LUMINAIRE LEVEL LIGHTING CONTROLS (LLLC) UPDATE

SAG MARKET TRANSFORMATION WORKING GROUP

MAY 22, 2023

AmerenIllinoisSavings.com

Agenda

- Program Theory Logic Model
  - Background
  - Target Market
  - Logic Model

- 2023 Market Engagement
  - Incentive Channels
  - Program Ally Training
  - Network Lighting Controls (NLC)/LLLC Informational Collateral

- Evaluation and Attribution
  - Evaluation Activities
  - Natural Market Baseline (NMB)

Ameren ILLINOIS

Background for LLLC as an MTI

Recognizing the huge savings potential, Ameren Illinois (AIC) launched the Luminaire Level Lighting Controls (LLLC) Market Transformation Initiative (MTI) pilot in 2021 to accelerate adoption of the technology within the service territory:

- A recent study by NEEA[1] showed significant 50 – 74% annual energy savings from 1:1 replacement of LLLCs compared to 59% savings of a full redesign, and at about one-third to half of the cost
- LLLC systems are a subset of Networked Lighting Controls (NLCs) and have been available for about a decade.
- LLLC systems have the unique characteristic of sensors embedded in every fixture, which enables usage flexibility across a variety of space types including warehouses, offices, hospitals and healthcare facilities, and schools
- LLLCs are easy to install, offer non-energy benefits and enable business owners to remotely address security and maintenance issues, as well as manage energy usage. Yet, LLLC adoption is low, with connected lighting comprising less than 1% of all luminaires in the US[2]

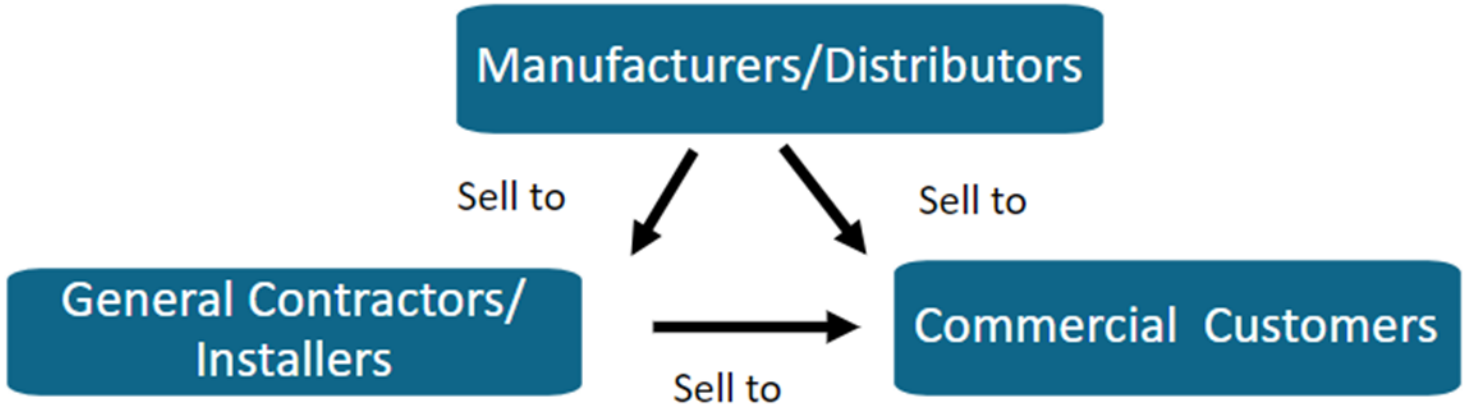
[1]NEEA 2020. *Luminaire Level Lighting Controls Replacement vs Redesign Comparison Study.* https://neea.org/resources/lllc-replacement-vs-redesign-comparison-study
[2]Wolgamott, C., and T. Kisch. 2021. *Trends in Lighting Controls.* Trends In Lighting Controls: Luminaire Level Lighting Controls (facilityexecutive.com)

Target Market

- In alignment with the TRM definition of the target market:

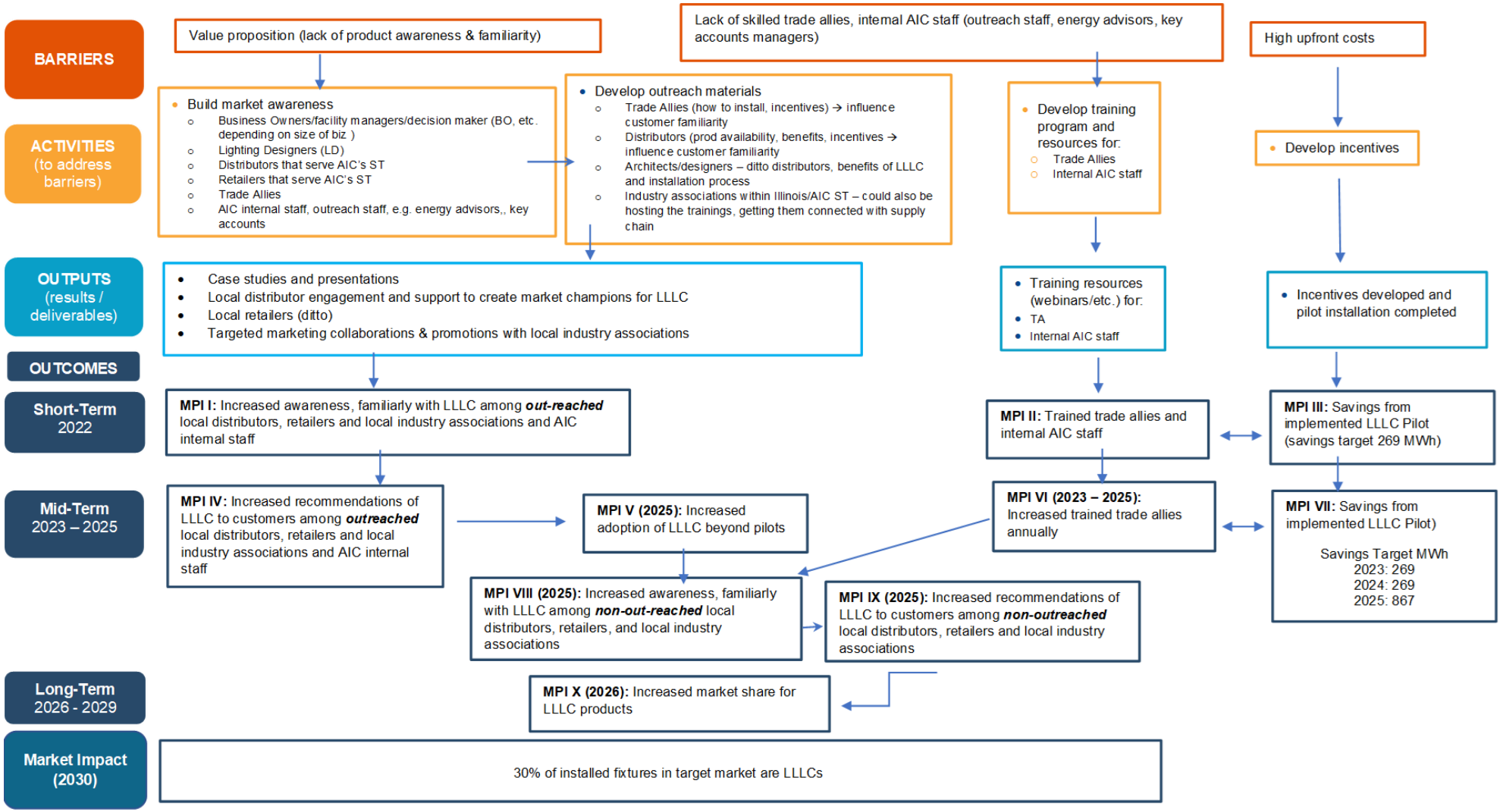
  ‘an actual or nominal place where forces of demand and supply operate, and where buyers and sellers interact (directly or through intermediaries) to trade goods, services or contracts or instruments, for money or barter’

- AIC characterizes the LLLC MTI Target Market with this relationship diagram identifying Manufacturers, Distributors, General Contractors, Installers, and Commercial Customers as comprising the Target Market.



Ameren ILLINOIS

Program Theory of Change: Logic Model (Version 1)



Preliminary information for SAG discussion purposes only; subject to Section 3.1 of EE Policy Manual

2023 LLLC Incentives

Participation Pathways:

- Standard Lighting
- Small Business Direct Install (SBDI)

Control Technologies Incentives:

- NLC Standard Lighting incentives:
  - $0.50 per watt controlled – NLC
  - $1.50 per watt controlled – LLLC

- SBDI:
  - NLC (includes LLLC) – $1.25 per watt controlled

Networked Lighting Controls (NLC) Eligibility:

- New installations only; not to replace existing networked lighting controls
- Interior spaces only; exterior spaces may apply using the Custom application
- Total Watts Controlled is the wattage of all LED light fixtures connected to the NLC system
- System must enable three or more control strategies
- System must be listed on the DLC Networked Lighting Controls Qualified Products List: www.designlights.org/lighting-controls/

Description	System Type	Control Strategies (Minimum 3)	Total Watts Controlled (A)	Measure	Incentive per Unit (B)	Total Incentive (A) X (B)
Networked Lighting Controls (Interior Only)	Non-LLLC installation *(Single controller/sensor controls multiple luminaires)*	☐Occupancy/Vacancy ☐Daylighting ☐High-end trim ☐Dimming ☐Scheduling		BPL32	$0.50/watt controlled	$
	LLLC installation *(Each luminaire has its own controller/sensors; DLC listing indicates LLLC)*			BPL32	$1.50/watt controlled	$

Ameren ILLINOIS

2023 Program Ally Training

2022 trainees were surveyed before and after training and ODC provided insight for successes and opportunities for improvement

AIC has updated the Training based on feedback from ODC and attendees of the 2022 Training

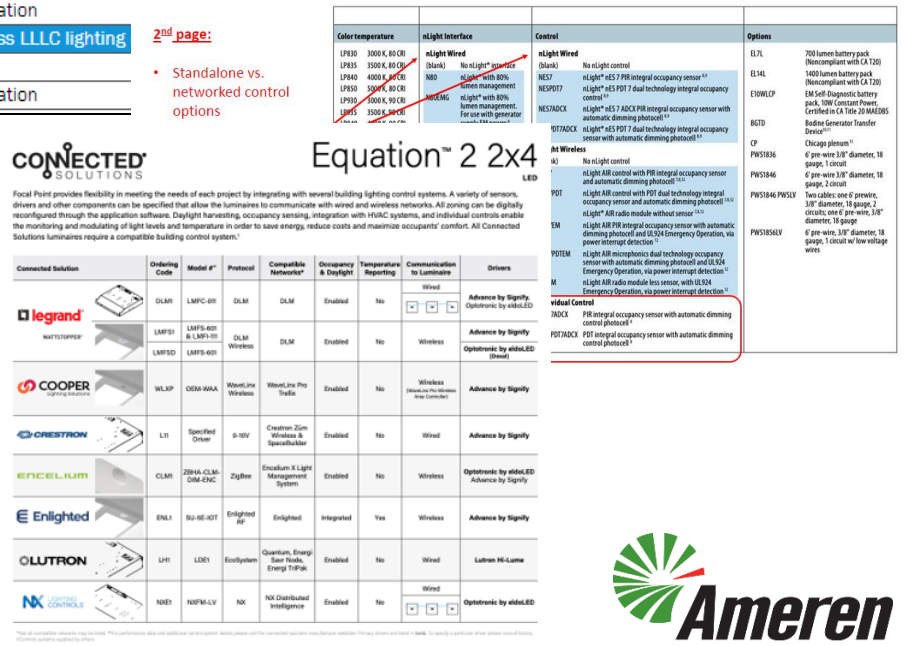
AIC is offering 6 In-Person LLLC Trainings in 2023

- 6 different locations
- Planning to host trainings at Distributor facilities
- Single day training that focuses on
  - What is NLC/LLLC
  - How to Commission LLLC
  - How to Bid and Sell LLLC (New)
  - How to Procure LLLC Equipment (New)

Response	Pre-Training Survey	Post-Training Survey
Understand the differences between non-LLLC and LLLC lighting control systems.		
Mean	2.45	4.00*
Standard Deviation	1.21	0.63
Describe the pros and cons between non-LLLC and LLLC lighting control systems.		
Mean	2.27	4.27*
Standard Deviation	1.10	0.79
Identify new types of advanced lighting controls that can reduce complexity/cost of installation and setup.		
Mean	2.18	3.82*
Standard Deviation	0.98	0.60
Use a new publicly available tool to understand, evaluate, and compare available NLCs.		
Mean	2.18	3.82*
Standard Deviation	0.87	0.75
Install a wireless LLLC lighting control system.		
Mean	2.36	4.14*
Standard Deviation		
Setup a wireless LLLC lighting		
Mean		
Standard Deviation		

2nd page:

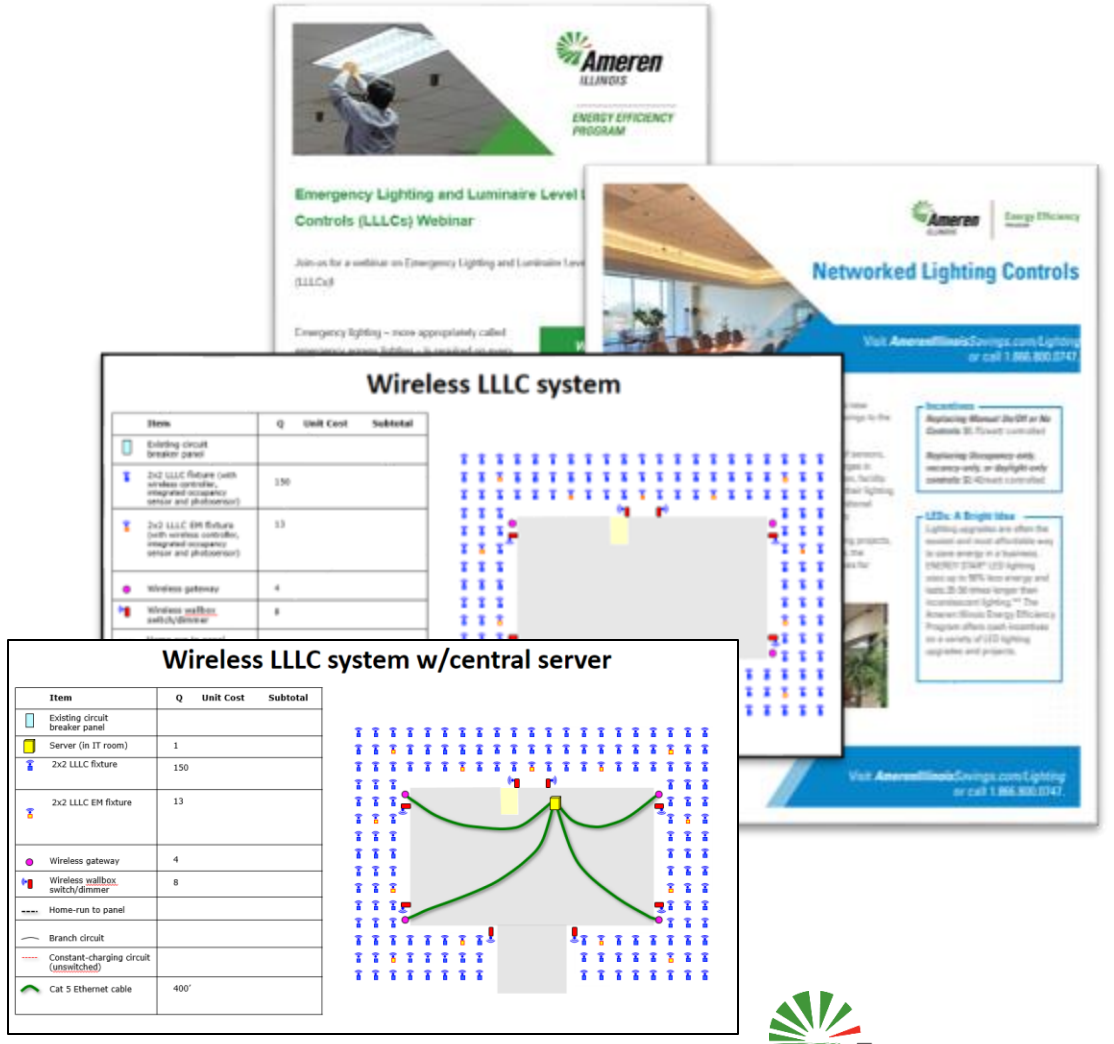
- Standalone vs. networked control options



2023 Educational Collateral

Creating additional Collateral and Supporting Resources for Distributors, General Contractors, Installers, and Customers

- Additional Case Studies of Local LLLC installations
- Educational flyers that outline NLC/LLLC characteristics and differences as well as energy savings and non-energy benefits
- Recordings of LLLC Educational Webinars
- Bidding Cost Sheets for LLLC Systems



Ameren ILLINOIS

2023 LLLC MTI Evaluation Activities

Evaluator Activities for 2023

- Revision of Program Theory Logic Model
  - AIC is working to update the Logic Model and Market Progress Indicators

- ODC Fielding Target Market Baseline Surveys
  - Program Ally Distributors and Installers
  - Customers

- Program Ally Training Survey
  - ODC completed 6-month post-training surveys for 2022 trainees to provide long-term training impact and insight for LLLC MTI efforts

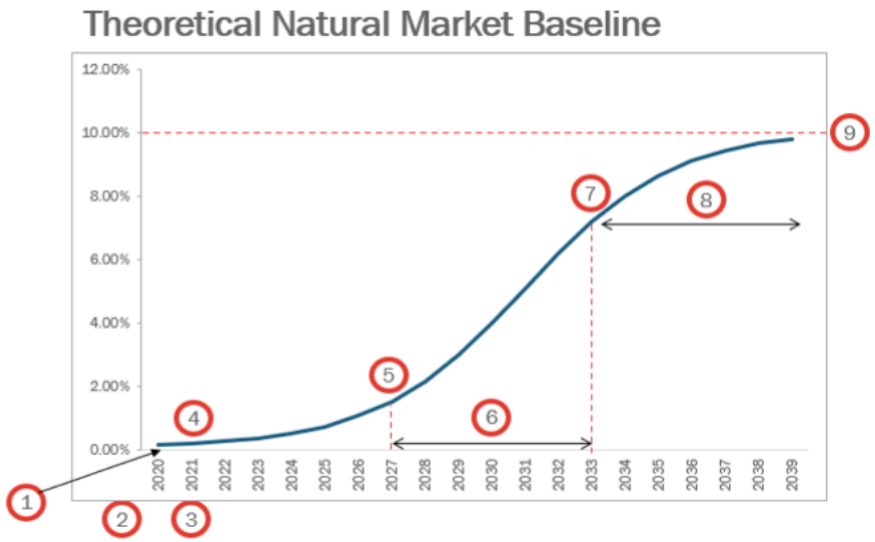
- 2022 LLLC Evaluation Memo

- Development of AIC LLLC Natural Market Baseline
  - ODC completed an Independent Review of the initial AIC LLLC NMB in May 2023

Natural Market Baseline (NMB)

AIC used the following NMB definition to support discussions of Literature and Market Data sources to develop the NMB for the LLLC MTI

1. Adoption Curve Shape
2. Year Product Enters Market
3. Forecast Start Year
4. Initial Market Share
5. Start of Hypergrowth
6. Ramp Period
7. Takeover Point
8. Takeover Period
9. Maximum Market Share



$$Market\ Penetration\ (year) = Initial\ MarketShare + \frac{(Maximum\ Market\ Share - Initial\ Market\ Share)}{1 + Factor\ \hat{}\left(\frac{Start\ of\ Hypergrowth + \frac{Ramp\ Period}{2} - Year}{Ramp\ Period}\right)}$$

QUESTIONS?

AmerenIllinoisSavings.com