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University of Toledo
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University of the Sciences in Philadelphia
University of Vermont
Upper Iowa University
Utica College
Vassar College
Virginia Commonwealth University
Virginia Department of General Services
Virginia State University
Wagner College
Washburn University
Wellesley College
Wesleyan University
West Chester University of Pennsylvania
West Virginia Health Sciences Center
West Virginia University
Western Connecticut State University
Western Oregon University
Westfield State University
Wheaton College (MA)

University of the Pacific FY2012 Go Green MB&A Presentation

Date: January 23, 2012

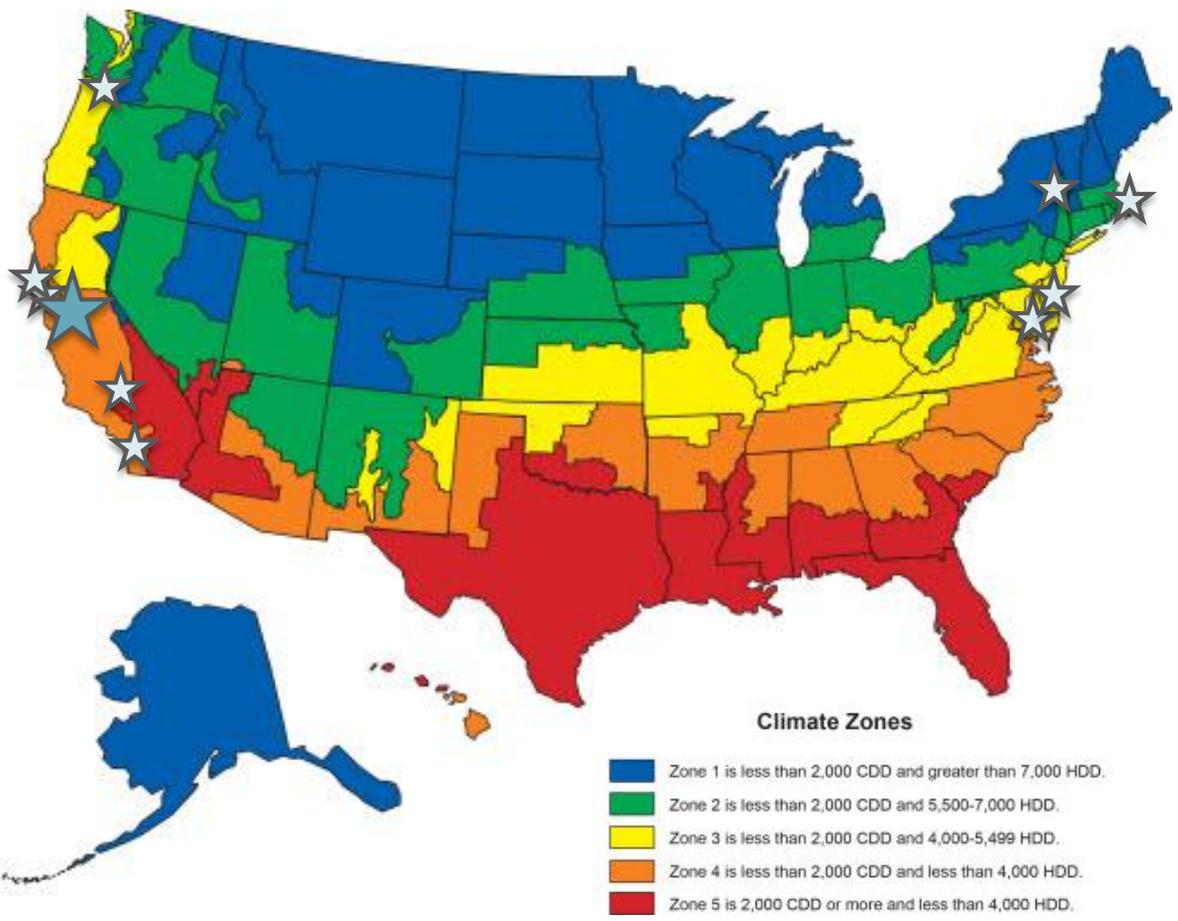
Presented by: Nate Pramuk & Forrest Ching

Sightlines



Developing a Peer Group

Go-Green Measurement, Benchmarking and Analysis



Go-Green Peer Institutions

- Emerson College
- Loyola University Maryland
- Saint Mary's College of California
- Siena College
- The Catholic University of America
- University of Portland
- University of Redlands
- University of San Diego
- University of San Francisco

Peer Group Based On

- Size
- Technical complexity
- Energy use

Go-Green MB&A Members

- Sightlines has approximately 59 Members
- Approximately 66% are private
- Approximately 34% are public
- Approximately 66% have signed the ACUPCC
- Approximately 40% are Charter Signatories



Scope 1 Direct Sources

- On-Campus Stationary
- Direct Transportation
- Refrigerants
- Agriculture

Scope 2 Upstream Sources

- Purchased Electricity

Scope 3 Indirect GHG's

- Faculty/Staff/ Student Commuting
- Directly Financed Air Travel
- Study Abroad Travel
- Solid Waste
- Wastewater
- Purchased Paper
- Transfer & Distribution Losses



Core Observations

Space:

- 70% of GSF is over 25 years old, a construction era characterized by cheap energy and few efficiency or conservation measures incorporated into building design.
- Lower density factor than peers - increases GHGs/student
- High summer temperature and air conditioning needs, energy consumption above peer average

Impactful but Invisible:

- Dramatic reductions in reported fossil consumption from 2008-2012 produce significant carbon savings
- Electricity consumption above peer average, may have an opportunity to set targets and outperform peer group
- Supported by “green” utility infrastructure – California grid and natural gas use on campus

Visible and Visceral:

- Commuting, air travel and solid waste dominate Scope 3 emissions and provide opportunities to highlight or further engage the campus community
- Producing more waste than peers, but diverting twice as much as the Sightlines database average
- Higher commuting emissions primarily the result of longer trip distances and a strong drive alone culture at Pacific



GHG Emissions per 1,000 GSF



Stresses intensity of operations
and commuting.

"Space"

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

GHG Emissions per Student



Stresses efficient use of space.

"Users"

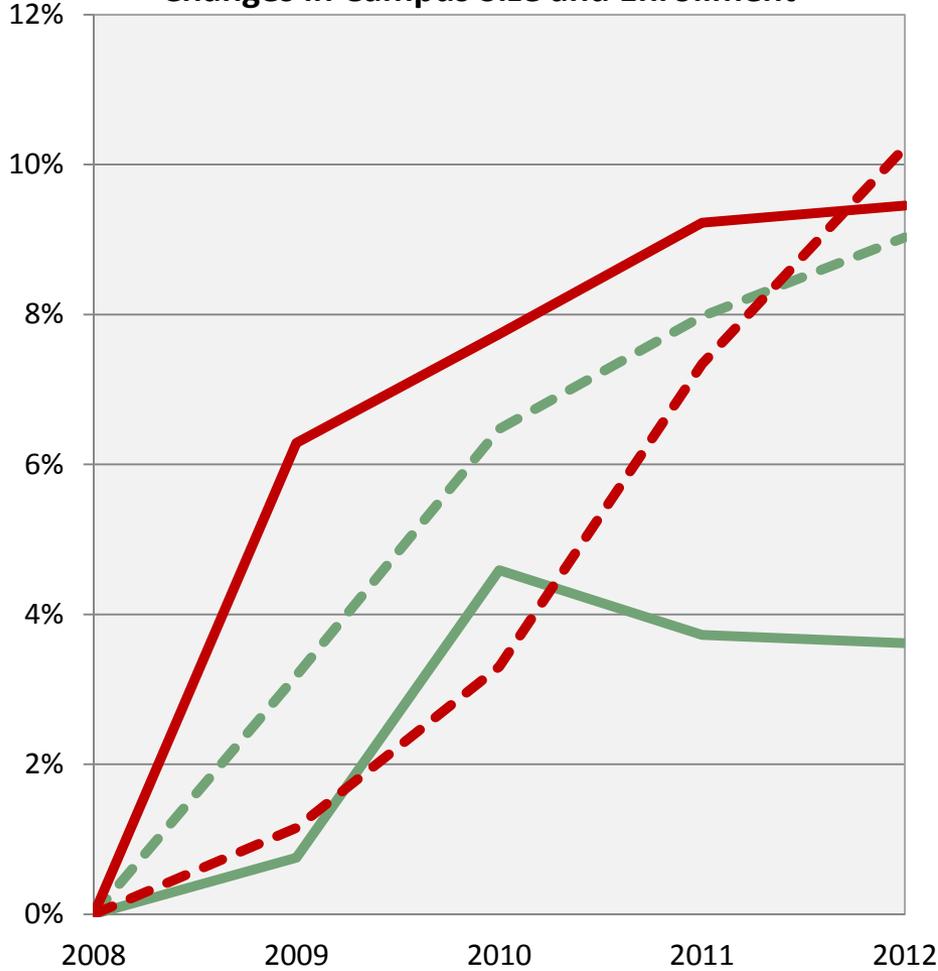
$$\frac{\text{Gross GHG Emissions}}{\text{Total Student FTE}}$$

Users In Context

Enrollment growing slightly faster than GSF

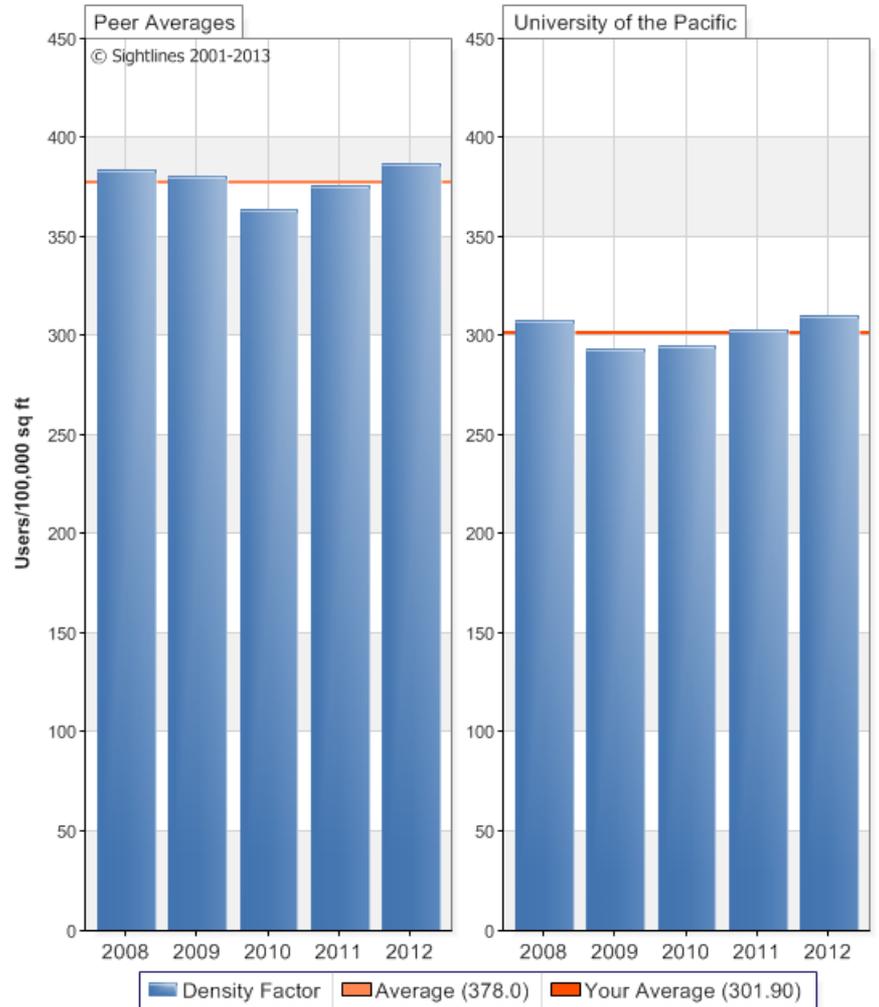


Changes in Campus Size and Enrollment



— Peer Average GSF - - - Peer Average Enrollment
— Pacific GSF - - - Pacific Enrollment

Density Factor

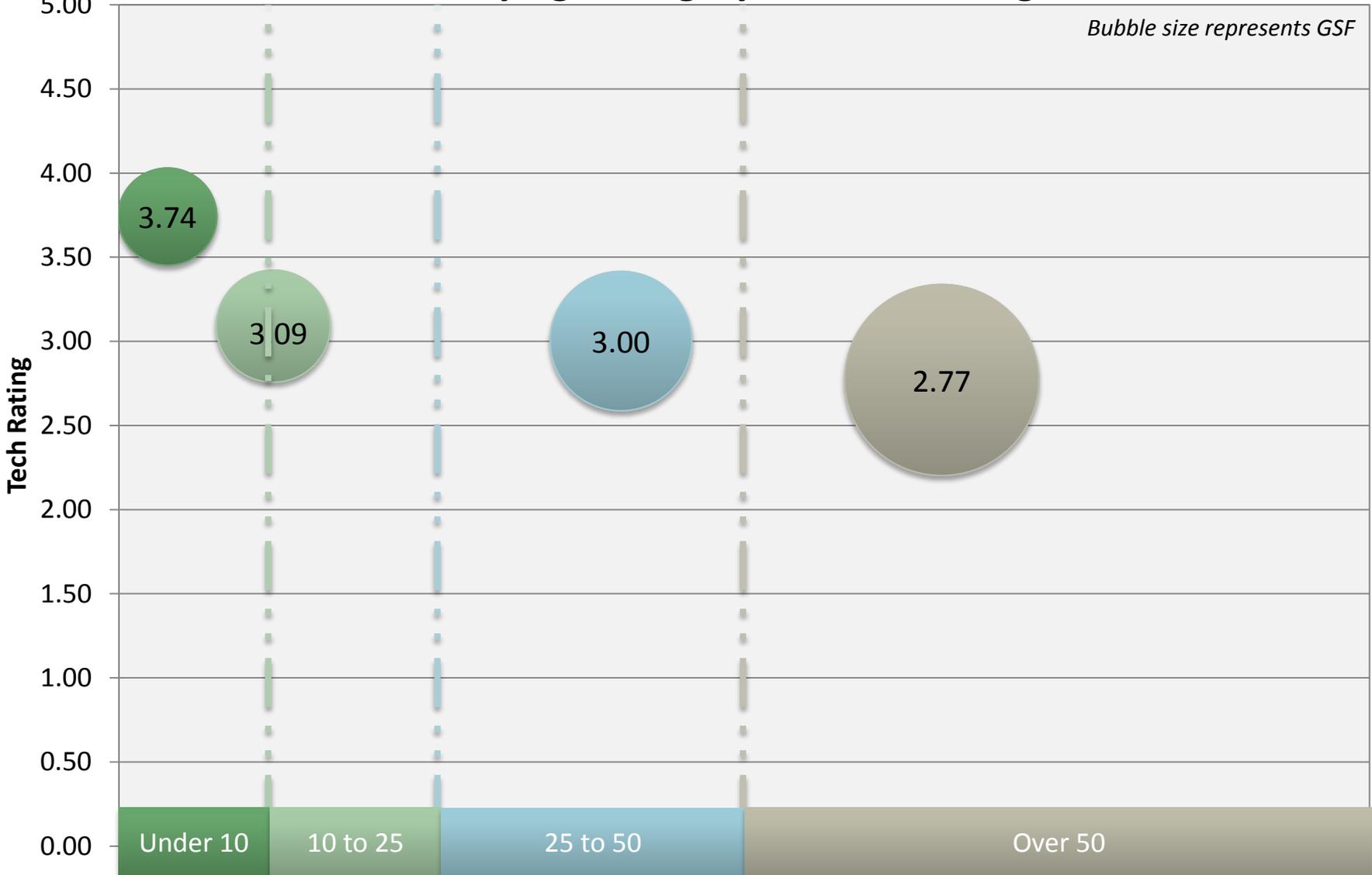


■ Density Factor — Average (378.0) — Your Average (301.90)





GSF by Age Category and Tech Rating

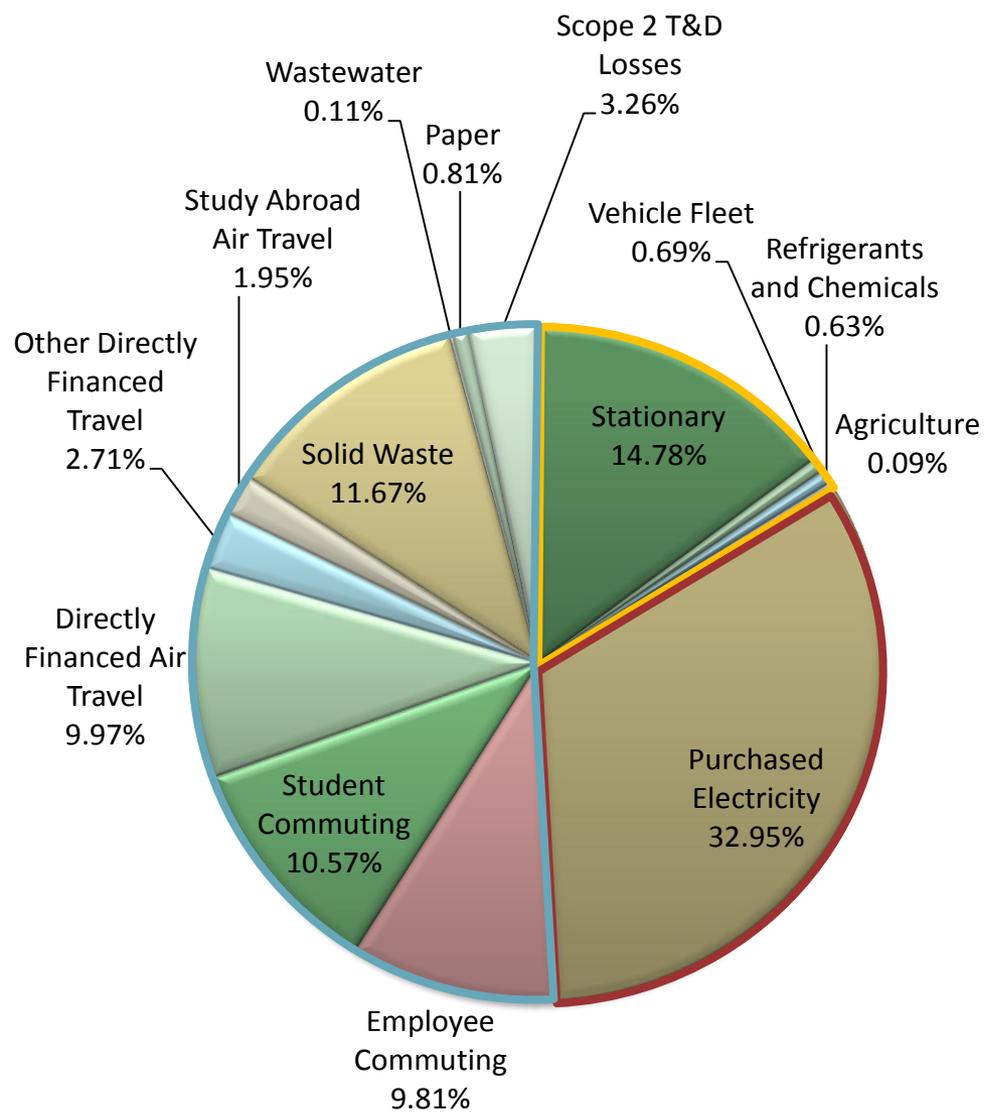


Total FY12 Gross Emissions: 23,834 MTCDE

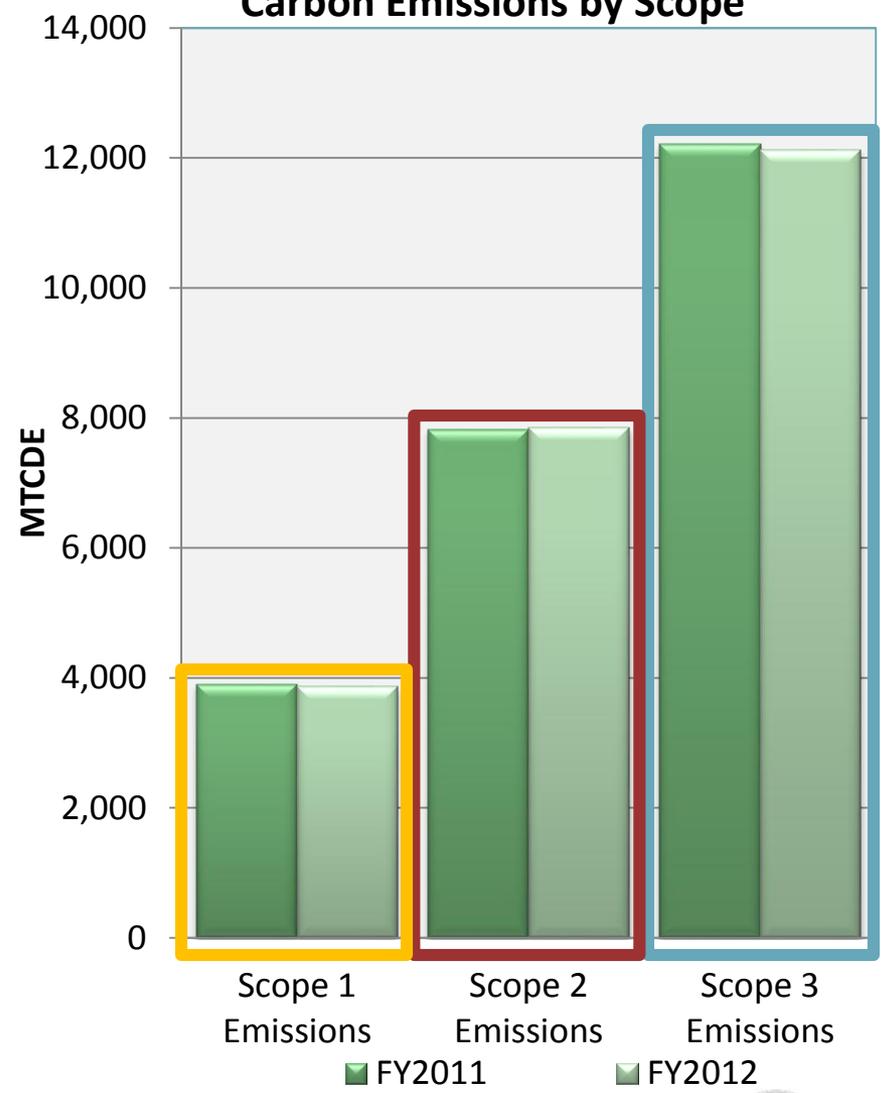
Scope 3 has the largest impact on gross campus emissions, often hardest to reduce



Carbon Emissions FY12



Carbon Emissions by Scope



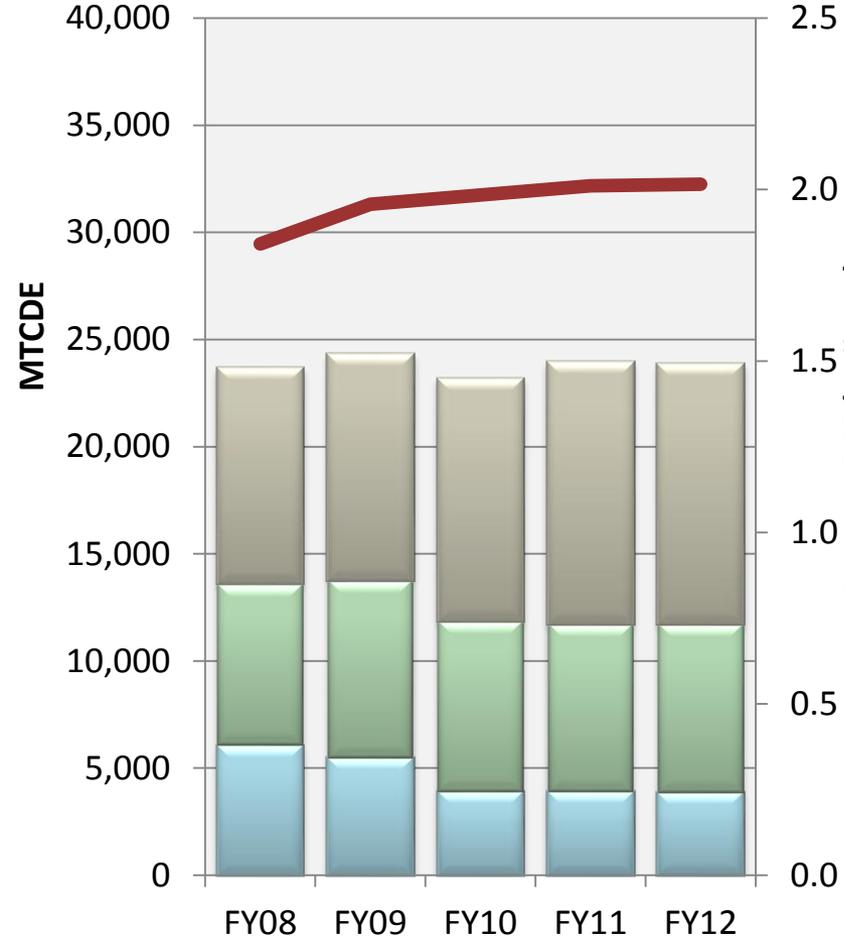
GHGs Flat as Campus Expands in Size

Significant decreases in Scope 1 & 2 emissions despite growing campus



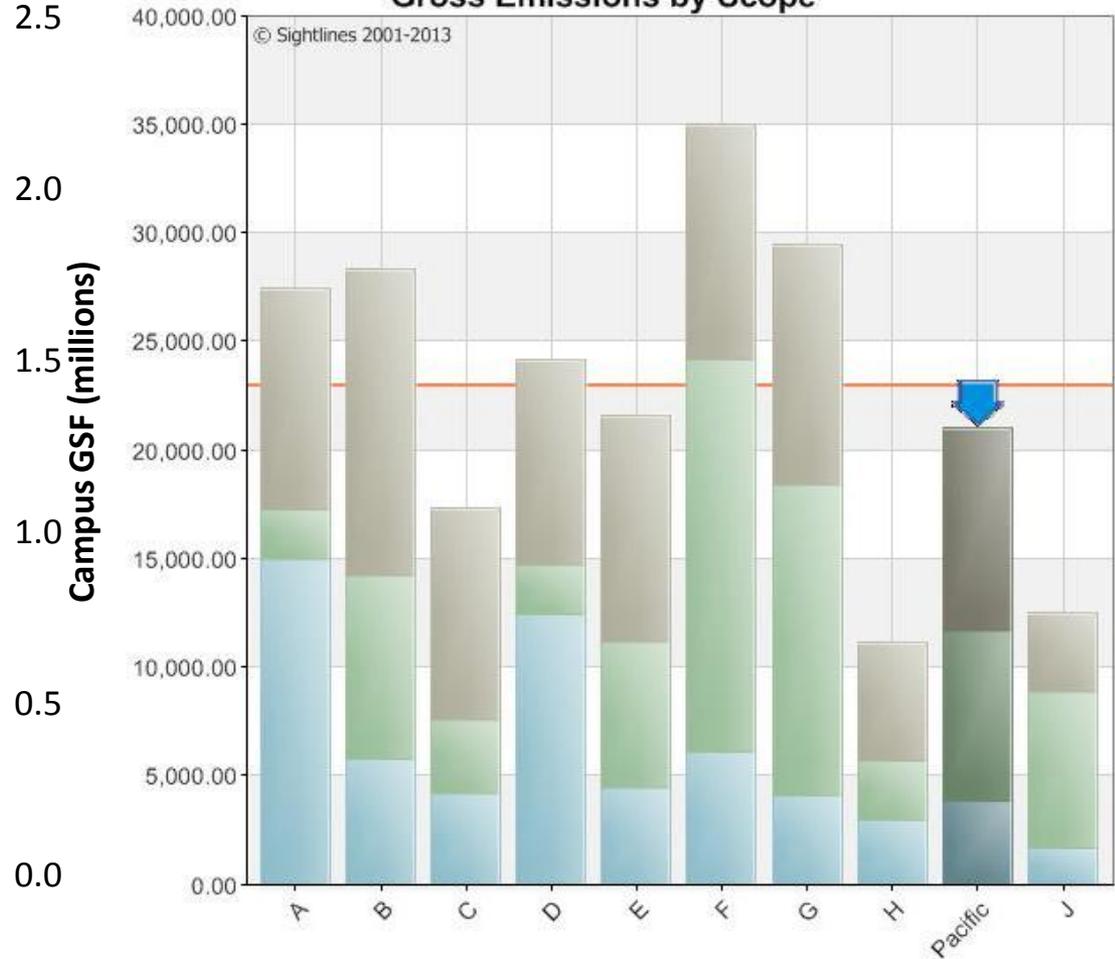
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Longitudinal Gross Emissions



GSF

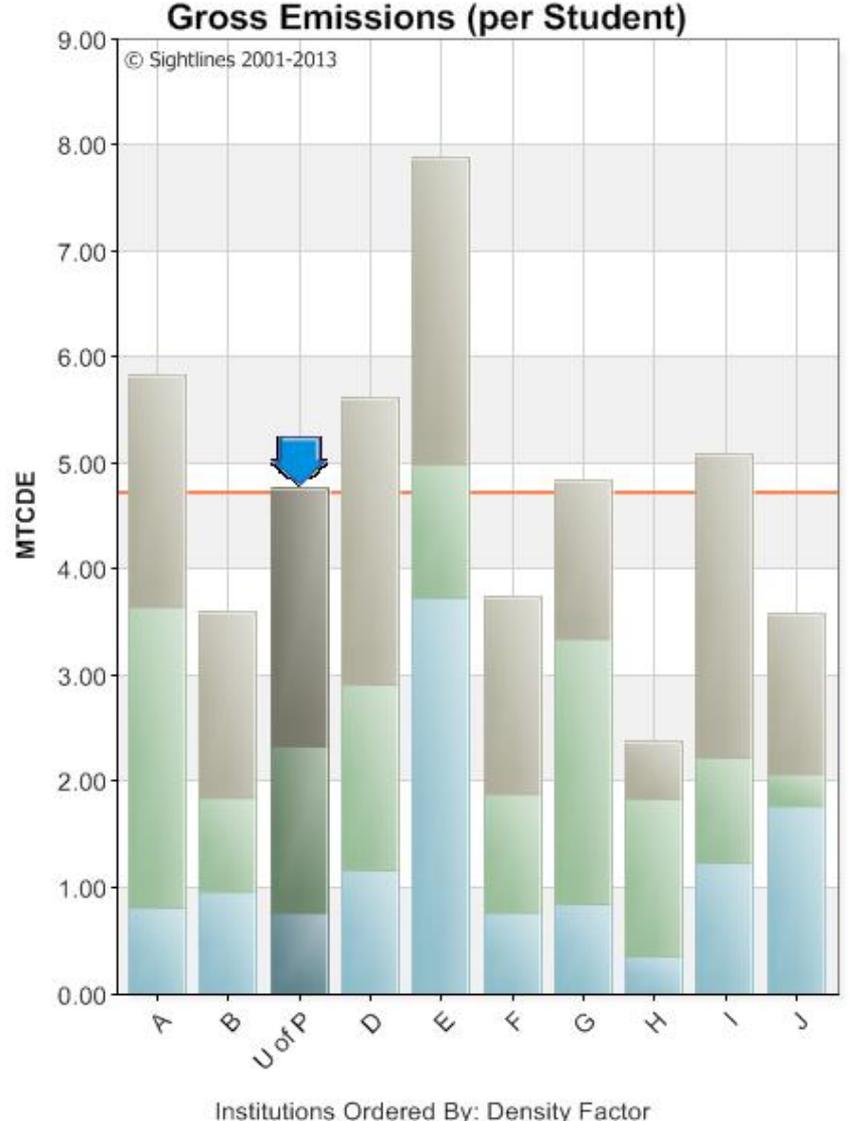
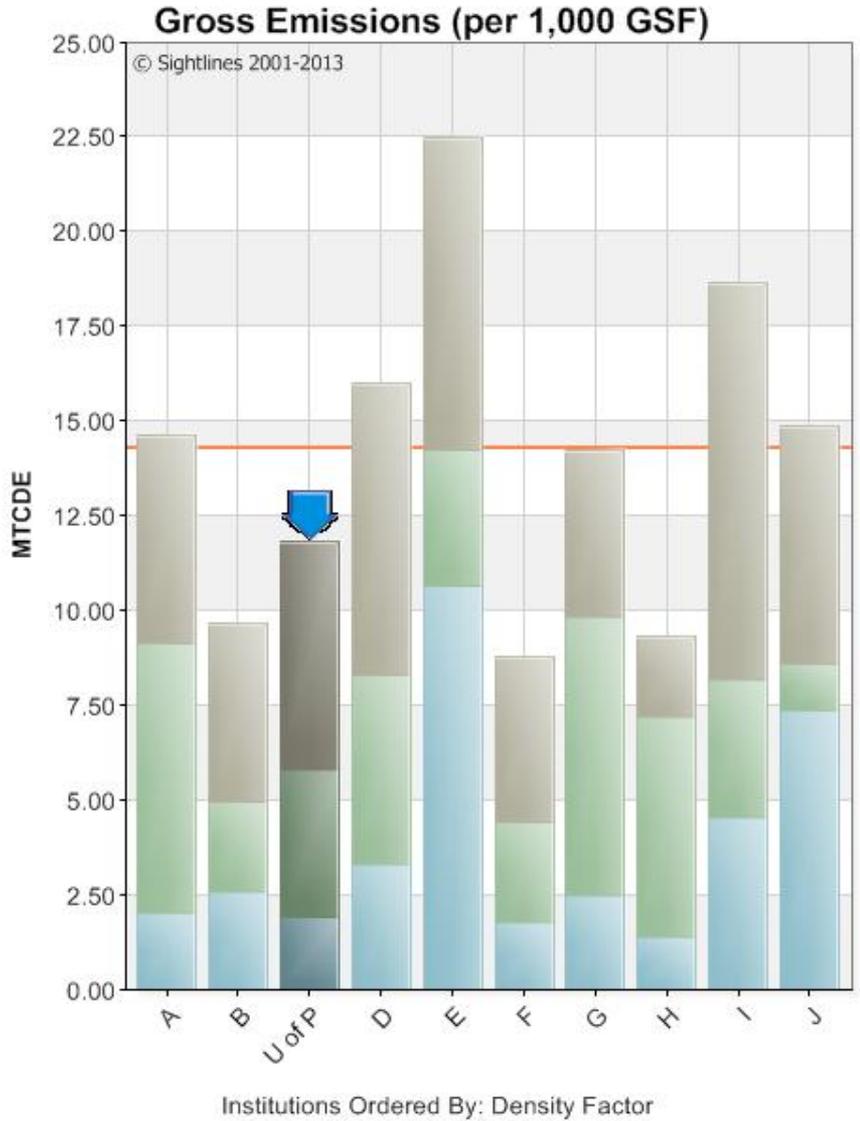
Gross Emissions by Scope



Scope 1 Scope 2 Scope 3

Normalized Emissions

Lower GHG emissions than peers for campus size, similar for # of users



Scope 1
 Scope 2
 Scope 3

Balancing Sustainability Initiatives

Striving for both structural & cultural change



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**Impactful but
Invisible**

Visible and Visceral

Necessary to tackle core challenges of operational sustainability – space management, energy use, etc.

Necessary to engage, excite and motivate the community to change personal behaviors – waste diversion, water use, commuting, etc.

Utility Emissions

“Impactful but Invisible”

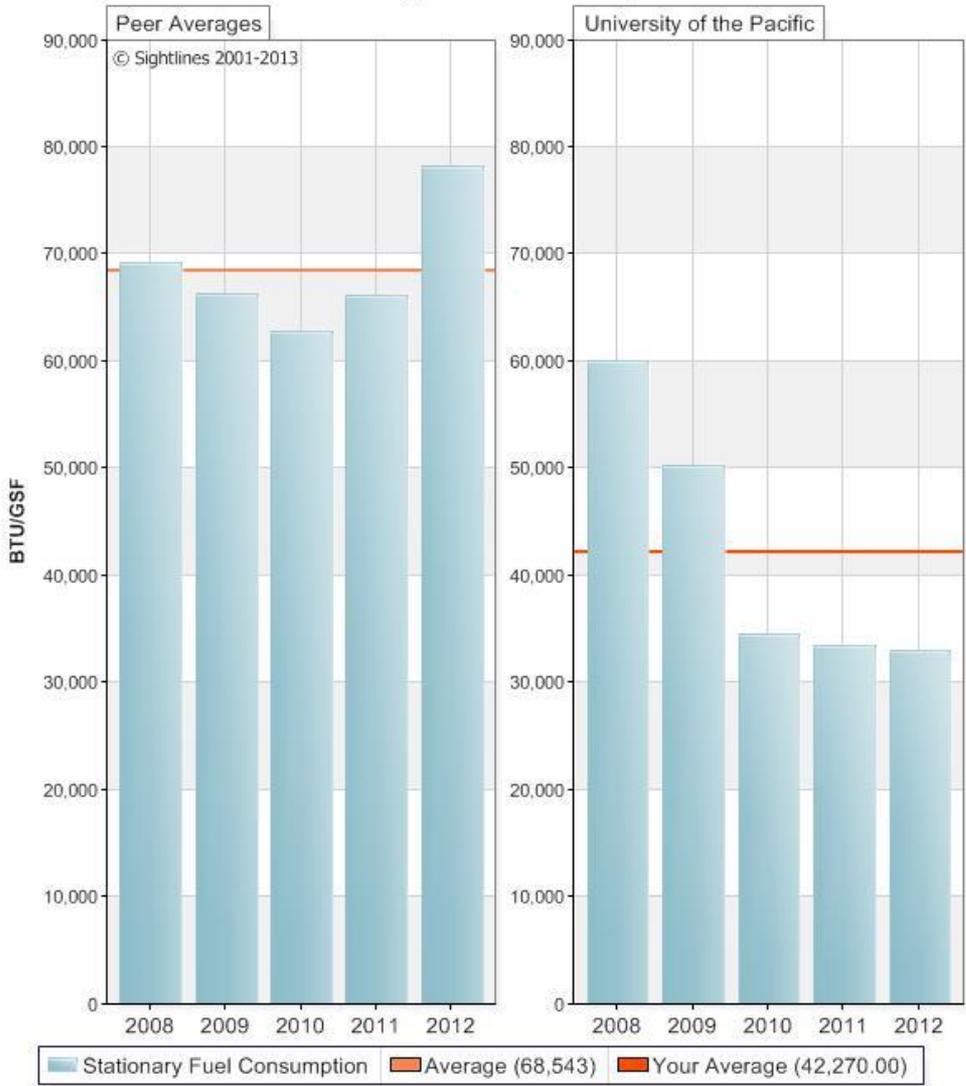


Fossil Fuel Consumption

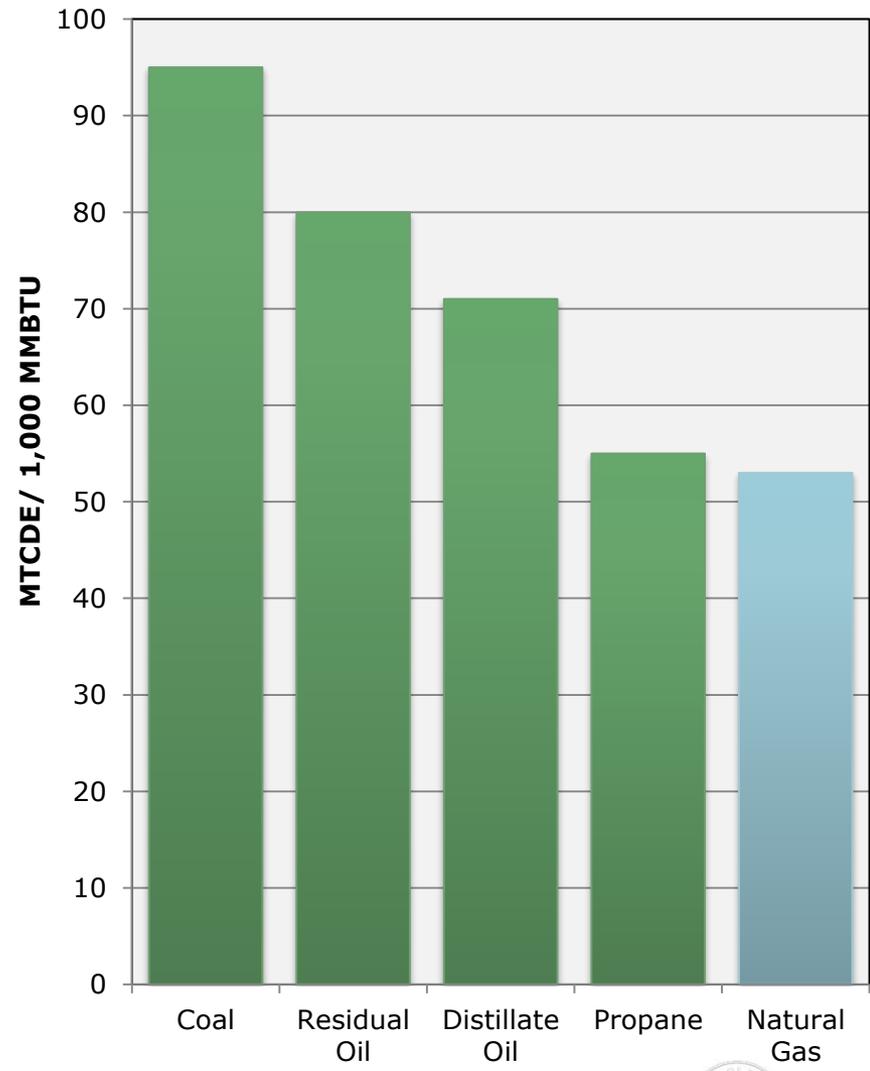
Return on investment into efficient boilers shows, energy decrease since FY08



Stationary Fuel Consumption



Carbon Intensity of Commonly Used Fossil Fuels

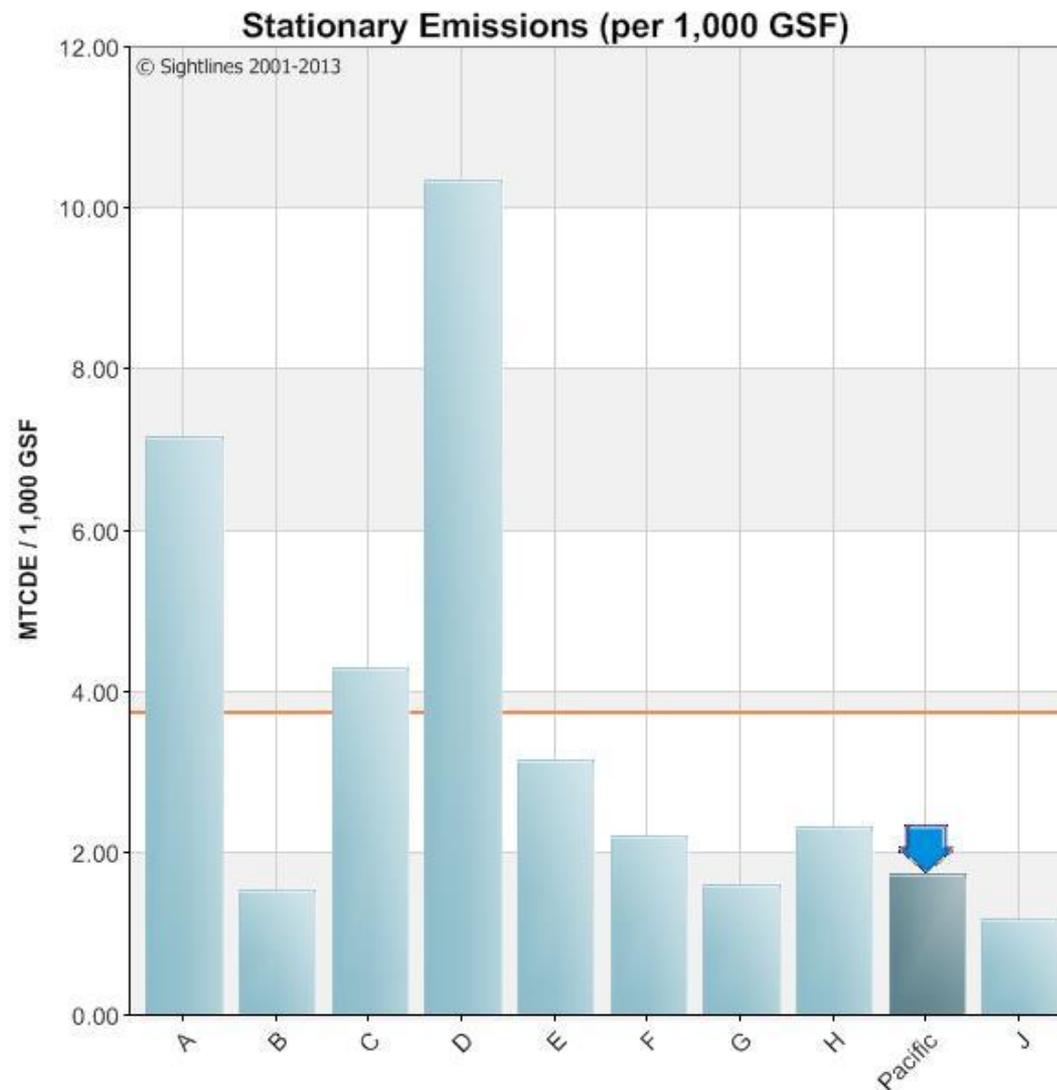
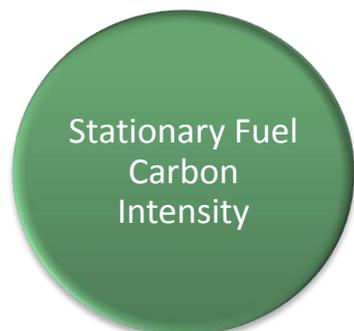


Scope 1 Emissions

Stationary emissions are lower than peers



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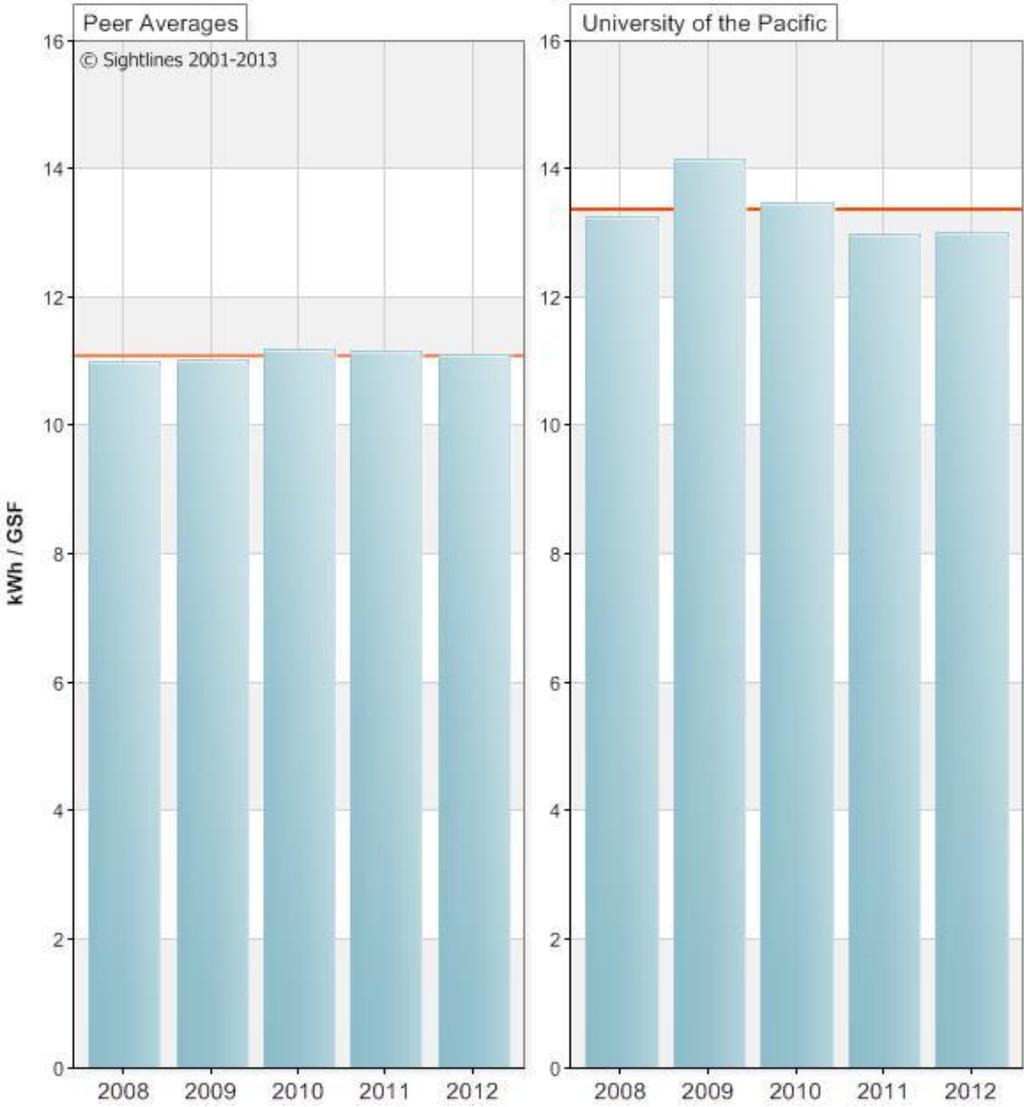


Electric Consumption

Consuming more electricity than peer average, higher climactic needs



Purchased Electricity Consumption



*The decrease in electricity consumption from **FY09 to FY12** is equivalent to taking 338 passenger vehicles off of the road*

Carbon Intensity by Grid

eGrids have gotten "greener" since 2007



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Carbon Intensity by Grid Region

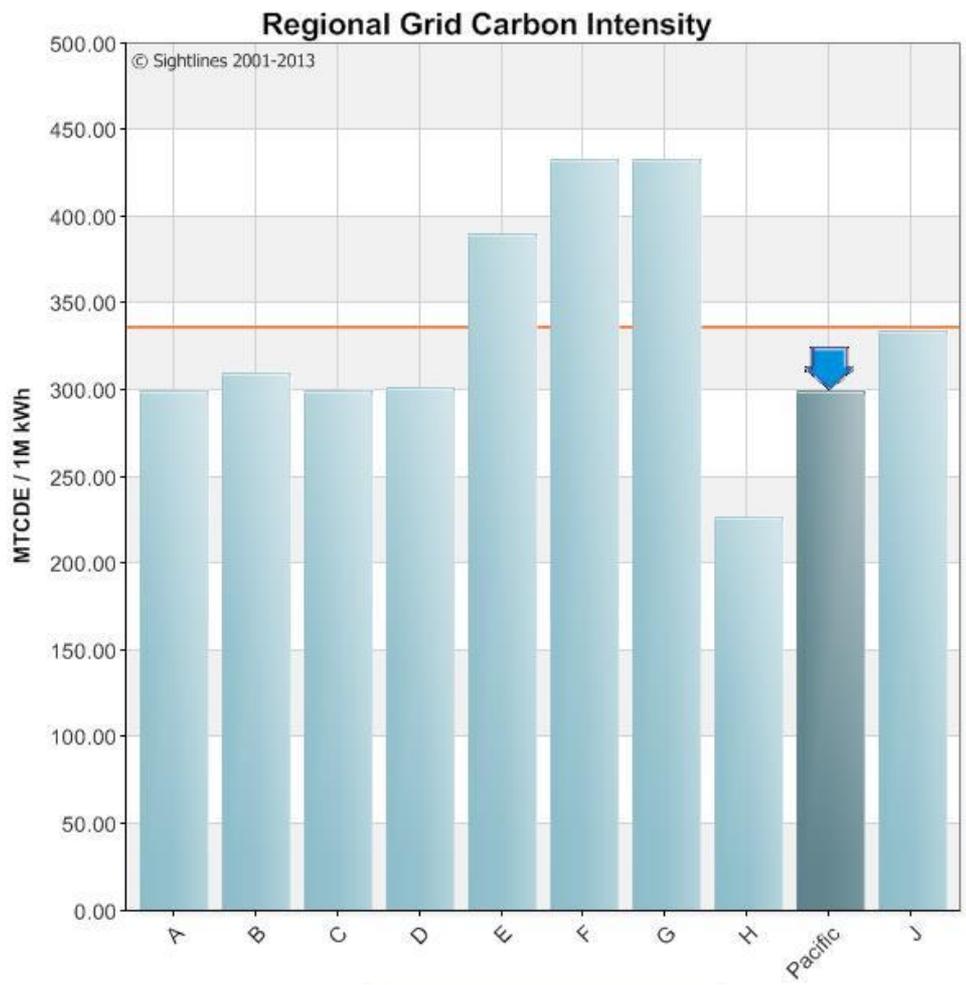


Peer Group Carbon Intensity

Pacific's grid is greener than more than half of peers

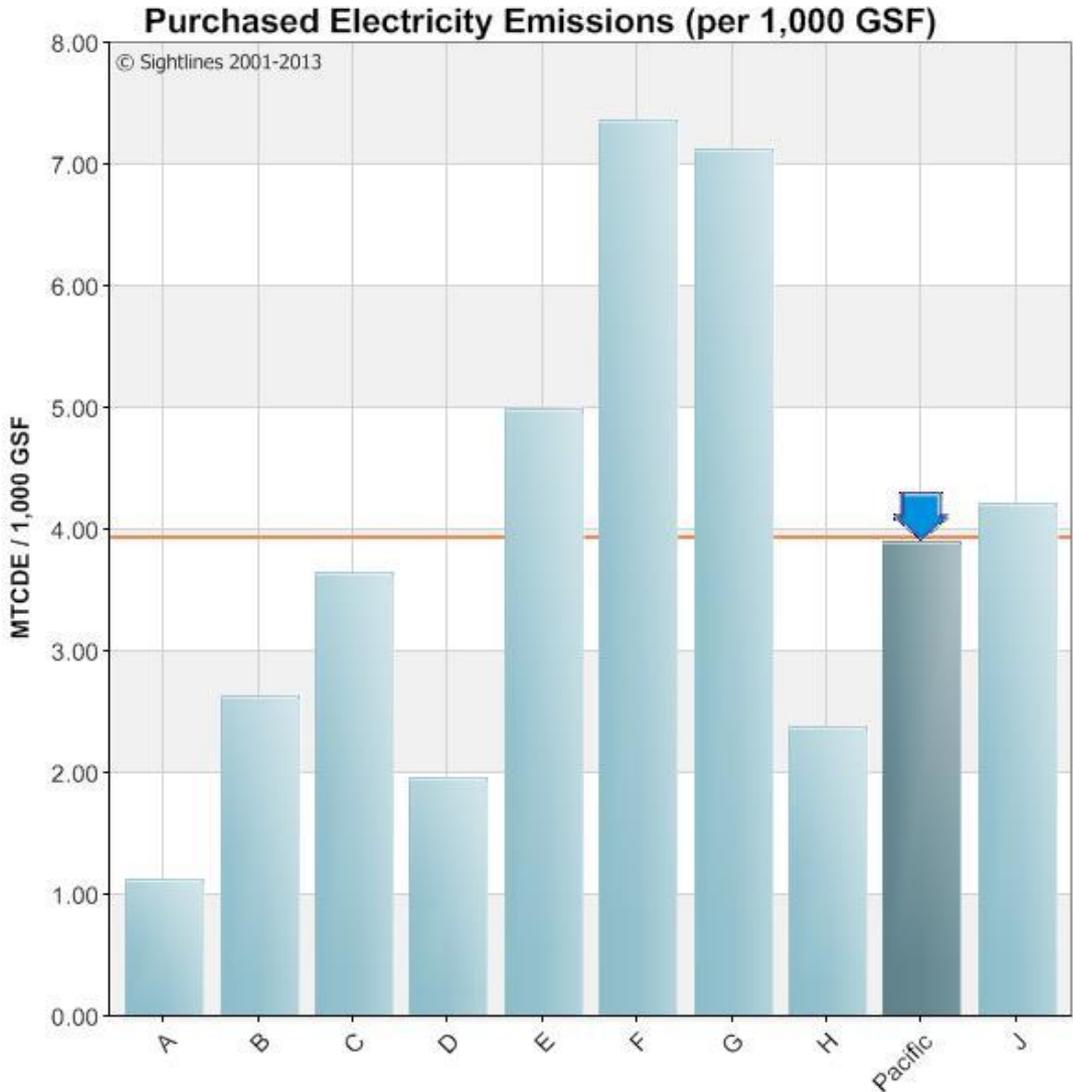
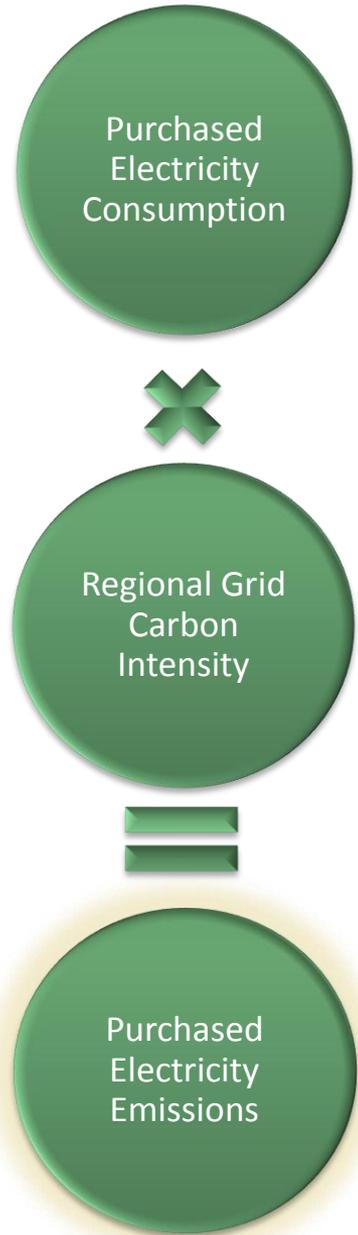


5 of the 9 peers are in a higher carbon intensity grid, resulting in a higher peer average.



Purchased Electricity

A cleaner grid curbs the emissions attributed to having higher energy needs



Lower total emissions than peers despite higher needs

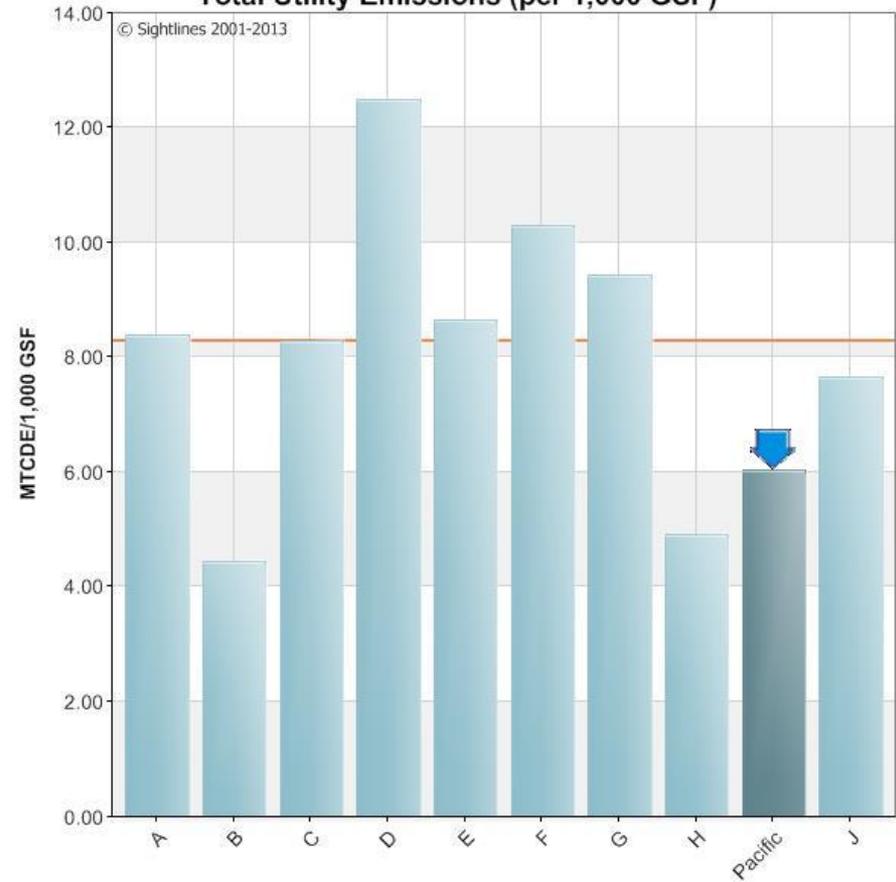
Attributed to significant investments into more efficient chillers and A/C



Total Energy Consumption



Total Utility Emissions (per 1,000 GSF)



Scope 3 Emissions

“Visible and Visceral”

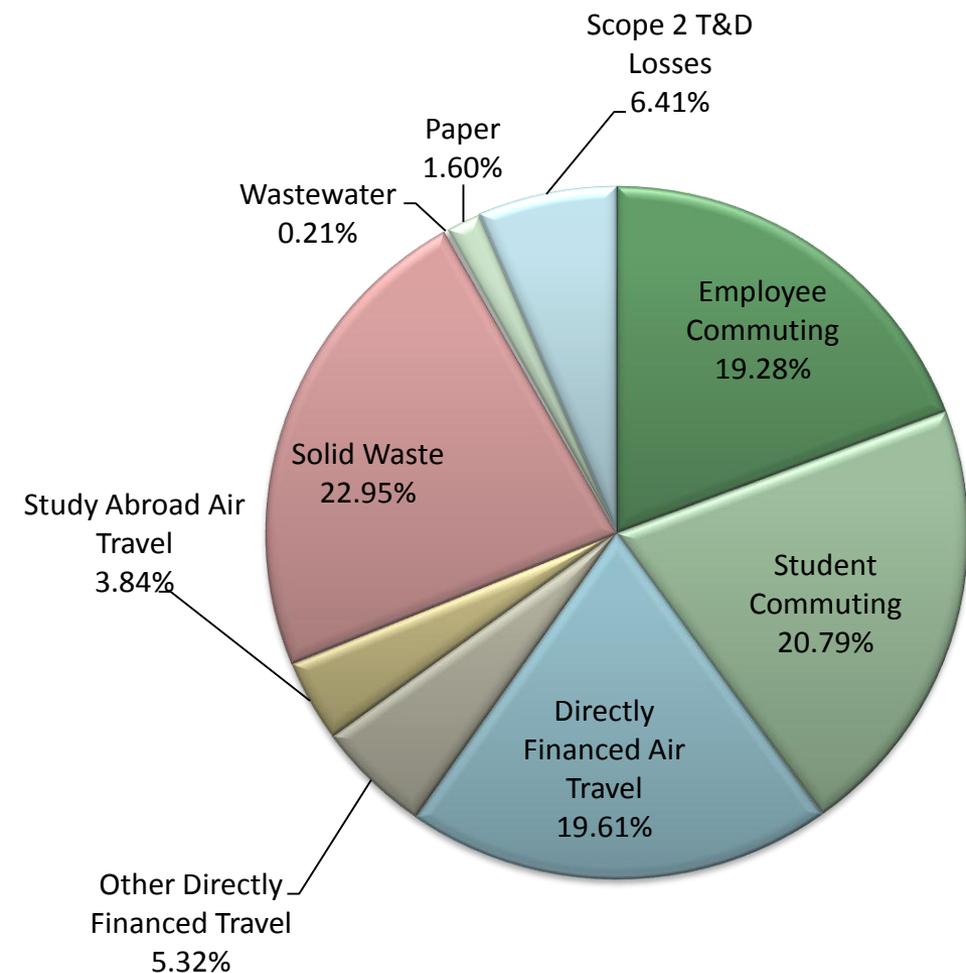


Scope 3 Emissions

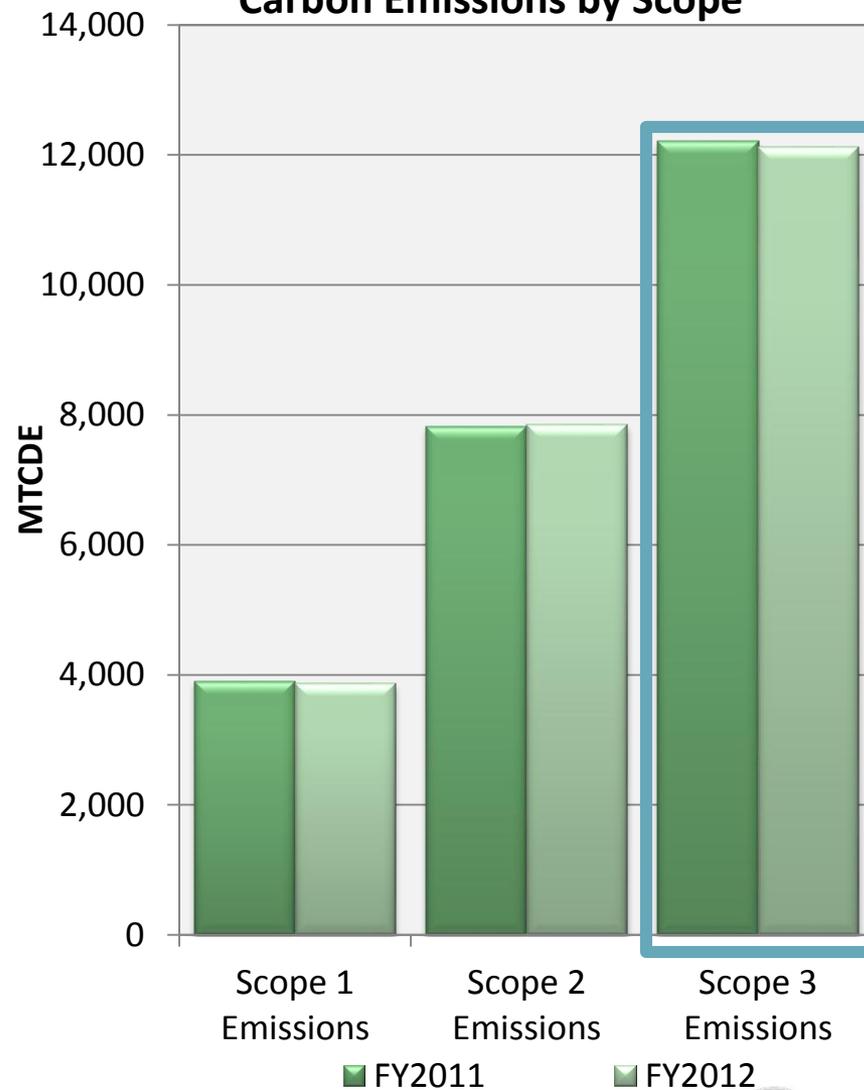
Accounts for 51% of campus emissions



Scope 3 Emissions FY12



Carbon Emissions by Scope





Institutional
Responsibility

- Policy
- Infrastructure

Individual
Responsibility

- Engagement
 - Solid Waste
 - Air Travel
 - Commuting

Combination
of
infrastructure
and campus
culture



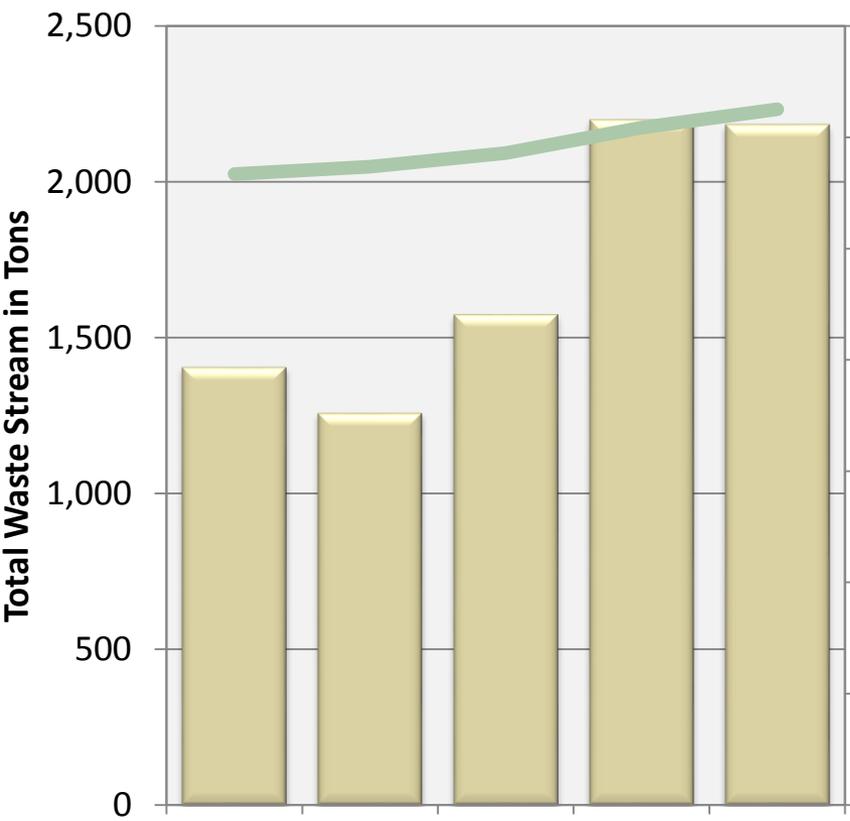
Pacific makes its campus initiatives visible, encouraging a sustainability-minded culture.

Landfill Rates

Significant increase in total waste since FY09

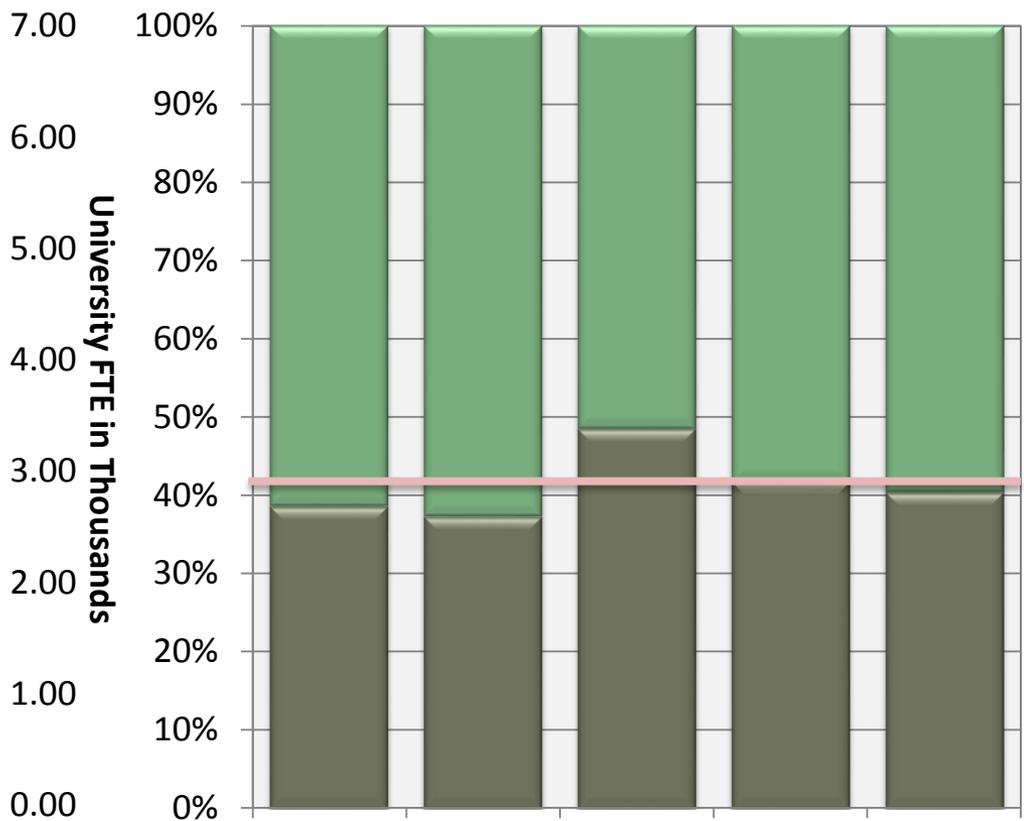


Total Waste Stream vs. Campus Users



Total Waste Stream
 Campus FTE

Landfill vs. Diversion Rates



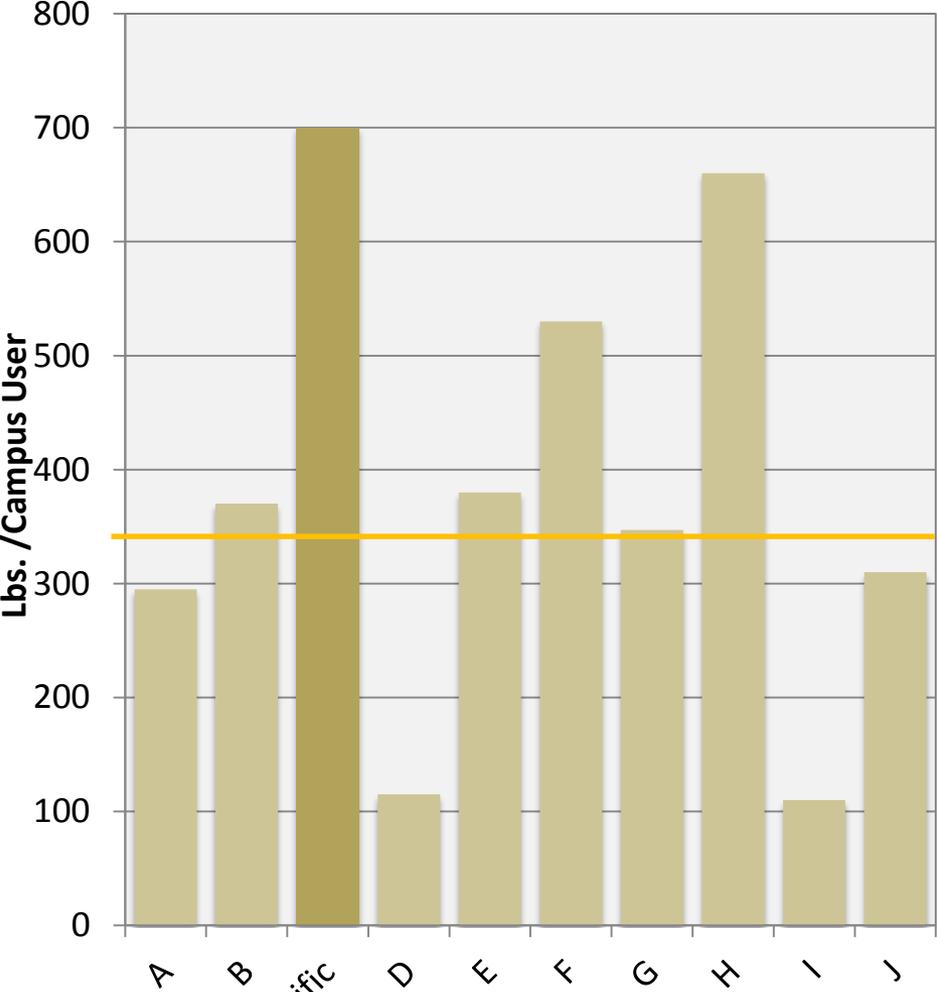
Landfill Waste
 Total Diverted Waste

Generating twice as much waste per person than peers

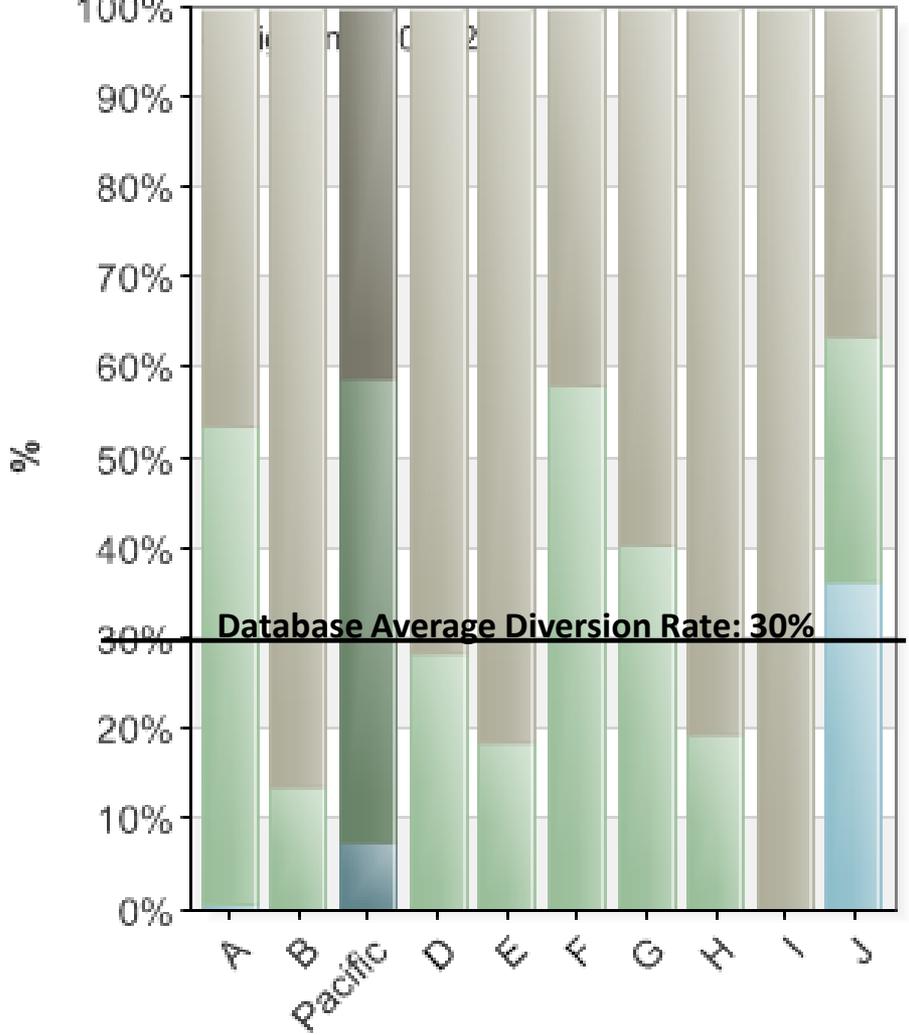
Diversion levels are among the highest in a top performing peer group



Total Waste Stream (per User)



Total Waste Distribution



Compost

Recycling

Landfill/Incinerated

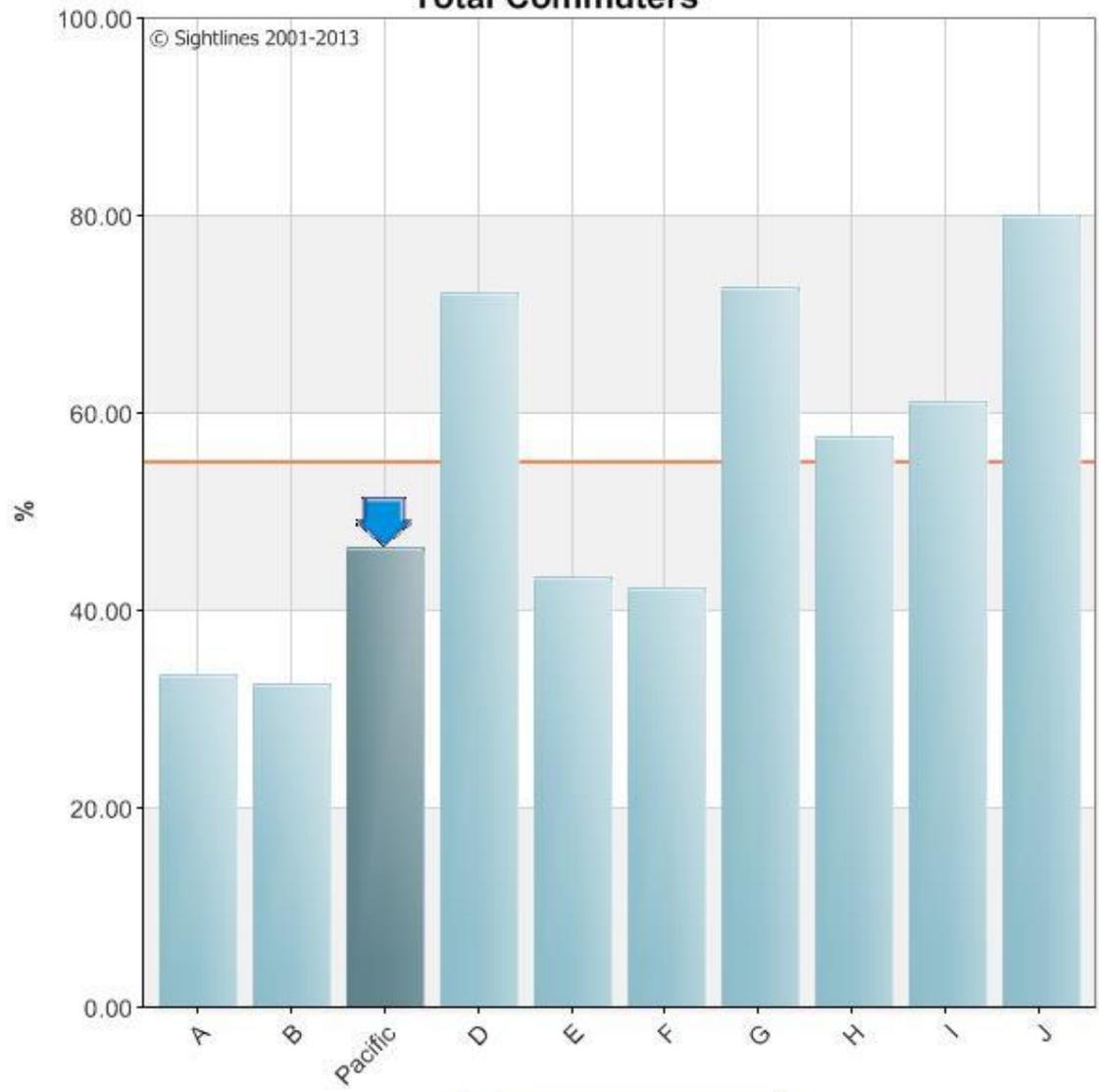
Campus commuting profile

Commuting profile defined by longer trip distance and drive alone habits



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Total Commuters



Major Impacts for Commuting Emissions

How Many?

	% of Users Commuting
Pacific	46%
Peer Average	55%

Note: Information from Rider 2010 commuting survey

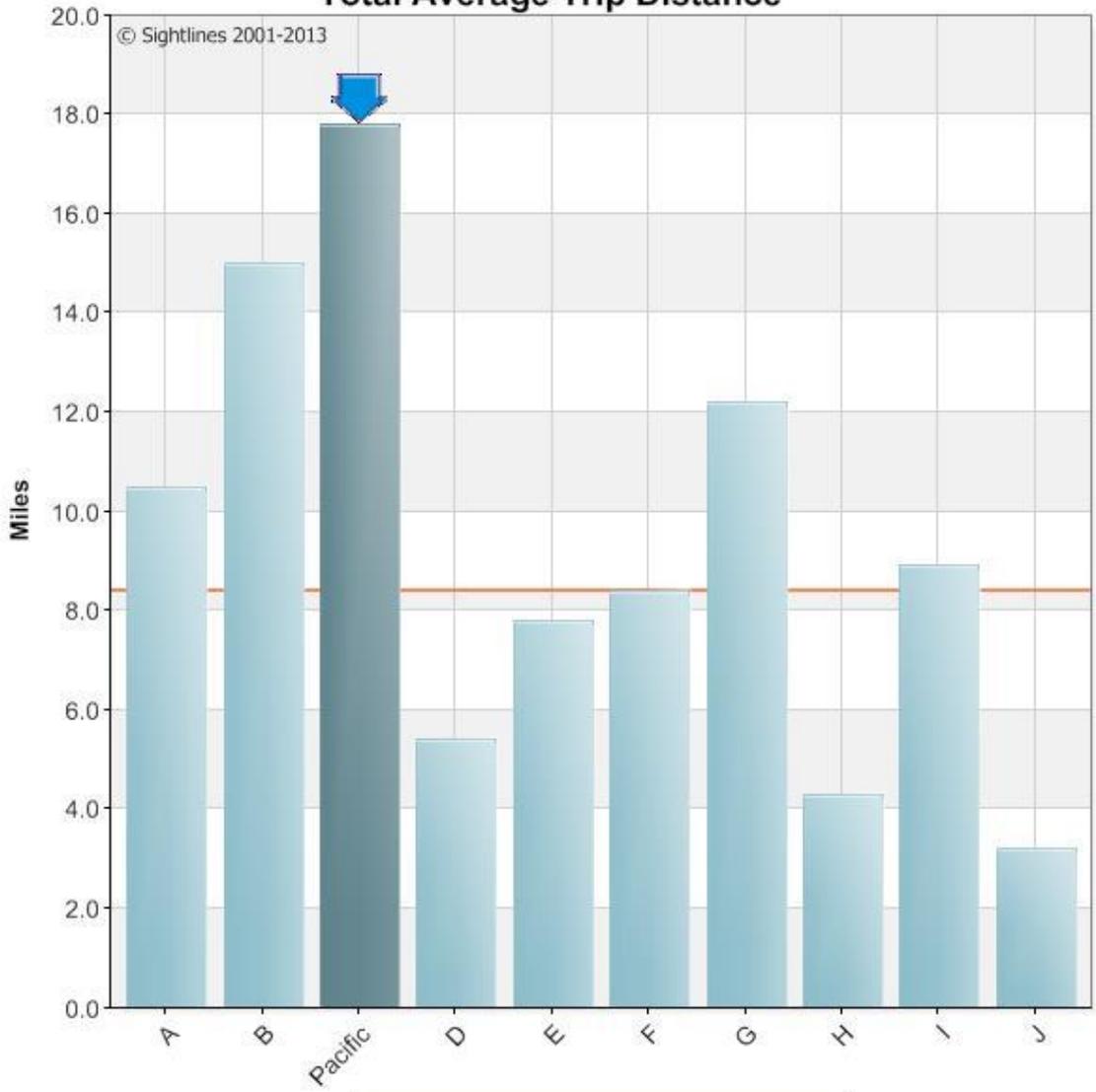


Campus commuting profile

Commuting profile defined by longer trip distance and drive alone habits



Total Average Trip Distance



Major Impacts for Commuting Emissions

How Many?

	% of Users Commuting
Pacific	46%
Peer Average	55%

How Far?

	Average One-Way Trip
Pacific	17.78 Miles
Peer Average	8.4 Miles

Note: Information from Rider 2010 commuting survey

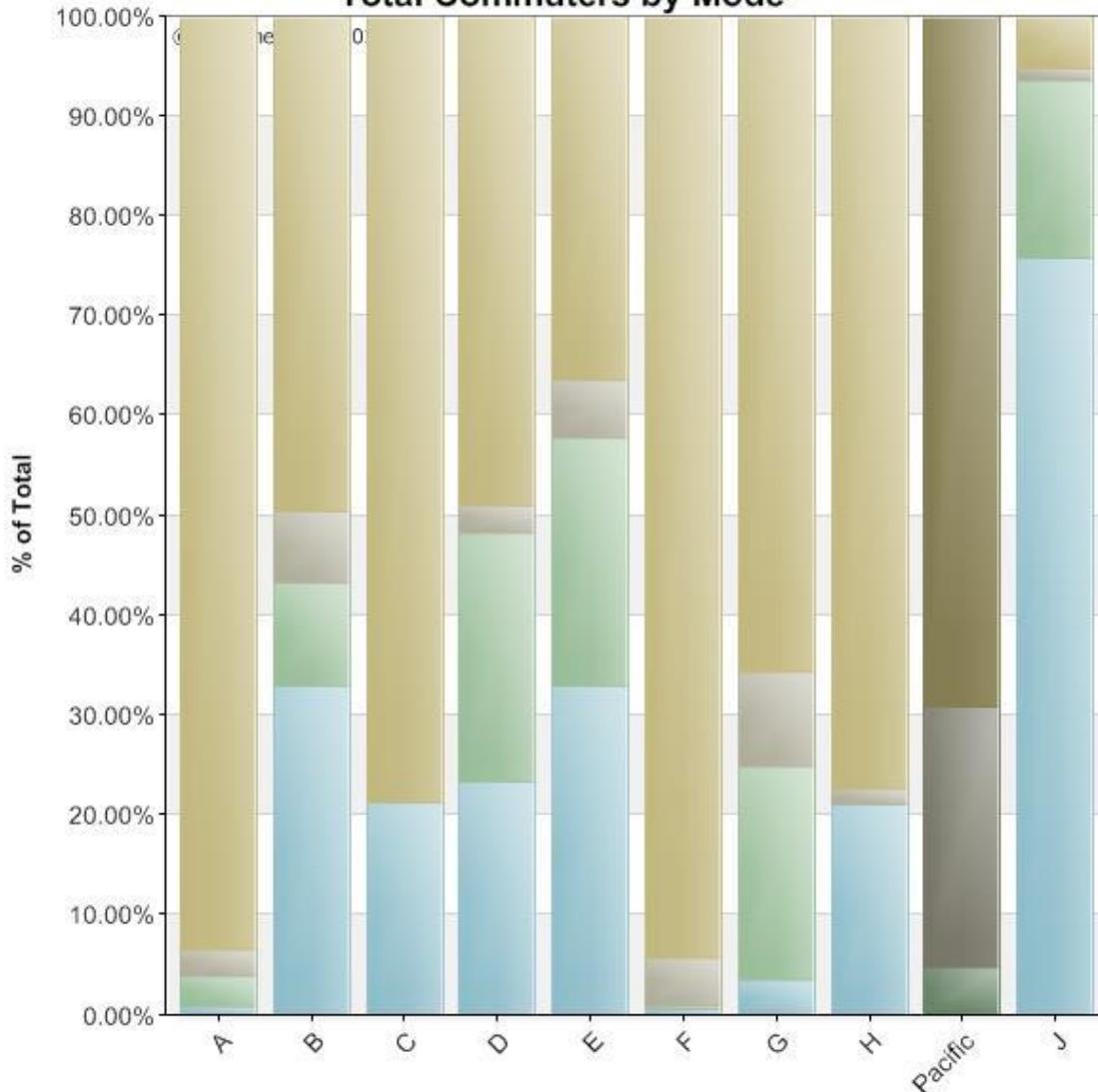
Campus commuting profile

Commuting profile defined by longer trip distance and drive alone habits



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Total Commuters by Mode



Major Impacts for Commuting Emissions

How Many?

	% of Users Commuting
Pacific	46%
Peer Average	55%

How Far?

	Average One-Way Trip
Pacific	17.78 Miles
Peer Average	8.4 Miles

What Mode?

	% by Automobile
Pacific	95%
Peer Average	65%

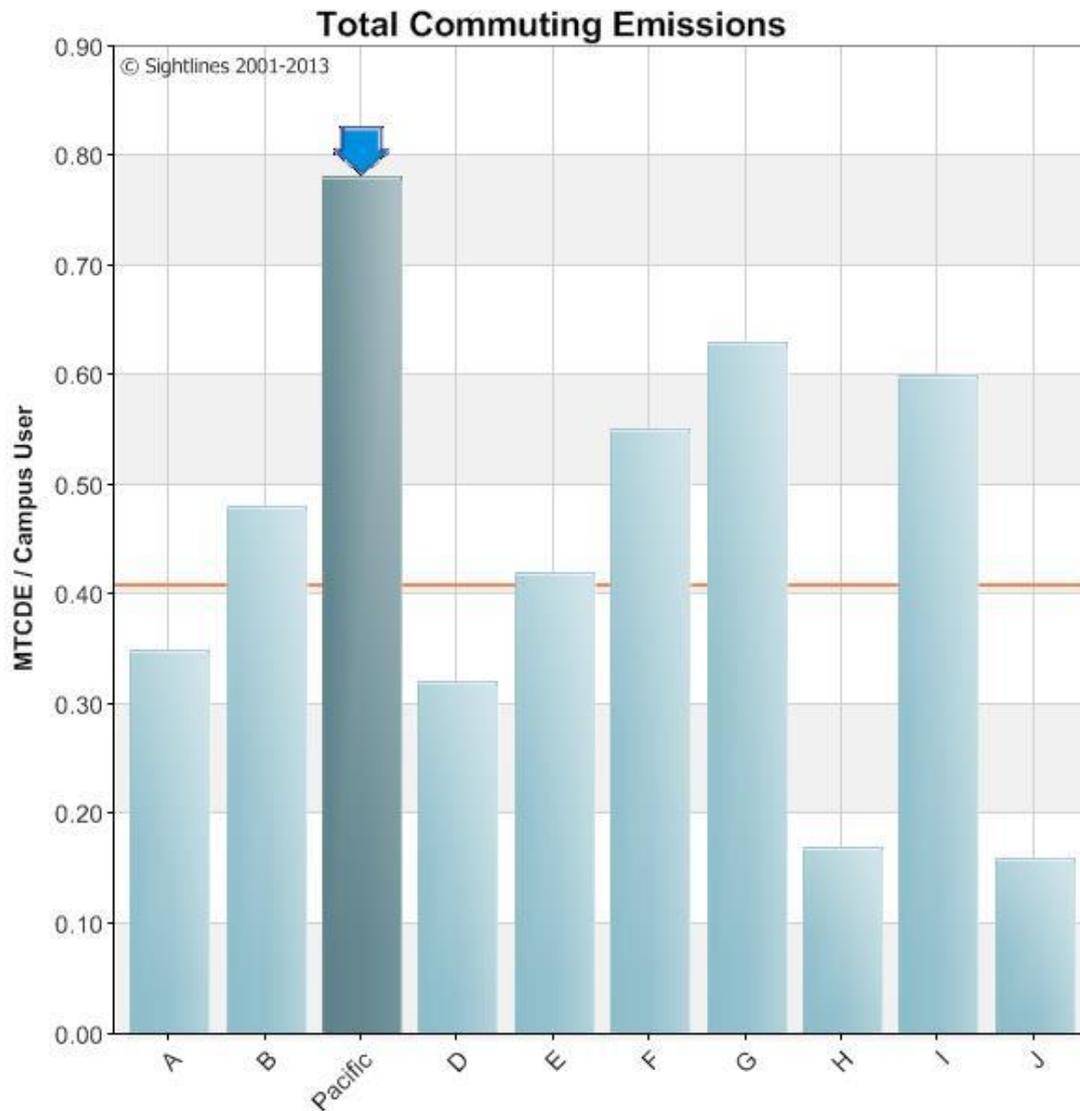
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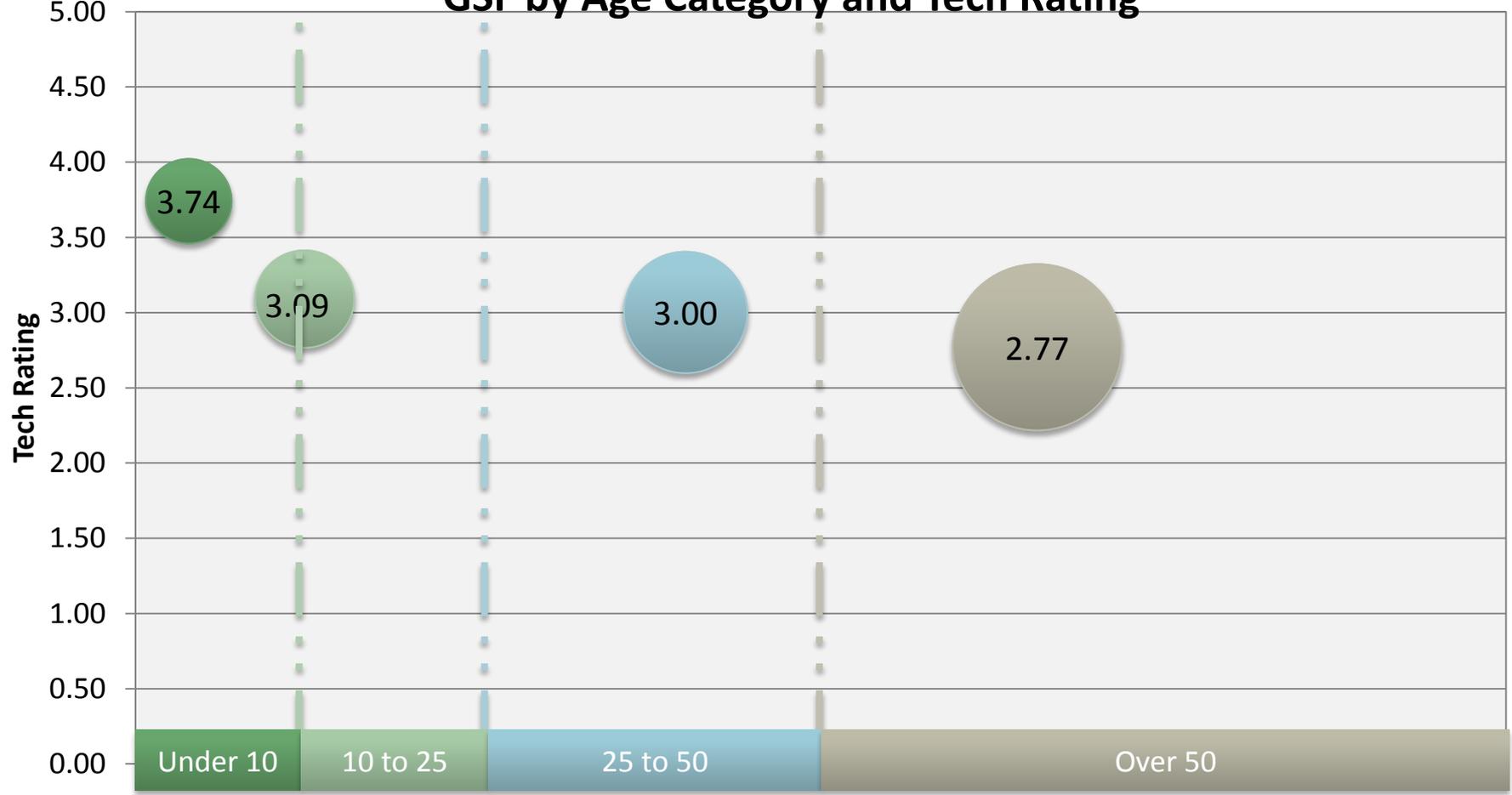
Conclusions





Pacific's campus age and tech rating make GHG reduction efforts challenging

GSF by Age Category and Tech Rating



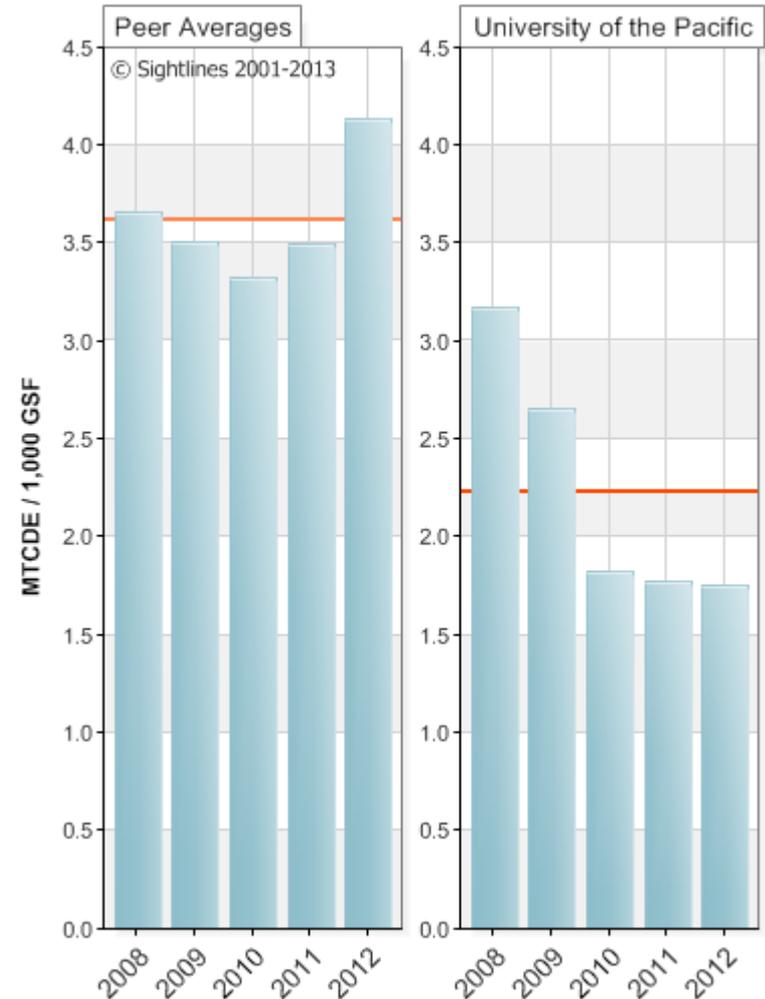


Pacific's campus age and tech rating make GHG reduction efforts challenging



Strong progress has been made on core invisible but impactful areas of the campus GHG profile. Most notably this is seen in fossil fuel consumption reductions since 2008.

Stationary Emissions (per 1,000 GSF)



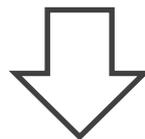
Concluding Comments



Pacific's campus age and tech rating make GHG reduction efforts challenging

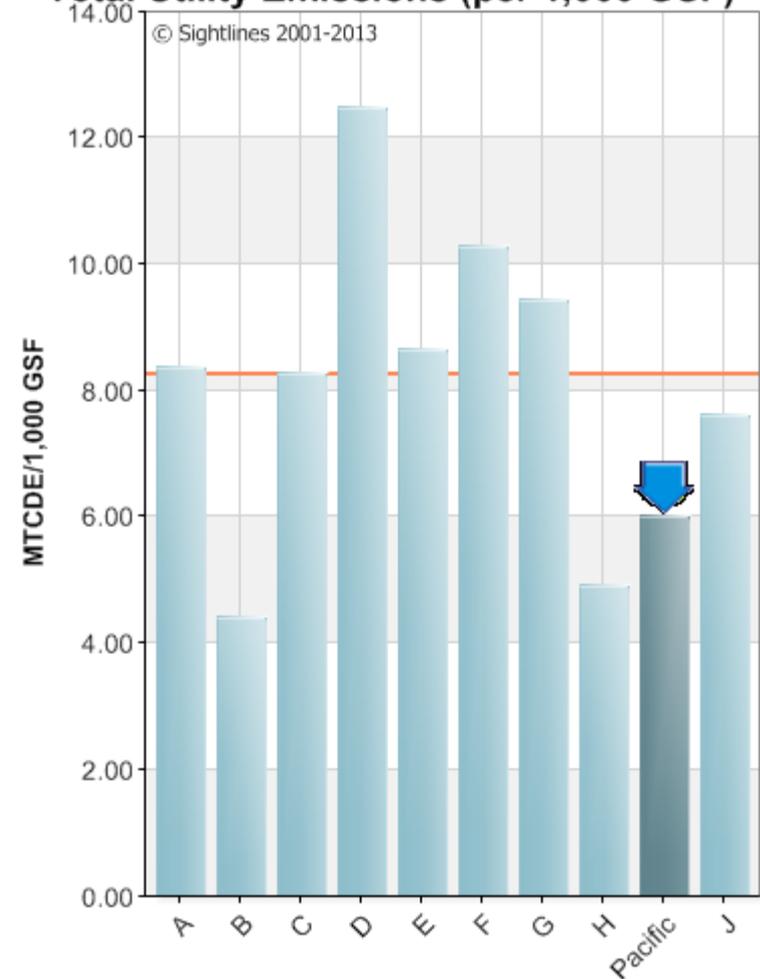


Strong progress has been made on core invisible but impactful areas of the campus GHG profile. Most notably this is seen in fossil fuel consumption reductions since 2008.



Despite higher needs and consumption, Pacific's total utility emissions are still below that of peers. This is primarily the result of investment into more efficient HVAC components and a "greener" electrical grid.

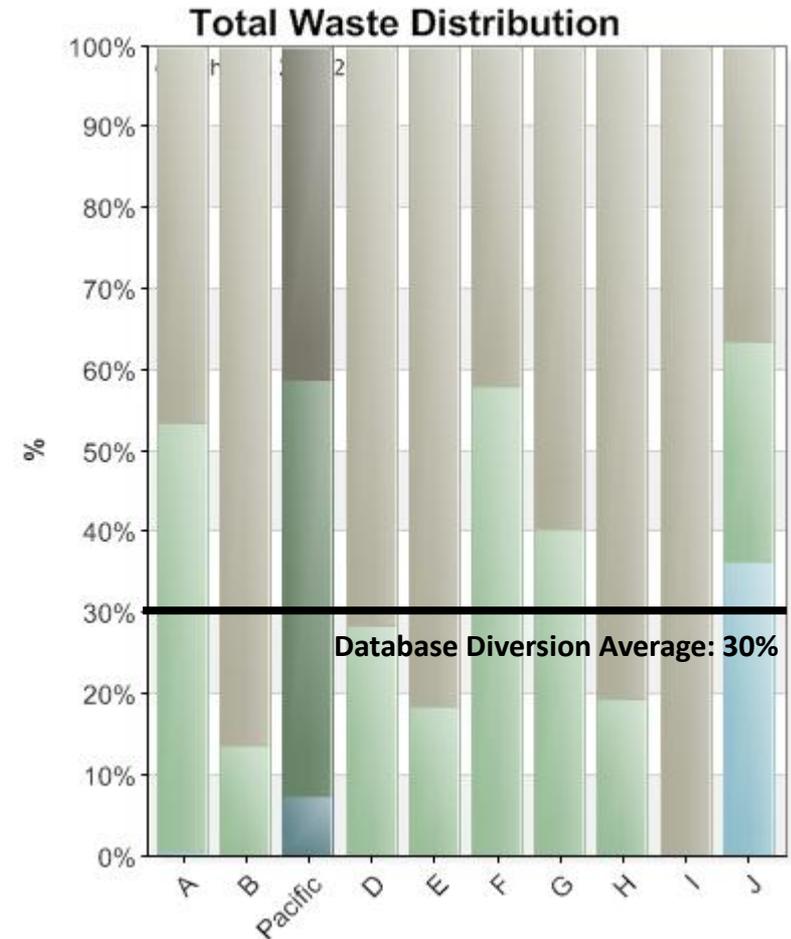
Total Utility Emissions (per 1,000 GSF)





Waste metrics highlight both an area of strong performance as well as opportunity for improvement. Waste production levels are among the highest in the peer group. This suggests a need to develop more effective policies to limit the disposable materials coming into campus.

Alternatively, Pacific has among the highest diversion rates in our database, showing a sufficient and effective infrastructure throughout the campus, supported by high levels of community engagement

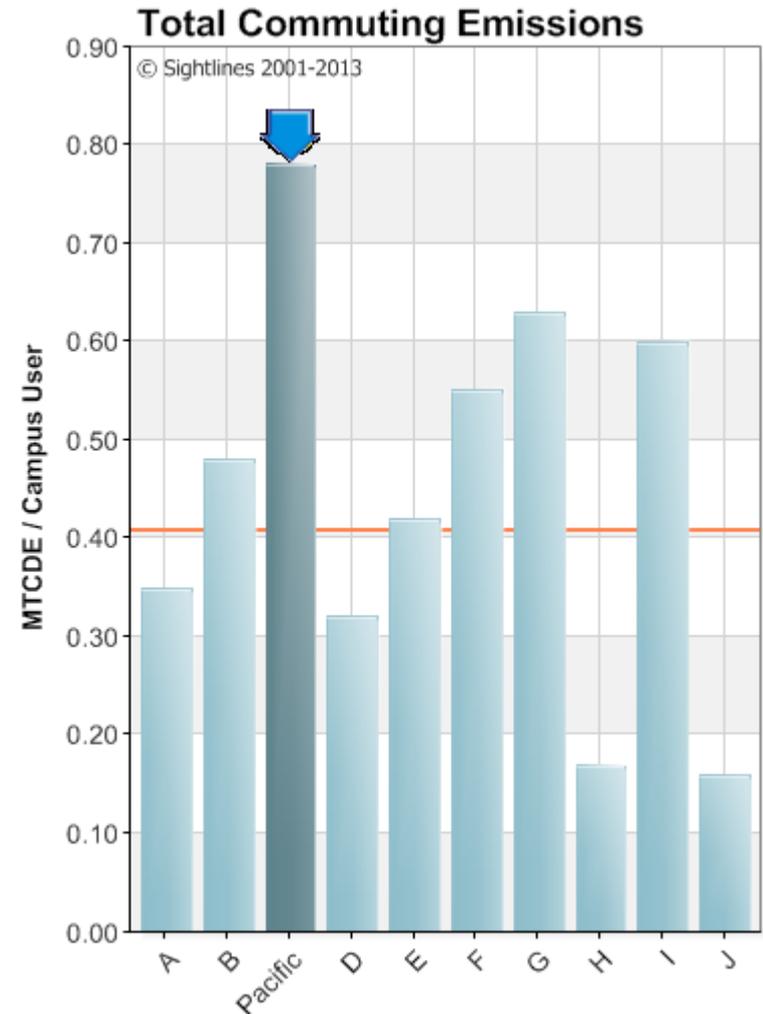




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Commuting remains an area for deeper understanding. Improving the data infrastructure through further surveying and analysis is critical to confirming these trends and developing strategies for addressing the drive alone culture of The University of the Pacific



Questions and Discussion

