STAN WALERCZYK'S PERSPECTIVE ON TLEDs & THE BIG PICTURE

TLEDs

Politics Often Push These
Even If Not Really The Best Solution

TLEDs

- I did not like them in the past
- But pricing and ‘politics’ have recently made them a very good solution in many applications
- Will focus on plug & play ones, which can use existing ballasts and then after those ballasts fail
  - Direct wired to line voltage
  - Connected to a new ballast
  - Connected to a dedicated LED driver

PRICING

- Was $20+
- Typical $8
  - Which is very good
- Recently heard down to near $6
  - Which is even better
  - But some of these are only rated for 30,000 hours & 75 – 80 CRI
- Who knows what next year

REBATES

- As you probably know, after planning, making decisions and length of rebate, prices can decrease significantly

REBATES

- Here are just two TLED examples across the country
  - $7.50
    - Which can cover all or most of the parts cost
  - $15.00
    - Which usually covers all parts, labor and disposal costs
    - People are usually not considering anything else
      - Even in parabolic louvers, which the louvers should be eliminated

REBATES

- One rebate provider had up to a $195 rebate on LED troffers and troffer kits , based on significantly higher rebate for higher wattage and lumen even if did not need them
- In mid July that rebate was slashed by up to over 80%, which is max $36 and often $25
- So now lighting vendors and end-customers are focusing on TLEDs, even if no rebate

TITLE 24

- Maybe the California Energy Commission and its lighting consultant focused on automatic demand reduction, daylight harvesting, bi-level lighting and controls for them and did not see the development of TLEDs
- Both TLEDs and reduced wattage T8s with existing ballasts do not trigger Title 24
  - Which saves a lot of time and money
  - Full Title 24 procedure can often add 20% to project cost without necessarily saving any additional significant energy
- Since other energy codes may copy Title 24, be aware

CALIFORNIA PREVAILING WAGES

- August 2015 the International Brotherhood of Electrical Workers (IBEW) cancelled Light Fixture Maintenance
  - Was main labor category for lighting retrofits for California public sector and union projects
  - Was often $50/hour to end-customer
- Since then have to use Inside Wireman
  - In some counties can be $140/hour to end-customer
  - This can kill many lighting retrofit projects
  - But plug & play TLEDs are fast to install, so often only cost effective solution
- Watch out in other states

THE BIG PICTURE

INCLUDE OTHER OPTIONS

- My lighting retrofit seminars and webinars across the country and some of my articles – white papers provide these options for linear fluorescent fixtures, including
  - Highest lumen fluorescent T8s & high performance ballasts
  - Extra long life fluorescent T8s & high performance ballasts
  - TLEDs (mainly plug & play keeping existing ballasts)
  - LED lightbars
  - LED troffer kits
  - LED troffers
  - Fluorescent & LED suspended indirect/direct fixtures
- Sorry, no time to dive into those comparisons now

DIMINISHING RETURNS

- Excluding any remaining low hanging fruit, we can still save about 60% in lighting retrofits, but electric bill reductions are a fraction of previous retrofits and LED troffer kits cost more than legacy products
- Following is a table based on last retrofit consuming 54W and just showing troffer kits
  - But many retrofits in the last 8 – 12 years only consume 39 – 48W, which is a bigger challenge
- In general low labor and parts cost plug & play TLEDs may often be better

DIMINISHING RETURNS

DIMINISHING RETURNS												
time frame	parts	watts	WSF (8' x 10' grid)	watt re-duction	annual hours	KWH	annual electric bill when installed	existing annual electric bill at time of retrofit	annual electric savings	installed cost after rebate	payback in years (just elec-tricity)	notes
original	4 F34T12s & 2 energy saving mag ballasts	144	1.8		3000	$0.12	$51.84					owned space where lights turned off when occupant leaves
first retrofit 8 years ago	2 F32T8s, reflector & .87 BF EE elect. ballast	54	0.7	63%	3000	$0.15	$24.30	$64.80	$40.50	$50.00	1.2	
current retrofit	LED troffer kit	20	0.3	63%	3000	$0.18	$10.80	$29.16	$18.36	$110.00	6.0	also replaced fluorescent task light with tunable LED one
future retrofit in 8 years	LED, OLED, laser diode, quantum dot, nanotube, etc. troffer kit	7.4	0.1	63%	3000	$0.15	$3.33	$9.00	$5.67	$90.00	15.9	

LED WATTAGE IS USUALLY SO LOW THAT CONTROLS ARE NO LONGER COST EFFECTIVE SAVING ENERGY

- Lighting only — 2.9 year payback
- Basic sensor only — 4.5 year payback
- Lighting & basic sensor — 3.7 year payback
  - **Sensor with 28W lighting — 29 year payback (probably infinite)**
- Lighting & advanced controls — 4.1 year payback
  - **Controls with 28W lighting — 29 year payback (probably infinite)**
- Office workers would probably manually turn off lighting frequently or at least some of the time, which would make payback for controls even worse
- Many end-customers want less than a 3 year payback
- **But various energy codes still mandate controls**

MAYBE IF CUSTOMERS ACCEPT AT LEAST ONE OF THESE, MAYBE BASIC LONG RETROFIT PAYBACKS MAY WORK

- LEED
  - Leadership in Energy & Environmental Design
- Zero Net Energy
  - Zero Net Energy
- EUI
  - Energy Use Intensity

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- **Thanks**

Except for appendix

APPENDIX

BIG BROTHERS

- Do you think we would be better off, save more energy and provide better lighting retrofits without the following?
  - Energy Codes
    - Especially ivory tower organizations, which accept a lot of information from control and other lobbyists
  - DesignLights Consortium (DLC)
    - Does not approve interior products, other than hibays, over 5000K, even if can be used below
      - Even fixed 6500K can be very beneficial for Human Centric Lighting
  - Prevailing wage developers
    - At least some of them