The DLC® drives efficient lighting by defining quality, facilitating thought leadership, and delivering tools and resources to the lighting market through open dialogue and collaboration.

Non-profit organization

Creates performance specifications

Provides tools, information, & expertise

Accelerates adoption of efficient commercial lighting
Stakeholder input is critical to the DLC
The DLC is supported by 74 Member programs throughout the U.S. and Canada.
Top Utility Use of DLC’s Hort Spec and QPL

Top North American Utilities with Horticultural Lighting Qualified Products (n=122)

- 50%: No DLC criteria
- 27%: DLC spec compliance
- 11%: DLC listing required
- 11%: No horticulture rebate

Data from Sceinergy
EISO CA Greenhouse Energy Profile Study

• Energy use in 4 Ontario CEA sub-sectors:
  – vegetables & fruits
  – flowers & potted plants
  – greenhouse cannabis
  – indoor cannabis

• Vegetable greenhouses are increasingly being lit to meet increasing demand.

• Existing vegetable greenhouses that are being lit are expected to be a significant driver of electricity growth over the next six years.

Indoor cannabis facilities use more almost 3.5 times more electricity per square foot than lit vegetable greenhouses
What are regulators doing in response?

• Statewide cannabis regulations - Photosynthetic Photon Efficacy (PPE) Lighting Power Density (LPD)
  – Illinois – LPD or DLC + PPE threshold
  – Massachusetts - LPD or DLC + PPE threshold
  – California - Title 24 rulemaking process is ongoing

• Building Codes
  – City of Denver – All indoor agriculture
    ▪ DLC or PPE thresholds (1.6 μmol/J (luminaires), or 1.9 μmol/J (lamps))

• National regulations
  – 2021 IECC (passed, waiting for validation)
    ▪ C405.4 Lighting for plant growth and maintenance (Mandatory). Not less than 95 percent of the permanently installed luminaires used for plant growth and maintenance shall have a photon efficiency of not less than 1.6 μmol/J as defined in accordance with ANSI/ASABE S640.
Hort Lighting QPL:

• Supports a variety of stakeholders with verified performance metrics

• Brings clarity to an industry that has lacked standardization

• Requires high-quality products:
  – 5 year warranty
  – Driver / fan lifetime: ≥50,000 hours
  – $Q_{90}$ ≥ 36,000 hours

My grow light is better than yours
### DLC Hort QPL helps Code Bodies and Utilities
- QPL ensures commercial products and licensees comply with lighting regulations
- Objective, 3rd party verified list limits staff need to be domain experts in horticultural lighting jargon and methods.
- Minimizes risk of misleading information or poor quality products

### DLC Hort QPL helps Growers
- Objective, 3rd party verified list to use for product selection
- Consistent, relevant product information allowing an “apples to apples” comparison
- All products are high efficacy (1.81+ µmol/J)
- All products certified for horticultural environments
- Eligible for utility rebates where available

### DLC Hort QPL helps Manufacturers
- 3rd party verification adds credibility to product performance
- Single technical specification and QPL that provides eligibility to the utility rebate market
- DLC qualified fixtures may be referenced or required by new horticultural energy codes
Horticultural lighting specification (V1.2)

- Single minimum photosynthetic photon efficacy threshold for any hort application
  - 1.9 μmol/J (-5%)

- Measurements and metrics based on IES and ASABE standards and metrics
  - DLC relies on standardized metrics and methods for predictions

https://www.designlights.org/horticultural-lighting/technical-requirements/
Qualified Products List (QPL)

- 69 products currently listed across 20 manufacturers
Trends in current product listings

- No systematic trend in PPE as a function of PPF
- Many available products that have comparable PPF to incumbent 600 W – 1000 W HID
- Average QPL PPE is 38% higher than best HPS
Average QPL PPE is slowly increasing

Qualified Horticulture Products as of February 19, 2020
(n=68)

- Average QPL PPE is slowly increasing
- Regulation PPE is 16% higher than threshold (excludes 16 products)
- Average PPF: 1053 µmol/s
- Threshold PPE: 1.9 µmol/J
- Regulation PPE: 2.2 µmol/J
Spectral composition

“Whitish” spectra is most common
- Increasing green content
  - On average, listed products contain 35% “green” content (500 – 600 nm)
- Only 4 listed products are “blurple”
- On average, listed products have 3% “far-red” content
Thank you!

Leora C. Radetsky
Senior Lighting Scientist
781-538-6425 x196
lradetsky@designlights.org
www.designlights.org