Today’s Webinar
LED Lighting vs. Fluorescents

Opportunities for Upgrading Common Interior Applications

Presented in Partnership with Carolina Consulting Group, Inc.
Thank You to Our Sponsors

- Land of Sky Regional Council
- NCDENR
- Division of Air Quality
- DEACS - Utility Savings Initiative
- EPA
- Waste Reduction Partners
Webinar Questions & Instructions

- **Technical Difficulties:** 888-353-3094 Onstream Media
- Lose Audio? refresh browser or log out and back in
- **How to Ask Questions:** Type and submit in the Q&A Window – to be addressed at the end of the presentations
- **Evaluation Survey at Conclusion:** Participant will be auto-directed to the survey and resource page.
- **Resource Slides and Recording:** Follow-up e-mail
Featured Presenter:
Dan Mull, PE, PEM, CEM
President, Carolina Consulting Group, Inc.

- Energy Management consultant with Carolina Consulting Group
- Actively involved in energy management for 40 years
- Worked in utility industry with then Carolina Power & Light
- Extensive experience in heavy industry and commercial properties as well assisting government agencies, colleges/universities, trade associations and utilities
- Director of North Carolina State University’s Energy Management Diploma Program
- Teaches extensively on Energy Management and has conducted over 450 energy audits in more than 20 countries
- Executive Director of Institute for Energy Professionals (PEM)
- PE in three states, Certified Energy Manager
- Mechanical Engineering Degree from Virginia Tech.
Carbon Dioxide Emissions (Million Metric Tons) from Commercial Buildings **Electricity** Use in the U.S

<table>
<thead>
<tr>
<th>Energy Use</th>
<th>Total CO2</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>211.9</td>
<td>20.4%</td>
</tr>
<tr>
<td>Space Heating</td>
<td>160.7</td>
<td>15.5%</td>
</tr>
<tr>
<td>Space Cooling</td>
<td>151.3</td>
<td>14.6%</td>
</tr>
<tr>
<td>Ventilation</td>
<td>95.2</td>
<td>9.2%</td>
</tr>
<tr>
<td>Refrigeration</td>
<td>69.1</td>
<td>6.7%</td>
</tr>
<tr>
<td>Electronics</td>
<td>46.4</td>
<td>4.5%</td>
</tr>
<tr>
<td>Water Heating</td>
<td>41.4</td>
<td>4.0%</td>
</tr>
<tr>
<td>Computers</td>
<td>37.7</td>
<td>3.6%</td>
</tr>
<tr>
<td>Cooking</td>
<td>13.6</td>
<td>1.3%</td>
</tr>
<tr>
<td>Other (4)</td>
<td>151.5</td>
<td>14.6%</td>
</tr>
</tbody>
</table>

Source: 2011 EIA Building Energy data book
Environmental Improvements of Upgrades

Example 2 lamp Fluorescent fixture 74 watts vs. 49W LED

Assumptions

- Office building 12 hours per day
- 100 light fixtures

<table>
<thead>
<tr>
<th></th>
<th>2 x4 fluor</th>
<th>2 x4 LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Hours</td>
<td>4,380</td>
<td>4,380</td>
</tr>
<tr>
<td>Electricity (kWh/yr)</td>
<td>32,412</td>
<td>21,462</td>
</tr>
<tr>
<td>CO$_2$e Emissions (tons/yr)</td>
<td>17.5</td>
<td>11.6</td>
</tr>
<tr>
<td>NO$_x$ (tons/yr)</td>
<td>0.013</td>
<td>0.009</td>
</tr>
<tr>
<td>SO$_2$ (tons/yr)</td>
<td>0.033</td>
<td>0.02</td>
</tr>
</tbody>
</table>

- Energy savings = 10,950 kWh
- Equivalent to annual energy use of roughly one home (US)
Pollution Conversion factors
Electricity to Greenhouse Gas (GHG)

* 1000 kWh = 1 MWh = 1,079 Pounds CO$_2$e Greenhouse Gas

* 1 ton CO$_2$e GHG = 1,853 kWh
  1 ton GHG is roughly equivalent of operating 2-100 watt lamps for a year
Financial Incentives
in North Carolina
Incentives and Savings: Duke Energy and Duke Energy Progress

- **Example:** if you have 100 49-watt LEDs replacing 74-watt Fluorescents, 4380 hours/year, $.085/kWh, annual savings = $931

**Duke Energy Smart Saver Prescriptive Incentive:**
- Fluorescent fixture replacement with LED
- $40.00 Per fixture incentive

**Duke Energy/Progress Energy Efficiency For Business**
- **Prescriptive Incentive:**
  - $0.35/watt reduction (fixture or lamp replacement)
  - This example = $8.75 Per Fixture
Financial Incentives in North Carolina

- Duke Energy assistance: 866-380-9580

- Duke Energy Progress assistance: 866-326-6059


- Other Financial Incentives by State: DSIRE [www.dsireusa.org](http://www.dsireusa.org)
Quick Evaluation

• Close Your Webinar Session
  o **Click** on the **OPTIONS** tab on the menu bar
  o Select **CLOSE SESSION**.
• You will be automatically directed to our survey.

Special Thanks:
Dan Mull, Carolina Consulting Group, Inc.
Thanks for Attending

For Energy Efficiency Technical Assistance in North Carolina
Contact: www.WasteReductionPartners.org

Public Buildings Energy Efficiency Outreach
Utility Savings Initiative
www.NCEnvironmentalAssistance.org