



California Energy Commission

DOCKETED

15-BSTD-01

TN 75270

MAR 05 2015

Residential Lighting Slides

Jon McHugh
McHugh Energy



Residential Lighting and Customer Choice

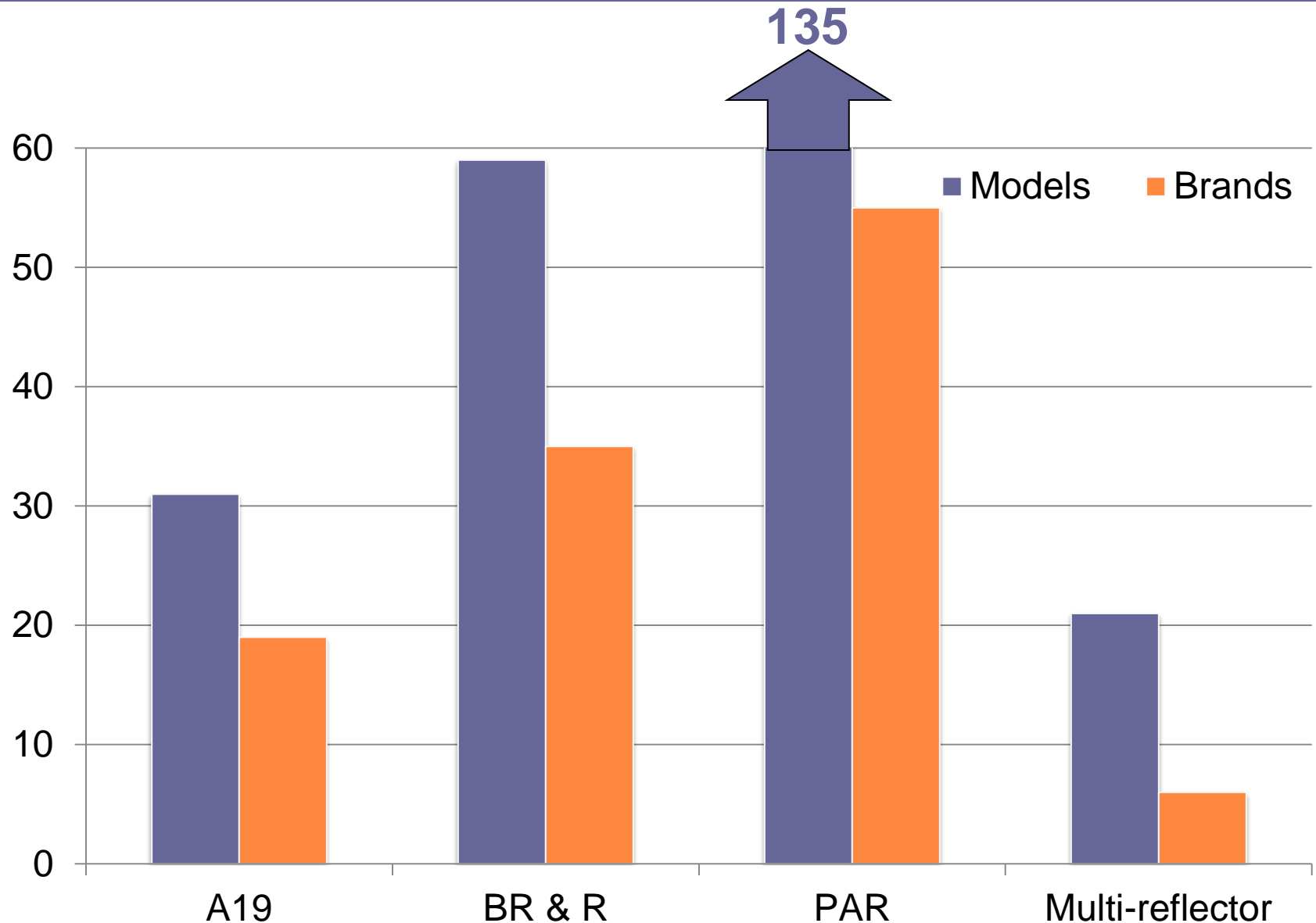
- ❑ 2016 T-24 proposal substantially increases the luminaires that are considered high efficacy
- ❑ Screw base fixtures and other traditional incandescent fixtures are allowed if they have a JA-8 compliant lamp
- ❑ Legacy high efficacy luminaires allowed w/o JA8 lamp
 - Pin based CFL or linear fluorescent w/ electronic ballasts
 - Pulse start metal halide and HPS lamps
 - Luminaires with GU-24 lamps
 - Hardwired induction HF generator and induction lamp
 - LED integral luminaires listed for outdoor locations
- ❑ Builder has light source choice limited by code.
- ❑ With replaceable lamps home owner has choice to replace poorly performing lamps

JA-8 Are There Enough Products?

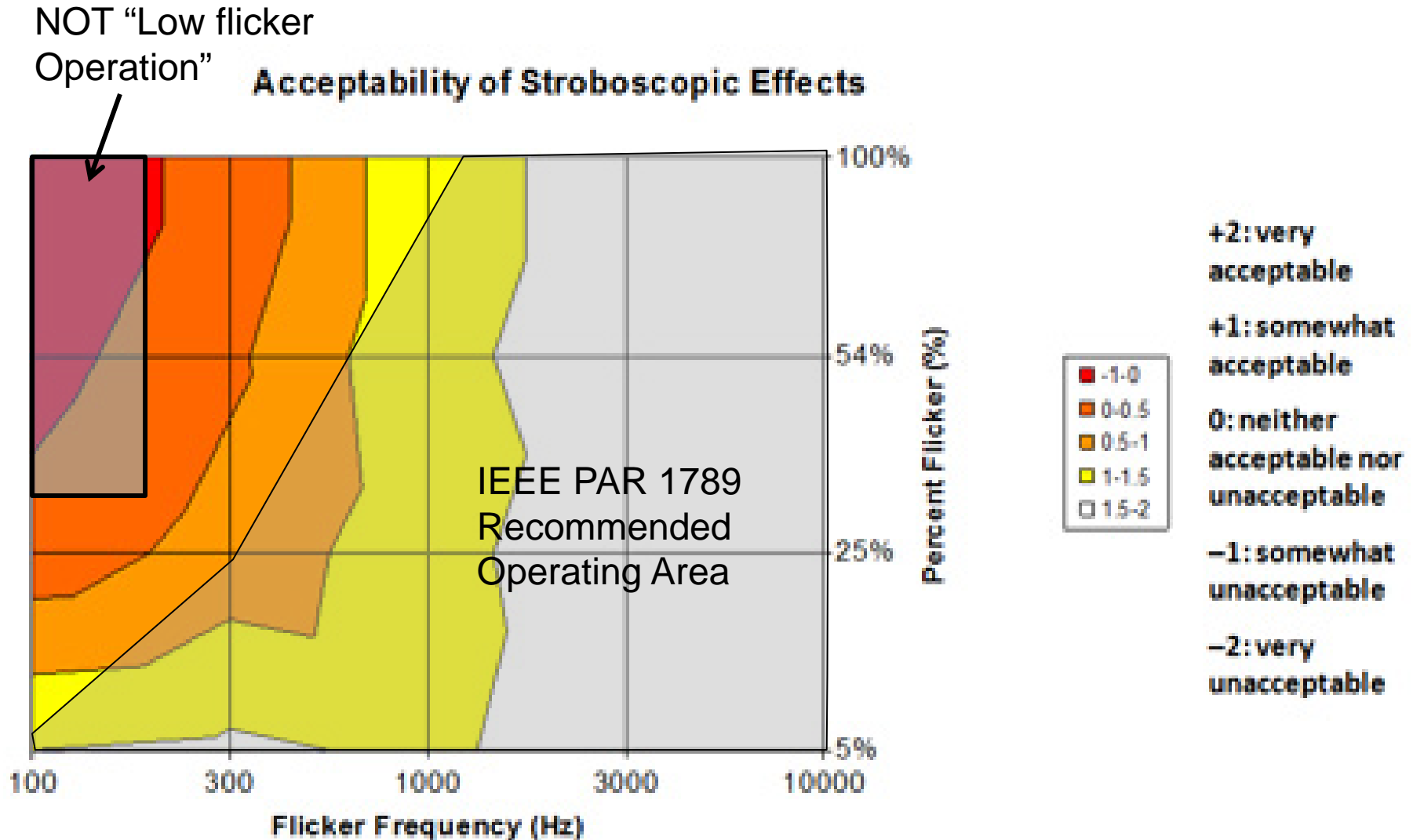
- ❑ 2013 T-24 JA8 Database – integral LED luminaires and LED light engines
- ❑ 7,494 Products in 2013 T-24 JA8 Database
 - 905 Light Engines
 - 6,589 Integrated Luminaires
 - 7 products with Luminous Efficacy < 45 Lm/W (low wattage)
 - 47 different manufacturers, 97 brands
- ❑ 2016 T-24 includes products in current JA8 database + integral lamps
 - All luminaires (except screw base downlights) with traditional incandescent bases can comply if they have a JA8 compliant lamp

ENERGY STAR Lamps

$\text{CRI} \geq 90$ and $\text{R9} \geq 50$; $\text{CCT} \leq 3,000\text{K}$

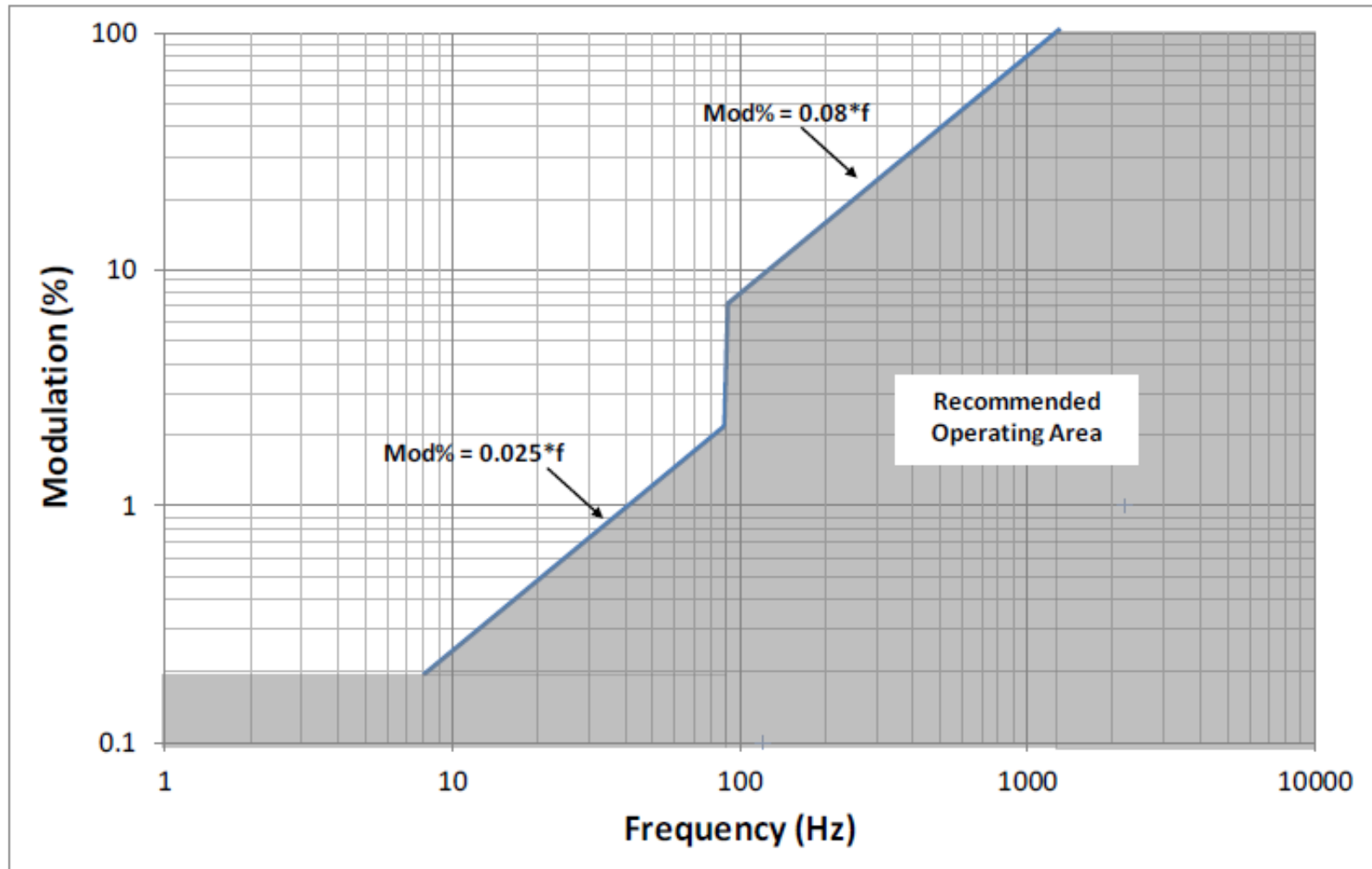


Acceptability of Flicker

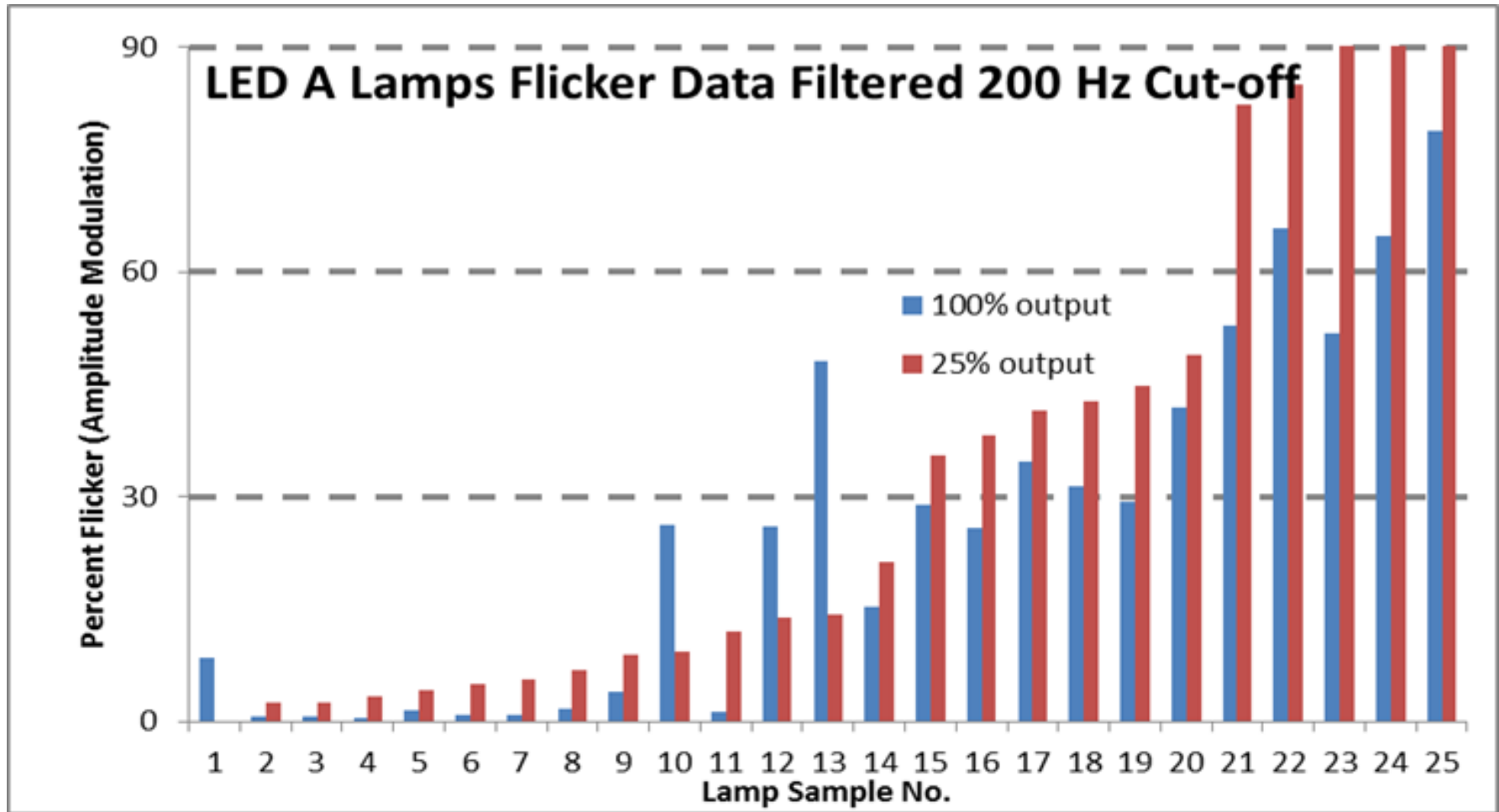


IEEE PAR 1789: Draft Recommended Practice for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers

7.18.1 Recommended practice summary



Half of Tested Lamps Pass Flicker Test



More recent tests by PNNL have found similar pattern – around half < 30% flicker