Lighting Tomorrow’s Campus

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Overview

• Current Conditions
• Paradigm Shift
• Our Goals
Current Conditions

- Building Vintage
- Outdated Design Philosophy
  - Retrofit
  - New Construction
- New & Emerging Technology
  - Challenges
    - Lack of education
    - Price Point
  - Opportunities
    - Product improvement
    - New campus standards
Current Conditions

• Classrooms
  – Power Density:
    • ~1.5 W/ft²
  – Light Quality
    • 70-80 CRI
    • 3500K, 4100K
  – Controls
    • Few and far between

• Auxiliaries
  – Housing
    • Lack of controls
    • Student Safety
    • Food Service
  – Athletics
    • Simple controls
    • TV-Photography
  – Associated Students
    • Long hours
    • Retail
Current Conditions

- Parking Lots/Structures
  - Power Density
    - Too low
    - Too high
  - Light Quality
    - 22-60 CRI
    - Color Temp
      - HPS – 2100K
      - MH – 4000K+
  - Distribution
    - Recommended Minimum
    - Uniformity ratios
  - Controls…..what controls?
Paradigm Shift

- Parking Lots
  - The Sources
    - LED
    - Induction
    - E-HID
  - Light Quality
    - 70+ CRI
    - 5000K+
    - Increased uniformity
  - Controls
    - Occupancy sensors
    - Wireless mesh networks (curfew and cops)
Paradigm Shift

• Parking Structures
  – The Sources
    • LED
    • Induction
    • Fluorescent
  – Light Quality
    • Security Cameras
    • Qualitative Feedback
  – Controls
    • Occupancy sensors
    • Daylighting
    • Wireless mesh networks (curfew and cops)
CSU Goals

• Our Policy
  – Design 15% below T24 2008
  – Energy Efficiency – 1st in the loading order
  – Good stewards of state funds

• Track Record
  – EUI reductions:
    • -50% since 73/74
    • -10% since 99/00

• Goals
  – Systemwide reductions:
    • 1990 GHG by 2020
    • Carbon Neutrality - 2030
CSU Goals

- **The Potential**
  - Classrooms/Offices/Labs
    - Size: 15M ft²
    - Today: 53M kWh/yr
    - Savings: 10M kWh/yr
  - Libraries
    - Size: 12M ft²
    - Today: 40M kWh/yr
    - Savings: 9M kWh/yr
  - Parking Facilities
    - Size: 17M ft²
    - Today: 60M kWh/yr
    - Savings: 20M kWh/yr

- **Total Costs & Savings**
  - ~$42M
  - Leverages ~$9.5M
  - Saves
    - ~$4.5M
    - ~100 jobs
    - ~12,000 tonnes CO₂
CSU Goals

• From Here to There
  • Identify Opportunity
  • Best Practice Lighting Design
    • ET Groups
    • CLTC
  • Life Cycle Cost/Benefit Analysis
  • Utility Partnerships
    • Audit Resources
    • Incentives
  • Strategic Procurement (Buy in Bulk!!!
Summary

• Challenges & Opportunities
• The Mechanism
  – Best Practices
  – Strategic Procurement
• The Result
  – Savings, Jobs
  – Sustainable Educational Facilities

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