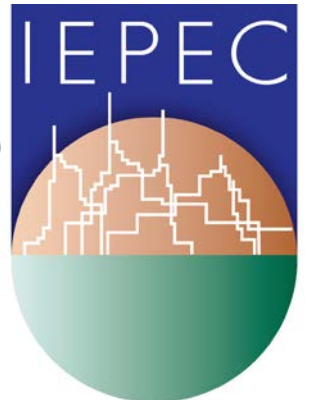


All Hands on Deck: A Quest for Continuous and Targeted Optimization of Upstream Lighting Savings

Jessi Taffel, DNV GL
Chad Telarico, DNV GL
Joe Bocanegra, National Grid

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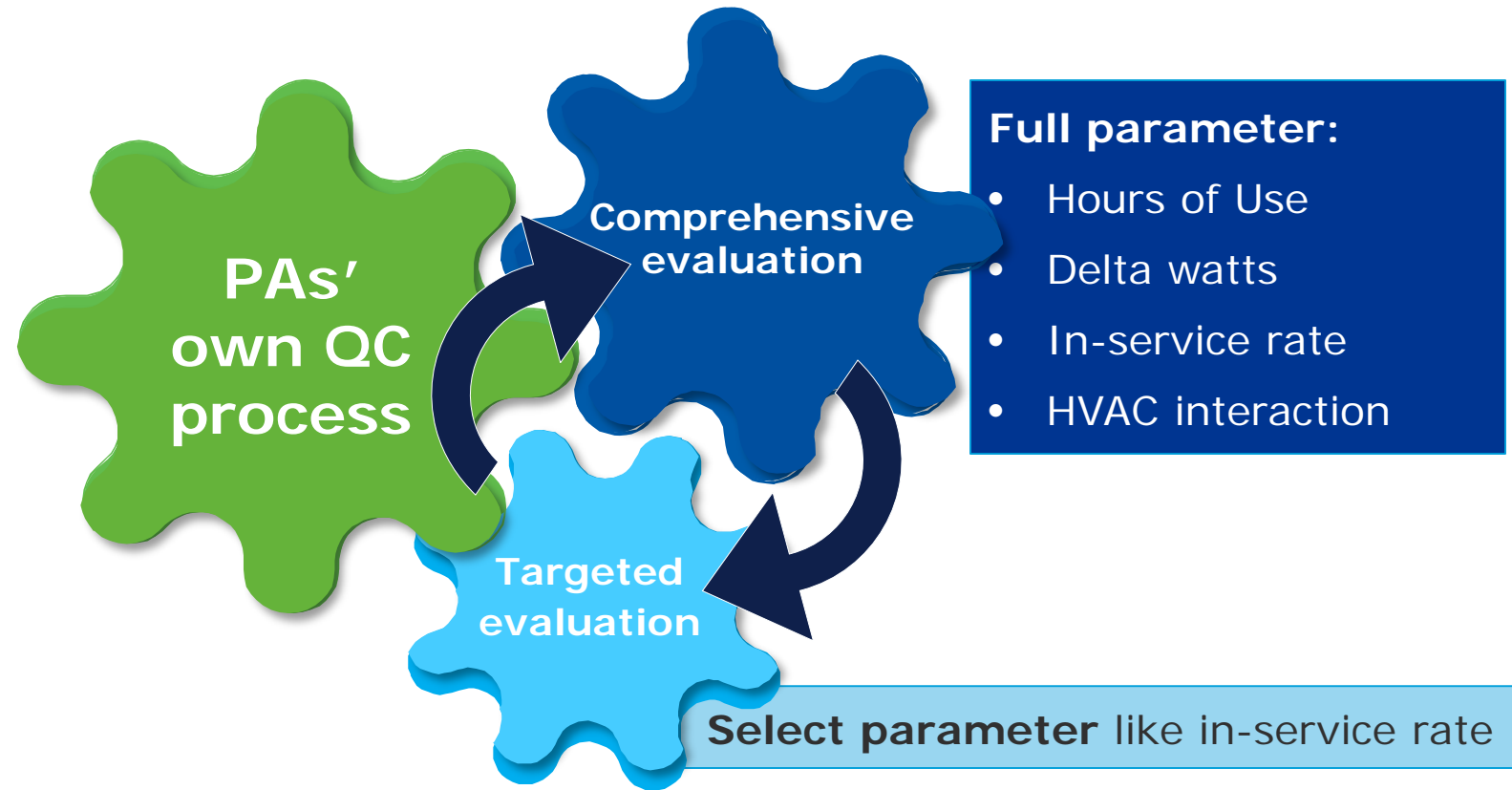


Background

- There have been multiple evaluations of the Massachusetts Commercial and Industrial Upstream Lighting Initiative covering a range of research areas, including identifying weak spots and ways to strengthen them.

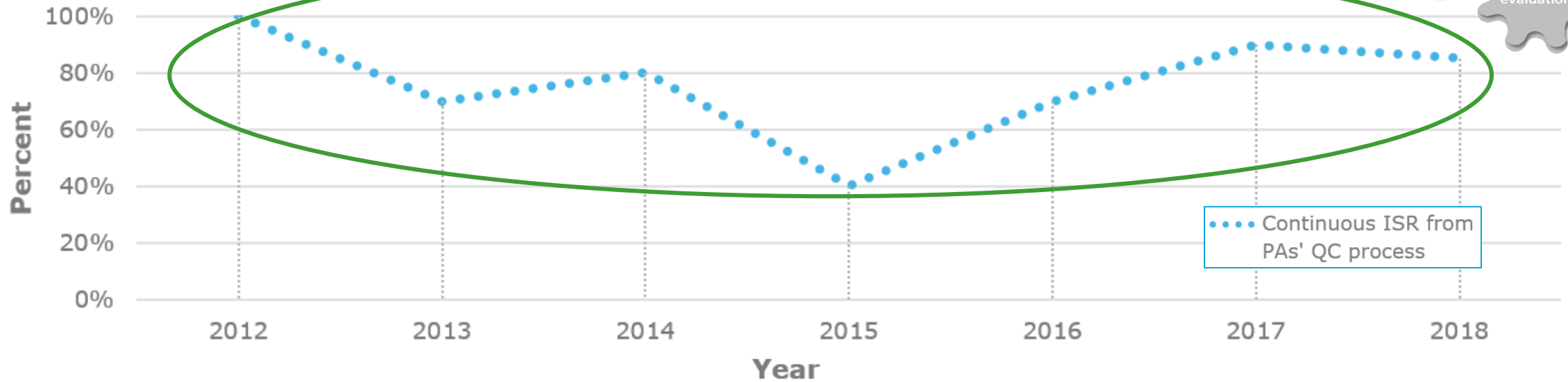
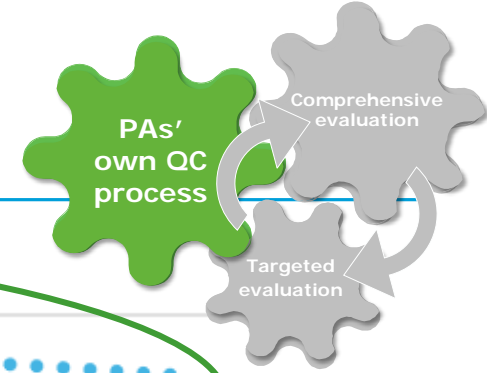


MA evaluation process to optimize savings



Adopt a similar evaluation framework to evaluate, adjust, and re-evaluate with the objective to improve program performance and achieve planned savings

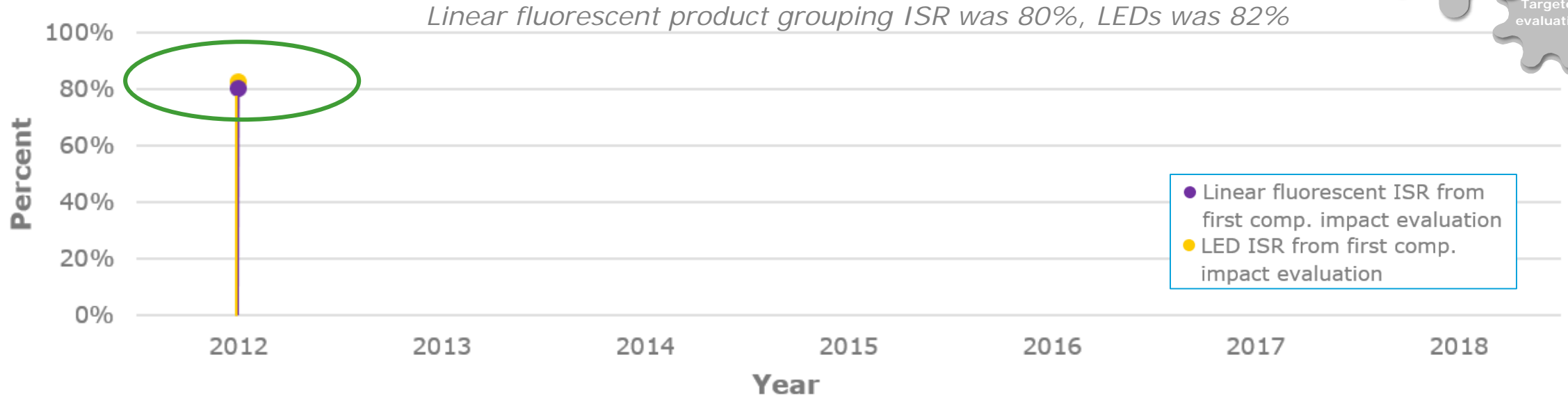
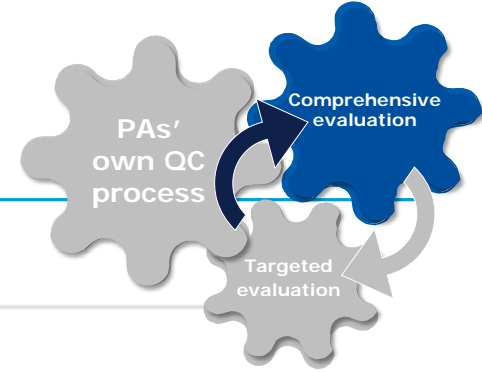
PAs' own Quality Assurance/Quality Control process



- MA PAs have their own QA/QC process, where there's continuous monitoring of **in-service rate (ISR)** and distributor performance
 - By understanding why inspections failed, distributors can take action to remedy

Collect real-time info via QC inspection contractor and make available to distributors and other stakeholders through an online portal. *Flag any adjustments to tracking data based on QC inspection findings and link to sales entry*

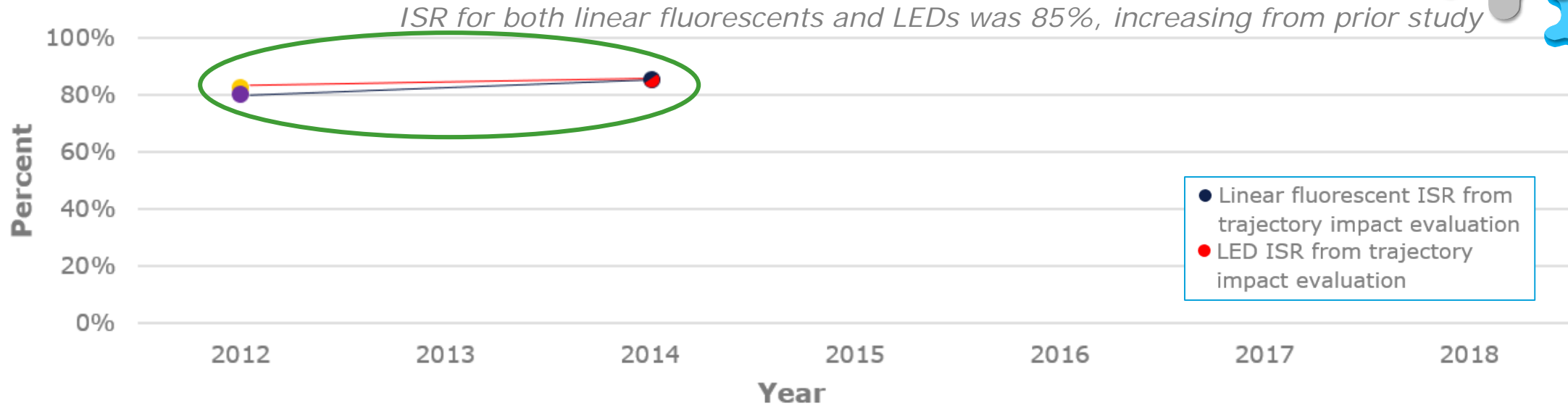
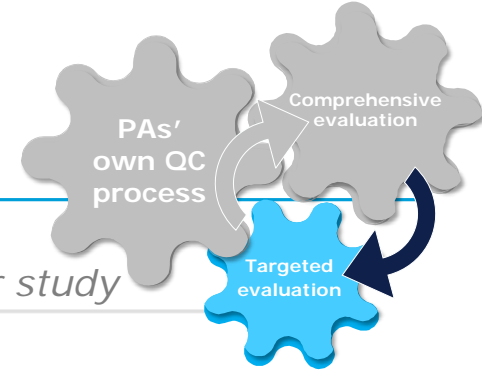
Comprehensive evaluation



- Traditional high rigor full parameter (hours of use, delta watts, **in-service rate**, HVAC interaction) evaluation conducted in MA
 - Evaluators completed 81 on-sites, covering linear fluorescent and LED technologies
 - Evaluation team observed several lamps in-storage

Enforce 30-day installation rule with an exemption request form

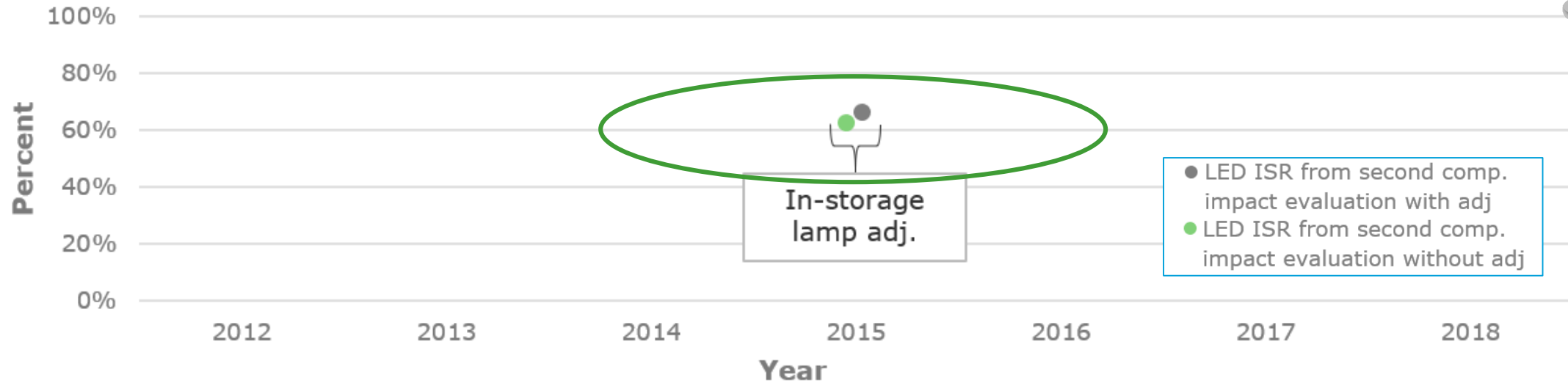
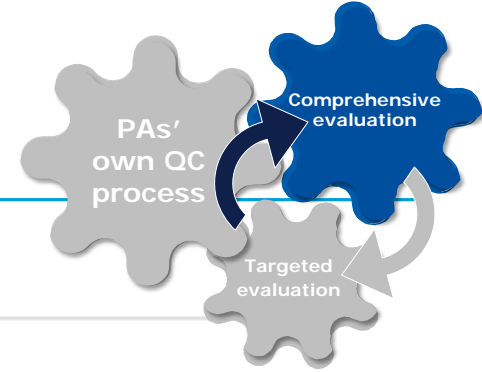
Targeted (in-service rate) evaluation



- In MA, a targeted follow-on trajectory study to understand what savings could be attributable for lamps that moved from storage to socket was conducted
 - Savings credit for lamps found installed at the time of the trajectory on-sites but previously in-storage was given to the PAs

Apply trajectory results to lamps in storage

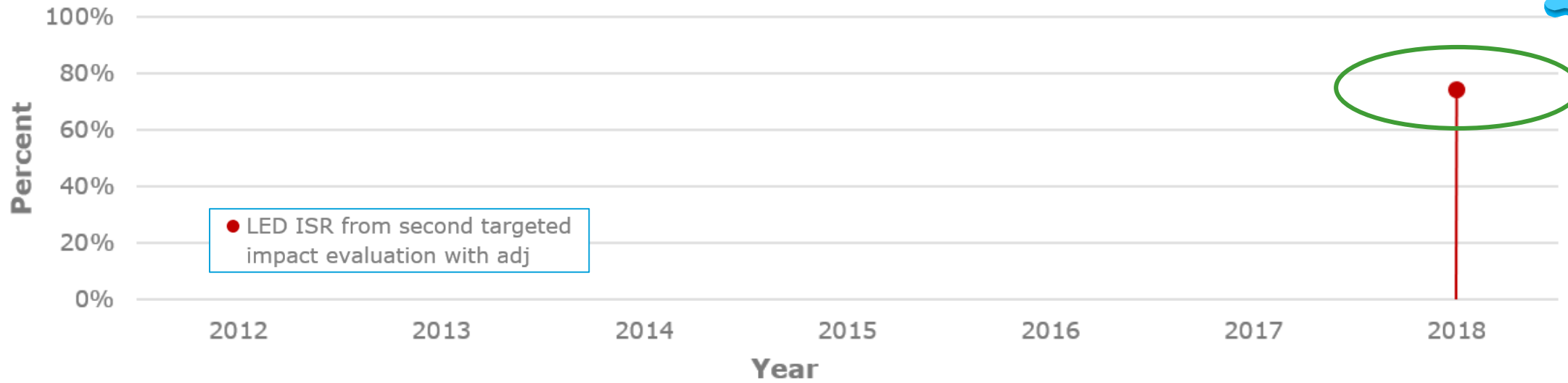
Comprehensive evaluation – round 2



- Second round of traditional high rigor full parameter (hours of use, delta watts, **in-service rate**, HVAC interaction) evaluation conducted, with 175 on-sites by evaluators and a trajectory study adjustment applied to in-storage lamps.

Use and monitor performance thresholds, taking distributor action as needed

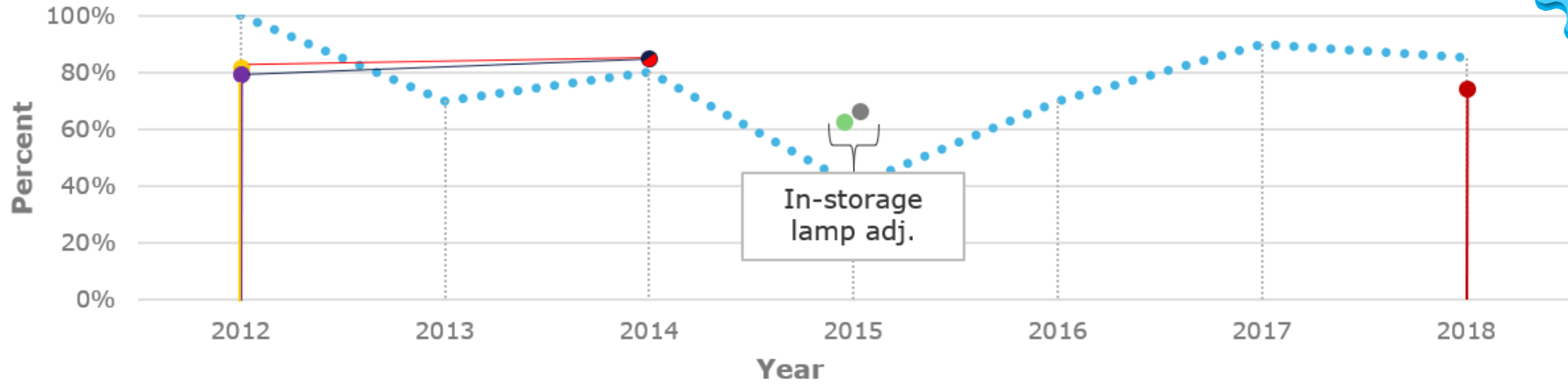
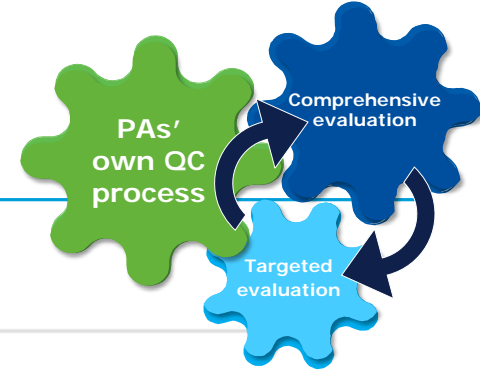
Targeted (in-service rate) evaluation – round 2



- Second round of targeted evaluation conducted, focused on ISR. 23 visits were complete and an overall value of 76% ISR was arrived at, replacing prior overall result of 65%.

Leverage QC inspection data for closer to real-time sense of ISR

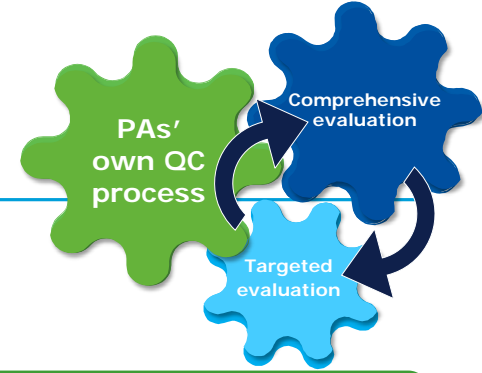
Results Summary



- Continuous ISR from PAs' QC process
- Linear fluorescent ISR from first comp. impact evaluation
- LED ISR from first comp. impact evaluation
- Linear fluorescent ISR from trajectory impact evaluation
- LED ISR from trajectory impact evaluation
- LED ISR from second comp. impact evaluation with adj
- LED ISR from second comp. impact evaluation without adj
- LED ISR from second targeted impact evaluation with adj

Evaluation activity and changes by program are continuous

Conclusions



Several opportunities for program:

- Enforcement of 30-day installation rule with an exemption request form
- Application of trajectory results, increases savings for any in-storage lamps
- Closer to real-time feedback through QC inspections
- Higher certainty around savings by adjusting and tracking adjustments based on QC inspection findings (assuming QC inspections are representative of population)
- Focus on select savings parameters

Program Administrators running a C&I Upstream Lighting program benefit from this (comprehensive to targeted and return back to comprehensive) evaluation framework

Questions?



Jessi Taffel

Jessica.Taffel@dnvgl.com

www.dnvgl.com

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