



Energy · Quality · ControllabilitySM

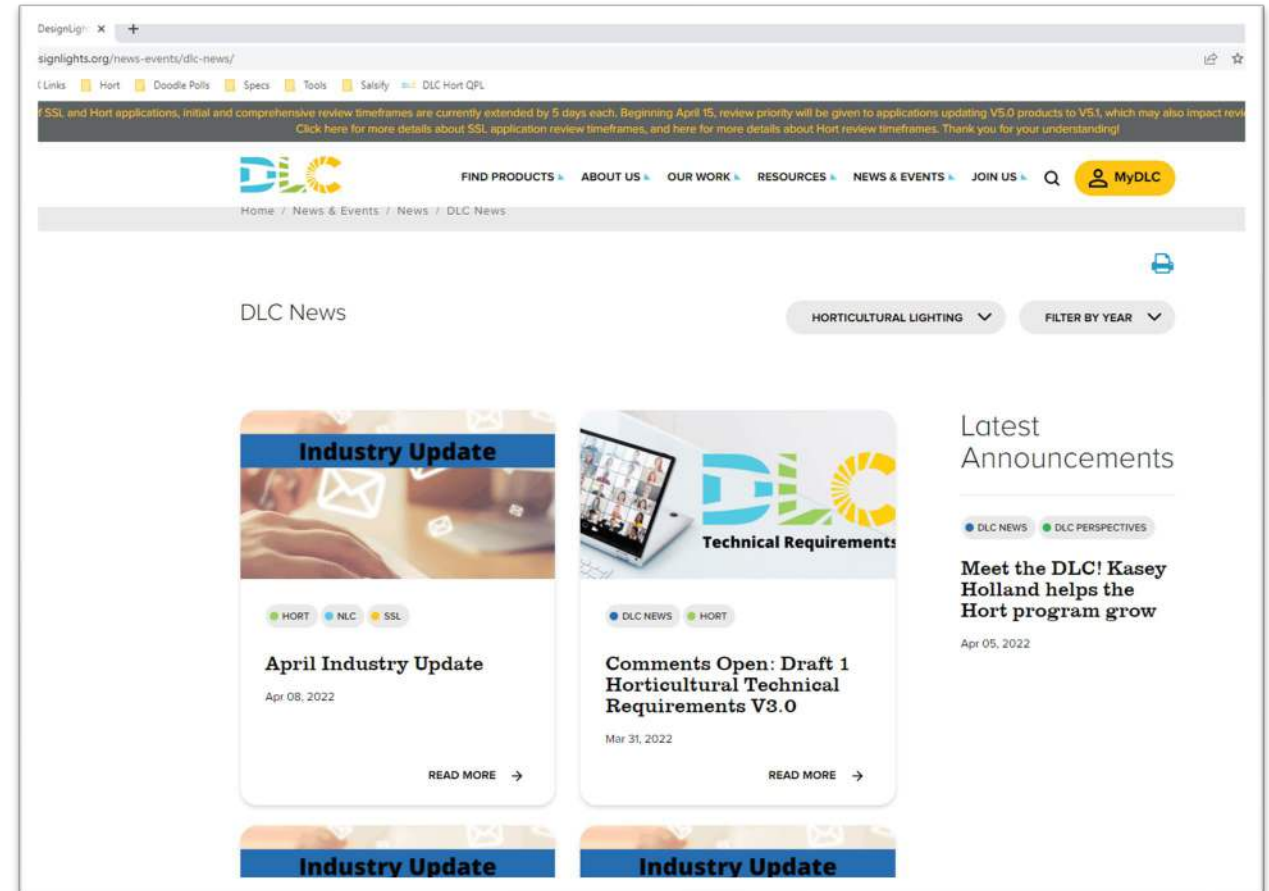
NLCs For Small/Medium Buildings: Lessons Learned and New Frameworks

July 16, 2025

designlights.org

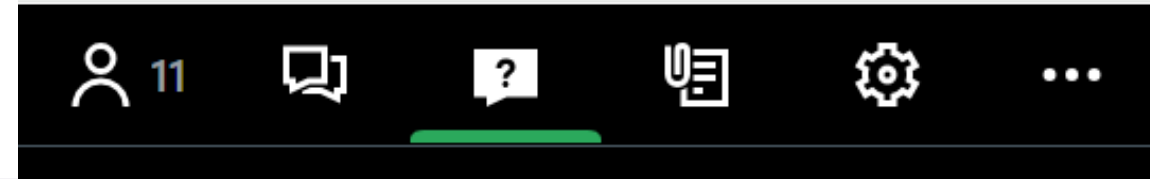
Welcome!

- **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 answered at the end during a live Q&A
 - Type questions into the Question pane to submit for Q&A



Agenda

Welcome & Introductions

Overview of DLC, NLCs + LLCs

3 Steps for any NLC

Frank Agraz, FSG

Kirby Corkill, Jarvis Lighting

Round Table / Q&A



Presenters & Hosts



Jason Jeunnette
Technical Manager



Frank Agraz
*Director of Engineering,
Facility Solutions Group*




Kirby Corkill
Team Leader, Jarvis Lighting


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.



SSL V6.0: Driving Adoption of Connected Lighting



Advance energy
efficiency and
support
decarbonization



Strengthen the
SSL QPL by
expanding
eligibility



Drive greater
adoption of
controls



Mitigate light
pollution



SSL V6 Controls Categories

Category	Name
1	No Integral Controls
2	Controls Ready Product
3	Product with One Integral Sensor Function
4	Product with Two or More Integral Sensor Functions
5	Product with Networked Controller
6	Product with Networked Controller and Two or More Integral Sensor Functions (LLLC)

DLC Networked Lighting Controls - Publicly Available Reports

- [Future-Proofing Energy Efficiency with Networked Lighting Controls](#)
- [Evaluating the Non-Energy Benefits of Advanced Networked Lighting Controls](#)
- [Energy Savings from Networked Lighting Control \(NLC\) Systems with and without LLLC](#)
- [Interoperability for Networked Lighting Controls](#)
- [Energy Savings Potential of DLC Commercial Lighting and Networked Lighting Controls](#)
- [Energy Savings from Networked Lighting Control \(NLC\) Systems](#)

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Industry Reports and Research

Search Resources

INDUSTRY REPORTS AND RESEARCH NLC

NLC-HVAC Integration Toolkit

The NLC-HVAC Integration Toolkit will help energy efficiency programs, integrators, and market actors successfully identify, pursue, and implement NLC-HVAC integration projects. Download the toolkit (zip file) for a decision tree, a handbook, case studies, and templates that will set your project up for success.

KEY TAKEAWAYS

- ✓ Decide if a project is a good candidate for integration and avoid projects where success is unlikely
- ✓ Learn about successful integrations through a list of published case studies searchable by building type
- ✓ See recommended best practices for integration and use an example construction integration specification

INDUSTRY REPORTS AND RESEARCH NLC

Excerpt – Pathways to Connected Lighting

An excerpt of our playbook, "Pathways to Connected Lighting", that helps energy efficiency programs meet target savings goals with NLC and HVAC integration with lighting controls.

KEY TAKEAWAYS

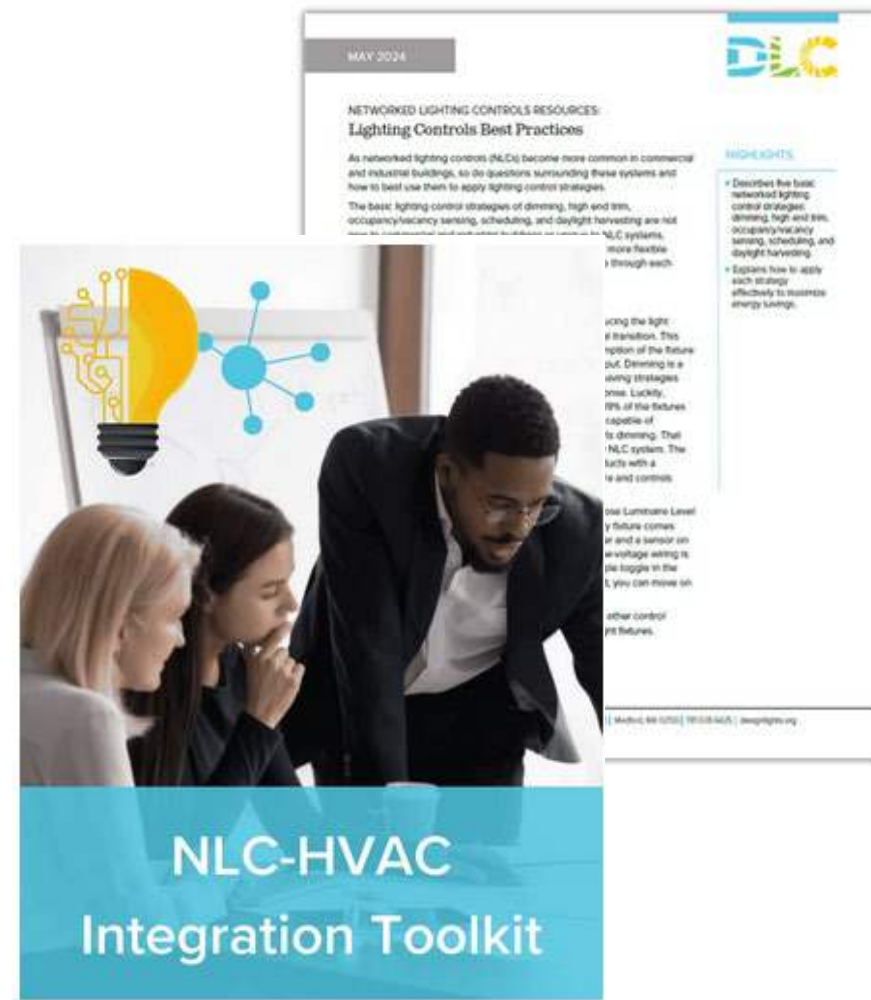
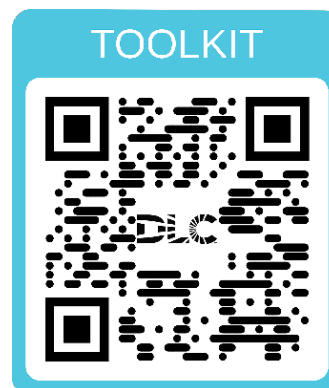
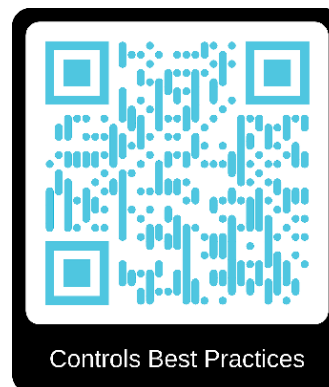
- ✓ Learn what is included in the playbook
- ✓ Learn how to assess your program and about strategies to level up savings from connected lighting.

DLC Networked Lighting Controls - Publicly Available Resources

- [Lighting Controls Best Practices](#)
- [NLC-HVAC Integration Toolkit](#)

Blogs:

- [Here's How Networked Lighting Controls Can Level Up Energy Efficiency Efforts](#)
- [Replace Old Lighting with the Best LED Solutions from our QPLs](#)



DLC Networked Lighting Controls - Member-Exclusive Resources

- [Lighting Controls and Technical Reference Manuals: Updates to Enhance Energy Savings](#)

Includes:

- TRM research report
- TRM workpaper template with resources

- [Kickstarting Connected Lighting in Energy Efficiency Programs: New DLC Playbook](#)

Includes:

- Program Self Assessment
- Clarifying Program Goals and Objectives
- Specific program strategies
- Advanced program strategies
- Useful resources for implementation



Lighting Controls and Technical Reference Manuals: Updates to Enhance Energy Savings

May 28, 2025



Kickstarting Connected Lighting in Energy Efficiency Programs: New DLC Playbook

Jan 29, 2025

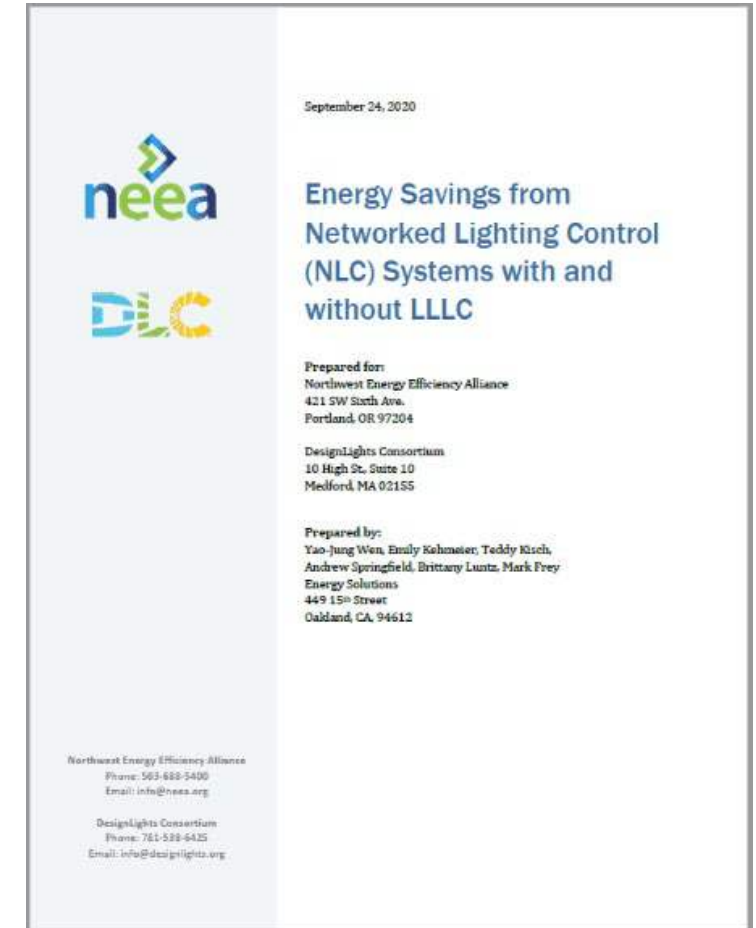


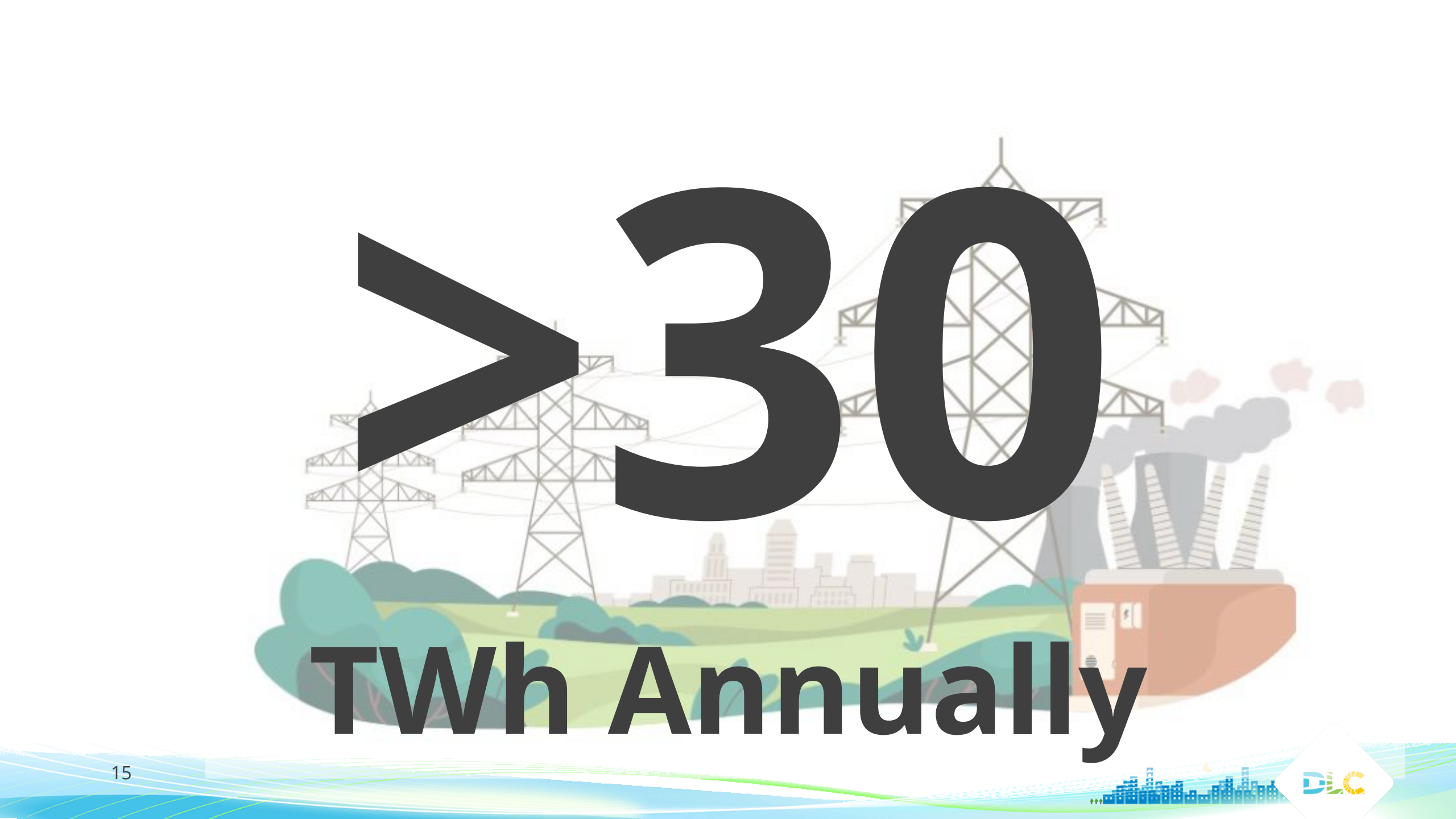
The background of the image is a photograph of a multi-story office building at night. The building's facade is composed of a grid of large glass windows, many of which are illuminated from within, showing office interiors with desks, chairs, and some people. A large, white, stylized arrow with a yellow border points from the left side of the image towards the right. The text "The Big Picture" is written in a blue, sans-serif font inside the white arrow.

The Big Picture

**~3 Million
Buildings
Nationwide**

DLC Study: Avg. 49% Energy Savings with NLCs



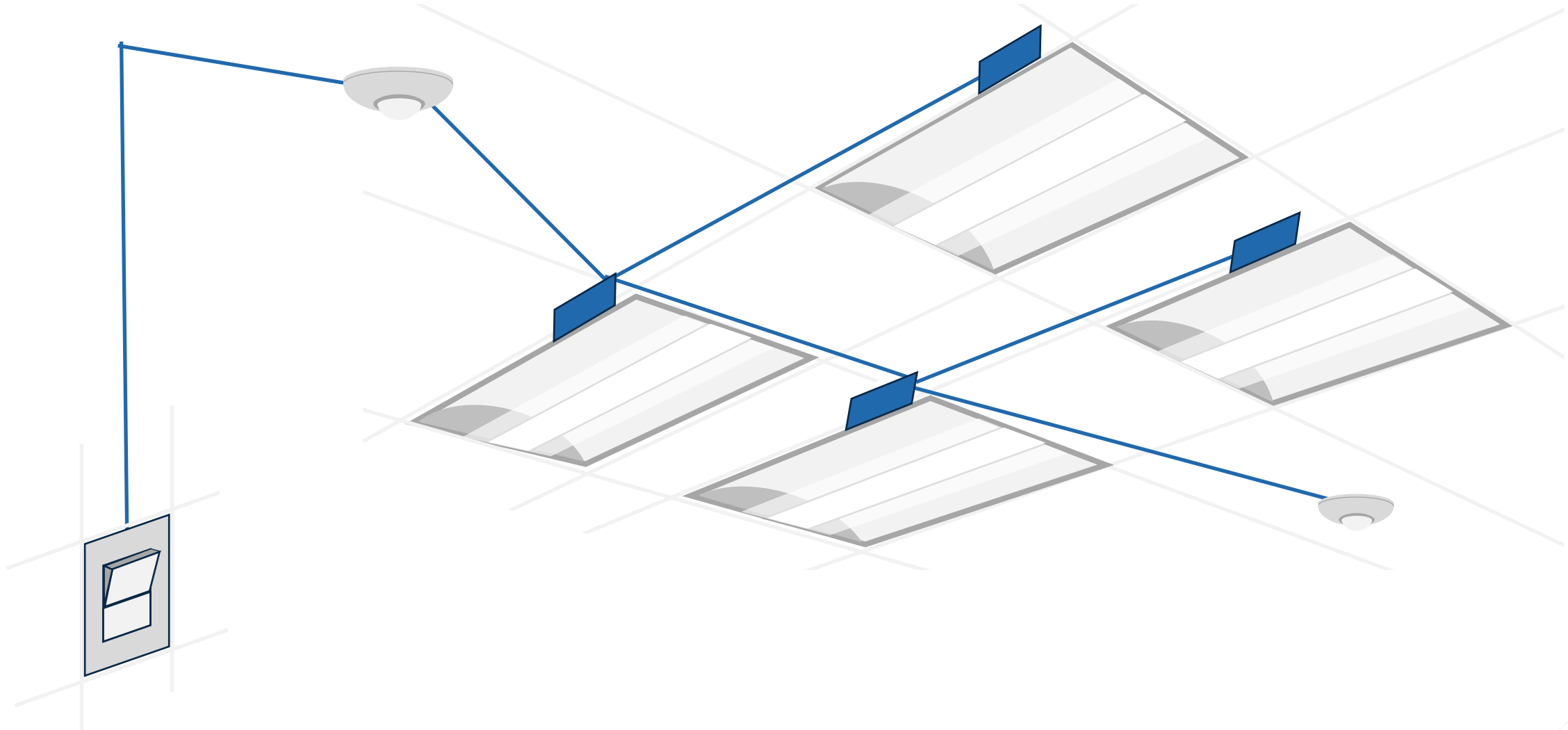
The background features a stylized illustration of a city skyline. In the foreground, there are green rolling hills and several large, grey electrical transmission towers with power lines stretching across the scene. To the right, a large industrial power plant with multiple cooling towers emitting grey steam is visible. The city buildings are depicted in a simplified, grey silhouette style in the background.

>30
TWh Annually

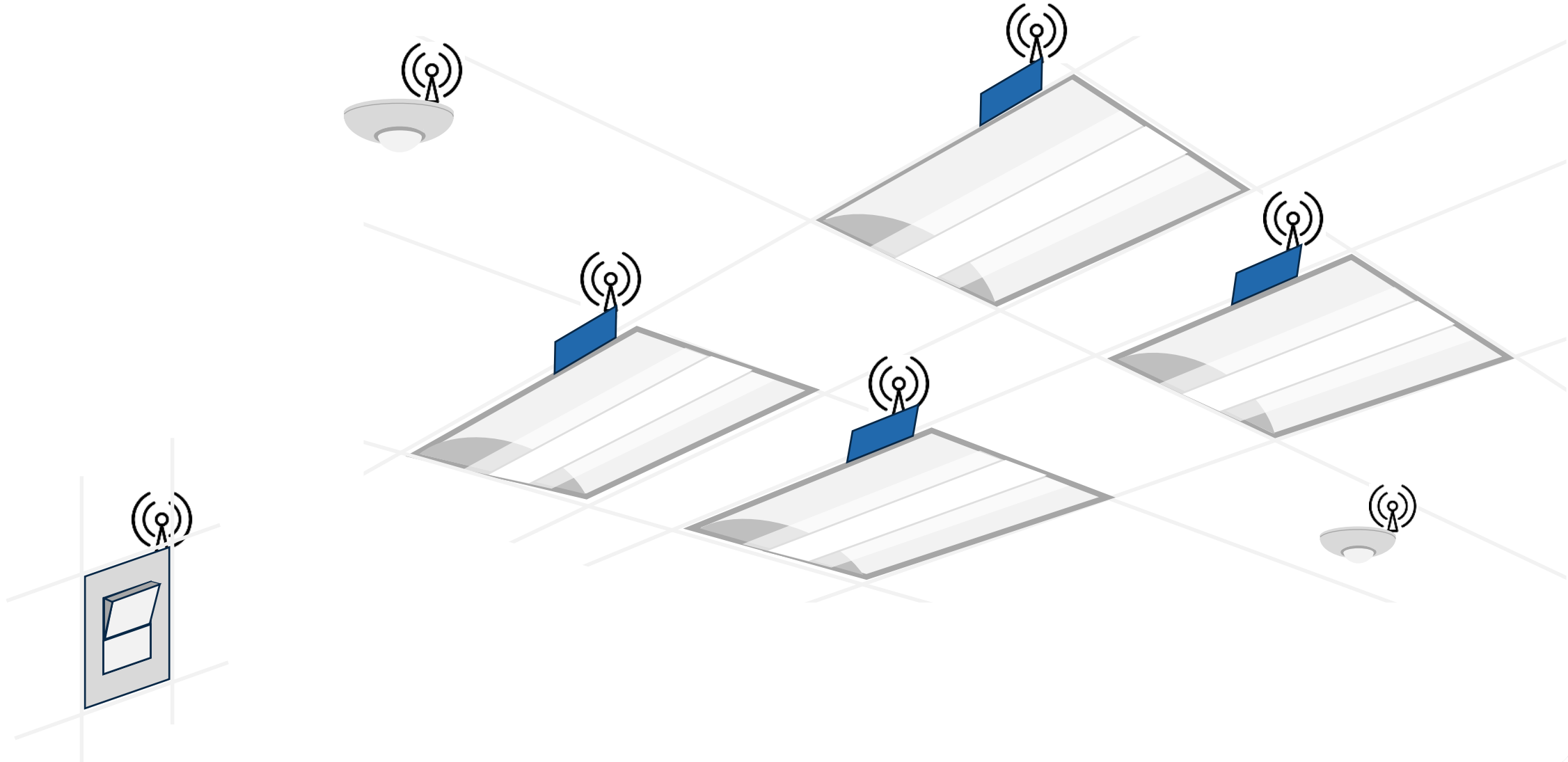
NLC + LLLC Overview



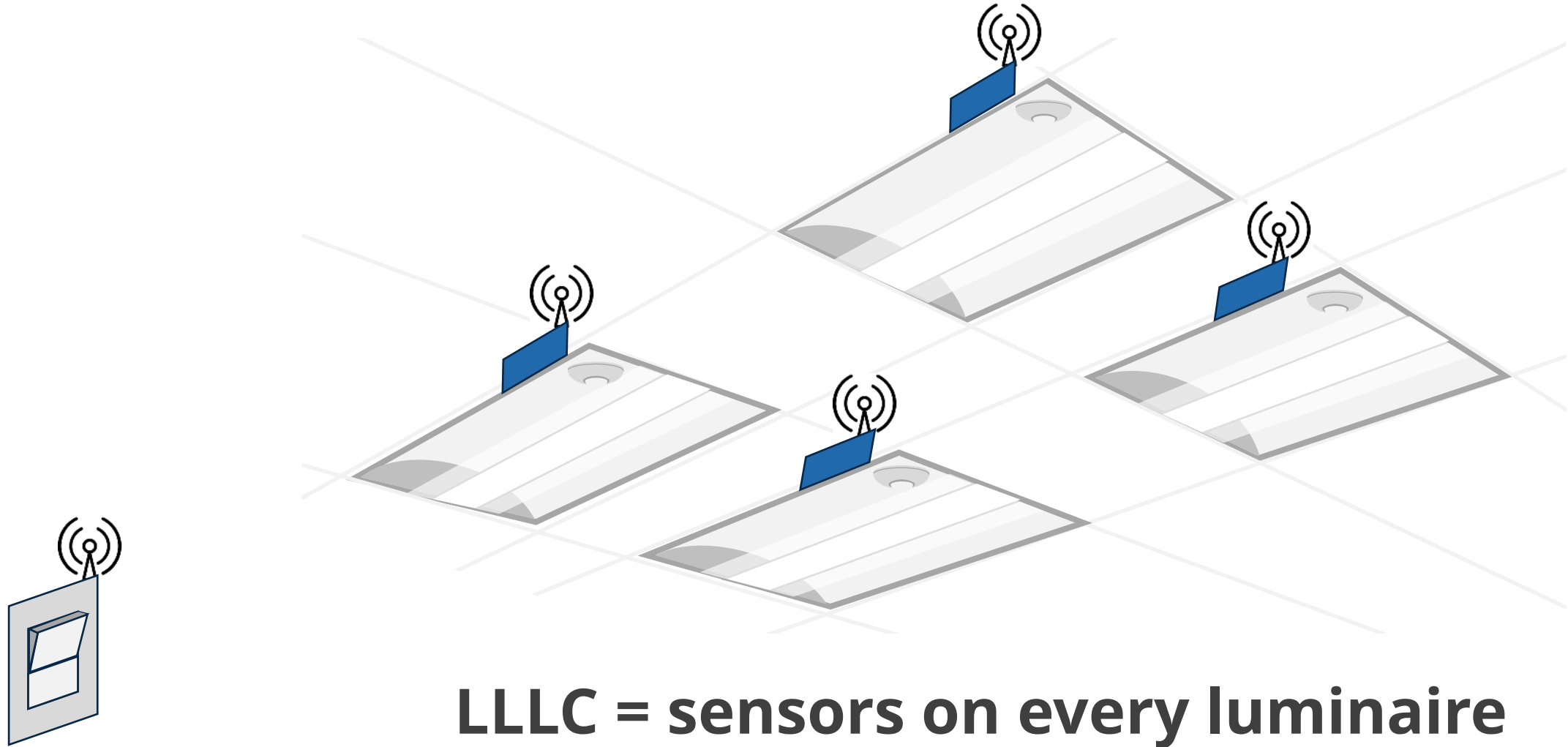
Define “Networked Lighting Control” (NLC)



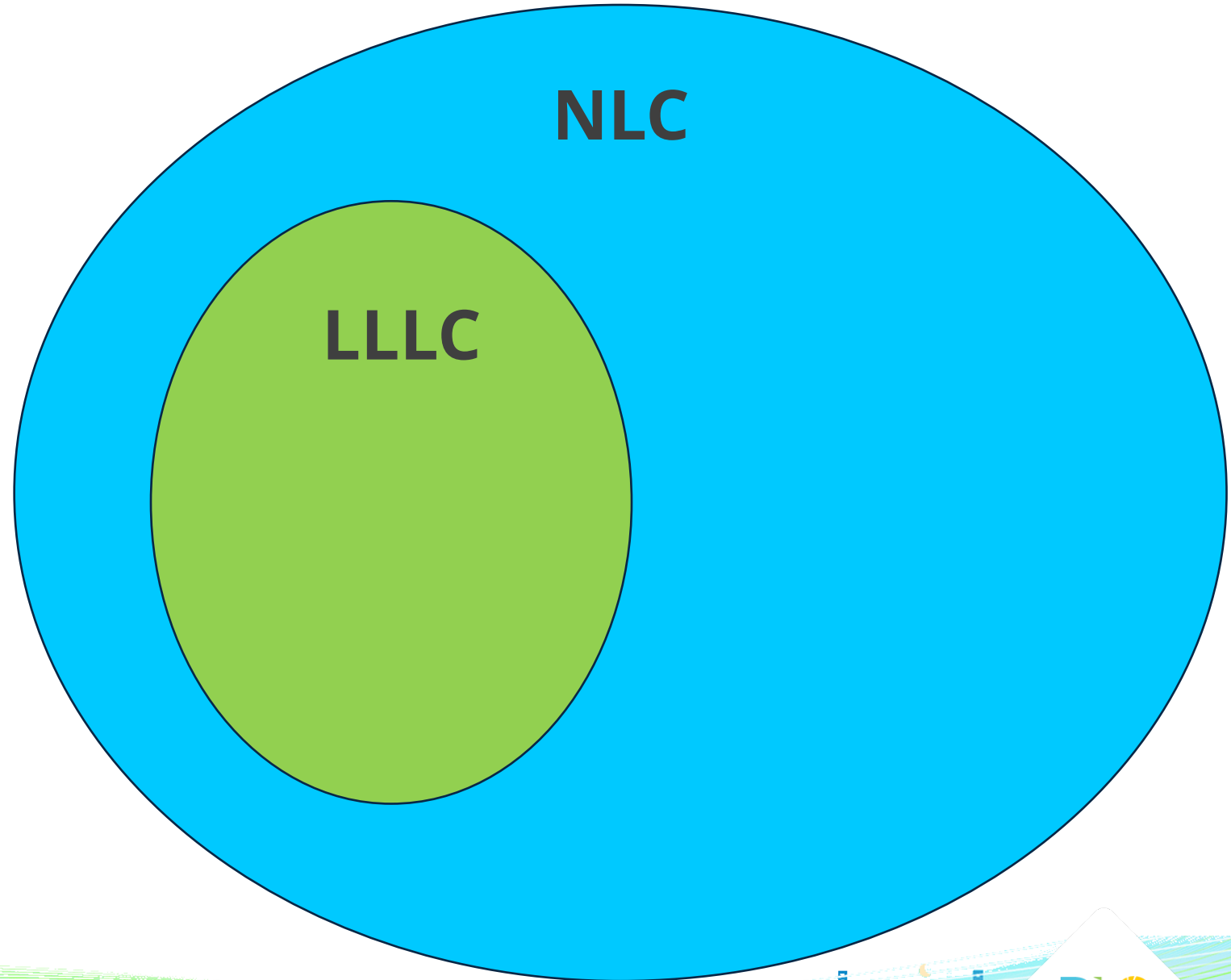
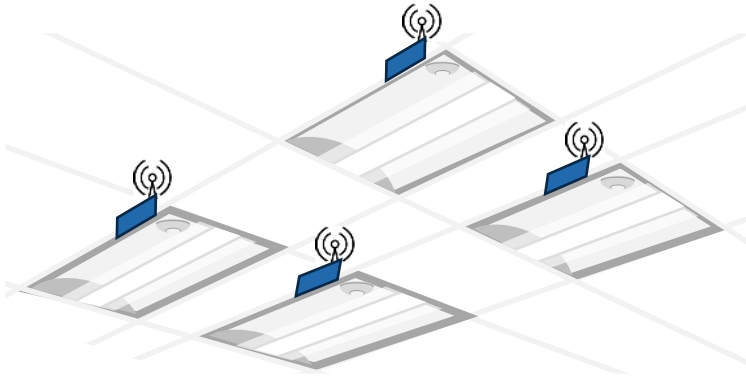
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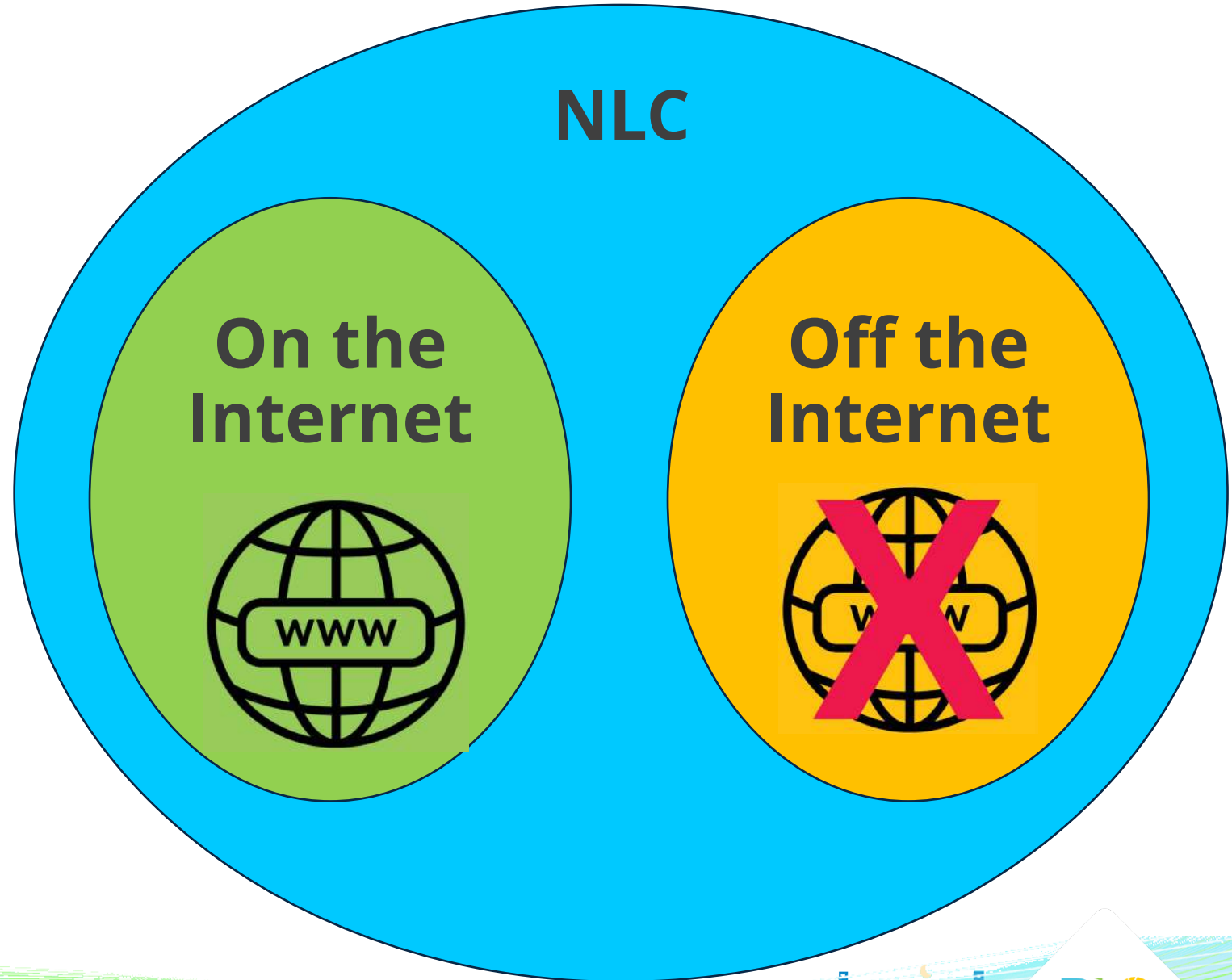
Define “Networked Lighting Control” (NLC)



LLLC is a type of NLC



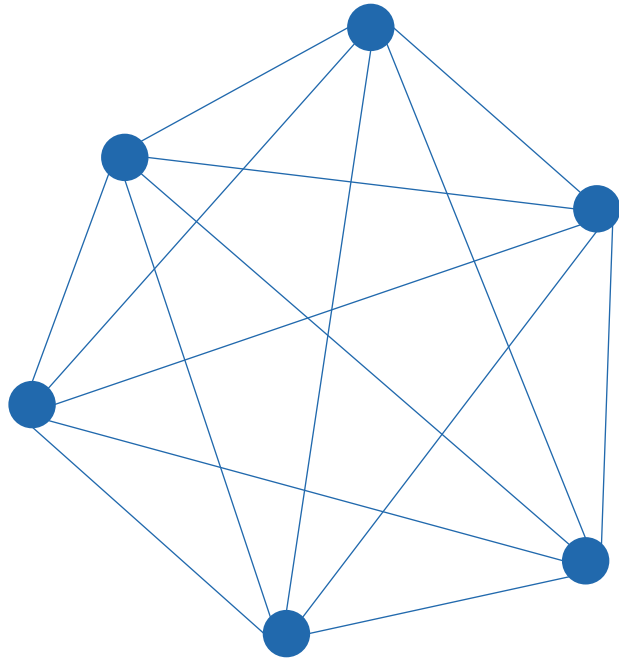
**NLC can be
on the Internet or
not**



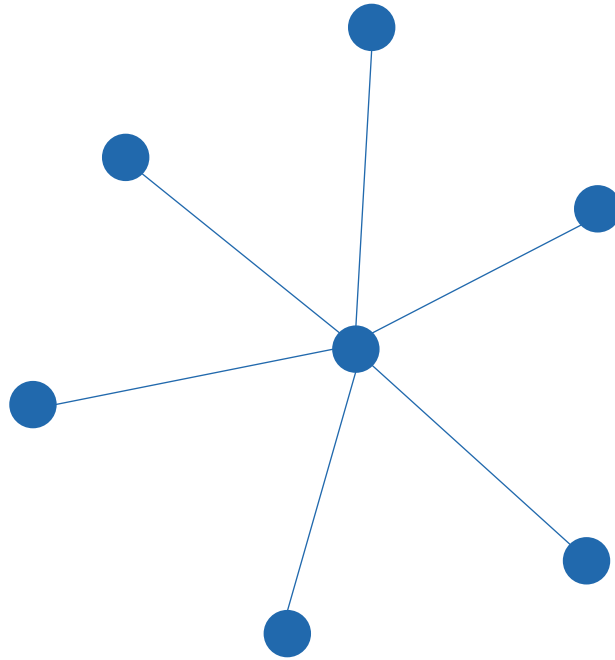
Some NLCs access the Internet occasionally through a phone



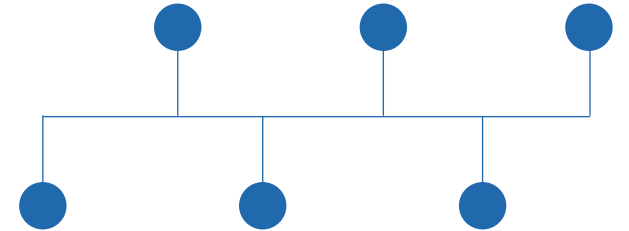
Network Typologies



Mesh



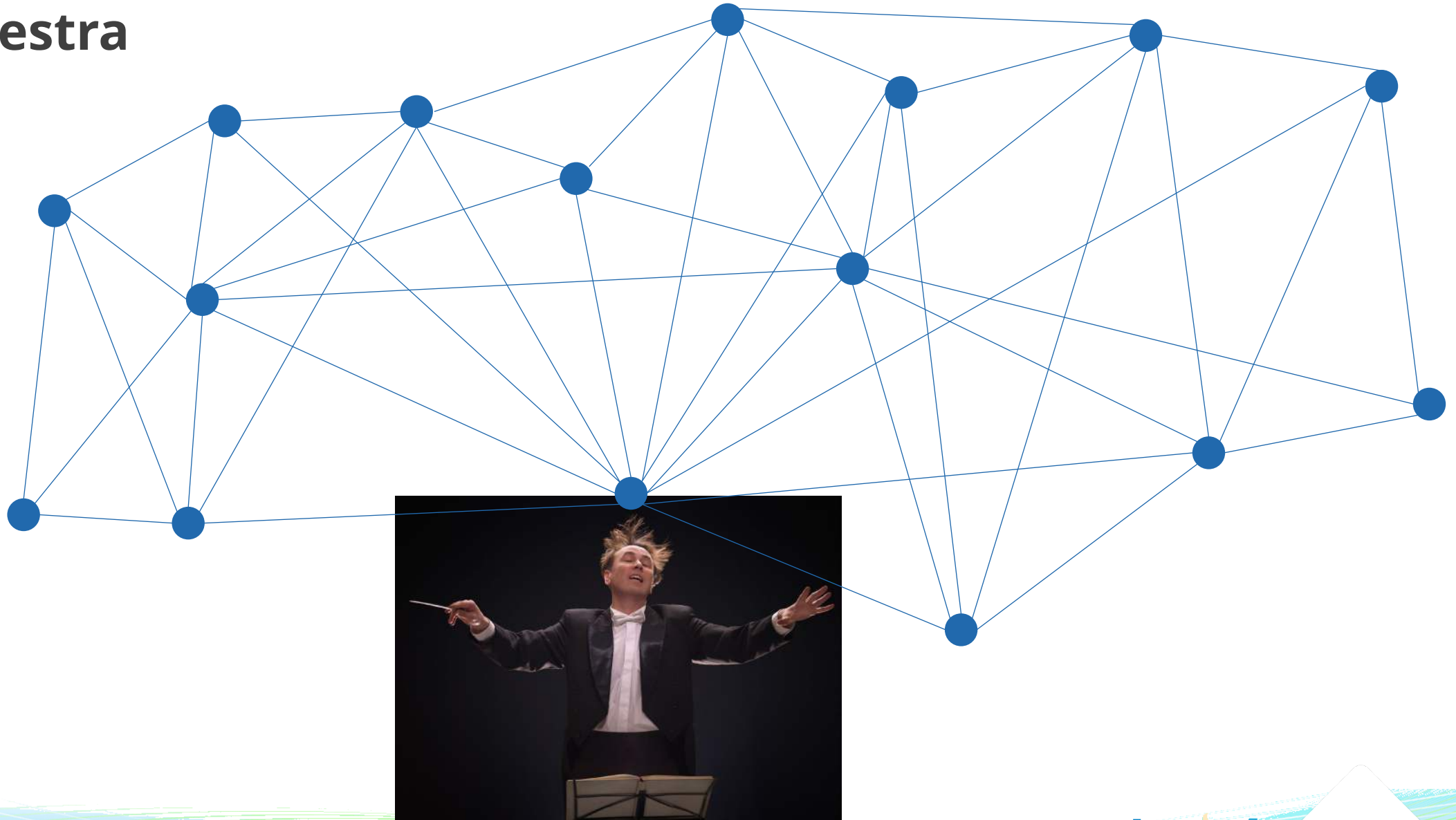
Star



Bus

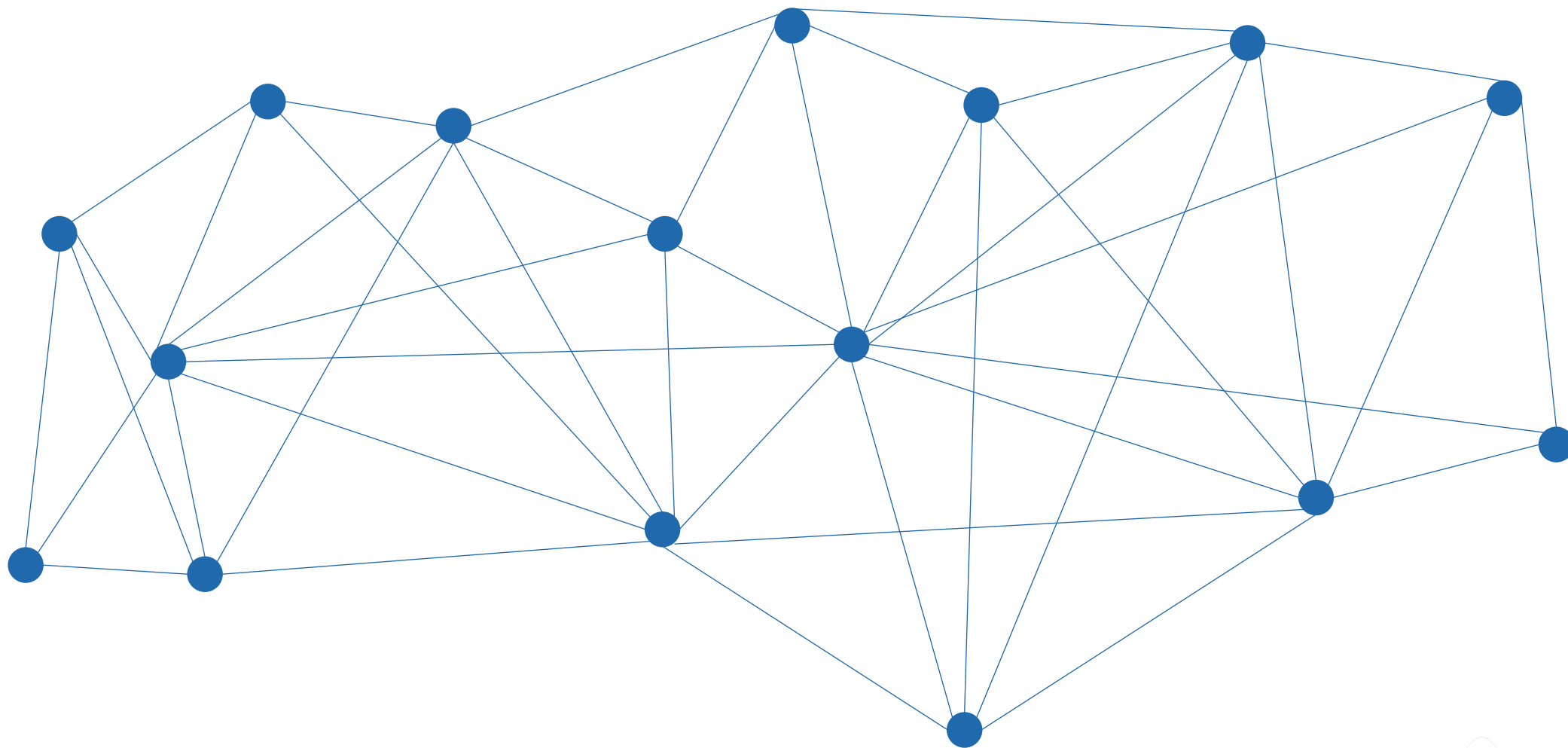


Orchestra





Jazz Band



Why Does This Matter?

Large Buildings

- 100s or 1000s of Luminaires
- Likely has a BMS
- Dedicated Building Staff

Lighting Control Strategies

- Occupancy Sensing
- Daylight Harvesting
- Local Control
- Scheduling
- Shade Integration
- BMS/HVAC Integration
- Energy Monitoring/Reporting
- Space Utilization

Small/Medium Buildings

- 10s or 100s of Luminaires
- Usually no BMS
- Shared Building Staff

Lighting Control Strategies

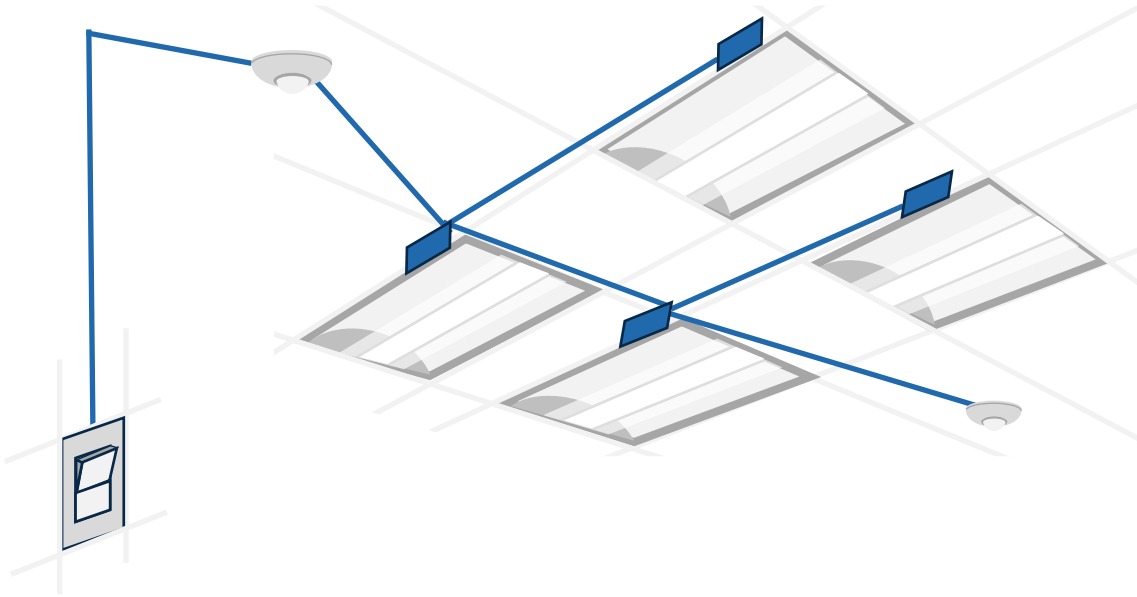
- Occupancy Sensing
- Daylight Harvesting
- Local Control
- Scheduling?
- HVAC Integration?



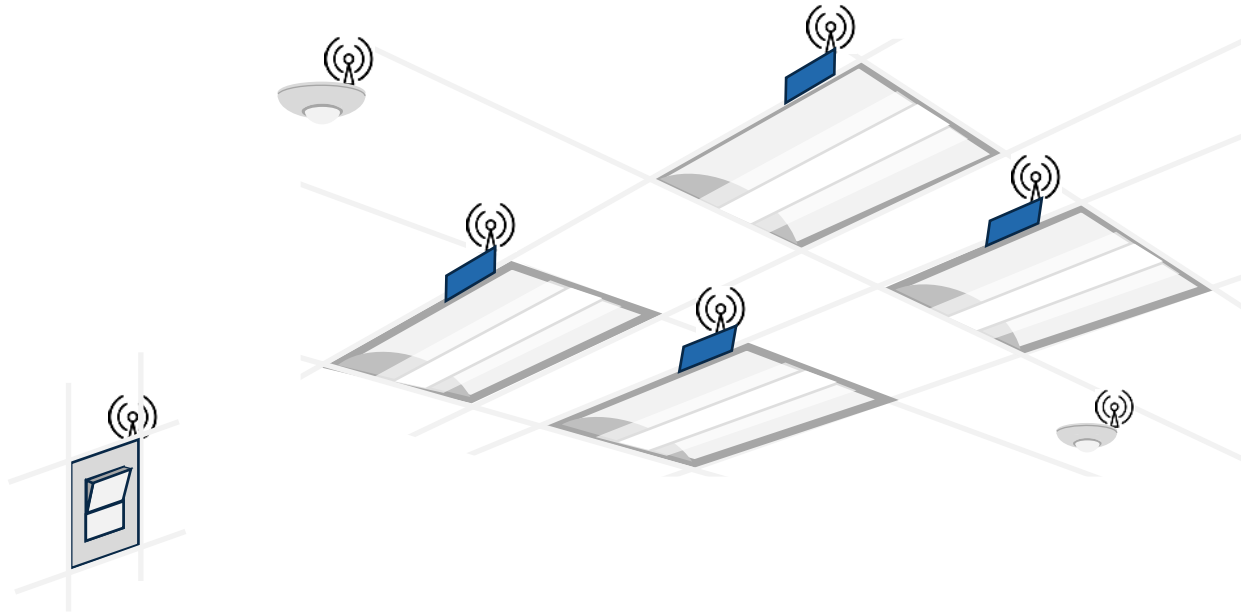
3 Steps for Any NLC



Step 1 – Build The Network

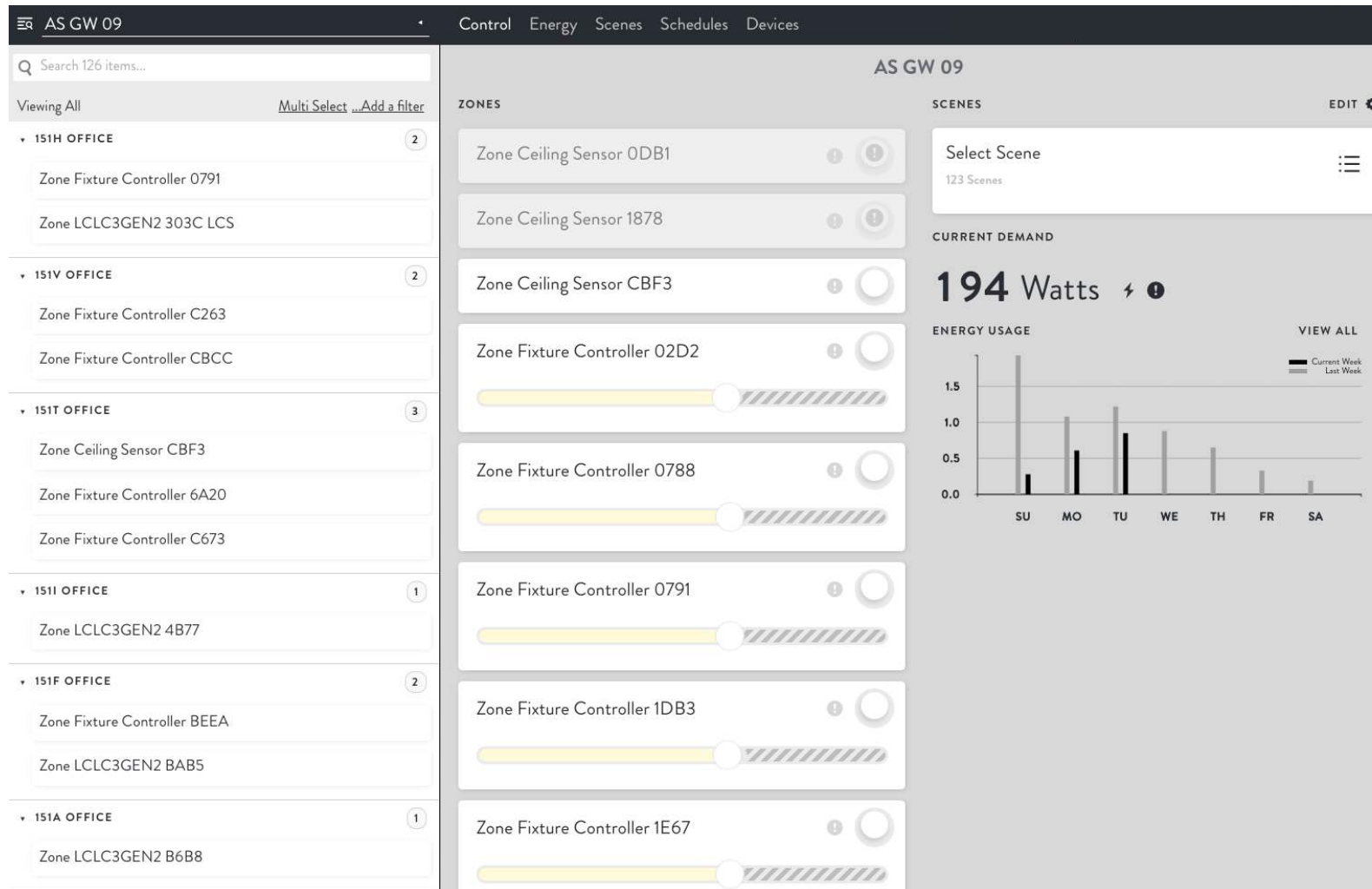


Connect Wired
Devices



Join Wireless Nodes

Step 2 – Organize The Network



Step 3 – Apply Control Strategies

High End Trim?
Daylight Harvesting?
Occupancy/Vacancy Sensing?
Scheduling?
Scene Control?
Personal Control?

Sequences Of Operation By Controlled Room

Unique ID - Loc Ref# - Room Name	Room Type	High End Trim	Dim?	Daylight Enabled?	Occ / Vac	Sensor Grouped or Discrete	Timeout Length (min)	Occ. Level	Unocc. Level
1 - Classroom 31	Classroom / Lecture Hall / Training Room	75%	Y	Y	Vac.	Grouped	10	100%	0%
2 - Classroom 30	Classroom / Lecture Hall / Training Room	75%	Y	Y	Vac.	Grouped	10	100%	0%
3 - Classroom 29	Classroom / Lecture Hall / Training Room	75%	Y	Y	Vac.	Grouped	10	100%	0%
4 - Library 28	Library	75%	Y	Y	Vac.	Grouped	20	100%	0%
8 - Library	Library	75%	Y	Y	Vac.	Grouped	20	100%	0%
11 - Library 28A	Storage Room ≥50 ft2	65%	Y	N	Occ.	Discrete	5	100%	0%
13 - Library 28C	Storage Room <50 ft2	65%	Y	N	Occ.	Discrete	5	100%	0%
14 - Library 28D	Storage Room <50 ft2	65%	Y	N	Occ.	Discrete	5	100%	0%



Frank Agraz, FSG

Networked Lighting Controls

Lessons Learned

Audit with Controls in Mind

- Existing Controls
- Control Zones
- Occupancy Pattern
- Integration
- Data/Asset Tracking



Priority vs Features vs Budget

- Wireless Flexibility
- Automation vs User control
- App-Based commissioning
- “Control-Ready” luminaires
- Proprietary vs Open system
- Labor considerations



Other Considerations

- Power: Battery vs Line Voltage
- Scalability
- Access to Ceiling
- Zone/Grouping Flexibility
- Facility IT Coordination



A photograph of a modern office building at night, with many windows illuminated from within, showing office interiors. A large white arrow graphic with a yellow border points from the left towards the right, partially obscuring the building. The text "Kirby Corkill, Jarvis Lighting" is written in blue inside the arrow.

Kirby Corkill, Jarvis Lighting

**MAKE THE PLAN,
WORK THE PLAN**



MAKE THE PLAN



- **Make the plan ahead of time**
- **Include all decision makers**
- **Keep plan functional and avoid fancy**
- **Consider real-world limitations**
- **Communicate the plan to all relevant parties**
(End customers, person commissioning, installers, IT department)

WORK THE PLAN



- **Right equipment in the right spot**
- **Person commissioning commissions as planned**
- **Actually communicate with end-users**



BEFORE I DO ANYTHING,
I ASK MYSELF,
‘WOULD AN IDIOT DO THAT?’

AND IF THE ANSWER IS YES,
I DO NOT DO THAT THING

-DWIGHT SCHRUTE



MANAGING EXPECTATIONS AND CHANGES



- Make sure space is functional.
- Resist changing the plan before customers have had time to get comfortable with the changes.
- If there are functional issues, address them by re-making the plan. Avoid 'impulse' fixes that haven't been thought through.

WHAT NOT TO DO



Do not put all the sensors on one side of the building and all the wireless control modules on the other.

WHAT NOT TO DO



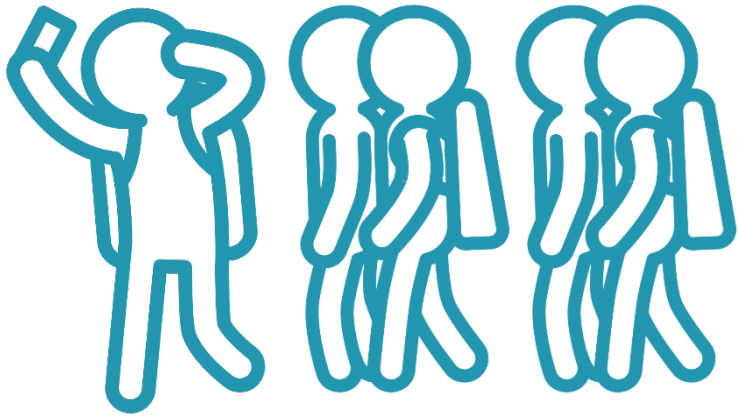
Do not try to install an internet gateway in a building that has no internet.

WHAT NOT TO DO



Do not try to run a wireless network through a mountain.

WHAT NOT TO DO



Do not let customers follow you around negotiating the settings for each room.

WHAT NOT TO DO



Do not forget to tell the building staff that sensors turn the lights off automatically.

Questions?

(type in question pane)

Thank You!



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