



The Millennials have landed.



Session: 092914

Date: Thursday, September 27, 2016

Time: 2:00pm – 3:00pm



## *A Bright Opportunity: Is LED Lighting Here or Hype?*

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## Question to ponder...

If there is a better way to do something are you willing to consider it?



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What we believe

There's a way to do it better  
– **find it.**

Thomas Edison

## We get your mission!

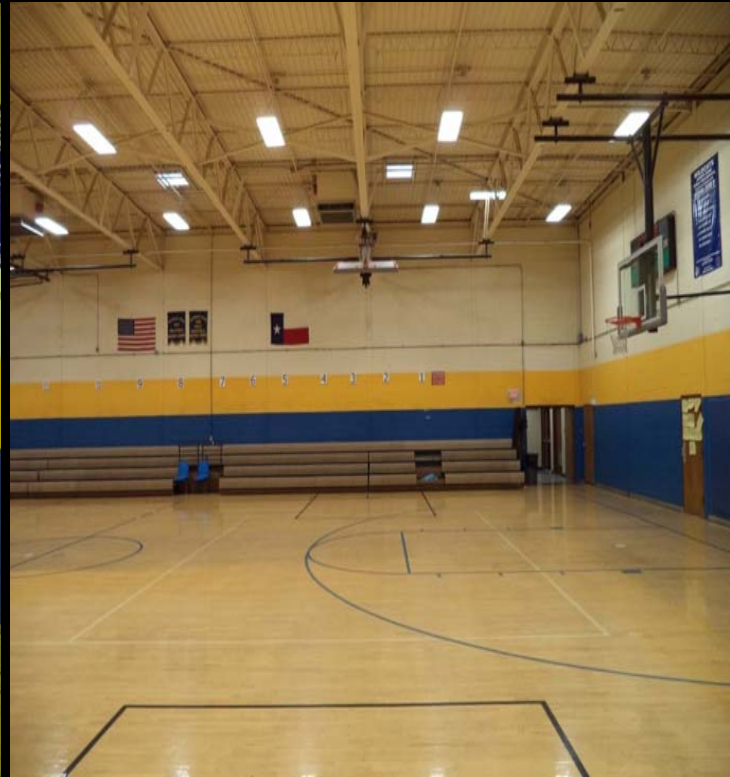
- Educate students in a comfortable environment
- Do it efficiently with taxpayer dollars

LED lighting might make you better at both

# LED: The Promise

- Energy Savings
- Longer Life
- Better Light Quality







# LED: The Desire

- So, why now?
- HCC's experience



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# LED: The Reality

LED is not a commodity yet, but people want to treat it like one.

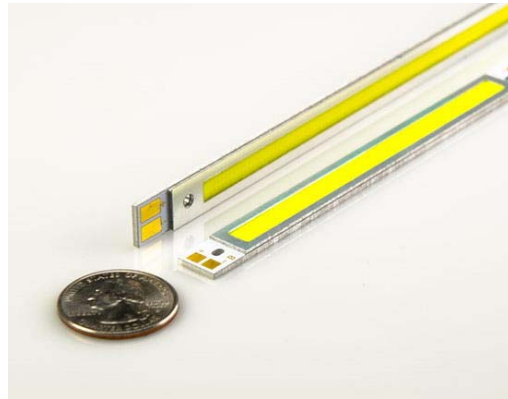
- Many choices for types of LEDs for fluorescent retrofits
- Vast quality disparity
- Significant differences in “Warranties”
- Prices are all over the map and are a moving target
- Lots of ways to “Buy” it.

# LED: The Reality

Different types of LED retrofits

- Chip on Board
- TLED – Plug and Play
  - Ballast dependent
- TLED – Direct Wire
  - No ballast needed
- TLED – Combination
  - Can be used with or without a ballast

# Chip on Board



**BBIER** Professional LED Lighting Manufacturing  
Let's light up the world!

**40W**



CE ISO9001 RoHS EPISTAR

A product advertisement for BBIER LED lighting. The ad features a green header with the company name and slogan. A red starburst graphic highlights the power rating of 40W. The main image shows a long, thin LED strip light with a power supply and wiring. Below the main image are several smaller images of different LED strip light models. At the bottom, there are several certification logos including CE, ISO9001, RoHS, and EPISTAR.





## Tubular LEDs

### 200D Series LED Tubes 120 LPW



# LED: The Reality

All LEDs are NOT created equal

- Disparity in quality
  - Differences in efficiency and interaction w/other components
    - Impacts energy use and potential savings
    - “DLC” matters
  - Light output
    - Lumens per Watt (LPW) 100 to 130
    - Enables or prevents “De-lamping” to lower initial costs or raise savings
  - Lamp Construction
    - All over the map. “recent” High profile recalls
    - You get what you pay for
  - Warranty
    - Length of life
    - What constitutes a “failure”...

## The “bid/proposal” process can be a challenge!

- To get apples to apples, there needs to be a tight specification
- To get a clean scope of work, there needs to be thorough survey and design
- To get that, someone needs to audit and understand what is there AND what will meet the design criteria
- To design properly, true lighting performance has to be known
- Once that is all done, proposals have to meet the specification
- Herein lies a common problem...

## With LED, here's what can occur that enables this

- Stated/promoted performance
  - Stamped on the product
  - In the “cut sheets”
  - In the calculations
- Measured/certified performance
  - Design Lighting Consortium (DLC)
  - Tests products for wattage, lumen output, beam angle, etc.
  - 250 manufacturers, 18,000 products, 82 members
  - Qualified Products List (QPL)

## The tale of three lamps and two ballasts

### Stated wattage

### Actual measured wattage

8 watt lamp #1 and ballast #1	14.6 watts
8 watt lamp #1 with ballast #2	9.5 watts
8.5 watt lamp #2 with ballast #1	13.7 watts
8.5 watt lamp #2 with ballast #2	11.6 watts
9 watt lamp #3 with ballast #1	15.8 watts
9 watt lamp #3 with ballast #2	20 watts

## Other things to understand

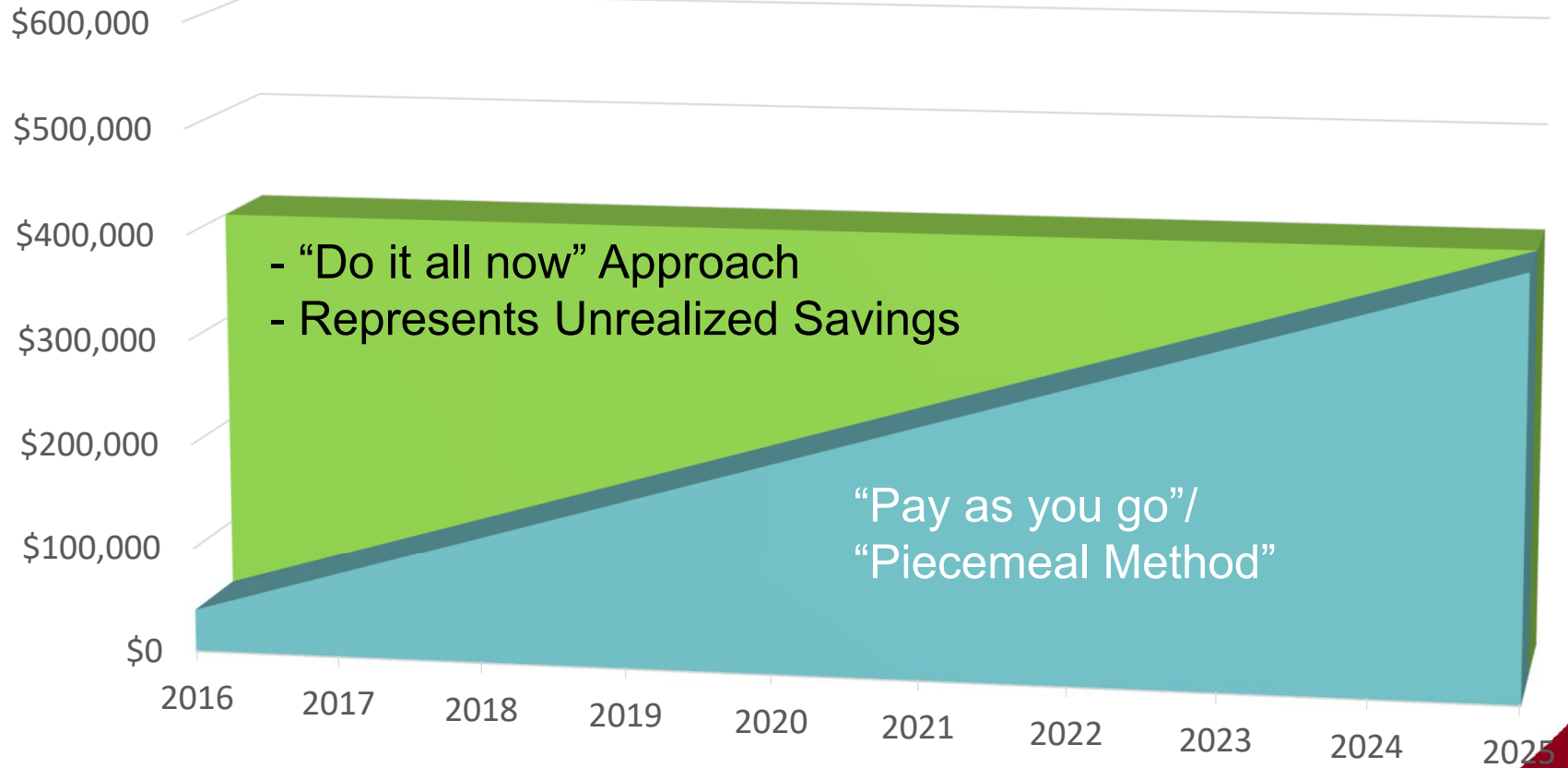
- Product Warranty
  - Know the difference
  - Years, % degradation, switching cycles, single diode, etc....
- Lumens per watt
  - Stated vs DLC
- Product History
  - How old is product
  - Success history

## LED: Solution

Look at LEDs as a solution, not just a light source

- Pick the “right” lamps
  - Work with an expert
- Develop the cash flow model
  - “Pay as you go” or “Do it all now”
- Funding

### Potential Annual Savings



- "Do it all now" Approach  
- Represents Unrealized Savings

"Pay as you go" /  
"Piecemeal Method"



### Potential Annual Savings

\$600,000  
\$500,000  
\$400,000  
\$300,000  
\$200,000  
\$100,000  
\$0

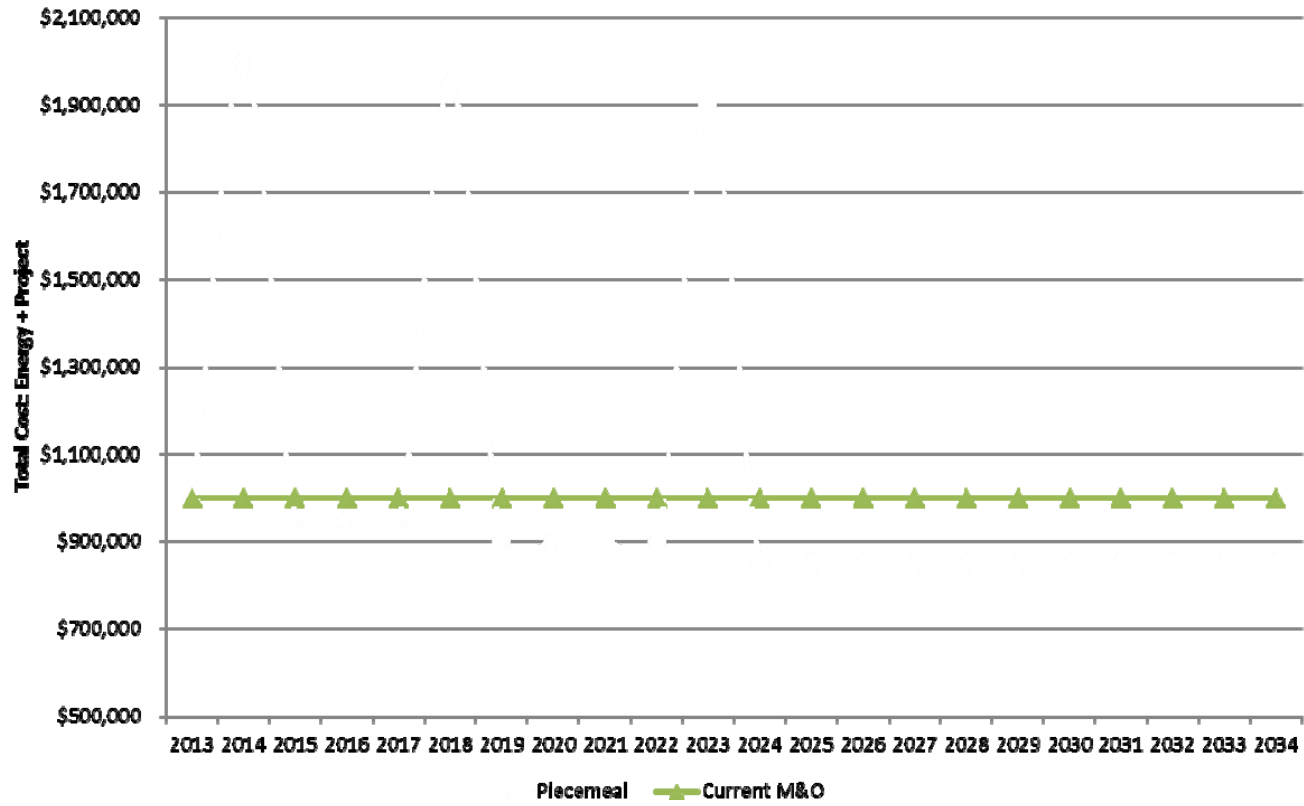
2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

Additional Savings from "Do it all now"  
\$1,800,000

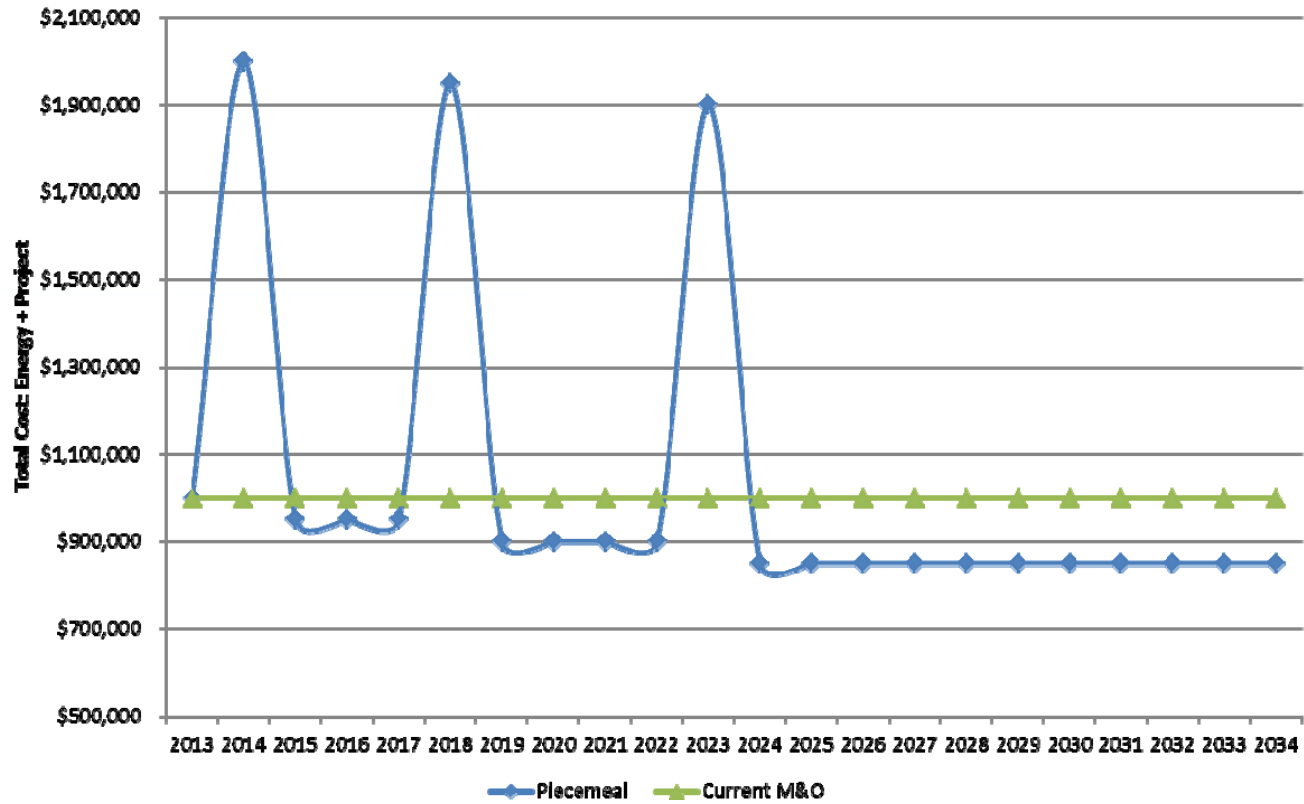
Piecemeal Approach  
\$2,200,000 Achieved Savings



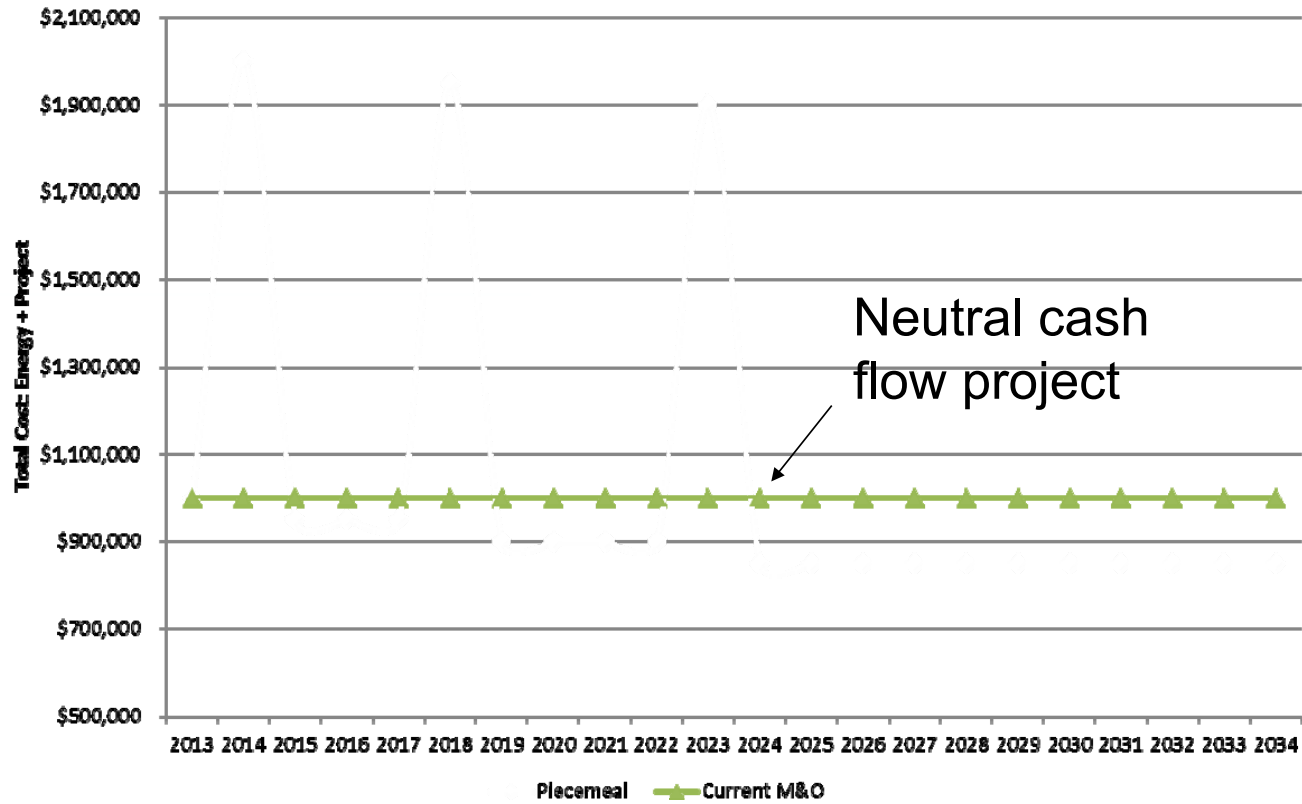
# Budget Certainty



# Budget Certainty



# Budget Certainty





## LED Lighting Business Case

### Potential benefits of LED lighting systems

(depending on product)

1. +- 50,000 total burn hours per lamp on most lamps
  2. Up to 10-year warranty on all lamps
  3. Lighting quality improvement
  4. 50%+ more efficient
  5. No more ballasts to replace
- ✓ **Safety and security of building exteriors**

# LED: The Future

What if...?

- we reduced every campus electricity usage by 10%-15%
  - Or tonnage off plant
  - Or kW load
- every building “looked better”
- what if you didn’t have to constantly change ballasts and lamps?

# LED: The Future

- There is a better way.
- Other Institutions are doing this.
- The results can be real.

“If you always do what you’ve always done...  
You’ll always get what you already have”!

**What will the Millennials think?**





# Seminar Evaluation

*We hope you enjoyed this session...*

*Please take a moment to complete the evaluation form.*

*Thank you!*

