Clemson University FY2013
Go Green MB&A Presentation

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Developing a Peer Group for Clemson

Go-Green Peer Institutions
- George Mason University
- Nova Southeastern University
- Texas A&M University
- The University of Alabama (Tuscaloosa)
- The University of Tennessee - Knoxville
- University of Arkansas
- University of Vermont
- Virginia Commonwealth University

Peer Group Based On:
- Size
- Technical Complexity
- Climate Zone
- Percent of Residential Students
### Simplifying GHG Sources into Scopes

*All expressed as metric tons of carbon dioxide equivalent*

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<td>Transmission &amp; Distribution Losses</td>
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Total FY13 Gross Emissions: 160,243 MTCDE

Utilities represent nearly 70% of Clemson’s emissions.
Similar Types of Buildings Relative to Peers

*Higher tech rating typically means higher consumption levels*

- **Tech Rating**
  - Higher Mechanical Complexity = More Energy Intensive
  - Larger buildings = More Energy Efficient

- **Average Size of Building**
  - Peer Avg.: 39,472
  - Larger buildings = More Energy Efficient
Physical Profile in Peer Context

Older buildings, historically lower levels of reinvestment

% of Space by Renovation Age Category

- Peers: 18% (Under 10 Years), 27% (10 to 25 Years), 29% (25 to 50 Years), 27% (Over 50 Years)
- Clemson: 31% (Under 10 Years), 34% (10 to 25 Years), 27% (25 to 50 Years), 10% (Over 50 Years)

Total Project Spending $/GSF

- Peer Averages (Clemson University E&E): 5.0
- Clemson University E&E: 5.0

Older Buildings = Higher Energy Consumption

Investing Below Peer Levels = Still Opportunities to Capitalize on
Carbon Mitigation to Date
Measuring the Carbon Mitigation Hierarchy

Tracking progress against neutrality and interim targets

Carbon Mitigation Portfolios:

1. AVOIDANCE
   - Preventing additional activities before they start – a key indicator of future performance
   - **Example:** Increasing space utilization instead of building or acquiring new space

2. REDUCE / ACTIVITY
   - Reducing an existing level of activity
   - **Example:** Fewer BTUs consumed; fewer miles traveled

3. REPLACE / INTENSITY
   - Lessening the carbon intensity of activities
   - **Example:** Fuel switching (coal > natural gas; introducing attributed renewables); commuting mode mix (drive alone > carpool)

4. OFFSETS
   - Utilizing carbon offsets to neutralize “unavoidable” GHGs
   - **Example:** RECs; sequestration; retail offsets
Activity & Intensity: By Source

Reductions in utility activity balanced by growth in most other sources
Avoidance at the Top of Hierarchy

Without strong space utilization, GHG reduction opportunities are diminished
Energy Consumption Falling Since FY07

Reduction in utilities is a highlight of Clemson’s profile

Activity and Intensity Portfolios
2007-2013

Total Energy Consumption

Peer Averages
© Sightlines 2001-2013

Clemson University

Clemson Avg.: 154,786

Peer Avg.: 126,305

0 20,000 40,000 60,000 80,000 100,000 120,000 140,000 160,000 180,000
2007 2008 2009 2010 2011 2012 2013

BTU/GSF

Stationary Combustion
Purchased Electricity
Utilities In Context of Institutional Growth

Energy savings have not been evenly distributed between fossil and electric
Intensity: Greening Campus Activities

Fuel switching has realigned stationary fuel carbon intensity with peers
Intensity: Greening Campus Activities

Regional utility providers reducing carbon intensity of electricity generation

Activity and Intensity Portfolios 2007-2013

- Utilities
- Student Commuting
- Employee Commuting
- Other Transport
- Other

-4% -2% 0% 2% 4% 6% 8% 10% 12%

eGRID Carbon Intensity: Clemson and Peer Regions

- Texas
- Virginia/Carolina
- Tennessee Valley
- Georgia/Alabama

- MTCDE/1M kWh

- eGRID 2007
- eGRID 2010
- eGRID 2012
Campus Utility Emissions Still Above Peers

Emissions decreasing at a faster rate than peers

Total Utility Emissions (per 1,000 GSF)

- **Peers**
- **Clemson**

Decreased 18%
Air Travel Represents Nearly 15% of all GHGs

Air travel consistently higher than peers and growing
Waste Among Most Visible Sources

Waste at highest level since FY10, corresponds to increased FTEs

- Total Waste Stream* Relative to Campus Population
- Landfill vs. Diversion Rates

Diversion Rates Continue to Grow Since FY07

*C&D waste excluded from totals
Waste Generation on Par with Peers

Diverting similar amounts to peers, even though more diversion types
Evaluating Progress
Larger Reductions Than Many Peers

Fuel switching and other external factors driving reductions to date

Net Change in GHGs 2007-2013

Peer Average: +7%

Distribution of Reductions by Portfolio

Ordered by Density Factor
Normalized Performance Over Time

*Clemson continues to decrease in both metrics*
Despite Progress GHGs Above Peer Levels

Magnitude of Scope 3 sources driving Clemson above peers
Major Takeaways
Major Takeaways From Today

Clemson has Avoided Nearly 10% of its Baseline GHGs Through Increased Space Utilization

Older Facilities and Historically Lower Funding Levels Likely Leading to Higher Energy Consumption Levels Than Peers

Recent Investments in Campus Facilities have Netted Energy and Carbon Savings Despite Campus Growth in GSF and Population

Scope 3 Sources Large Contributors to Clemson’s Profile Due to Higher Air Travel Levels and Growing Student Commuter Population
Comments & Questions