

Illinois EE Stakeholder Advisory Group Network Lighting Controls Subcommittee

Wednesday, July 27, 2022 Meeting

10:30 am – 12:00 pm

Teleconference

Attendees and Meeting Notes

Meeting Materials

- SAG Network Lighting Controls Subcommittee Webpage
- Posted on the [July 27 meeting page](#):
 - [Wednesday, July 27 Network Lighting Controls Subcommittee Agenda](#)
 - [Energy Futures Group Presentation: Network Lighting Controls / Luminaire Level Lighting Controls Program Spotlights](#)
 - [Northwest Energy Efficiency Alliance Presentation: Luminaire Level Lighting Controls, an MT Opportunity](#)

Attendees (by webinar)

Celia Johnson, SAG Facilitator

Greg Ehrendreich, Midwest Energy Efficiency Alliance (MEEA) – Meeting Support

Aaron Kwiatkowski, CMS Energy

Andrey Gribovich, DNV

Andy Vaughn, Ameren Illinois

Ashley Harrington, ComEd

Carl Nelson, Center for Energy & Environment

Catherine Allen, ComEd

Chris Wolgamott, Northwest Energy Efficiency Alliance (NEEA)

Dan Mellinger, Energy Futures Group, representing NRDC

Elaine Miller, NEEA

Emily Pauli, ComEd

Hameed Yusuf, Resource Innovations

Jeff Harris, NEEA

Jim Fay, ComEd

John Lavalley, Leidos

Laura Pettersen, Resource Innovations

Liesel Schulte, Design Lights

Matt Armstrong, Ameren Illinois

Nicholas Crowder, Ameren Illinois

Peter Brown, Lighting Transitions

Sanjyot Varade, Resource Innovations

Shonda Biddle, Center for Energy & Environment

Opening & Introductions

Celia Johnson, SAG Facilitator

Purpose of meeting: To discuss program designs and best practices on Network Lighting Control measures, with presentations from Energy Futures Group (representing NRDC) and Northwest Energy Efficiency Alliance (NEEA).

Network Lighting Control / Luminaire Level Lighting Control Program Spotlights Best Practices

Dan Mellinger, Energy Futures Group (representing NRDC)

- Best practices etc. that will be discussed should not be considered as criticisms of Ameren or ComEd offerings – have not done any comparison of the highlighted programs; not identifying any gaps.
- Industry lacks standardized terminology. The term we use “NLC” others call “advanced lighting controls” or ‘connected lighting’ or etc. and sometimes there are differences and overlaps in the definitions. A wide range of products can fit in this definition. There are subcategories.
- First subcategory is luminaire level lighting controls (LLLC) – a subset of controls, not a competing technology – that itself is a confusing topic. Every luminaire has its own sensor and controller.
- Second subset is “Non-LLLC” or something that doesn’t really have its own name. Remote sensors and controls. Maybe think of as “traditional NLC” but that also creates confusion. Ask two contractors what a network lighting control is, you get two answers.
- Third subset is a product type that is promoted by manufacturers – room-based systems. These are repackaged with everything required for a small space. Marketed as simple, out of the box solutions. Many of them meet the NLC definition and are qualified by the DLC as an NLC. Most of these systems, networking is localized to the room level only, which is a big difference from the other types.
- Will reference NLC to refer to all of these technologies today unless otherwise noted.
- NLC design observations based on experience in northeast and Midwest:
 - Programs have to accommodate customer sizes and different technologies – match tech, capabilities and cost to customer needs. Don’t constrain how customers can participate. Limit the ability to increase penetration.
 - Complexity is a killer. It’s a barrier to participation (program complexity) – we can address that by ensuring that programs are easy to engage with and comply with reporting. Tech complexity is limited ability to control – this is manufacturers – but programs can include a pathway for tech that is less complex and easier to install.
 - Incentives alone will not drive volume. Throwing money at the problem doesn’t convince if benefits aren’t understood. Even at 100% incentive, if customer doesn’t perceive value and contractor sees risk of complexity, may struggle to drive volume.
 - Energy savings are not enough motivator. Have to focus on energy and non-energy values. Once converted to LEDs, customers see less value in controls.
- Design recommendations
 - 1. Accommodate all customer sizes – multiple participation pathways. Example performance-based program that accommodates all

technologies and a prescriptive or midstream program that only accounts for luminaire level controls.

- 2. Multiple control technologies – could be remote mounted, luminaire level, room-based. Customers have different needs and capabilities. Minimally, should include occupancy, daylighting & trim.
- 3. Workforce training – a lot of programs are addressing. Trainings are infrequent and not diverse enough – may focus on hardware/technology components which is important but it should also (or as a separate venue) cover operations, facility management, sales strategies, code compliance. We know customers and contractors want to participate in different platforms (online, on-demand, in-person, live webinars, etc.).
- 4. Energy monitoring – this is a requirement of DLC-qualified NLCs. There is value to measuring and reporting on savings, rather than using engineering estimates or calculations. Let's take advantage of the data capabilities.
- 5. Marketing should hit on energy and NEBs
- 6. Commissioning – should not be overlooked. Can't be realized if it isn't operating correctly. It has to perform and deliver. Also important for attribution and evaluation.
- Reframing the opportunities and benefits:
 - We have to acknowledge we haven't been as successful as we hoped. Anticipated trajectory is not there.
 - Energy isn't enough of a driver – 3/30/300 Rule – no idea how that responded to the current high inflation. There are orders of magnitude different between costs for energy, leasing, and employees. There is a perception that controls are problematic and why would they want to risk employee productivity? Even percent of energy savings is not enough argument.
 - If we want to capture the energy savings, we have to reframe the opportunity to well being and etc. Building shell upgrade for homeowners as an example – comfort messaging. That resonates more than savings numbers. We need that kind of messaging on the business side.
- Value propositions related to COVID:
 - Employee well-being – occupant satisfaction with the right light and ability to control and adjust. NLC can help with sophisticated things like circadian tuning of light levels, aiding retention and recruitment.
 - Shift to hybrid means customization and flexibility are important. Minimize and optimize space usage.
 - Could increase marketability of space.
- Consumers Energy – Program Spotlight
 - NLC program for several years. Aim of program is to transform market from units to a holistic system of lighting improvements. Program is a hybrid – has prescriptive levels and custom savings calculations. Can accommodate all three types of technologies as long as they meet the required capabilities.
 - DNV is the implementer in Michigan

- Qualifications: have a payback range of 1-8 years. Has to include 3 savings strategies. DLC-qualification is not required for NLC but is for luminaires.
- Two incentive levels offered depending on the customer type.
- Monitoring kicks in as requirement over 100k sq. ft. Ensures savings are attributed during evaluation.
- Trainings in person since 2017 – over 150 trade allies trained
- Results: wanted to put them all in a matrix but the available public information varies and I'm just highlighting results for each program. Consumers has an absolute energy savings number and projects completed, but don't have that granularity for the others. 5.5% of total C&I savings, 33% of lighting in Business Solutions program.
- Marketing example – energy savings% messaging, but goes on to talk about other benefits – code compliance, productivity, employee morale, reduced maintenance. Benefits that aren't apparent to a customer and not interesting to a contractor. Program has to share that with customer.
- Energize Connecticut – Program Spotlight
 - Statewide umbrella branding for programs administered by multiple utilities.
 - Program offers luminaire incentives through midstream as well as prescriptive. Also has performance lighting program (good/better/best approach).
 - Can accommodate all the NLC technologies.
 - Open to all business customers. Must be DLC-qualified for NLC/LLLC systems and 80% of luminaires (unique program design element).
 - Prescriptive and midstream have an adder over the uncontrolled incentive level. Performance incentives are per kWh.
 - Energy monitoring is required for high performance tier.
 - Has focused on training, including on-demand and live in-person
 - Interesting contrast in results – both programs half of retrofit savings are from controls broadly. UI – vast majority is from enhanced/performance tier and only 3% midstream; Eversource – flipped, majority of savings from midstream. Similar amount of savings but emphasis is different.
 - Performance tiers – standard, enhanced, and high-performance. Incentives based on kWh. Highlight – LLLC can qualify in either enhanced or performance tier depending on the details.
 - Commissioning requirements – evaluation result from June – applies to the prescriptive and midstream programs. If it is a remote mounted, it can claim 49%; same for luminaire lighting controls but MUST be networked and commissioned. Non-networked LLLC was found (is that really LLLC, though?). Systems with integrated occupancy and daylight but not networked – those should be claiming lower control savings factor of 38%. A little puzzling why commissioning applies to LLLC but not NLC.
- Rhode Island Energy – Program Spotlight
 - Comprehensive program offerings similar to CT. Strong emphasis on LLLC in midstream and prescriptive and business DI.

- All business customers are eligible. Straightforward process.
- Hurdle is code calculations are required – savings and incentives are relative to code
- Performance lighting has two tiers with different incentive levels. Savings greater than 40% below code is the incentivized savings.
- Monitoring needed for tier 2.
- 15% of product volume in midstream incorporated controls in 2021. Couldn't full details on occupancy sensor vs full LLLC. Will be able to do that in the future. 16% of all custom interior lighting savings.
- Midstream incentive schedule – key feature for RI is that incentive levels for uncontrolled LEDs values were decreased quite significantly about a year and a half ago, more moved to the controlled solutions to drive customers to the controls. Would like to see an even greater differentiation between non-networked and LLLC solutions.
- Rhode Island uses the same implementer for midstream as MassSaves – same incentive levels and structures in that program
- Additional resources as noted on the slide
 - LCA Education Express – everything related to controls. Can track CEUs.
 - NXT Level Lighting – started in northwest and is available outside of the northwest, NEEA will cover more of that
 - DLC NLC Program summaries – public resource of program information

Luminaire Level Lighting Controls, an MT Opportunity

Jeff Harris, Elaine Miller, Chris Wolgamott, NEEA

- Complex market and not as much differentiation in products as we would like. We will focus on luminaire-level lighting controls – LLLCs present the best opportunity for market transformation programs, we feel. They are the sweet spot from that perspective.
- Crux of it is that it's a subset of NLCs but we think it has a higher level of business benefits. It's all about market transformation theory.
- Graphic from marketing pieces – Better Bricks site – showing the benefits these technologies offer. Ease of installation is a big one. Flexible controls at the granular level. Better lighting quality. Occupant comfort – focusing conversation on the benefits that tenants and owners value. Don't want to lead with the savings.
- MT Vision is that it becomes the dominant practice in commercial buildings. Little incremental cost. Greater demand for a quality lighting experience. Accepted practice in retrofits and new construction.
- We recognize it is a big paradigm shift. Systems instead of widgets. Currently low adoption. Not just about better controls – have to move from uncontrolled to controlled. Bundle with all the benefits to get them to take on controls at all. Could connect to HVAC and plug load over time. It's a tough road.
- We've been at it a while. Started back in 2011 engaging one building owner to test a product. They loved it. That got us started. Did work testing and verifying. 2013 began program development, working on the specification which came online in 2015. Up to 28 manufacturers now in 2022. Did a lot of work on the

supply chain – educating trade allies, specifiers, building owners and maintenance staff. Worked on regional infrastructure and how savings are treated in the regional technical forum. In 2019, we are now in Market Development phase. Doubling down on supply chain. Leveraged training networks in the region. NXT Level training is built into the curriculum. How to sell the products. Debunking myths. Build the awareness and the understanding of the value. Work with utilities to engage building owners. Pushing it from code option to hopefully someday a code requirement.

- Market barriers:
 - Product readiness – growth of manufacturers and specifications. This is ready. Product is available. We can check that box.
 - Trade ally knowledge – still more work there but have seen a shift over several years. Challenge on confusion with naming.
 - Awareness of value proposition – really need to continue on this. Business benefits and connecting it to what building owners care about. Have begun that work and made strides but have to do more.
 - First cost – issues have been addressed; costs have dropped. Trajectory is trending downward. COVID supply chain issues, of course.
- Leveraging influencers:
 - NEEA doesn't do broad marketing and training – works through others. AIA, BOMA, IFMA, other organizations and platforms. Is really all about looking for leverage points and champions and getting the word out.
 - Complicated utility landscape. Many utilities have incentives for these products. More and more offerings in the region. This is on top of whatever the utility is offering.
 - Working a lot with manufacturers to help activate their sales channels in the Northwest.
- MT Theory: How we reach our vision
 - It's a complex program. Multifaceted approach that wants to build the capabilities of the supply side. Get business owners to understand the benefits and ask for it. Even if specifiers specify the product, it is often "value engineered" out. Really have to help the sales focus – manufacturers and reps in the region. Keeping up with the product expansion. Deepening technical and sales skills. Developing the business benefits from the owner POV, understanding the sub-markets. Trying to look for the early adopters and enable them to tell the story. Data is a key component – understanding data over time to see where market is going. Have recently improved the data collection – LLLCs are a little easier that way to count than some of the other systems.
- Where is the Tech Today?
 - Big shift is interoperability – that's a buzz word we hear all the time. We've seen a shift in the product itself, how they work together. We're not seeing competitors work together, but they are working toward the same communications path (Bluetooth, ZigBee, etc.). The ability to talk to each other, even if they aren't fully working directly together. Increase in the number of Bluetooth systems – not necessarily a winner but BT low

- energy is definitely on the rise right now. Simplicity is its biggest win – easy and secure. It's becoming the leader right now. That “easy button” install is a huge thing. There have been apps since the beginning but the difference between ten years ago vs today – ease of installing on the apps, better customer usability. Gets us to actually seeing the savings if we can get them programmed and commissioned correctly, and gets rid of the view that “controls don't work” or “don't do anything” – you can get down to the fixture level and see what they are doing. Nobody will be disabling controls because they don't work because we can make them work. Systems across the board – some are easy to install without gateways and do the bare minimum; others have gateway options to step it up. Even upgradeable at a later date. Don't have to replace lights or system to add that gateway and let the system do more.
- Observations from LightFair: bigger this year than last year, unsurprisingly. Always seen big manufacturers showing off, this show saw lot of mid-tier manufacturers like fixture manufacturers.
 - [Dan Mellinger] Important observation here – because this mid-tier manufacturer is a popular product type for small and medium level retrofit products sold through distribution. It's great to have a mid-level manufacturer with these LLLC products. Because for a long time it was just the big manufacturers focusing on new construction type projects.
 - There were booths with every fixture in the booth with sensors in them. Doesn't feel like a major shift, but it is really pretty big to see in the mid-tier.
 - Every session about controls spoke about LLLC. Some of them really focused on it. Becoming more prevalent as a “word” out there. Have to work on making sure we have constant definitions across platforms and companies so they don't take too many liberties with what they are calling LLLC. LLLC is starting to get into IES documents. There were 4 manufacturers when we started this back in 2012-2013. Now there are 24-25 of them, and new ones come in all the time. Some small companies doing amazing work, as well as the big companies. Very encouraging to see all the products and advancements.
 - One of the things we fight with controls is the perception of how bad controls are – that's been around since the 70's. It's a big battle for us to fight and one of the reasons we think LLLC is a winner. Ease of install, and granularity of the controls.
 - Recommendations for Illinois
 - From our perspective, the product and manufacturers and supply chain are at a pretty mature standpoint. Not a commodity just yet, but it is really moving in the right direction and is ready for a big increase in demand.
 - Need to emphasize for Illinois – timing is right to build the business case for the owner/manager of the space. Products are there.

What's going to drive the demand is those business benefits. Not about first cost or energy savings for the end-users as much.

- Believe LLLC is the best chance for NLC to meet the business needs for what the business owner wants.
- SEM for commercial customers – LLLC is a platform for helping meet SEM because the data stream coming off of it can help HVAC, customizing lighting to occupancy or partial-occupancy, help customers get to their next benchmark
- We would love to partner with other regions on helping collect data so we all can understand the market better and how it is responding.

Q&A

- [Jim Fay] Presenter said they figured out the data question from an MT perspective. Could you elaborate on where the data is going to come from to measure the impact on the market and what issues you have overcome in figuring out where the data is going to come from – e.g., proprietary nature of some of the data vs data placed into the public domain?
- [Elaine Miller] We started out gathering distributor sales data – very challenging. Products weren't in their systems in the way they could be pulled out. We pivoted to now gathering LLLC data from an org called Incentive which has manufacturer sales data. Have made great strides in collecting sales data. There is a process of talking to utilities to see how much they are doing with the product. We still scratch our heads on understanding LLLC in proportion to overall sales of the controls market. We don't have a line of sight on that yet but we are trying to figure it out.
 - NEEA to share additional information about Incentive with ComEd.

Closing and Next Steps

Celia Johnson, SAG Facilitator

Next Steps

- Q4 meeting (December): Ameren Illinois and ComEd will report on 2022 progress for NLC measures