sightlines | sustainability solutions

The University of Alabama

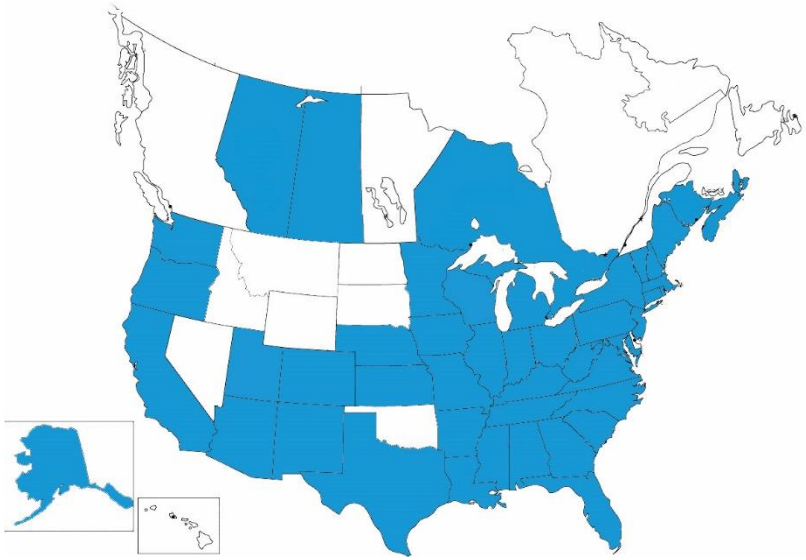
Presenters: Kevan Will, James Ireland, and Dan Scott

May 2016

Vanderbilt University
Virginia Commonwealth University
Virginia Department of General Services
Wagner College
Wake Forest University
Washburn University
Washington University in St. Louis
Wellesley College
Wesleyan University
West Chester University
West Liberty University
West Virginia Health Science Center
West Virginia Institute of Technology
West Virginia School of Osteopathic Medicine
West Virginia State University
West Virginia University
Western Connecticut State University
Western Oregon University
Westfield State University
Wheaton College
Widener University

Who Partners with Sightlines?

Robust membership includes colleges, universities, consortiums and state systems



Serving the Nation's Leading Institutions:

- **70% of the Top 20 Colleges***
- **75% of the Top 20 Universities***
- **34 Flagship State Universities**
- **11 of the 14 SEC Institutions**
- **14 of the 14 Big 10 Institutions**
- **9 of the 12 Ivy Plus Institutions**

* U.S. News 2016 Rankings

Sightlines is proud to announce that:

- 450 colleges and universities are Sightlines clients including over 325 ROPA members.
- Consistently over 90% member retention rate
- We have clients in over 40 states, the District of Columbia and four Canadian provinces
- More than 125 new institutions became Sightlines members since 2013

Sightlines advises state systems in:

- Alaska
- California
- Florida
- Hawaii
- Maine
- Massachusetts
- Minnesota
- Mississippi
- Missouri
- Nebraska
- New Hampshire
- New Jersey
- Pennsylvania
- Texas

Sources of Campus Emissions

Collected carbon emissions at The University of Alabama

Scope 1 – Direct GHGs

- On-Campus Stationary (Natural Gas; Fuel Oil)
- Vehicle Fleet
- Refrigerants
- Agriculture

Scope 2 – Upstream GHGs

- Purchased Electricity

Scope 3 – Indirect GHGs

- Faculty/Staff/ Student Commuting
- Directly Financed Travel
- Study Abroad Travel
- Solid Waste
- Wastewater
- Paper Purchasing
- Transmission & Distribution Losses

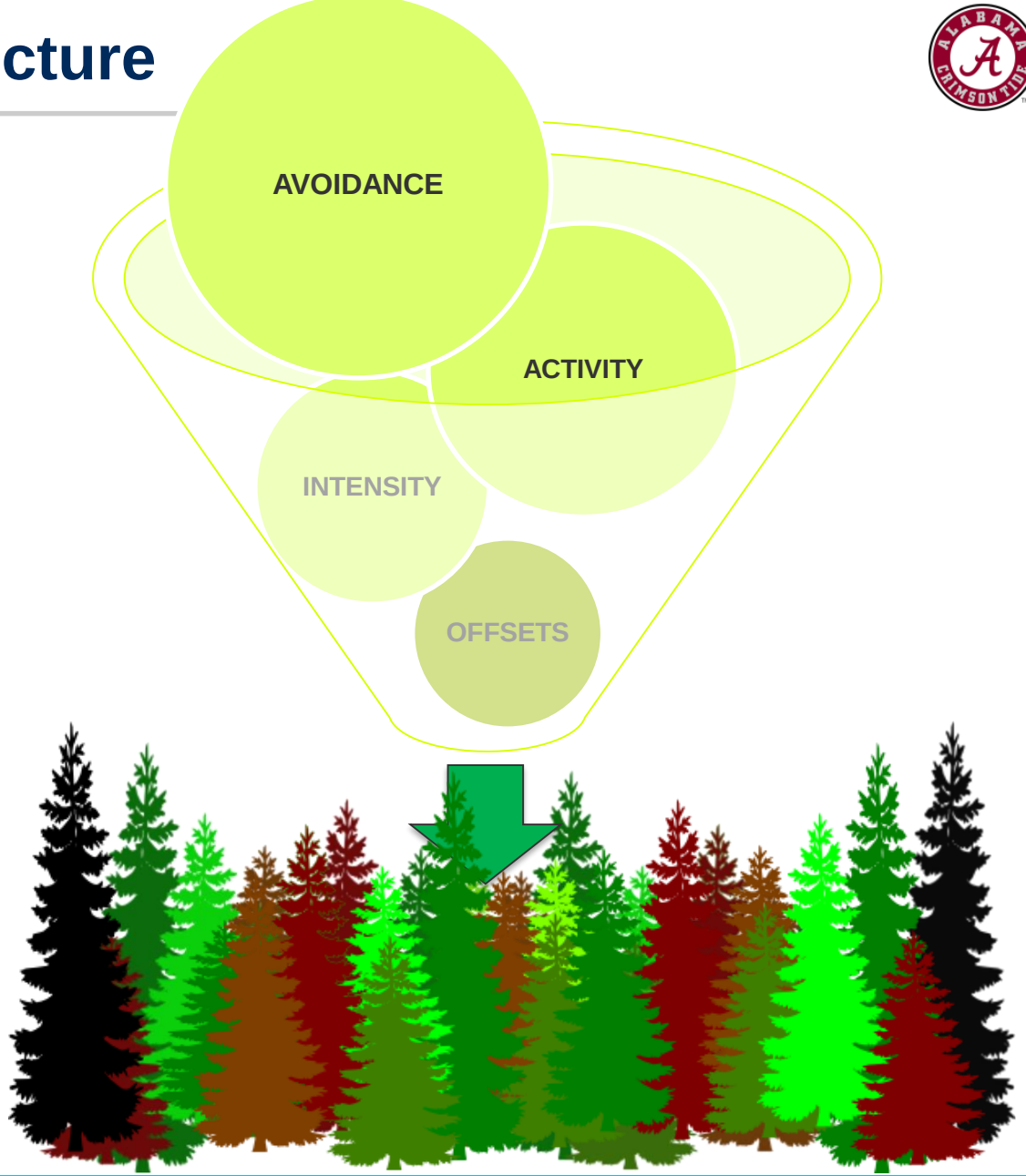
Carbon Mitigation Structure

AVOIDANCE:
- Prevent activities before they start
- **Example:** Increase space utilization instead of building or acquiring new space

ACTIVITY:
- Reduce the existing level of an activity
- **Example:** Consumer fewer BTUS' of energy or travel fewer miles

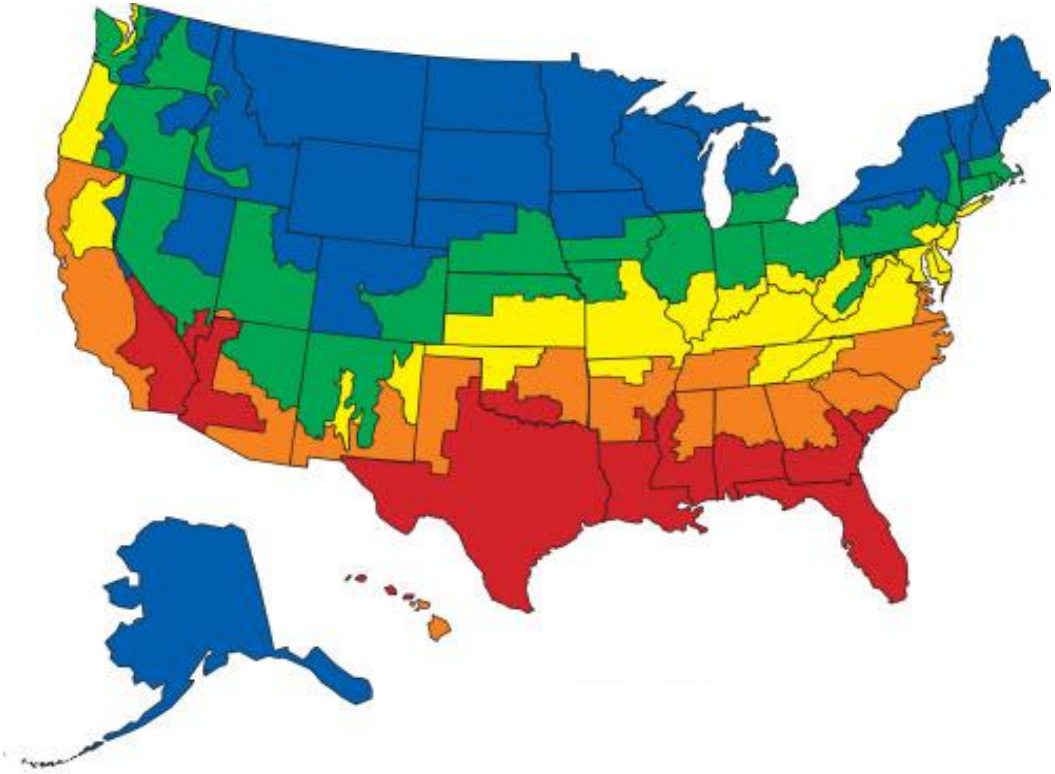
INTENSITY:
- Lessening the carbon intensity of activities
- **Example:** Fuel switching (coal to natural gas; introducing renewables)

OFFSETS:
- Utilizing carbon offsets to neutralize unavoidable GHGs
- **Example:** RECs; sequestration; retail offsets



Peer Institutions Used For Benchmarking

The University of Alabama is located in climate zone 4



Institution Name:	Location:
Arizona State University	*Tempe, AZ*
Clemson University	*Clemson, SC*
George Mason University	*Fairfax, VA*
Michigan State University	*East Lansing, MI*
The University of Dayton	*Dayton, OH*
University of Arkansas	*Fayetteville, AR*
University of Tennessee	*Knoxville, TN*
Virginia Commonwealth University	*Richmond, VA*

Sustainability Solutions Measurement and Analysis Members

- Sightlines has approximately 50 Sustainability Solutions Members
- Approximately two-thirds are private
- Approximately two-thirds have signed the ACUPCC
- Approximately forty percent are Charter Signatories

Peer Group Based On

Size

Technical Complexity

Climate Zone

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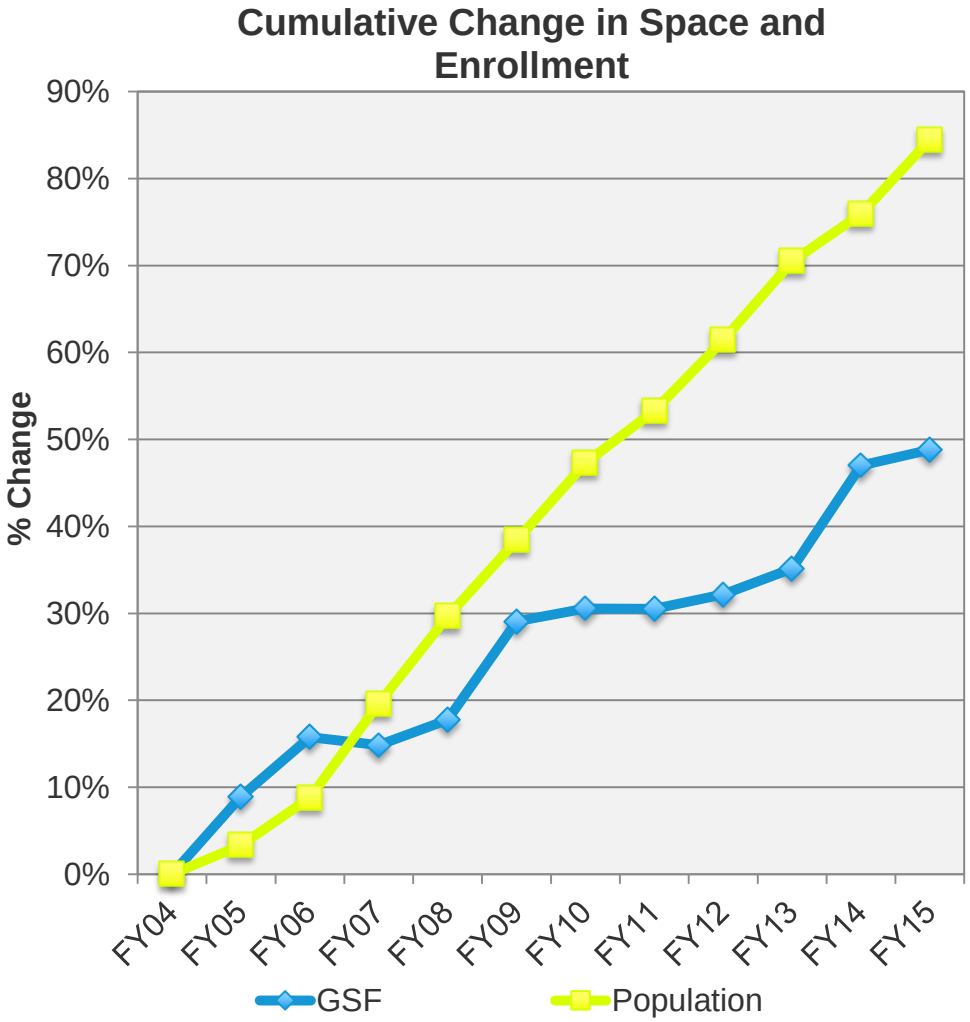
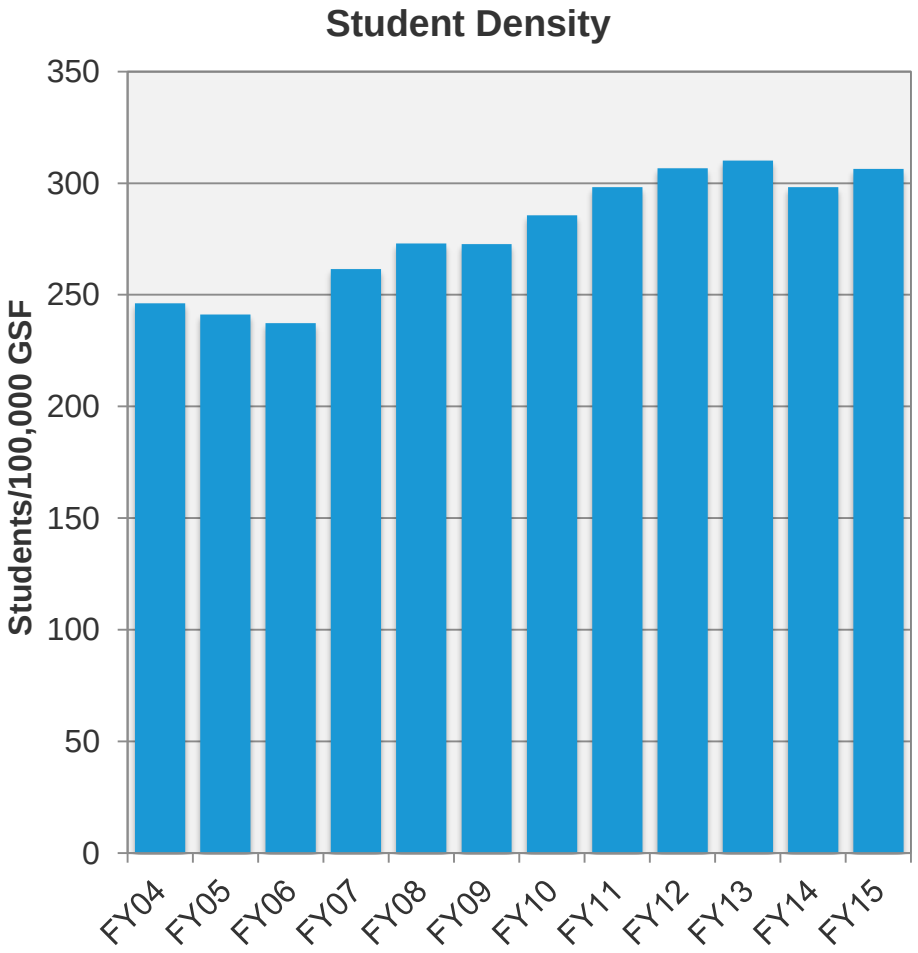
The University of Alabama Profile

Institutional Profile Changes

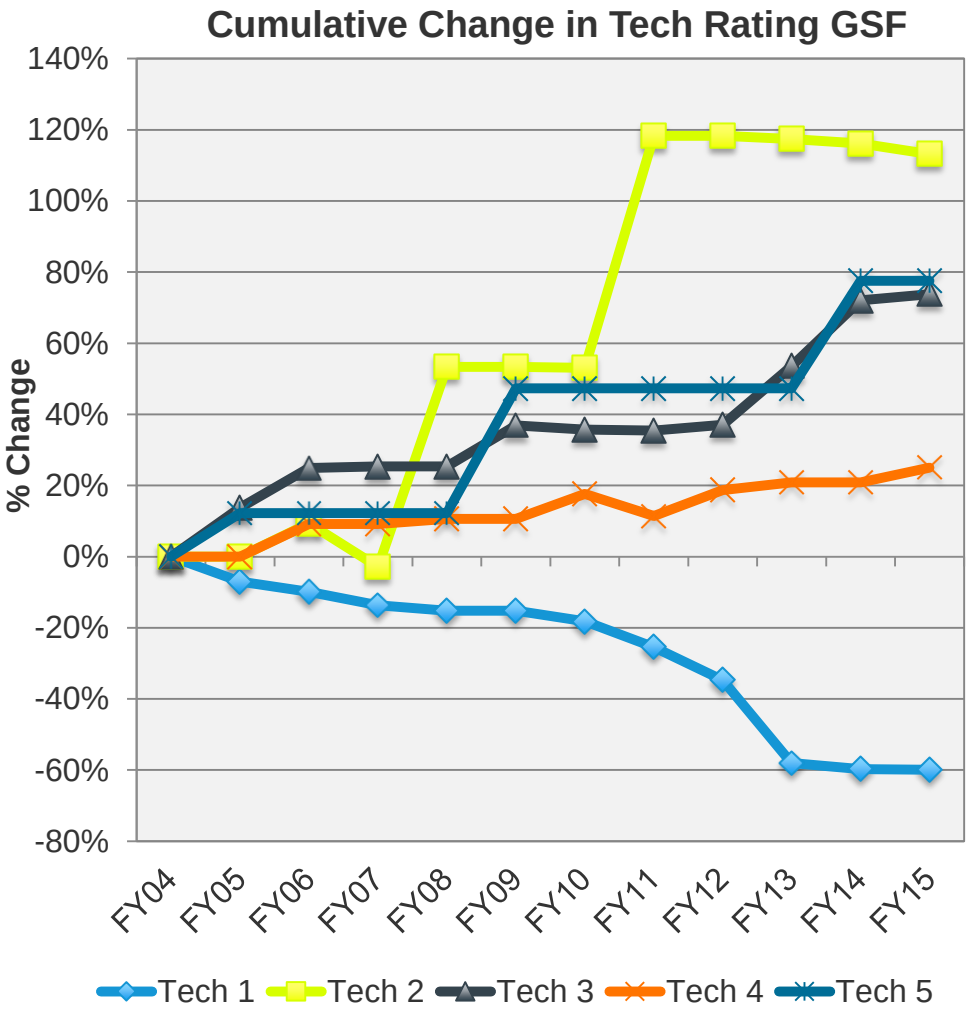
Massive growth in space and enrollment through the analysis

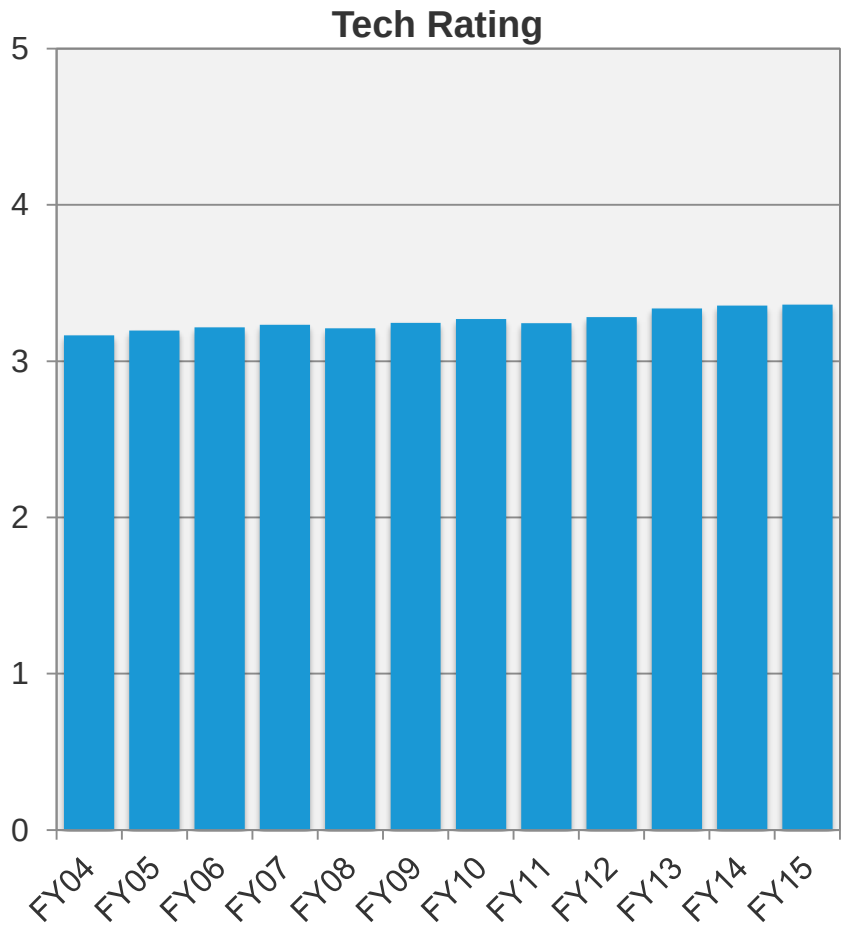




Institutional Profile Changes

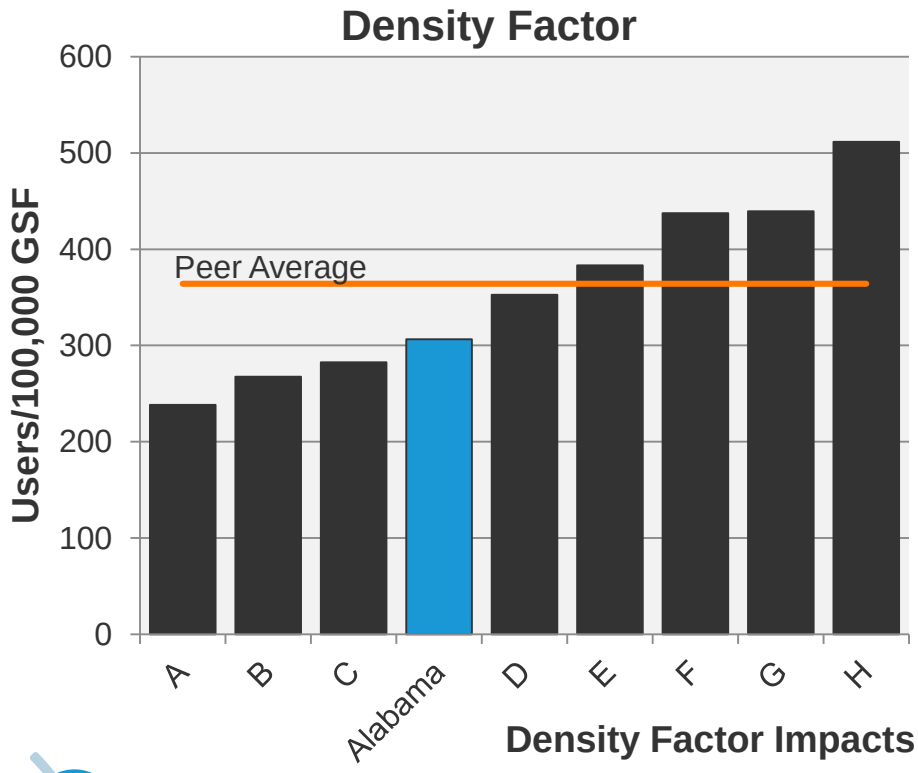
Significant shifts in tech rating GSF make-up

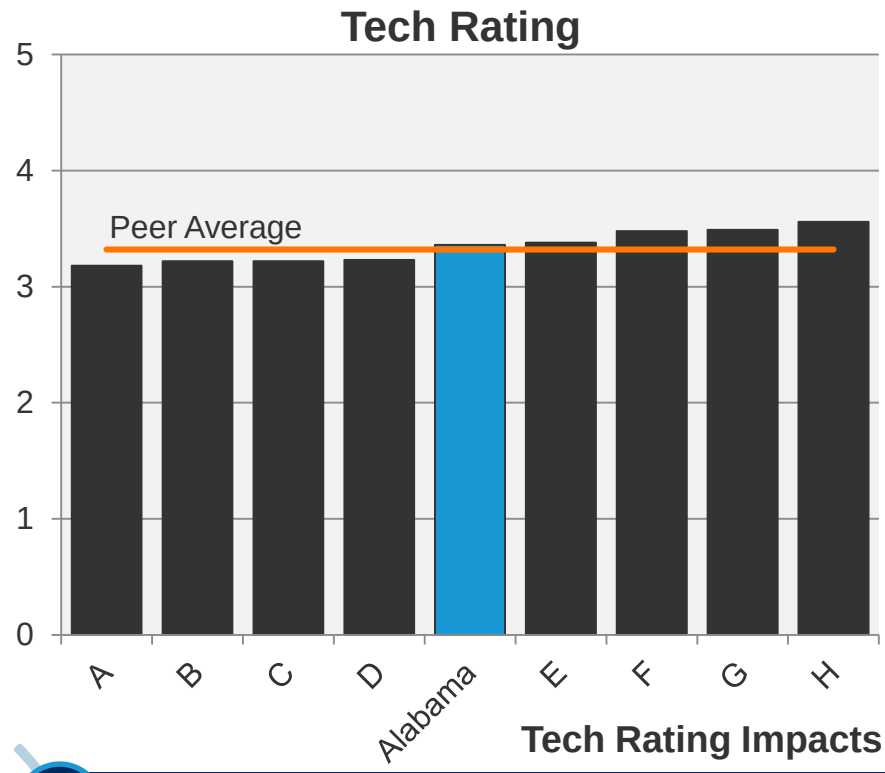




Density & Tech Rating

High density and complexity drive emissions





Density Factor Impacts:

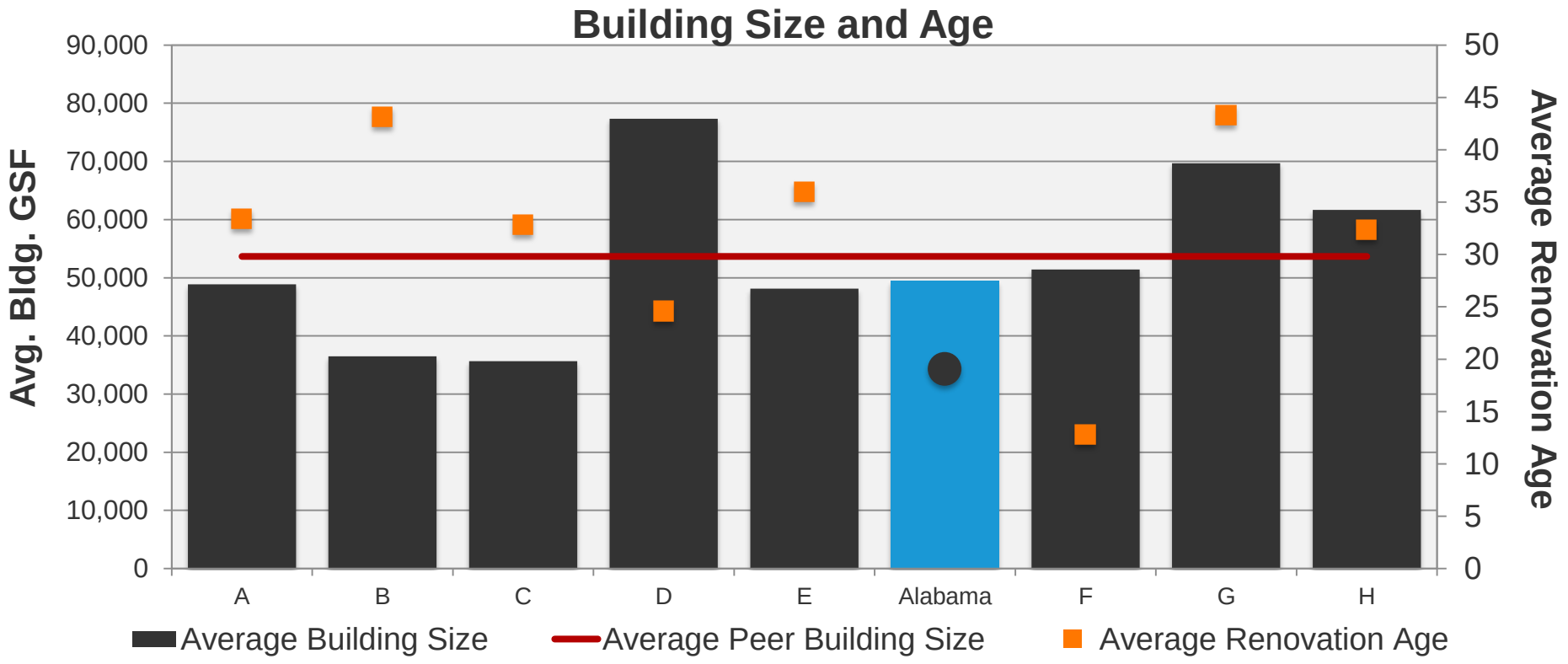
- Energy consumption
- Waste output
- Operational demands

Tech Rating Impacts:

- Energy consumption
- Staffing needs
- Capital demands

Age and Size of Buildings Impact Consumption

Space profile is a significant driver of scope 1 and 2 emissions



Younger Buildings =	Smaller Buildings =
Lower Energy Consumption	**Less Energy Efficient**

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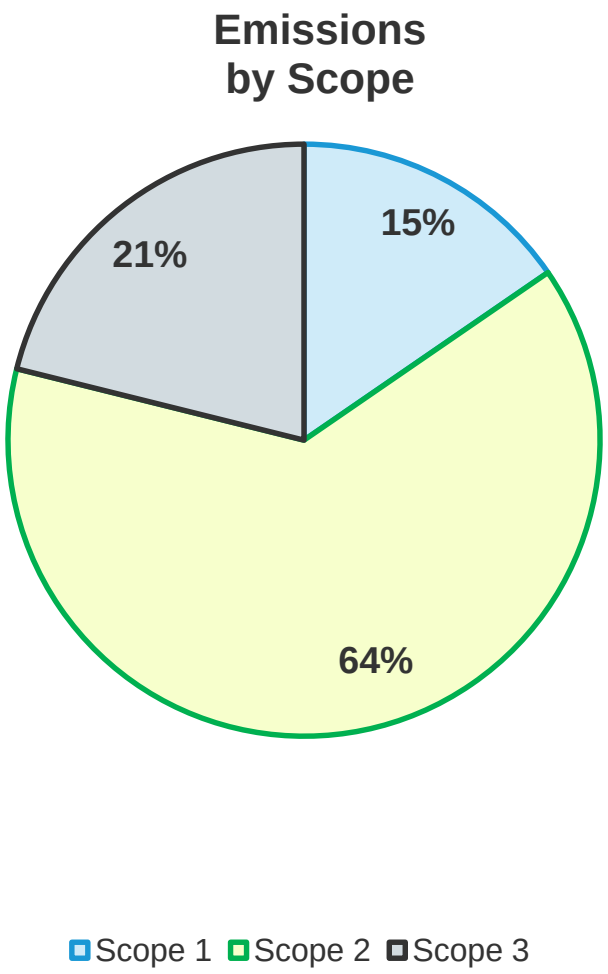
The University of Alabama Emissions Profile

Distribution of Emissions by Level of Control

FY2015 emissions by source and scope



Scope 1 – Direct GHGs

- On-Campus Stationary (Natural Gas; Fuel Oil)
- Vehicle Fleet
- Refrigerants
- Agriculture

Scope 2 – Upstream GHGs

- Purchased Electricity

Scope 3 – Indirect GHGs

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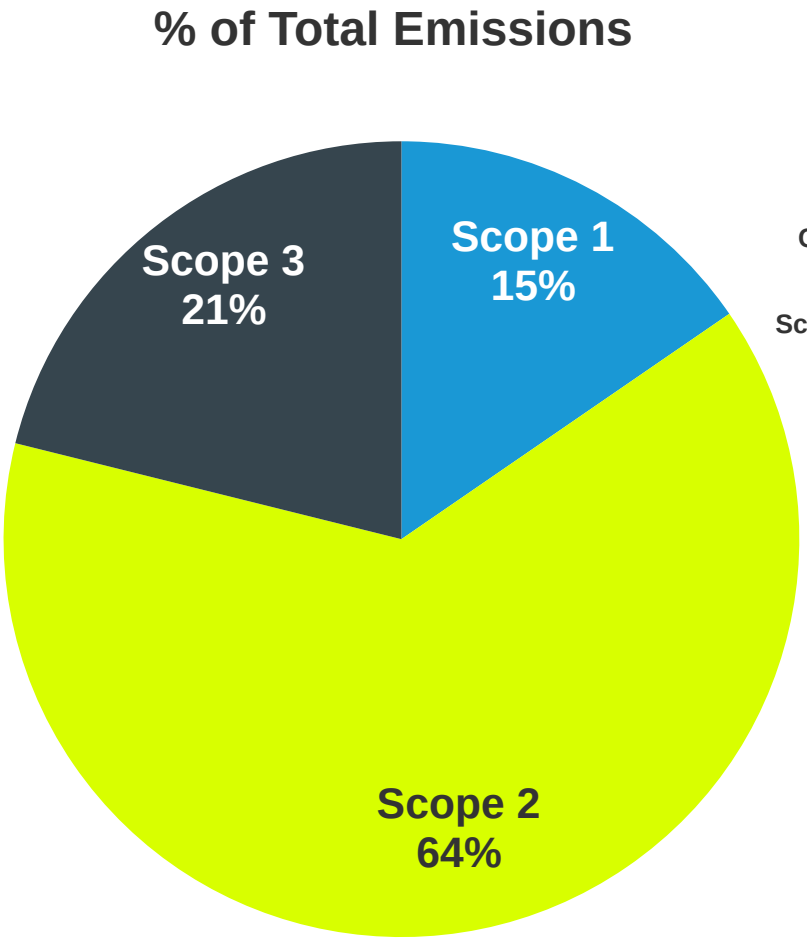
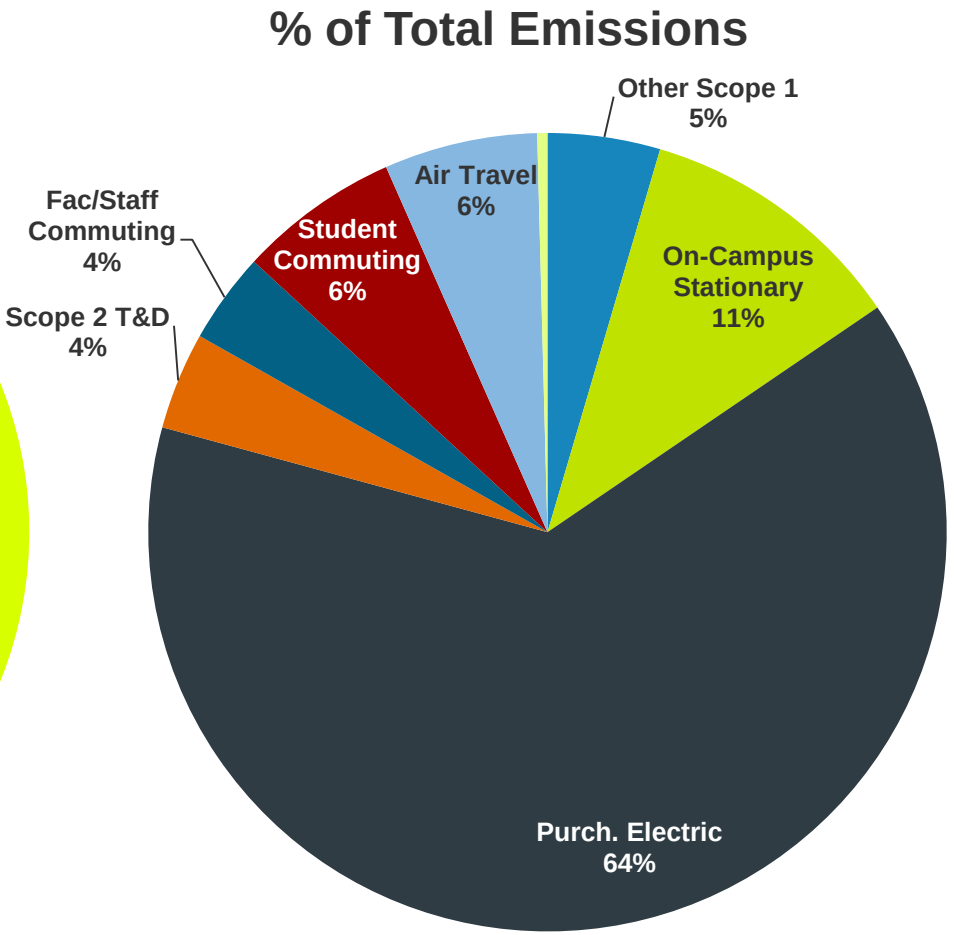
- Directly Financed Travel
- Study Abroad Travel
- Solid Waste
- Wastewater
- Transmission & Distribution Losses

FY15 Gross Emissions

Energy consumption makes up the majority of total emissions



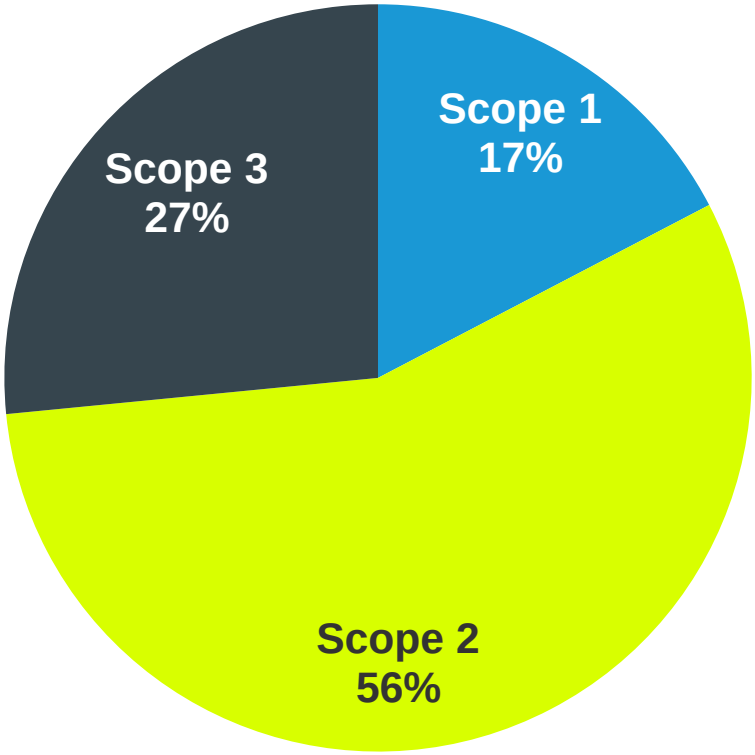


FY04 Gross Emissions Comparison

80k increase in MTCDEs since the beginning of the analysis

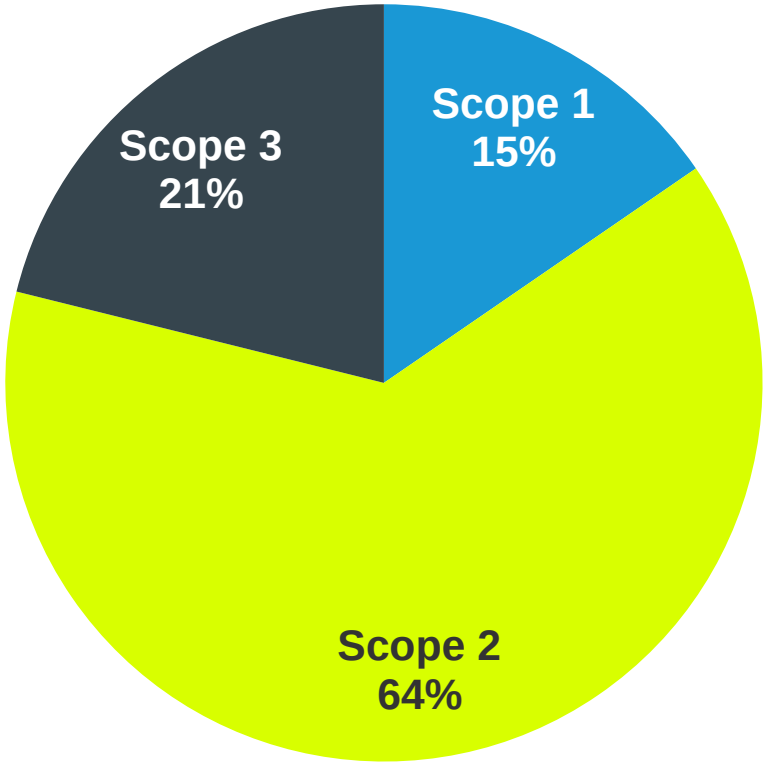
% of Total Emissions – FY04

145,892 MTCDE



% of Total Emissions – FY15

225,230 MTCDE



Tech Rating:
3.16

6%

Tech Rating:
3.36

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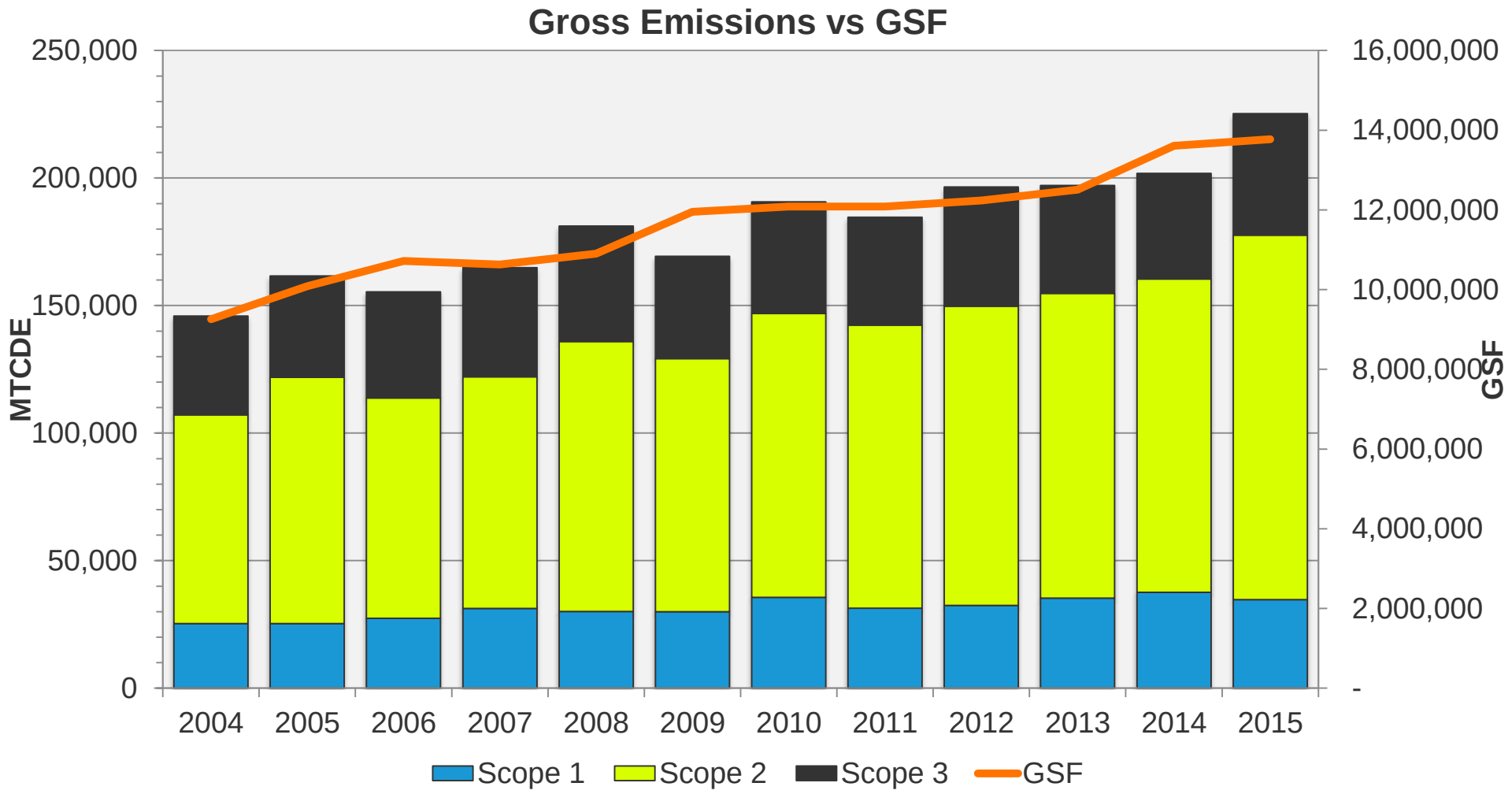
Gross Emissions vs Campus GSF

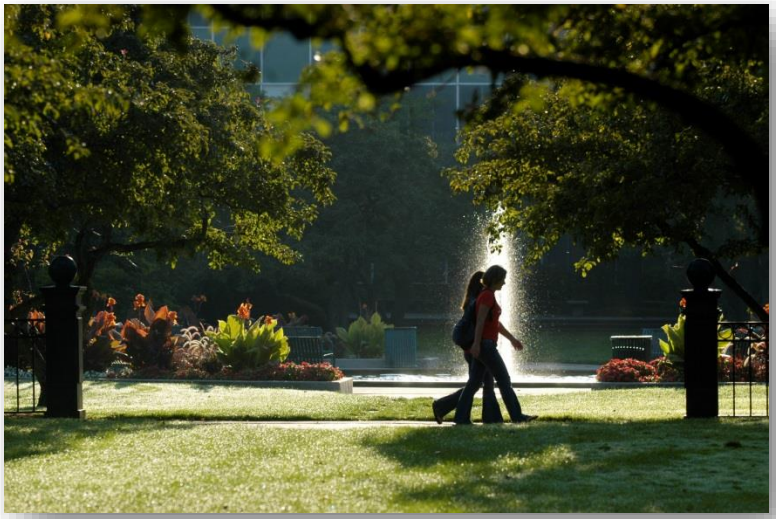
Gross emissions growing in pace with campus growth



Benchmarking GHG Emissions

Emissions per student; emissions per 1,000 GSF

GHG Emissions per Student



Stresses intensity of operations and commuting.

$$\frac{\text{Gross GHG Emissions}}{\text{Total Student FTE}}$$

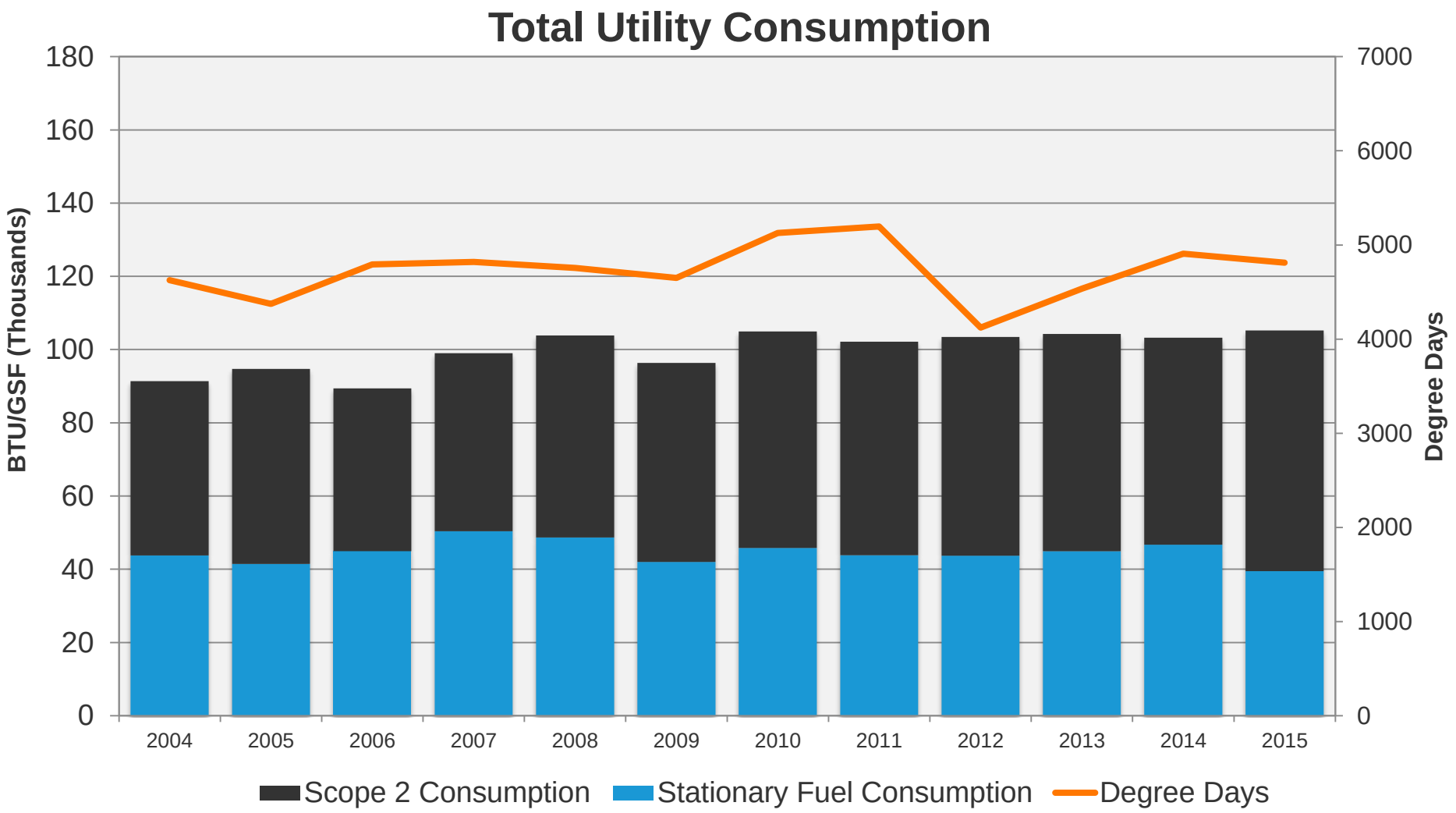
GHG Emissions per 1,000 GSF

Stresses efficient use of space.

$$\frac{\text{Gross GHG Emissions}}{\text{Total GSF in Footprint}} \times 1{,}000$$

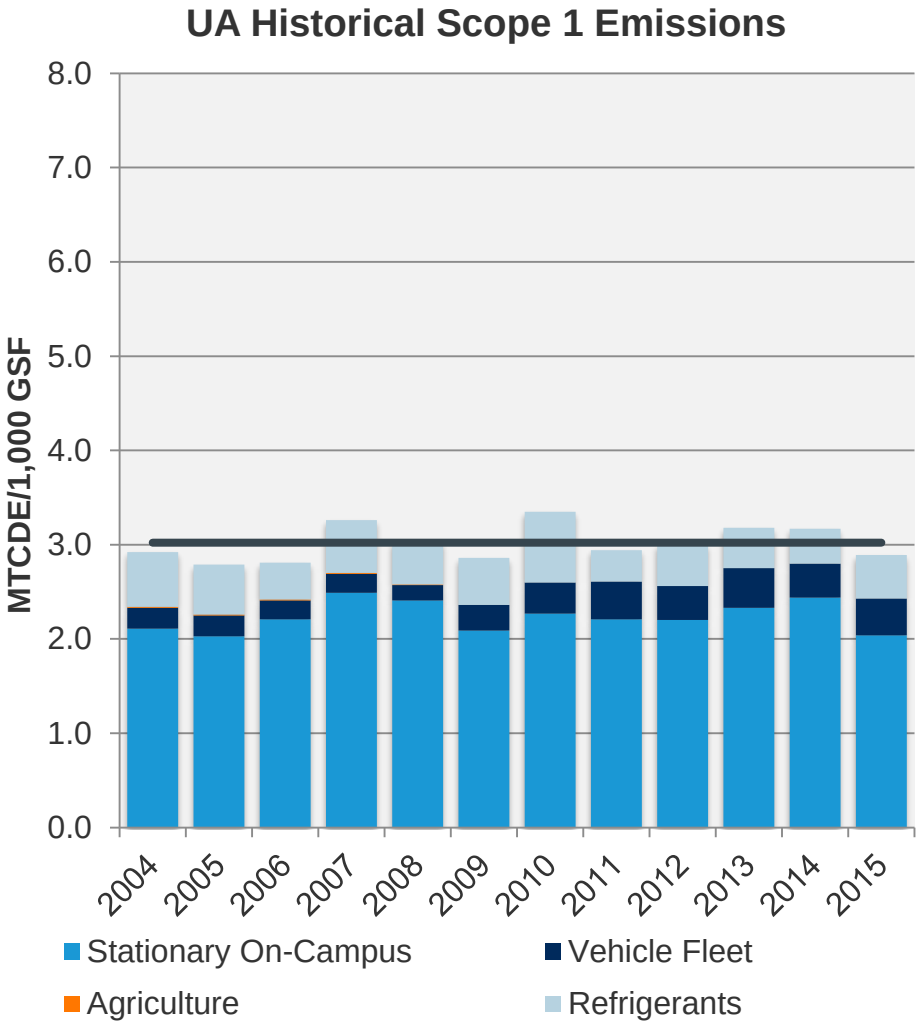
Scopes 1 and 2

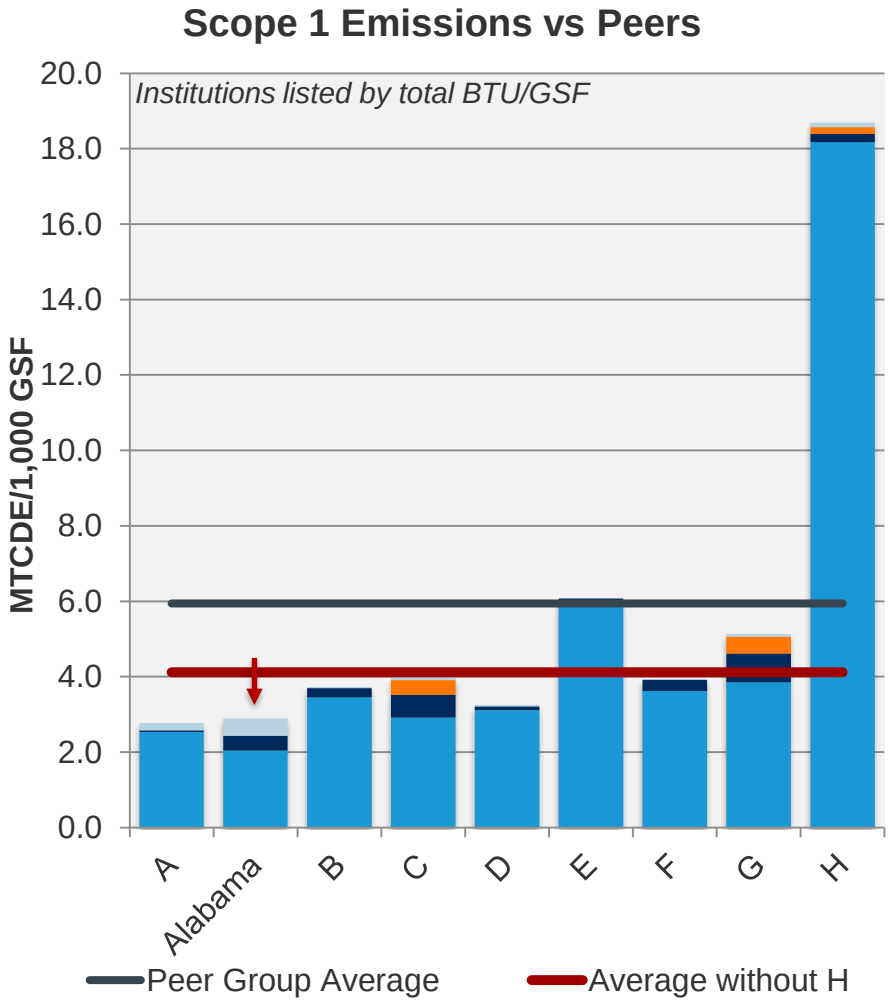
Utilities: Total Energy Consumption



Degree Day: A unit used to determine the heating or cooling requirements of buildings, representing a decrease or increase of one degree below/above (65°F) equates to one degree day.

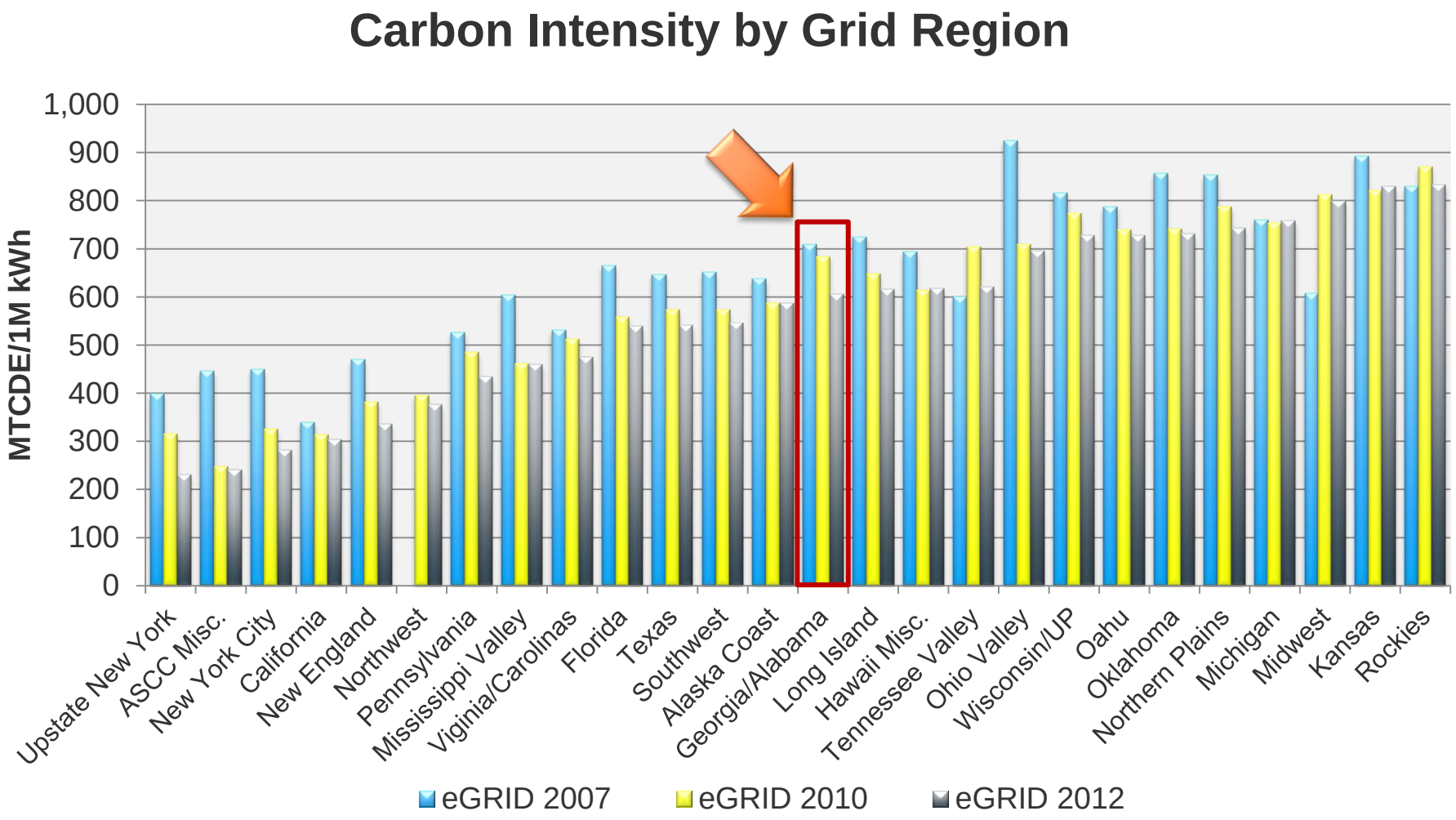
Scope 1 Emissions by Source





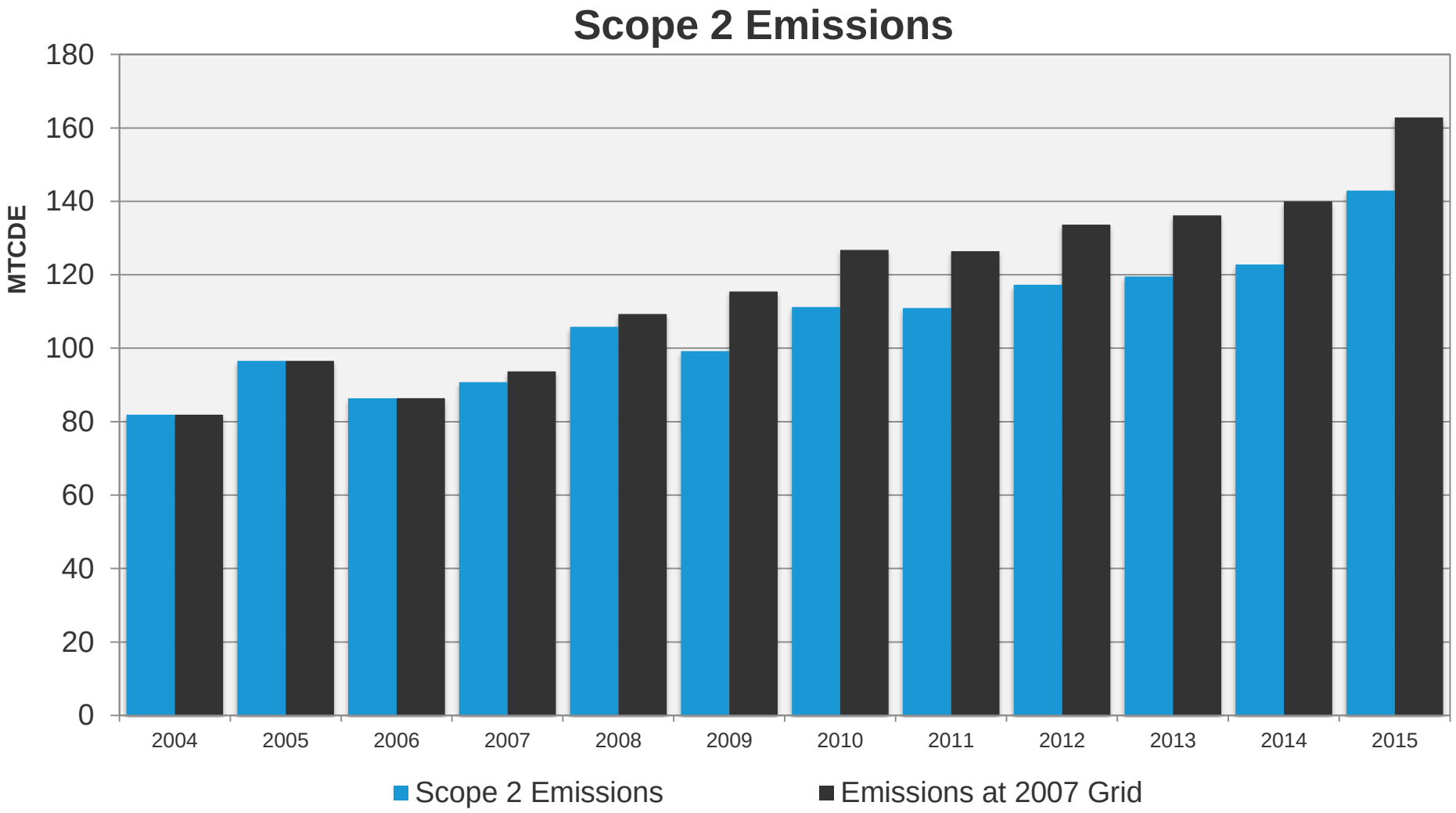
Electrical Grids Across the Country

Electrical grids getting "greener" since 2007



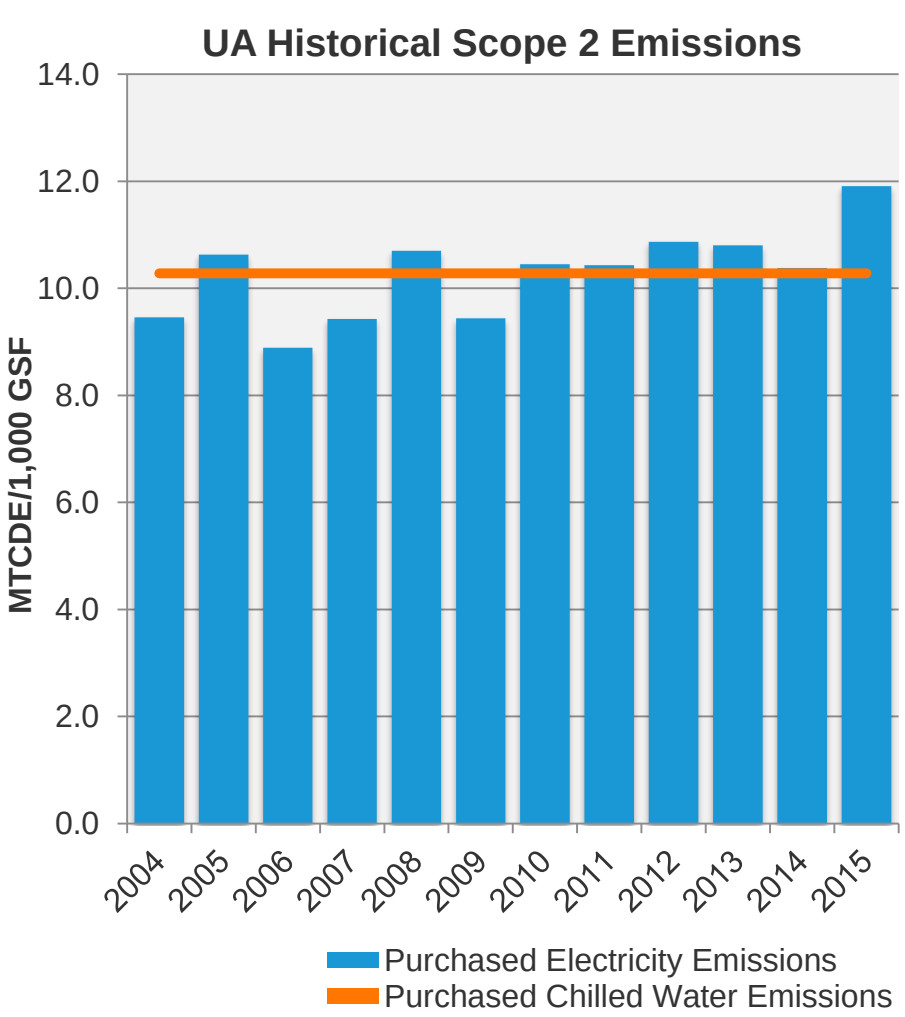
Utilities: Scope 2 Emissions

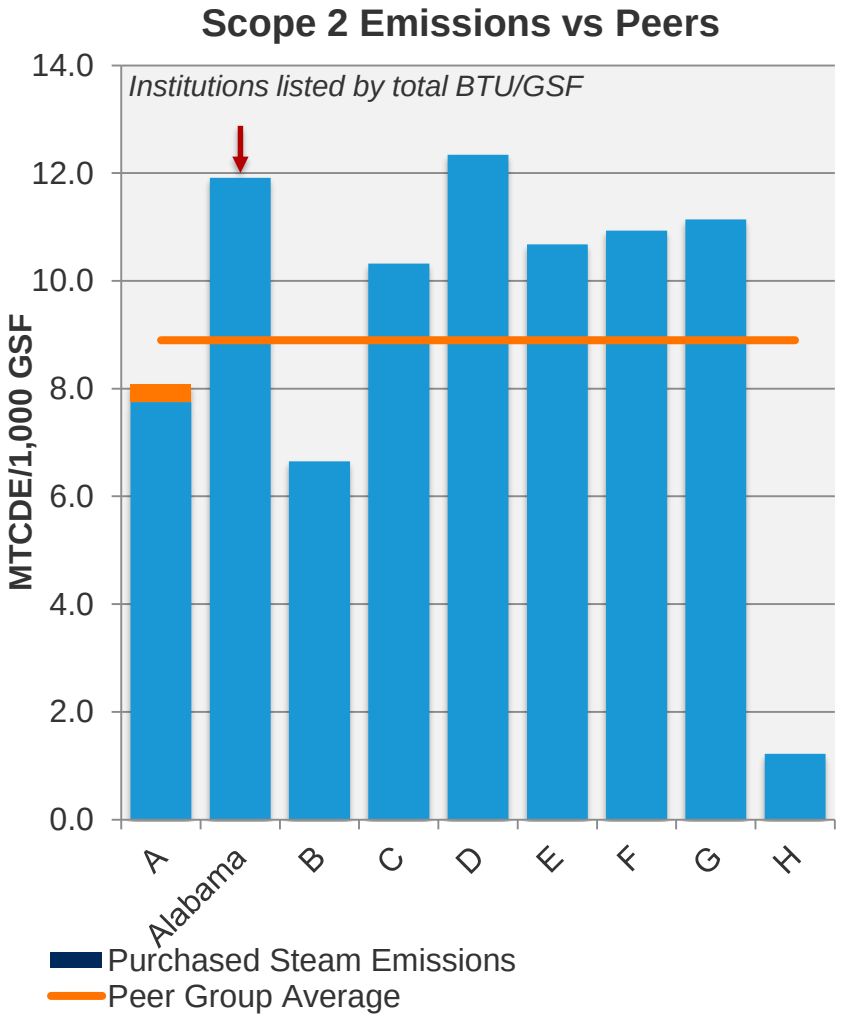
Scope 2 emissions lower over years due to the "cleaning" of the grid



Scope 2 Emissions by Source

Higher electricity consumption drives scope 2 emissions higher





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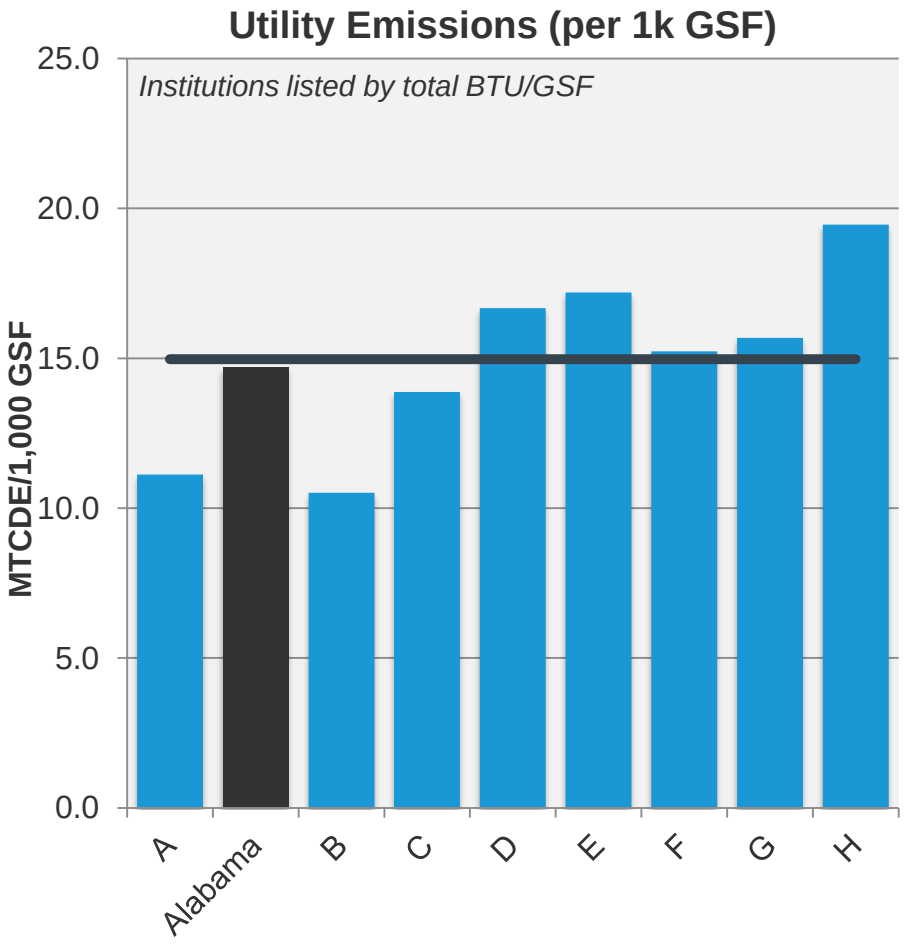
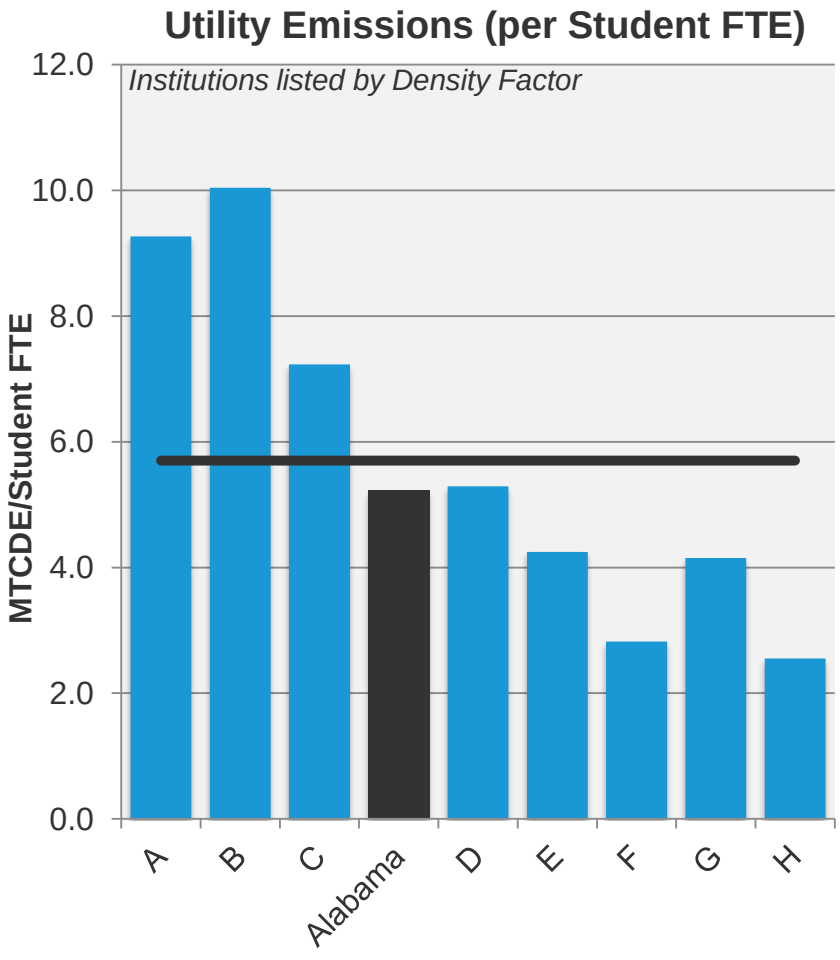
Utility Emissions: Normalized

Alabama benefits from lower fossil emissions than peers





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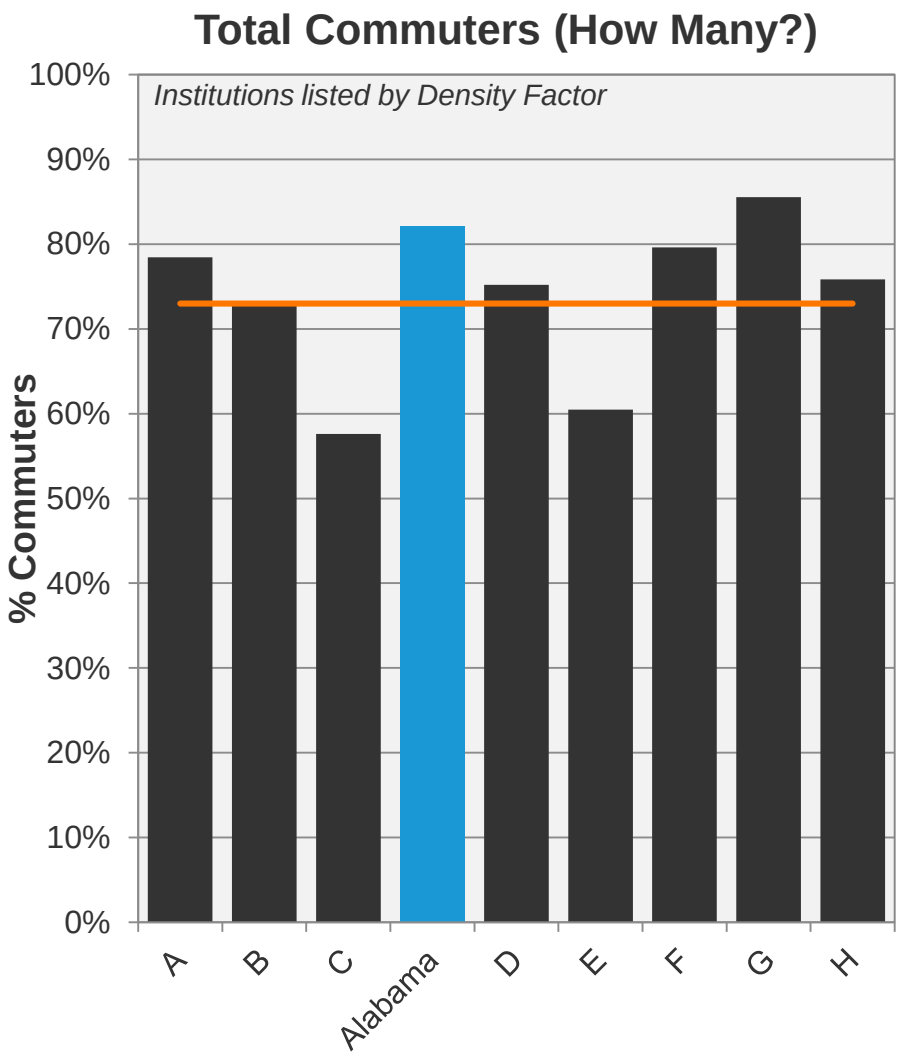
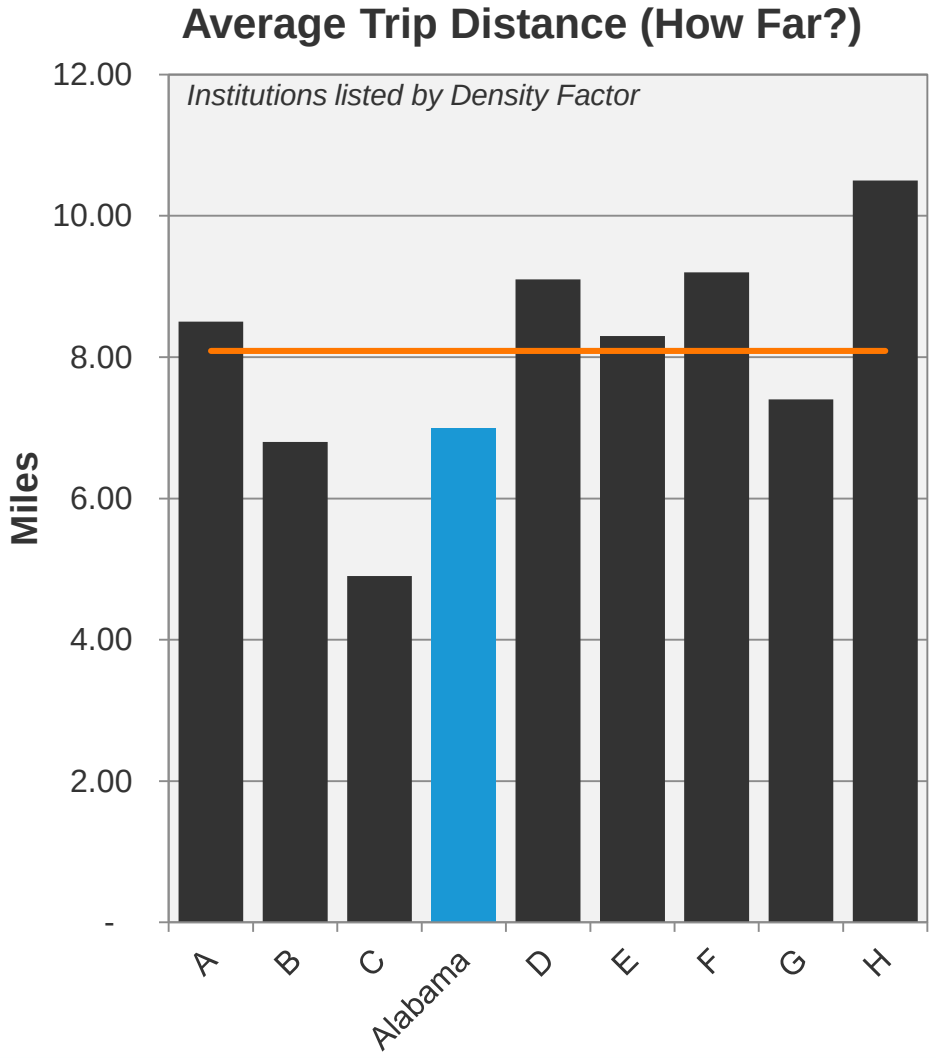
Commuting and Other Sources

Alabama's Commuting Data Compared to Peers

Alabama has more commuters as a percentage; traveling shorter distances





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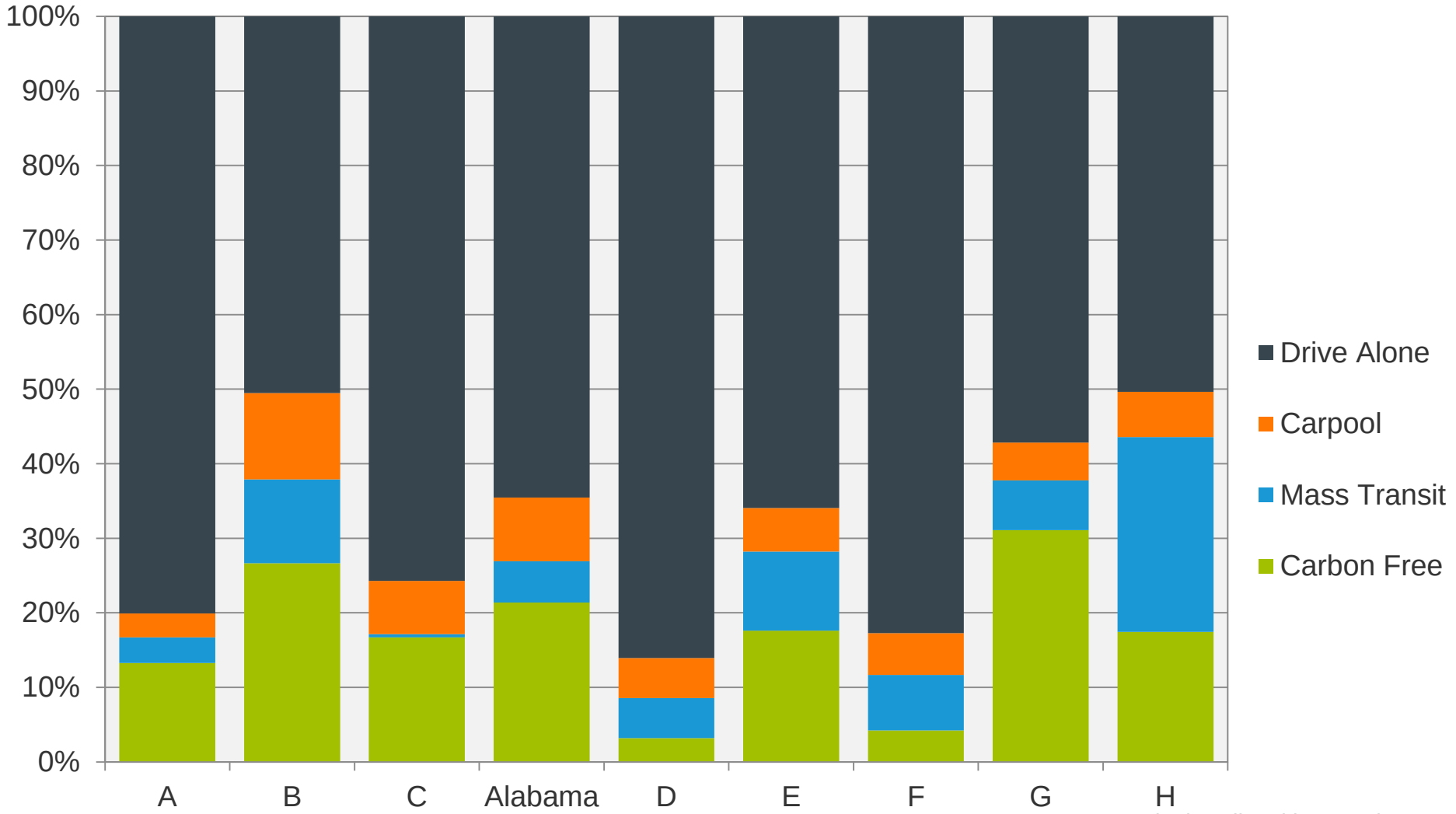
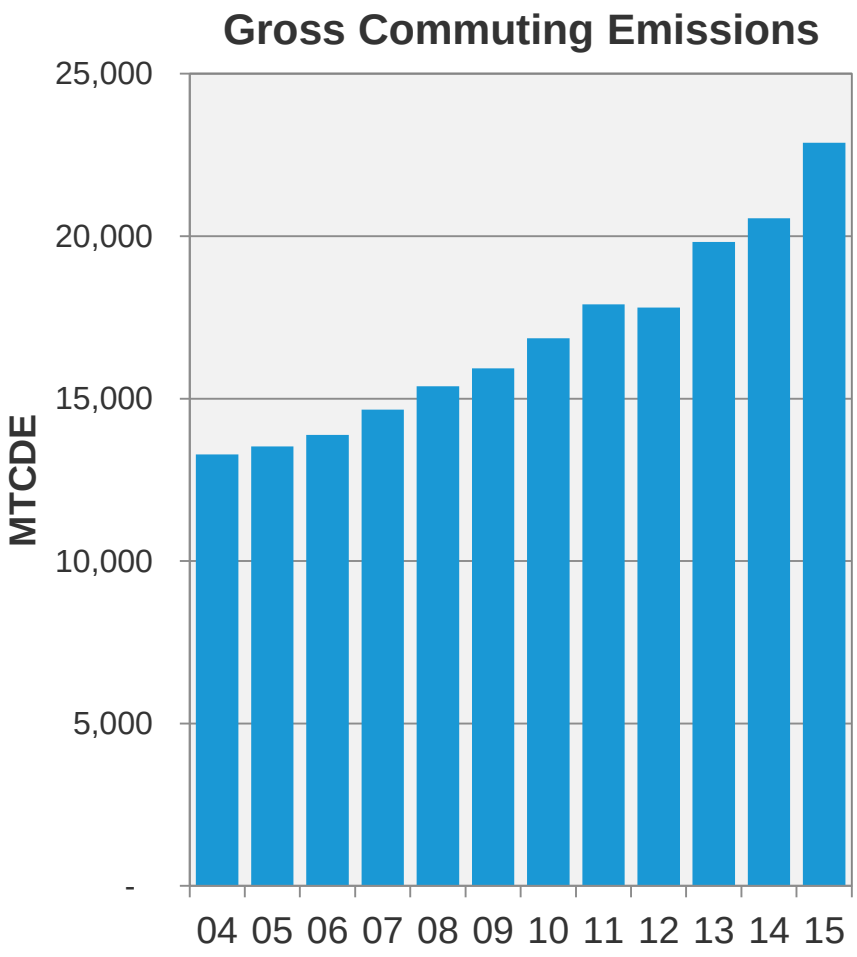
Distribution of Mode

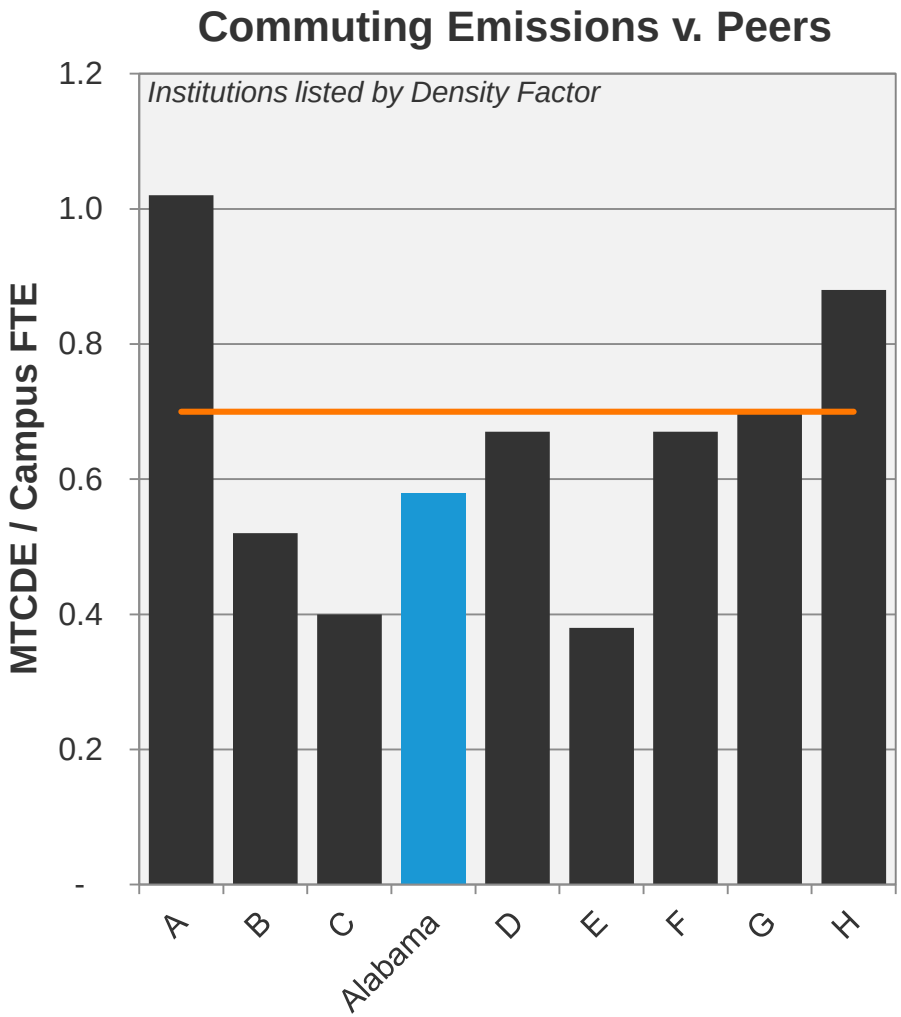


Institutions listed by Density Factor

Commuting: Peer Context

Alabama benefits from increase in campus users when benchmarked against peers

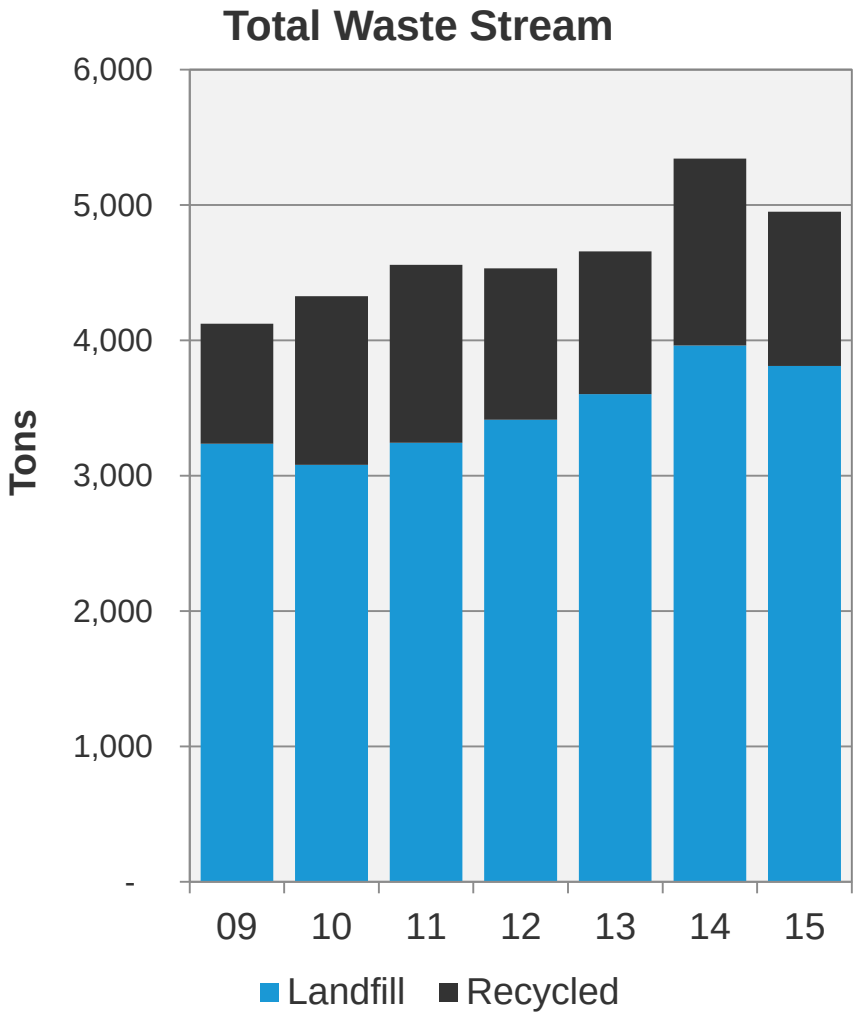


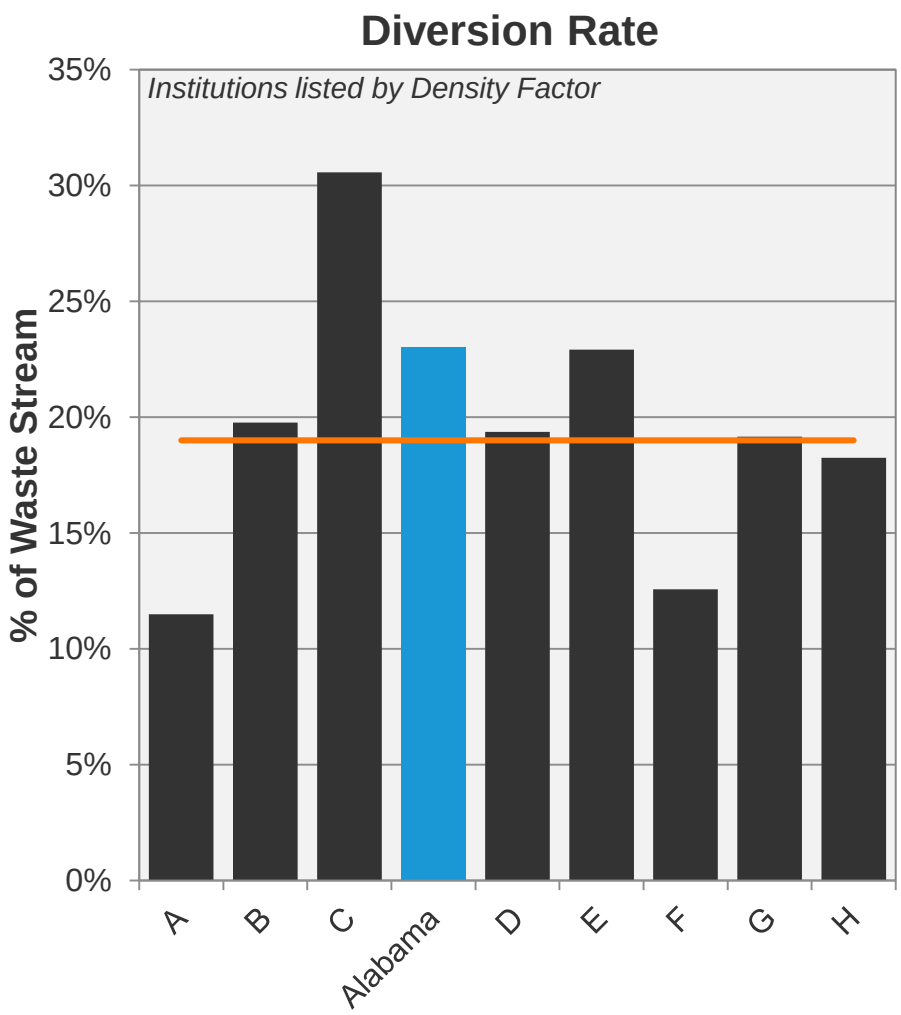


Database Average: 0.58 MTCDE/Campus User
Database Maximum: 1.33 MTCDE/Campus User

Waste and Diversion with Peer Context

Alabama continuously performs better than peers in terms of waste diversion





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Waste and Diversion with Peer Context

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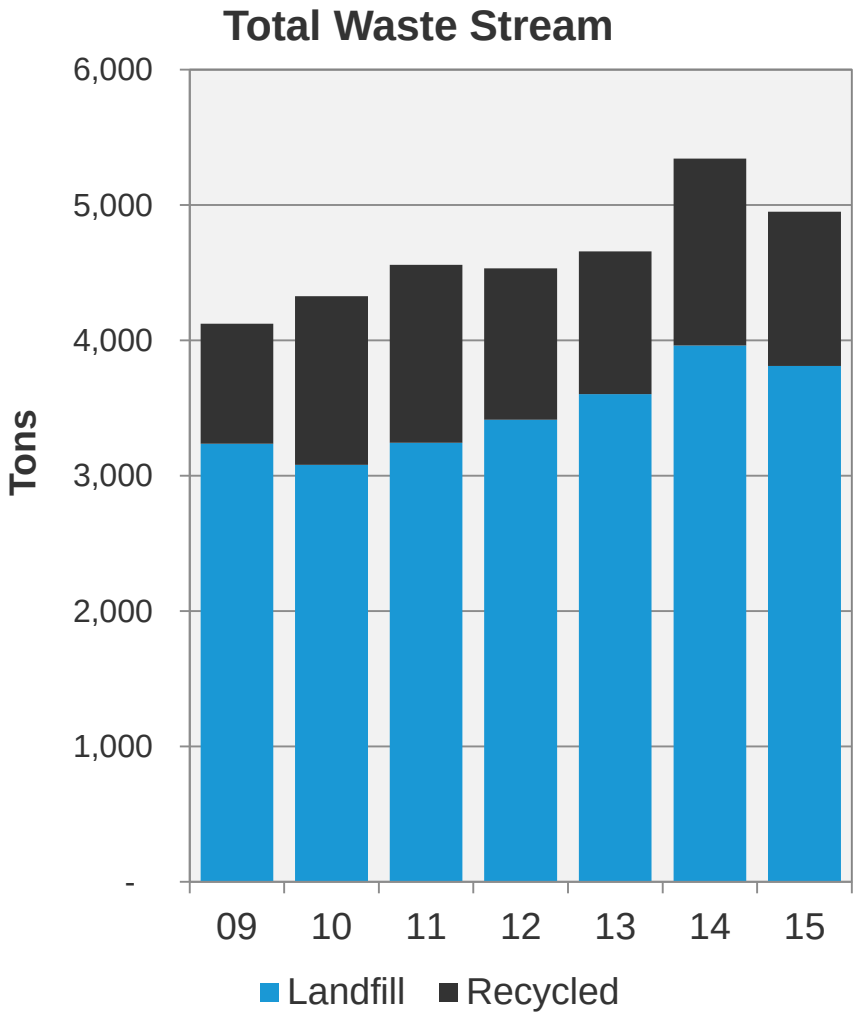

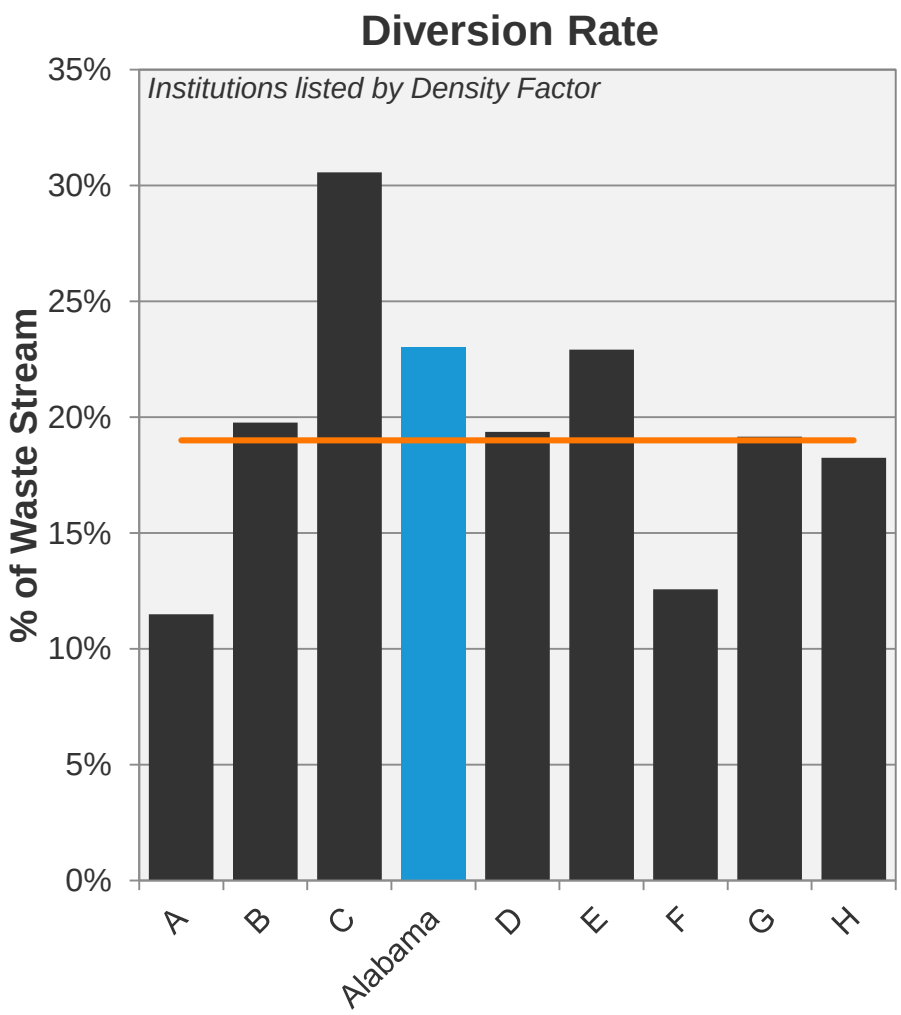

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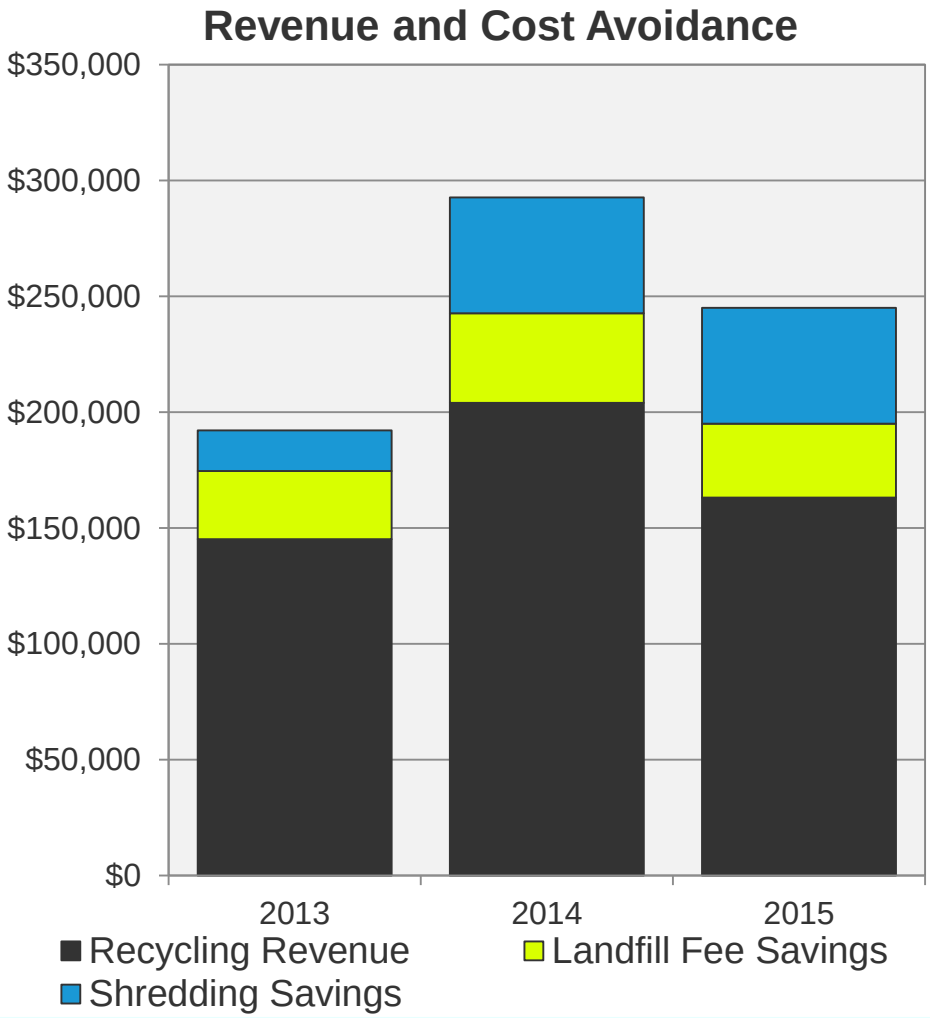
What Has Recycling Efforts Saved?

While recycling reduces emissions, there are other benefits involved

Resources Saved in FY15:
13,305 Trees
297,411 Gallons of Oil
3,130,640 Kilowatts of Energy
5,478,620 Gallons of Water

Total Revenue and Savings from FY13-FY15:

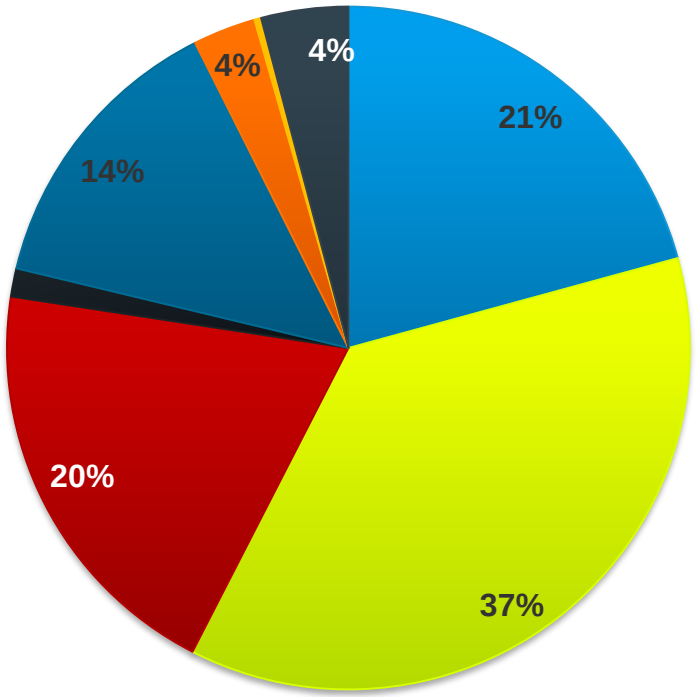
$730k



Scope 3 Summary

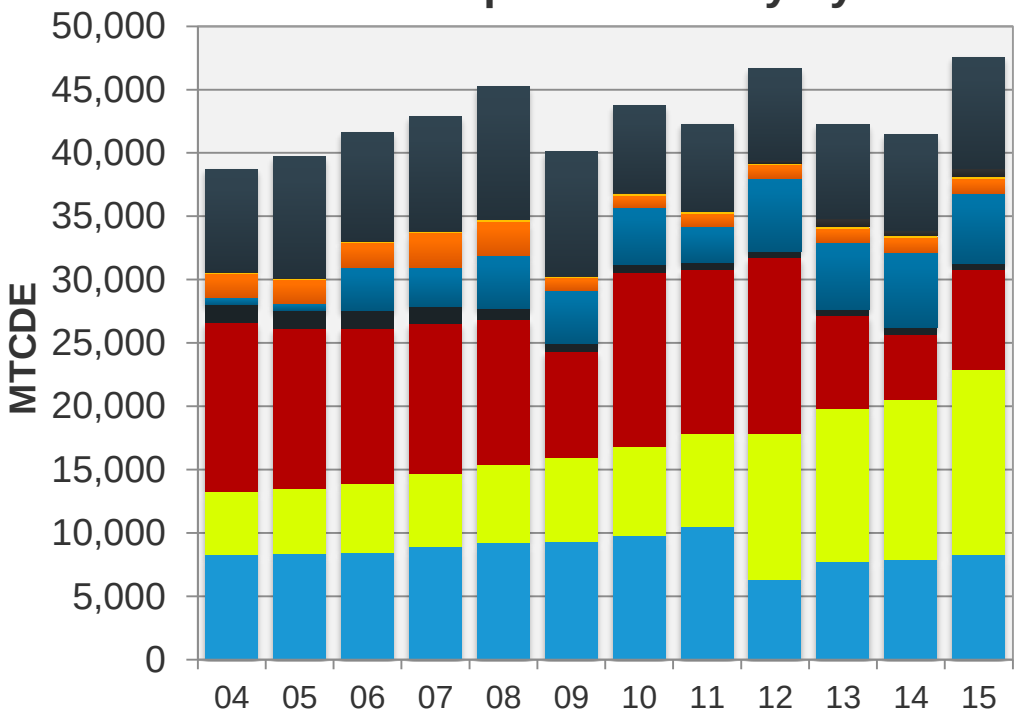
Student commuting is the main driver of scope 3 emissions increase

FY15 Scope 3 Summary



- Faculty / Staff Commuting
- Directly Financed Air Travel
- Study Abroad Air Travel
- Wastewater
- Scope 2 T&D Losses

Historical Scope 3 Summary by Source



- Student Commuting
- Other Directly Financed Travel
- Solid Waste
- Paper Purchasing

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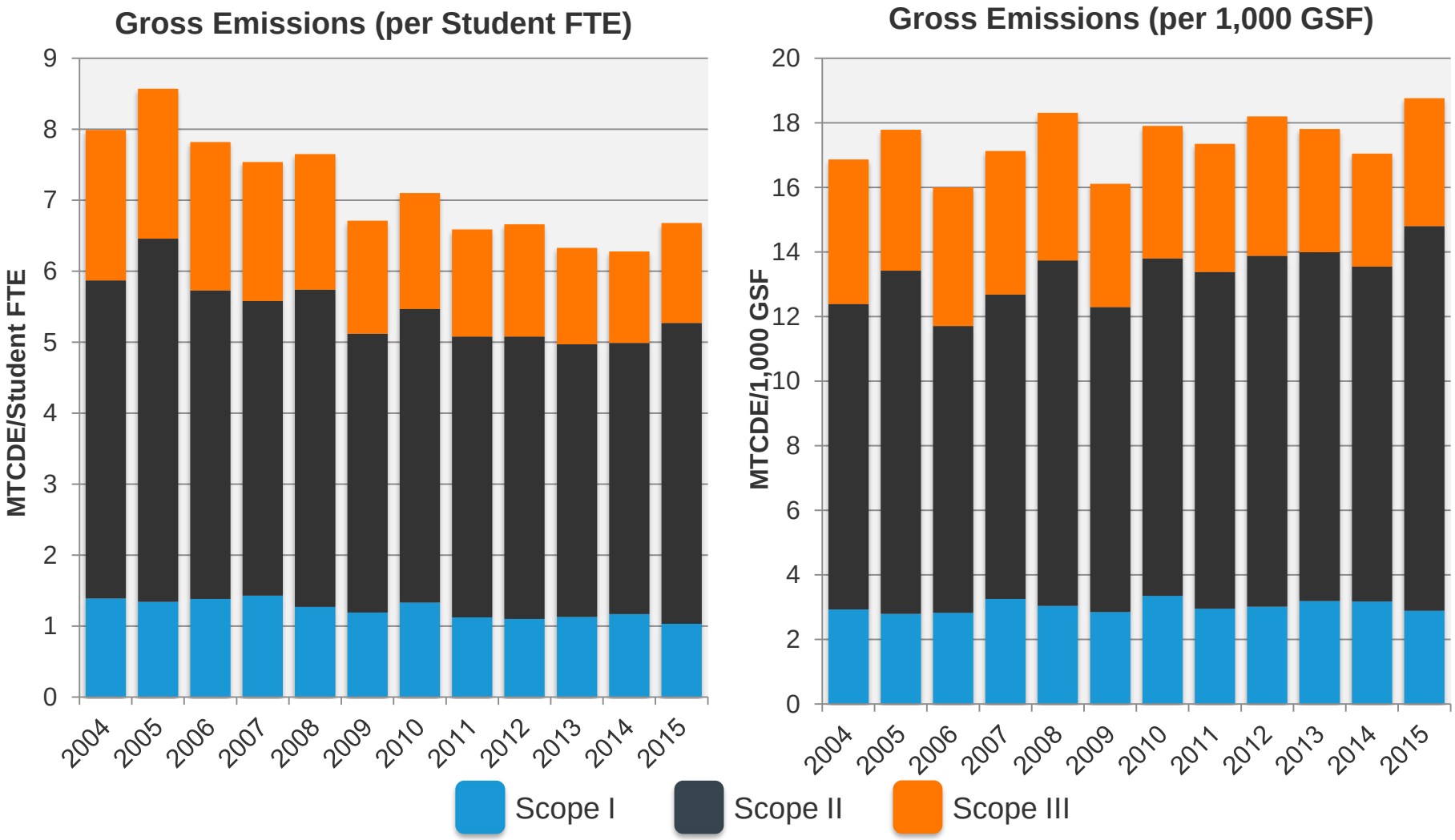
Summary and Conclusions

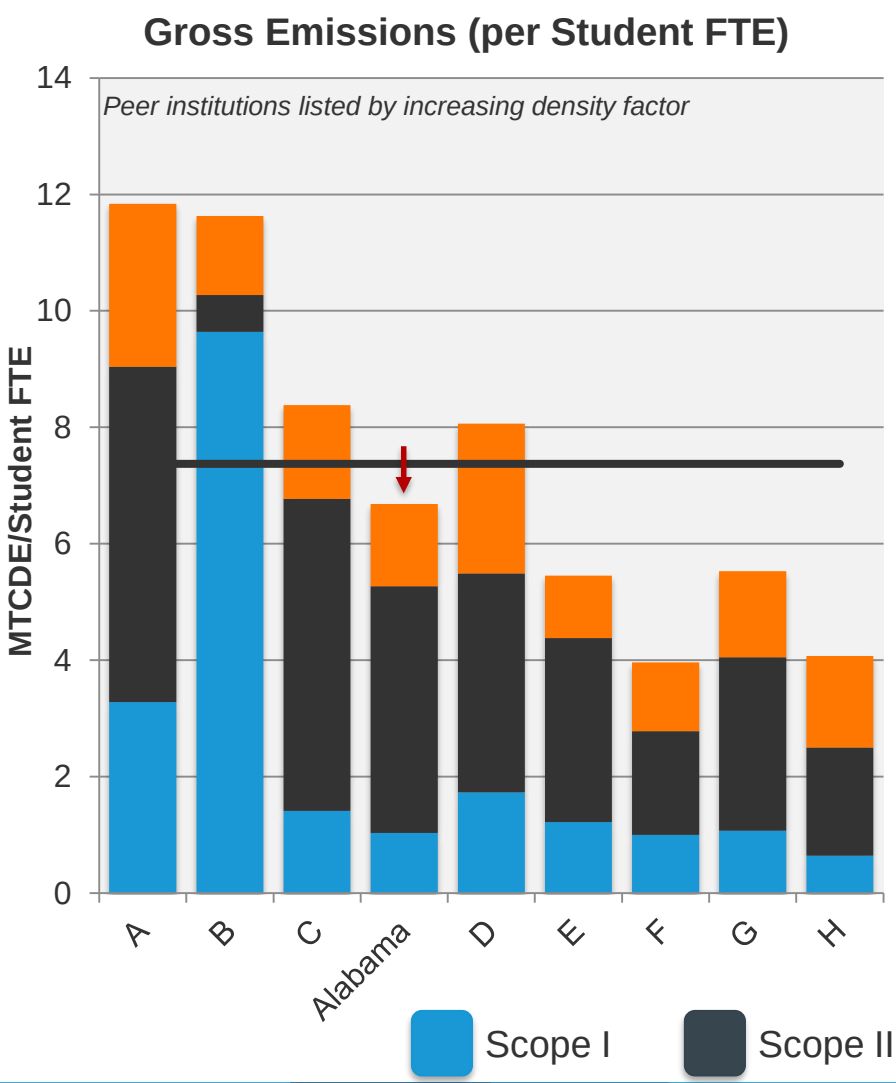
Total Emissions Summary

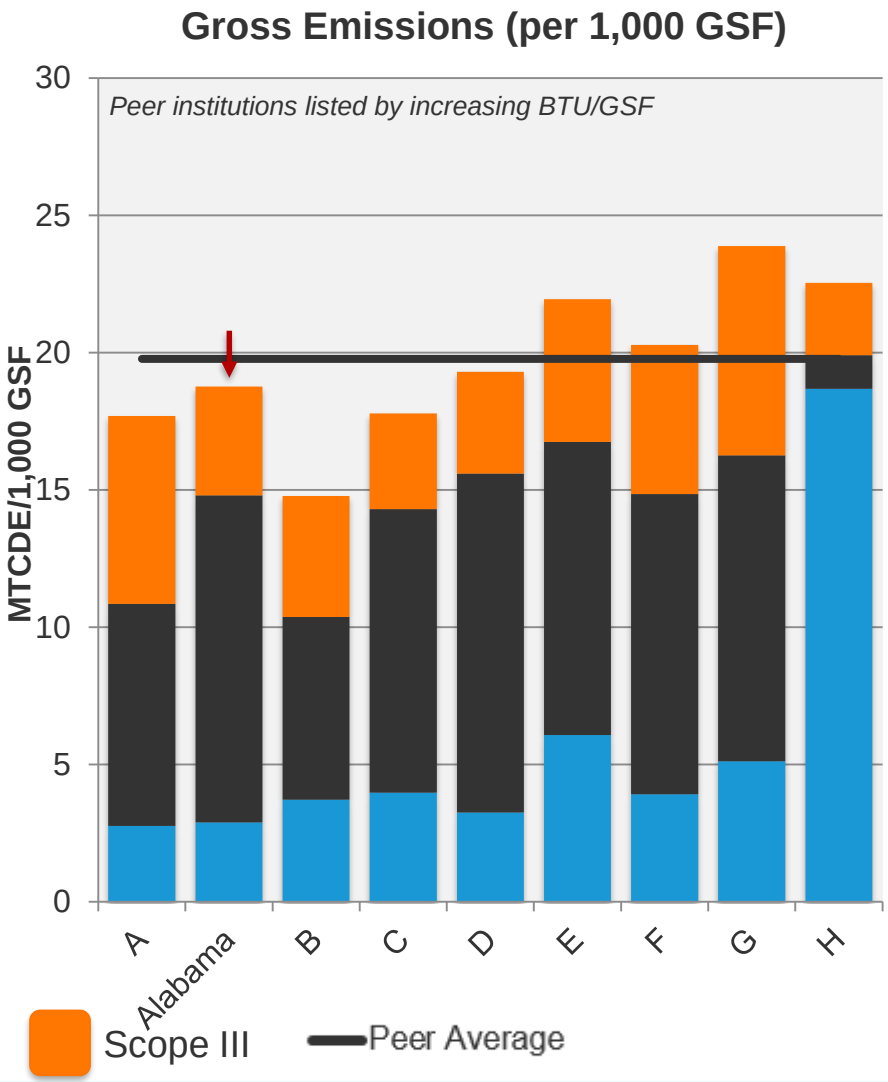
Scope 2 emissions drives increase in FY15



GHG Emission Peer Benchmarks

Alabama performs below peer levels on both metrics

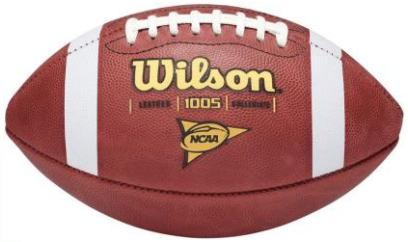




Scope I Scope II Scope III Peer Average

Perception vs Performance

The University of Alabama



"Green" Schools

- American University
- Arizona State University
- George Mason University
- The Richard Stockton College of NJ
- Tufts University
- University of Denver
- University of San Francisco
- University of Vermont
- Wesleyan University

	Alabama	"Green" Schools Avg.	% Difference
BTU/GSF	105,000	117,000	-11%
GHG(MTCDE)/GSF(1,000)	18.76	15.91	18%
GHG(MTCDE)/Student	6.68	5.43	23%
Waste Pounds/Student	251	317	-26%
Gallons of Water/Student	9,088	8,045	13%

Concluding Comments

Student Population Growth

- Alabama continues to benefit from the massive student population growth it has seen from the beginning of the analysis. However, as the population continues to grow, increases in commuting emissions will result. Developing incentives to remain on campus or practice carbon-free commuting will be the key to curb this portion of the emissions.

Alabama's Campus Grows More Complex

- Alabama continues to replace lower complexity buildings with space containing more complex systems . As this transition continues, an increase in electricity consumption will result from the more intense systems. Aligning new construction and renovation with Sustainability practices on campus will help to manage this increase.

Scope 2 Emissions Control Profile

- Scope 2 emissions continue to be a focal point of the overall emissions profile due to a grid which primarily uses coal as its fuel source. Alabama can significantly reduce its gross emissions through agreements with power companies to receive electricity through more renewable resources.

Questions and Comments