GORDIAN®
Building knowledge

Chapman University

Sustainability Solutions

FY20/21 GHG Benchmarking Update

April 2022

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University of Toledo
University of Vermont
University of Washington
University of West Florida
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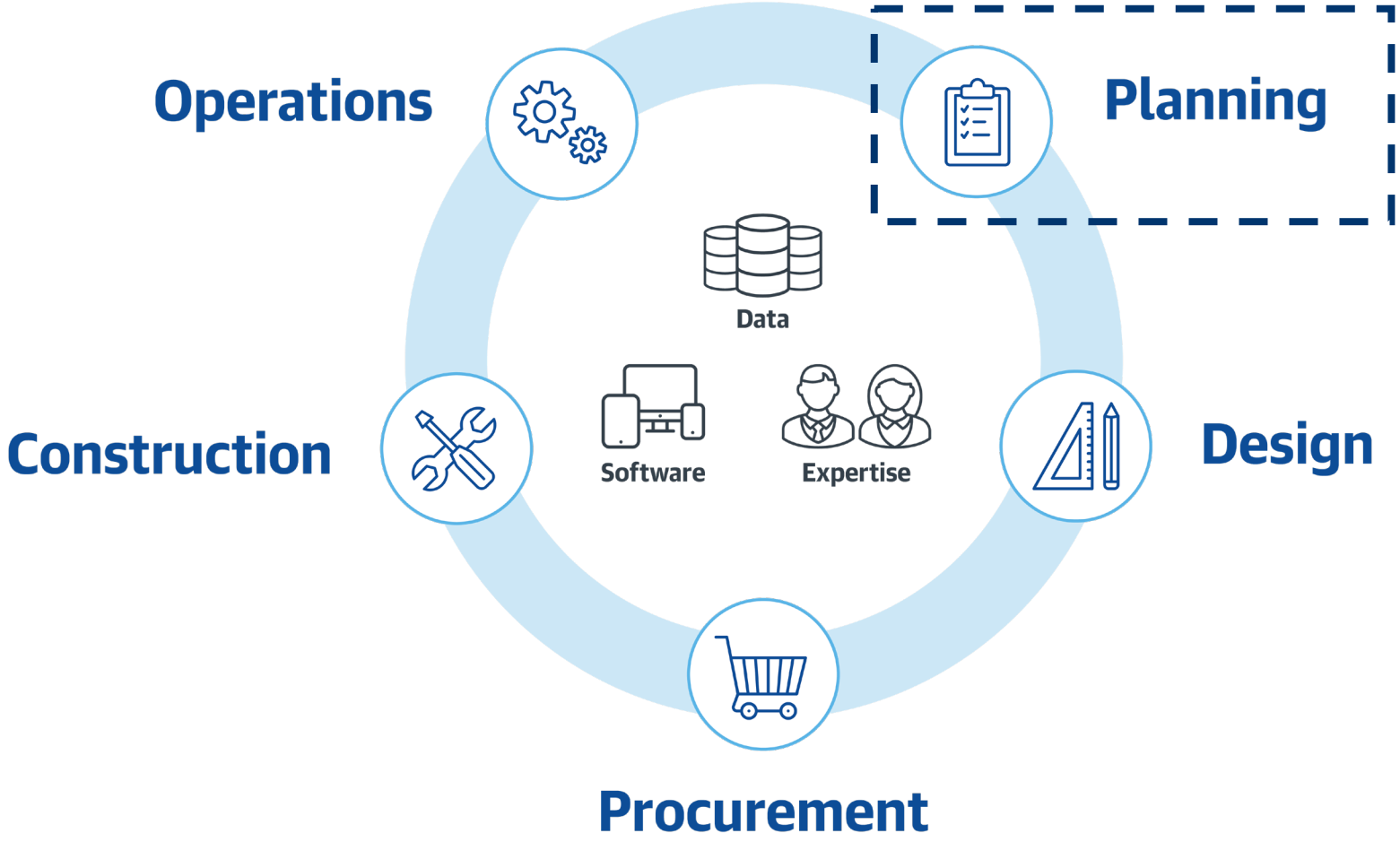
Vanderbilt University
Virginia Commonwealth University
Wake Forest University
Washburn University
Washington State University
Washington State University - Tri-Cities Campus
Washington State University - Vancouver
Washington University in St. Louis
Wayne State University
Wellesley College
Wesleyan University
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

GORDIAN®

Sightlines Solutions

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.

University of New Hampshire

SIMAP
SUSTAINABILITY INDICATOR MANAGEMENT & ANALYSIS PLATFORM

Components of Emissions Profile

Scope 1:
Direct GHGs

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

Scope 2:
Upstream GHGs

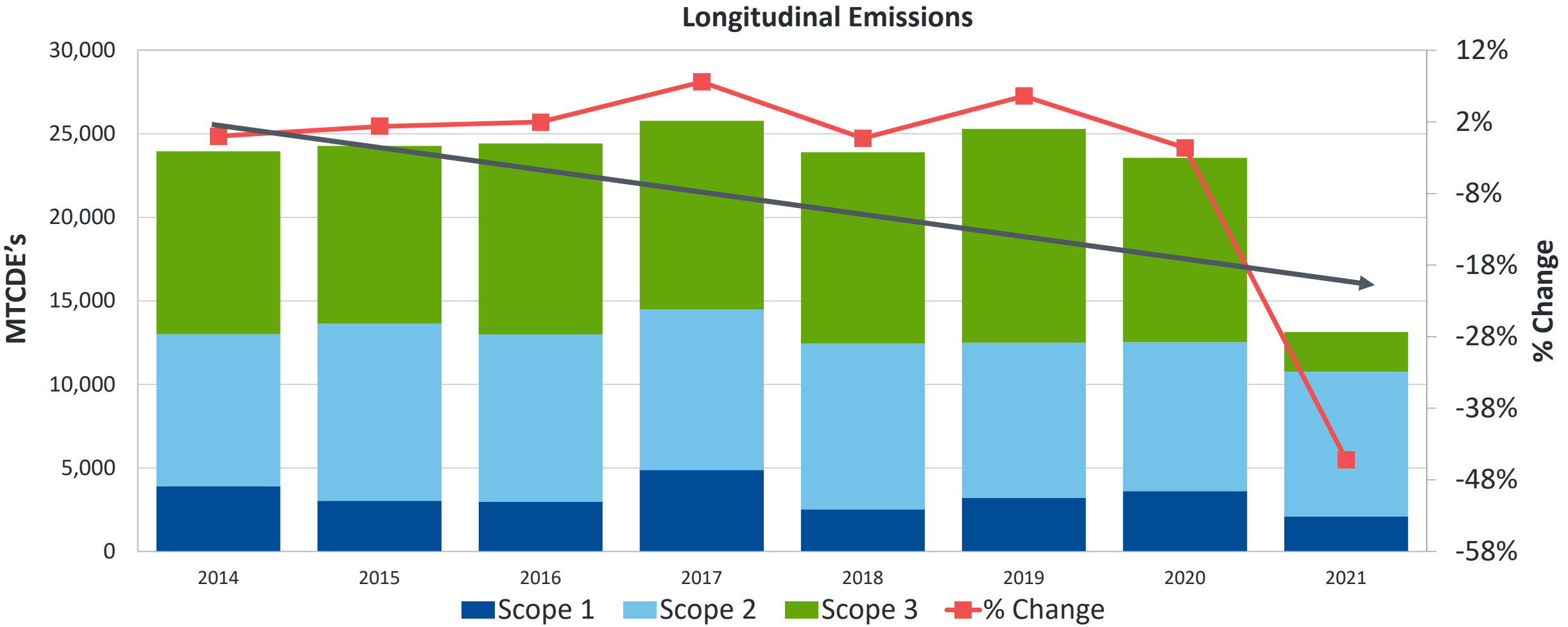
- Purchased Electricity

Scope 3:
Indirect GHGs

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

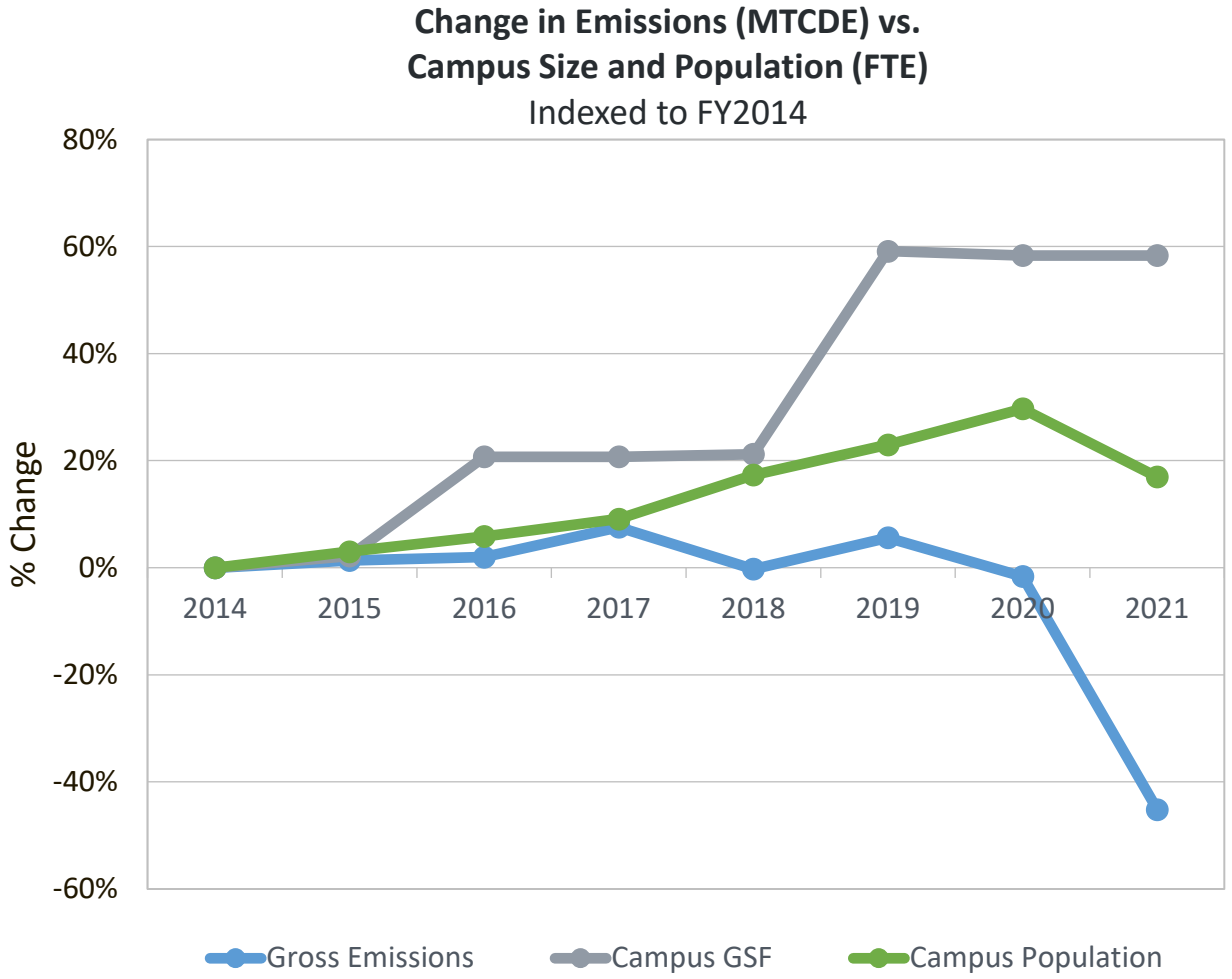
Longitudinal Emissions by Scope

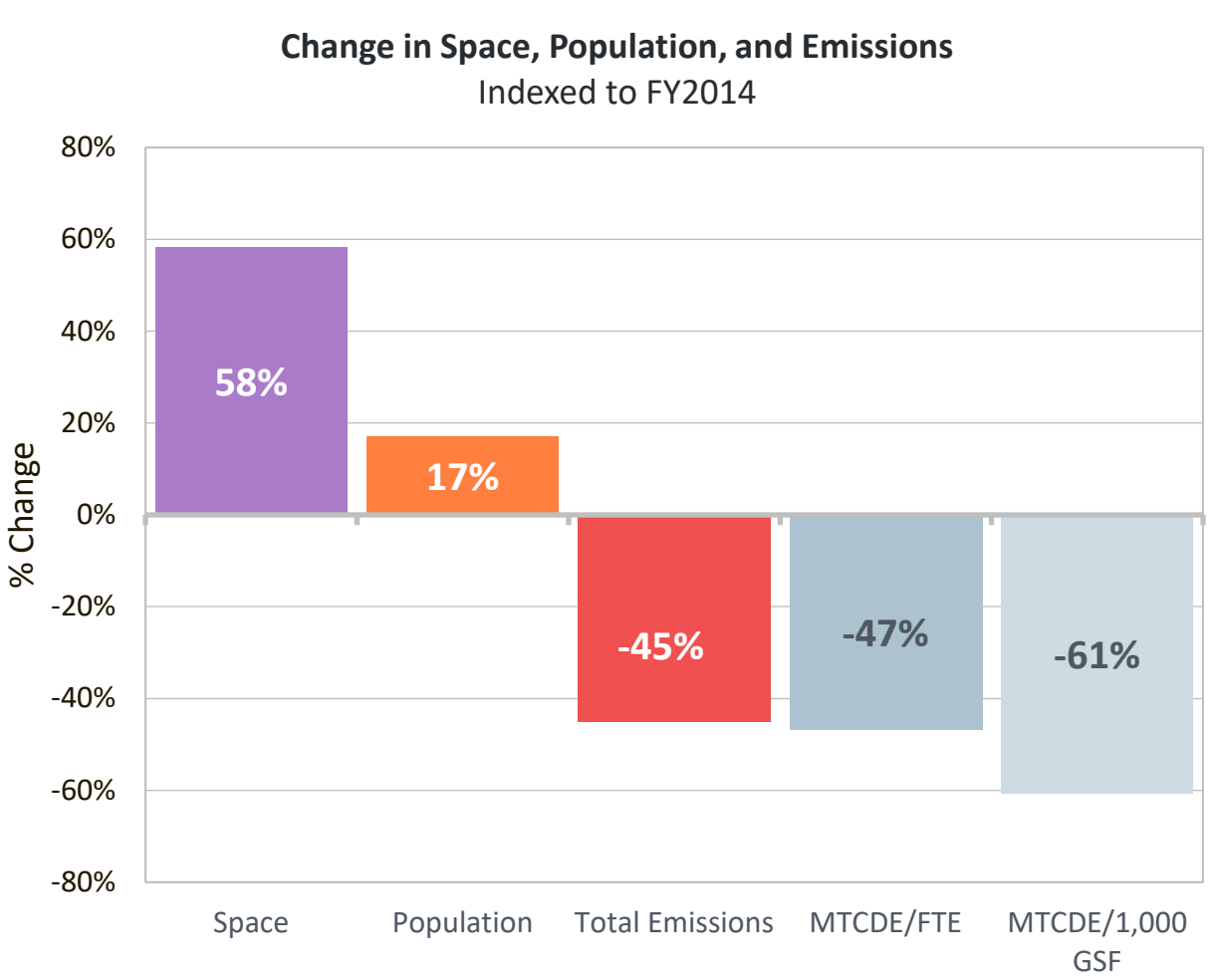
Chapman's FY21 emissions were dramatically impacted by Covid



Progress Against 2014 Baseline

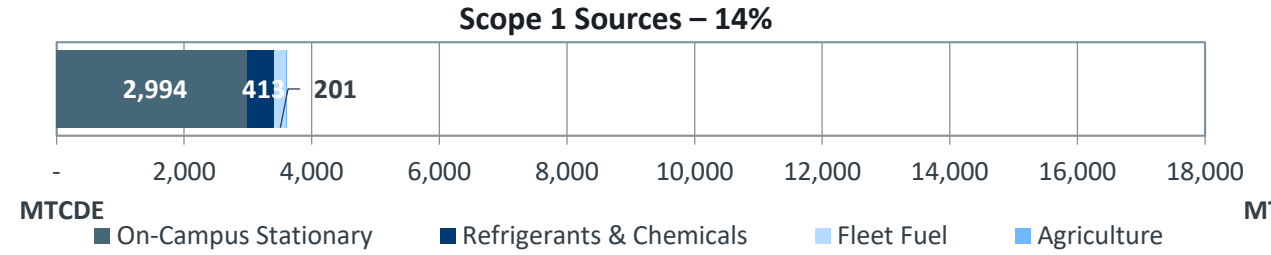
Chapman's emissions substantially decreased when normalizing by population and space

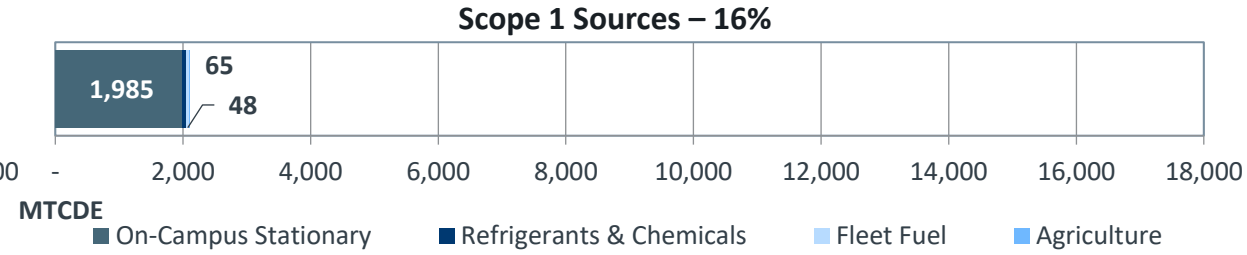


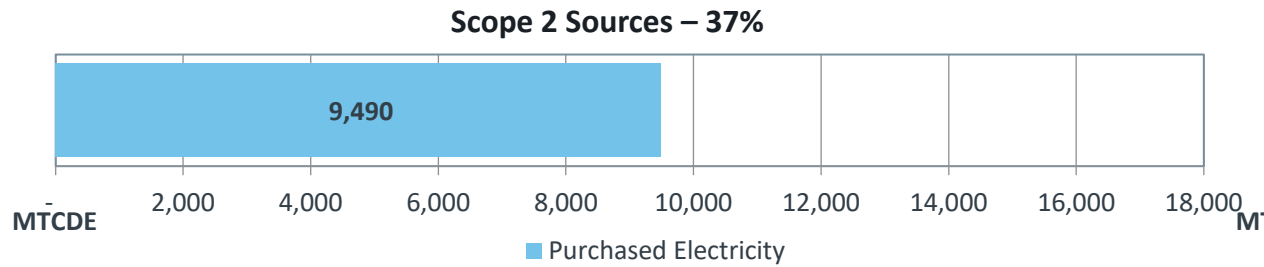


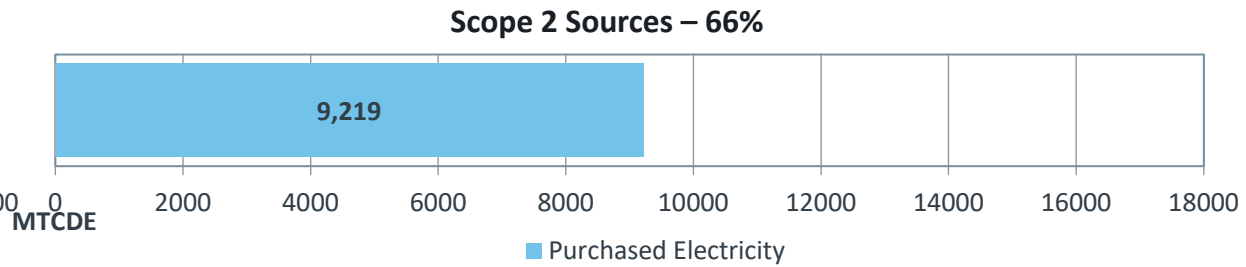
FY21 Distribution of Emissions by Level of Control

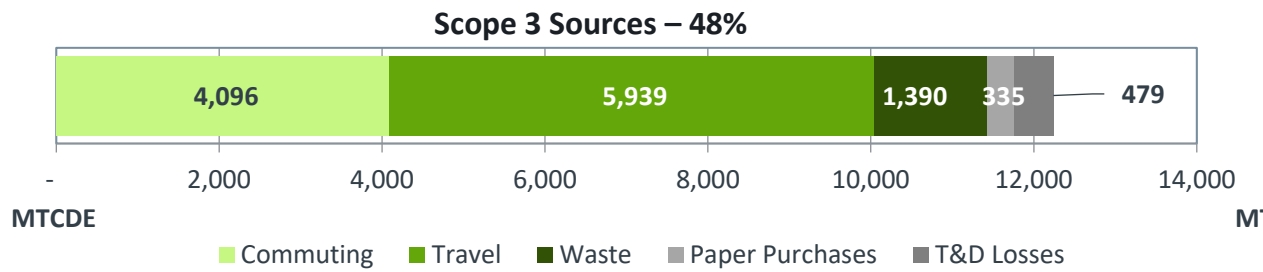
Chapman's emissions varied significantly within Scope 3, Scope 2 & 1 saw less fluctuation

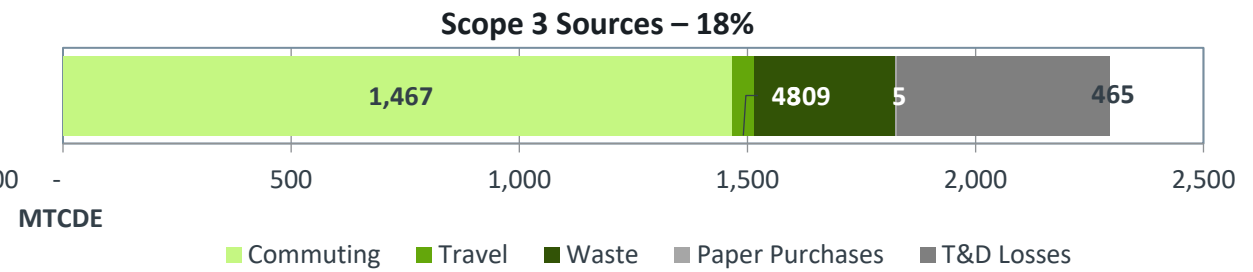












Sustainability Peers

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

*Chapman institutional peers

Two Ways to Normalize Emissions for Comparison

GHG Emissions per 1,000 GSF EUI Adjusted

Stresses intensity of operations.

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

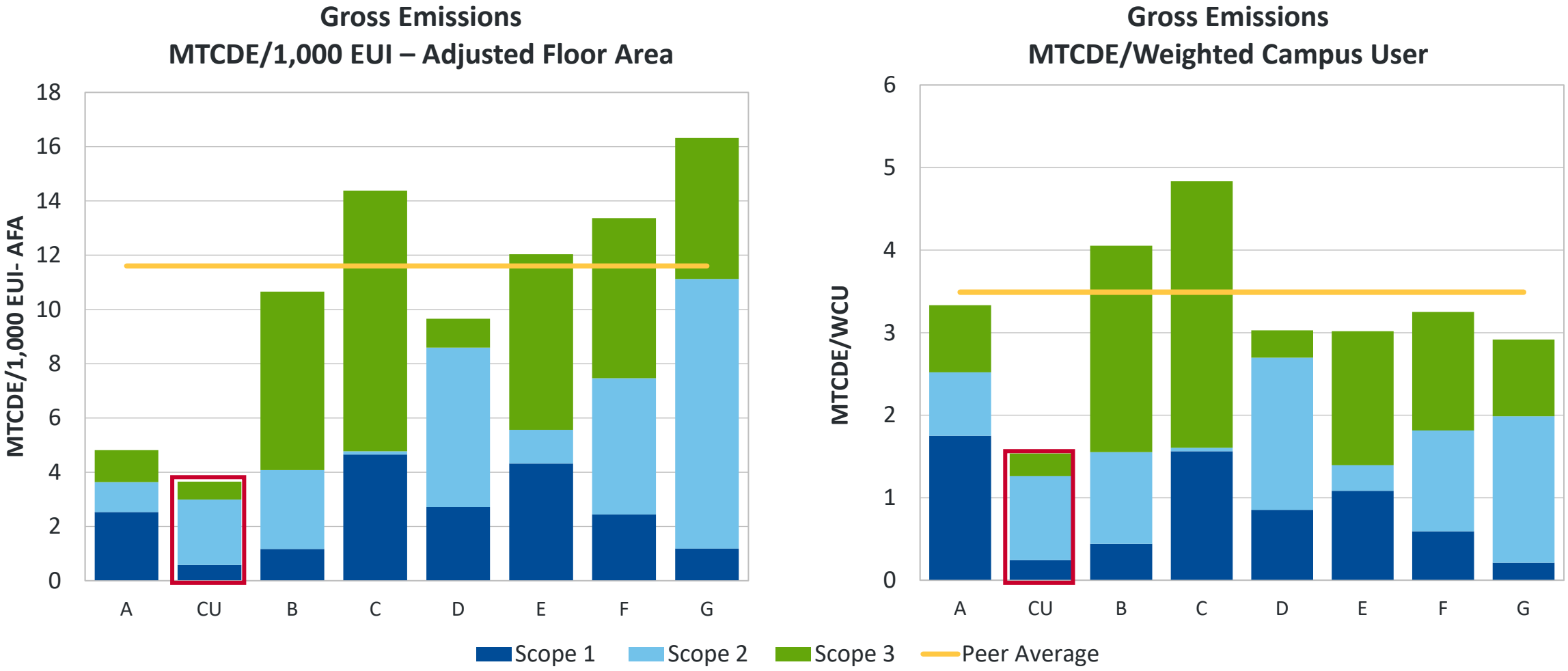
GHG Emissions per Weighted Campus User

Stresses efficient use of space.

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

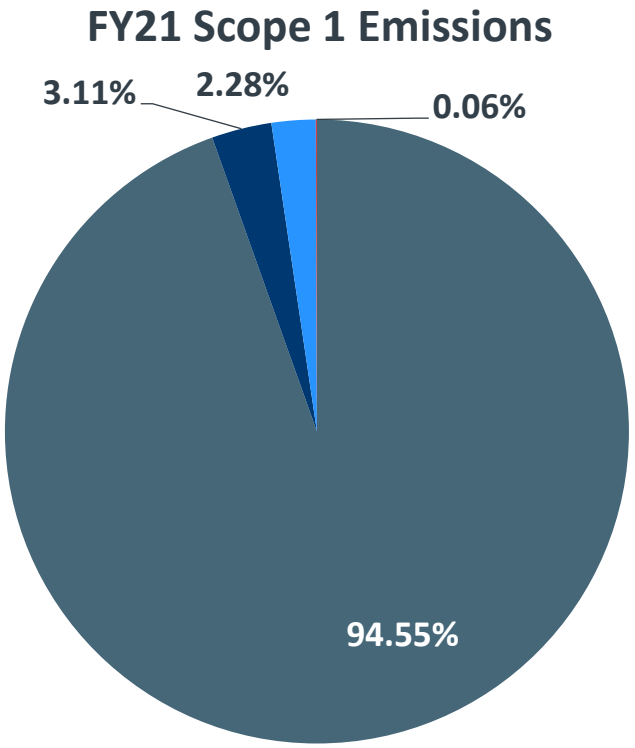
Total Gross Emissions per Space and Campus User

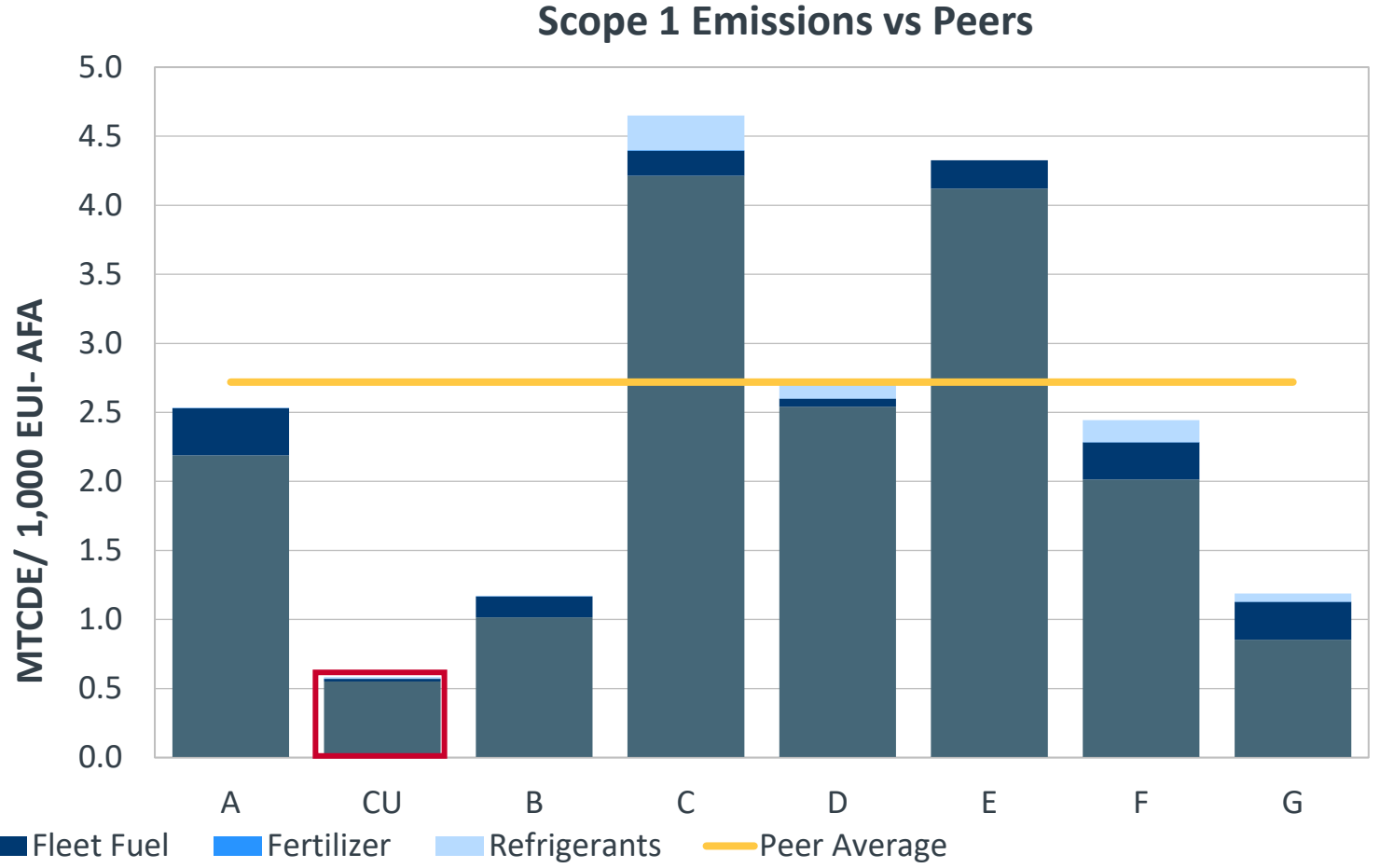
Chapman emits less than peers when normalized by GSF and population



Scope 1: Direct Emissions

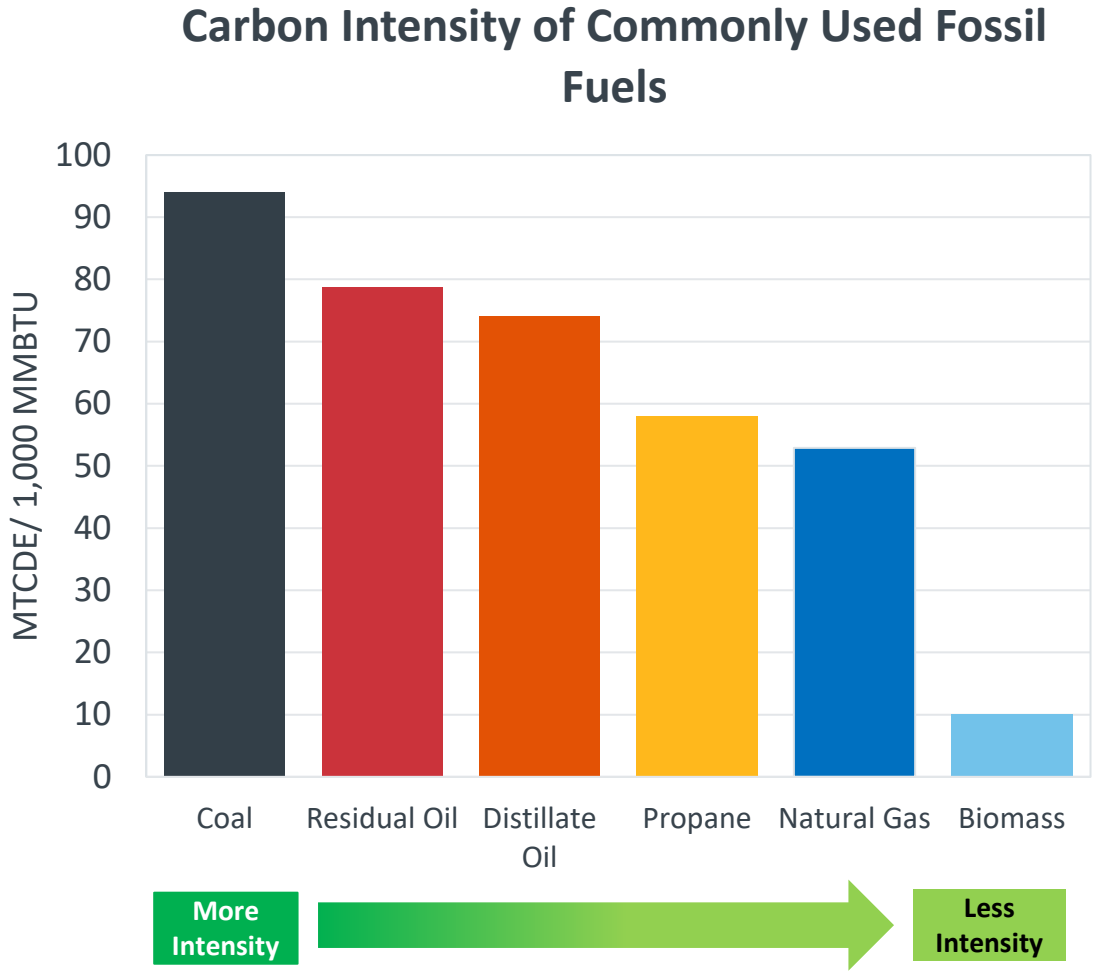
Chapman's scope 1 emissions are significantly below peer average

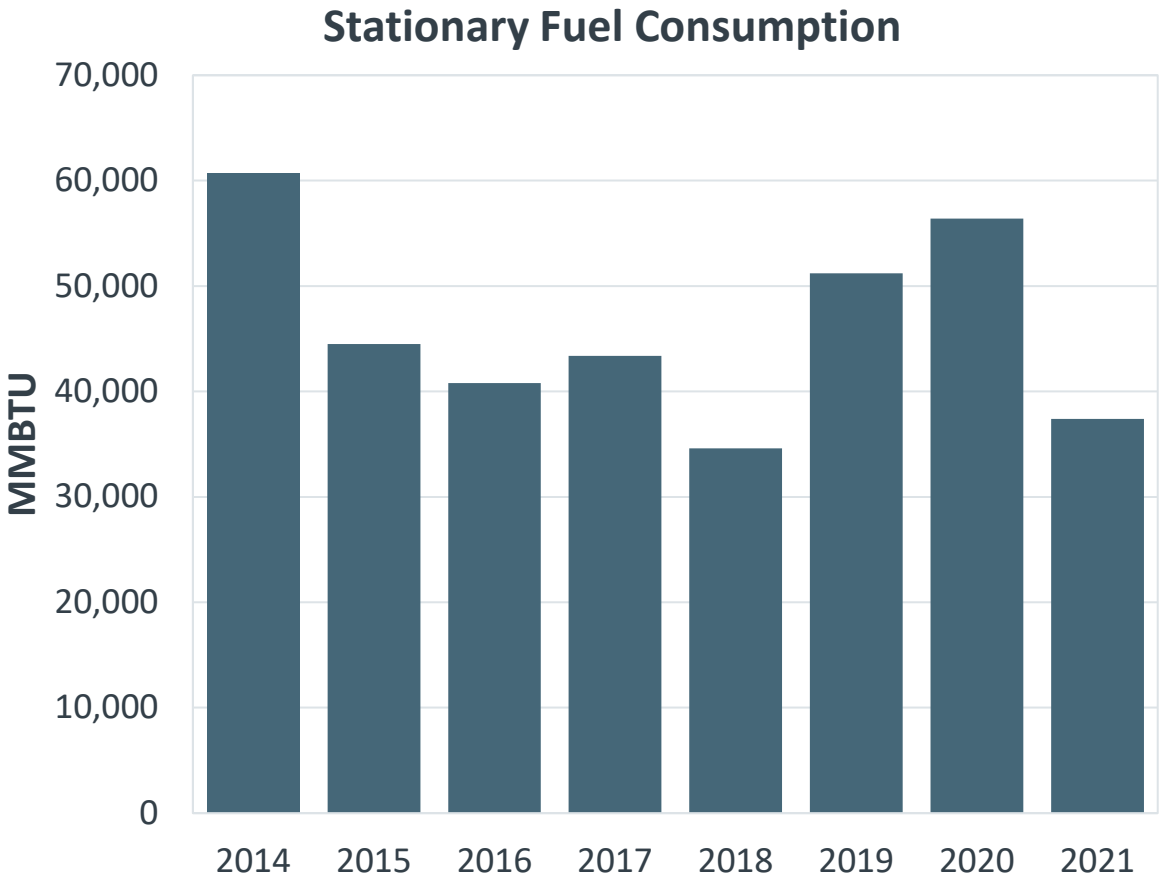




Scope 1: Stationary Fuel Consumption

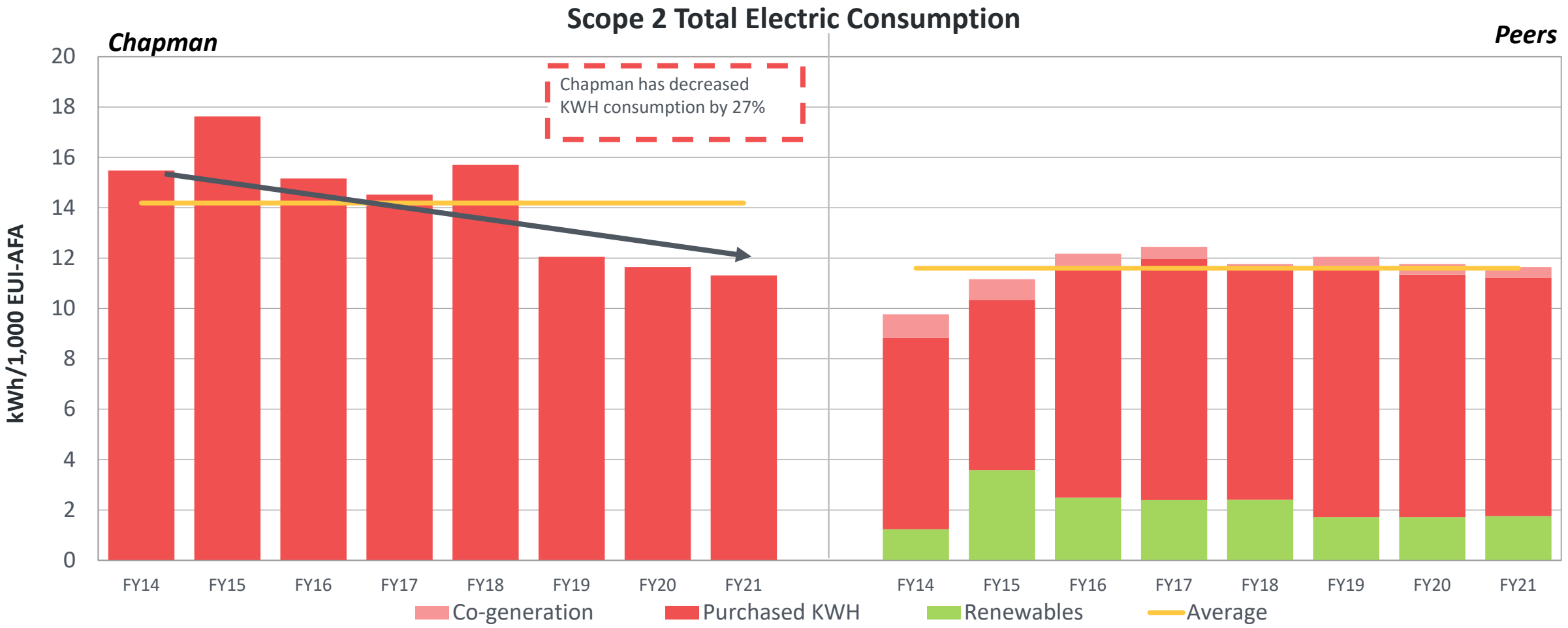
Chapman's decrease in Scope 1 lead by a decline in natural gas consumption





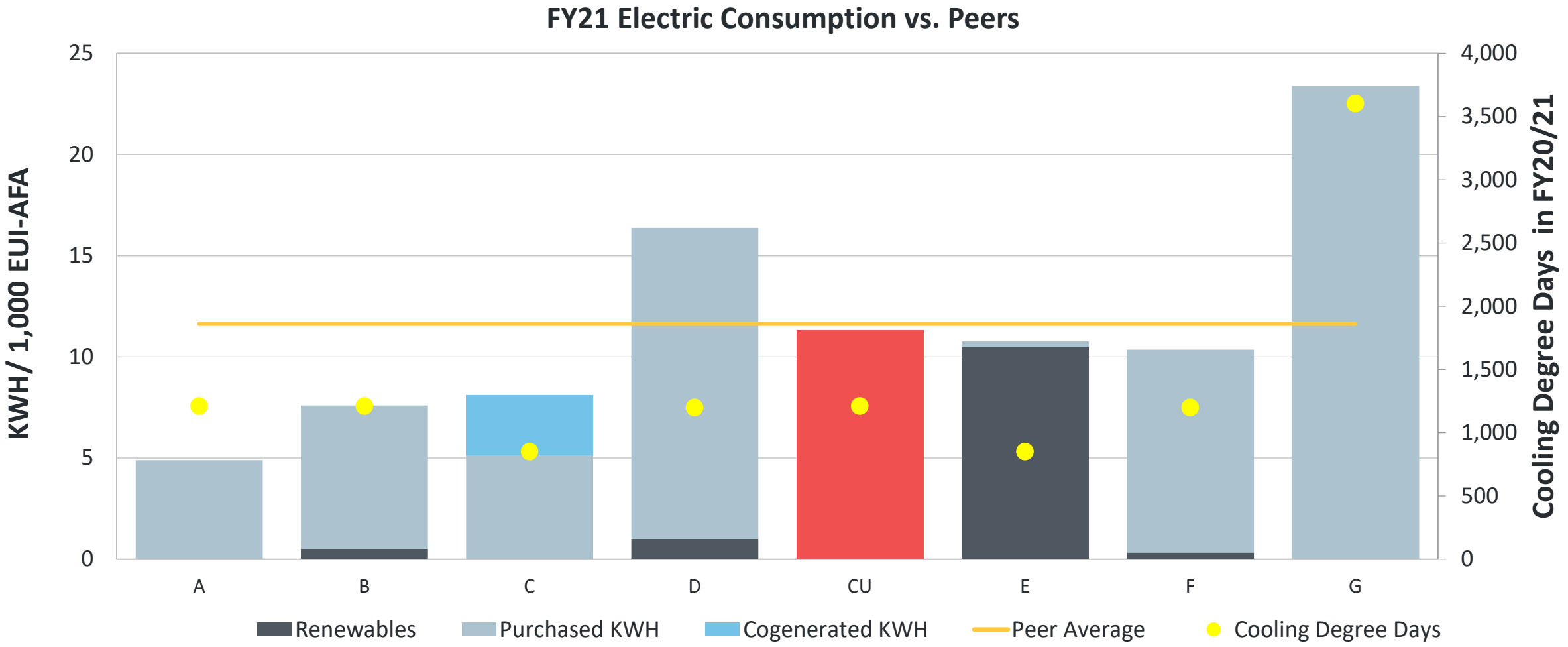
Scope 2: Total Electric Consumption vs. Peers

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



Scope 2: Total Electric Consumption vs. Peers

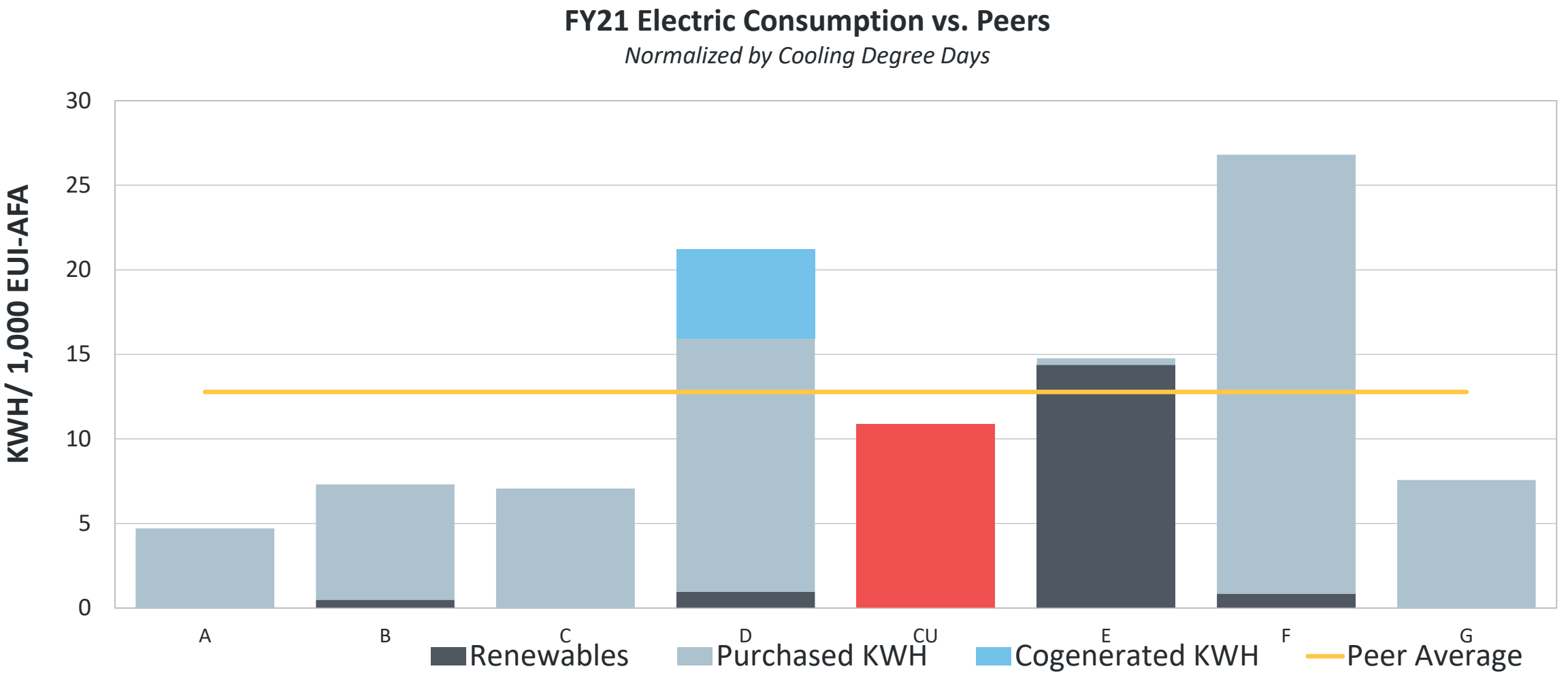
While total consumption is similar to peer average, peers diversify their electrical sources



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

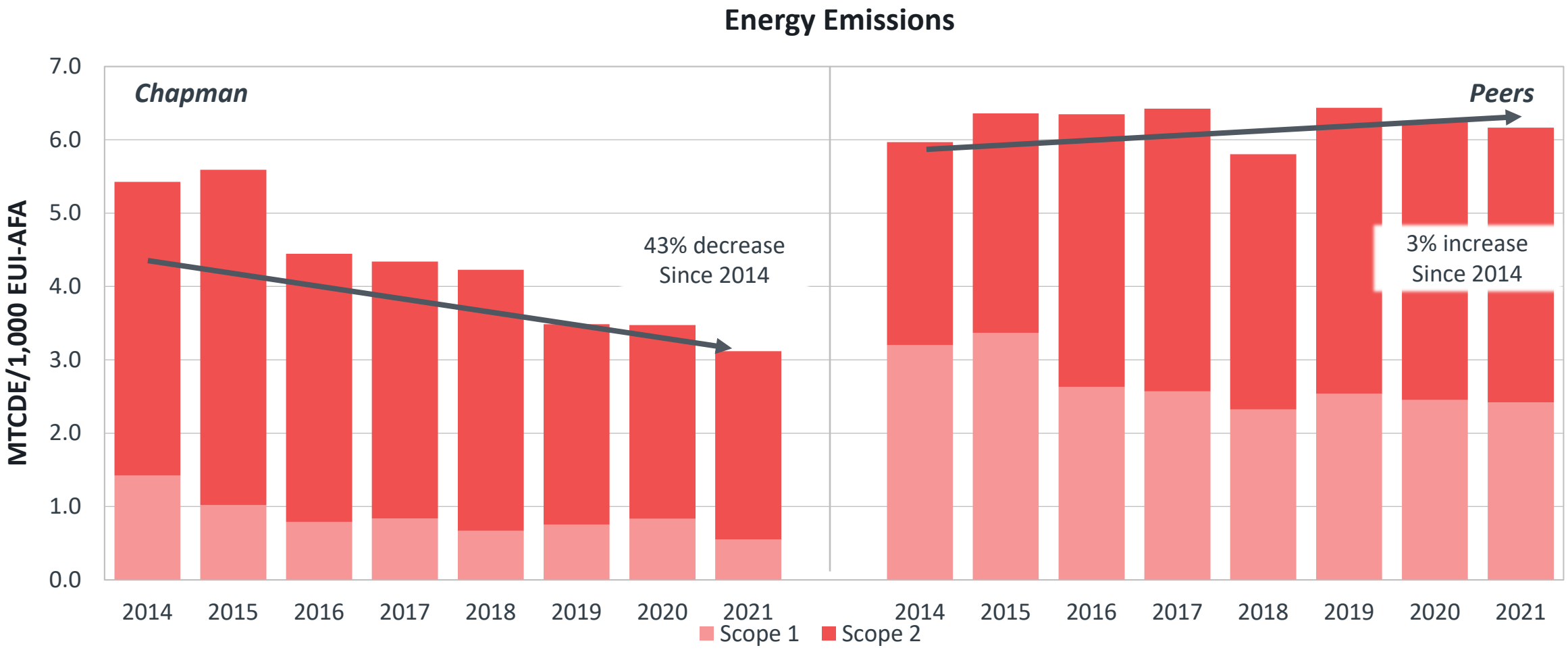
When normalizing by cooling degree days, Chapman consumed less than peer average



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

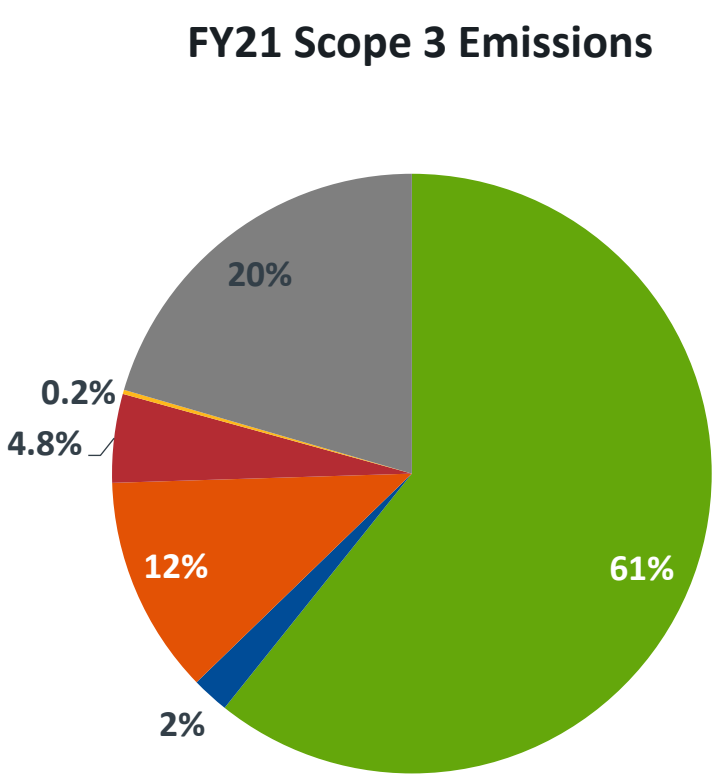
Energy Emissions vs. Peers

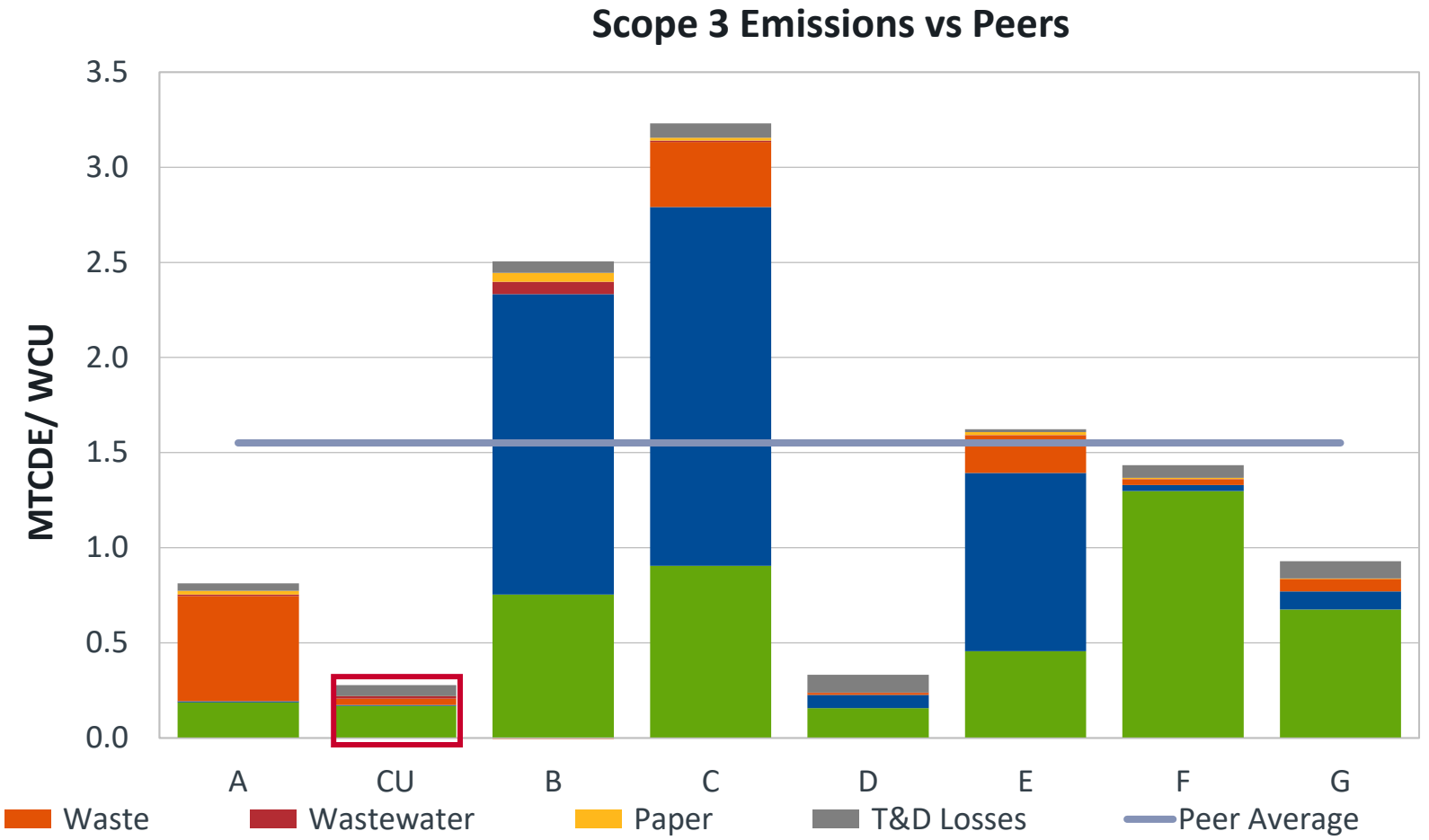
Chapman's decrease in emissions has been partially due to energy efficiency upgrades



Scope 3: Indirect Emissions Overview

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

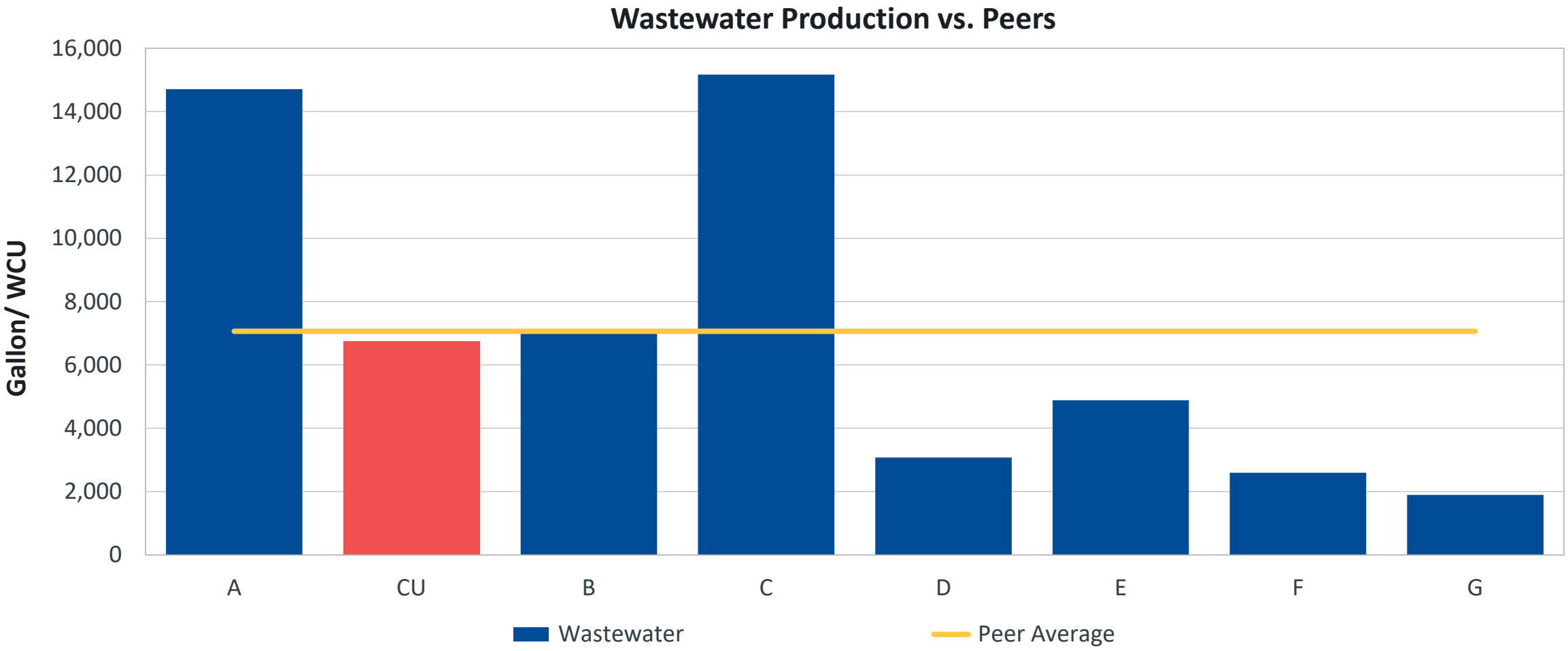




Paper data was extrapolated for all years from FY17

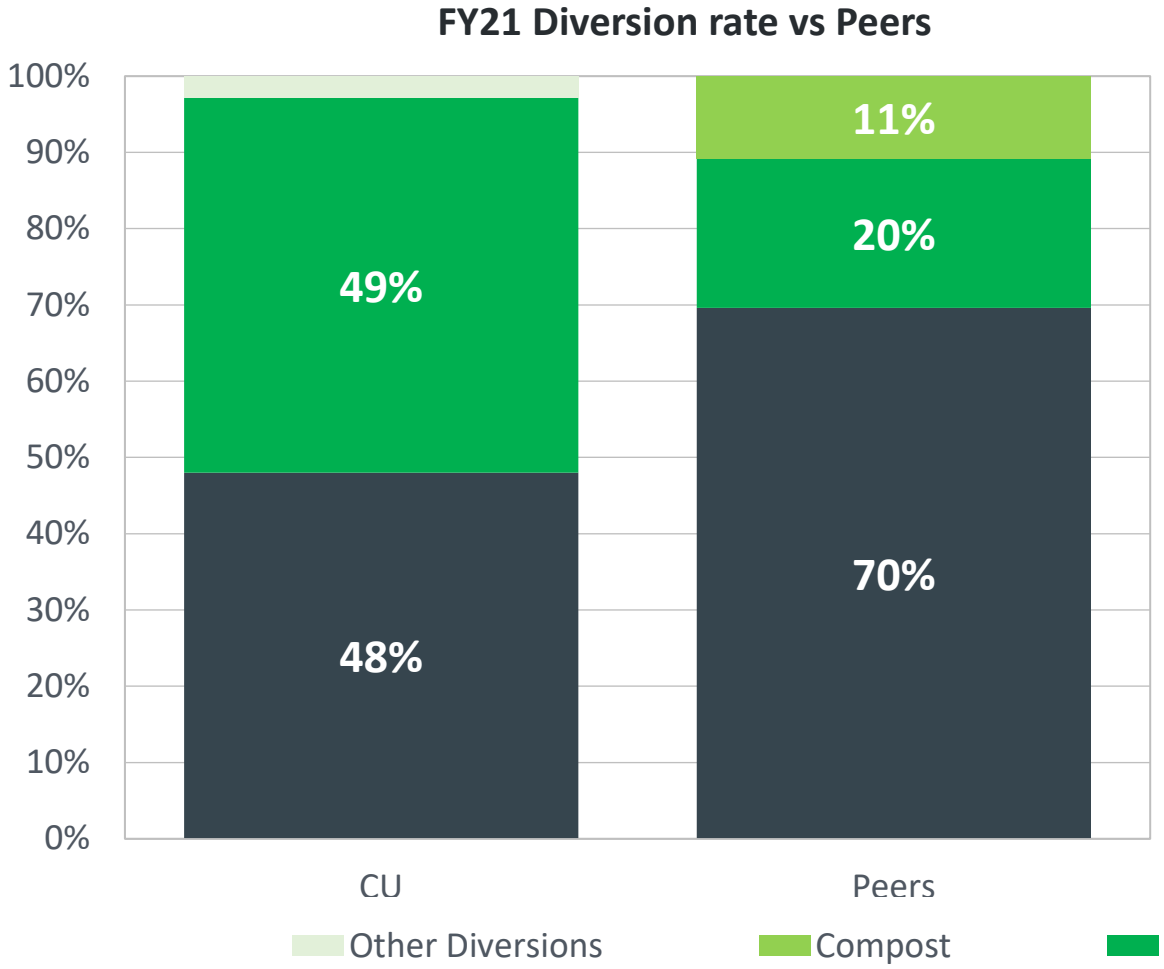
Wastewater Production Similar to Peers

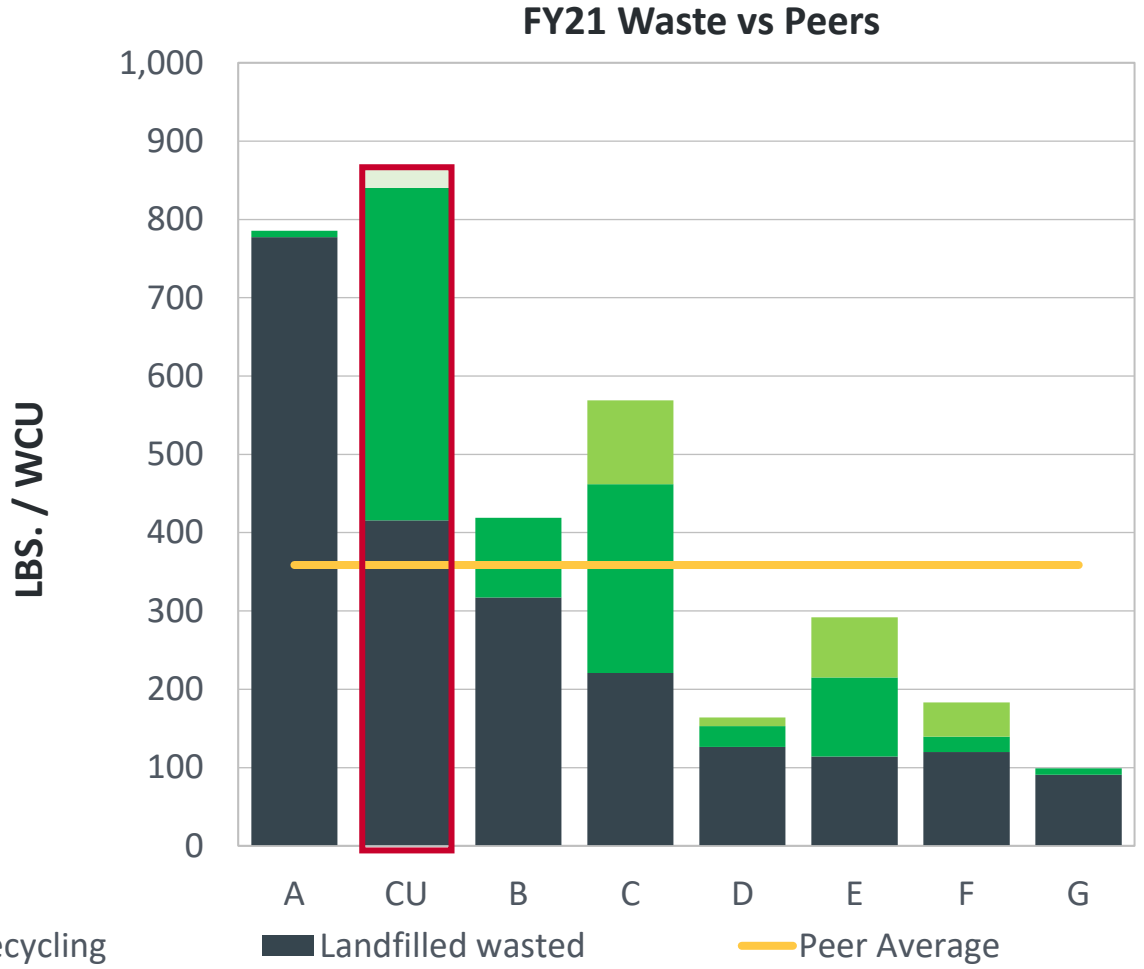
While wastewater is less than 5% of emissions, water reduction should be prioritized



A Closer Look at Waste

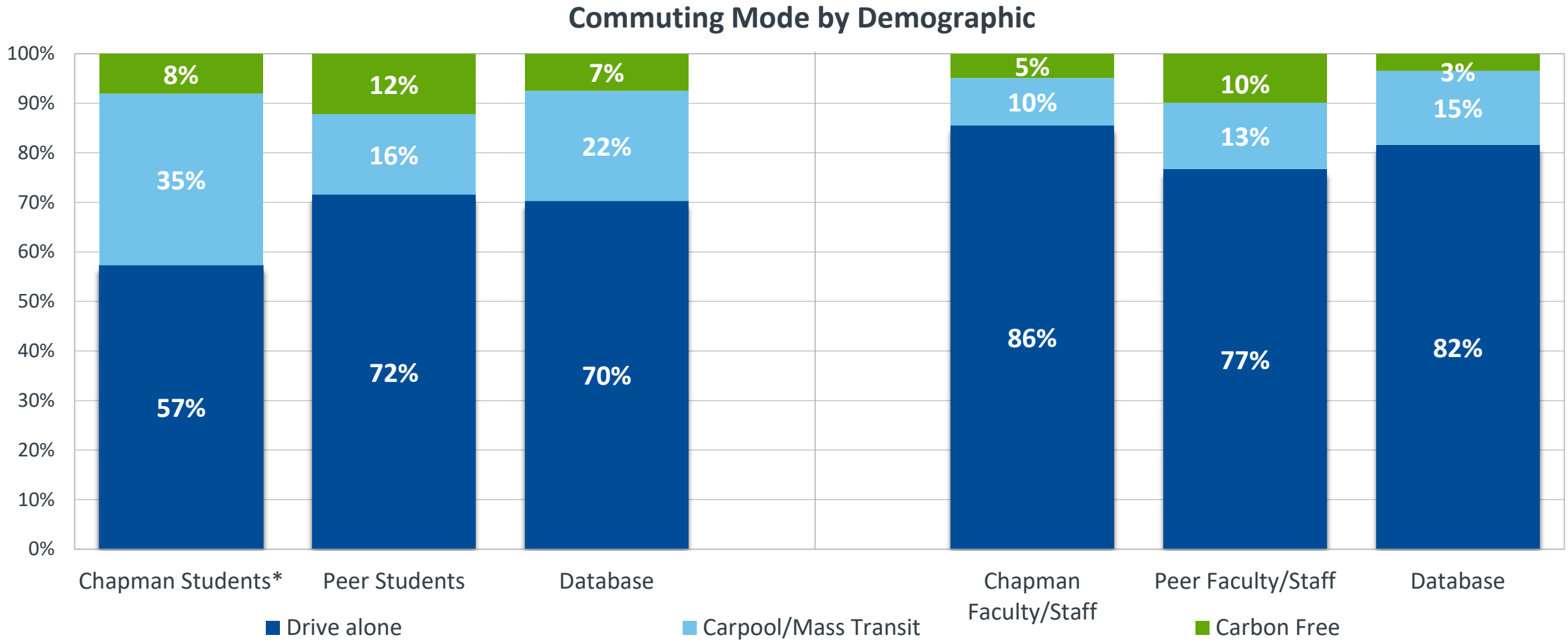
Chapman diverts more waste to recycling than peers, but produces more total waste





Commuting Profile by Mode of Transportation

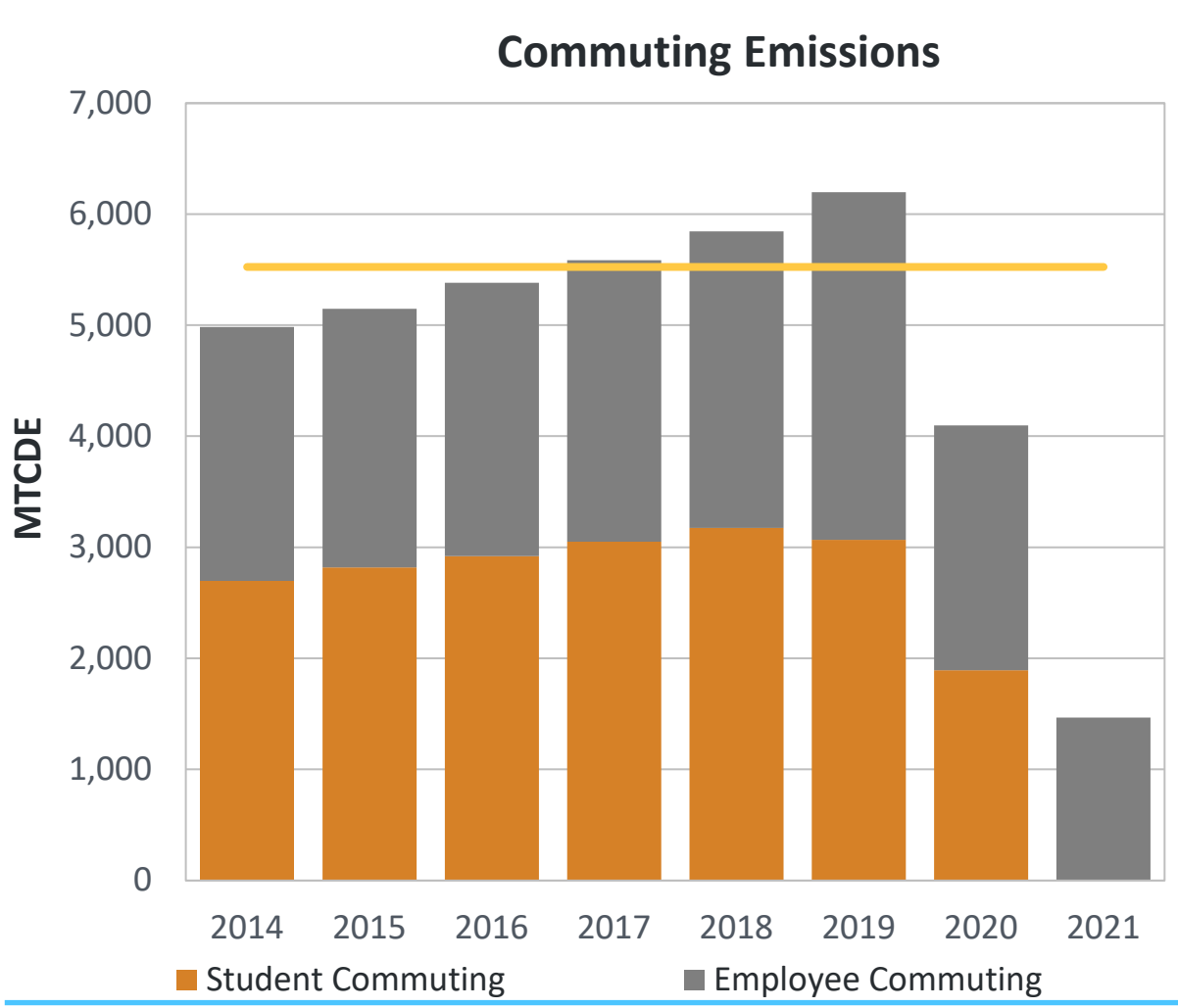
Chapman faculty/staff utilize alternative transportation methods less than peers

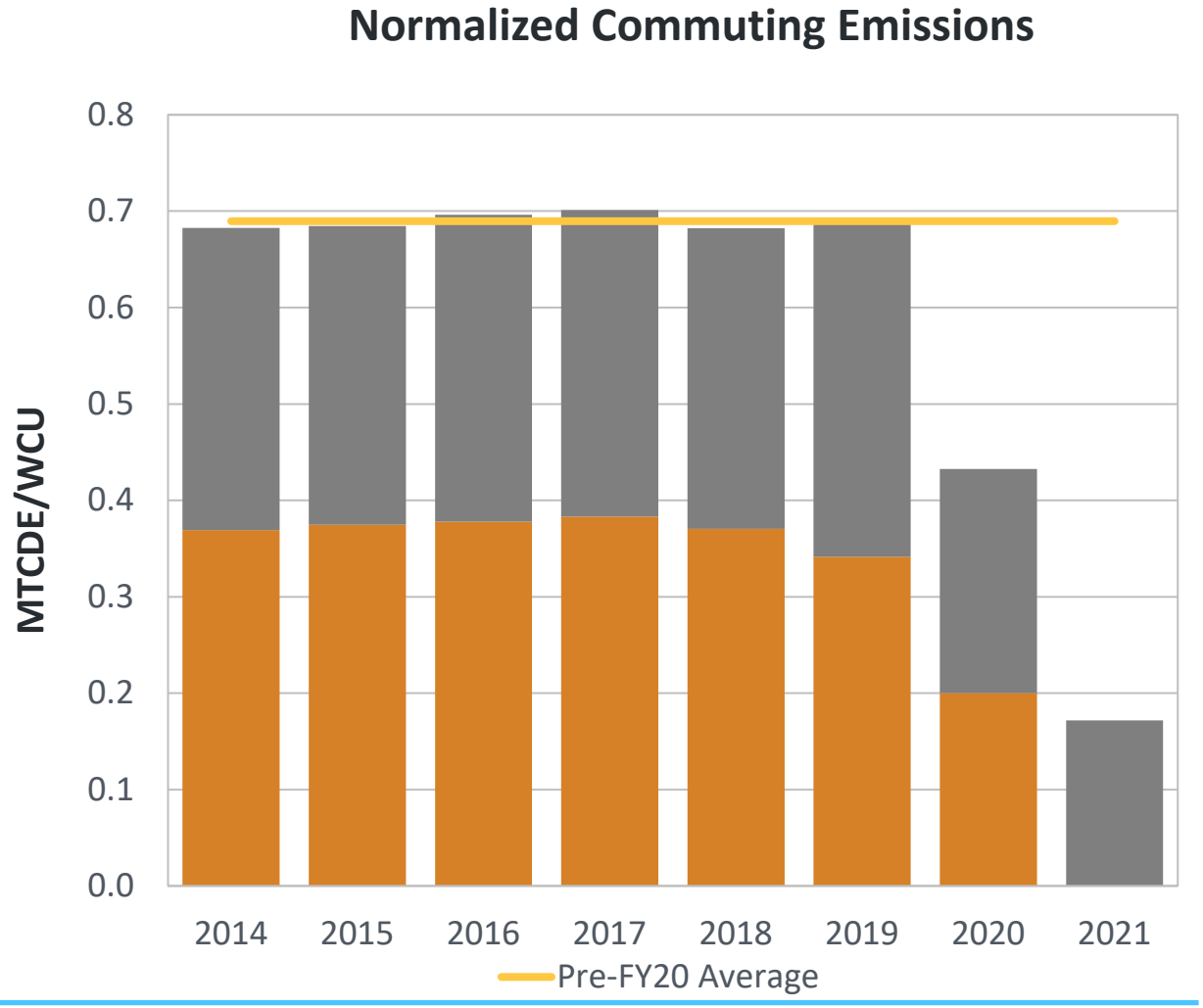


*Chapman students did not commute in FY21

Total Commuting Emissions

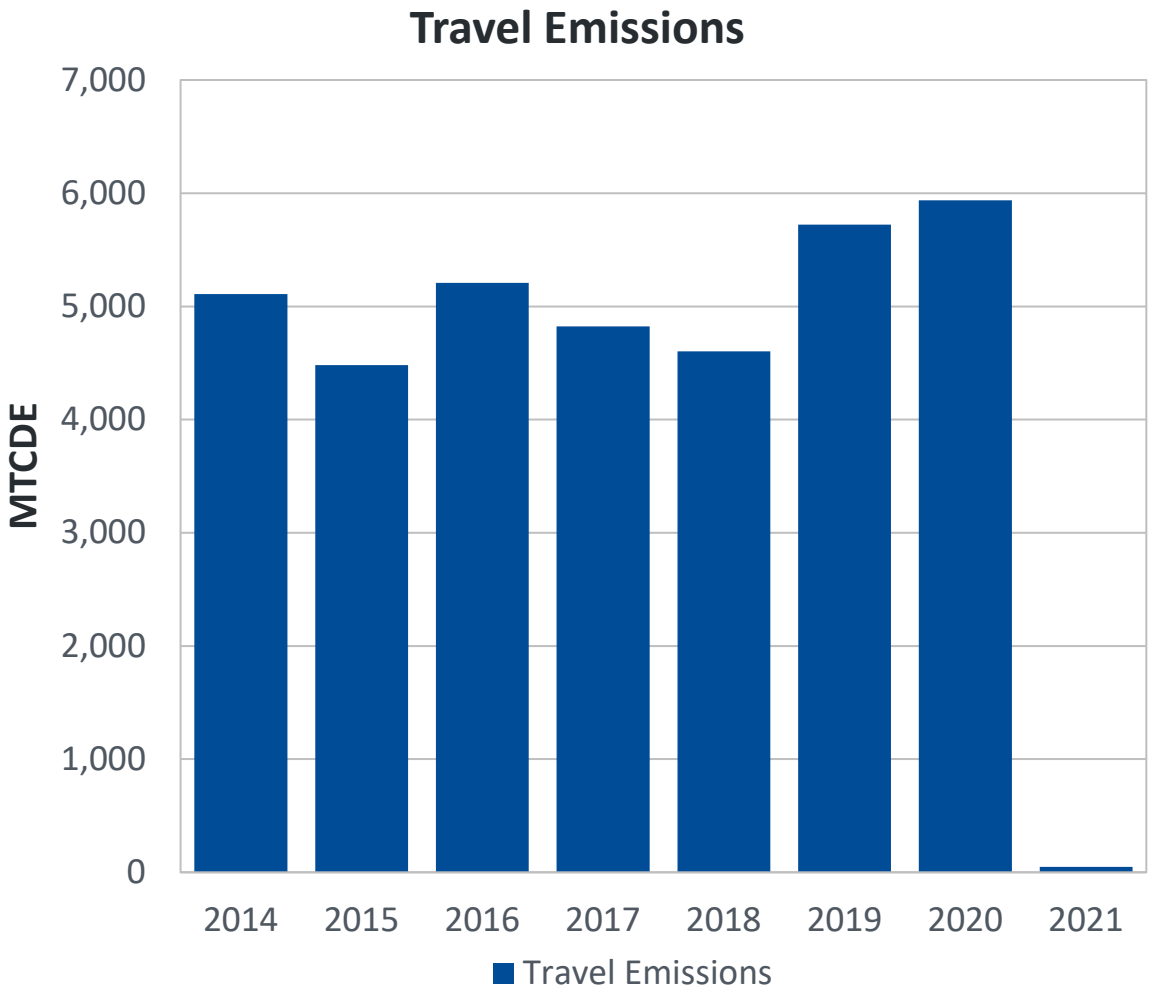
With more staff and classes remote, commuting emissions substantially decreased

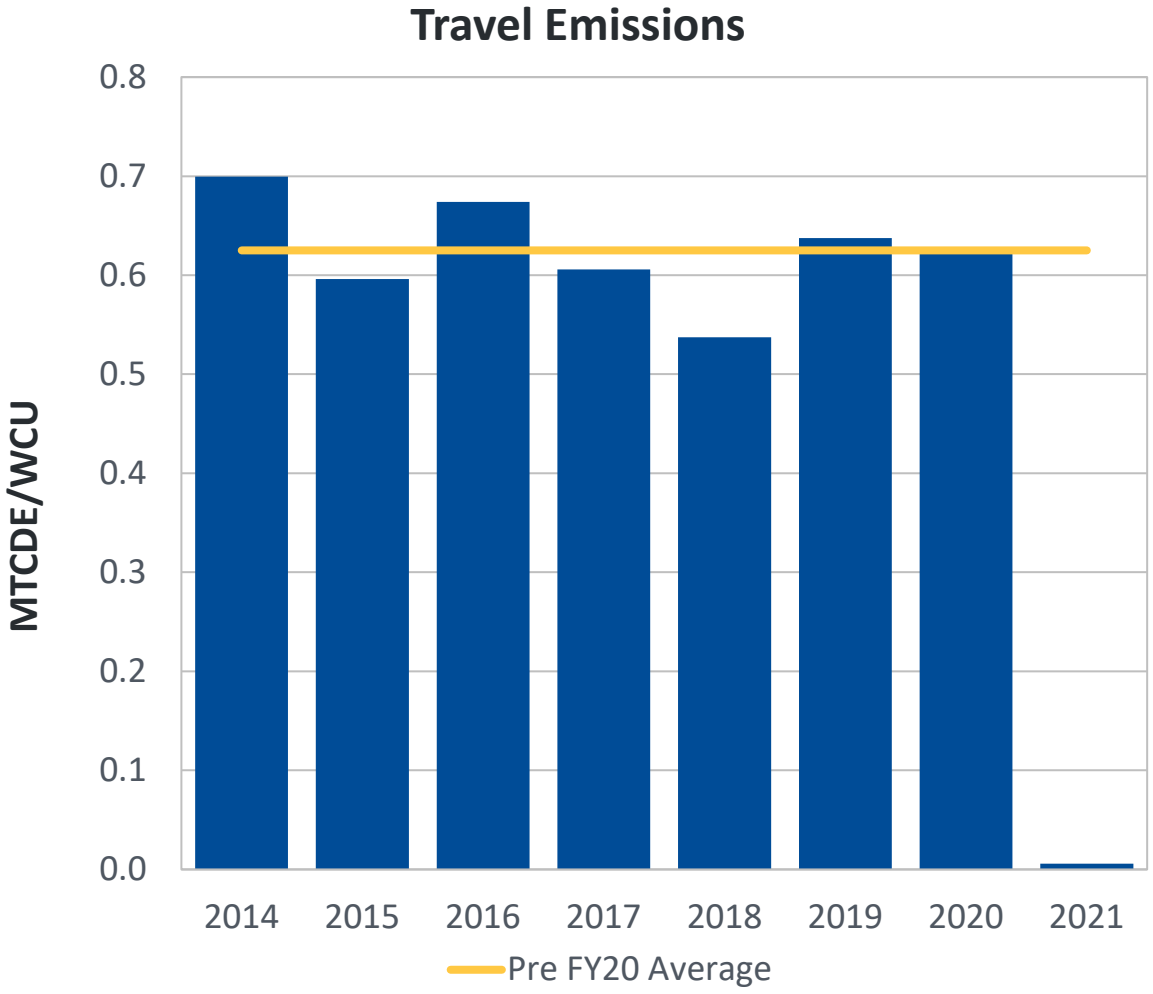




Total Travel Emissions

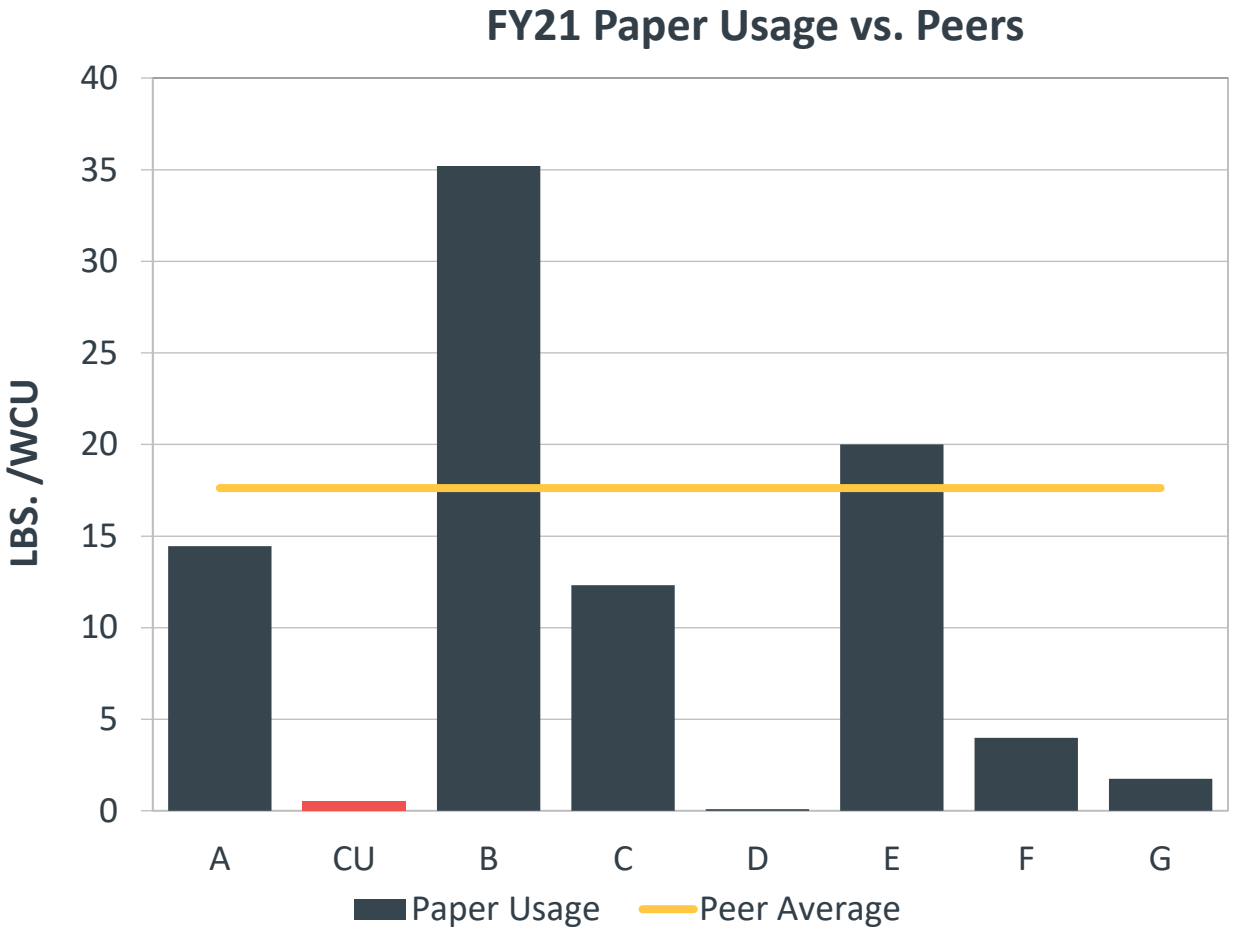
With almost no travel in FY21, emissions were close to zero

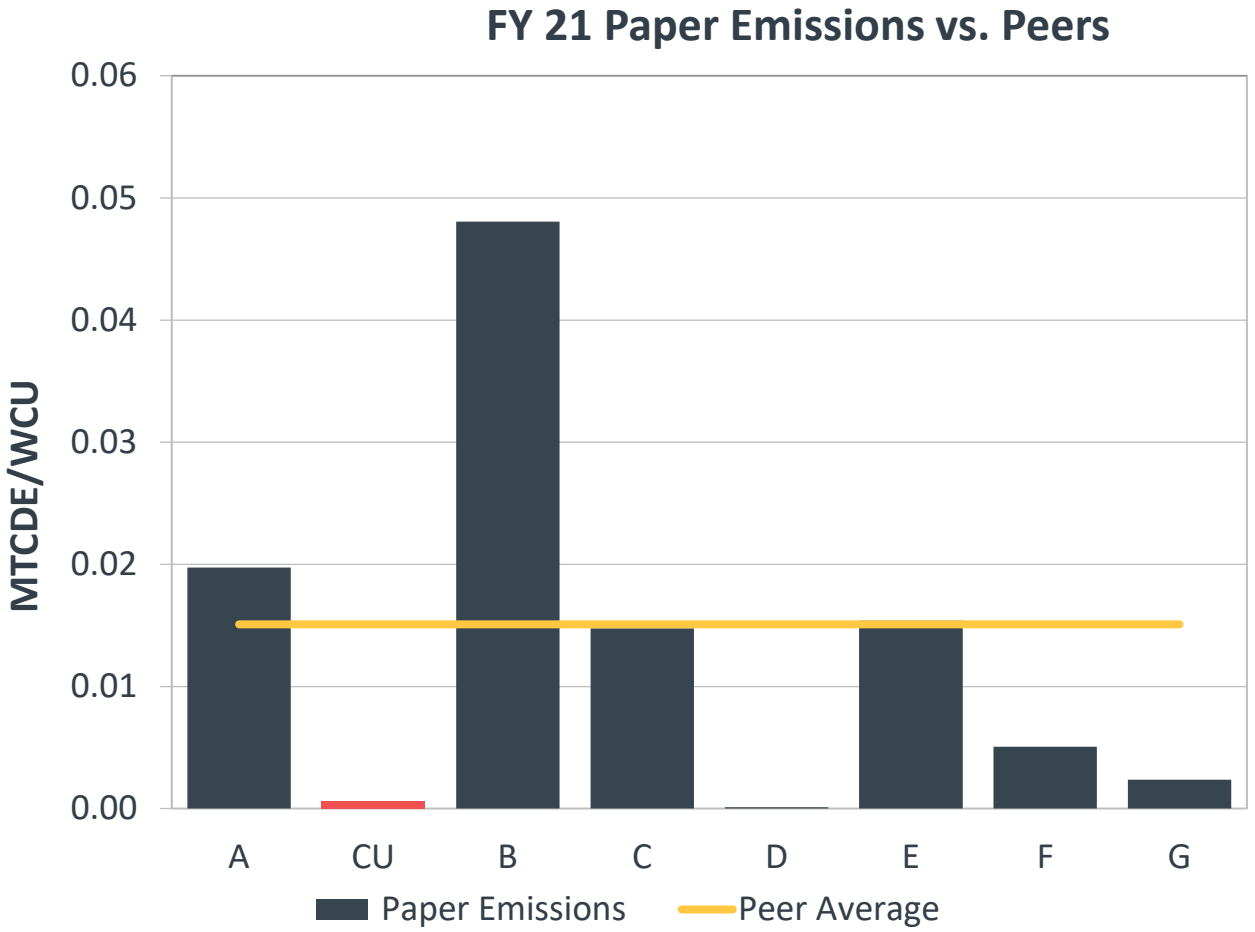




Paper Profile

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





Concluding Comments

Scope 1:

Chapman's Scope 1 emissions saw an overall decrease due to a suspension of traditional fleet activities (athletic travel, campus shuttles) and less MMBTU's of natural gas consumed. Many of these decreases are most likely due to Covid-19 and distance delivery of education. Going forward, Chapman should electrify their vehicle fleet and prioritize energy efficiency projects.

Scope 2:

Chapman will most likely see electricity consumption increase as larger buildings return to full occupancy and the Keck center continues to be built out. Beyond prioritizing energy efficiency projects, Chapman should consider on campus solar, or purchasing renewable electricity directly from SCE, to decrease Scope 2 emissions.

Scope 3:

Scope 3 saw significant reductions due to the Covid-19 pandemic. Chapman should use this a learning opportunity for how to reapproach education. Can students and staff continue to work remotely in some instances to reduce commuting emissions? Additionally, as travel resumes, Chapman should begin the process of phasing in offsets for study abroad and departmental travel.