

The University of Arizona Sustainability Solutions FY22 GHG Presentation

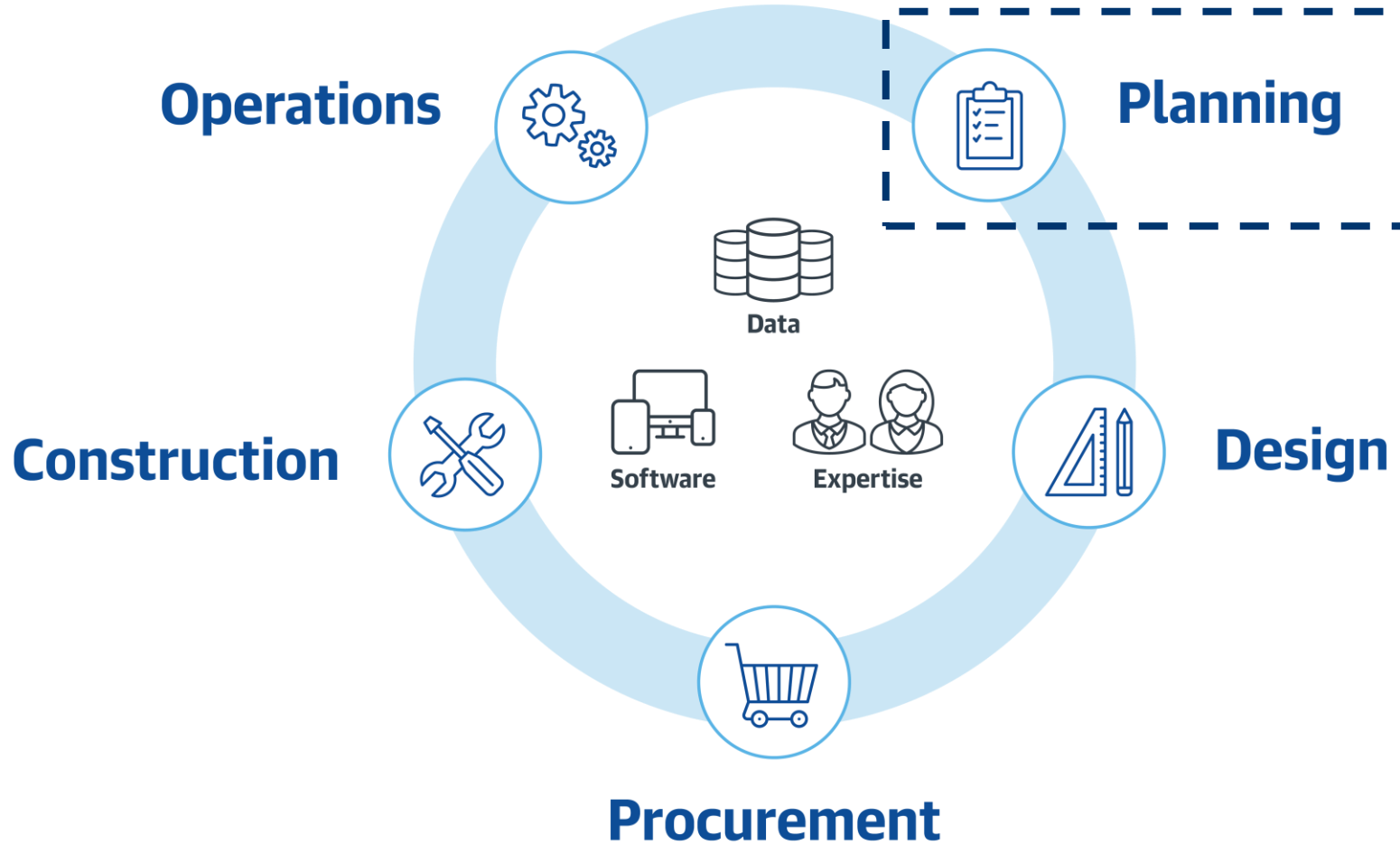
June 2023

Duncan Ketel and Sarah Mason

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



For decades, America's colleges and universities have been at the forefront of environmental sustainability.

We are providing insight and proven strategies that allow your institution to thrive while enhancing the sustainability of the environment we share. This opens up more time for pursuits of your true mission: advocating and implementing campus policies that minimize impact on our planet.

Sustainability Solutions Agenda



Overview of Gordian 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**



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

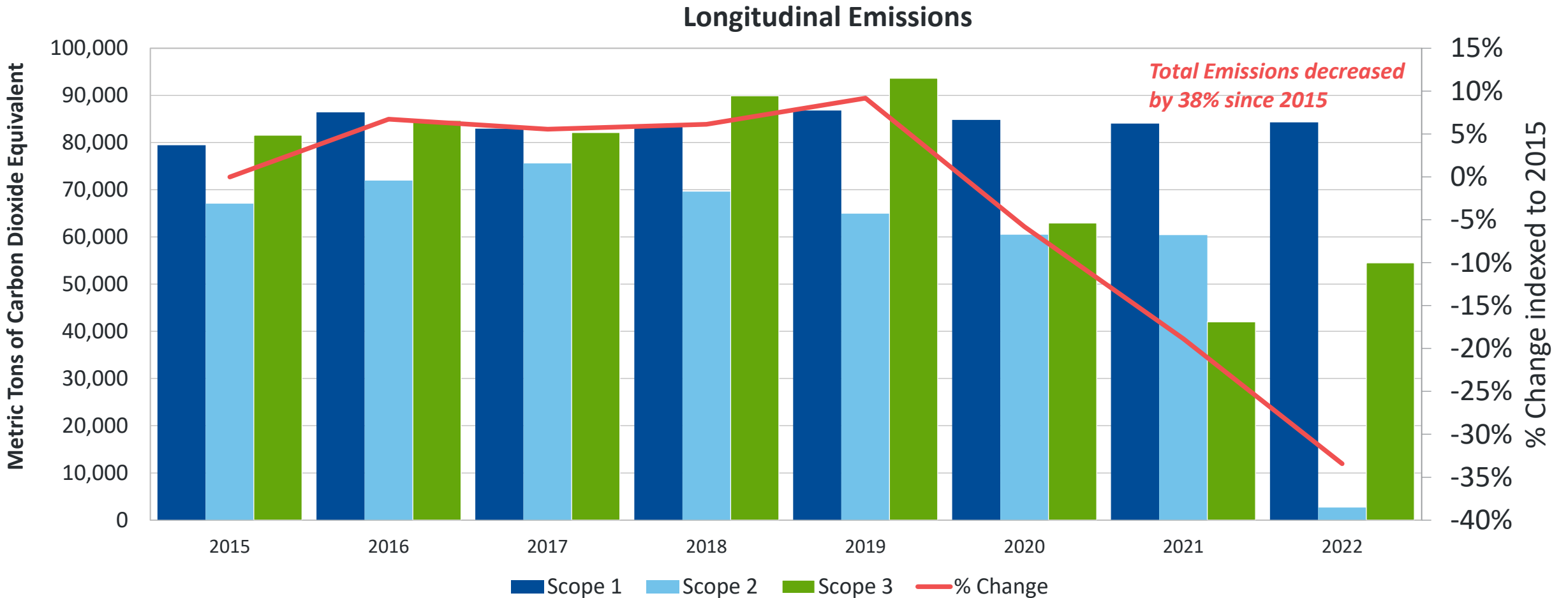


- Commuting
- Directly Financed Travel
- Solid Waste
- Paper Purchasing
- Transmission & Distribution Losses

Longitudinal Emissions by Scope



By entering an agreement with TEP, UArizona is approaching scope 2 neutrality



Sustainability Peers



Peers determined using location, campus size, and population



Peer Institution	Location
Clemson University	Clemson, SC
Michigan State University	East Lansing, MI
Texas A&M University	College Station, TX
Towson University	Towson, NJ
University of Alabama	Tuscaloosa, AL
University of Arkansas	Fayetteville, AR
University of Texas – Rio Grande Valley	Edinburg, TX
Virginia Commonwealth University	Richmond, VA

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.

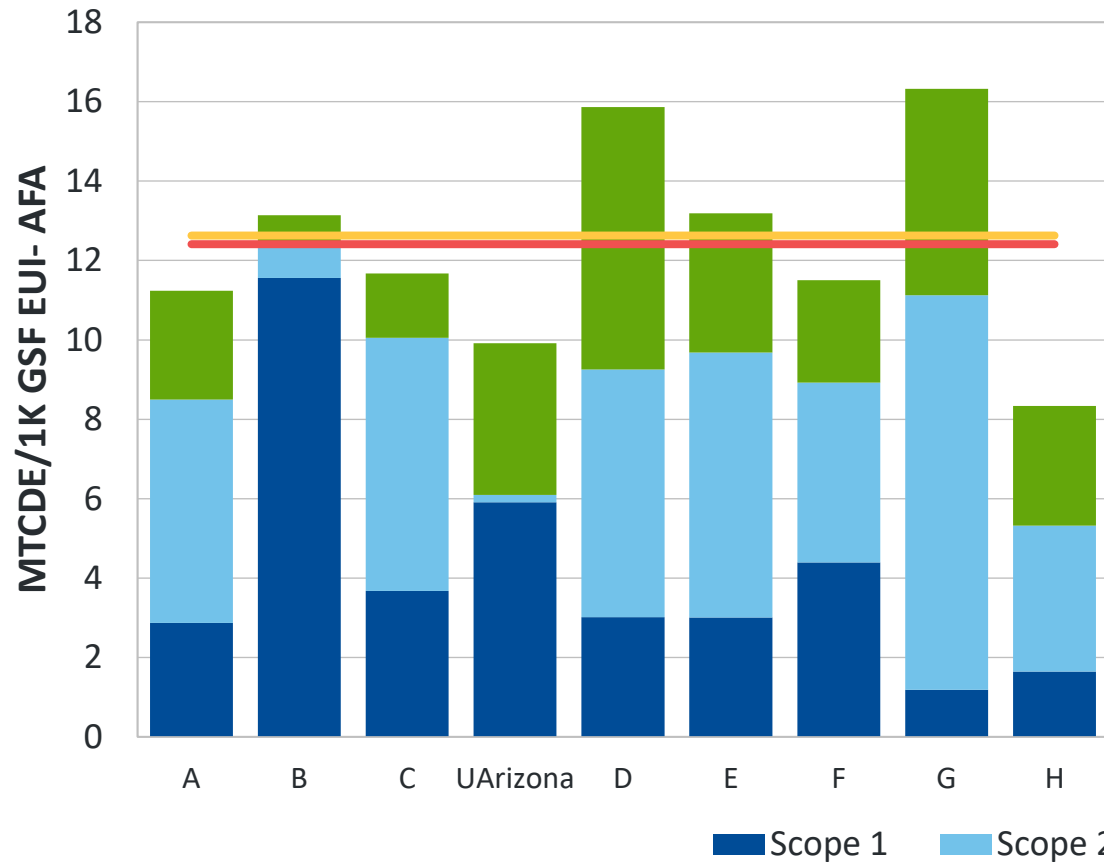
$$\frac{\text{Gross GHG Emissions}}{\text{Weighted Campus User}}$$

Total Gross Emissions per Space and Campus User

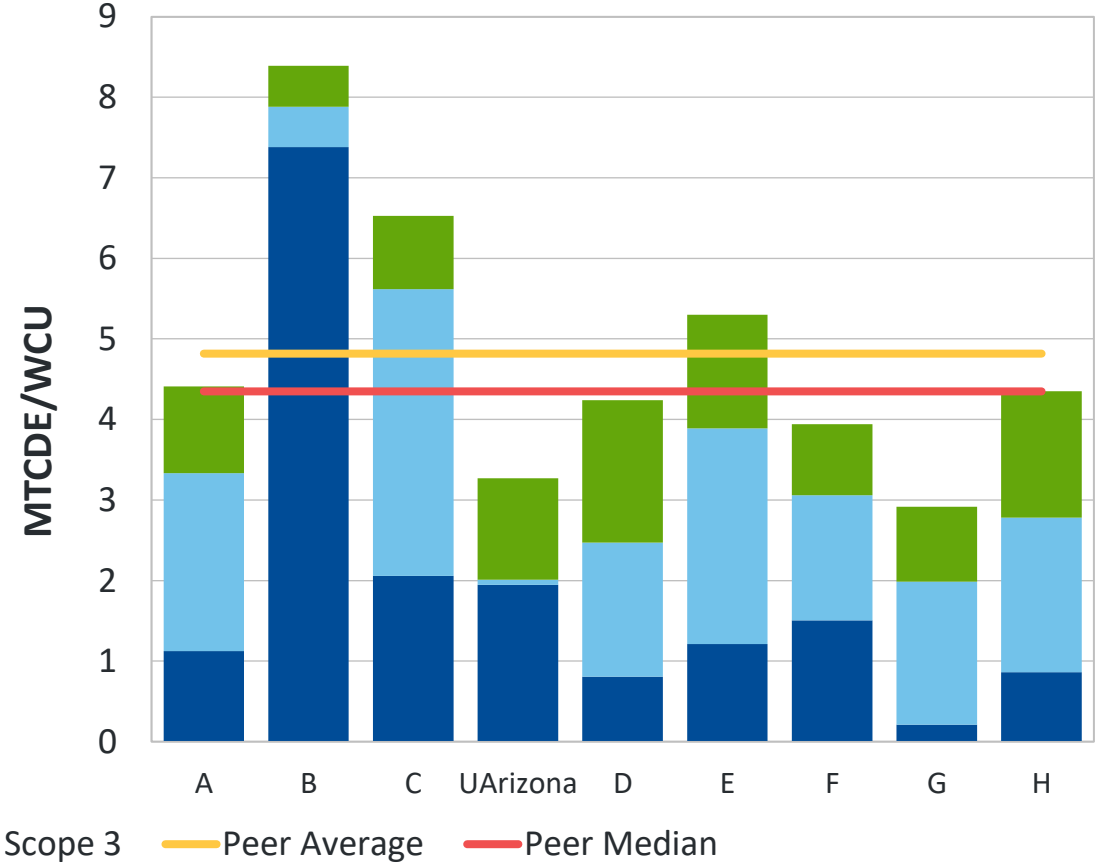


UArizona gross emissions below peer average and median

Gross Emissions
MTCDE/1K EUI – Adjusted Floor Area



Gross Emissions
MTCDE/Weighted Campus User

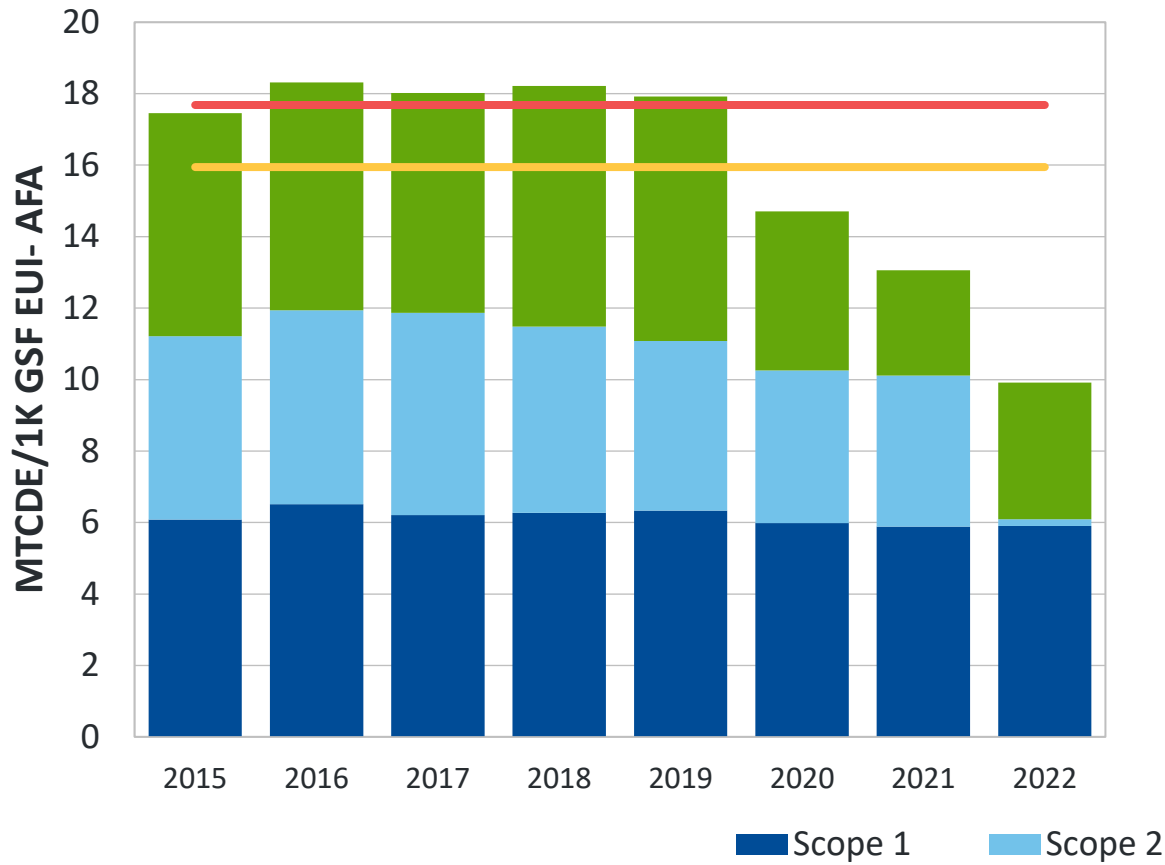


Trending Gross Emissions Normalized by Space

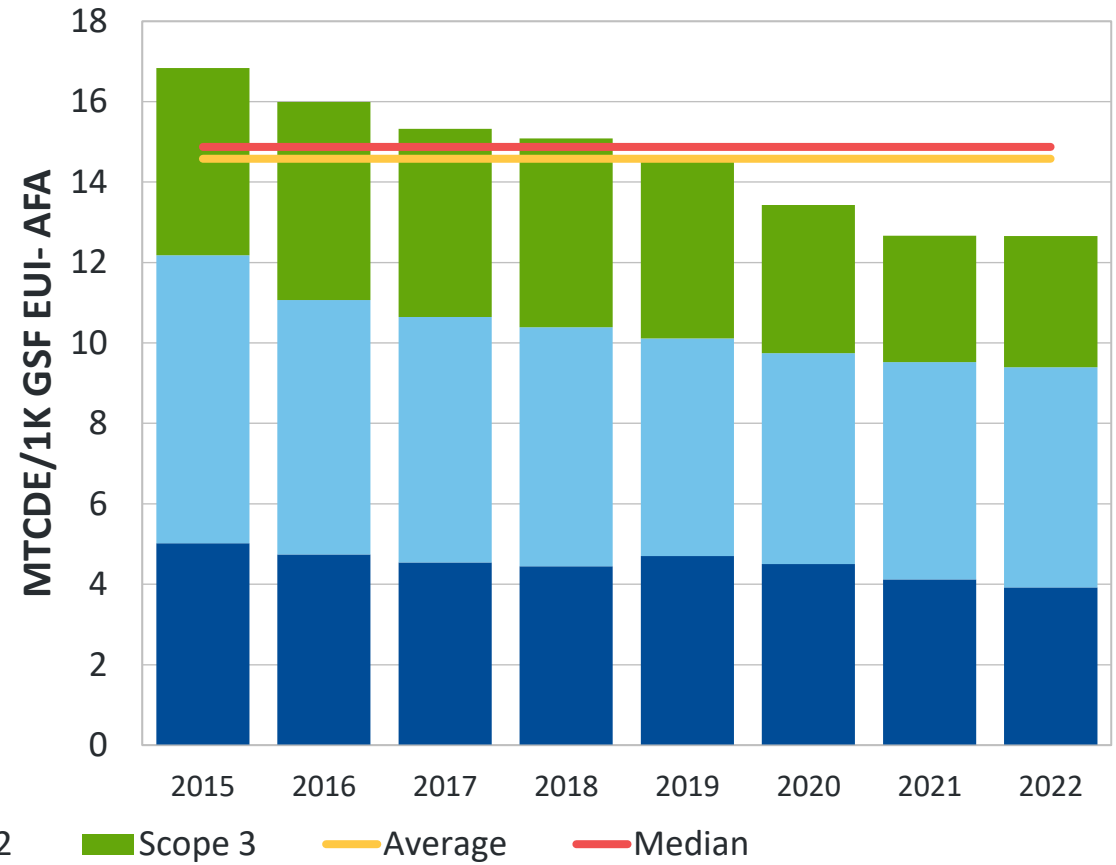


UArizona has seen consistent decreases in emissions since FY19

UArizona Gross Emissions



Peer Gross Emissions

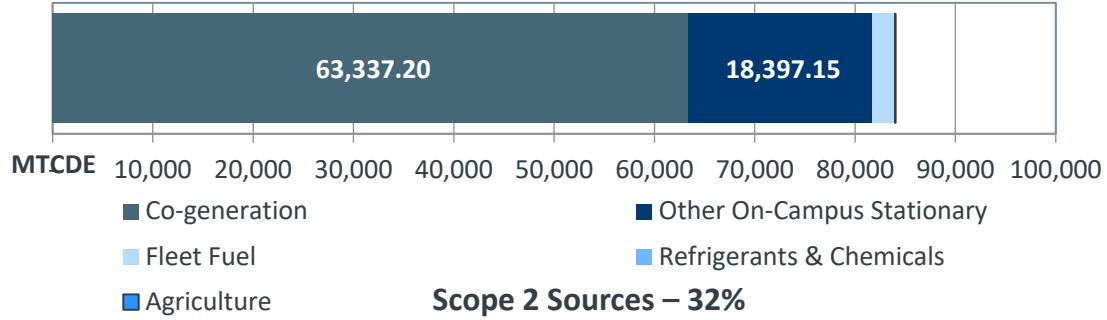


FY21 vs FY22 Distribution of Emissions by Level of Control

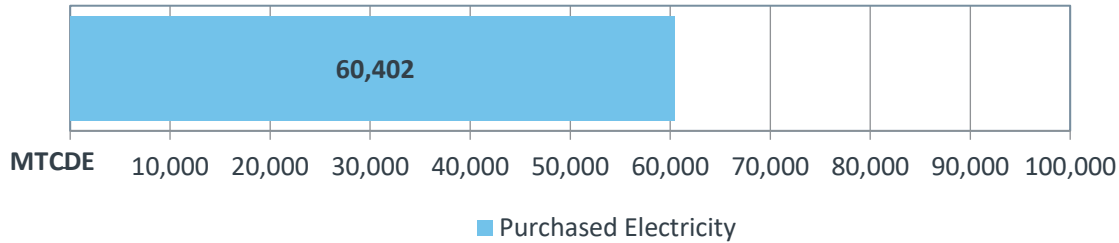


Total FY21 emissions: 186,226 MTCDE Total FY22 emissions: 141,596 MTCDE

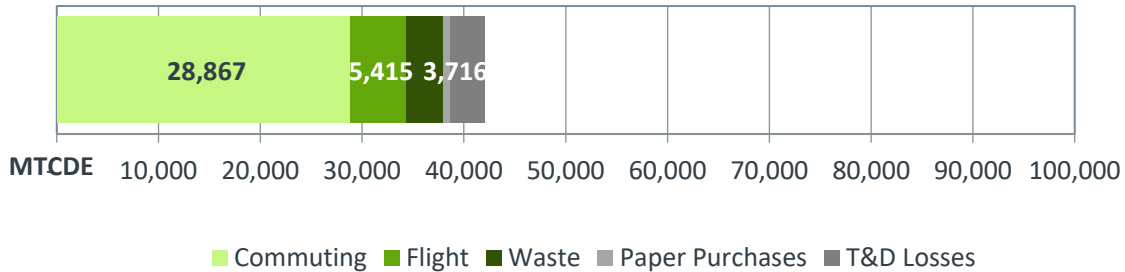
Scope 1 Sources – 45%



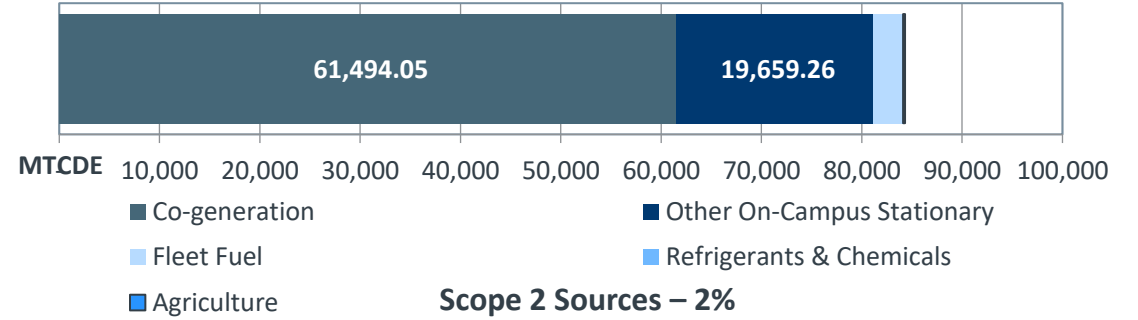
Scope 2 Sources – 32%



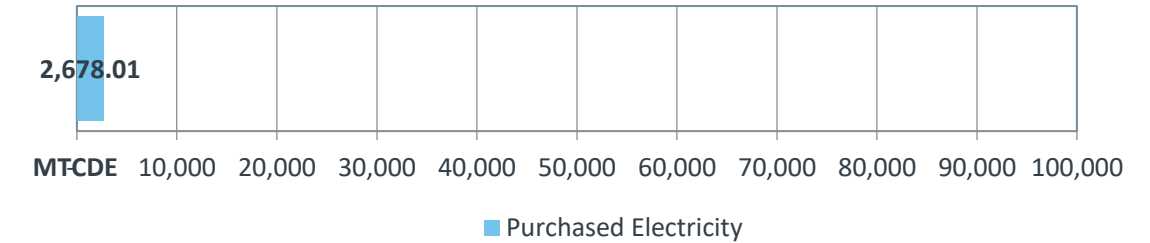
Scope 3 Sources – 23%



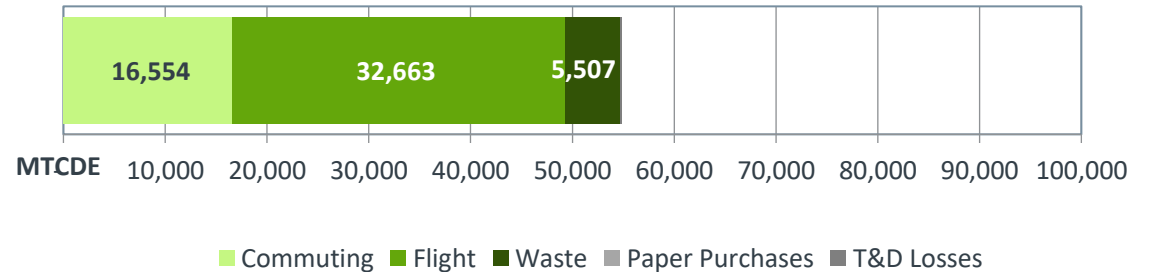
Scope 1 Sources – 60%



Scope 2 Sources – 2%



Scope 3 Sources – 39%



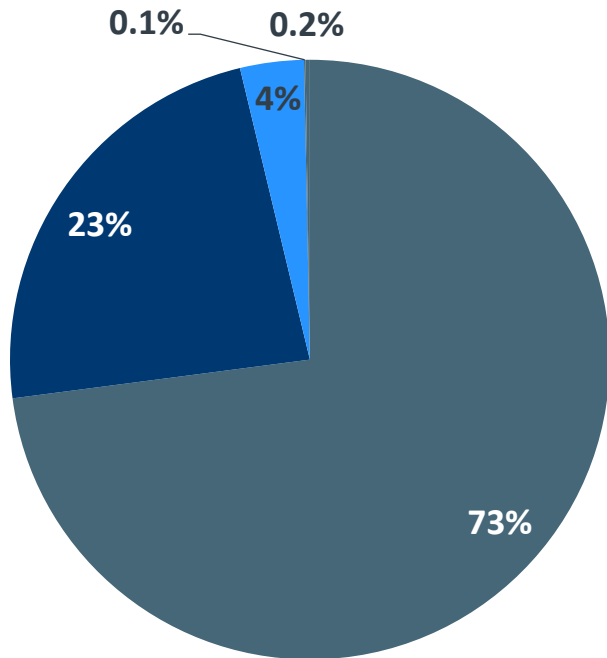
*Updated with new commuting data



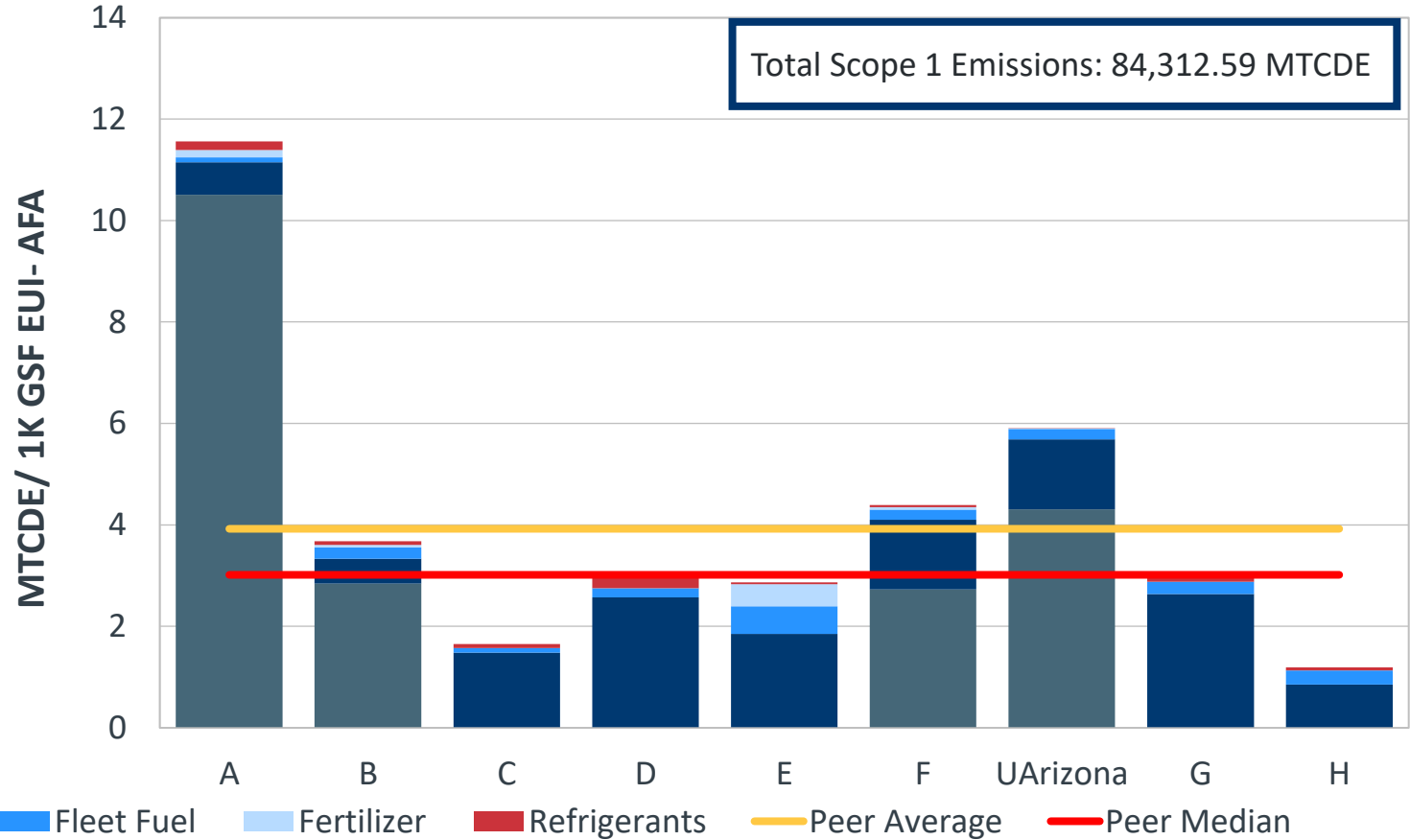
Scope 1: Direct Emissions

UArizona's scope 1 emissions are higher than the peer average and peer median

FY22 UArizona Scope 1 Emissions



Scope 1 Emissions vs Peers



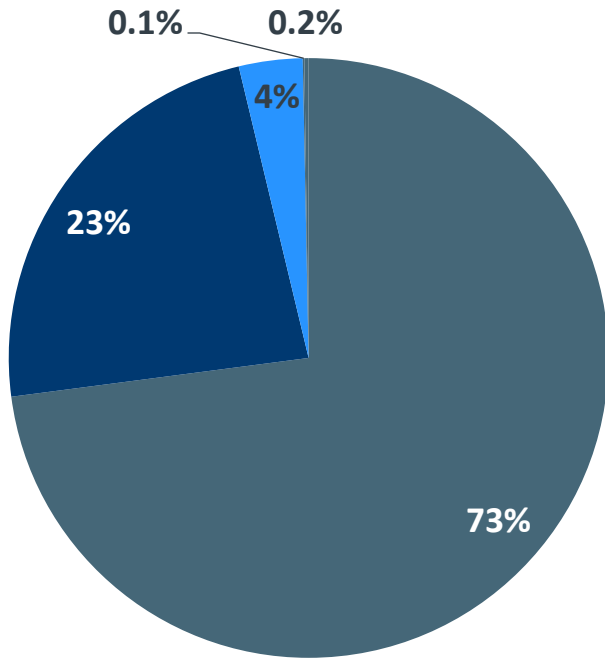
Cogen Fuel
 Stationary Fuel
 Fleet Fuel
 Fertilizer
 Refrigerants
 Peer Average
 Peer Median

Scope 1: Direct Emissions- Cogen Comparison

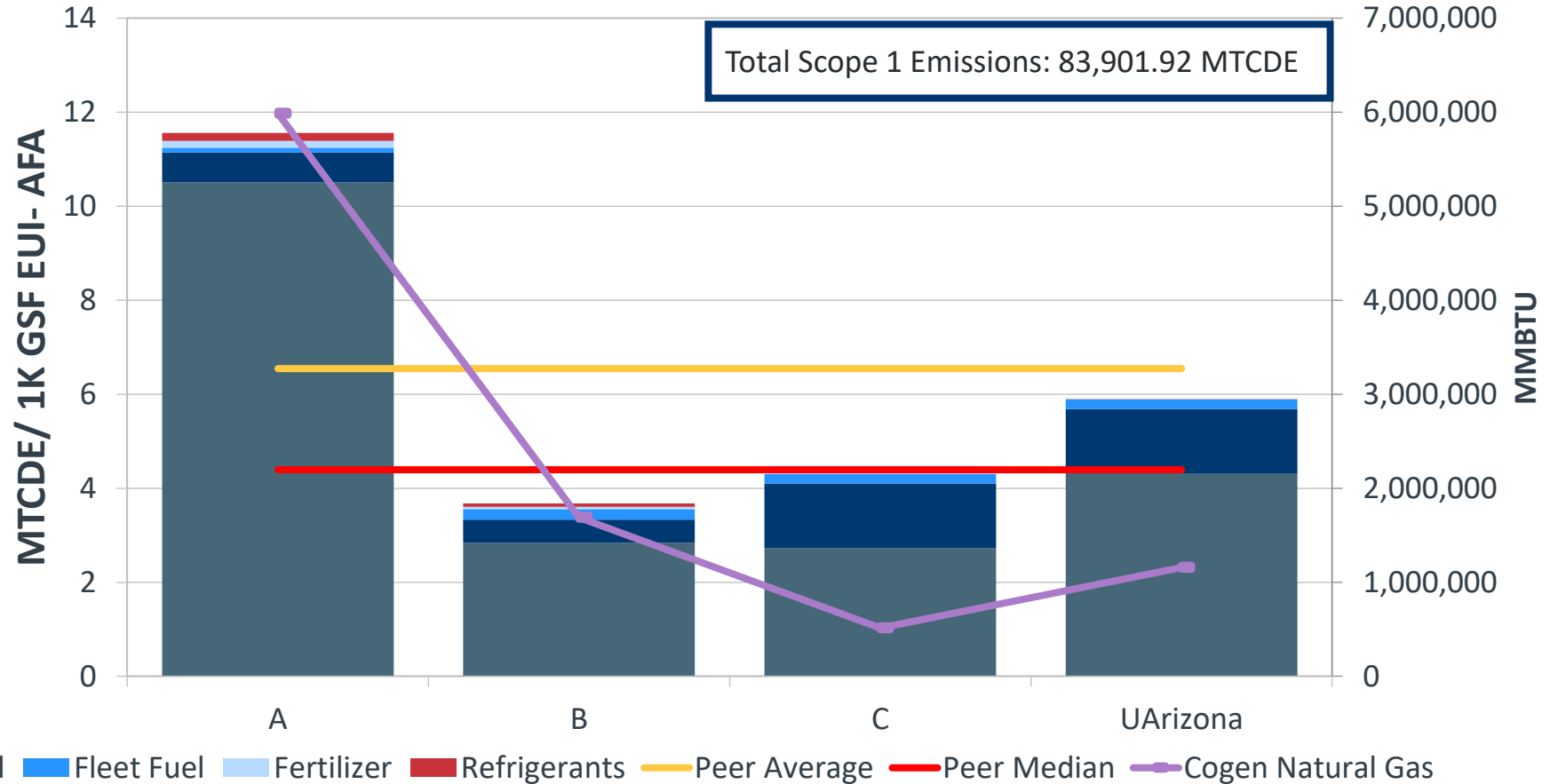


UArizona's scope 1 emissions below peer average, but higher than Cogen median

FY22 UArizona Scope 1 Emissions



Scope 1 Emissions vs Peers

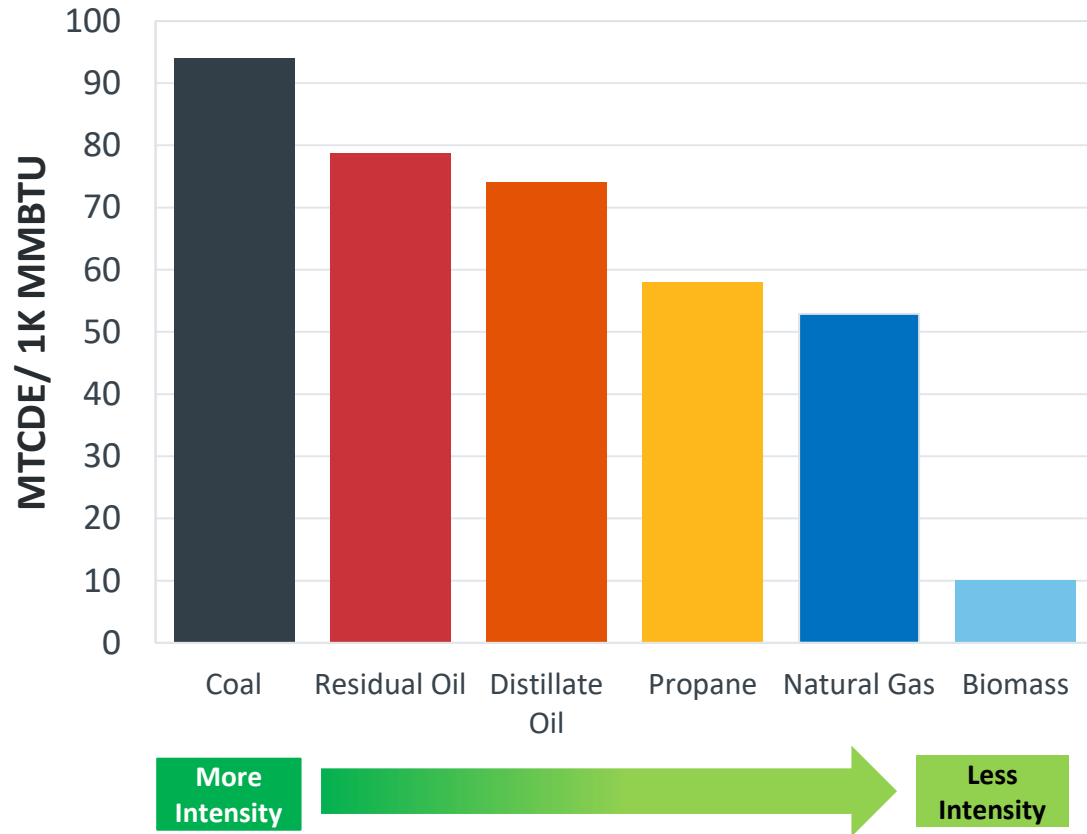


Scope 1: Stationary Fuel Consumption

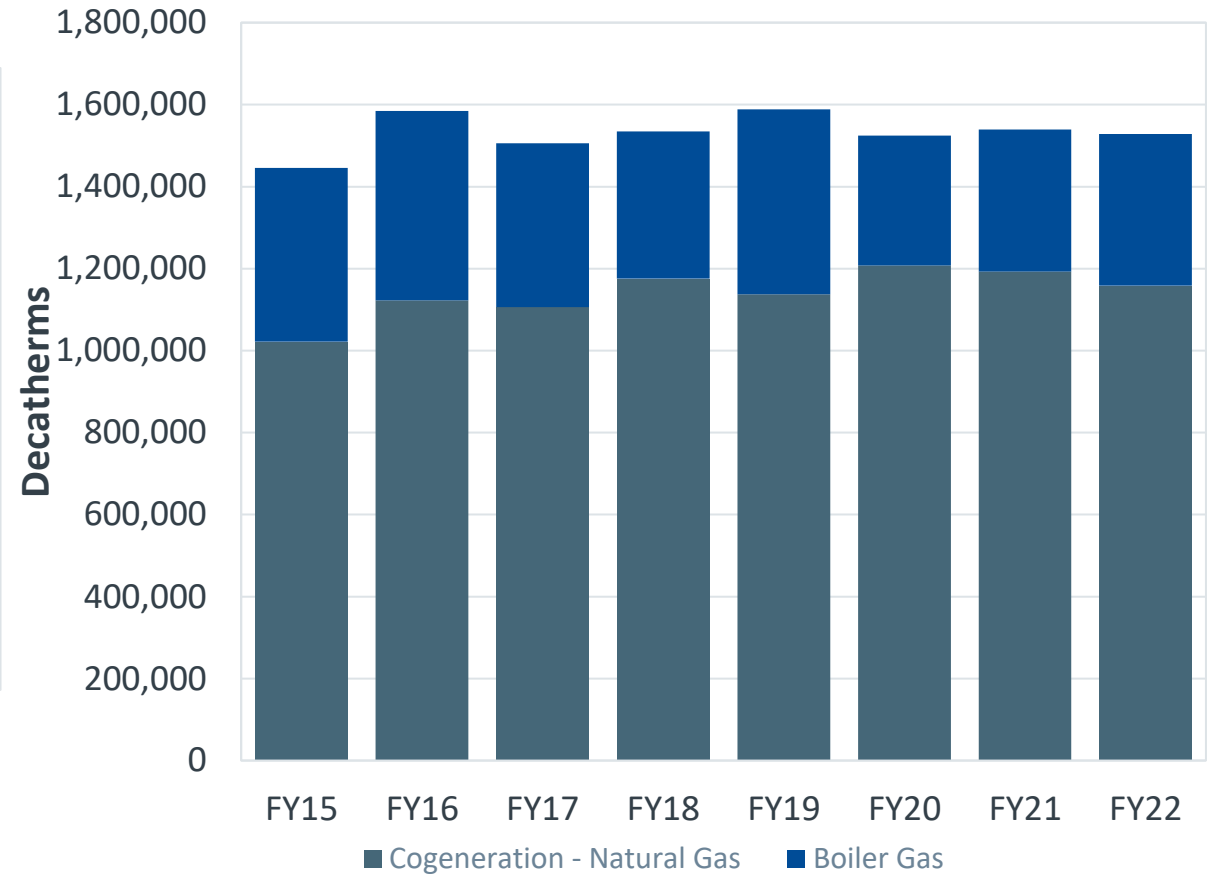


Natural gas consumption decreased in FY22, driven by less fuel consumed at plant

Carbon Intensity of Commonly Used Fossil Fuels



Stationary Fuel Consumption

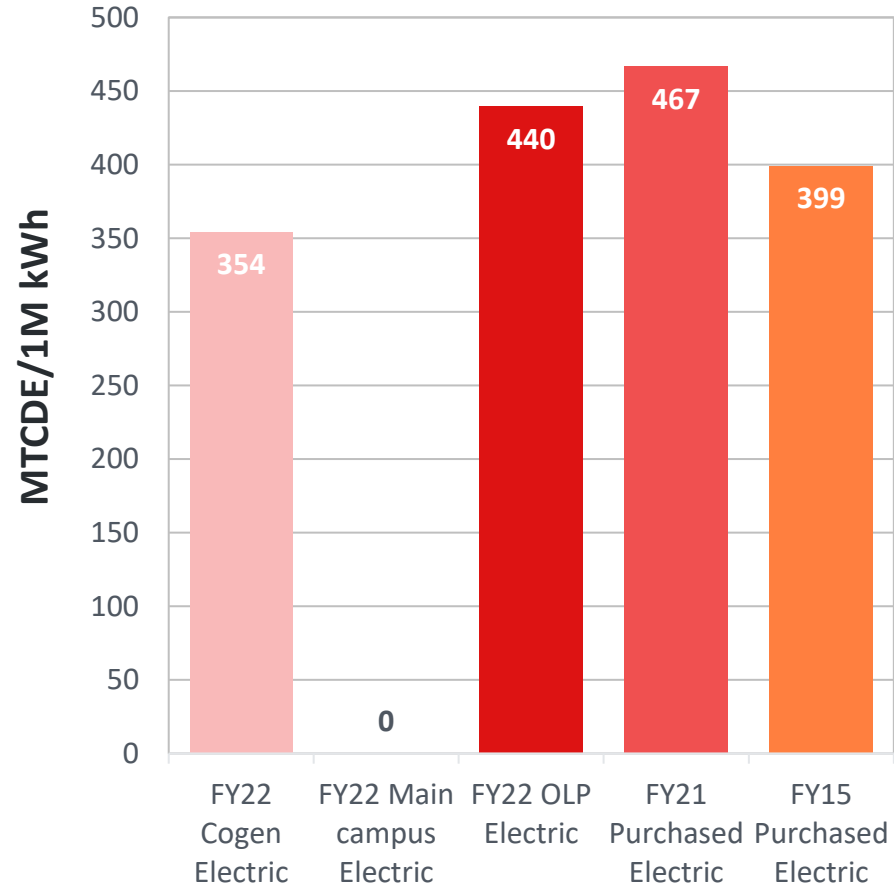


Scope 1&2: Campus Electric Consumption

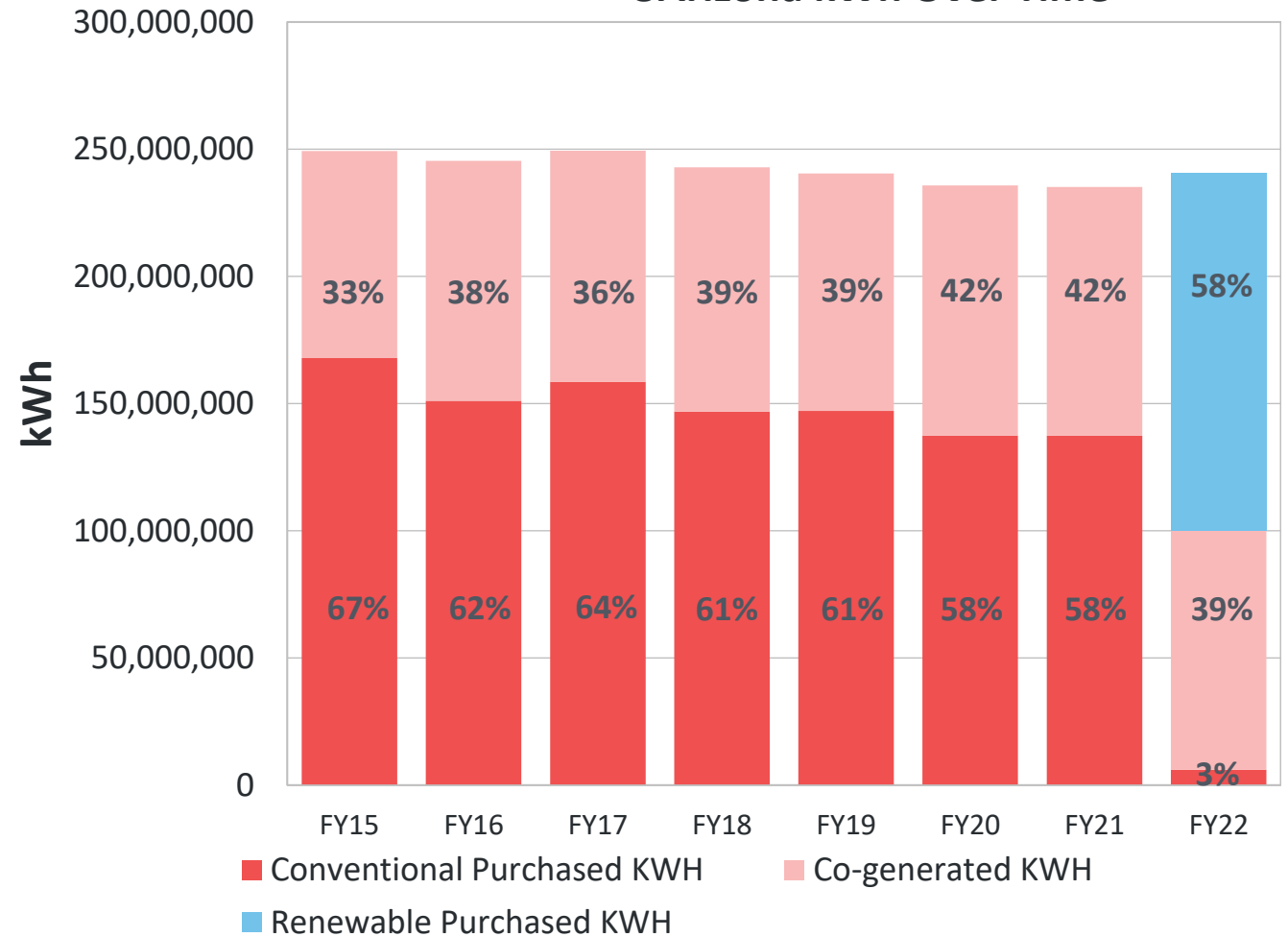


Outlying Property (OLP) and Syncharpha electricity is only source of scope 2 emissions

Carbon Intensity of Electricity



UArizona kWh Over Time

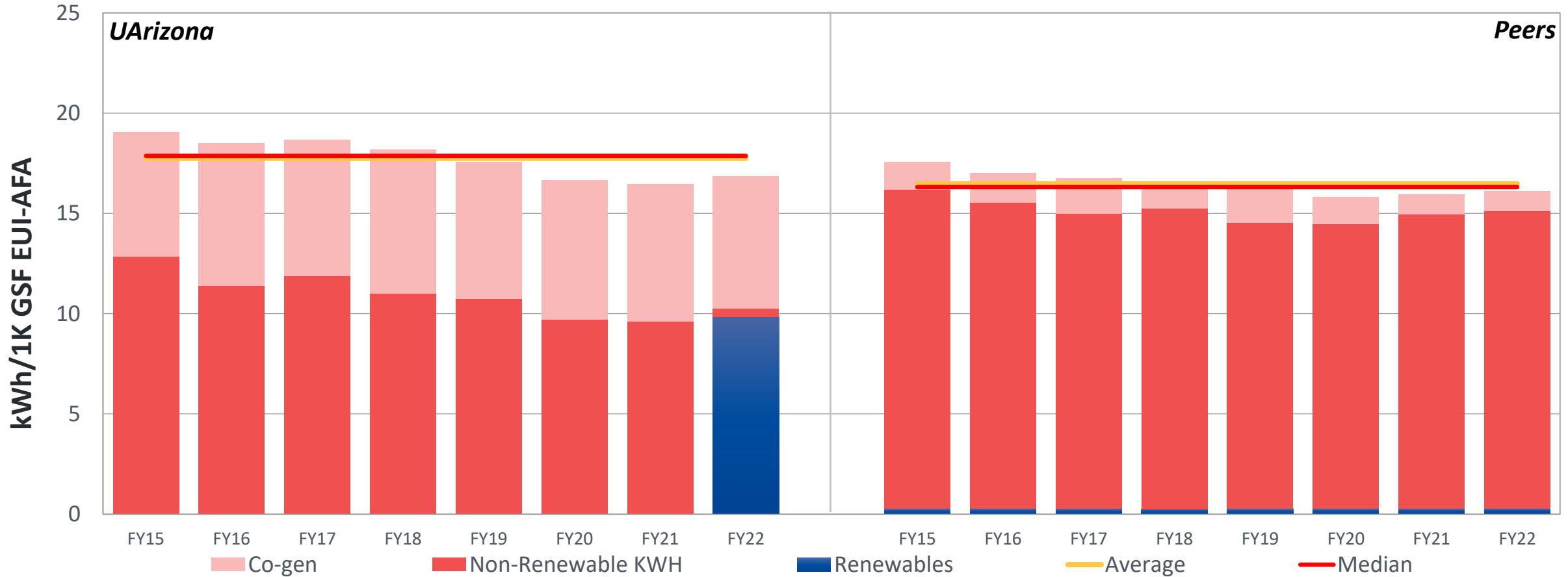


Scope 1&2: Total Electric Consumption vs. Peers



UArizona continues to consume more KWH's than peers when normalized

Scope 1&2 Total Electric Consumption

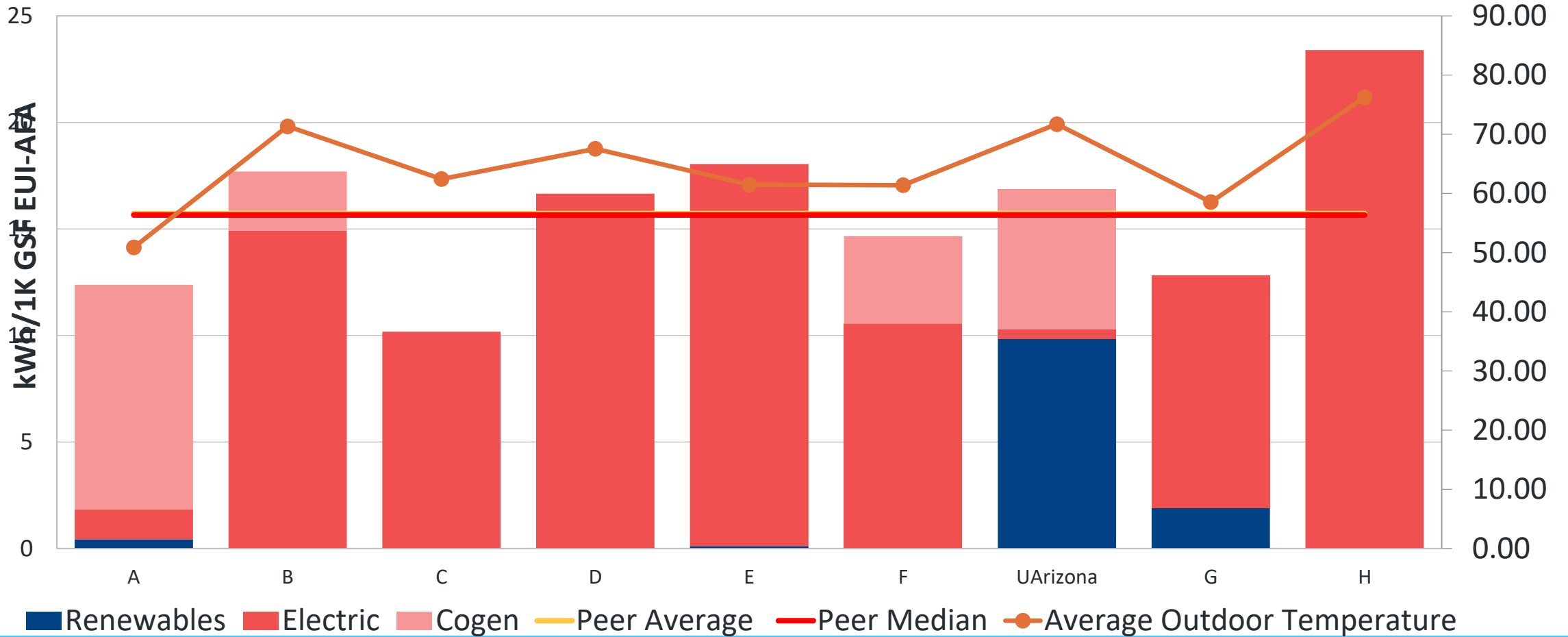


Scope 1&2: Total Electric Consumption vs. Peers



Arizona has the second highest outdoor temp among peers, but 4th highest KWH's consumed

FY22 Electric Consumption vs. Peers

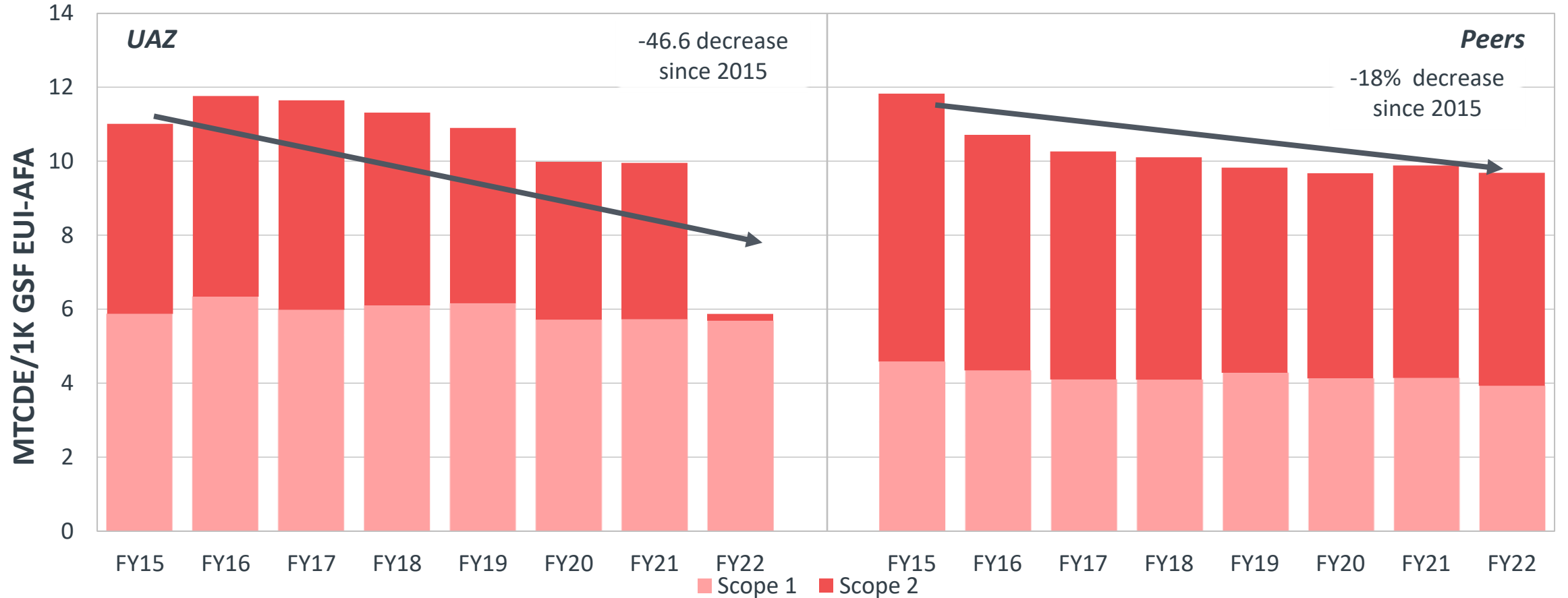


Energy Emissions vs. Peers



Total energy emissions: 64,172 MTCDE (Scope 2: 2,678 MTCDE, Scope 1: 61,494 MTCDE)

Energy Emissions

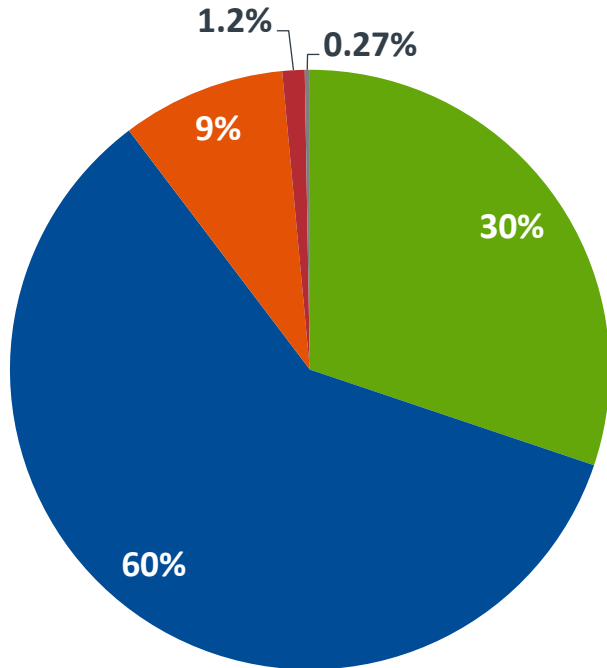


Scope 3: Indirect Emissions Overview

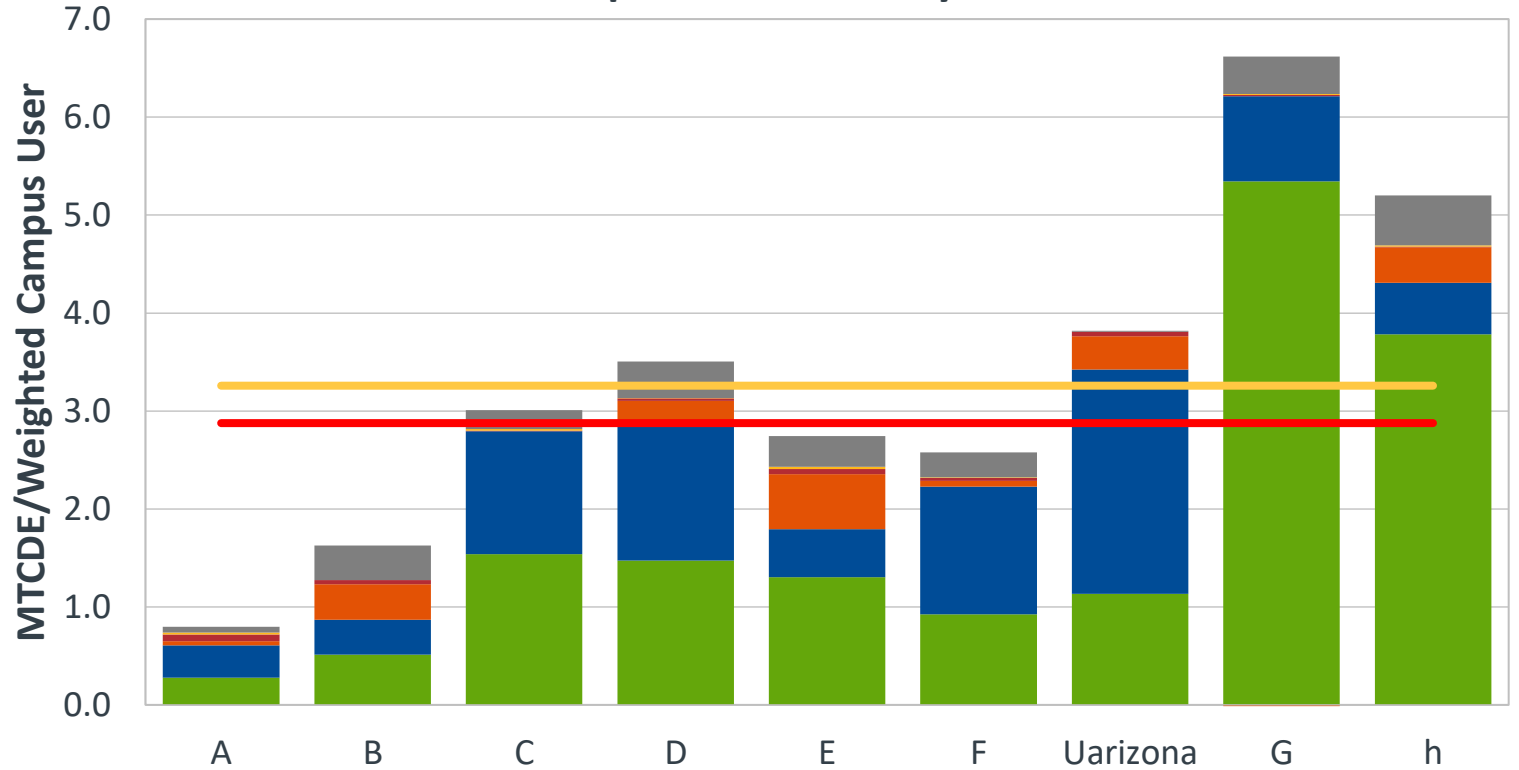


Total Scope 3 emissions: 54,873 MTCDE

FY22 UAZ Scope 3 Emissions



Scope 3 Emissions by Source



■ Commuting
 ■ Travel
 ■ Waste
 ■ Wastewater
 ■ Paper
 ■ T&D Losses
 — Average
 — Peer Median

Peers arrayed by density

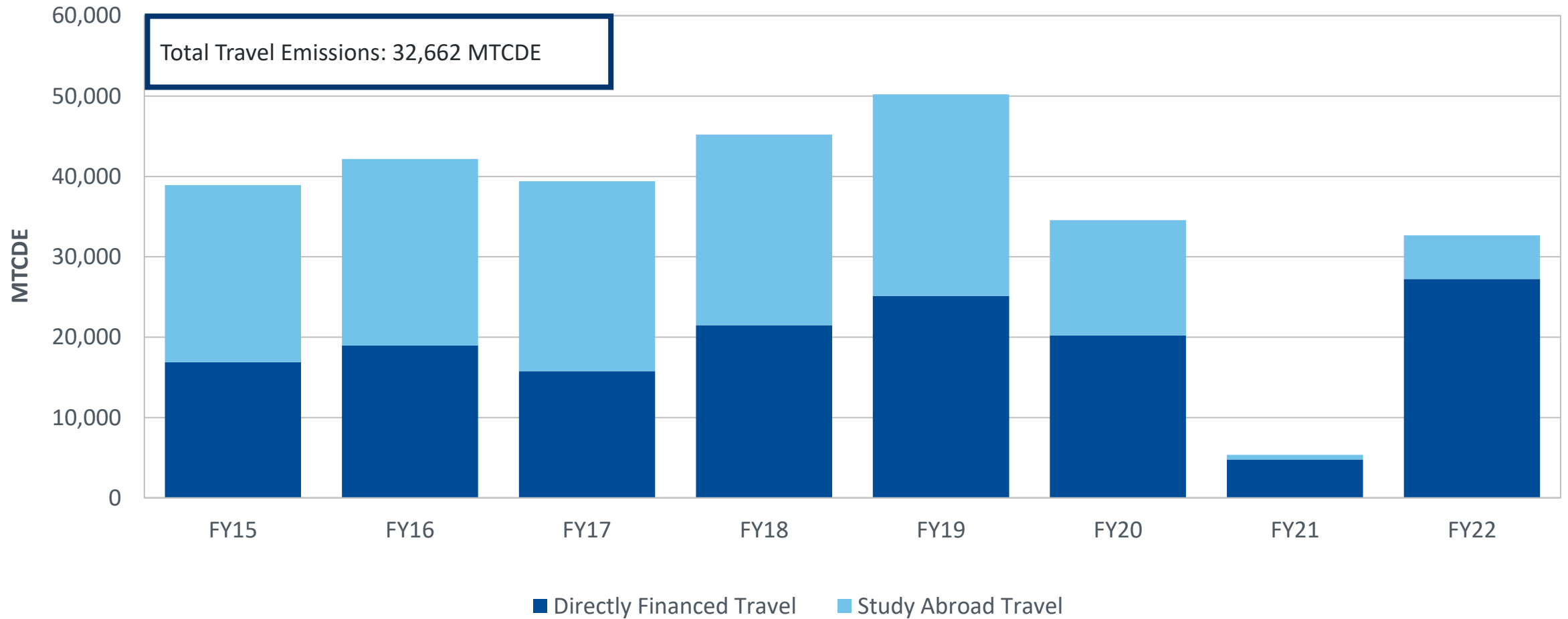


Travel Profile (Air Miles Flown)



Travel emissions have begun to normalize to pre-Covid levels

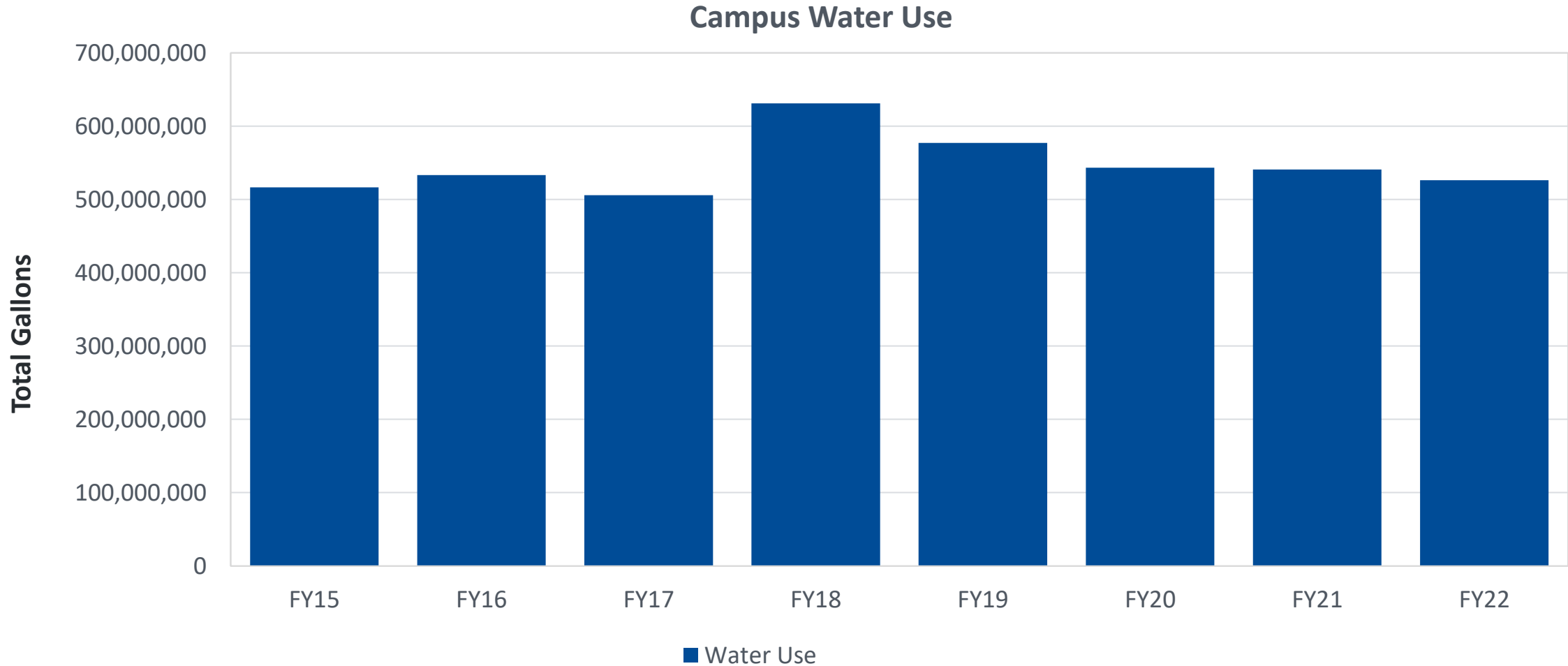
UAZ's Travel Emissions



UArizona Water Use



Water continues to steadily decline since FY18

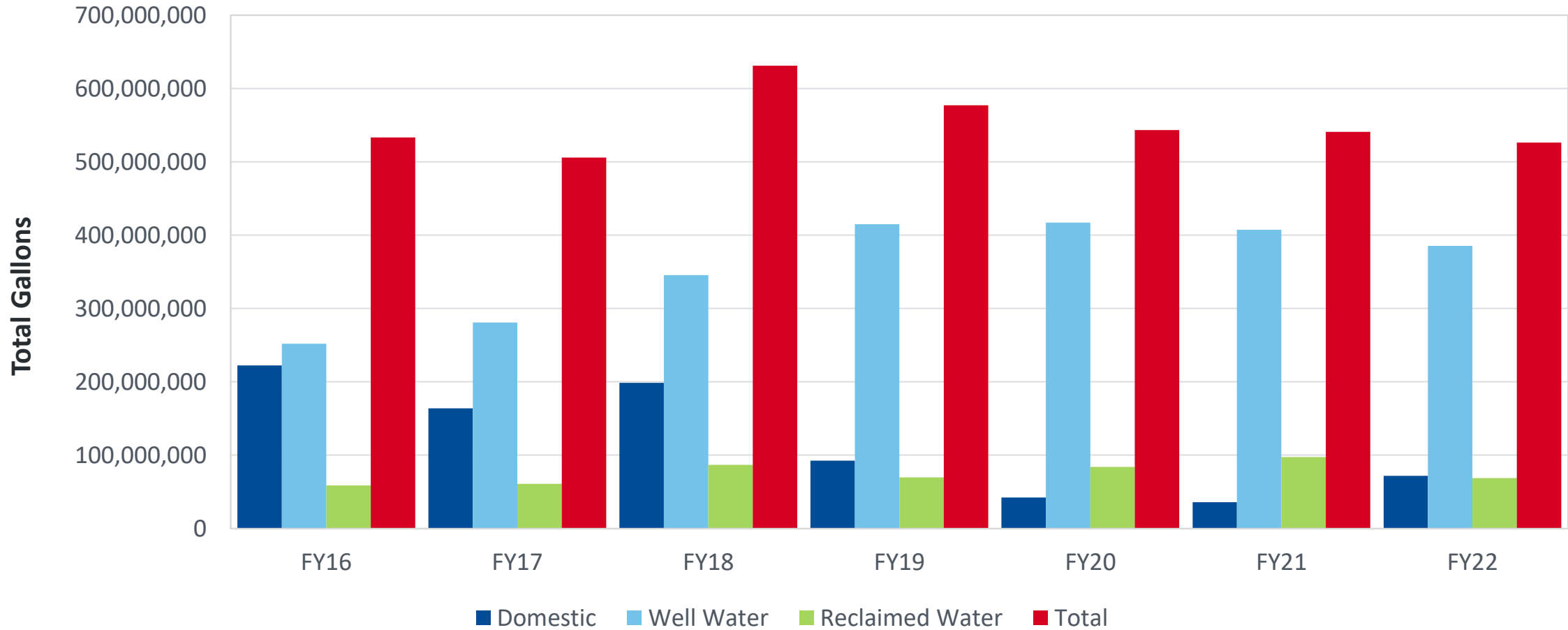


UArizona Water Use by Source



Domestic water usage nearly doubled from FY21 to FY22

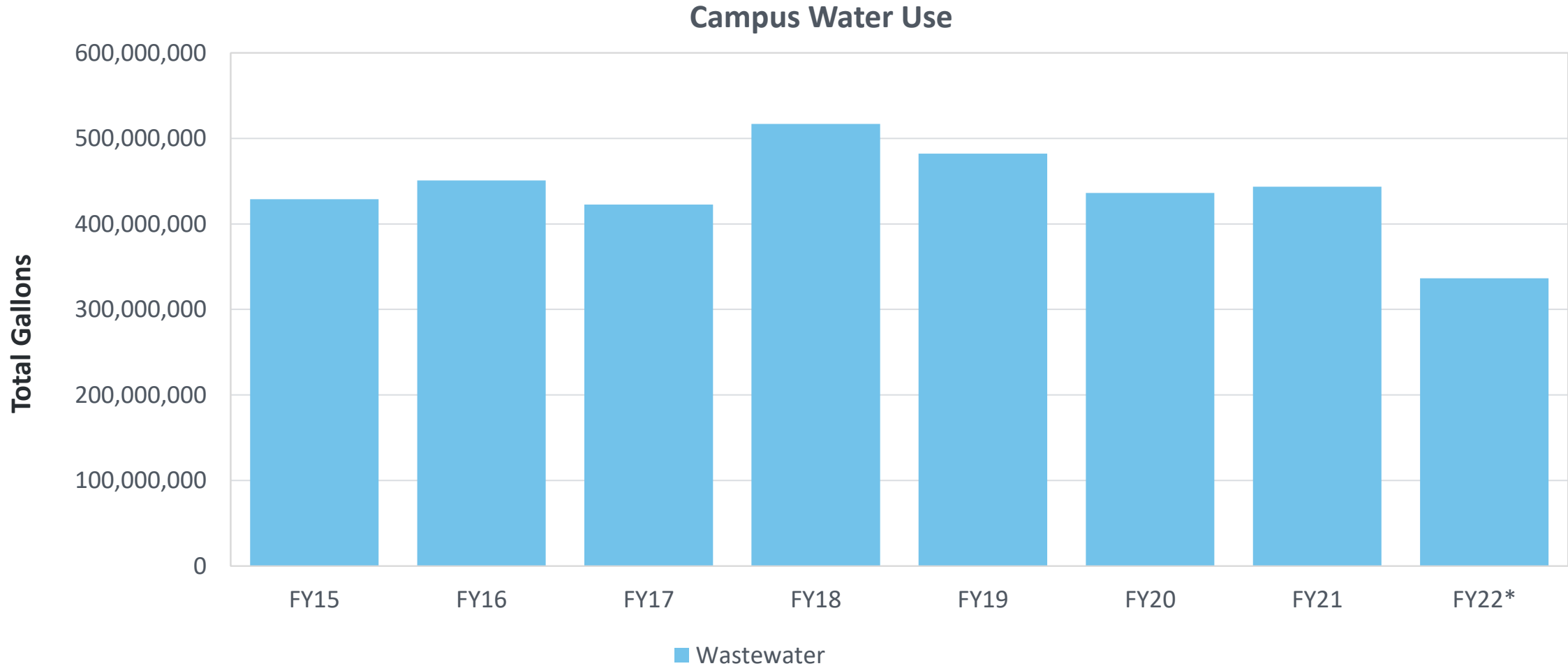
Campus Water Use



UArizona Wastewater Over Time



Update in methodology for FY22 shows substantial decrease in wastewater

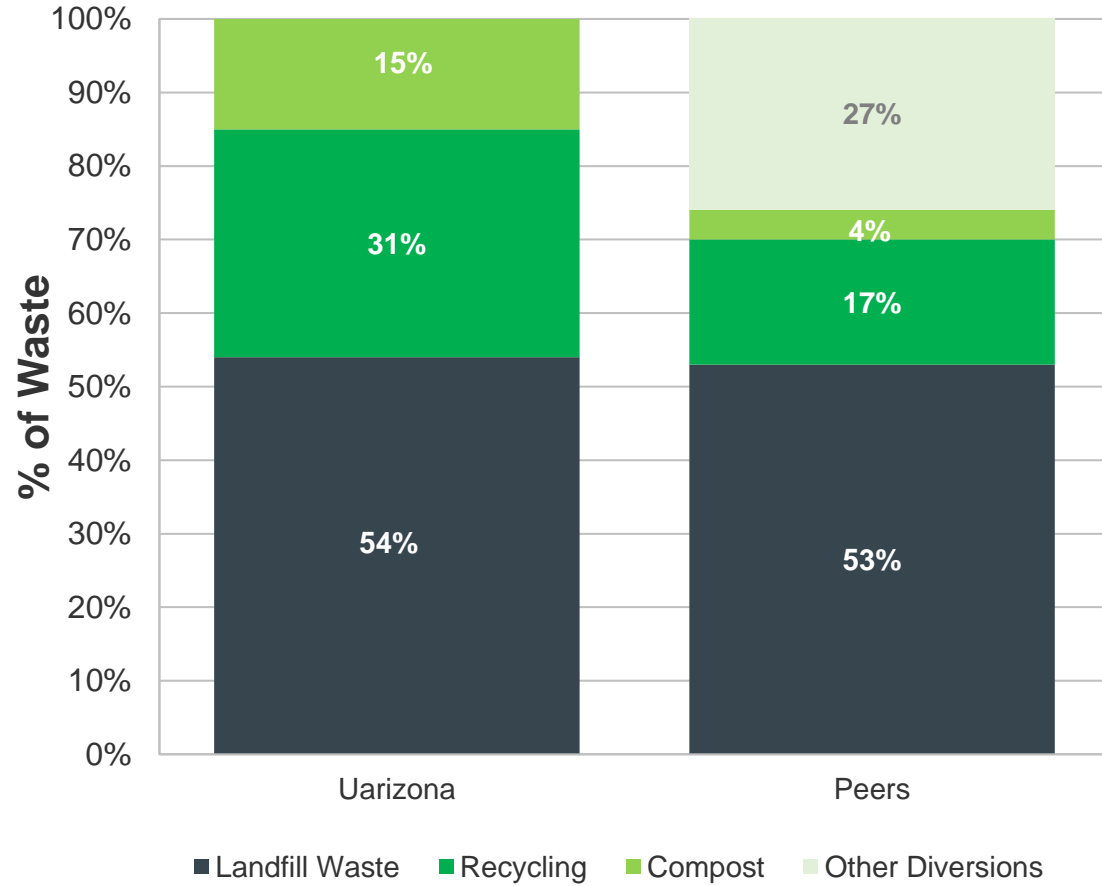


Scope 3: A Closer Look at Waste

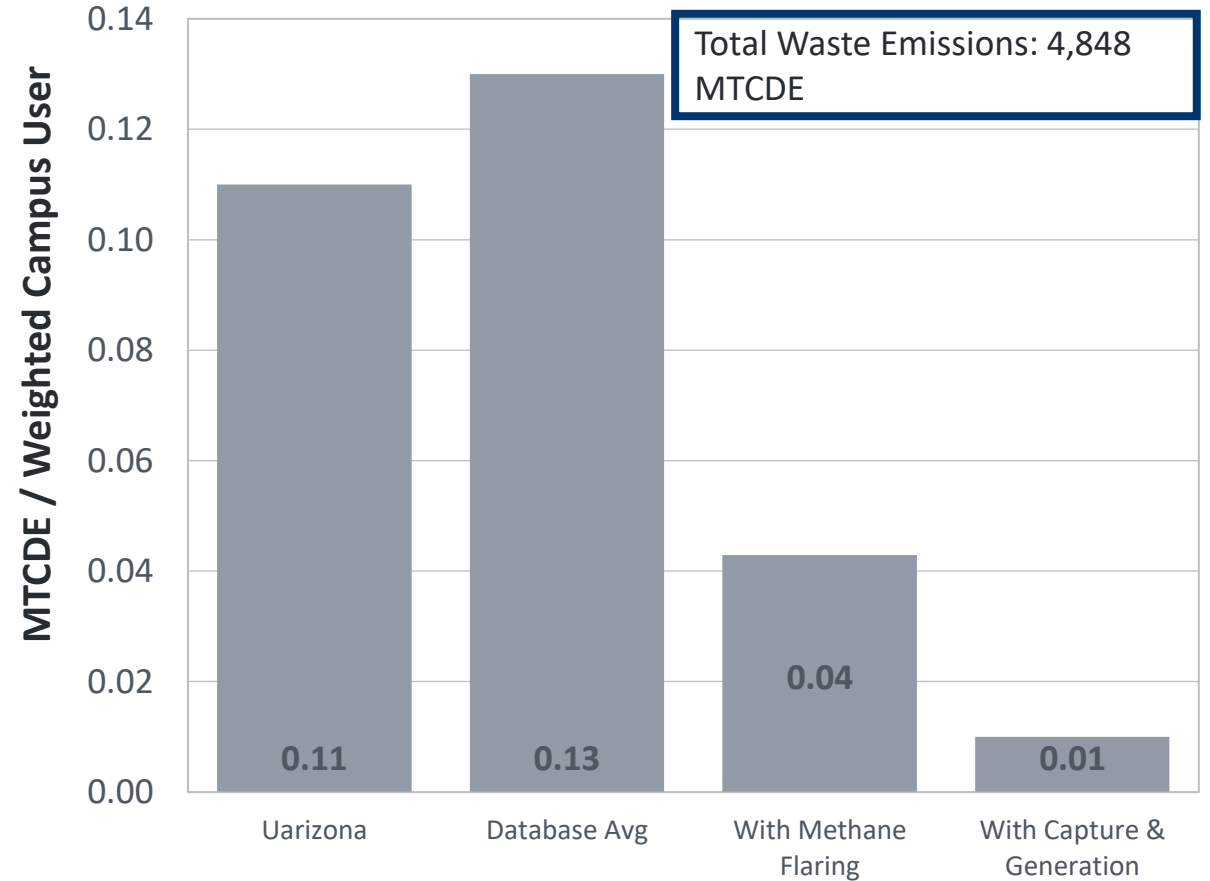


UArizona recycles and composts at higher rate than peers

FY22 Waste Diversion Rates vs. Peers



Solid Waste Emissions

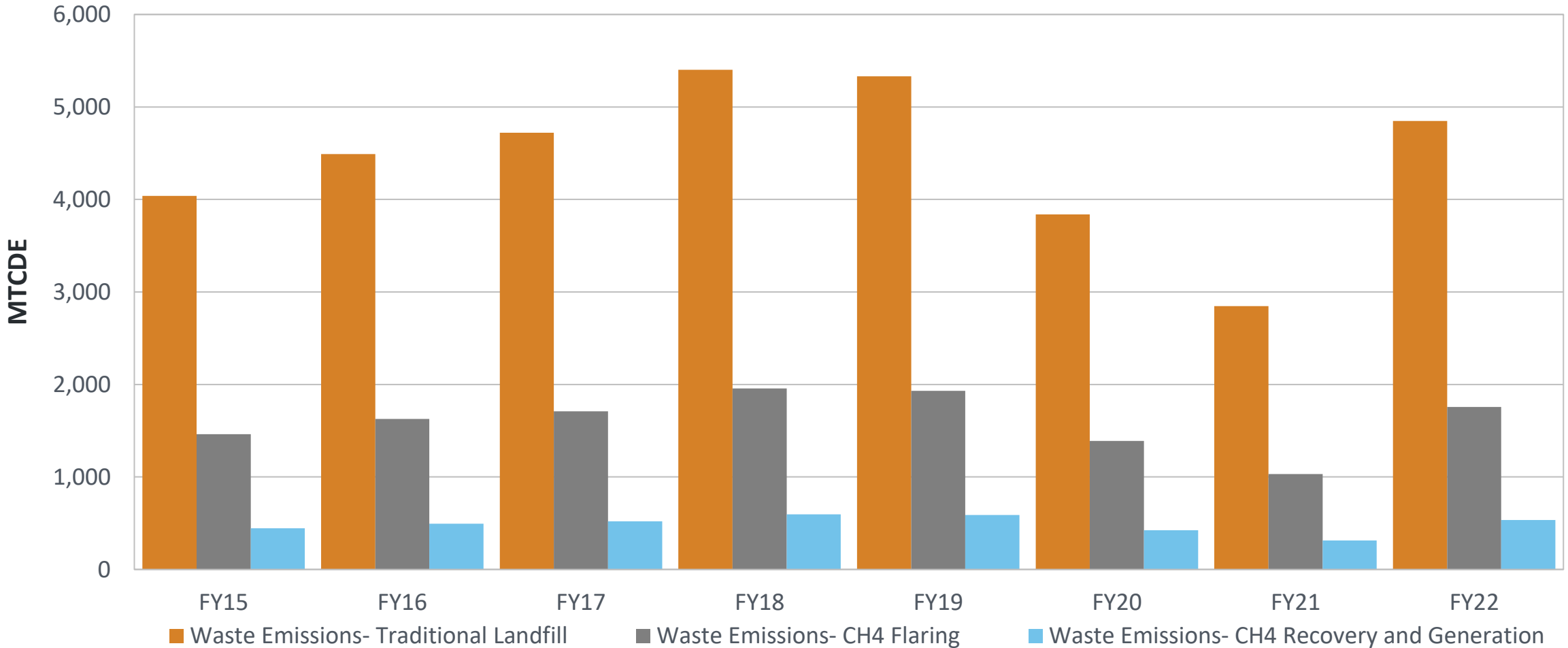


Scope 3: Impact of New Waste Contract



By switching landfill providers, UArizona could reduce waste emissions by 89%

Waste Emissions

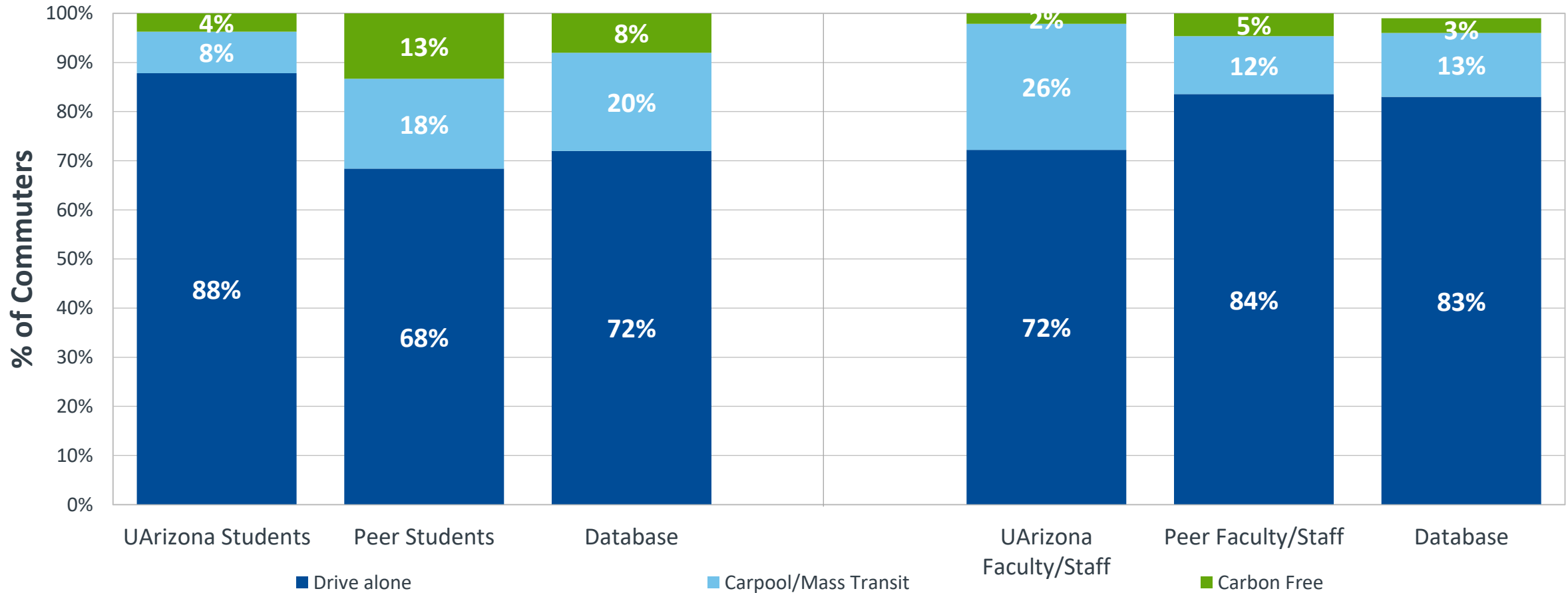


Scope 3: Commuting Profile



Comparing UArizona commuting modes to peers and database

Commuting Mode by Demographic as a Percent of Passenger miles

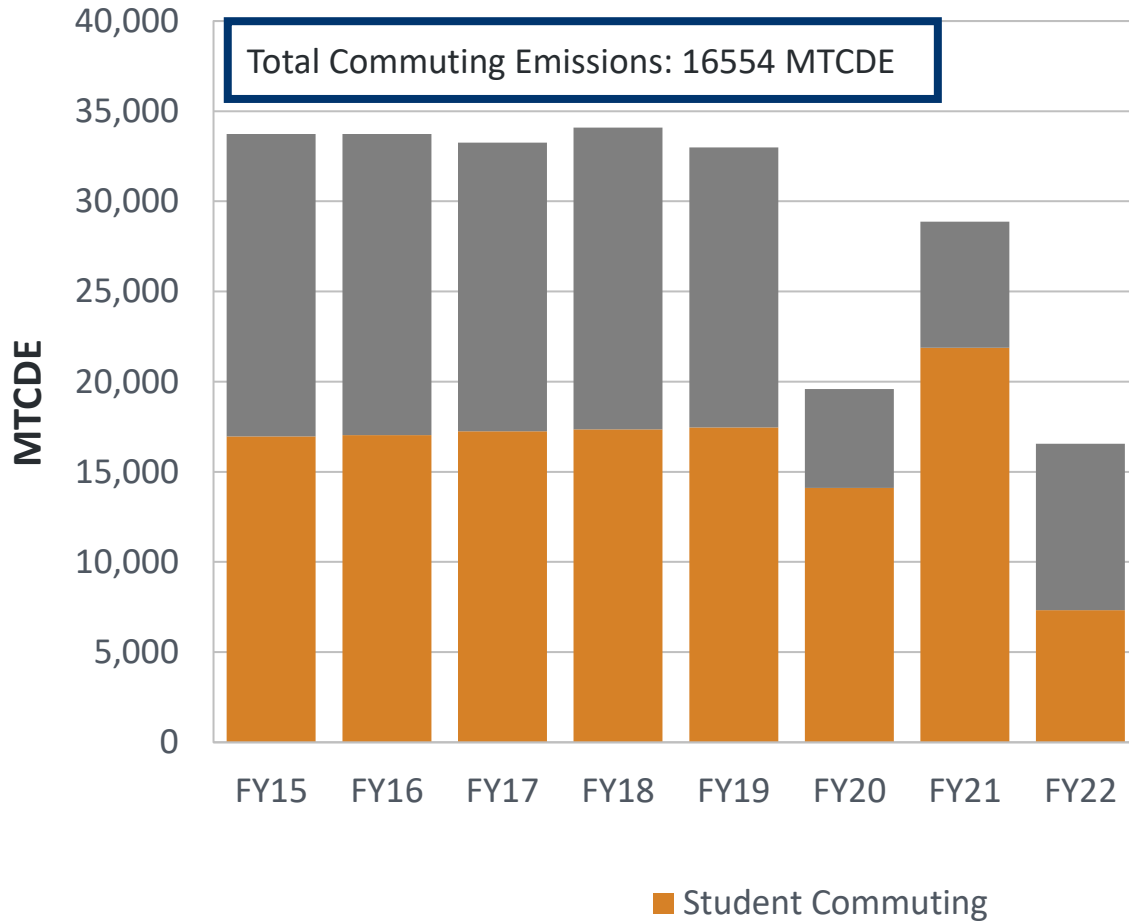


Scope 3: Total Commuting Emissions

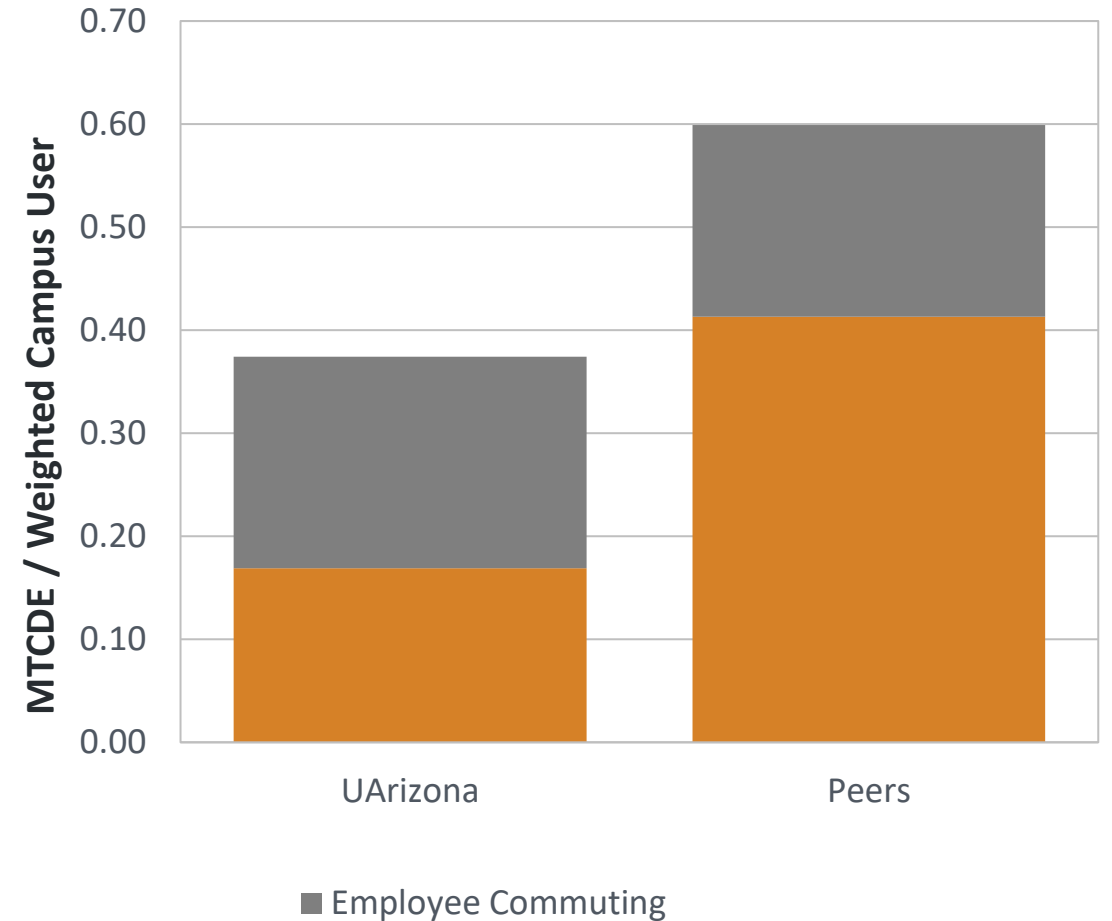


Improved data collection methodology reduces student commuting emissions

Commuting Emissions



FY22 Commuting Emissions vs. Peers





G  **RDIAN**®
Building knowledge