

Chapman University Sustainability Solutions

FY20/21 GHG Benchmarking Update

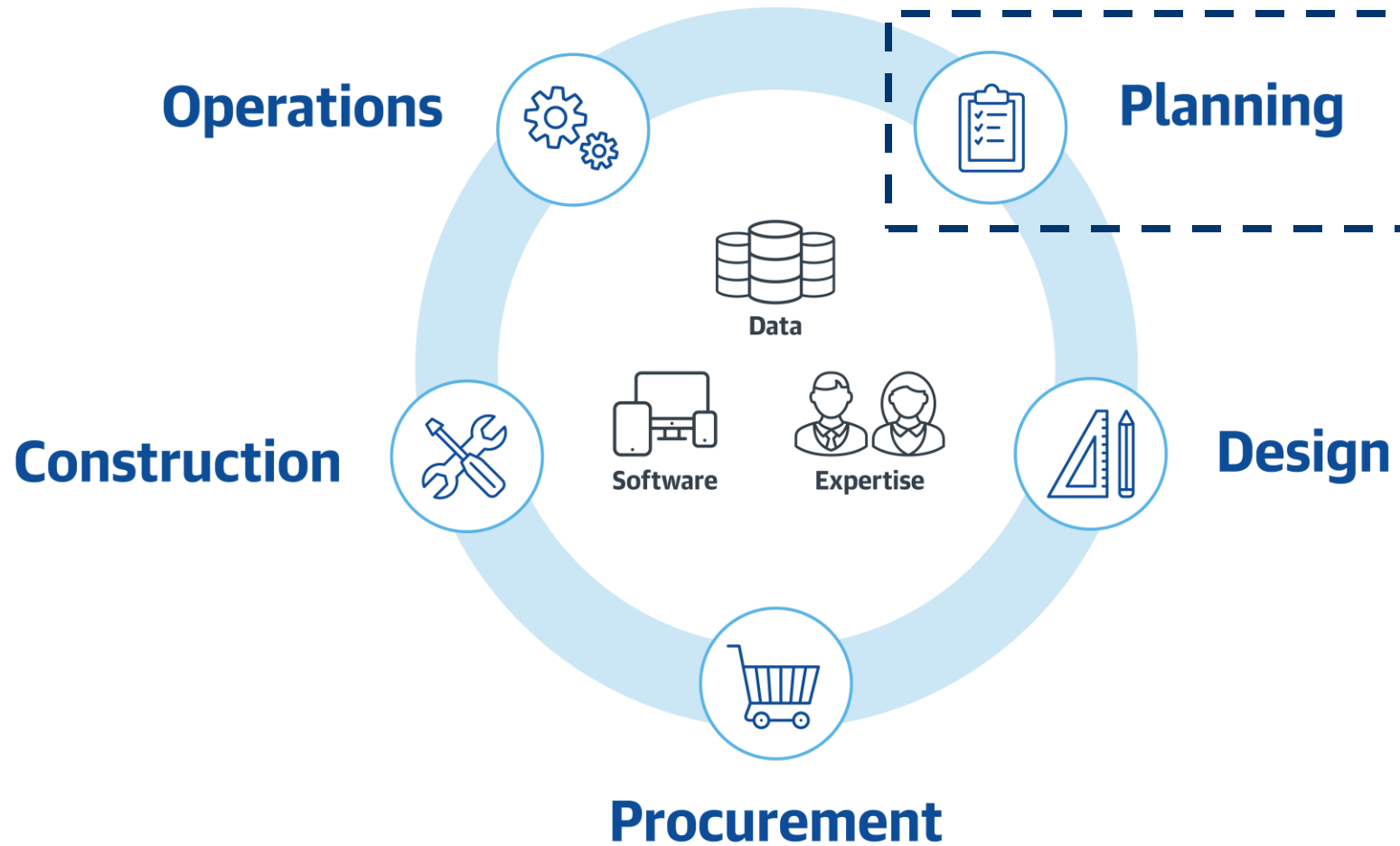
April 2022

Duncan Ketel and Tiffany Smith

University of the Sciences in Philadelphia
University of Toledo
University of Vermont
University of Washington
University of West Florida
University of Wisconsin - Madison
Vanderbilt University
Virginia Commonwealth University
Wake Forest University
Washburn University
Washington State University
Washington State University - Tri-Cities Campus
Washington State University - Vancouver
Washington University in St. Louis
Wayne State University
Wellesley College
Wesleyan University
West Chester University
West Virginia Health Science Center
West Virginia University
Western Oregon University
Westfield State University
Widener University
Williams College
Worcester Polytechnic Institute
Worcester State University



What We Do



Data

Drive Meaningful Action



Software

Improve Workflows



Expertise

Deliver Results



FACILITIES BENCHMARKING & ANALYSIS

Take control of your facilities and make the case for change without the guesswork



FACILITIES ASSESSMENT & PLANNING

Plan and execute capital investment plans that are inclusive, credible, flexible, affordable and sustainable



SPACE UTILIZATION

Ensure your space is working up to its full potential



SUSTAINABILITY SOLUTIONS

Measure, compare and improve environmental stewardship

Sustainability Solutions Agenda



Overview of Sightlines Data Analysis

Summary of Emissions Profile

Scope 1 Emissions Overview

Scope 2 Emissions Overview

Scope 3 Emissions Overview

SIMAP Partnership



At the end of 2017, Gordian entered into a partnership with the Sustainability Institute at the University of New Hampshire, ensuring our Sustainability Solutions are always based on the most up-to-date science and methods.

They host *Sustainability Indicator Management & Analysis Platform* (SIMAP). This is a carbon and nitrogen-accounting platform that tracks and analyzes campus-wide sustainability based on nearly two decades of work supporting campus inventories.



Components of Emissions Profile



Scope 1: Direct GHGs



- On-Campus Stationary Fuel
- Vehicle Fleet Fuel
- Fertilizer
- Refrigerants

Scope 2: Upstream GHGs



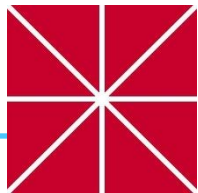
- Purchased Electricity

Scope 3: Indirect GHGs

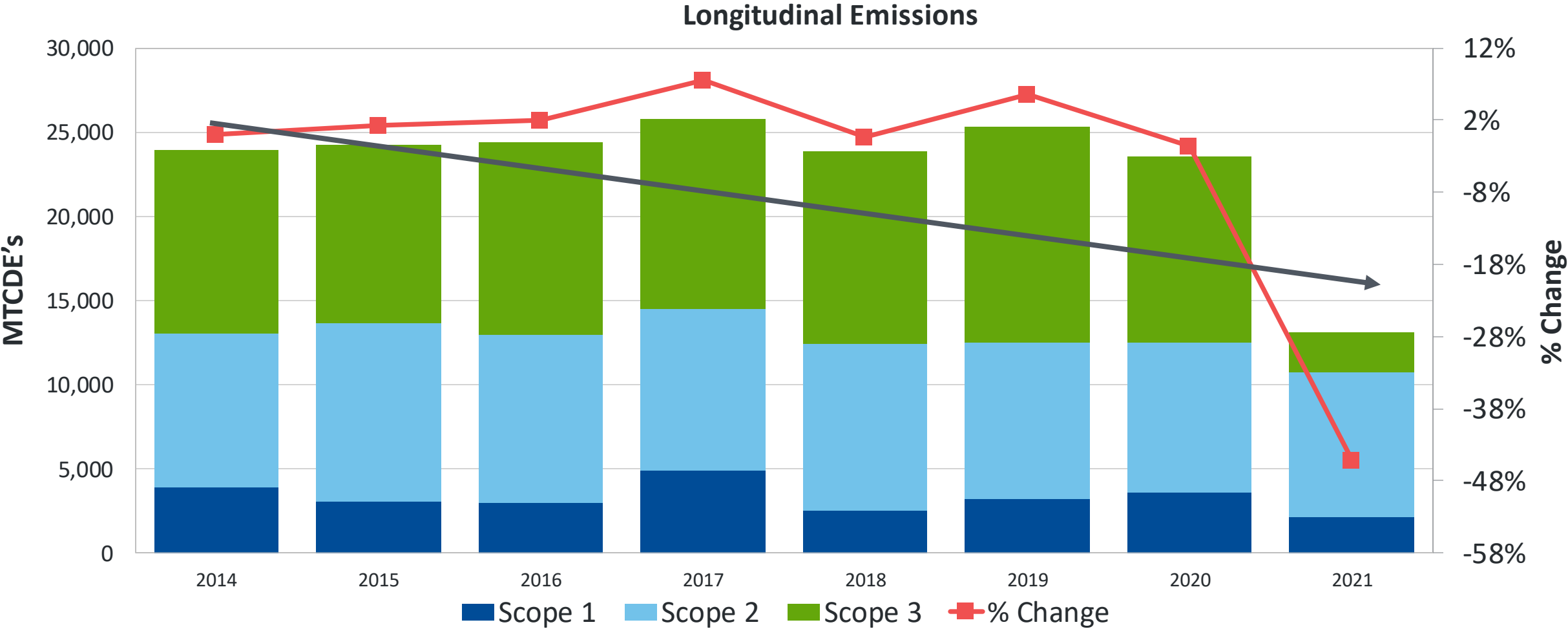


- Commuting
- Directly Financed Travel
- Solid Waste
- Paper Purchasing
- Transmission & Distribution Losses

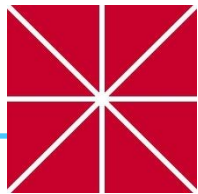
Longitudinal Emissions by Scope



Chapman's FY21 emissions were dramatically impacted by Covid

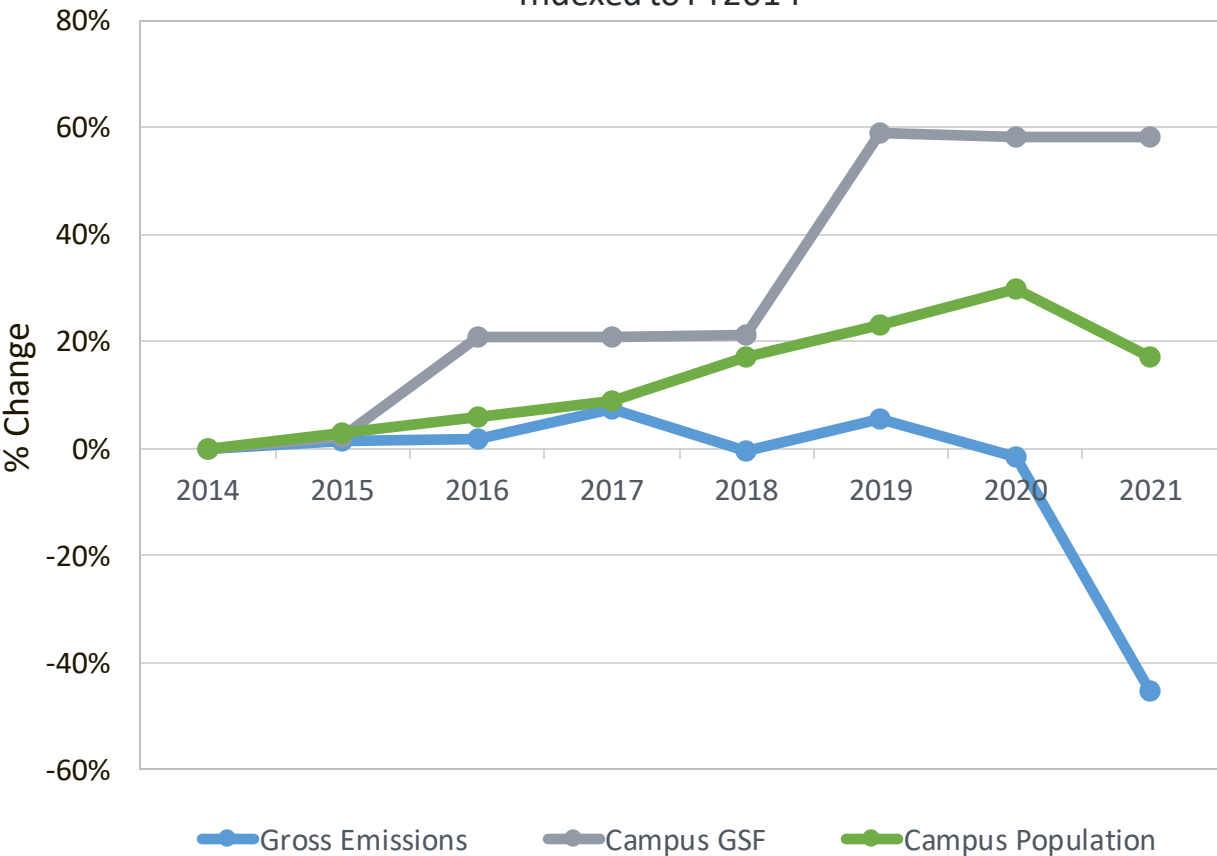


Progress Against 2014 Baseline

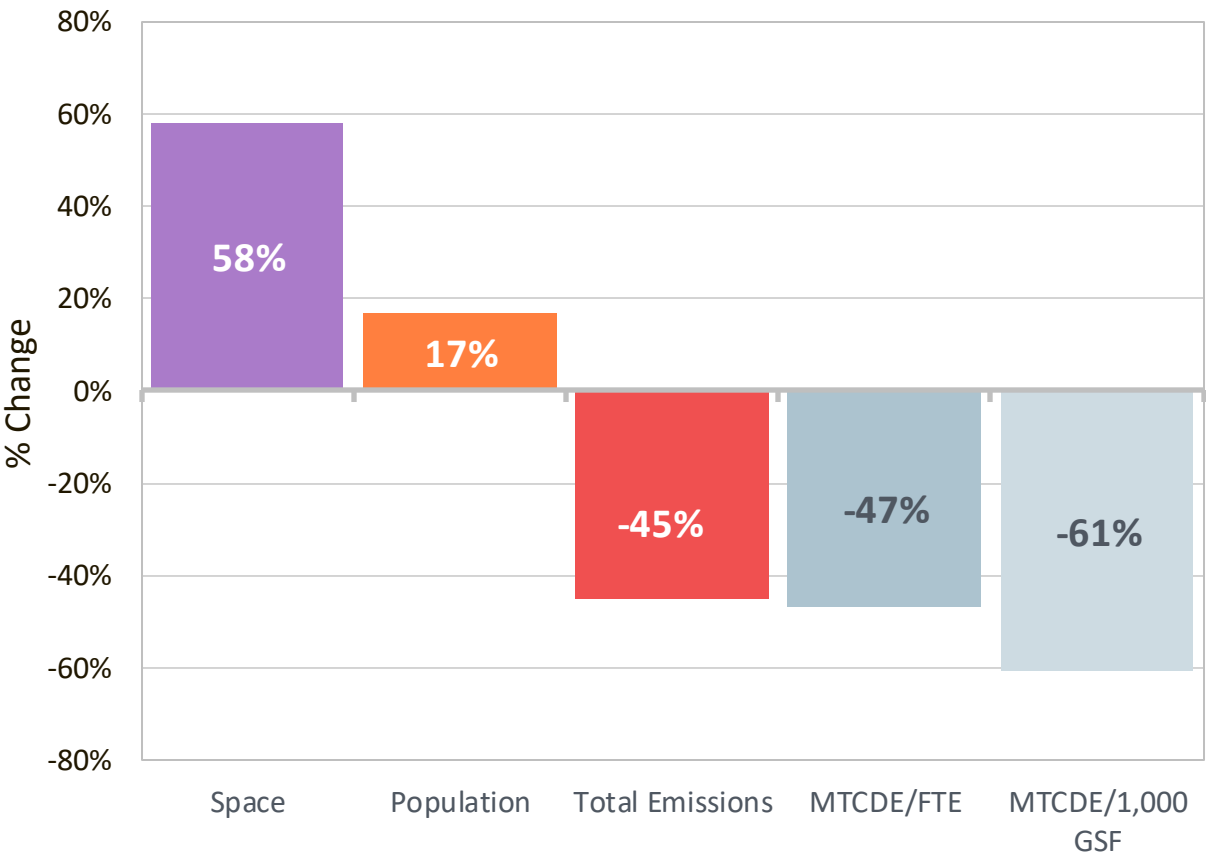


Chapman's emissions substantially decreased when normalizing by population and space

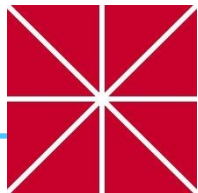
Change in Emissions (MTCDE) vs.
Campus Size and Population (FTE)
Indexed to FY2014



Change in Space, Population, and Emissions
Indexed to FY2014

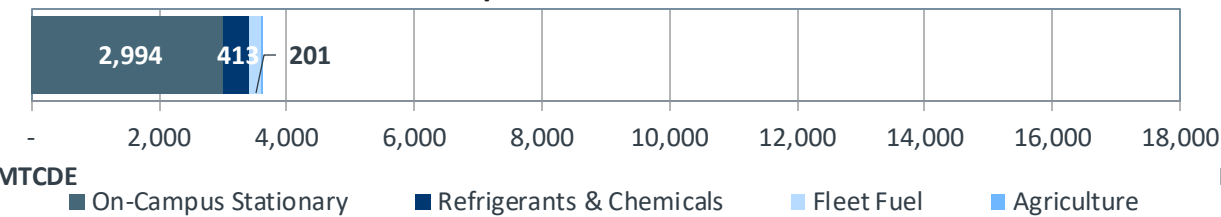


FY21 Distribution of Emissions by Level of Control

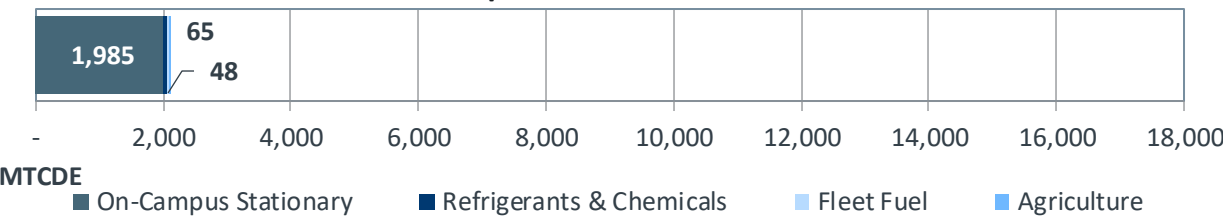


Chapman’s emissions varied significantly within Scope 3, Scope 2 & 1 saw less fluctuation

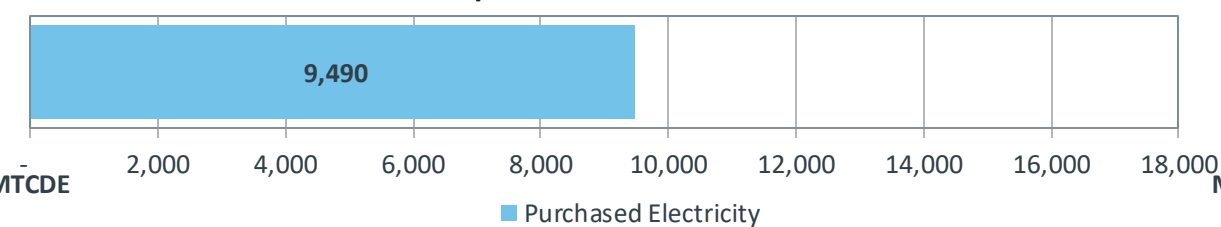
Scope 1 Sources – 14%



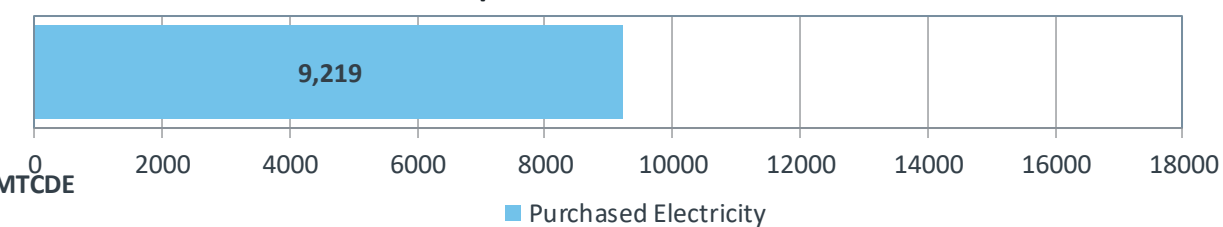
Scope 1 Sources – 16%



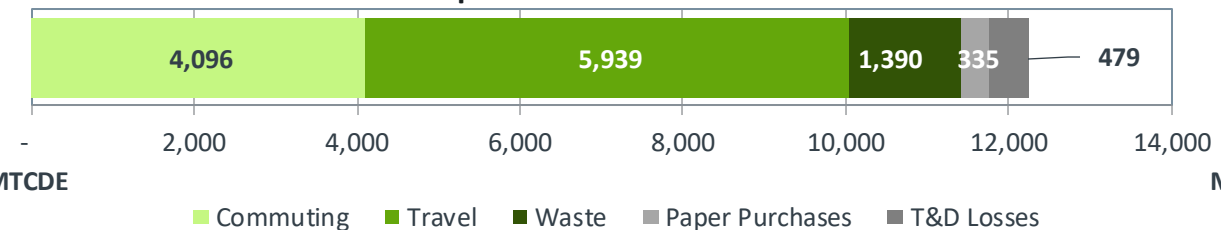
Scope 2 Sources – 37%



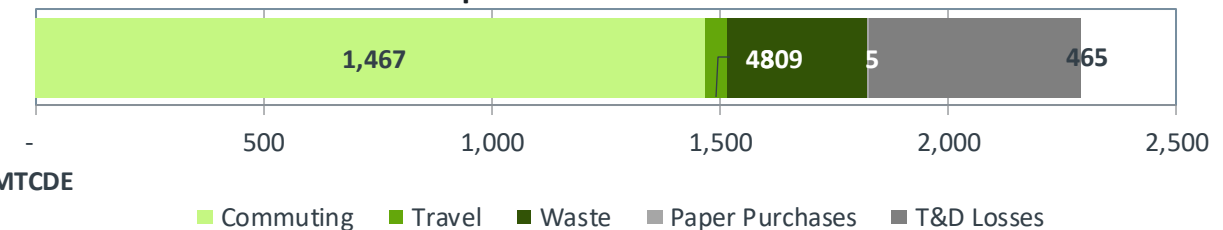
Scope 2 Sources – 66%



Scope 3 Sources – 48%

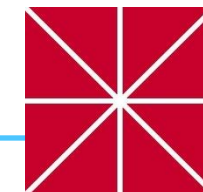


Scope 3 Sources – 18%



Sustainability Peers

Peers determined using location, campus size, and population



| Peer Institution | Location |
|--|-------------------------------|
| Idyllwild Arts Academy | Idyllwild, California |
| St. Mary's College of California | Moraga, California |
| University of San Francisco* | San Francisco, California |
| University of San Diego* | San Diego, California |
| University of Denver | Denver, Colorado |
| University of Texas- Rio Grande Valley | Edinburg, Texas |
| Stockton University | Galloway Township, New Jersey |

Two Ways to Normalize Emissions for Comparison



GHG Emissions per 1,000 GSF EUI Adjusted



Stresses intensity of operations.

$$\frac{\text{Gross GHG Emissions}}{\text{EUI Adjusted GSF}} \times 1,000$$

GHG Emissions per Weighted Campus User



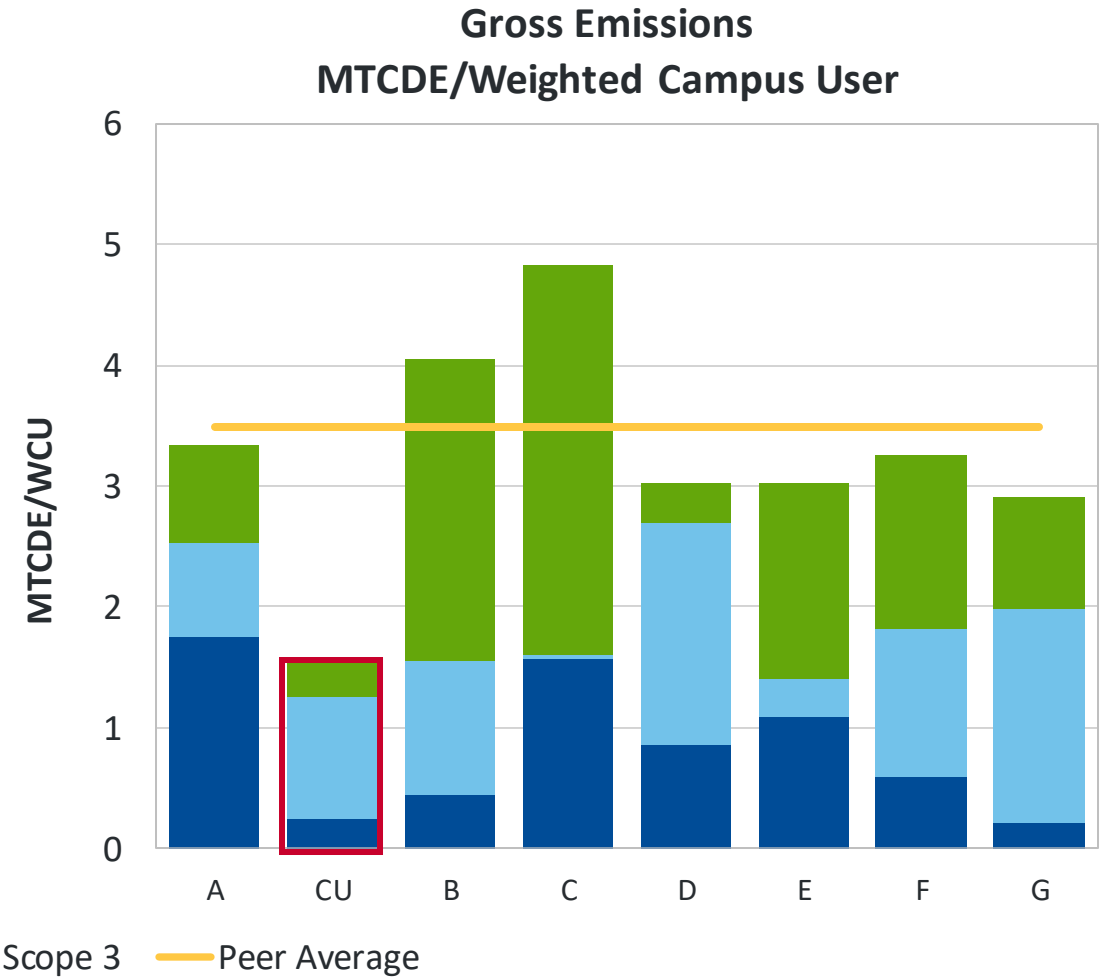
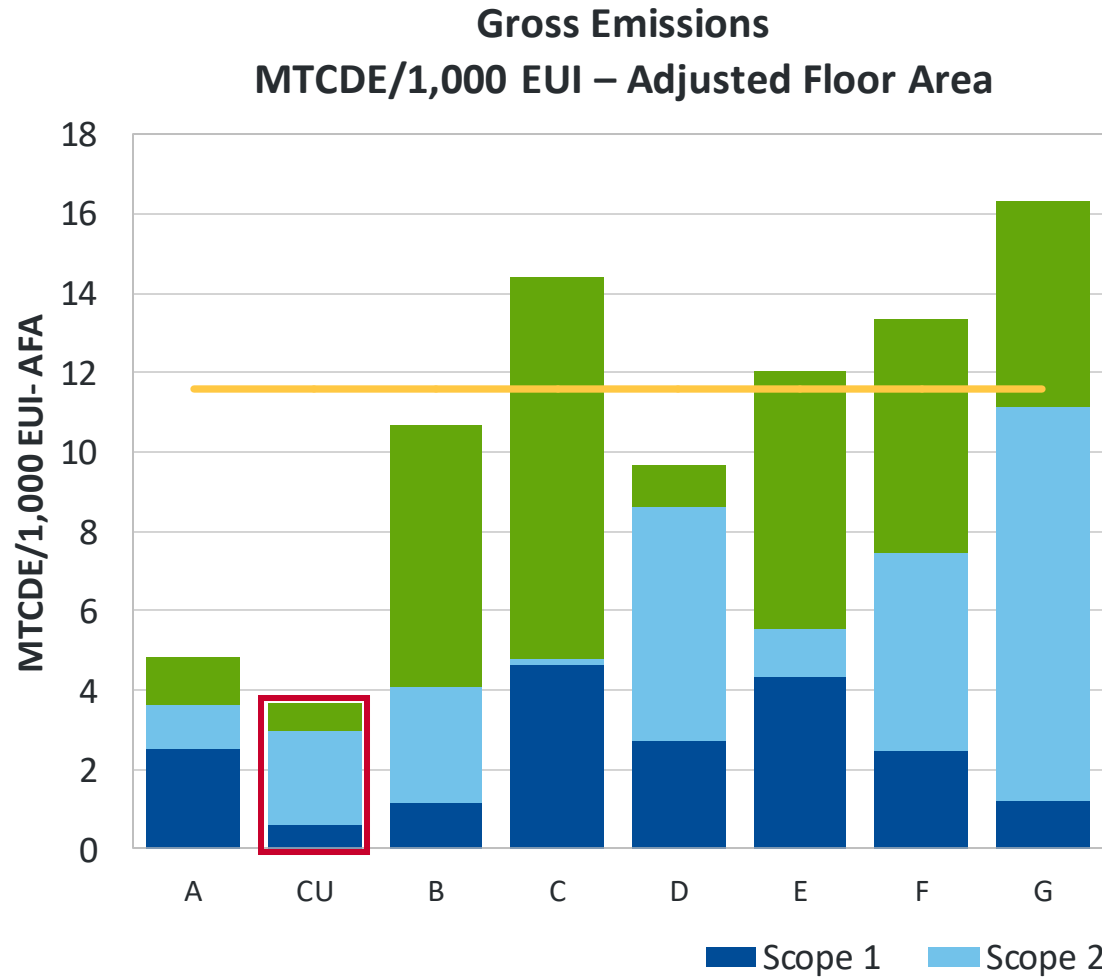
Stresses efficient use of space.

$$\frac{\text{Gross GHG Emissions}}{\text{Weighted Campus User}}$$

Total Gross Emissions per Space and Campus User

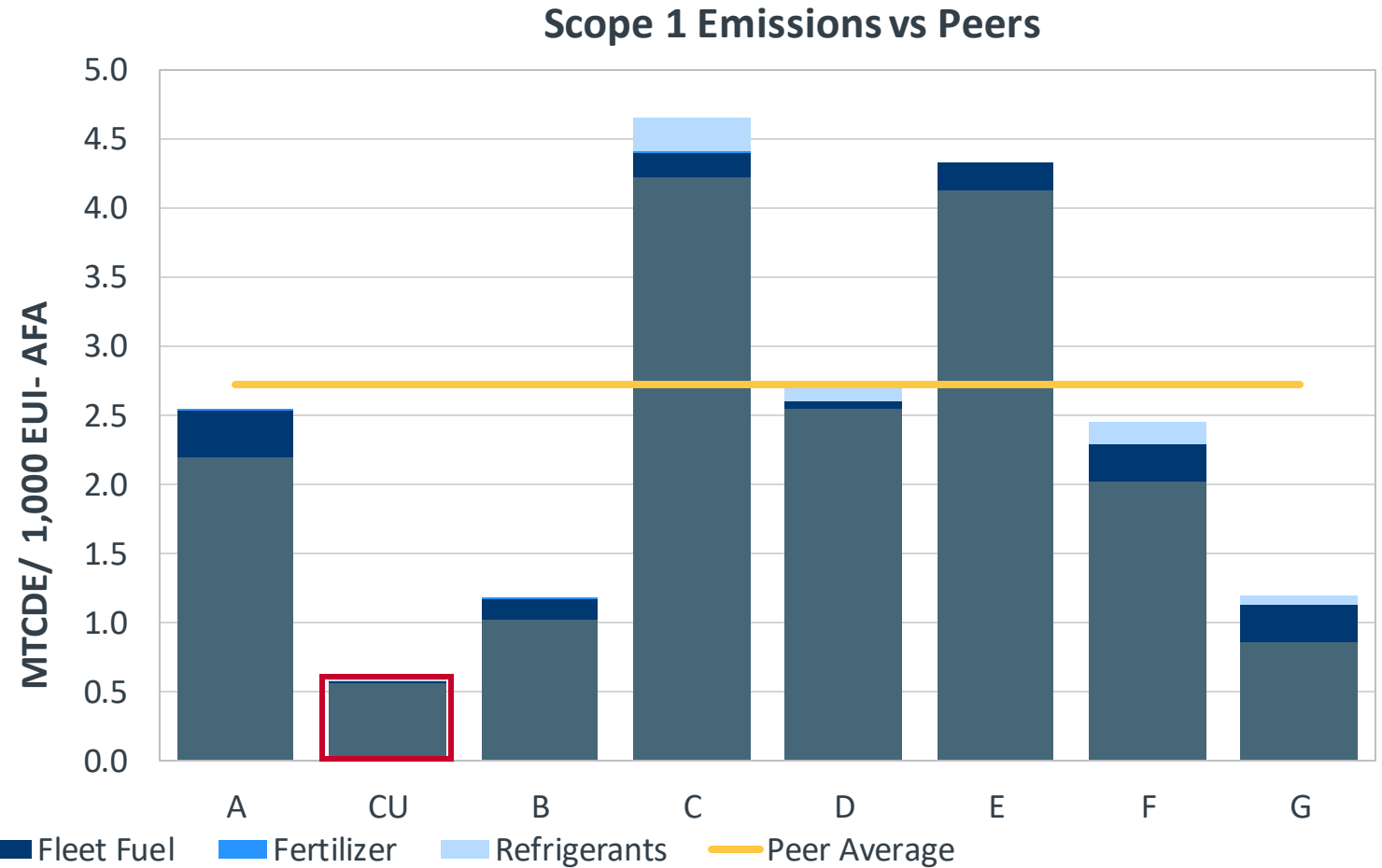
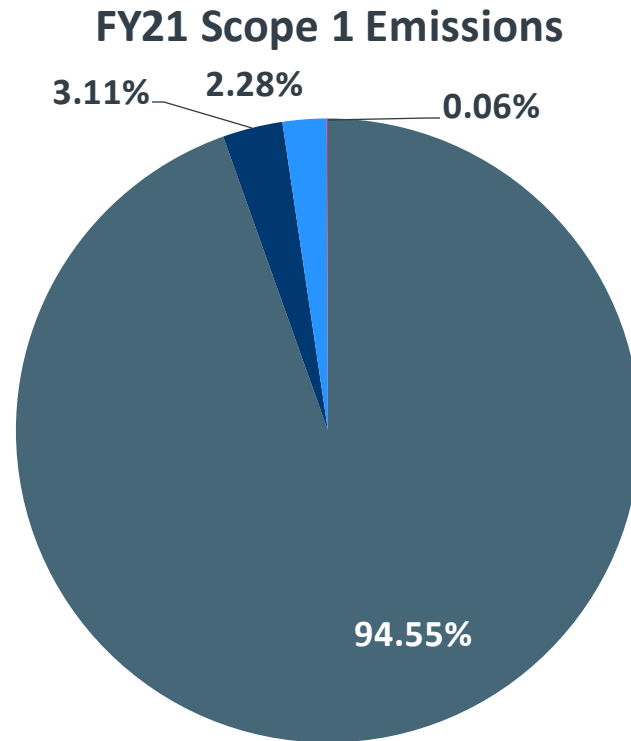


Chapman emits less than peers when normalized by GSF and population



Scope 1: Direct Emissions

Chapman's scope 1 emissions are significantly below peer average

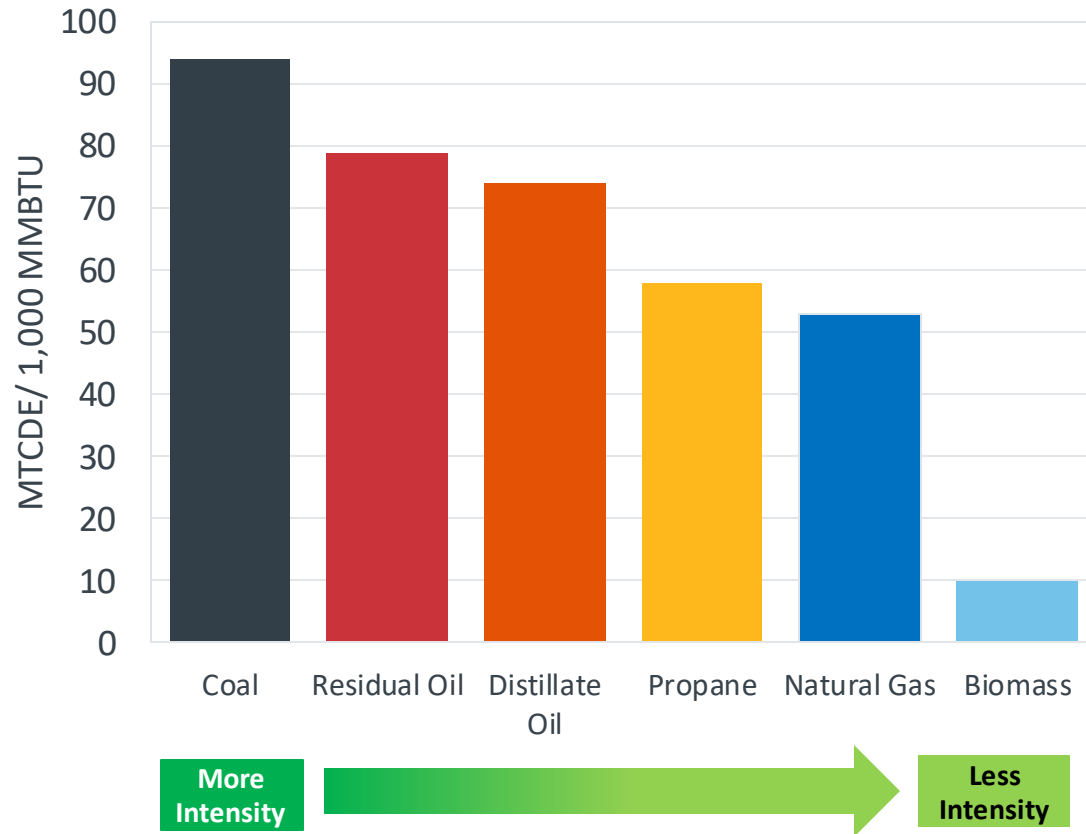


Scope 1: Stationary Fuel Consumption

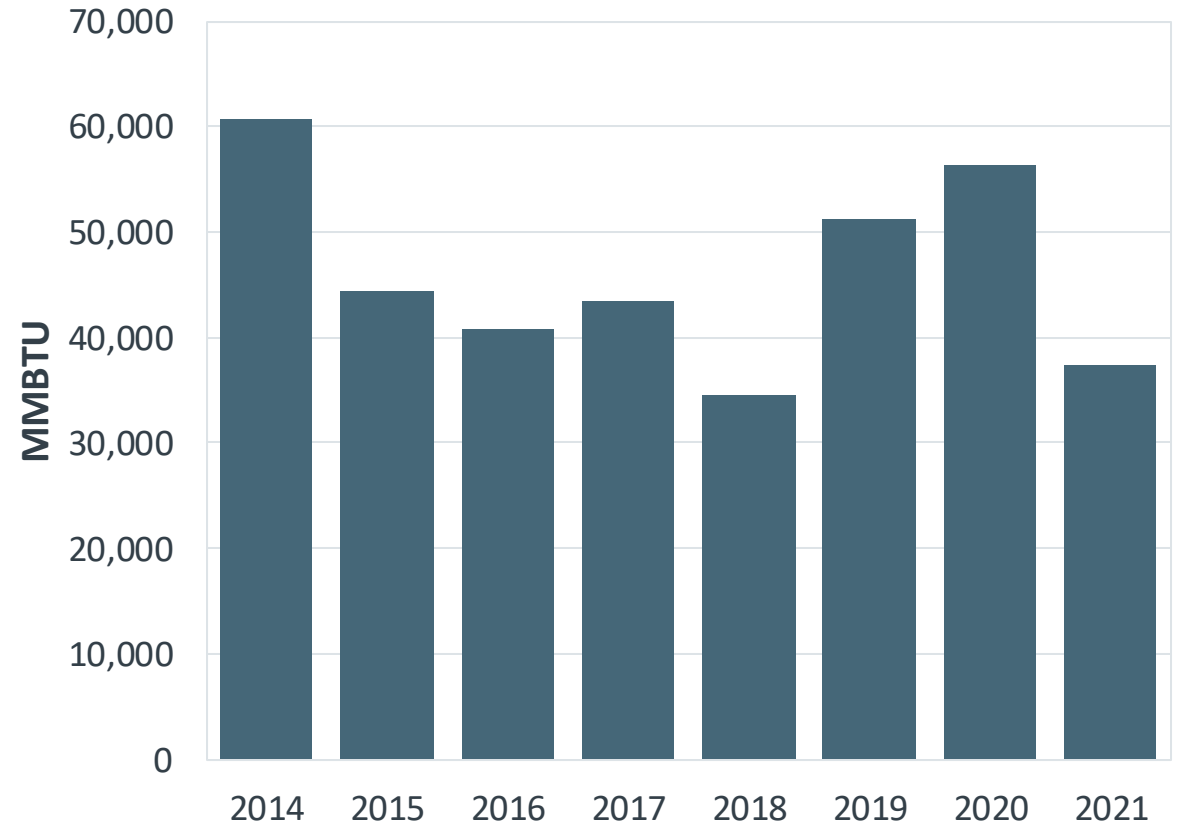


Chapman's decrease in Scope 1 lead by a decline in natural gas consumption

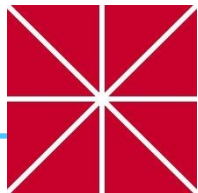
Carbon Intensity of Commonly Used Fossil Fuels



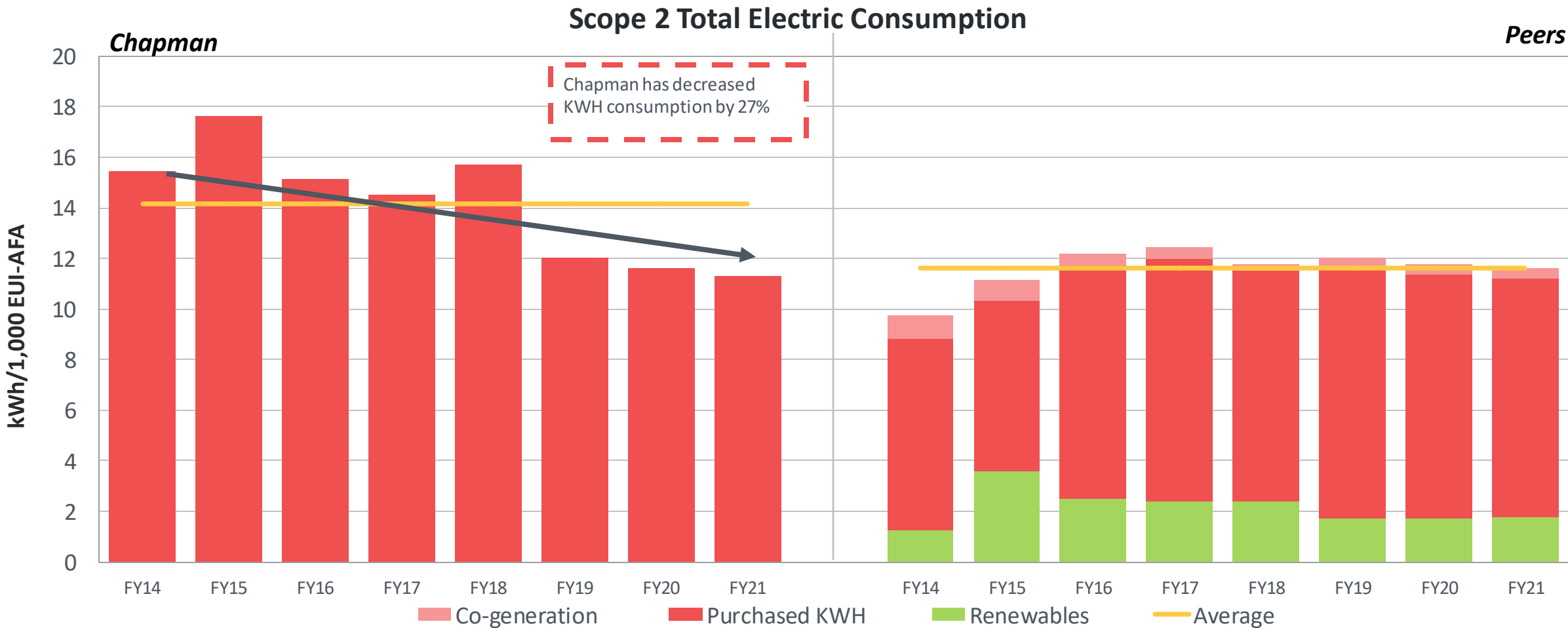
Stationary Fuel Consumption



Scope 2: Total Electric Consumption vs. Peers



Since FY19/20 Chapman’s electric consumption has been comparable to peers

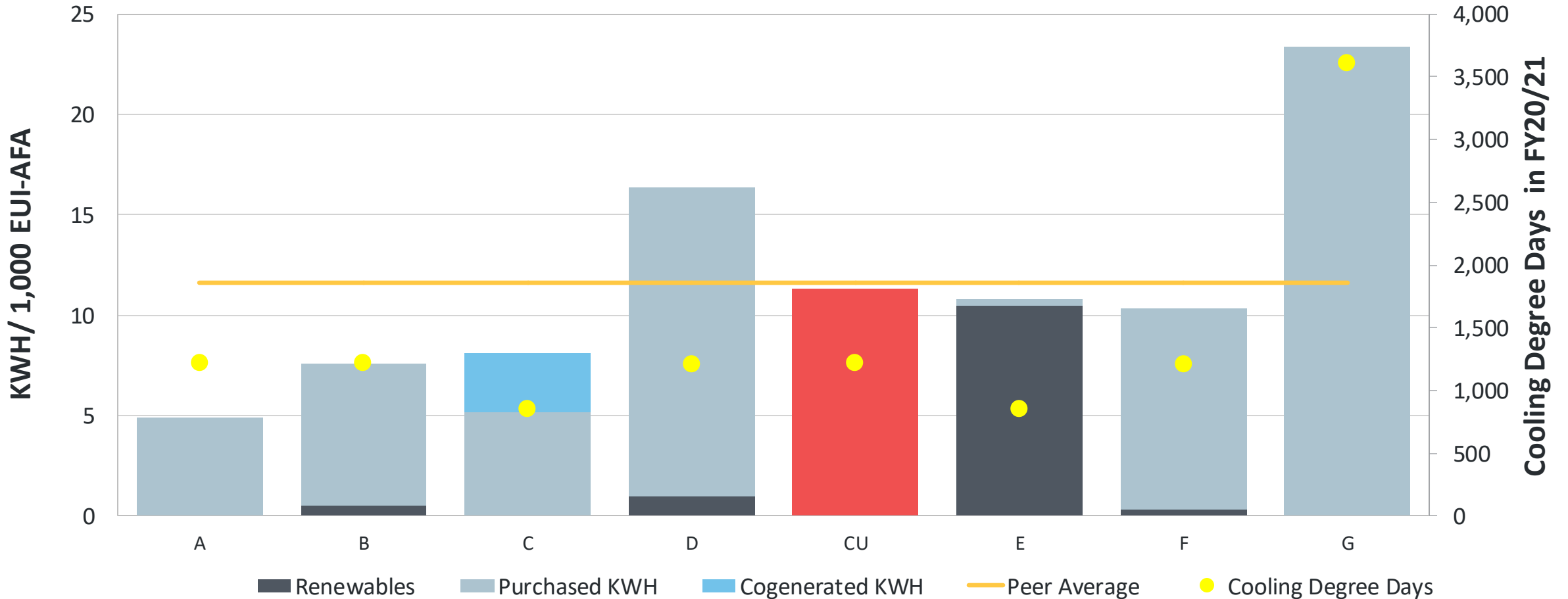


Scope 2: Total Electric Consumption vs. Peers



While total consumption is similar to peer average, peers diversify their electrical sources

FY21 Electric Consumption vs. Peers



Peers arrayed by technical complexity; The relative mechanical complexity of the campus on a scale of 1-5

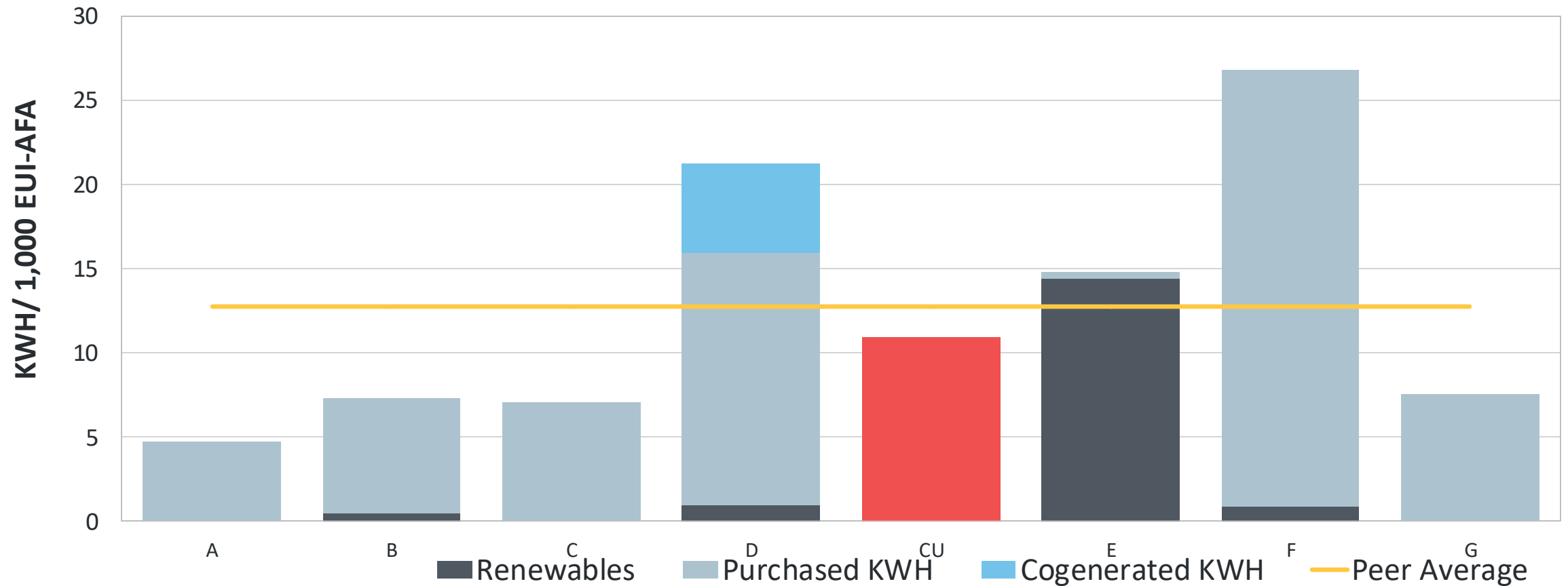
Scope 2: Total Electric Consumption vs. Peers



When normalizing by cooling degree days, Chapman consumed less than peer average

FY21 Electric Consumption vs. Peers

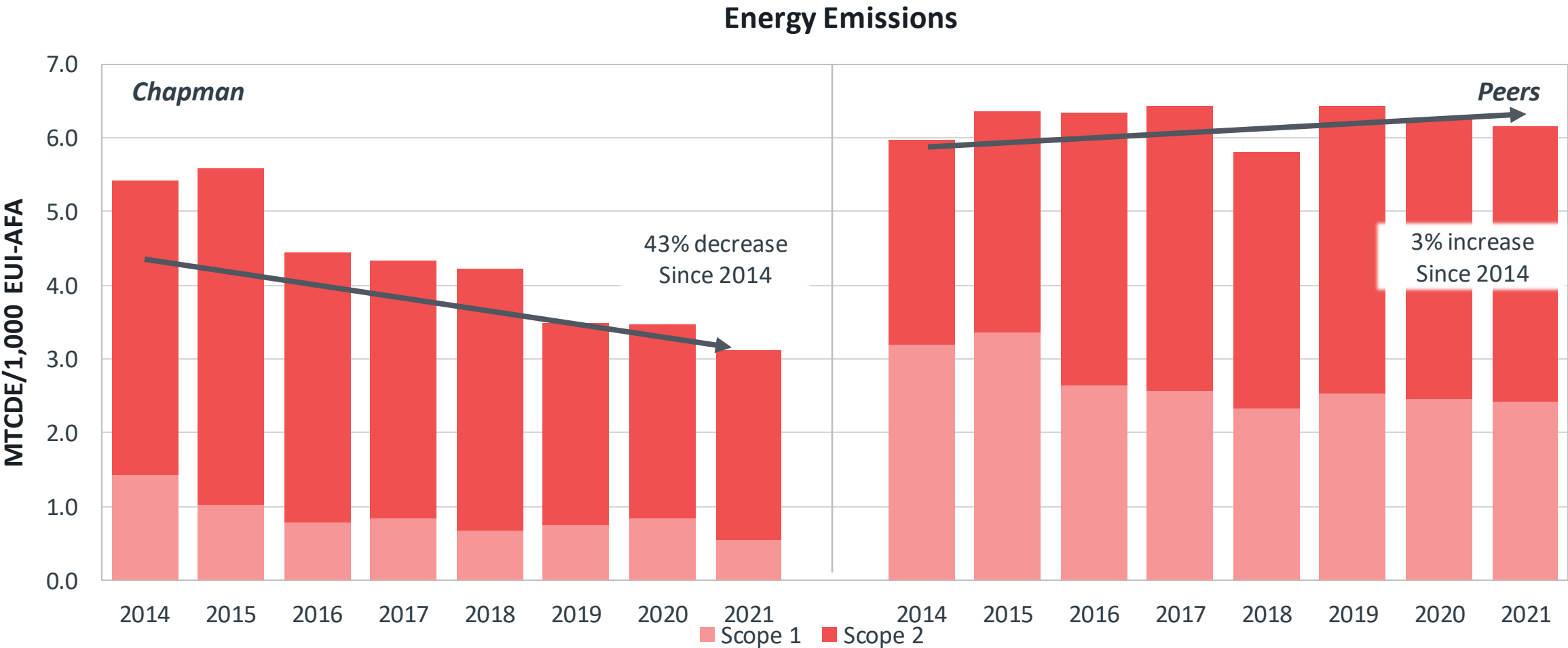
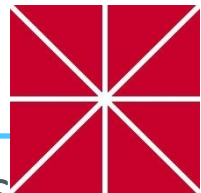
Normalized by Cooling Degree Days



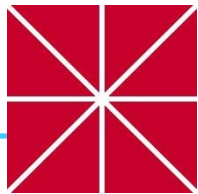
Peers arrayed by technical complexity; The relative mechanical complexity of the campus on a scale of 1-5

Energy Emissions vs. Peers

Chapman's decrease in emissions has been partially due to energy efficiency upgrades

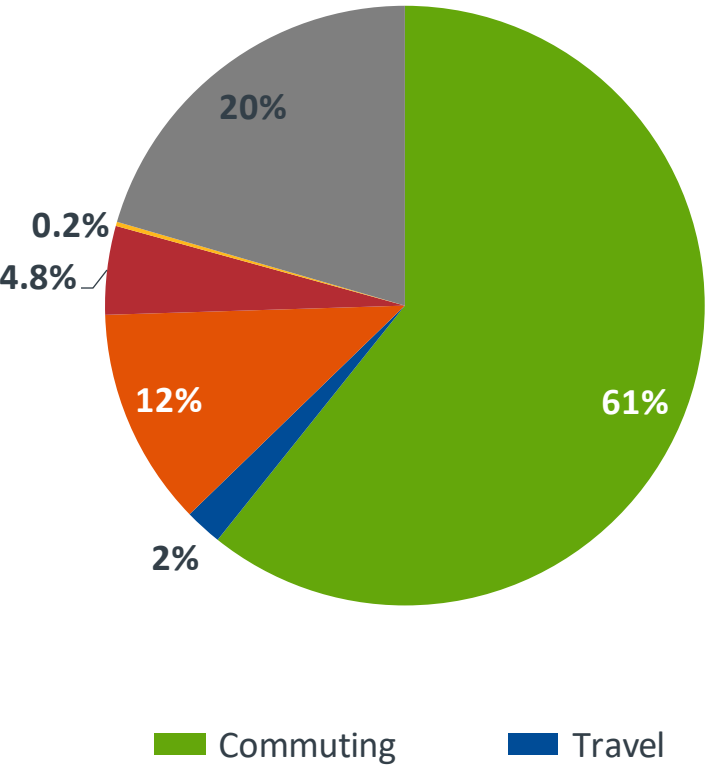


Scope 3: Indirect Emissions Overview

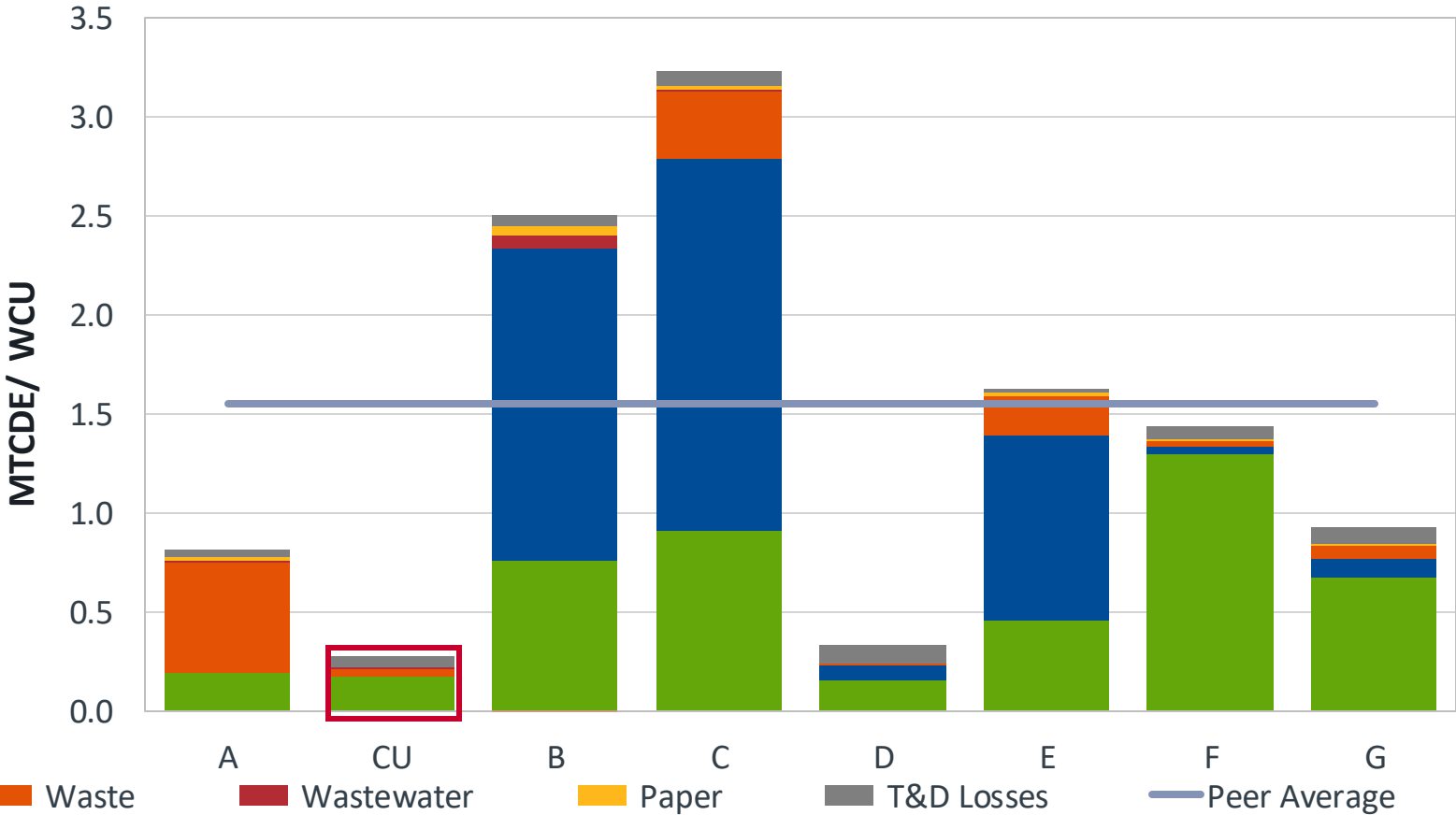


With decreases in commuting and travel, waste became largest Scope 3 source

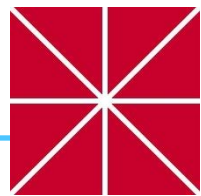
FY21 Scope 3 Emissions



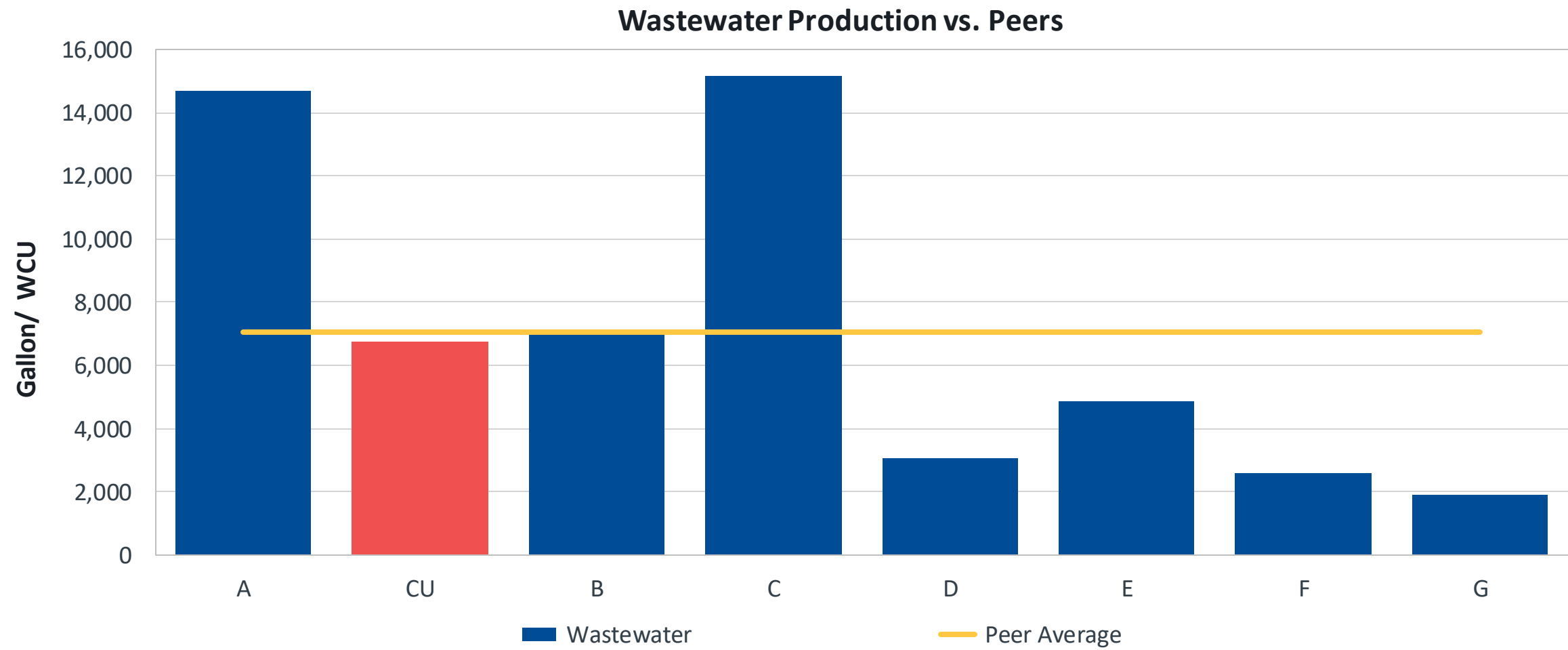
Scope 3 Emissions vs Peers



Wastewater Production Similar to Peers



While wastewater is less than 5% of emissions, water reduction should be prioritized

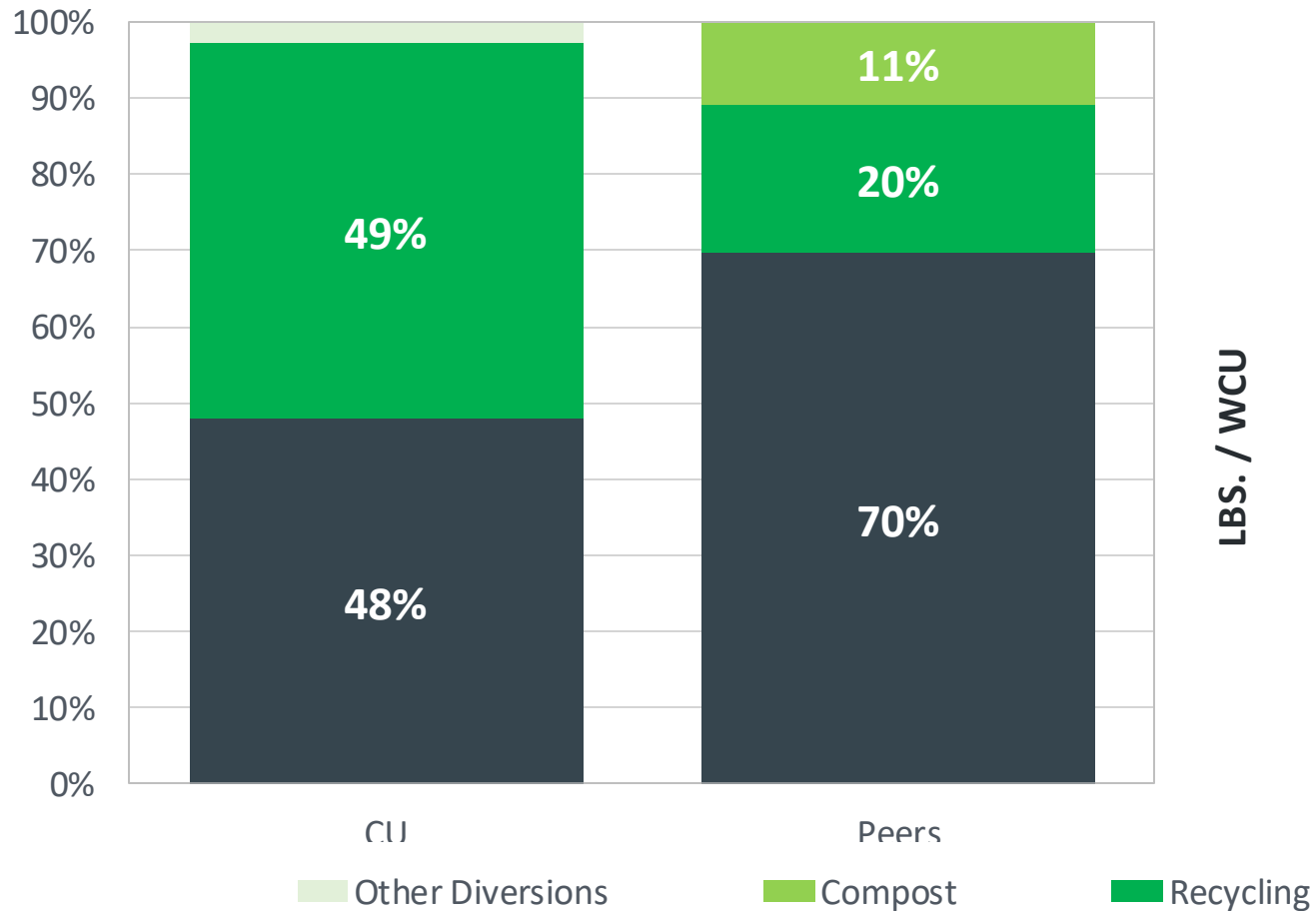


A Closer Look at Waste

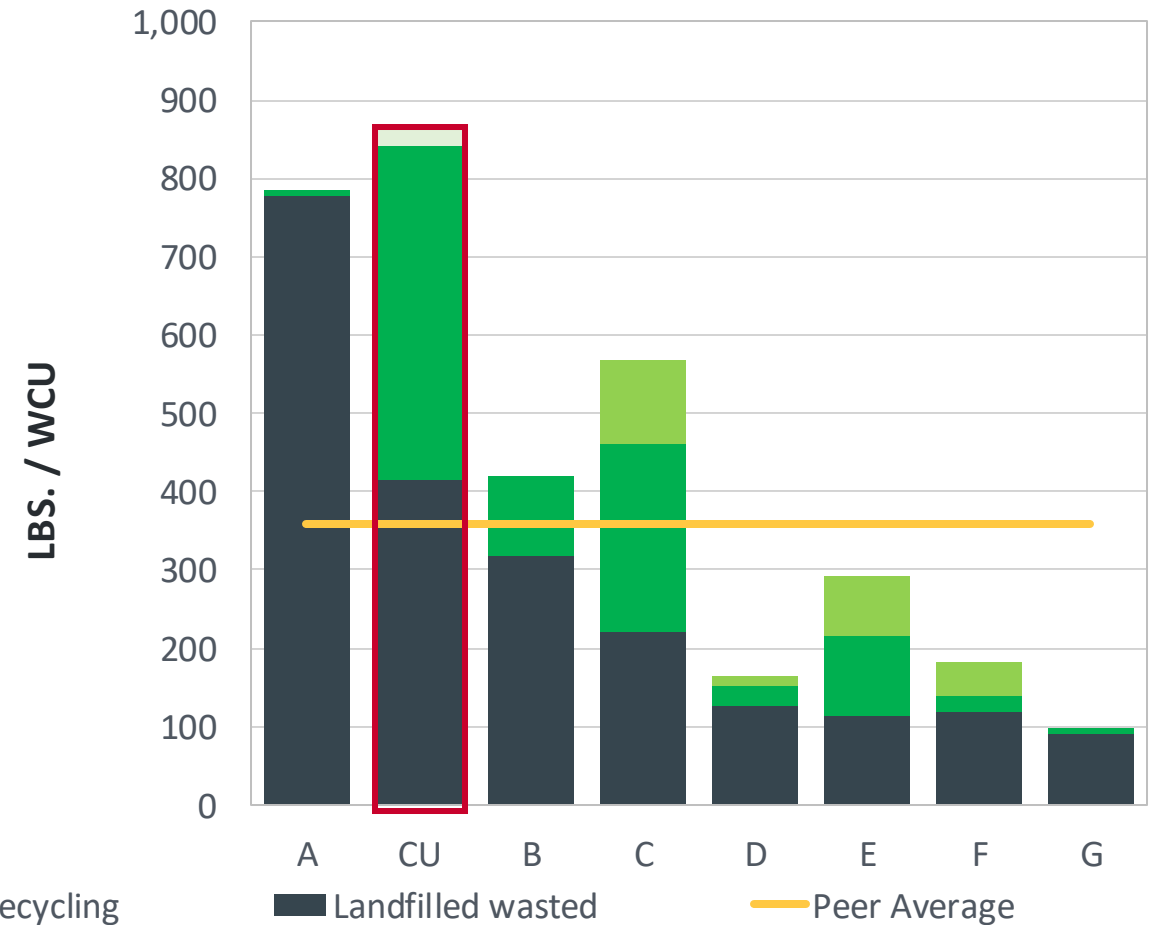


Chapman diverts more waste to recycling than peers, but produces more total waste

FY21 Diversion rate vs Peers



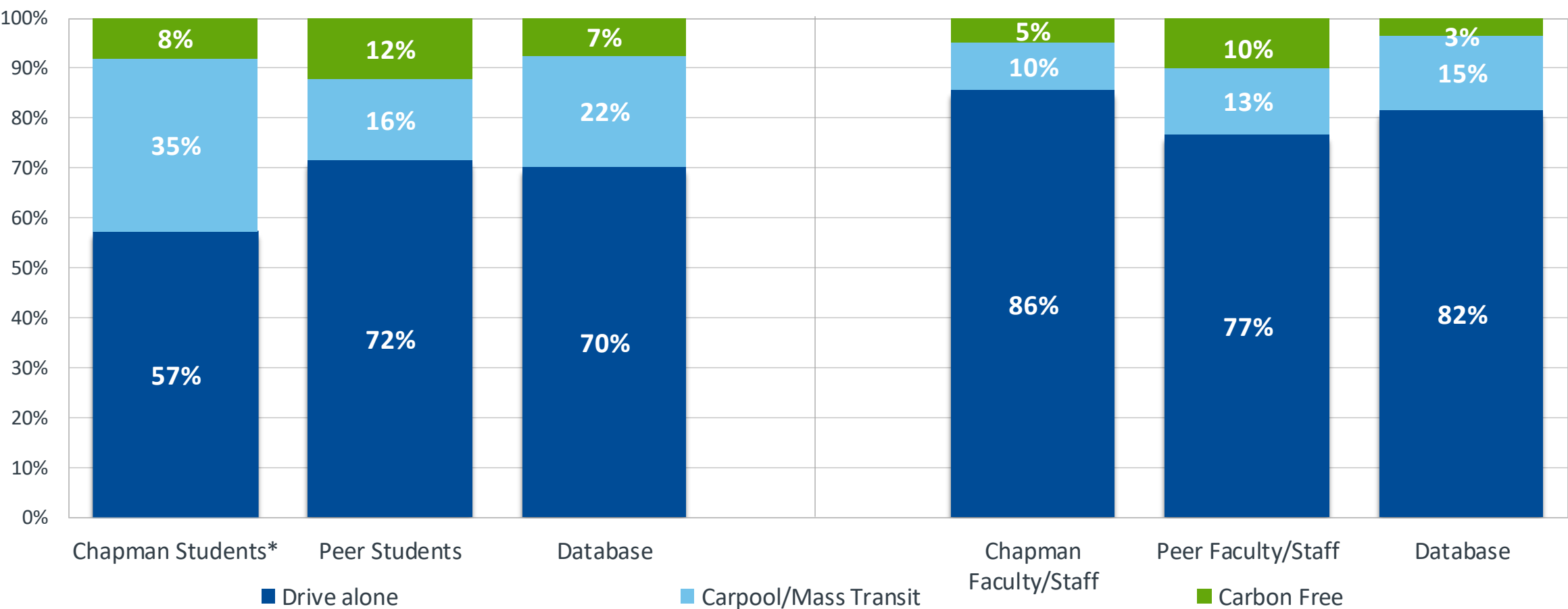
FY21 Waste vs Peers



Commuting Profile by Mode of Transportation

Chapman faculty/staff utilize alternative transportation methods less than peers

Commuting Mode by Demographic

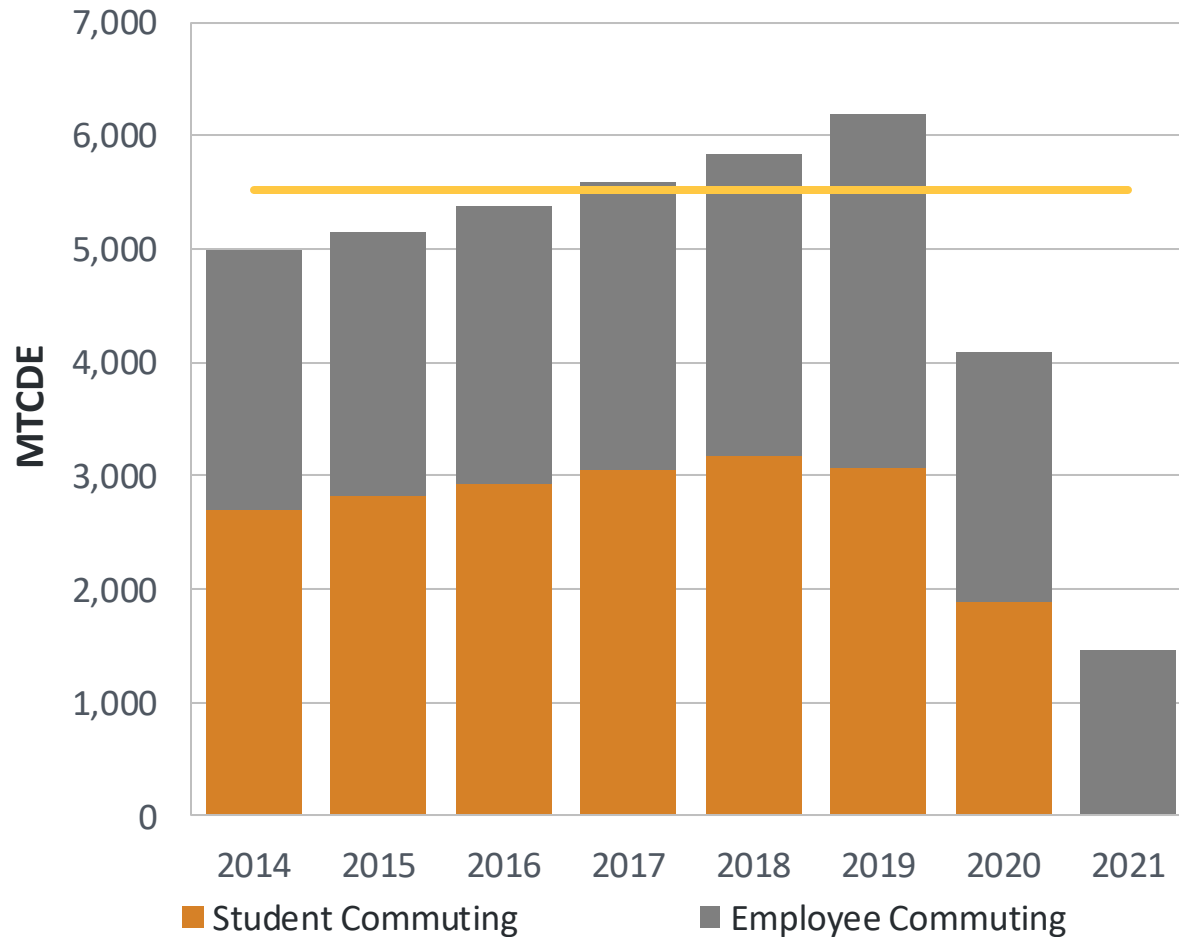


Total Commuting Emissions

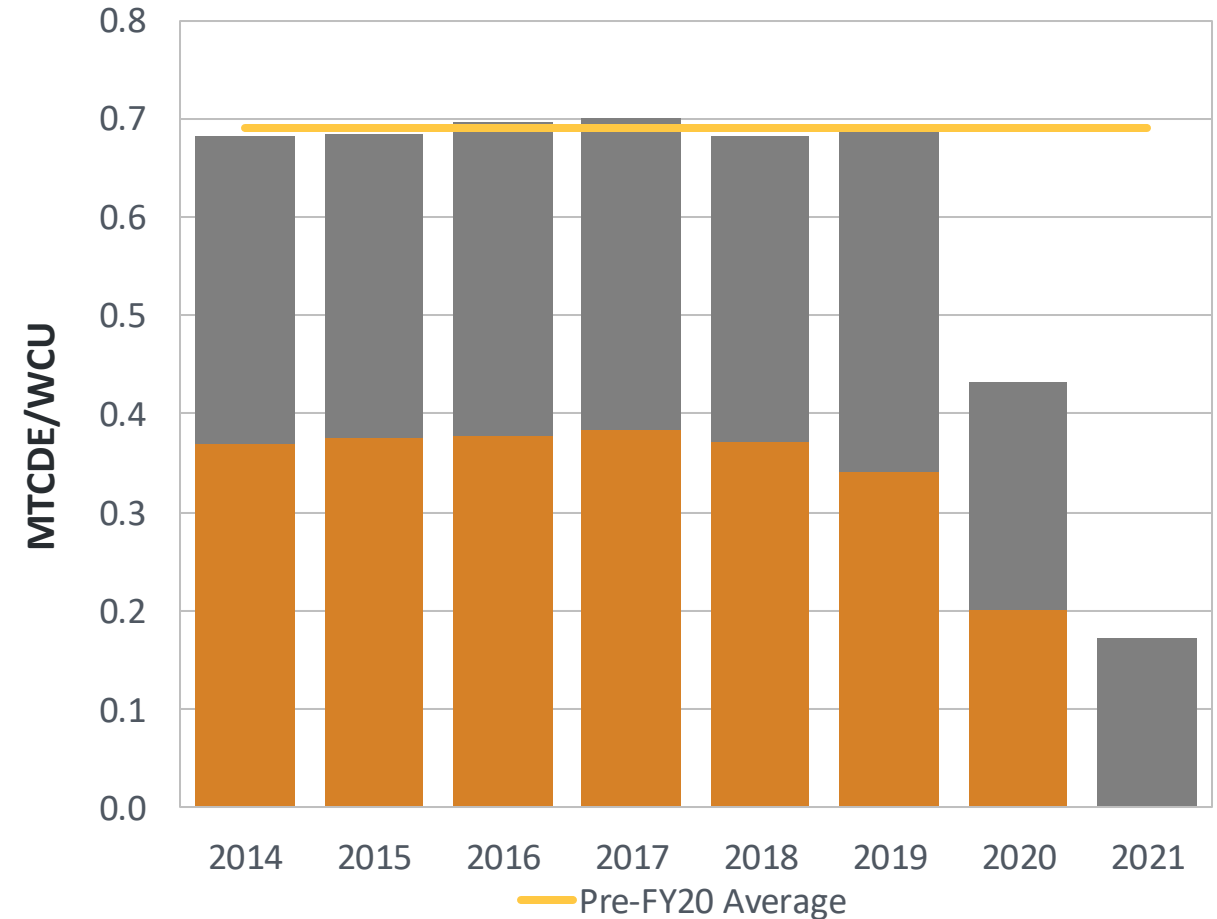


With more staff and classes remote, commuting emissions substantially decreased

Commuting Emissions



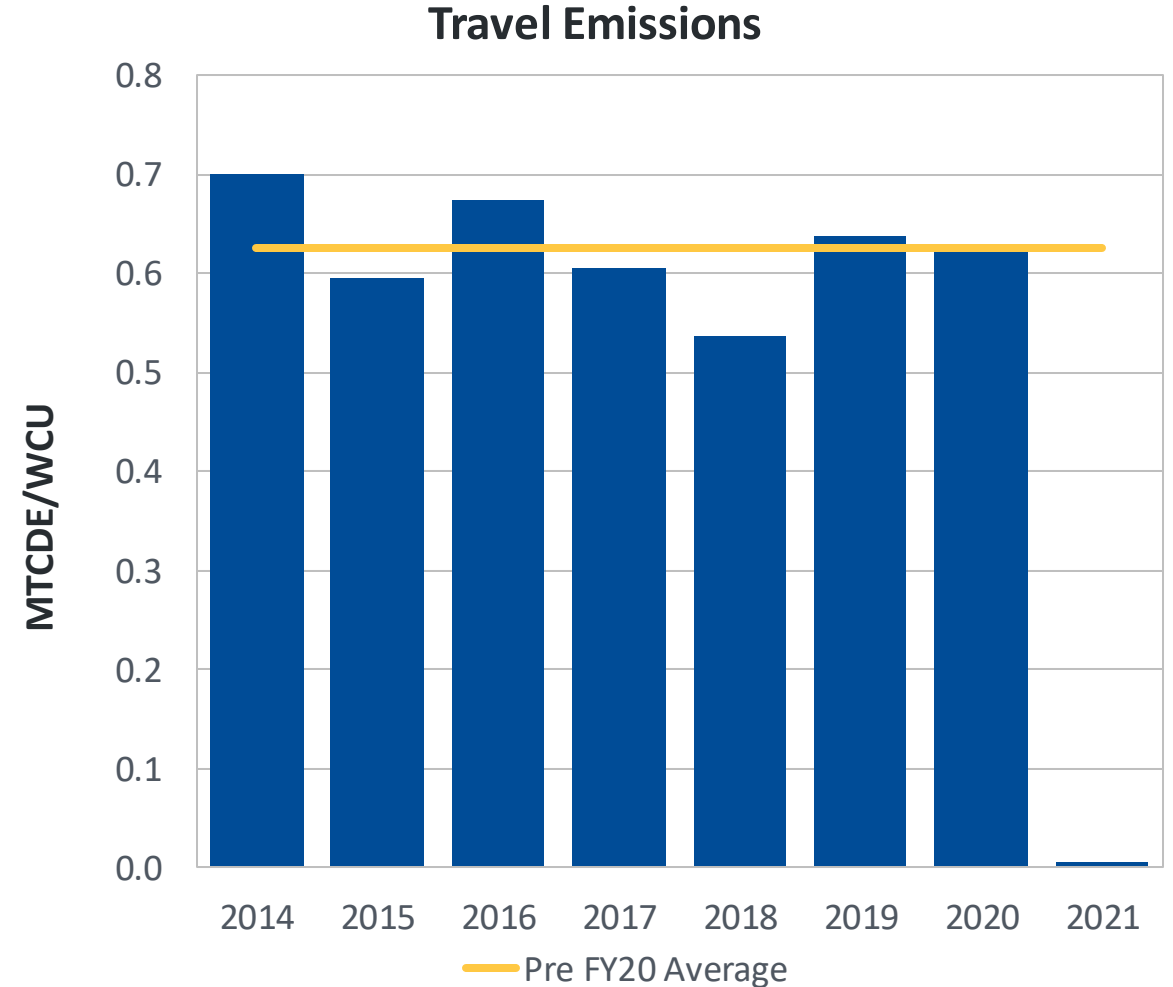
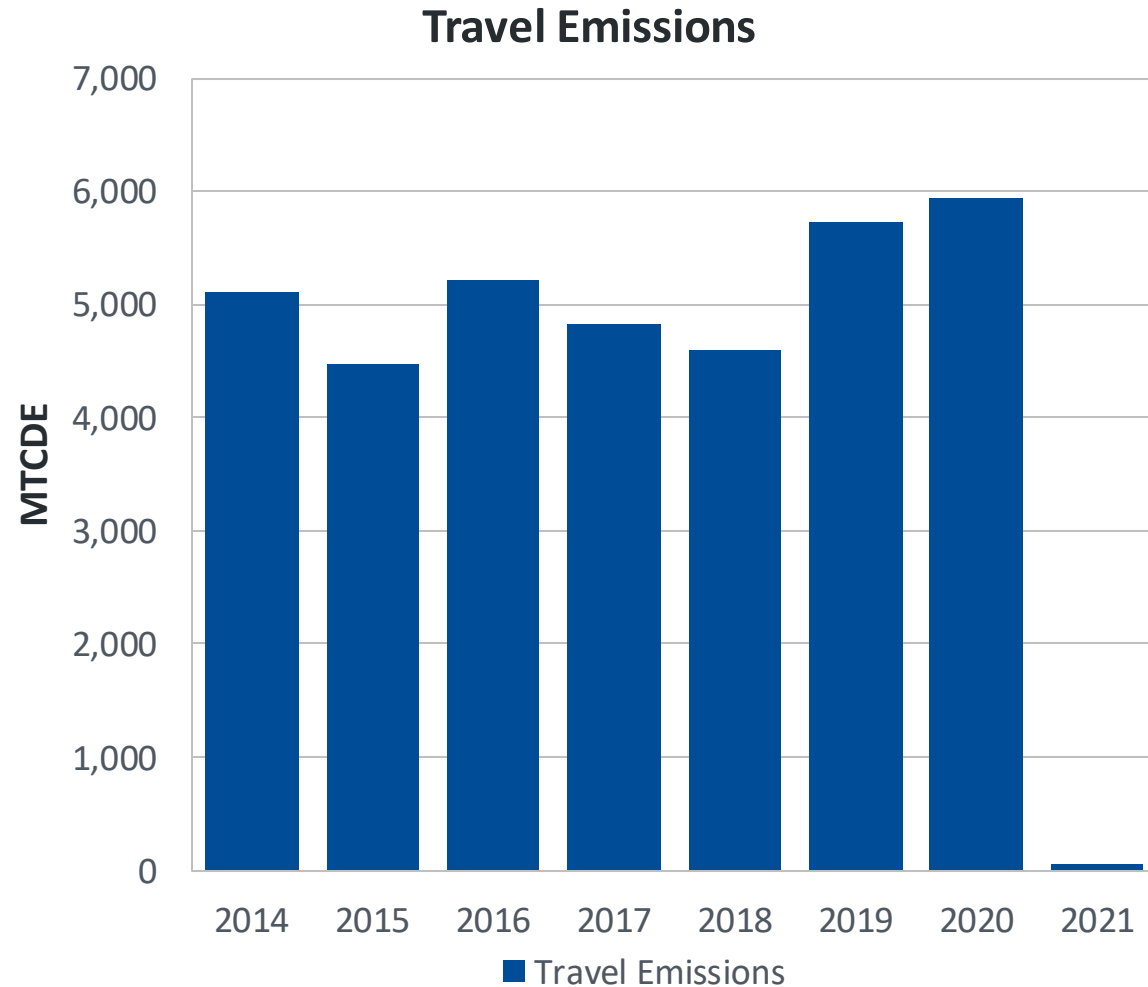
Normalized Commuting Emissions



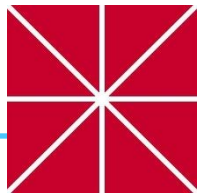
Total Travel Emissions



With almost no travel in FY21, emissions were close to zero

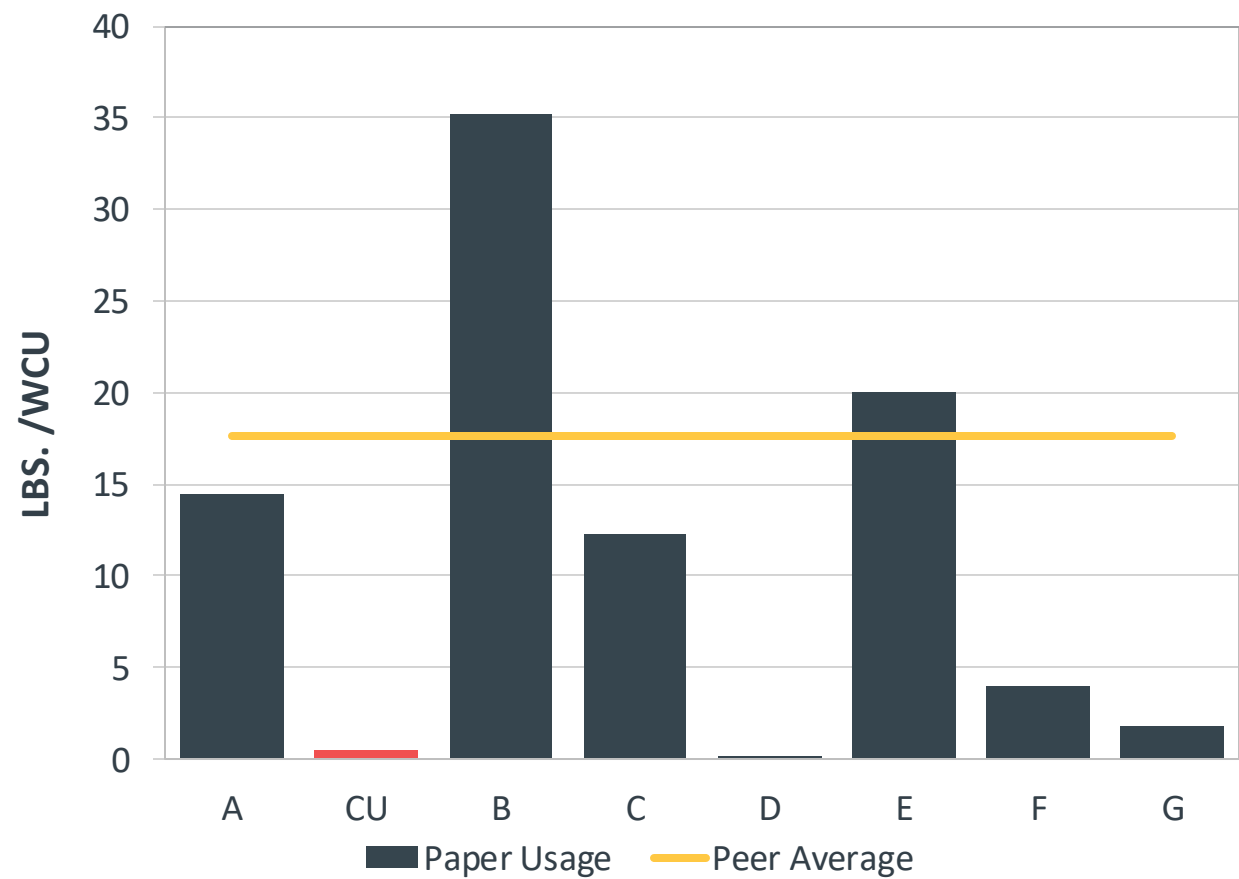


Paper Profile

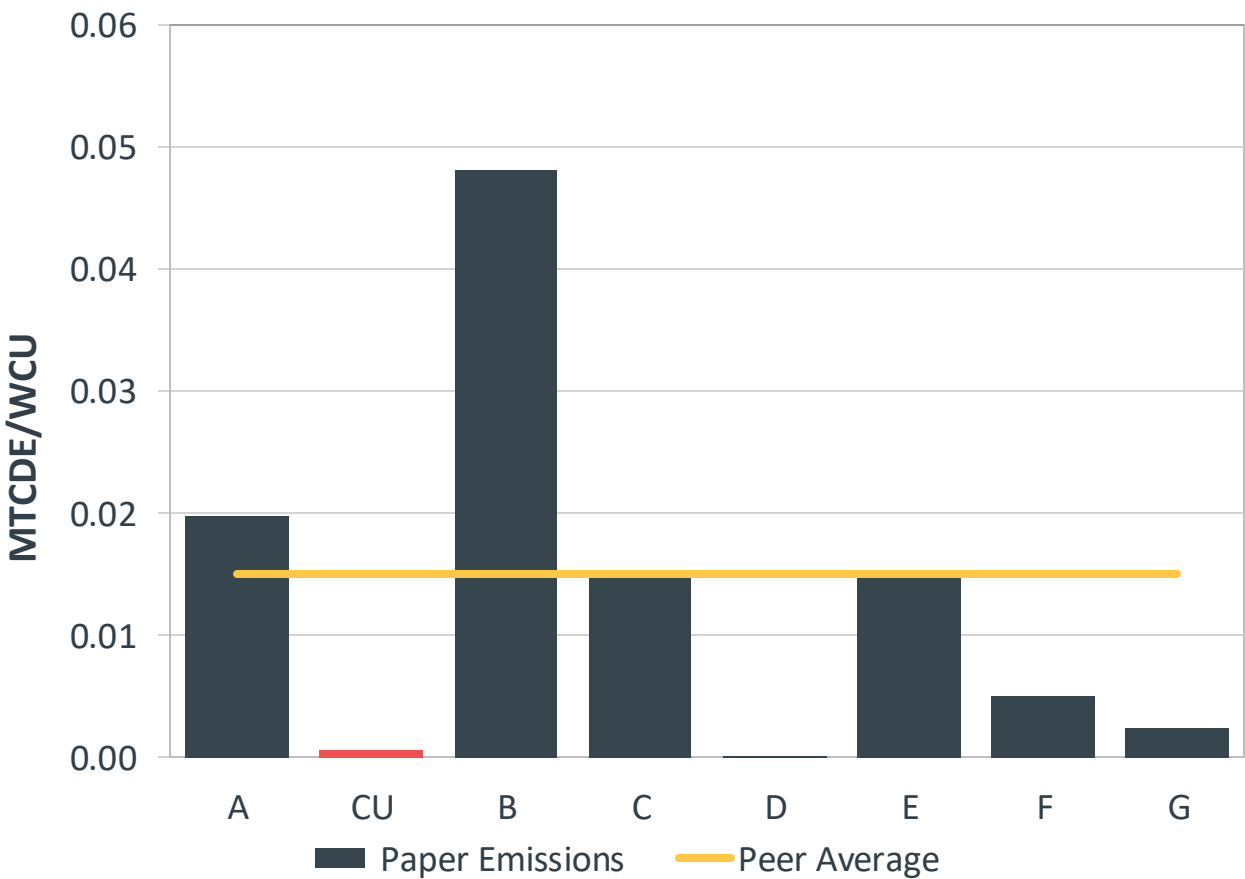


With fewer students on campus and most classes remote, paper usage dwindled

FY21 Paper Usage vs. Peers



FY 21 Paper Emissions vs. Peers



Concluding Comments

