



# Technical Requirements Table V4.0

## June 8, 2016

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# Agenda

- **Background/Objectives of Spec Revision**
  - Purpose of DLC
  - Development Process and Stakeholder Input Process
  - Motivations for Specification Revision
  - Goals of Specification Revision
- **V4.0 Requirements Review**
  - Implementation Timeline
  - Efficacy Levels
  - Allowances determination process
- **Updates to Listed Products**
- **Additional Development Efforts**
- **Questions**

# Misc. Notes

- Slides will be posted on [www.designlights.org](http://www.designlights.org) after presentation
- FAQs will be developed in response to questions gathered on this webinar, and sent into [info@designlights.org](mailto:info@designlights.org).
- Please use GoToWebinar interface (Question pane) to submit questions during today's webinar

# DesignLights Consortium™ SSL QPL

- A program for the qualification of commercial, industrial, and outdoor SSL luminaires
- Begun in 2009 by NEEP, at the request of a group of utilities, to cover applications of lighting not covered by ENERGY STAR®
- Recognizing the critical relationship between energy efficiency incentive programs and adoption of new technologies, the DLC QPL is driven by efficiency programs to serve their customers and achieve their energy savings goals
- **Goal:** To drive quality and energy savings while not inhibiting innovation in the industry
- **Goal:** to support needs of member energy efficiency programs in achieving savings in their C&I lighting programs

# General DLC Development Process

DLC Aggregates  
Requests/Suggestions  
for Development

- Maintain “wish lists”
- Spec Development (new primary uses)
- Spec Revision (new performance thresholds)
- Policy Development
- Policy Revision

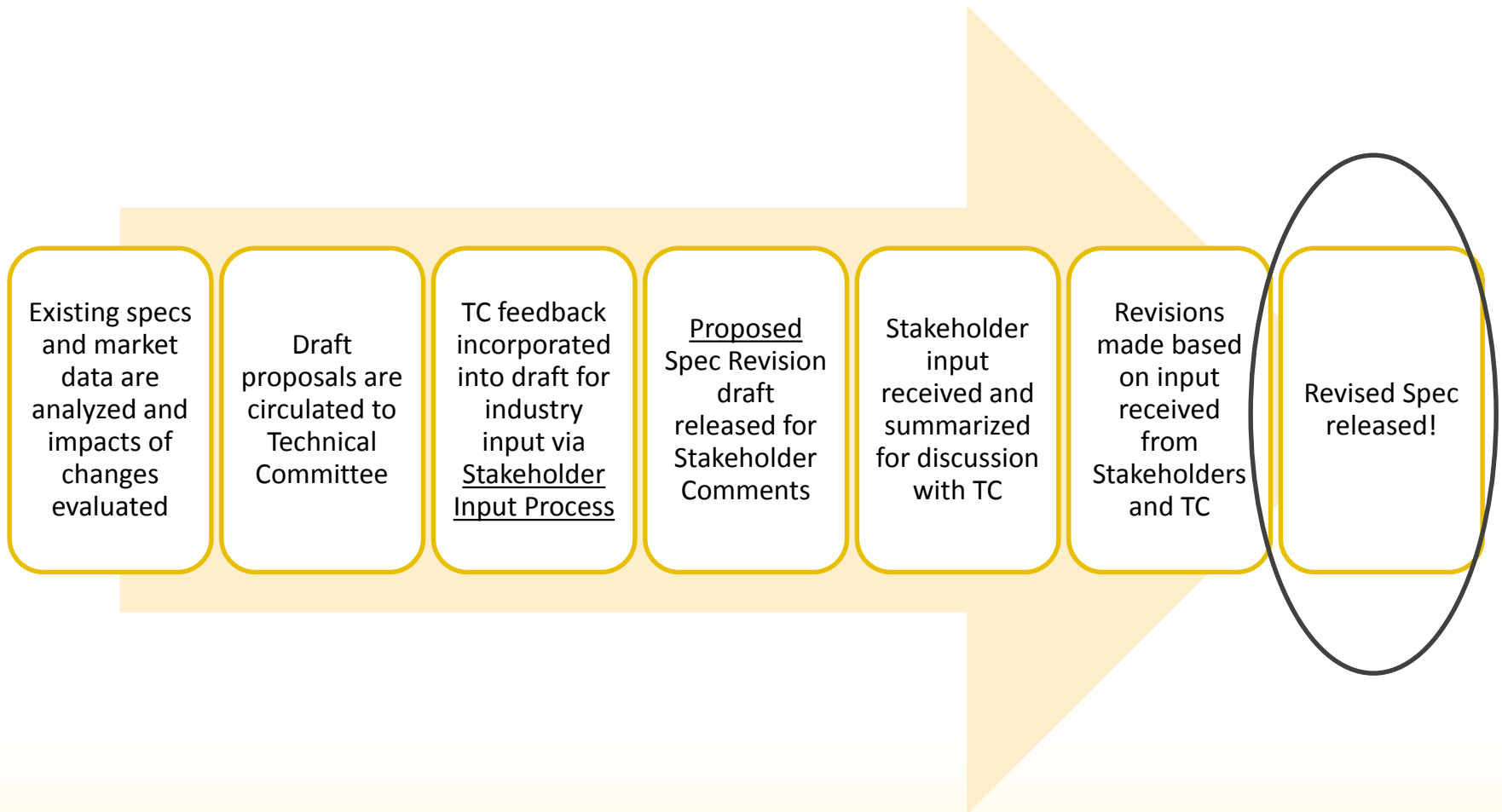
Prioritize wish lists  
periodically

- Active review with DLC Technical Committee
- Surveys of entire DLC Membership

Prioritized tasks  
undertaken for  
development

- Any new spec development or program change goes through Stakeholder Input Process

# Spec Revision Process



# DLC Spec Setting Approach

- General approach: Identify products that will deliver significant energy savings via luminaire-level performance specifications
  
- Focus on efficacy to ensure savings
  - Prescriptive incentive programs often assume 1-for-1 replacement
  - Difficult to assess layout/lighting design at luminaire level
  
- Include Provisions for quality and performance to aid persistence
  - What attributes will ensure products will remain installed and meet expectations for duration of measure life?
    - Color (CCT and CRI)
    - Minimum Light Output
    - Light Distribution (Zonal Lumens, Spacing Criteria)
    - Lumen Maintenance and LED ISTMT
    - Warranty
    - Driver ISTMT (currently only Premium)
  
- Include Provisions important to the membership
  - Power Quality (THDi and Power Factor)

# DLC Spec Revision Drivers?

What drives need for specification revisions?

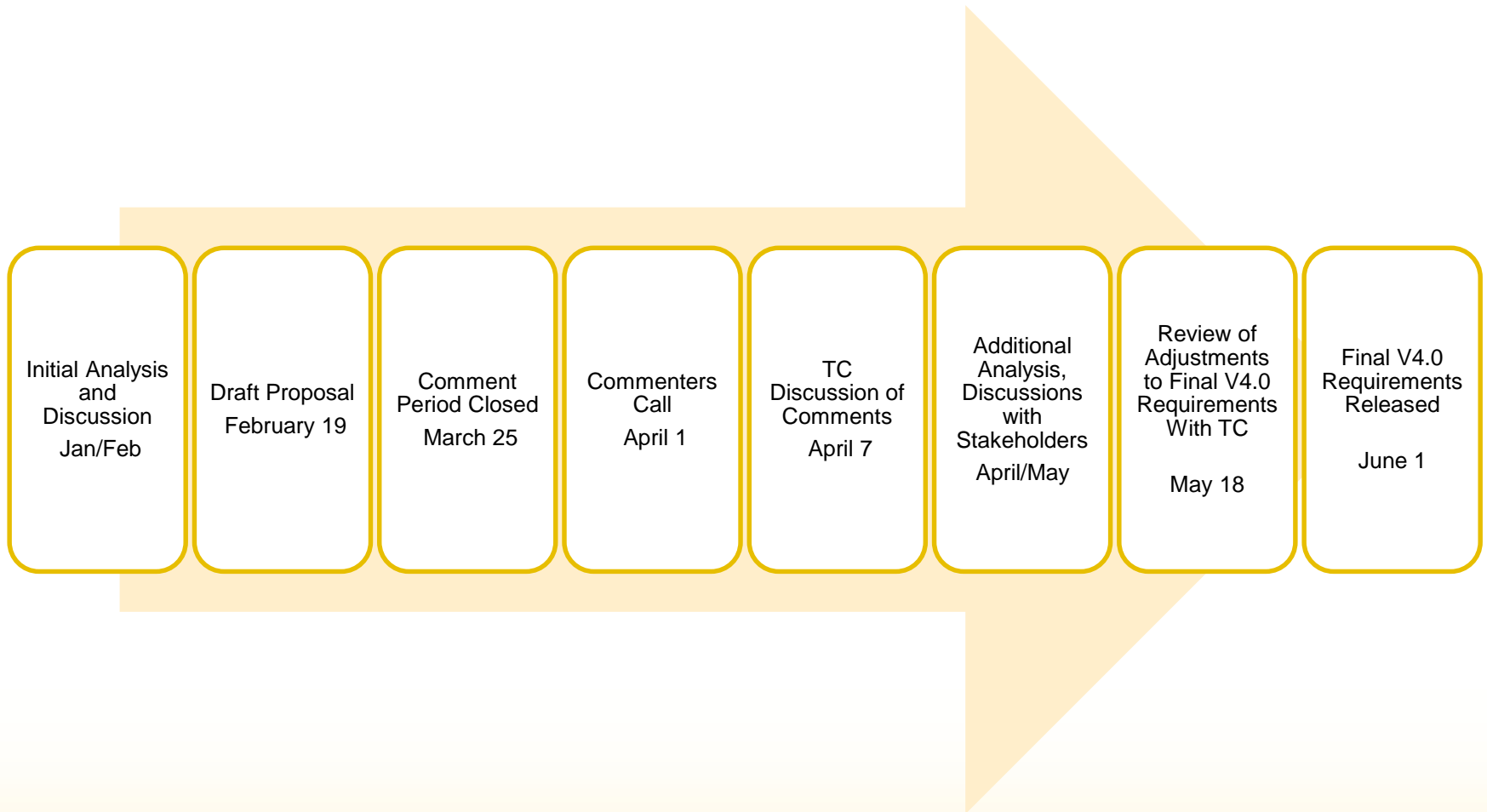
- Changes in the market
  - Evolving technology, newer products generally more efficient than older products
  - Evolution of specifications necessary to ensure relevancy
- Changes in ability to claim savings
  - Regulatory pressures
  - Also driven by market changes:
    - Performance of available product,
    - Assumed baselines for incumbent technology and sales of efficient products,
    - Changing building energy codes
- Desire to drive market transformation
  - Transformed market will achieve highest energy savings



## V4.0 Direction from DLC Members

- Want to significantly revise efficacy levels/push market towards adoption of most efficient products
- Length of time since last major efficacy revision is a concern
- Number of products on the QPL a concern
  - Are we identifying the best products? All quality products?
  - Product availability: likelihood that many products still represented on the QPL are no longer on the market.
- Target goal: push towards 50<sup>th</sup> percentile for standard, 95<sup>th</sup> percentile for premium, or higher

# V4.0 Development Overview



# Timeline

- Proposed:
  - Finalization early April 2016
  - Phase In:
    - Early June 2016 (cutoff for new applications under V3.1),
    - Early January 2017 (final delisting for products not meeting V4.0)
- Stakeholder Feedback
  - DLC changes requirements “too frequently”
  - Grace periods not long enough
  - Concerns regarding recovery of investment in product development, testing, and listing

# DLC SSL QPL Revision History

Major revisions to Technical Requirements:

<b>Revision</b>	<b>Develop Timeline</b>	<b>Final Announce.</b>	<b>Effective Date</b>	<b>Major Revisions</b>
TRT V1.6	Spring/Summer 2011	July 2011	April 2012	Modest Efficacy Revisions
TRT V2.0	Q1 2013	April 2013	Jan 2014	Significant Efficacy Revisions
TRT V3.0	2014-15	June 2015	March 2016	New structure; Specialty; Premium; Minor Efficacy Revisions
TRT V4.0	Q1-2 2016	June 2016	April 2017	Significant Efficacy Revisions

# Efficacy Level Revision History

Category	V1.5 (Sept 2010)	V1.6/1.7 (July 2011)	V2.0/2.1 (April 2013)	V3.0/3.1 (June 2015)	V4.0 (June 2016)
Outdoor, All	40-56	35-70	50-80	65-75	90-100
<i>Outdoor Area</i>	50	60	70	Low 65	<i>Low 90</i>
<i>Outdoor Fuel Pump</i>	56	70	80	Mid 70	<i>Mid 95</i>
<i>Outdoor Decorative</i>	40	40	60	High 75	<i>High 100</i>
REF/Display Case	35	45	50	50	80
Interior directional	30	40	45	45	65
Troffer	55	60-65	85	85	100
Linear Ambient	n/a	n/a	n/a	85	105
High-Bay/Low-Bay	60	70	80	80	105
Linear Replacement Lamps (bare lamp)	n/a	75/96	85/100	85/100	100/110

# Timeline

- Some categories not changed since 2013/2014, but some set as recently as 11/2015 (V3.1 Categories, Premium levels)
- Member efficiency programs need to see revisions to be able to run effective incentive programs
  - Market evolution, regulatory pressures
- V3.1 categories tied to performance of existing categories
  - Luminaires and lamps/retrofits have same luminaire-level requirements
- Premium: Optional for listing; members evolving use of classification
- Adjustment: Pushed back development release and phase-in
  - Allowed more time to discuss with commenters, determine solutions
  - Provided longer phase-in

# Revision: Timeline

Finalized V4.0 TRT  
Announcement:

**June 1, 2016**

Cutoff for Submission  
under V3.0/V3.1:

**August 31, 2016**

- Allows submission of products currently in process

New!

V4.0 Compliant  
Products Identified  
on QPL:

**January 2017**

- Allows programs to filter/sort/search as needed

Delisting of products  
not meeting V4.0:

**April 1, 2017**

# Efficacy Levels

- Proposed Standard Levels resulting in ~50% attrition
- Proposed Premium Levels targeted at top ~5% of products
- Jan/Feb analysis was projecting impacts of V3.0/V3.1 delisting
- Stakeholder Feedback
  - Overall attrition rates for standard; perspective on how disruptive this would be to market
  - Concern on how program would use Premium; question of whether investment in product development, testing, qualification would payback
  - Efficacy levels set at General Application, mismatched effects on Primary Uses
  - Technical Challenges in meeting proposed levels for specific types of products
    - “Architectural” Indoor products, “Historical/Decorative” Outdoor Products, High CRI/Low CCT products, Products with particular Optical Qualities



# Efficacy: Special Cases

- Sensitive to feedback about impact on specific product types
  - No desire to exclude high-quality products from QPL
  - Don't want to drive poor optics, high CCTs, or other effects
- Challenge: difficult to define “quality” parameters
- Challenge: lowering requirements for a whole category to accommodate specific product types allows more products to qualify that *don't* have the features we are trying to accommodate
  - How do we isolate just those products we need to accommodate?
- Challenge: creating additional categories is administratively burdensome

# Efficacy: Dealing with Special Cases

- Approach: DLC will consider “Allowances”
- How will it work?
  - Finalized general requirements based on impacts on all products across a category
  - Continue discussions about particular product types/features that would need accommodation
    - Request submission of specific proposals by **July 18**, discuss at Stakeholders Meeting and throughout the summer
  - IF performance feature can be objectively defined, include it in an “allowance table”, which would function similarly to tolerances

# Allowances: Example (for illustration only)

- Relatively simple examples:

<b>Feature</b>	<b>Allowance</b>
CRI ≥90	5 lm/W
CCT = 2700	5 lm/W

- Could be limited to indoor or outdoor products as needed

- More challenging requests:

<b>Product Type</b>	<b>Allowance</b>
“Non-planar” Troffers	5 lm/W
“Decorative Historical” Outdoor	10 lm/W
“Architectural” Linear Ambient	15 lm/W

- Challenge is in objectively defining these product types

# Potential Allowances

- Discussed or proposed to this point:
  - Color Properties (Low CCT, High CRI)
- Architectural Linear Ambient
- “Architectural” or “Non-planar” Troffers
- Decorative/Historical Outdoor
- Specific optical qualities
  - Features to reduce glare, pixelation
- Specifics of wall-wash (specific distributions to ensure even illuminance)
- Specifics of case lighting (small form factors, even luminance, appropriate illumination of merchandise)

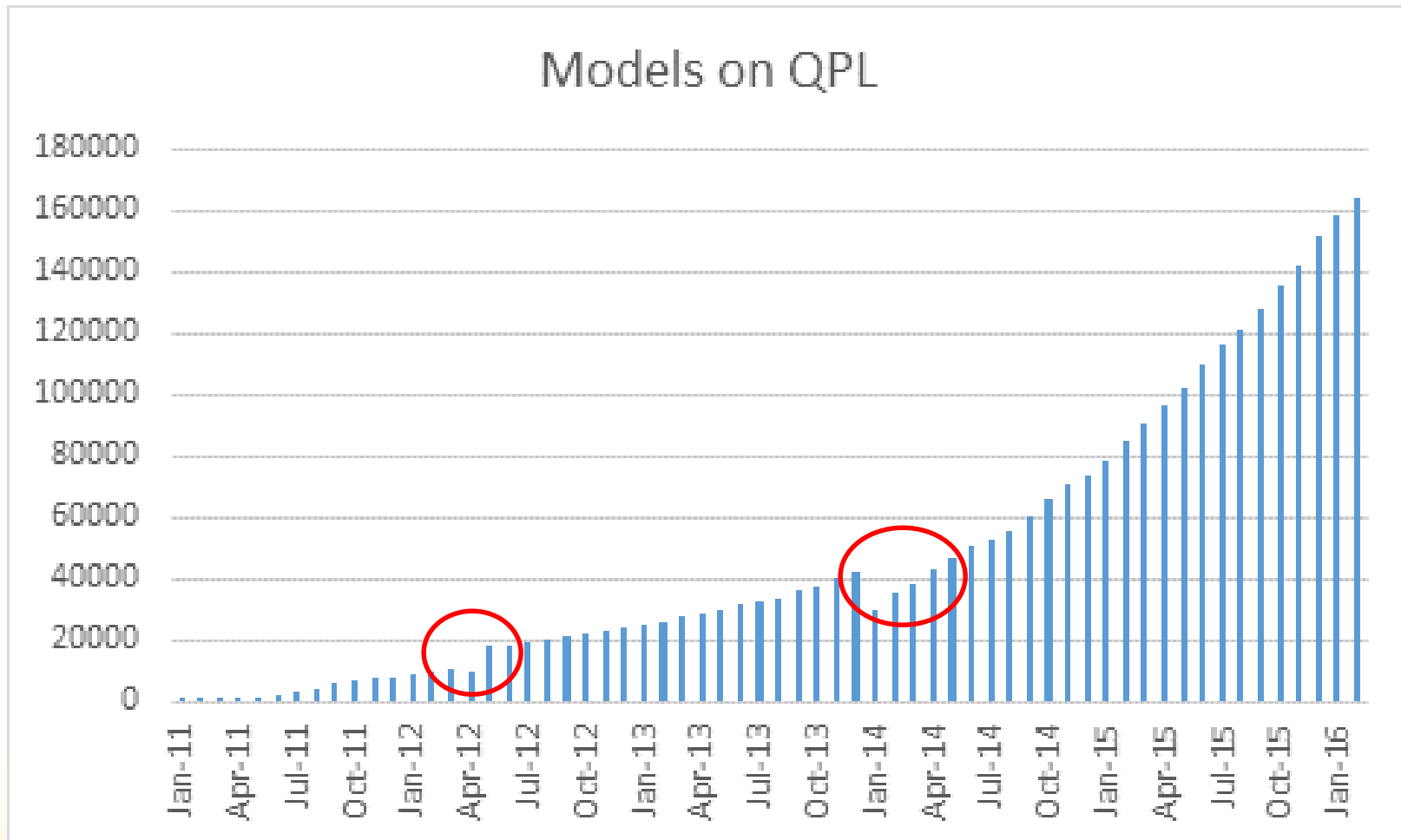
# Allowances: Next Steps

- Stakeholders must submit proposals for specific allowances by **July 18, 2016**.
  - Proposals must include a way to rigorously, objectively define products with need for specific allowances
    - Definitions: what does it mean to be “architectural”?
    - Performance Features: Metrics, Methods of Measurement
      - Reference test procedure(s) (standard(s)), and applicable accreditations are best
- Proposals will be reviewed by DLC and TC, worked to refine in small groups. Developed proposal will be distributed for Stakeholder review and comment.
- Discussed at 2016 Stakeholders Meeting, and in working group conference calls
  - Working groups will include interested Stakeholders, Members
  - Volunteer to be included in working groups on specific topics by contacting [info@designlight.org](mailto:info@designlight.org)
- Goal is to finalize any allowances to be implemented on same timeline as V4.0 transition

# Draft Technical Requirements V4.0 Analysis

- Key question: what level of performance?
  - Product Availability, based on published performance of products on QPL?
    - % of total qualified
    - Specific # of products available
- Additional Questions
  - Efficacy is by General Application, what are effects by Primary Use?
  - Effects by Manufacturer: are we disproportionately affecting certain segments of the industry?
- What are likely impacts on “quality”?
  - Color quality: CCT, CRI vs. efficacy
  - Optical quality/glare: difficult to objectively assess
- General Approach: conduct analyses on current QPL
  - Efficacy Distribution
  - Efficacy Over time (distribution vs. date qualified)
  - Efficacy vs. Color (availability; distribution by color)
  - Attrition rates, for general application, primary uses and by manufacturer
- Keep in mind:
  - 10-month transition period
  - Have seen “bounce back” as manufacturers adjust products and records for the new specifications

# Growth of QPL Over Time



# Standard Efficacy Levels

- Feedback often negative, but some support in follow-on conversations
  - Most objections involved questions about how industry can support non-incentive market/specification
  - Begs larger questions about the purposes of the DLC; current focus is on the needs of the DLC Member Programs
- Key question: what level?
  - Product Availability, based on published performance of products on QPL?
    - % of total qualified
    - Specific # of products available
- Analysis to support
  - Attrition rates, Effects by Age/Date Qualified, Effects by CCT



# Standard Efficacy Revisions

Category*	Current Efficacy Standard Level	Final Efficacy Standard Level	% of Products Passing New Level
Outdoor, Low	65	90	51.3%
Outdoor, Med	70	95	46.4%
Outdoor, High	75	100	44.8%
Interior Directional	45	65	48.7%
Display Case	50	80	52.8%
Troffer	85	100	46.8%
Linear Ambient	85	105	46.4%
High-Bay	80	105	51.5%
LRL	100	110	60.7%

\*Retrofit kit categories and luminaire-level testing for lamp categories will be the same as luminaires

# Premium Efficacy Levels

- Feedback indicated lots of industry concern
  - Questions about how Members Plan to use
  - Drives at value in seeking Premium qualification
- Key question: what level?
  - Product Availability, based on published performance of products on QPL?
    - % of total qualified
    - Specific # of products available
- Discussed at length: is top 5-10% appropriate target?  
How many products needed to effectively run program for Premium?

# Premium Efficacy Revisions

Category*	Current Efficacy Premium Level	Proposed Efficacy Premium Level	Final Efficacy Premium Level	Products Passing New Level (% , Count)
Outdoor, Low	100	115	110	8.28%
Outdoor, Med	105	120	115	8.88%
Outdoor, High	110	125	120	6.39%
Interior Directional	75	95	90	8.94%
Display Case	85	130	125	15.08%
Troffer	110	130	125	5.17%
Linear Ambient	110	140	130	3.61%
High-Bay	110	140	130	7.94%

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# Reminder: Timeline

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# Transition of Existing Products

- Products determined on meeting the V4.0 requirements based on testing provided with original qualification, as represented by “Measured” performance on the QPL.
- Products that meet V4.0 levels will transition automatically
  - No manufacture action will be required
- Products that do not meet V4.0 levels may be updated
- Fees consistent with previous transitions
  - Based on testing needed
- OEM products must update before private labelers

# Updating Products

- If product's performance better than when originally submitted: Submit updated data
  - Will require new LM-79 demonstrating improved efficacy
  - Will need additional information on what was changed in the product; additional testing may be needed
  - For example: if changed LED, heat sink, drivers, optics: new ISTMT and IES files also required
- If part of family meets the V4.0 requirements, but not all: Re-bracket family
  - Will need part of family that meets V4.0 identified
  - Will required new "worst-case" LM-79 on lowest-passing member
- Detailed [guidance](#) provided with V4.0 announcement.
- DLC will be seeking to develop simplified updating process in Policy Development.

# Other Efforts!

- Prioritization for Category Development
  - PL Lamps; Higher-output outdoor Lighting; Sign lights; Hazardous Env. Lights; Medium Screw-base HID replacement, etc.
  - Horticultural Spec: separate working group
- Prioritization for Policy Development
  - Rated data rules; Family Grouping changes; DC-powered systems, Microgrids; Color-Tuning; New standards; Flicker, etc.
- Requests for input will be out in advance of Stakeholders Meeting



Photography by Ryan Dravitz

**2016**

# STAKEHOLDER MEETING **August 2-3 • Denver, CO**

## **Panel Topics**

- Industry Collaboration
- DC/POE Lighting
- SSL/CALC Spec Development
- New Partnerships and Business Models of Lighting
- The Future of Lighting

## **Discussion Sessions**

1. SSL Spec Development: Hazardous Environment Lighting & Higher Lumen Output
2. SSL Policy Development: Color-Tuning
3. DC & POE Lighting
4. Allowances For Unique Applications
5. Controls Spec Development: 2017



# Thank You!

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