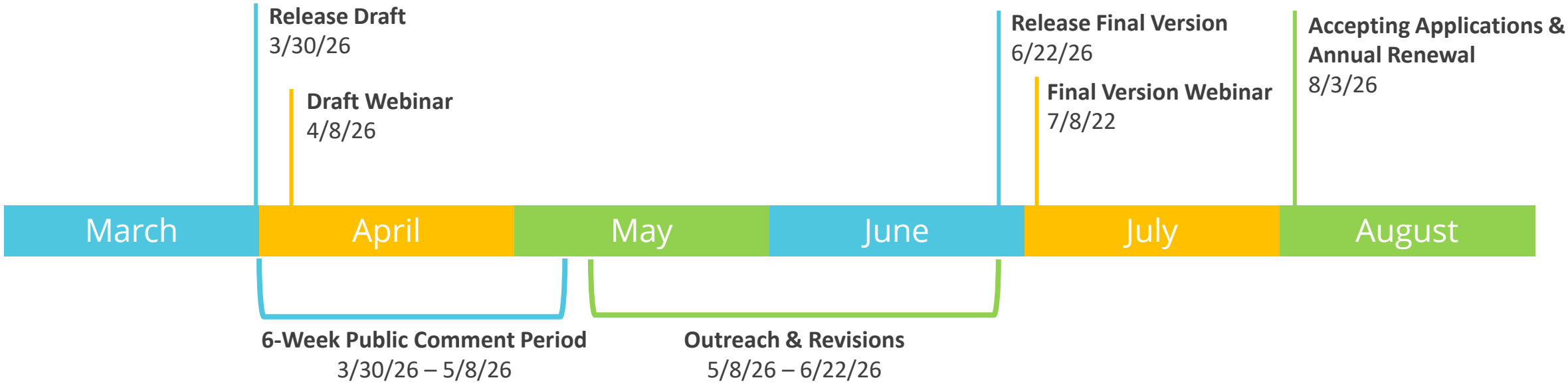
Bagwat Mohan
Senior Technical Operations

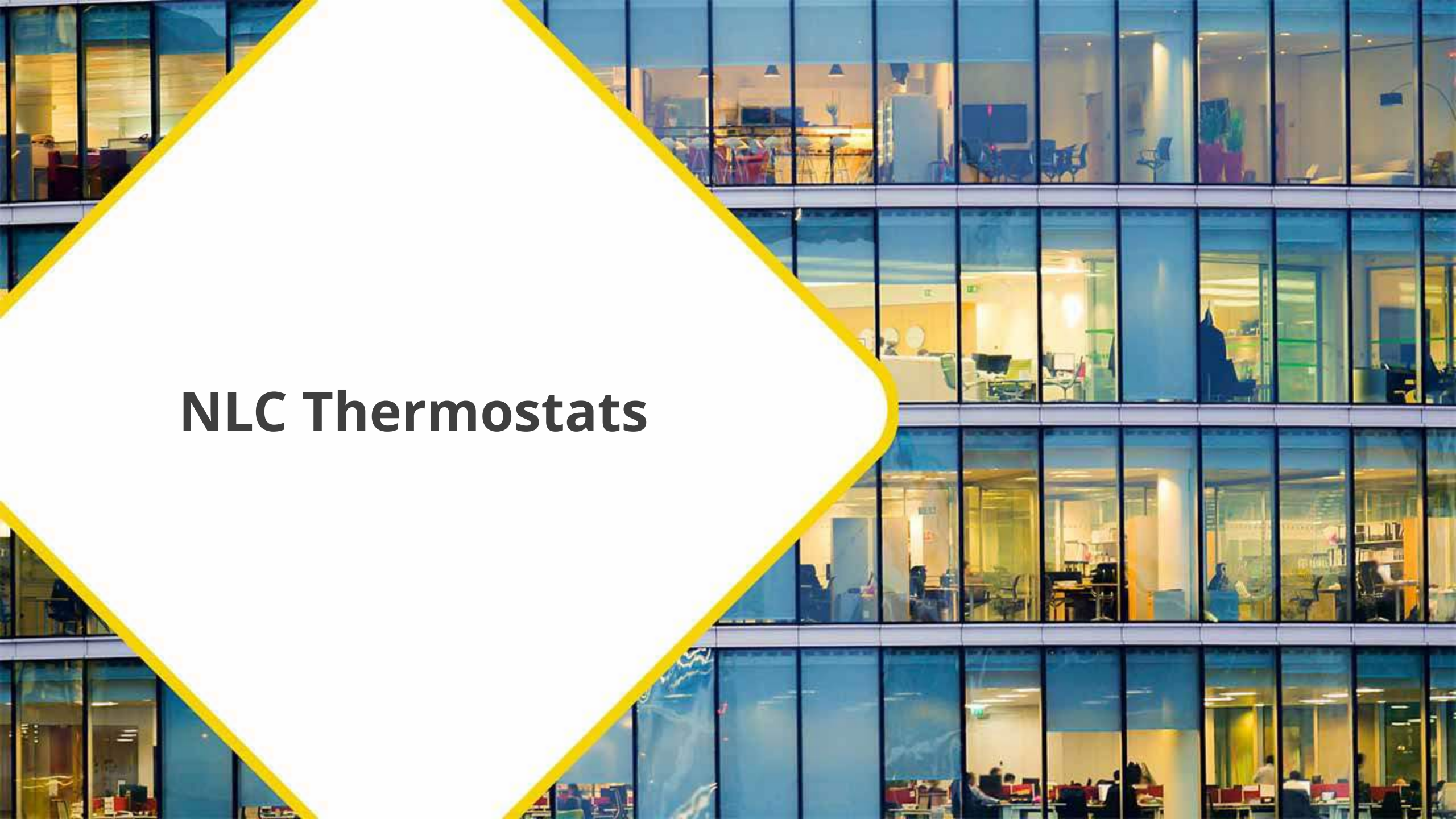
Andrew Antares
Project Manger

Webinar Objectives



NLC5.2 Update Timeline





NLC Thermostats

Future of Commercial Lighting Programs

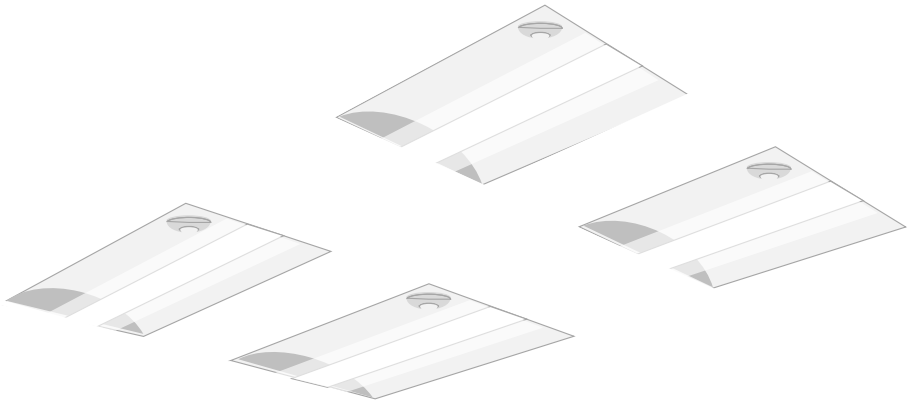
Declining

- TLEDs
- Simple LED retrofits

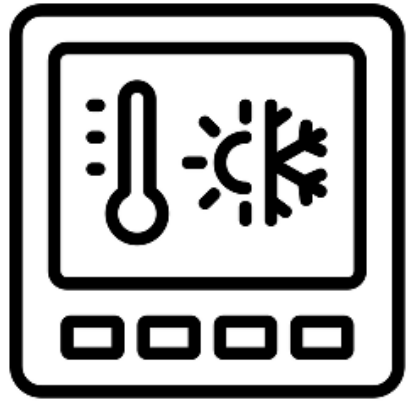
Growing

- LLLC
- Integration with HVAC controls

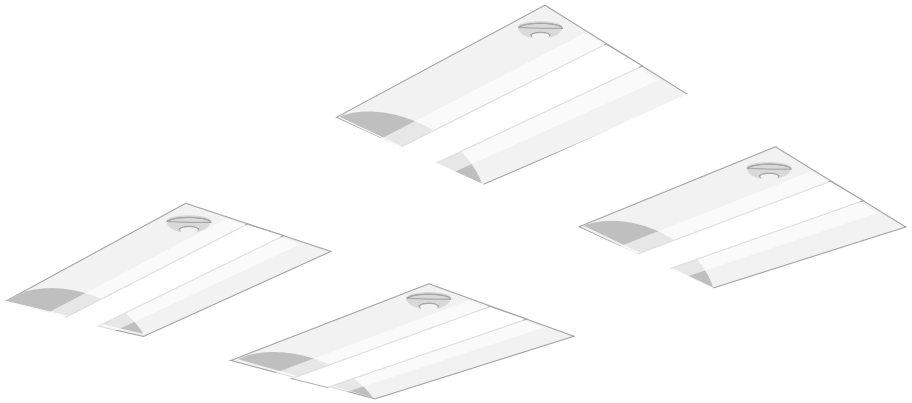
LLLC occupancy sensors can inform thermostats or BAS



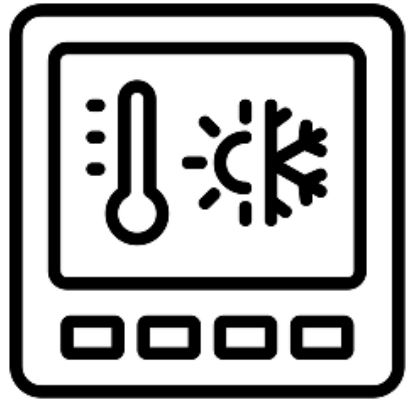
Occupancy data



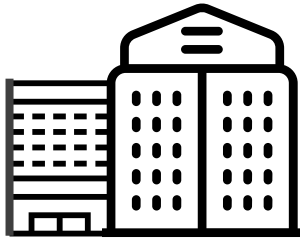
Occupied Standby Mode



Occupancy data

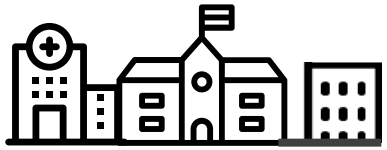


Occupied Standby Mode



Large Buildings
BAS

50% of commercial square footage,
6% of buildings



Smaller Buildings
Hardwired Dry Contact
Digital Thermostats

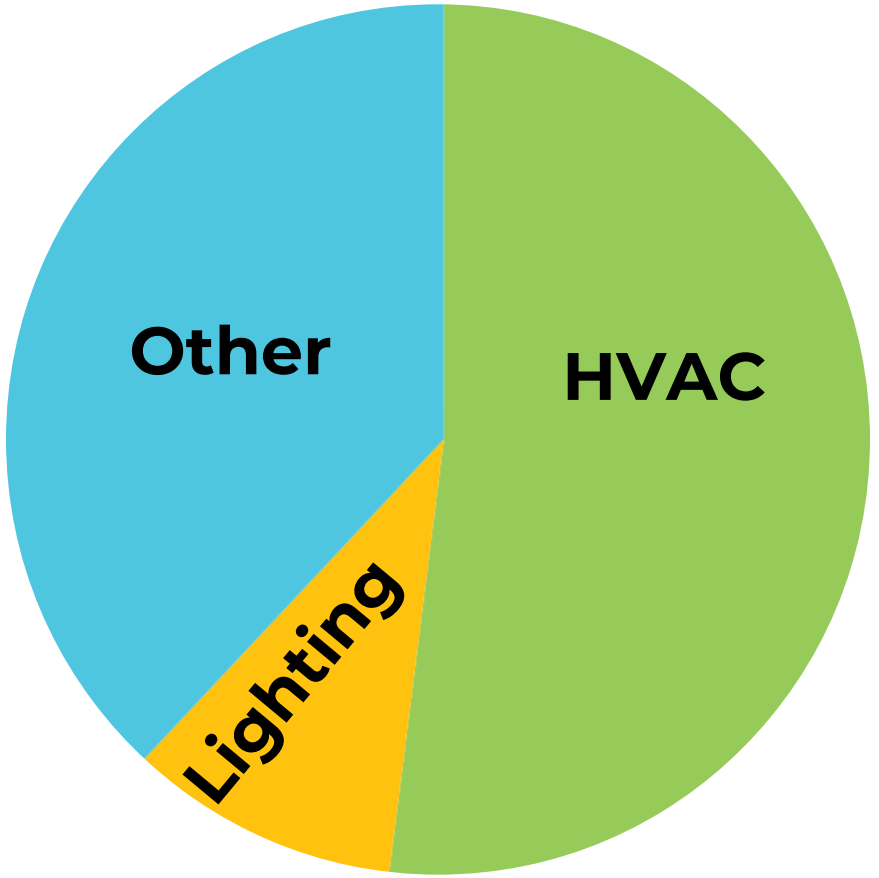
50% of commercial square footage,
94% of buildings

50,000 ft^2 threshold applied to https://www.eia.gov/consumption/commercial/ (CBECS 2018)

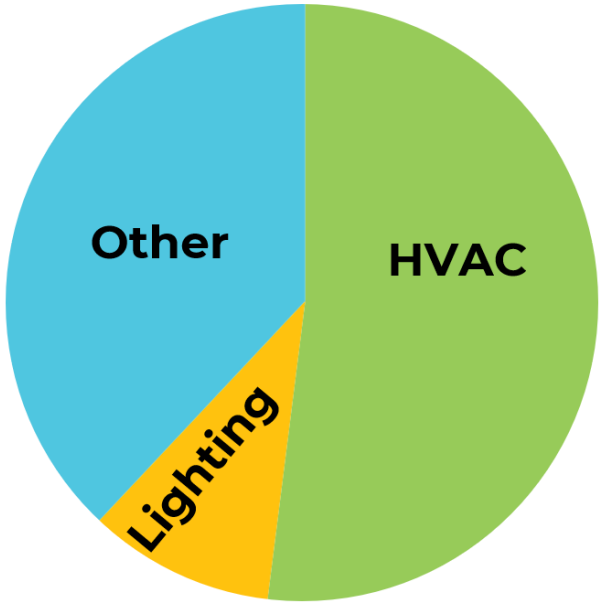
Energy use in commercial buildings in 2018

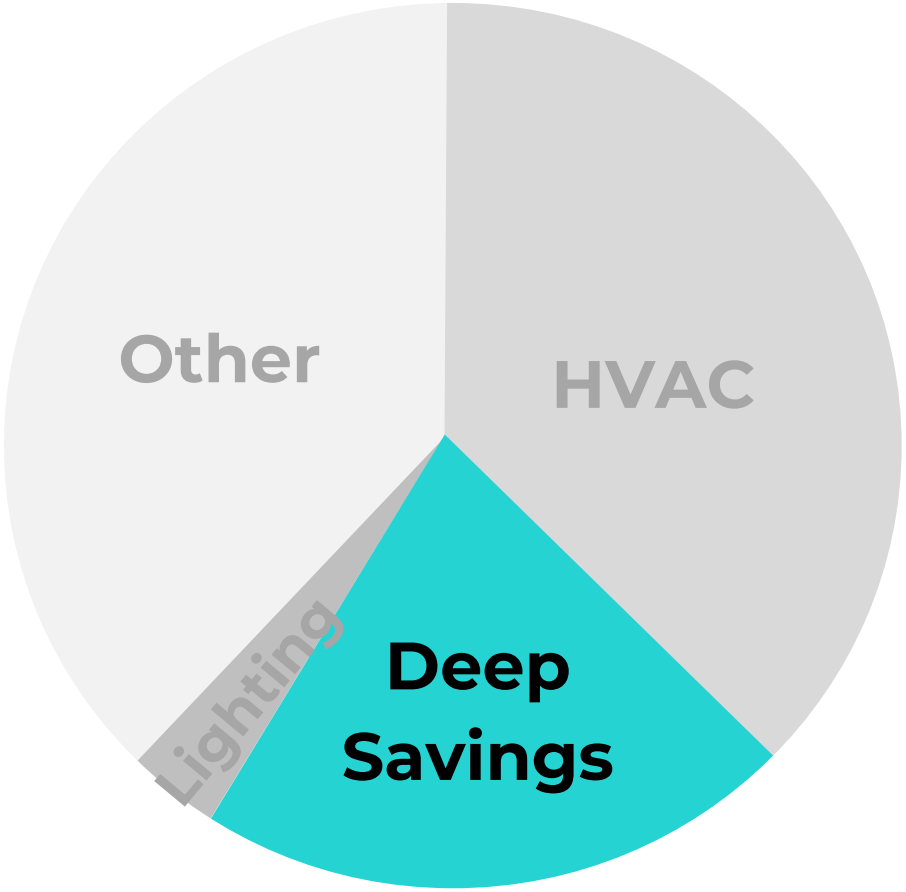
HVAC	52%
Lighting	10%
Other	38%

CBECS (Commercial Buildings Energy Consumption Survey), US EIA, 2022



Deep savings in suitable buildings





NLC-Integrated Thermostats on the NLC Qualified Products List

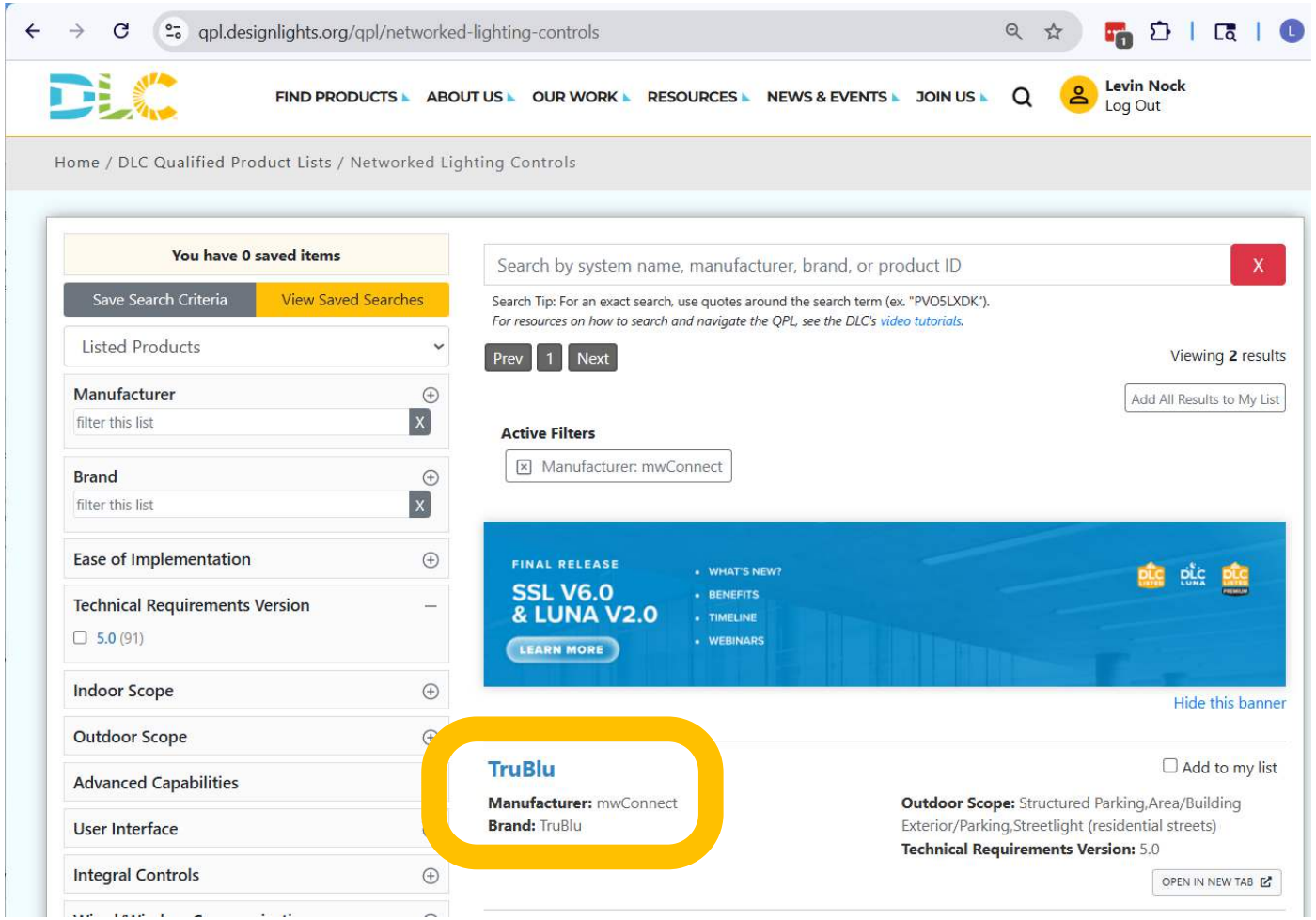
Why add NLC-integrated thermostats to the DLC QPL?

1. Match Thermostat with LLLC Luminaire confidently
   - Control system and thermostat on NLC QPL; luminaire on SSL QPL
2. Support incentives that already exist
3. Collect data to develop new incentives
4. Deeper energy savings from retrofit projects in appropriate buildings

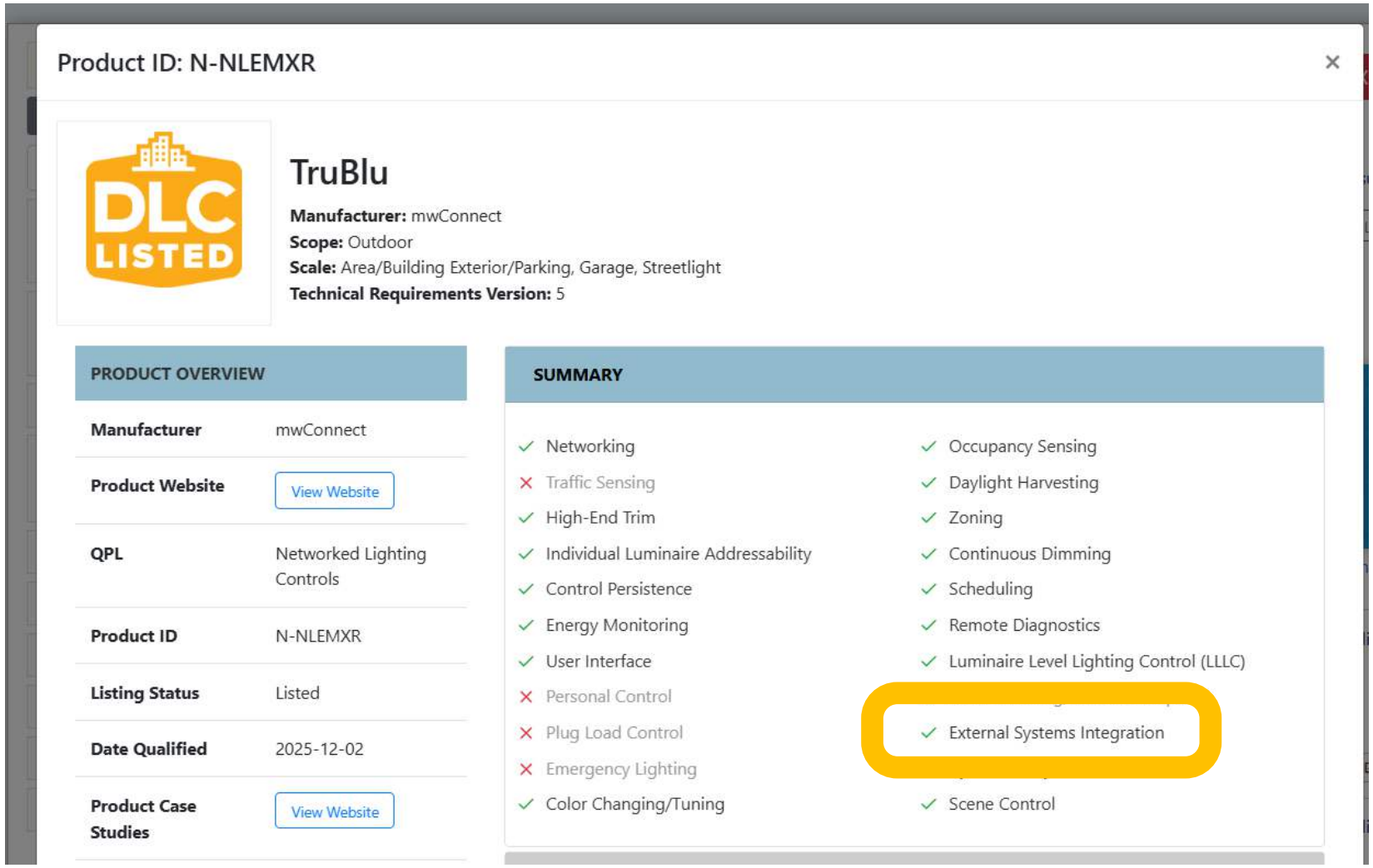
Aspect of NLC system on NLC QPL; not a separate thermostat list.

- At least for now

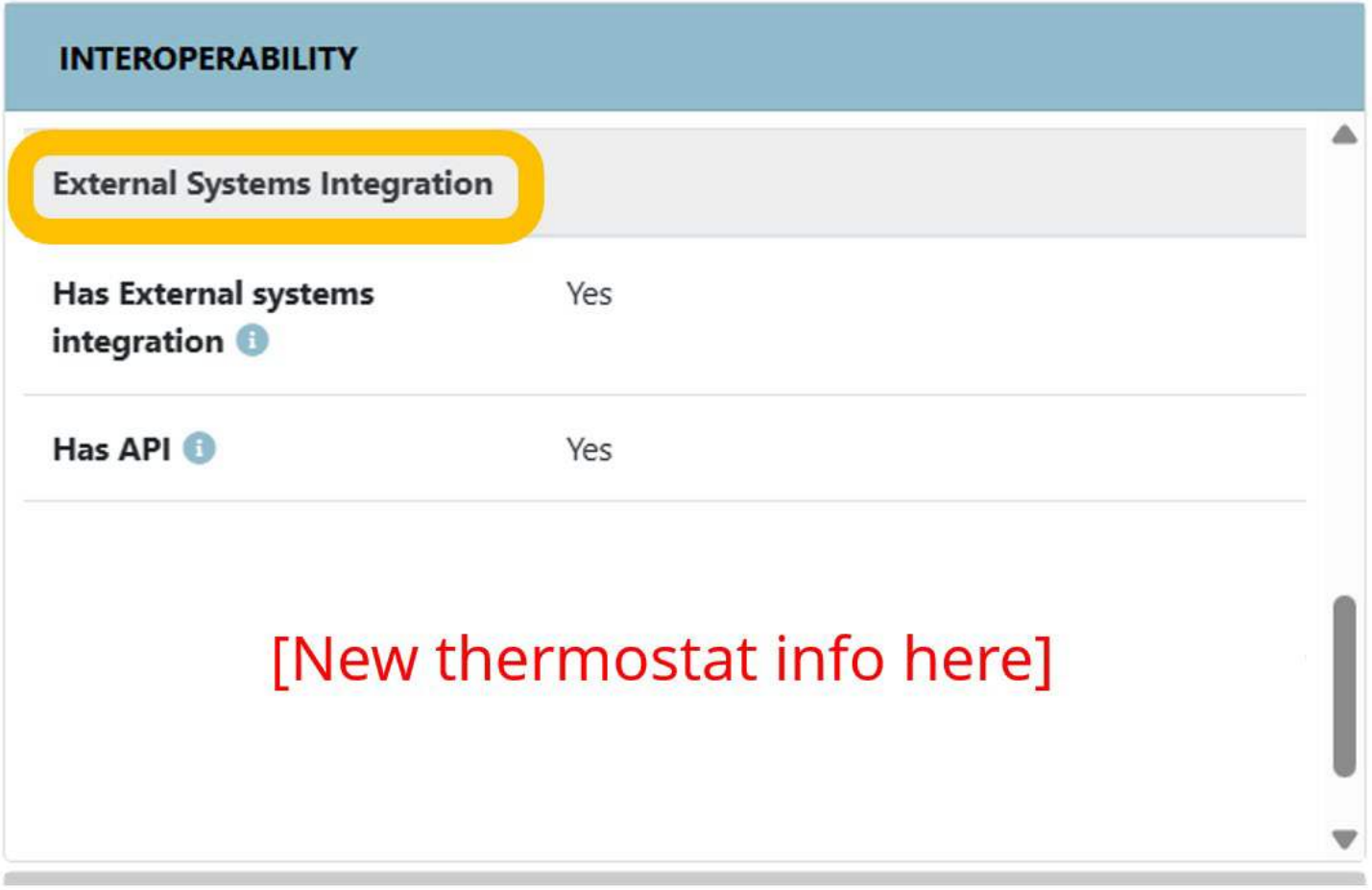
NLC QPL



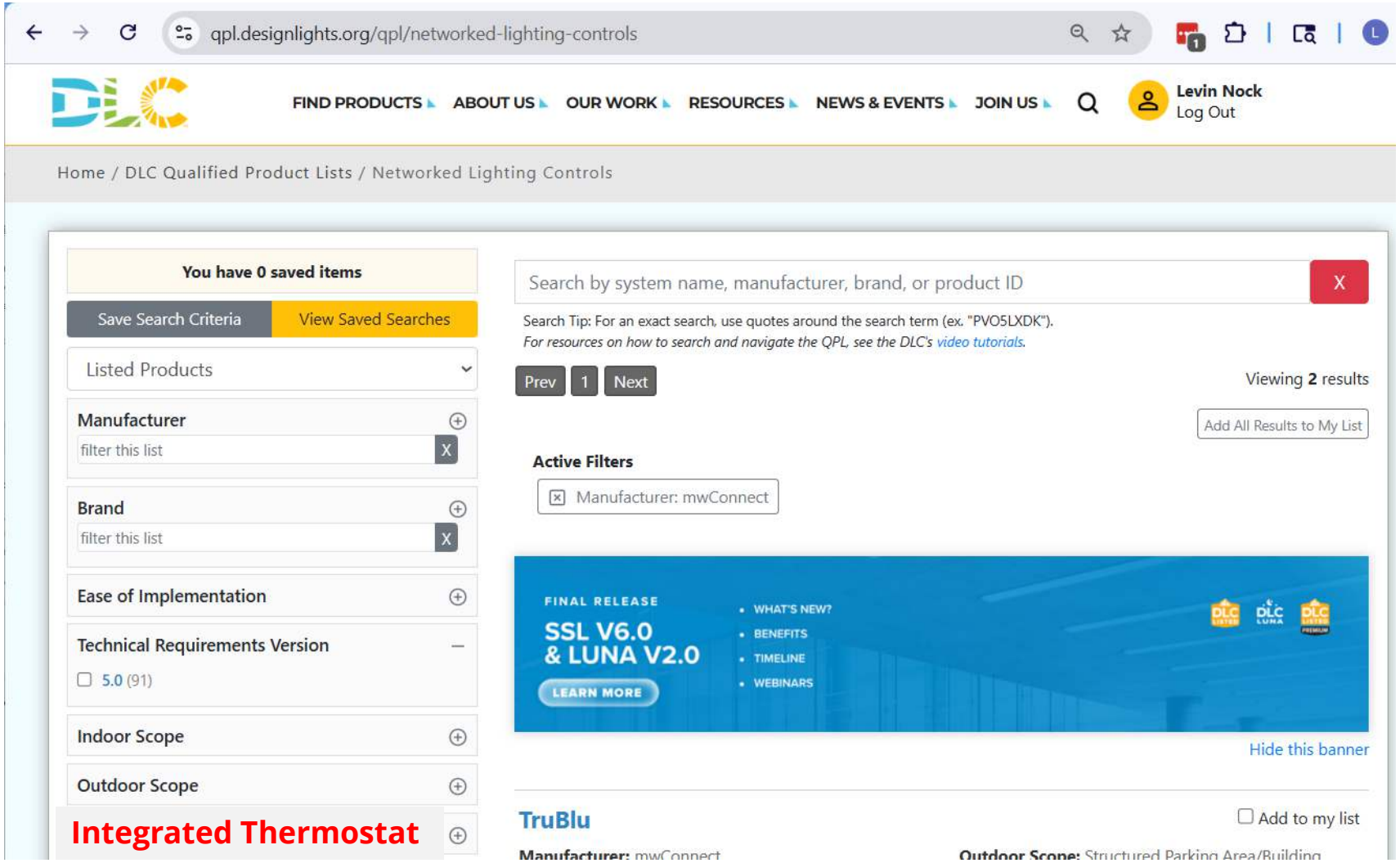
NLC QPL pop-up window for one system



NLC QPL
External Systems Integration details for one system



Thermostat filter(?)



New draft text in NLC Technical Requirements

NLC-integrated Thermostats

Thermostats are now available that can be easily integrated with an NLC system, to receive digital occupancy data from the NLC system. Within the External Systems Integration capability, the DLC recognizes NLC systems that support these thermostats, as shown in Table TH-1.

Thanks to Thermostat Working Group!

How to define “easily integrated?”

- Energy Efficiency Programs
- NLC and Lighting Manufacturers
- Thermostat Manufacturers
- Others
  - Standards Bodies
  - Integration Software Provider
  - Distributor/ESCO

	Table TH-1 Rows 2-5 Meaning of “easily integrated”	Acceptable Answer(s)
	Does the thermostat receive and respond to digital occupied/unoccupied data by changing temperature setpoints and fan control?	Yes
	Can thermostat-NLC integration be configured by GUI, without writing code?	Yes
	Can the thermostat be configured by GUI to subscribe to occupancy data from multiple occupancy sensors?	Yes
	Can the GUI display zones for lighting and for HVAC together, overlaid on a single floorplan?	Yes

Row	Table TH-1 Rows 1, 6-13 Product info on QPL	Acceptable Answer(s)
1	Name of the thermostat manufacturer, model name, and model number?	-
6	Can the thermostat receive data for partial occupancy, and respond appropriately? For example, a thermostat controls a space with 10 occupancy sensors, one of which currently indicates 'occupied'. This indicates 10% partial occupancy. Can the thermostat respond differently, versus data indicating complete vacancy or full occupancy?	Yes or No
7	Does lighting-thermostat integration require a gateway?	Yes or No
8	Can lighting and thermostat be scheduled together on one GUI display, with offset(s) for thermal inertia?	Yes or No
9	Are the primary thermostat terminal designations RGYW?	Yes or No
10	In addition to digital occupancy data, can the thermostat also accept 24VAC wired occupancy input?	Yes or No
11	What digital protocol(s) is used to transfer occupancy data? Bluetooth NLC, EnOcean, Zigbee 3.0, Zigbee 4.0, other	choose all that apply
12	Besides occupancy, what additional data can the NLC transfer to the thermostat; configured by GUI without writing code? none, humidity, CO2, particulates, pressure, other	choose all that apply
13	What GUI type(s) are supported? mobile app, web browser, wallstation	choose all that apply

Key Question 1

Regarding Row 3 of Table TH-1 asks, “Can thermostat-NLC integration be configured by GUI, **without writing code**?”

Question: Is the current language “without writing code” sufficiently clear, or is there other language that could indicate this distinction in a more precise way without sacrificing brevity?

Key Question 2

Regarding Row 5 of **Table TH-1** asks, “Can the GUI display zones for lighting and for HVAC together, overlaid on a single floorplan?”

Question: Is the current language sufficiently clear, or is there a less prescriptive way to specify the desired result, that lighting and HVAC zones can be easily matched with a GUI, in a manner that can be unambiguously confirmed or denied?

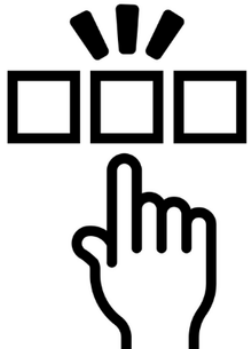
Key Question 3 (Similar to Key Question 1)

Regarding Row 12 of **Table TH-1** asks, “Besides occupancy, what additional data can the NLC transfer to the thermostat; configured by GUI **without writing code**?”

Question: Is the current language “without writing code” sufficiently clear, or is there other language that could indicate this distinction in a more precise way without sacrificing brevity?

NLC HVAC Integration Toolkit

Toolkit Goals

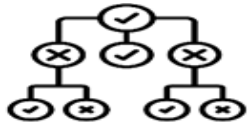
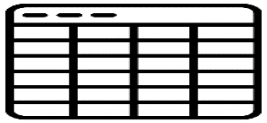


Choose appropriate projects

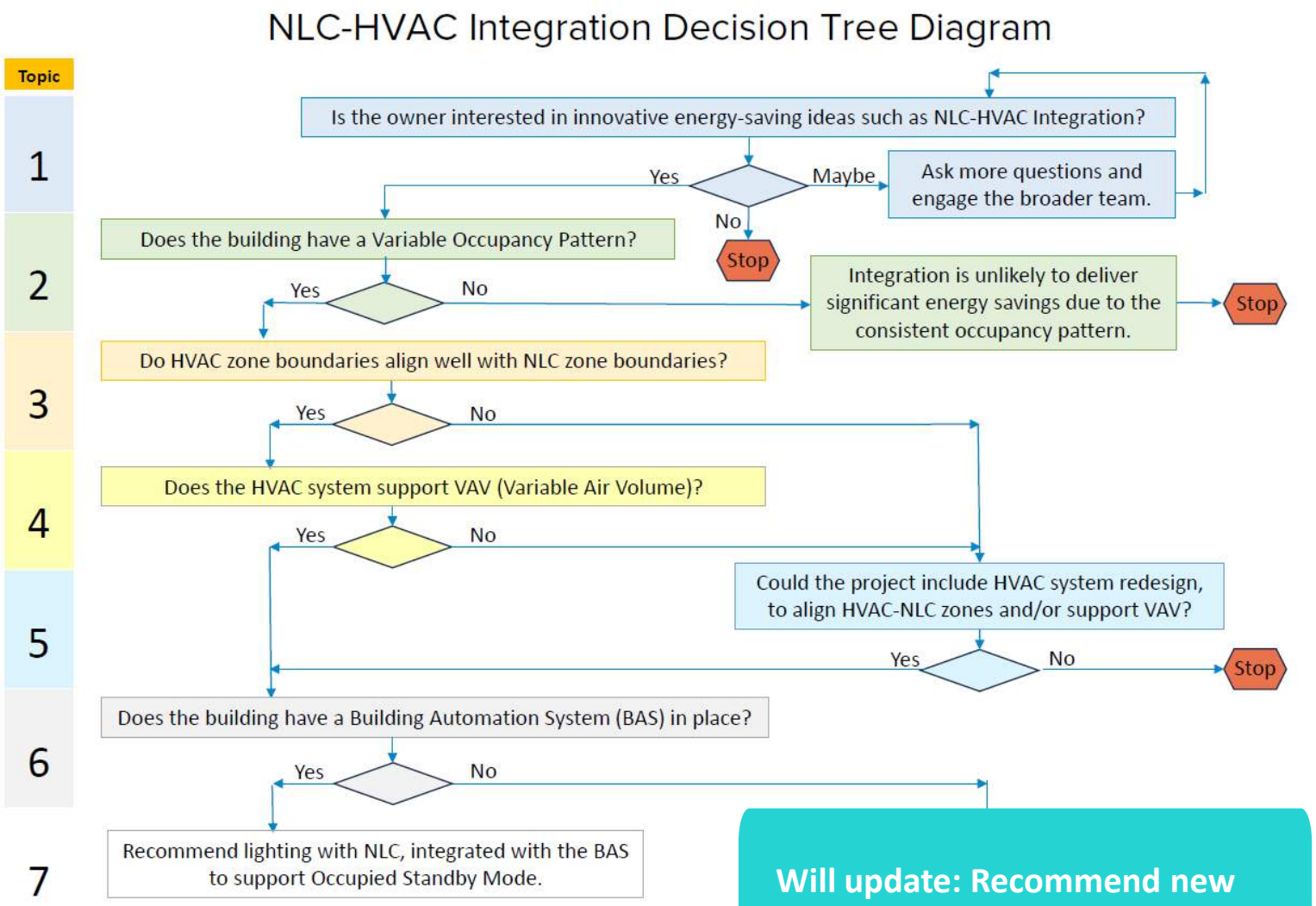
Collaborate better

Save energy

Five Toolkit Documents

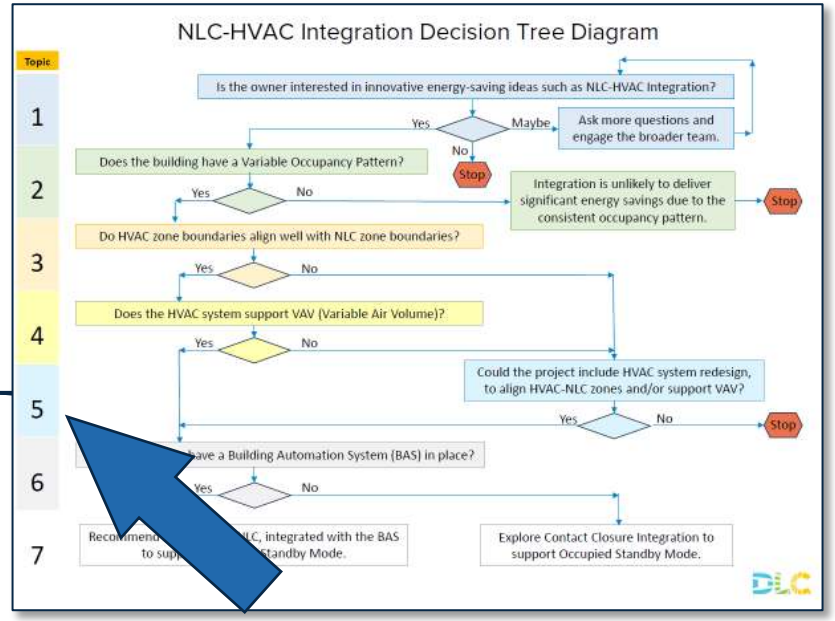
Handbook	**PDF**	
Decision Tree	**PDF**	
Case Studies	**Excel**	
Responsibility Matrix	**Editable Excel**	
Project Template	**Editable Word**	

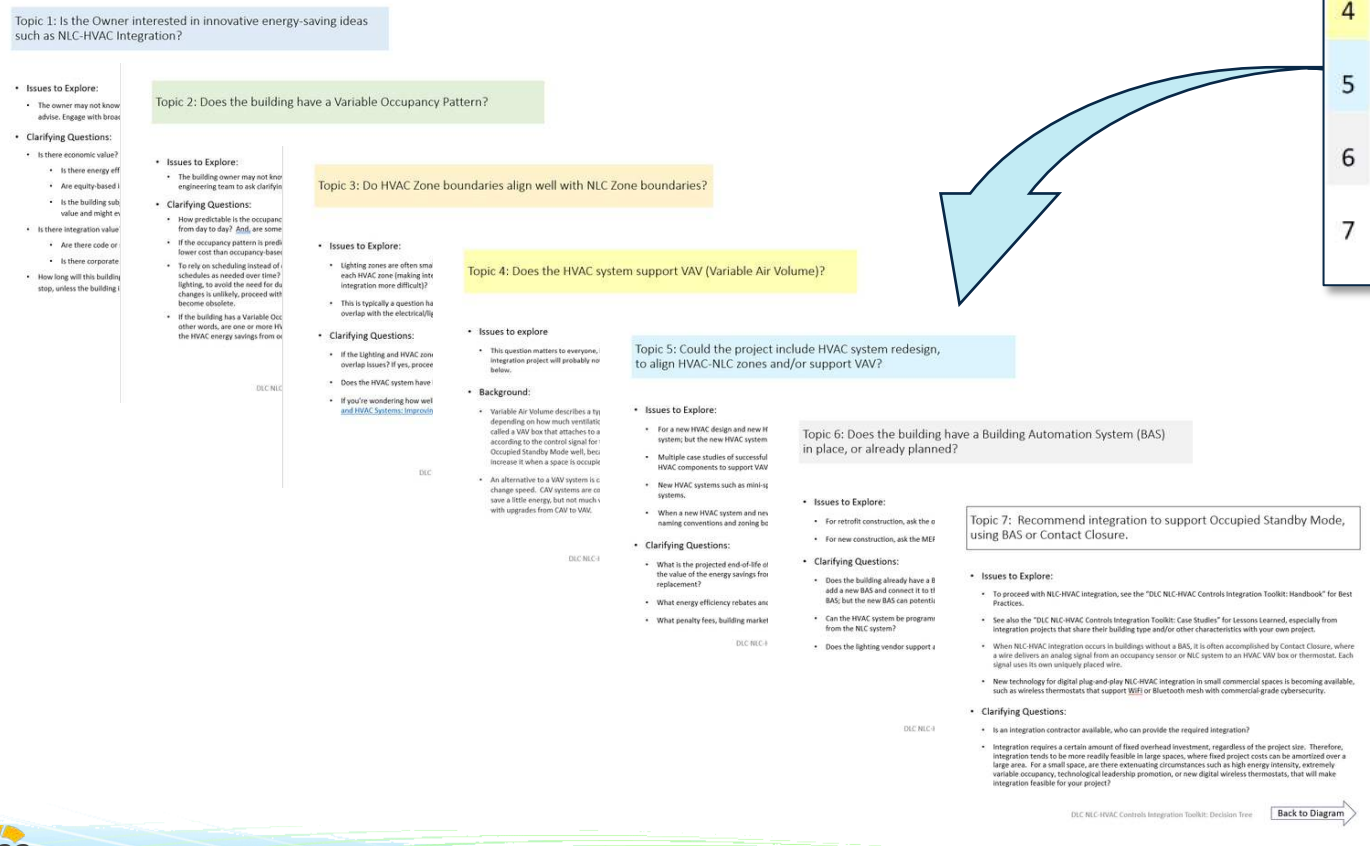
Decision Tree Diagram



Will update: Recommend new thermostat networked with LLLC

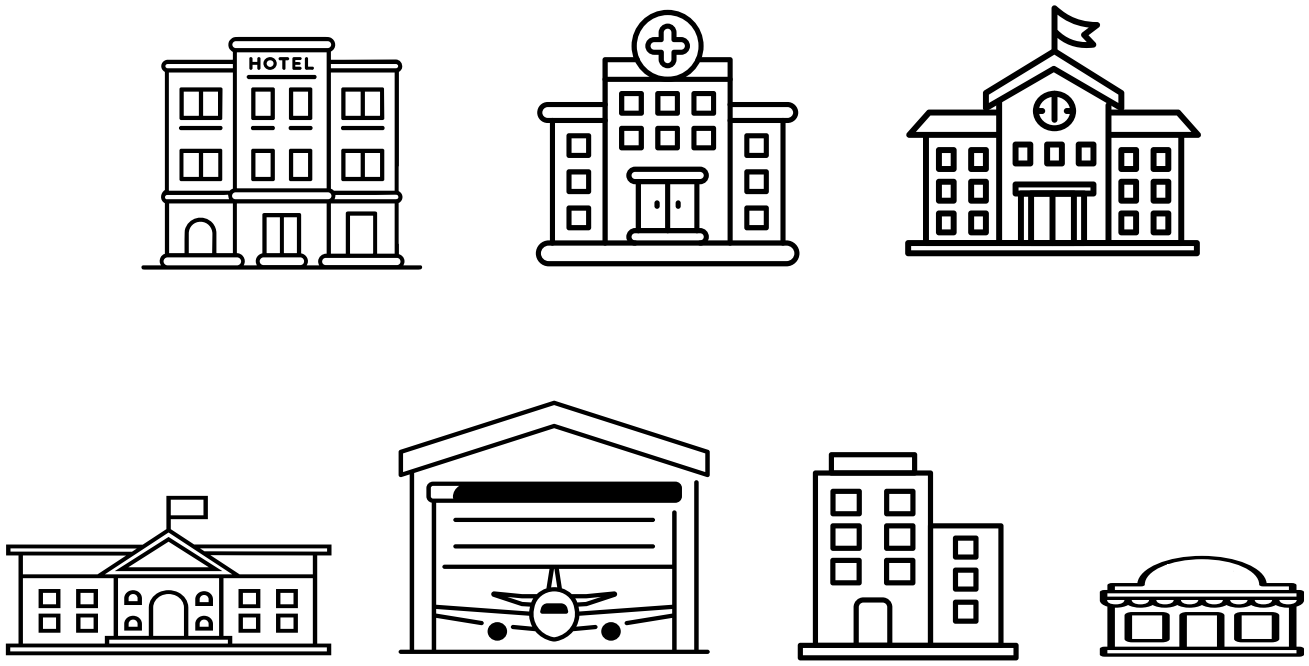
Decision Tree
Detail Page for Each Topic





18 Case Studies, 7 Building Types

- **Healthcare**
- **Higher Education**
- **Hotel**
- **Industrial**
- **K-12 Education**
- **Office**
- **Retail**



NLC-HVAC Integration Toolkit

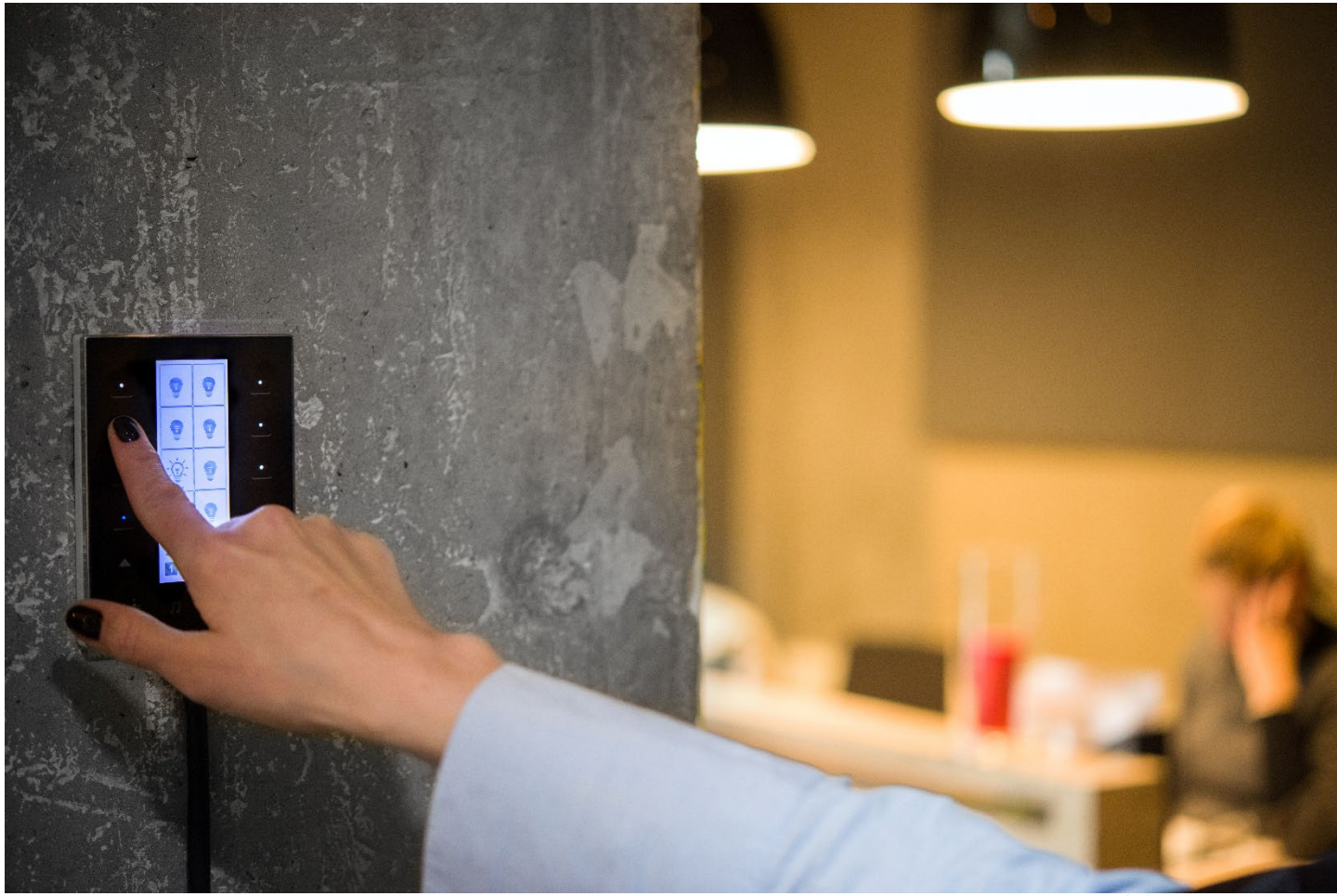
Download Toolkit

https://designlights.org/resources/reports/nlc-hvac-integration-toolkit/

ANSI C137.9 Configuration Reporting

Controls Savings Are Hard to Verify

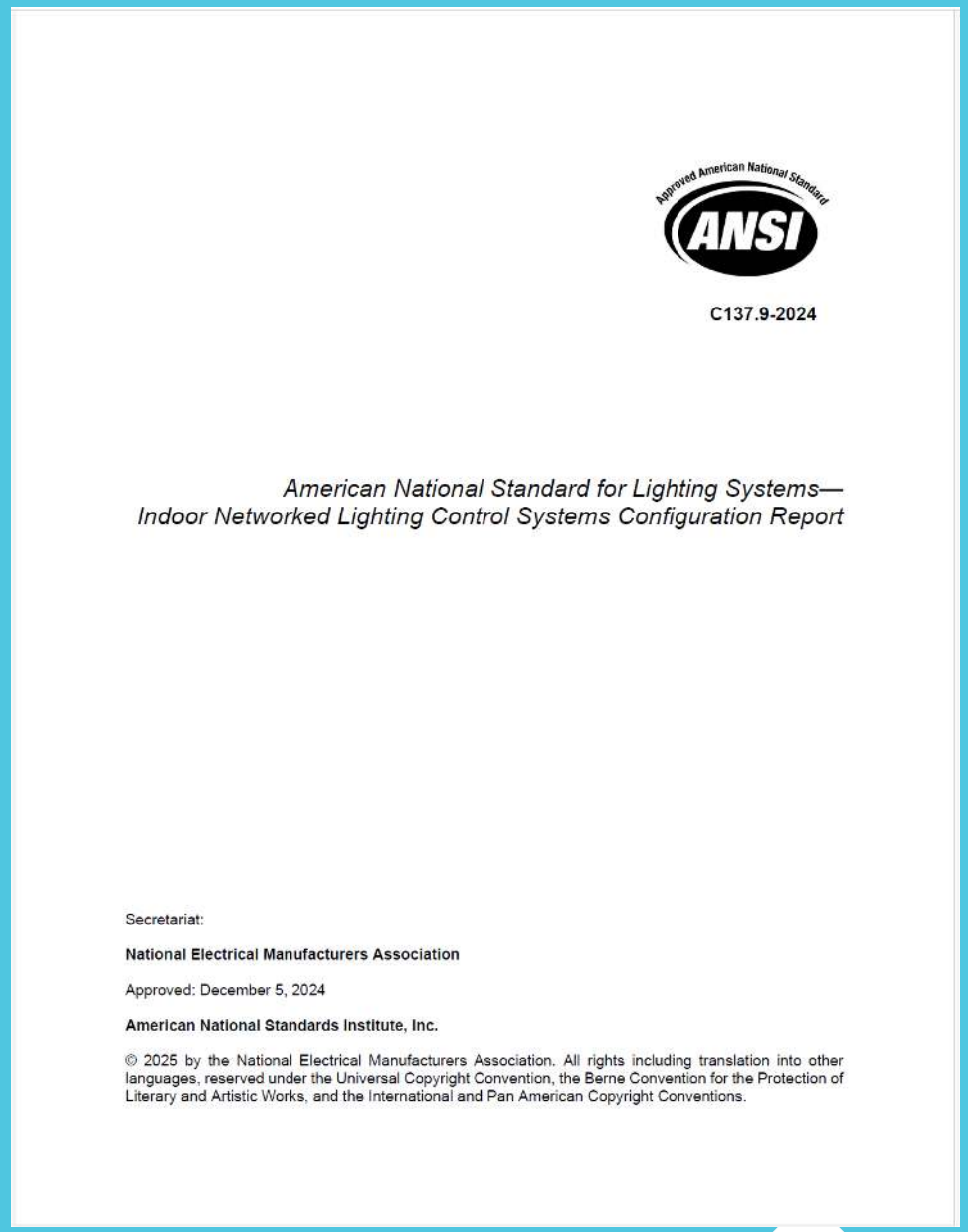
- Savings depend on:
  - occupancy patterns
  - daylight availability
  - schedule adherence
  - tuning decisions (timeouts, trim levels)
  - overrides / user behavior



Installation alone is not evidence of savings.

ANSI C137.9
Indoor Networked Lighting Control Systems Configuration Report

Approved: December 2024
Published: March 2025



Approved American National Standard
ANSI

C137.9-2024

American National Standard for Lighting Systems—
Indoor Networked Lighting Control Systems Configuration Report

Secretariat:

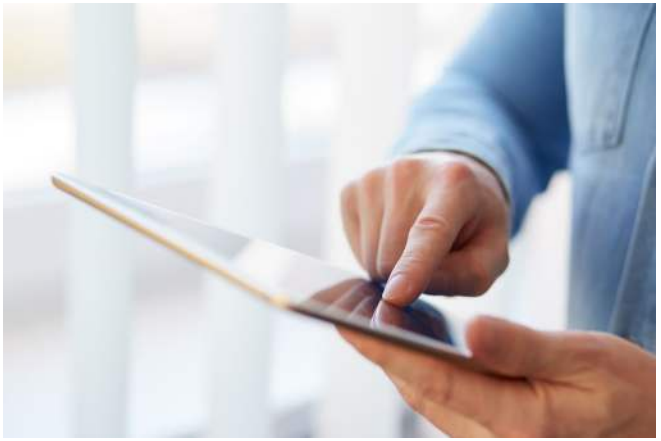
National Electrical Manufacturers Association

Approved: December 5, 2024

American National Standards Institute, Inc.

ANSI/NEMA C137.9 Overview:

- Written with and for **EE Programs** – ensure alignment with program needs and goals
- **Standardized NLC Configuration:** Provides high-level overview of NLC configuration settings for a specific installation.
- **Reporting:** Reports generated by the NLC System.
- **Submission Process:** Incentive Applicant then submits PDF reports to EE Programs for review.



ANSI C137.9

NOT Energy Use Data

Example Report

EXAMPLE PDF Export—System Configuration Report

1	2	3	4	5	6	7	8	9	10	11	12	13	14
System Manufacturer: Controllerly				**System Name:** Controllerly Ignite			**Project Name:** Head Office				**Report Generated:** 11/20/2023, 11:00 a.m.		
Spaces		**Quantity**		**Configuration**						**Watts Controlled (measured or user input)**			
ASHRAE 90.1 Space Type	**Areas in this Space Type**	**# of Luminaires Controlled**	**# of LLLC Luminaires**	**Daylight Harvesting Enabled**	**Scheduling Enabled**	**Occ. Sensing Enabled**	**Manual or Auto On**	**Sensor Timeout (min)**	**High-end Trim Level**	**Total Connected Load**	**Effective Connected Load with:**		
											High-end Trim Applied	**Occ. Sensing Enabled**	**Daylight Harvesting**
Conference / Meeting / Multipurpose Room	1	5	0	N	Y	Y	M	10	85%	212	180	180	0
Conference / Meeting / Multipurpose Room	1	12	12	Y	Y	Y	M	10	85%	507	431	431	431
Corridor	1	10	10	Y	Y	N	M	5	80%	312	250	0	250
Lobby	1	3	3	Y	Y	N	M	5	80%	78	62	0	62
Office ≤300 ft²	6	25	25	Y	Y	Y	M	10	85%	780	663	663	663
Office ≤300 ft²	6	6	6	N	Y	Y	M	10	85%	780	663	663	0
Office ≤300 ft²	2	8	8	Y	Y	Y	M	5	90%	260	234	234	234
Office ≤300 ft²	2	2	2	N	Y	Y	M	5	90%	260	234	234	0
Office ≥300 ft² (Open Plan)	2	31	31	Y	Y	Y	M	10	85%	1131	961	961	961
Restroom	2	4	4	N	N	Y	A	10	80%	38	30	30	0
Stairwell	1	8	8	N	N	Y	A	5	80%	189	151	151	0
Storage Room	1	2	2	N	N	Y	A	5	80%	39	31	31	0
Storage Room	2	14	14	N	N	Y	M	5	80%	429	343	343	0
Total		130	119							3763	3156	2844	2296

ANSI C137.9 – NLC QPL Display

- NLC V5.2:
  - **Reported** Capability
- Future TR Version:
  - **Required** Capability

Focus On Energy (WI) offering $500 per report in 2026

Requirements Reorganization

Requirements Organization

Table 1: Required and Reported Capabilities for Indoor Lighting Systems

Required **Indoor System Capabilities**	***Reported*** **Indoor System Capabilities**
Networking of Luminaires and Devices	Type of User Interface
Individual Addressability	Luminaire Level Lighting Control (LLLC, integrated)
Zoning	Control Persistence
Continuous Dimming	Scheduling
Cybersecurity	Energy Monitoring (room-based systems)
Occupancy Sensing	Personal Control
Daylight Harvesting/Photocell Control	Scene Control
High-End Trim	Plug Load Control
Energy Monitoring (except room-based systems)	Load Shedding/Demand Response
	External Systems Integration
	Configuration Reporting
	Emergency Lighting
	Device Monitoring/Remote Diagnostics
	Color Changing/Tuning
	NLC Integrated Thermostats

Requirements Organization

Table 2: Required and Reported Capabilities for Outdoor Lighting Systems

Required Outdoor System Capabilities	*Reported Outdoor System Capabilities*
Networking of Luminaires and Devices	Type of User Interface
Individual Addressability	Luminaire Level Lighting Control (LLLC, integrated)
Zoning	Control Persistence
Continuous Dimming	Scene Control
Cybersecurity	Load Shedding/Demand Response
Occupancy Sensing AND/OR Traffic Sensing	External Systems Integration
Daylight Harvesting/Photocell Control	Emergency Lighting
High-End Trim	Device Monitoring/Remote Diagnostics
Scheduling	Color Changing/Tuning
Energy Monitoring	

Table 3 Converted To Paragraph Form

308 **Table 3: Definitions of Capabilities and Requirements**

Row	Capability	Requirements
1	Networking of Luminaires and Devices	The capability of individual luminaires/lamps and control devices to exchange digital data with other luminaires/lamps and control devices on the system. This capability is required at the room, space, or area level, but not at the whole building level or beyond (e.g. non-lighting systems, or the internet).
2	Occupancy Sensing	The capability to affect the operation of lighting equipment based upon detecting the presence or absence of people in a space or outdoor environment. Outdoor systems must include either occupancy sensing or traffic sensing. They may include both, but that is not required.
3	Traffic Sensing	The capability to affect the operation of lighting or other equipment based upon detecting the presence or absence of moving vehicles in an area. Systems may satisfy this requirement through external systems integration as described below in lieu of in-system sensors if another source of data is used for presence or absence detection. Outdoor systems must include either occupancy sensing or traffic sensing. They may include both, but that is not required.
4	Daylight Harvesting / Photocell Control	The capability to automatically affect the operation of lighting or other equipment based on the amount of daylight and/or ambient light that is present in a space, area, or outdoor environment. This capability is typically called daylight harvesting for indoor systems, and photocell control for outdoor systems.

Converted To

154 **3.4.0. Networking of Luminaires and Devices**

155 The capability of individual luminaires/lamps and control devices to exchange digital data
156 with other luminaires/lamps and control devices on the system. This capability is required
157 at the room, space, or area level, but not at the whole building level or beyond (e.g. non-
158 lighting systems, or the internet).

159 **3.4.1. Type of User Interface**

160 The type of interface provided by the control system for users to read and adjust control
161 system settings during system start-up, commissioning, and/or ongoing operation.

162 **3.4.2. Individual Addressability**

163 The ability to communicate digitally and uniquely with each individual luminaire/lamp,
164 sensor, controller and user interface device in the lighting system, allowing for software-
165 controlled configuration and re-configuration of devices and control zones independent of
166 electrical circuiting.

167 **3.4.3. Zoning**

168 The capability to group luminaires/lamps and form unique lighting control zones for a
169 control strategy via software-defined means, and not via physical configuration of
170 mechanical or electrical installation details (e.g. wiring).

171 **Indoor**: Zoning is required for occupancy sensing, high-end trim and daylight harvesting
172 control strategies except for systems that feature luminaire level lighting control (LLLC)
173 capabilities as defined in these requirements under "Reported Capabilities", in which case
174 zoning is only required for occupancy sensing and high-end trim control strategies.

175 **Outdoor**: Zoning is required for high-end trim.

DLC SUMMIT 2026

NEXT GEN LIGHTING:

CONTROLS, INTEGRATION, AND THE ENVIRONMENT

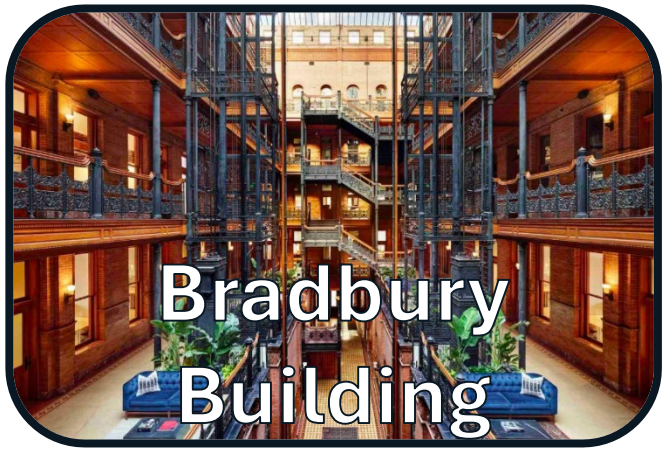
OCTOBER 26–27, 2026 | LOS ANGELES, CA

Thank you to our hosts!

Summit Venue: California Endowment Center

Stay at the DoubleTree in downtown LA

Nearby Attractions



Why attend the DLC summit?

Day 1: Lighting Programs 201 for Industry Partners

Mid-afternoon meeting centered around:

- understanding EE program challenges
- learning terminology
- getting up to speed on summit themes

Day 1: Tour & Mixer at the La Kretz Innovation Campus

Day 2: Sessions Begin

Morning

Next Gen Lighting Savings: Scaling Advanced Controls

Next Gen Buildings: Integrating Lighting and HVAC for Whole Building Savings

Capturing Controls in TRMS for Next Gen Savings

Lighting Controls and Light Pollution: Aligning Energy Savings and Environmental Responsibility

concurrent

Afternoon

Sponsorship Opportunities

Cocktails, coffee, sessions, meals, and more!

Speaking opportunities

Promotion before and during summit

Review

NLC5.2 Update Timeline

Download NLC V5.2 & comment form

NETWORKED LIGHTING CONTROLS

Technical Requirements for NLC V5.2 Draft 1

COVER LETTER | DRAFT TECHNICAL REQUIREMENTS | HELP SHAPE NLC V5.2 - SUBMIT COMMENTS | REGISTER FOR WEBINAR

The DesignLights Consortium (DLC) is pleased to release Draft 1 of the Networked Lighting Controls (NLC) Technical Requirements Version 5.2. The DLC is committed to providing decision makers with data and resources on quality lighting, controls, and integrated building systems to reduce energy use, carbon emissions and light pollution. Through the **NLC Qualified Products List (QPL)** and its technical requirements, the DLC helps efficiency programs, manufacturers, specifiers, and building owners identify NLC systems that provide reliable performance, security, and measurable energy impacts.

With each new version of the technical requirements, the DLC has worked closely with manufacturers, utilities, researchers, and other stakeholders to ensure that the NLC program continues to reflect both technological progress and real-world deployment experience. Previously, the DLC updated the technical requirements to support interoperability, energy reporting, and integration with other building systems, helping align the NLC program with broader trends toward connected and data-enabled building infrastructure.

https://designlights.org/our-work/network-lighting/nlc-v52-draft/

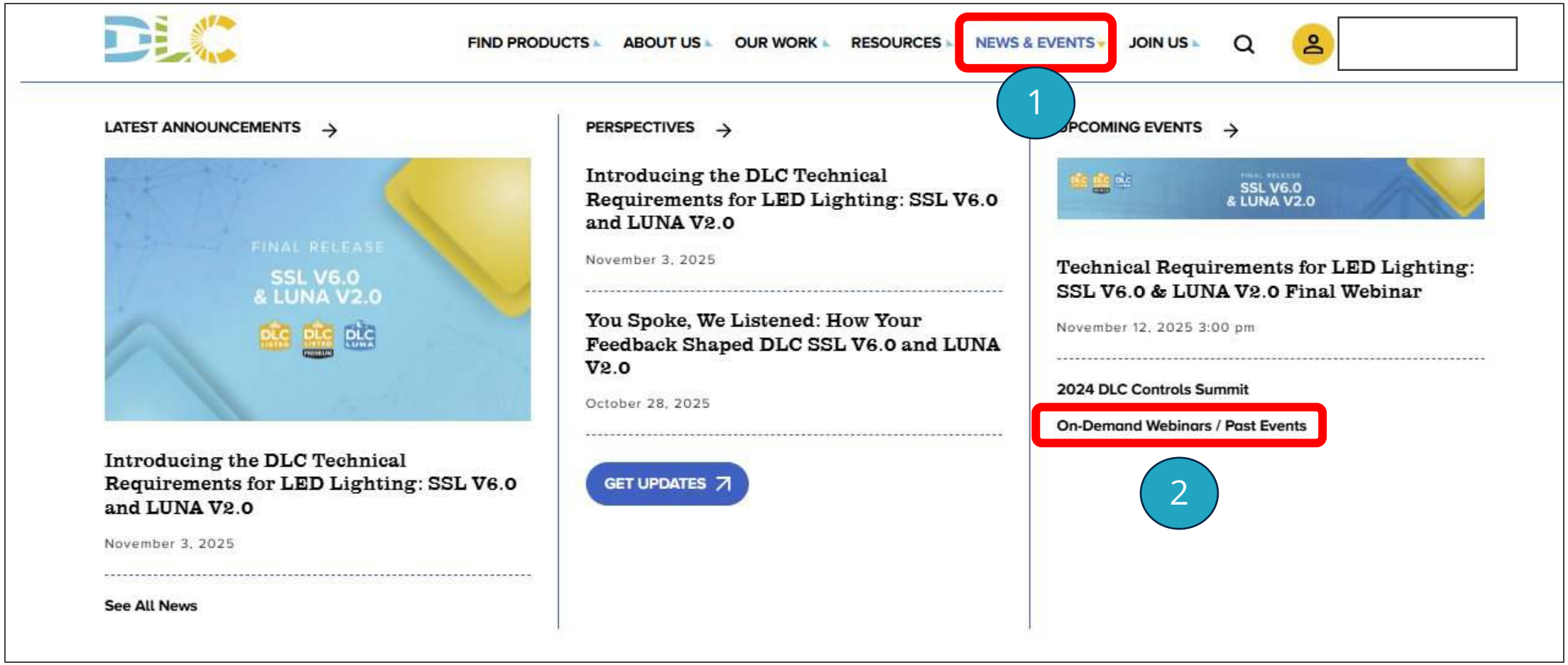
Comments due by May 8, 2026

	NLC V5.2 Comment Form
Document:	Networked Lighting Control (NLC) System Technical Requirements
Version:	Draft of NLC V5.2
Comments Due:	Close of business, Friday May 8, 2026
Instructions and Background:	To comment, enter your organization, name, email address, and phone number at the top of the worksheet. Then enter any comments in Column D "Comment and Rationale". Provide your proposed change corresponding to your comment in Column F "Proposed Change". Comments to the Technical Requirements that are not related to a specific revision the DLC has proposed may be added at the bottom of the worksheet. Save the Excel file with your comments, with your initials appended to the end of the filename, and email the file to comments@designlights.org by close of business, **Friday May 8, 2026**.

Submit comment via email to comments@designlights.org

Q&A

Thank you for attending!
The webinar will be available online later this week



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- Use me sparingly!
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