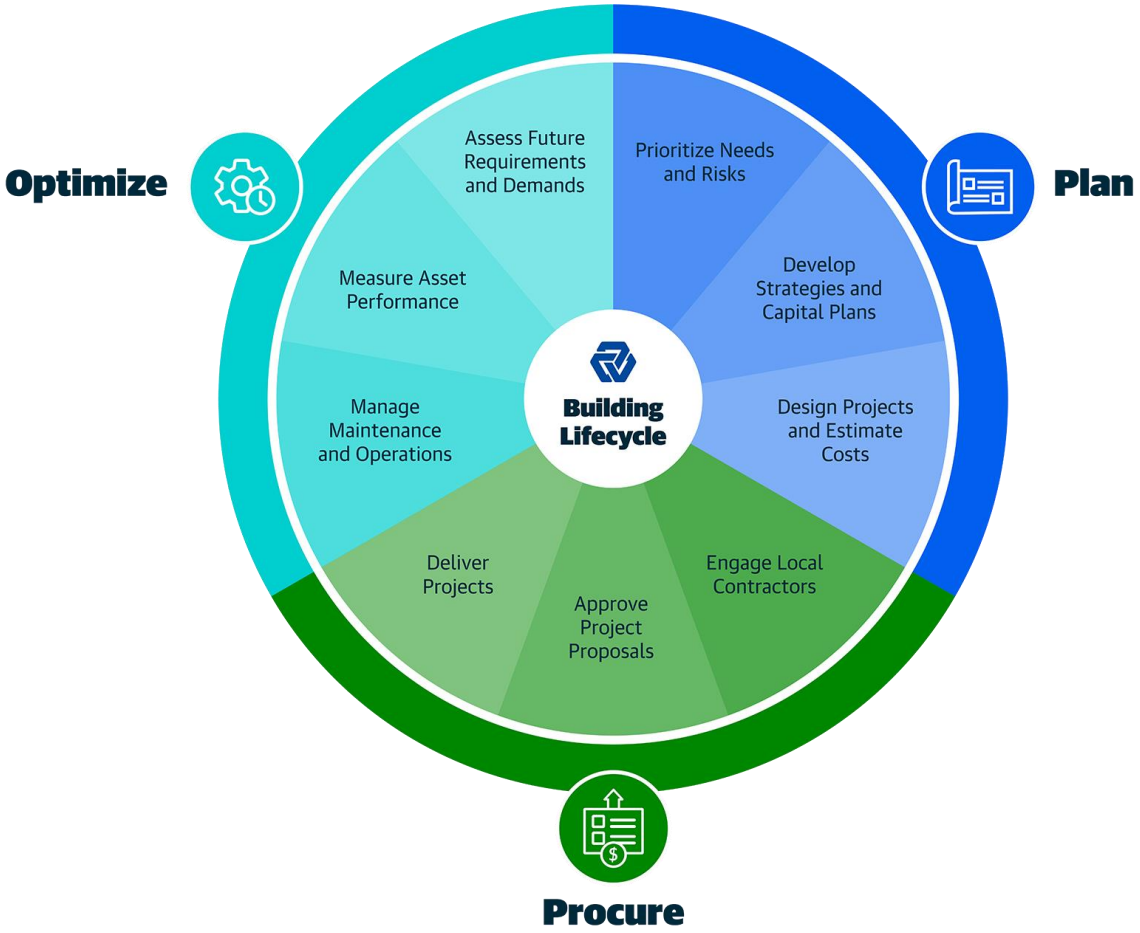
GORDIAN®

The University of Arizona
FY24 Greenhouse Gas Analysis

May 2025

Duncan Ketel

Effectively Manage the Entire **Building Lifecycle**



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Comprehensive Capital Planning Solutions

Return on Physical Assets (ROPA)

Benchmark key facilities metrics against peers and Gordian's database to improve efficiency and effectiveness of space, operation & investment

Space Utilization

Utilization analysis for teaching spaces to identify opportunities to match campus space with programmatic needs

Sustainability Solutions

Quantify GHG inventory, identify opportunities for carbon mitigation, satisfy reporting requirements

Facility Condition Assessments

Expert evaluation of facilities and site conditions to identify deferred needs, upcoming needs, critical issues and compliance considerations

Strategic Capital Planning

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

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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

SIMAP
SUSTAINABILITY INDICATOR MANAGEMENT & ANALYSIS PLATFORM

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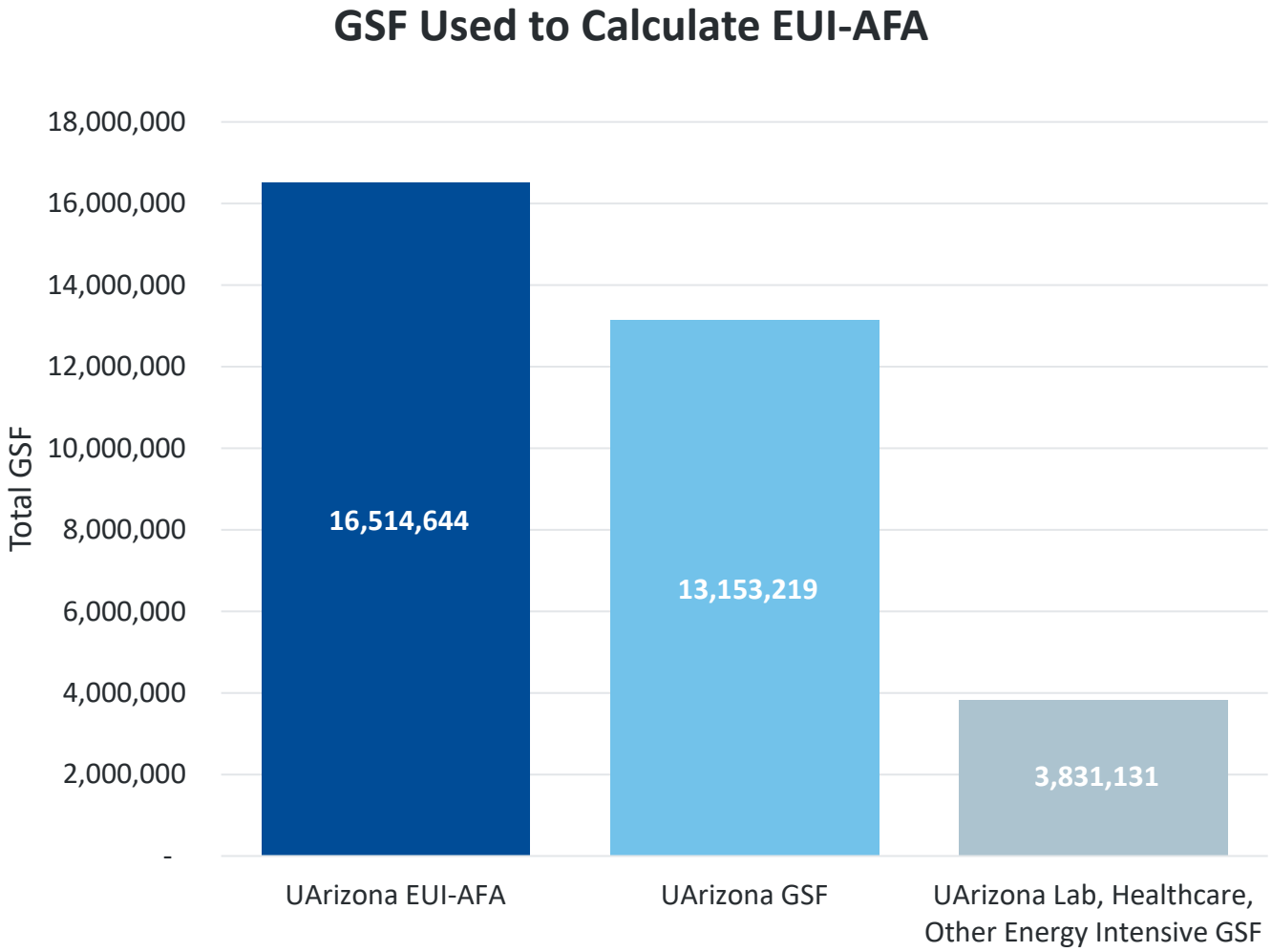
Components of UArizona's Emissions Profile

Scope 1 Direct GHGs	Scope 2 Upstream GHGs	Scope 3 Indirect GHGs
• On-Campus Stationary (Cogen plant and other) • Vehicle Fleet Fuel • Refrigerants • Fertilizer	• Purchased Electricity	• Faculty/Staff/ Student Commuting • Directly Financed Air & Ground Travel • Study Abroad Travel • Solid Waste • Wastewater

Included Scope

16.5M EUI-AFA included in Sustainability Scope

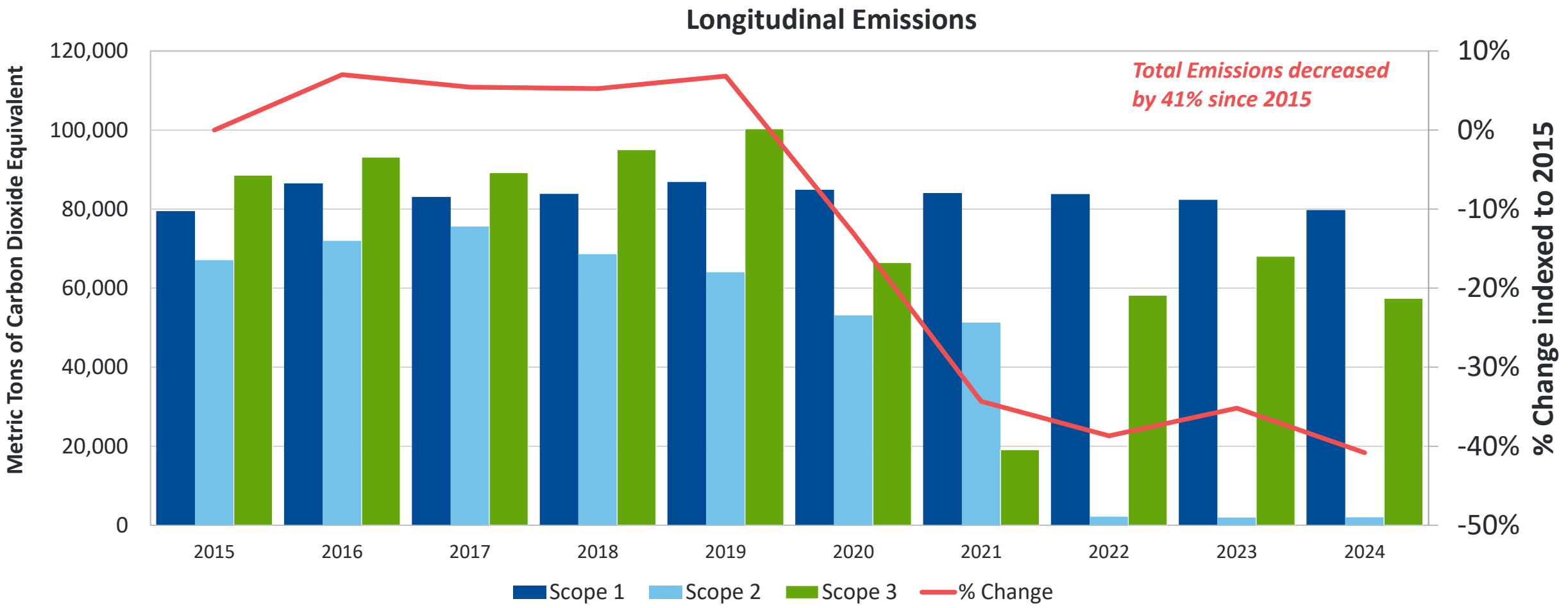


- Scope includes main campus in Tucson and designated Outlying Properties within the city of Tucson.
- Parking Garages are excluded from total GSF
- Laboratory, Healthcare, and Other Energy Intensive GSF is broken out for EUI-AFA adjustments

Emission Summary

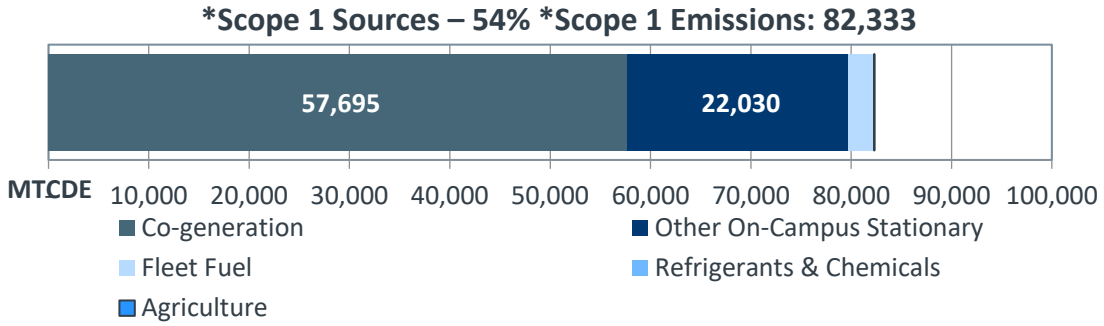
Longitudinal Emissions by Scope

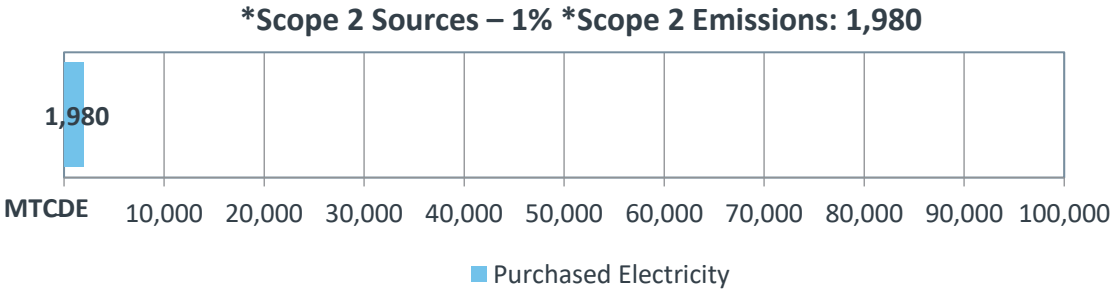
Total emissions decreased by 4% in FY24 from prior year

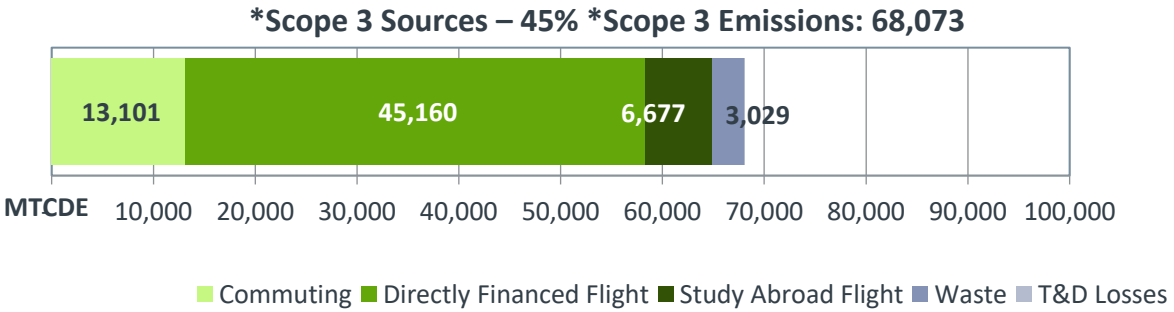


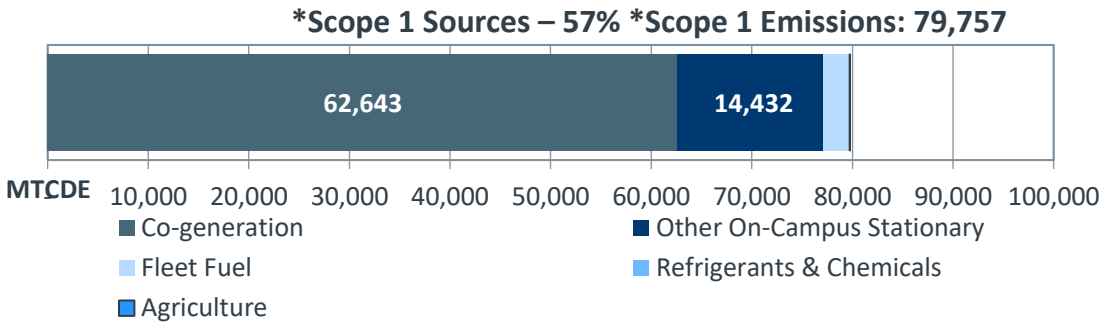
FY23 vs FY24 Distribution of Emissions by Level of Control

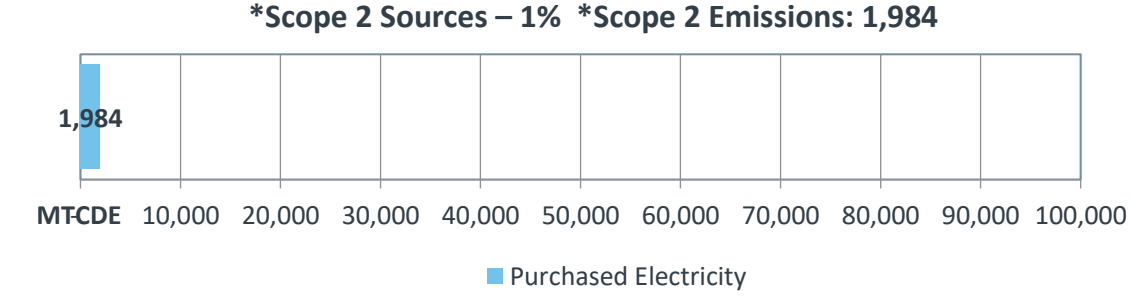
Total FY23 emissions: 152,386 MTCDE Total FY24 emissions: 139,139 MTCDE

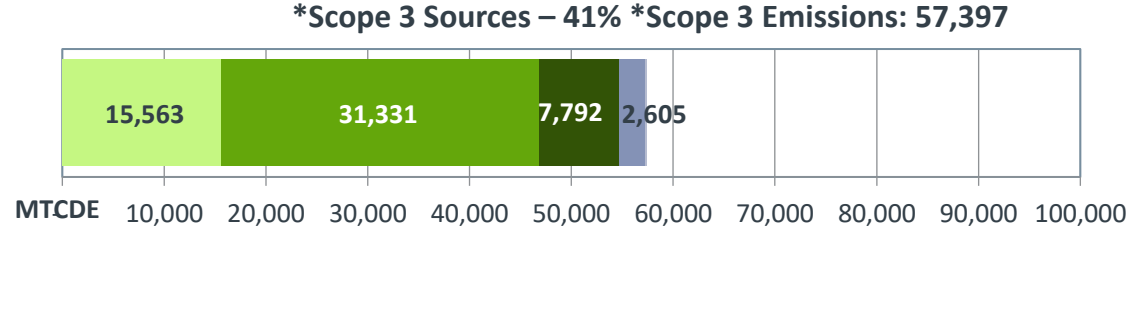










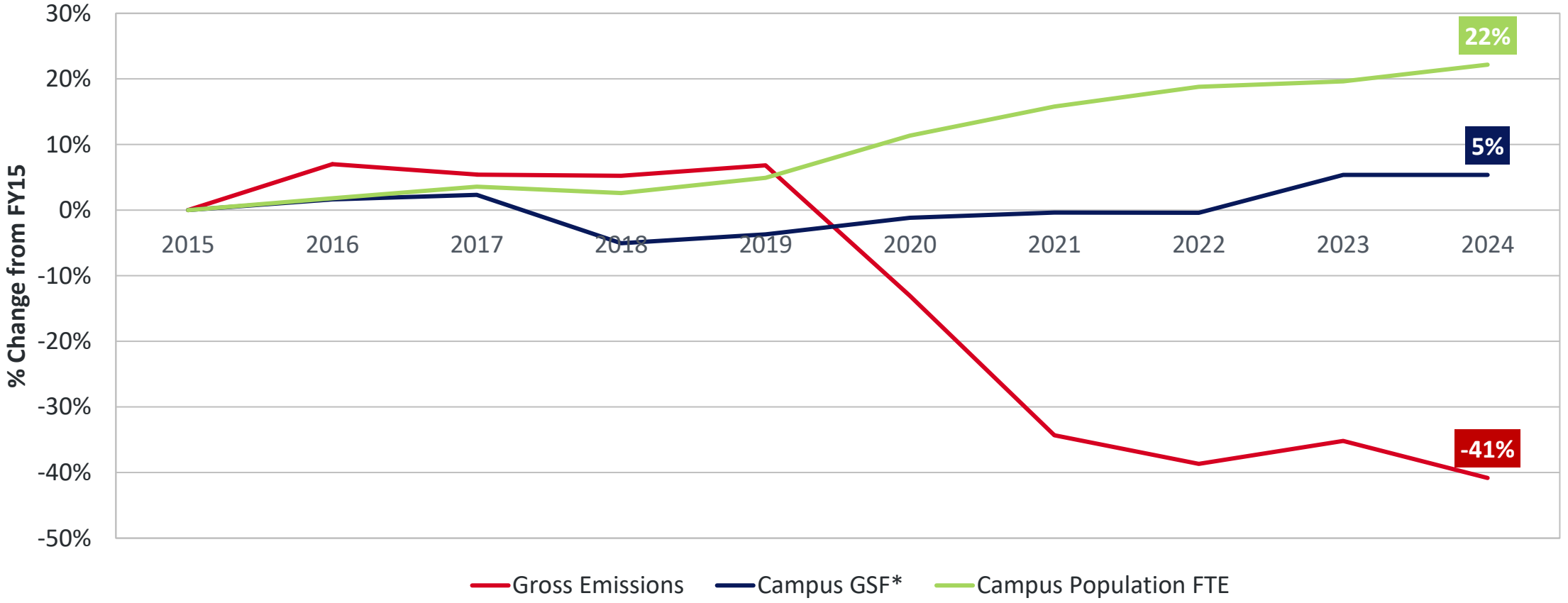


Great Improvements Despite Growing Campus

The University of Arizona has decreased emissions while increasing their campus footprint

Change in Emissions vs. Change in Campus Size and Population

Indexed to FY2015



**Excludes parking garages*

Sustainability Peers

Peers determined using location, campus size, and population

Peer Institution	Location
Clemson University	Clemson, SC
Florida State University	Tallahassee, FL
Michigan State University	**East Lansing, MI**
Texas A&M University	**College Station, TX**
University of Alabama	Tuscaloosa, AL
University of Arkansas	**Fayetteville, AR**
University of Tennessee	**Knoxville, TN**

***Co-generation 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.

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

Defining Normalization Process

GSF vs EUI-Adjusted Floor Area

Energy Use Intensity (EUI) is a unit of measurement representing energy consumed by a building relative to its size, per square foot.

Energy intensive space includes “laboratory space”, “healthcare space”, and “other energy intensive space”.

AASHE STARS calculates the formula the following way:

EUI-AFA = A+(2*(B+C))+D

A = Gross floor area of bldg. space
B = floor area of lab space
C = floor area of healthcare space
D = floor area of other energy intensive space

Total Campus FTE vs Weighted Campus User

The Weighted Campus User metric is used more widely in campus sustainability in order to give more credence to onsite residents, and the energy use they require by being onsite full-time.

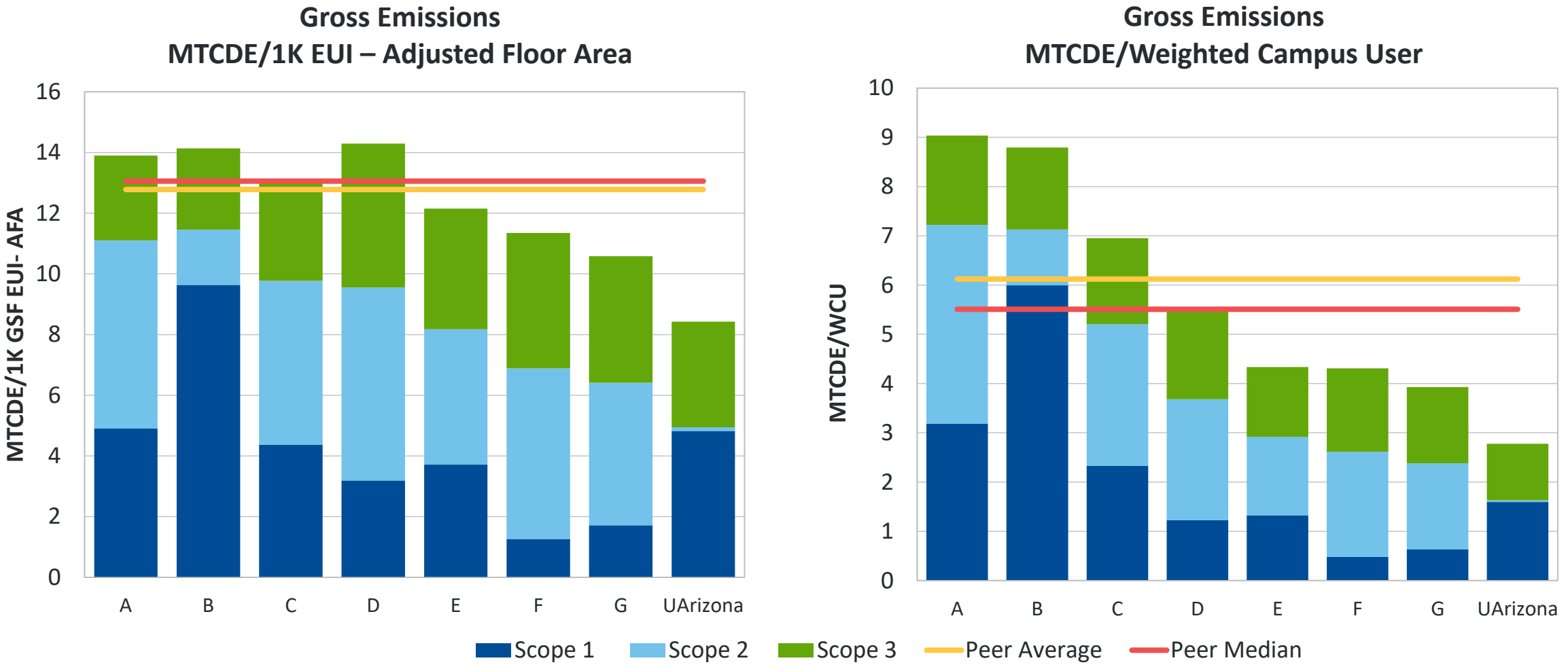
$$WCU = (A+B+C) + 0.75\ [(D-A) + (E-B) – F]$$

A = student residents onsite
B = employee residents onsite
C = other residents onsite/staffed hospital beds

D = Total FTE student equivalent enrollment
E = FTE of employees (faculty and staff)
F = FTE of students enrolled ONLY in distance education

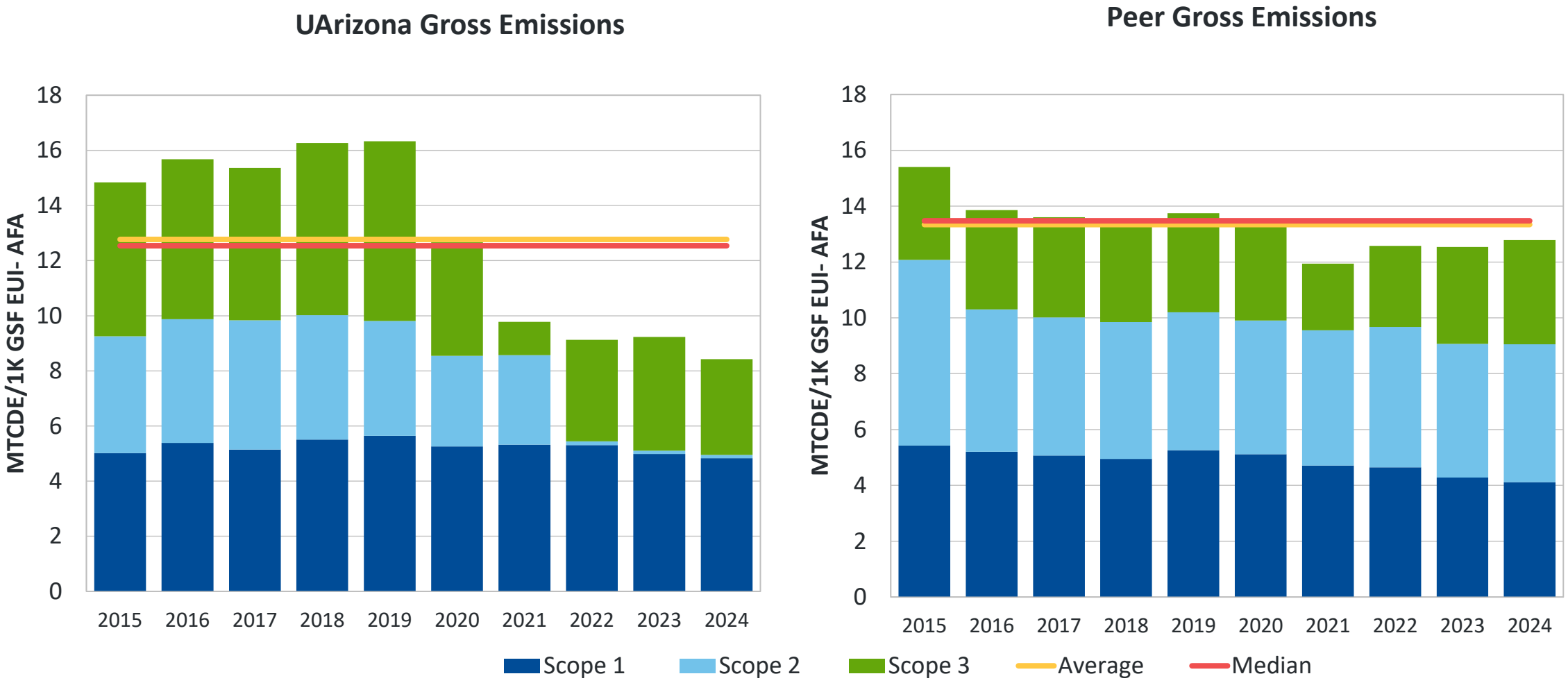
FY24 Gross Emissions per Space and Campus User

Arizona has lowest emissions per GSF and WCU among peers



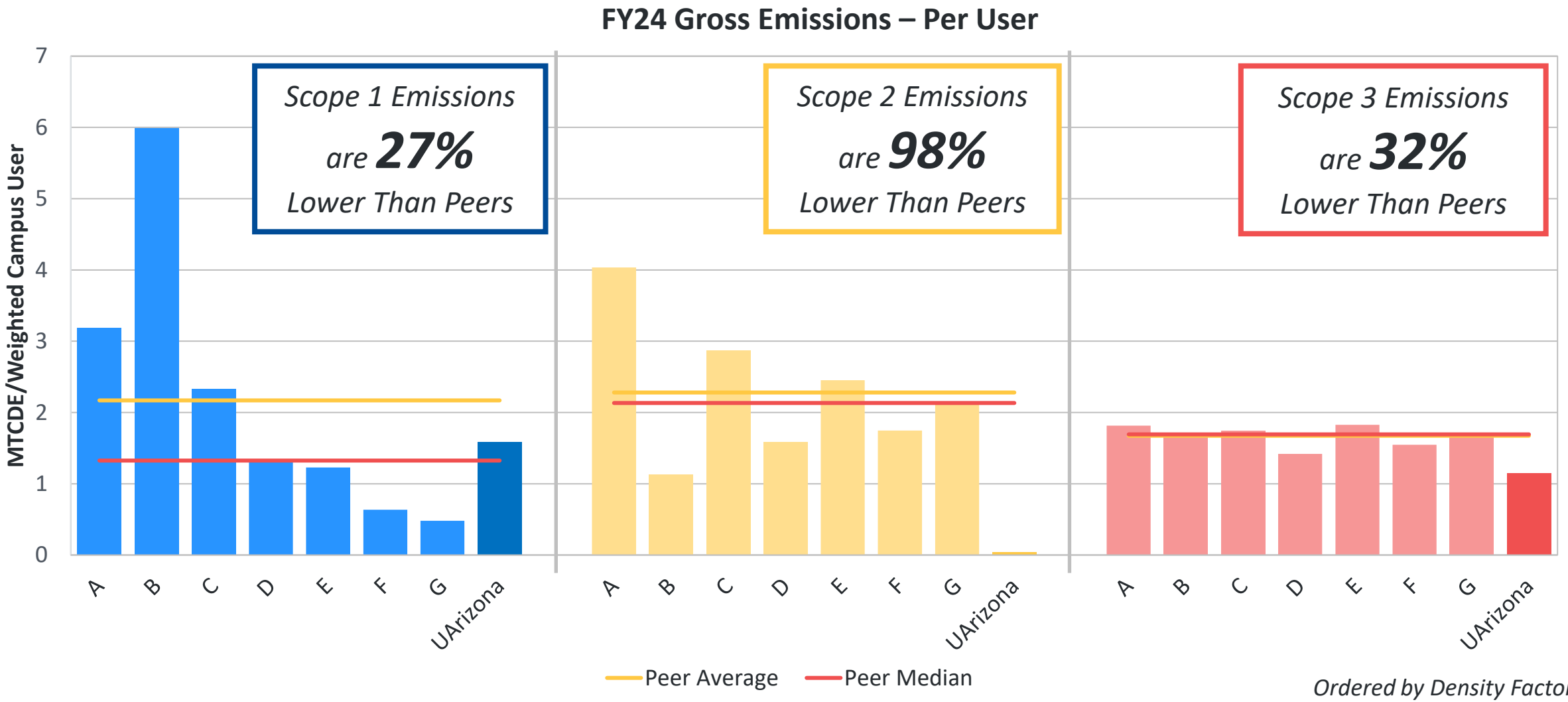
Trending Gross Emissions Normalized by Space

Scope 2 and 3 grew for peers in FY24, resulting in an overall increase



Emissions are Below Peers Across all Scopes

When normalizing by user, emissions are lower than peer average across all scopes

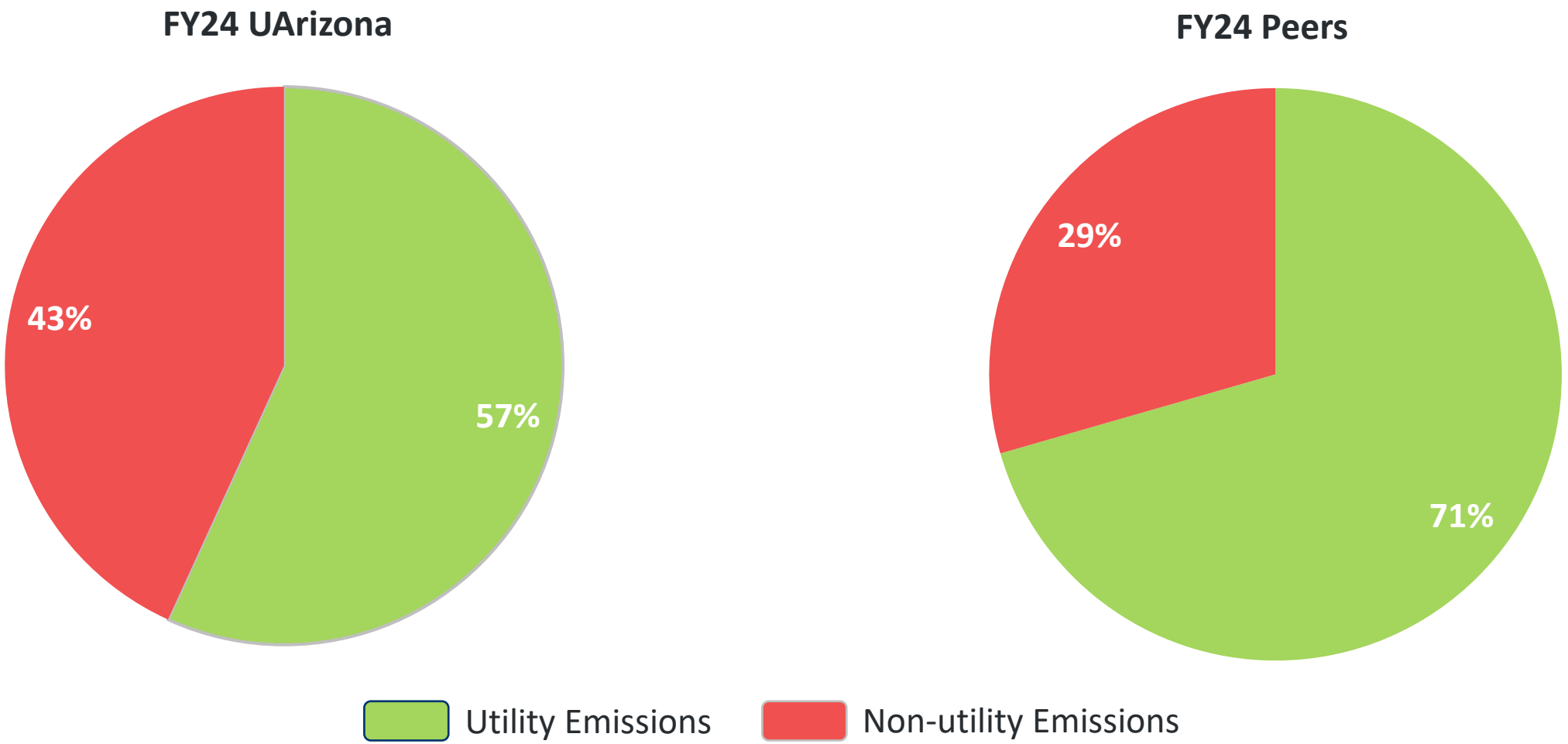


Ordered by Density Factor

Utilities

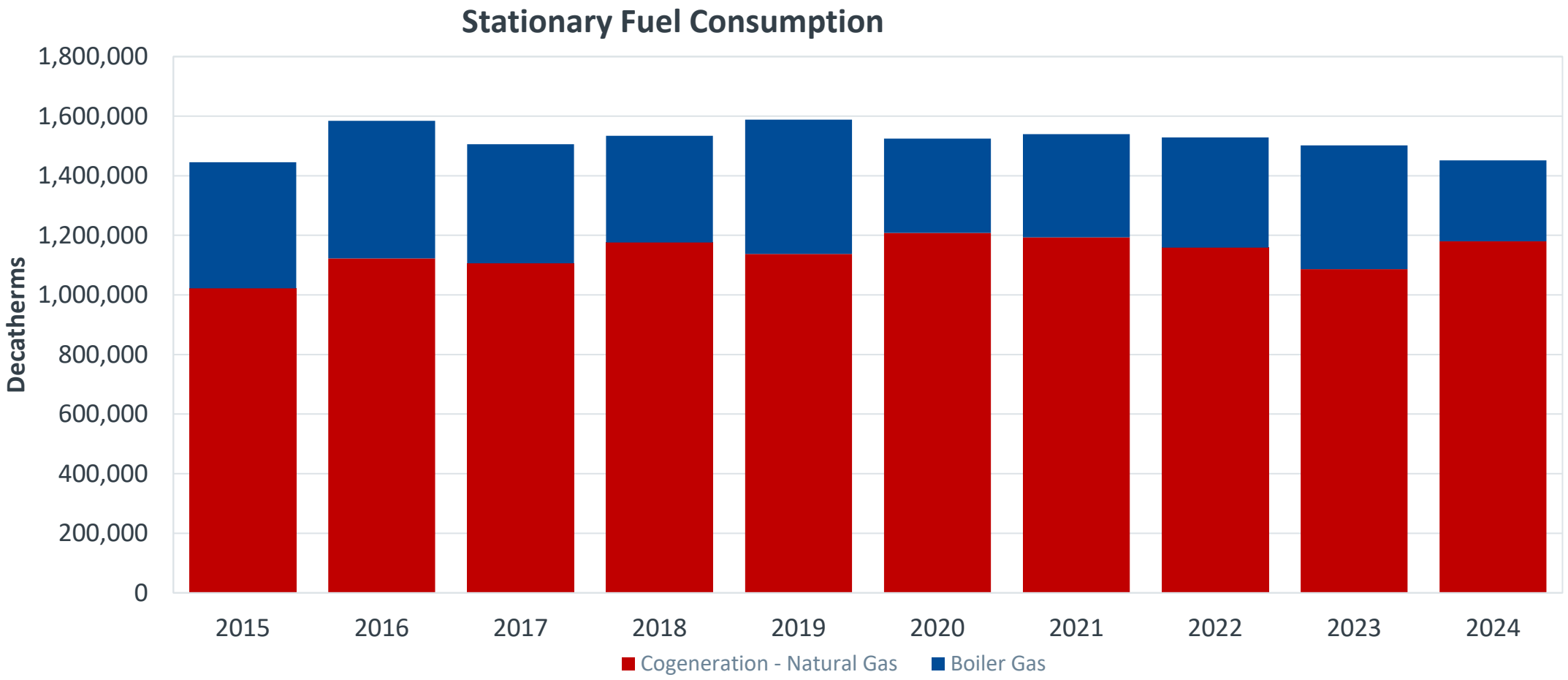
Current Emission Profile – Utility vs. Other

Scope 2 neutrality leads to lower utility emissions than peers



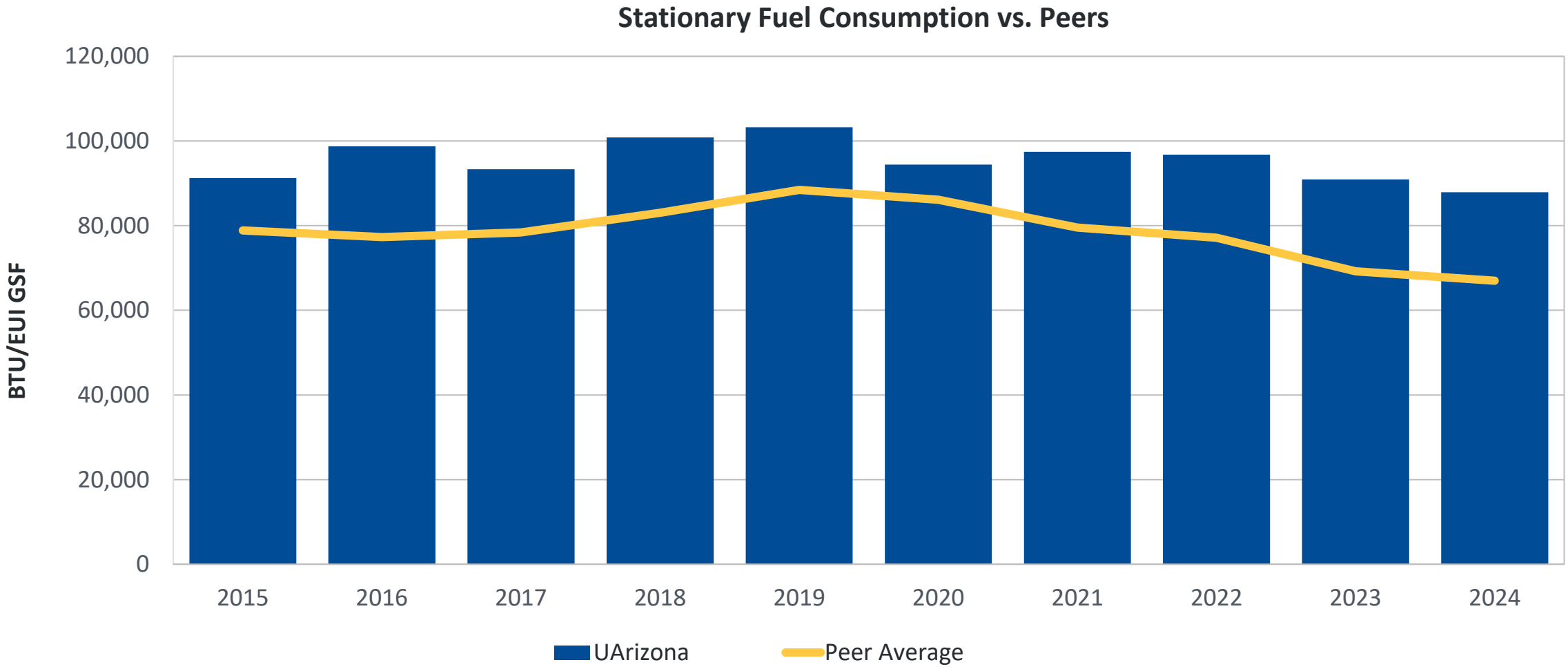
Scope 1: Stationary Fuel Consumption

Natural gas consumption has decreased by 9% since FY19 peak



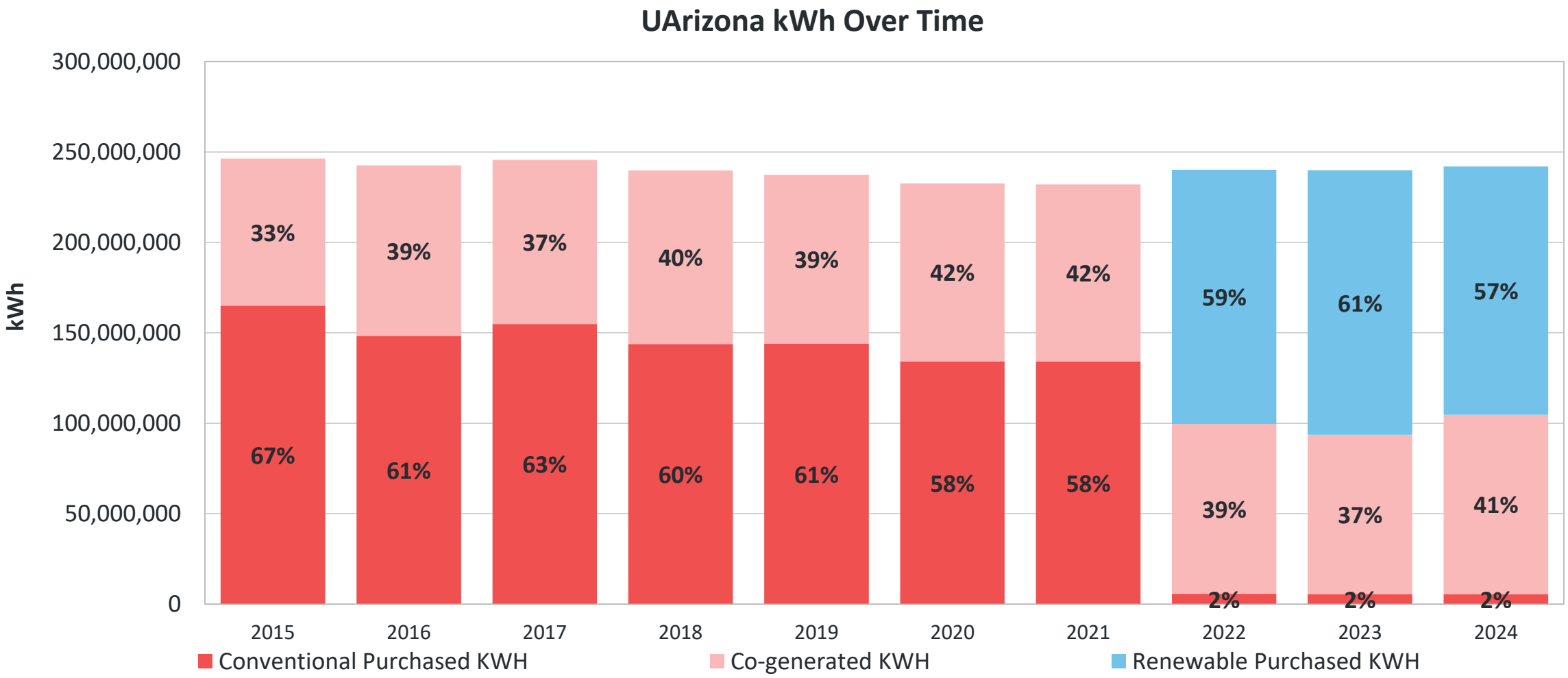
Energy Consumption – Scope 1

Stationary fuel consumption is higher than peers but continues to decrease in FY24



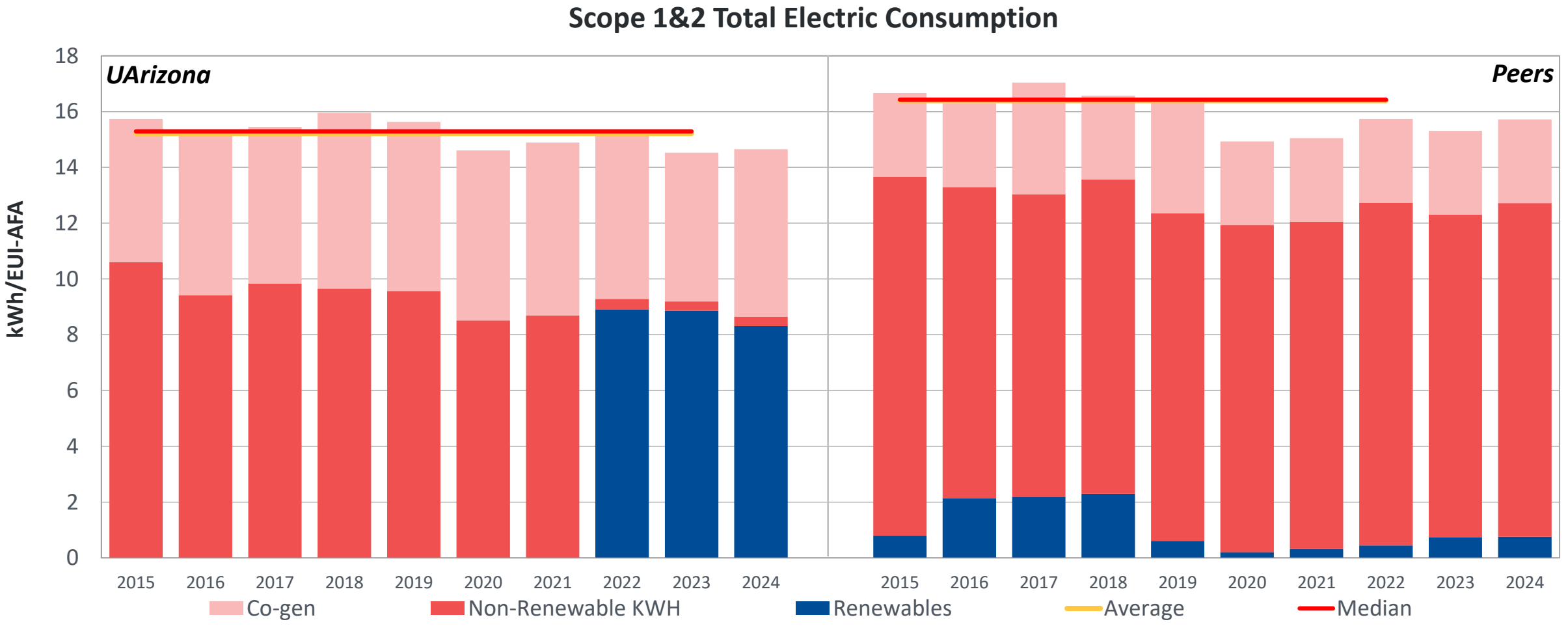
Scope 1&2: Campus Electric Consumption

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



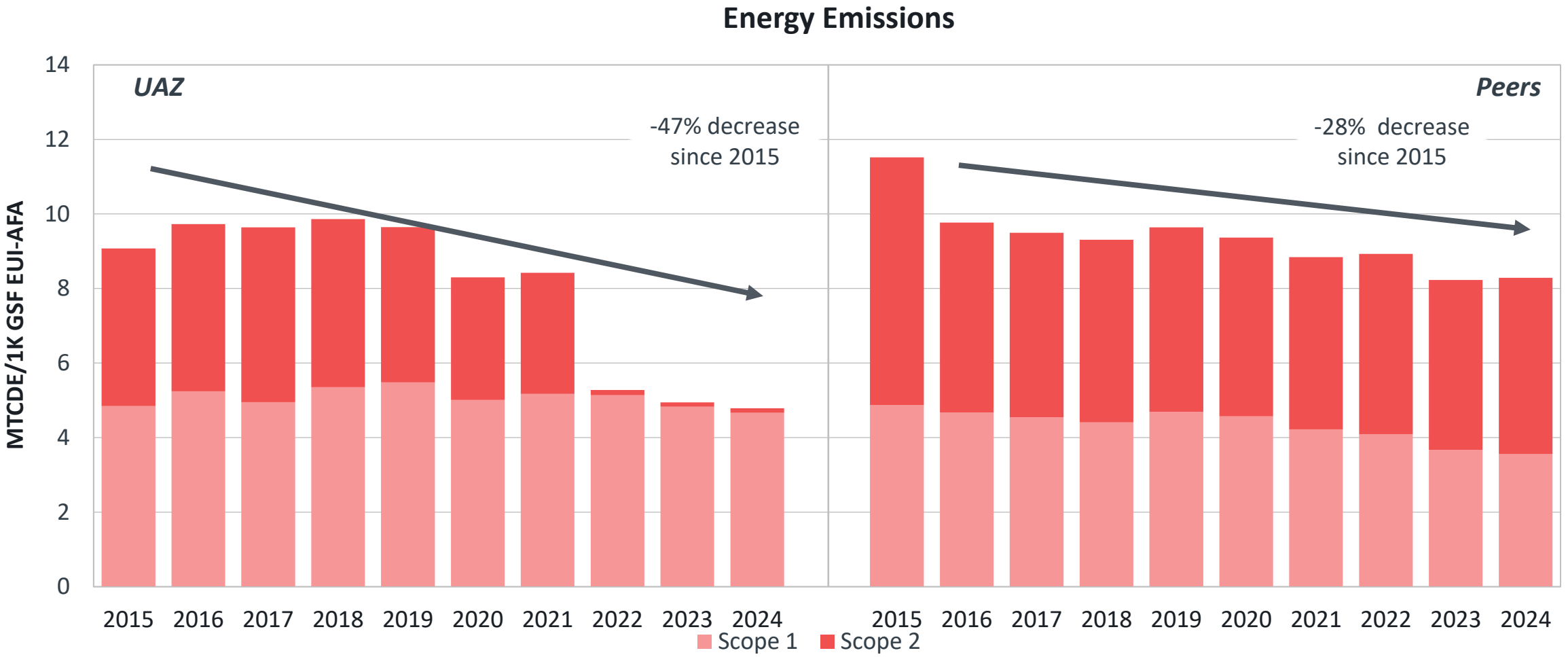
Scope1&2: Total Electric Consumption vs. Peers

UArizona consumes less electricity than peers and majority of KWH's are carbon neutral



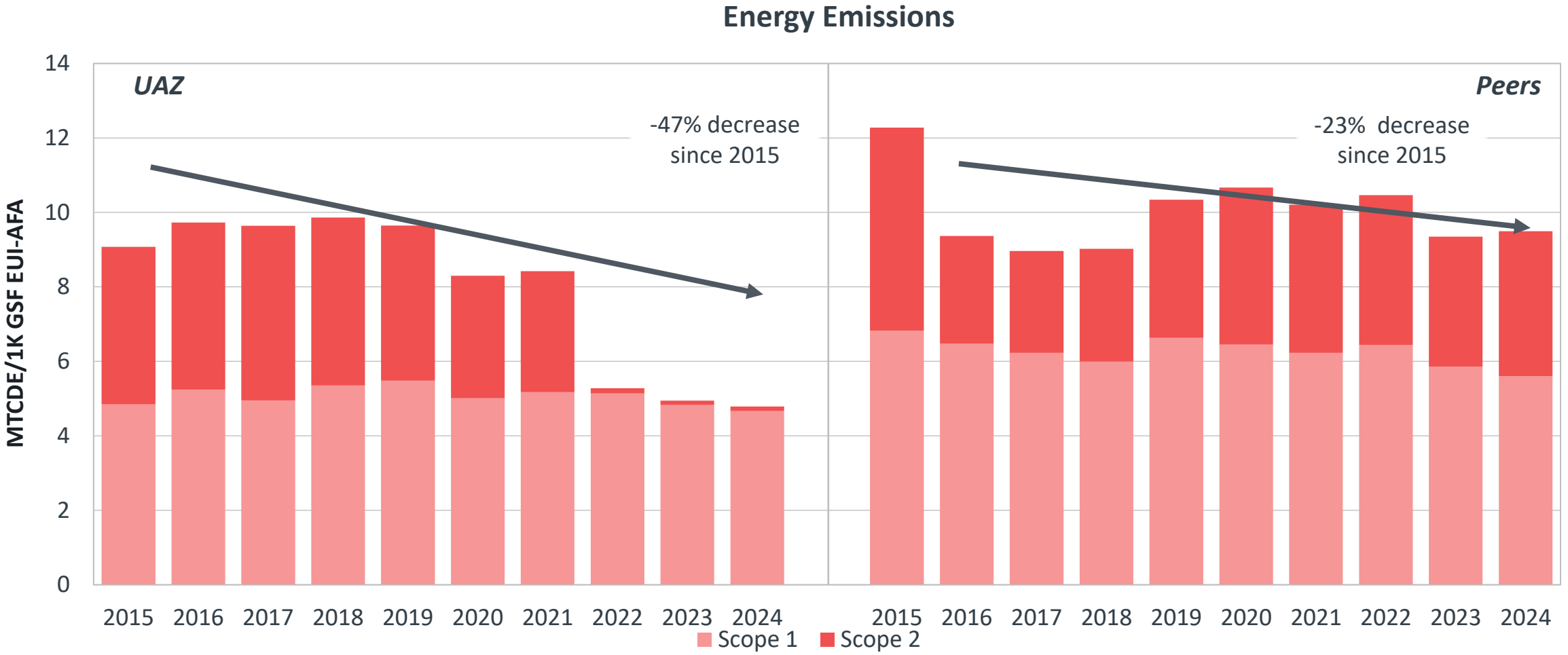
Energy Emissions vs. Peers

Total energy emissions: 79,059 MTCDE (Scope 2: 1,984 MTCDE, Scope 1: 77,075 MTCDE)



Energy Emissions vs. Cogen Peers

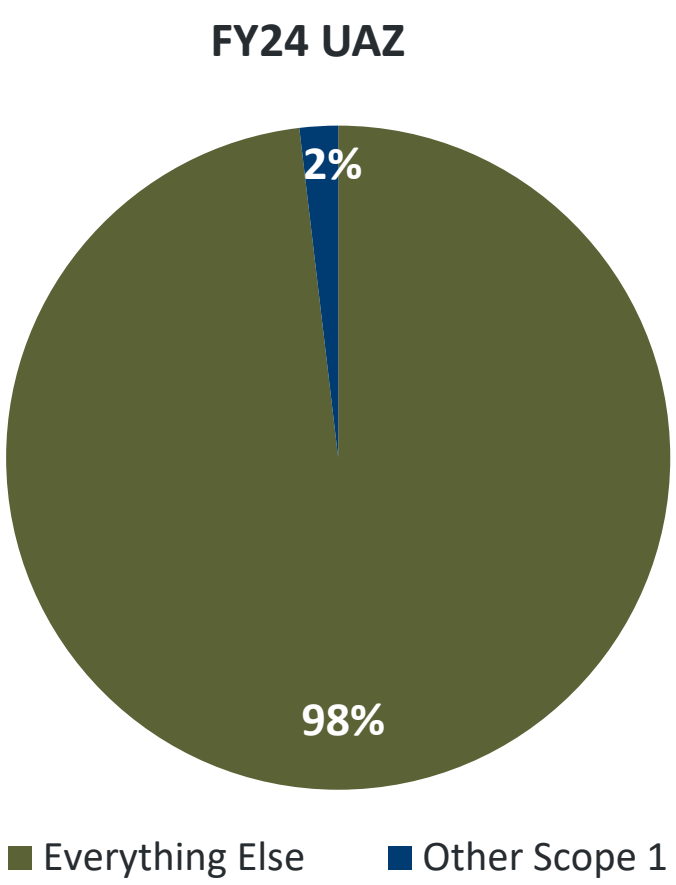
Total energy emissions : 79,059 MTCDE (Scope 2: 1,984 MTCDE, Scope 1: 77,075 MTCDE)

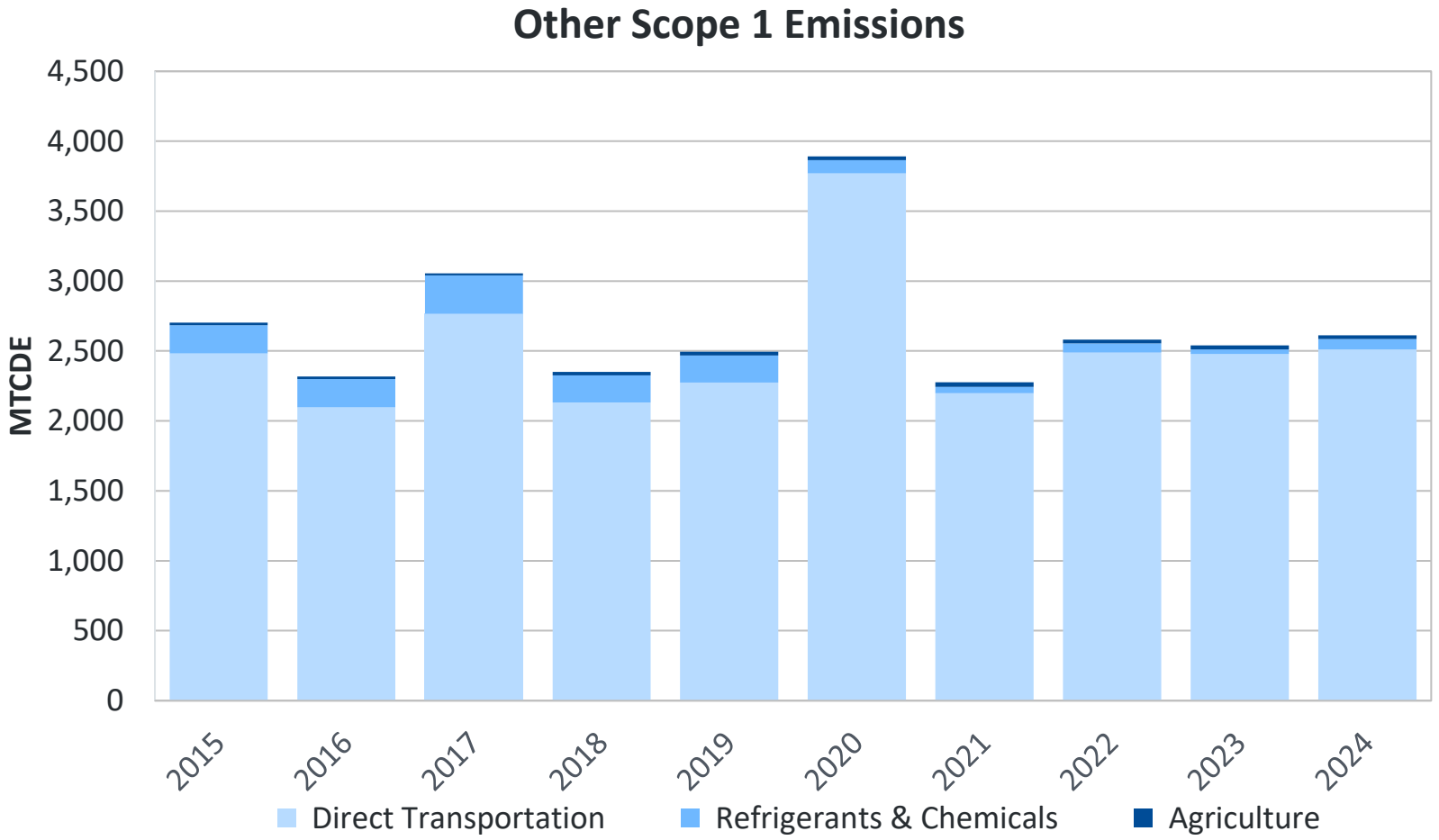


Non-Utility Emissions Sources

Other Scope 1 Emissions Are Small Portion of Total

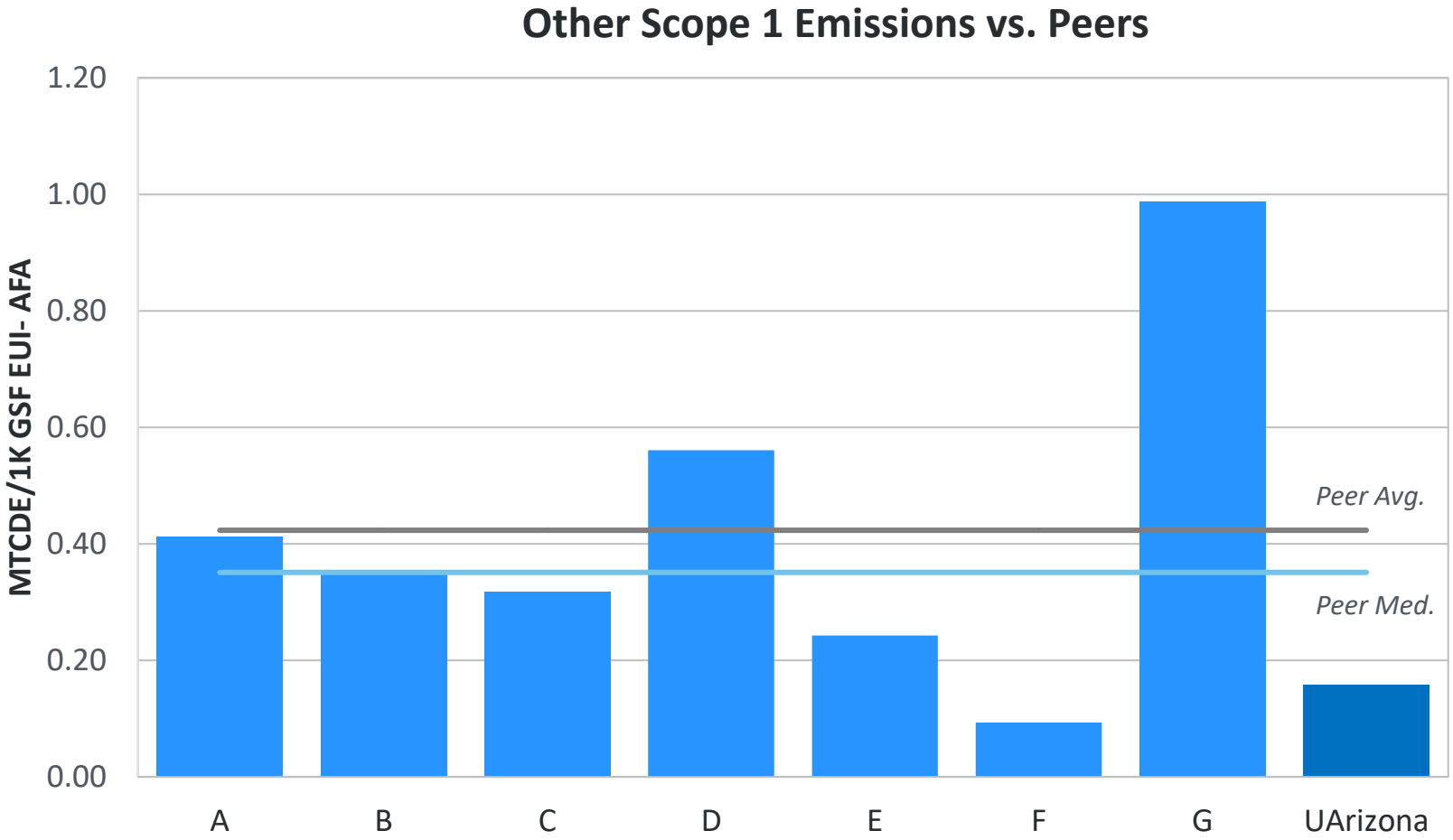
Direct Transportation and Refrigerants & Chemicals increased in FY2024

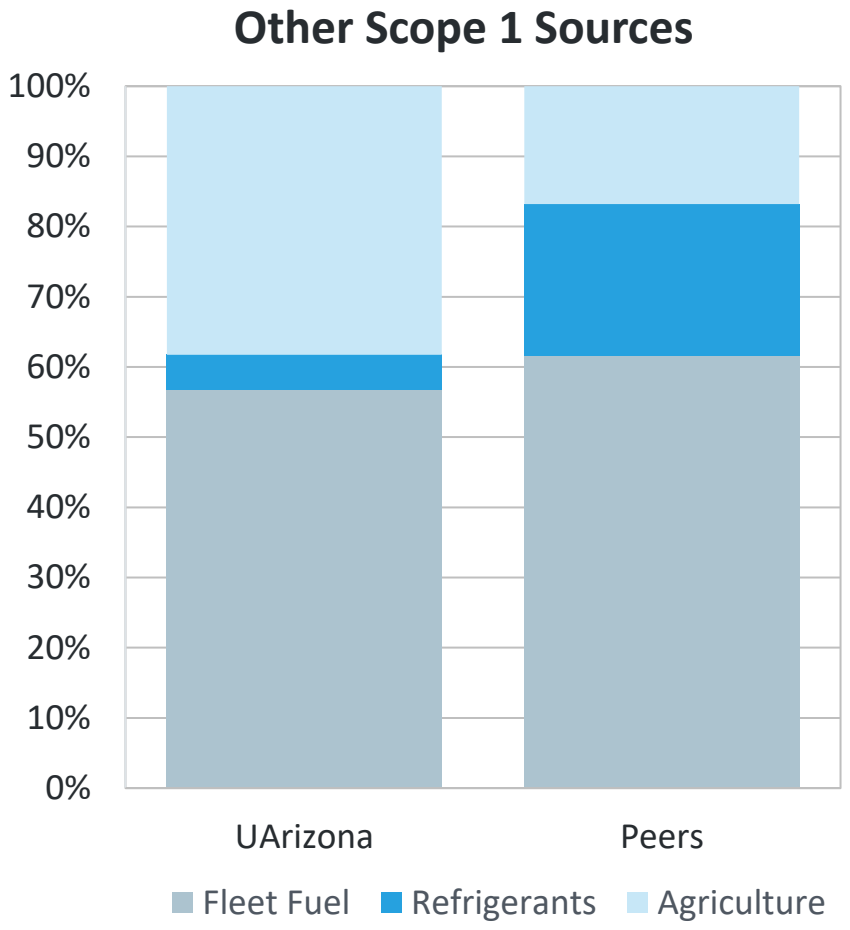




Other Scope 1 Emissions Compared to Peers

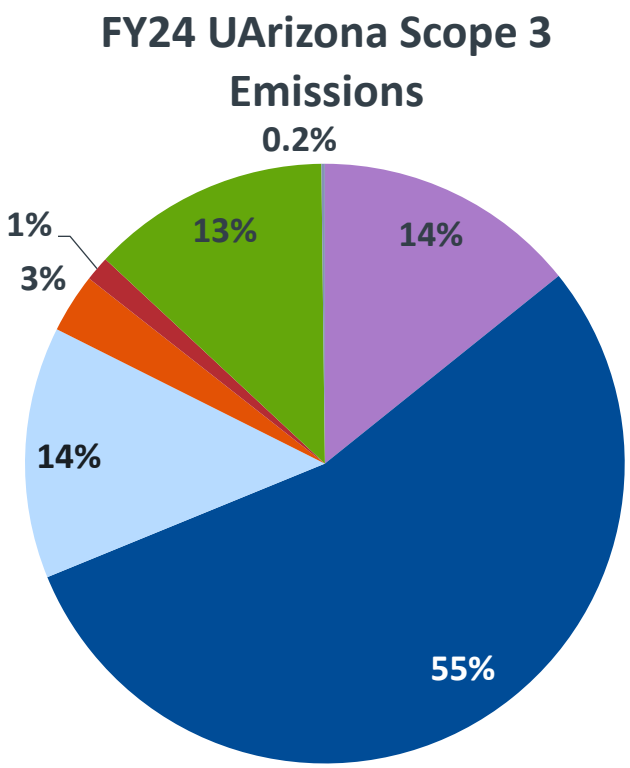
Other scope 1 sources remain below peers, proportionally UArizona has more fertilizer emissions

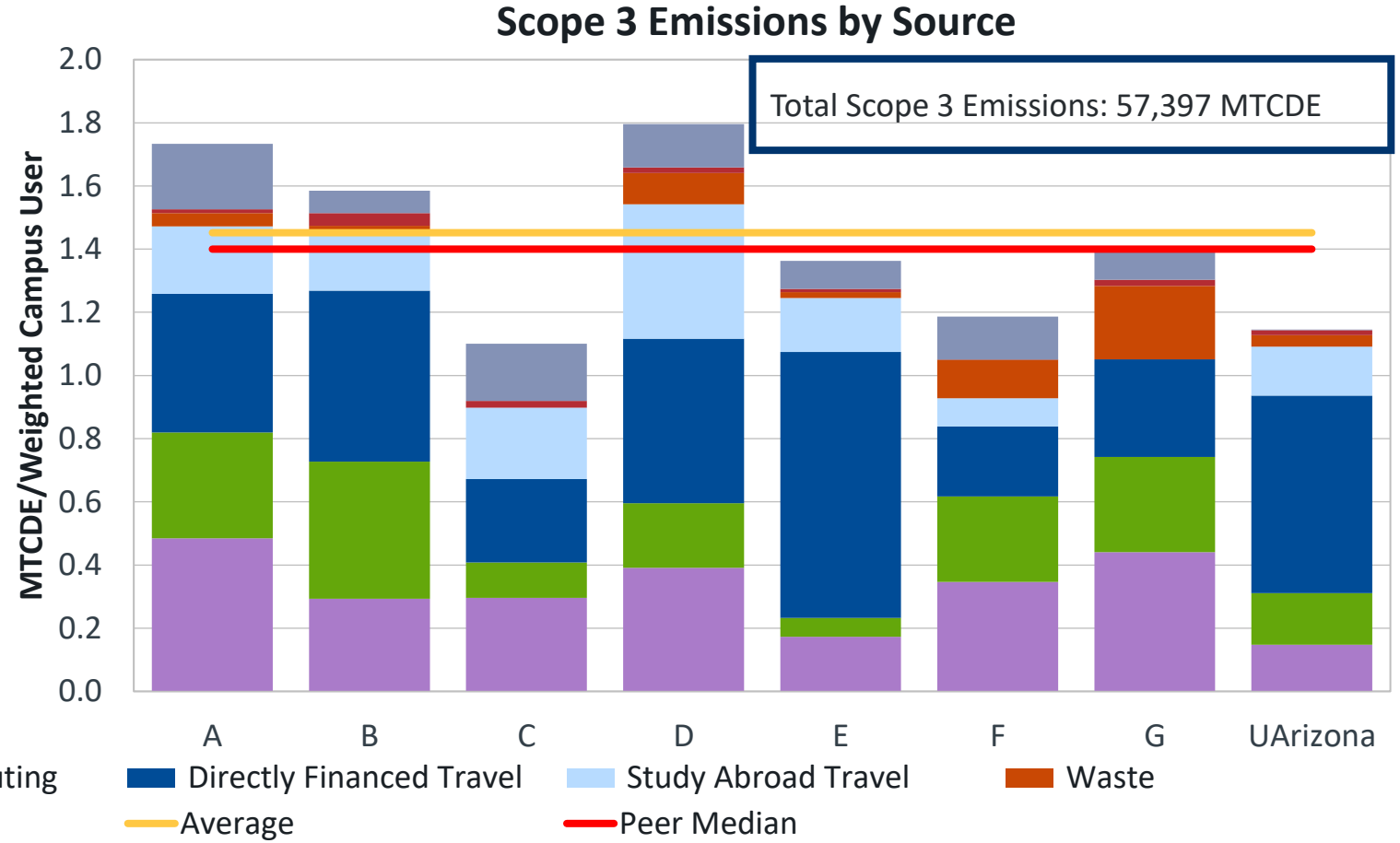




Scope 3: Indirect Emissions Overview

UArizona's scope 3 emissions remain below peer average and median

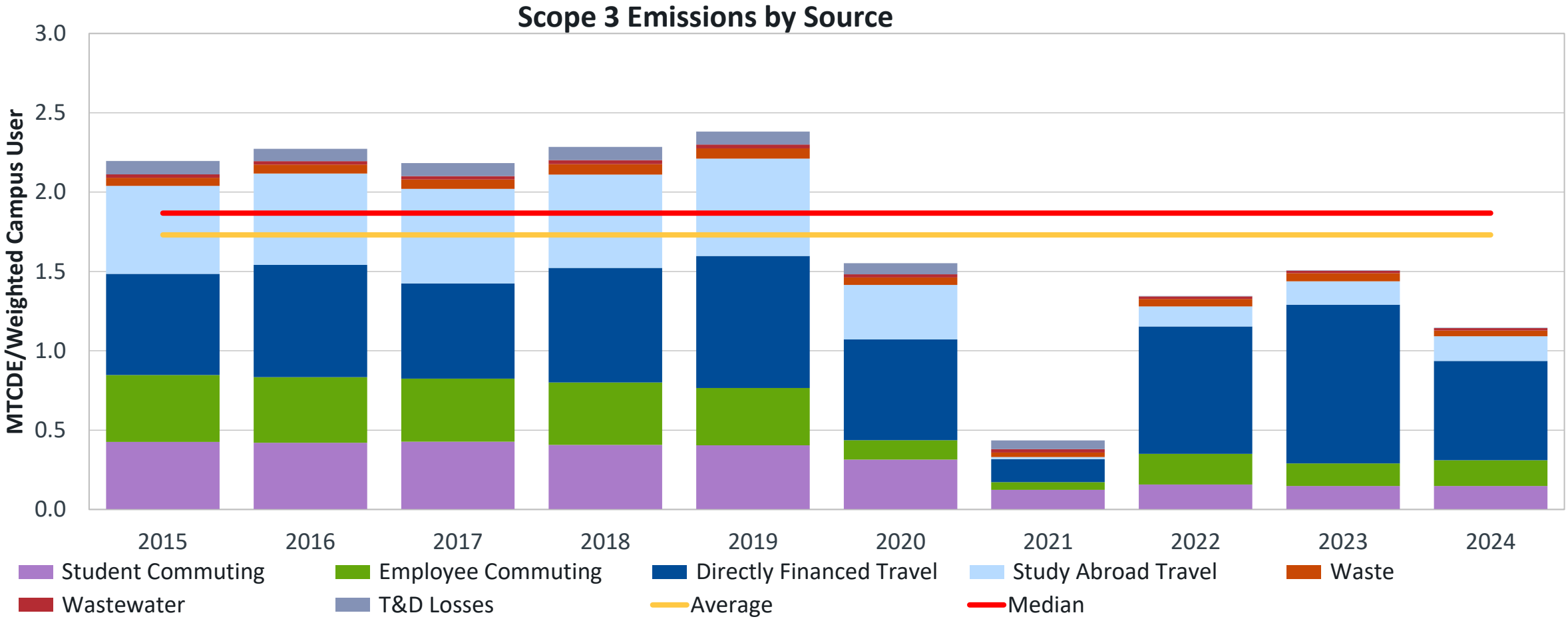




Peers arrayed by density

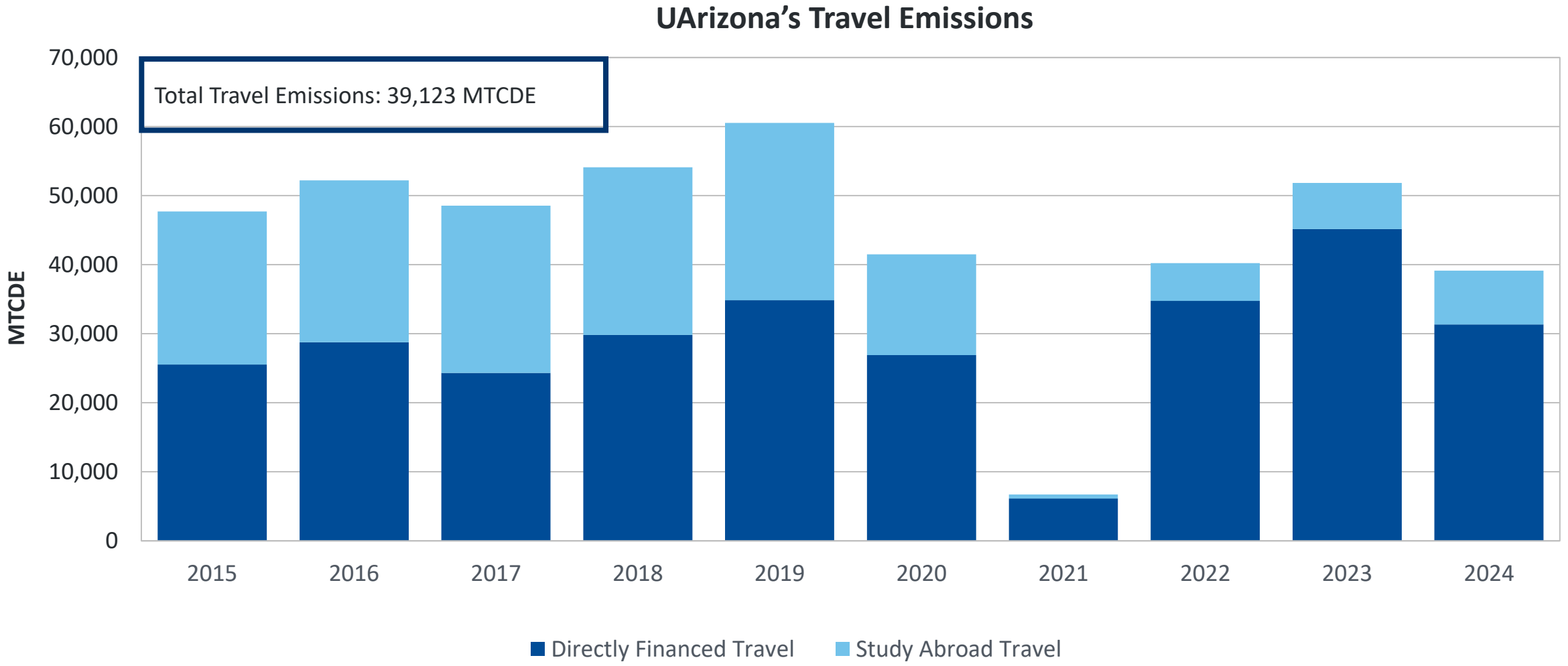
Scope 3 Trending Emissions Longitudinally

Travel and commuting still remains below pre-pandemic levels



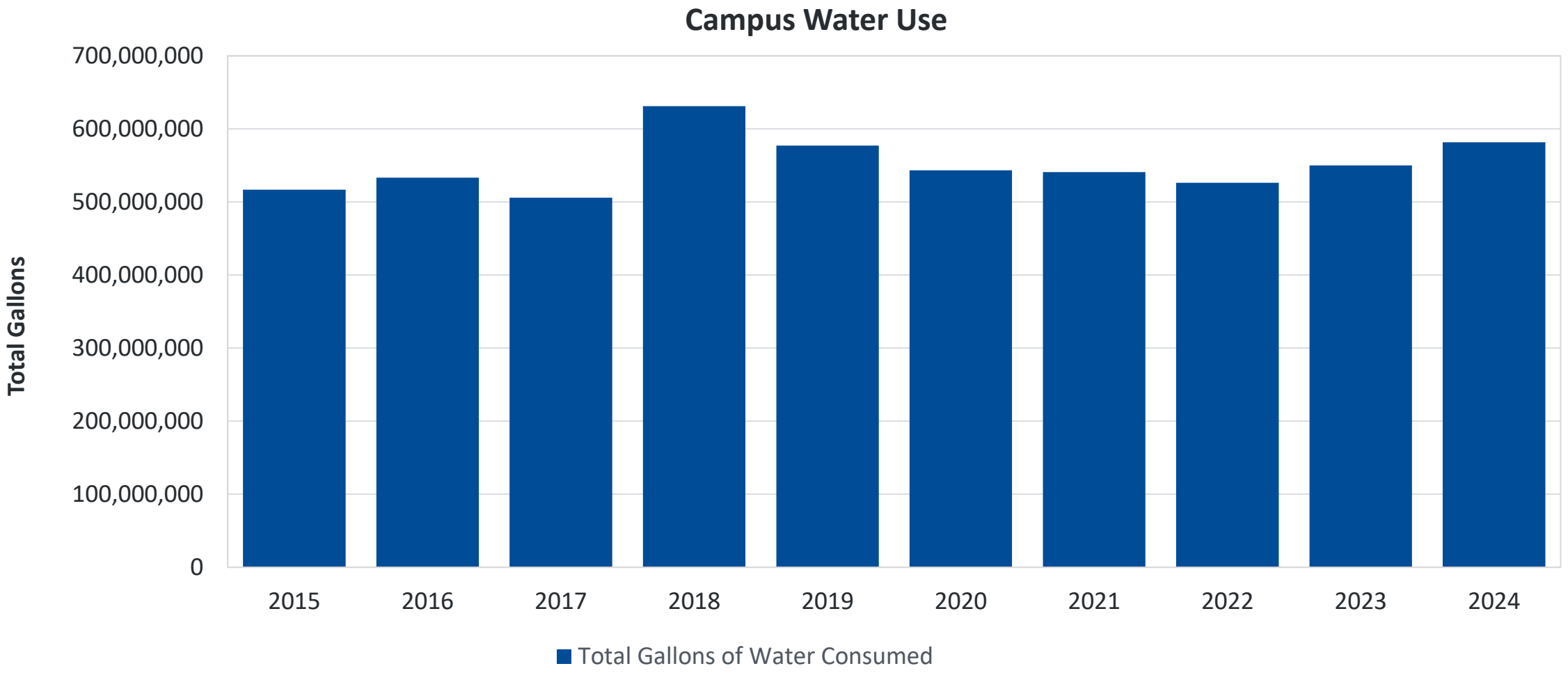
Travel Profile (Air Miles Flown)

Air travel emissions decreased by 24% in FY24



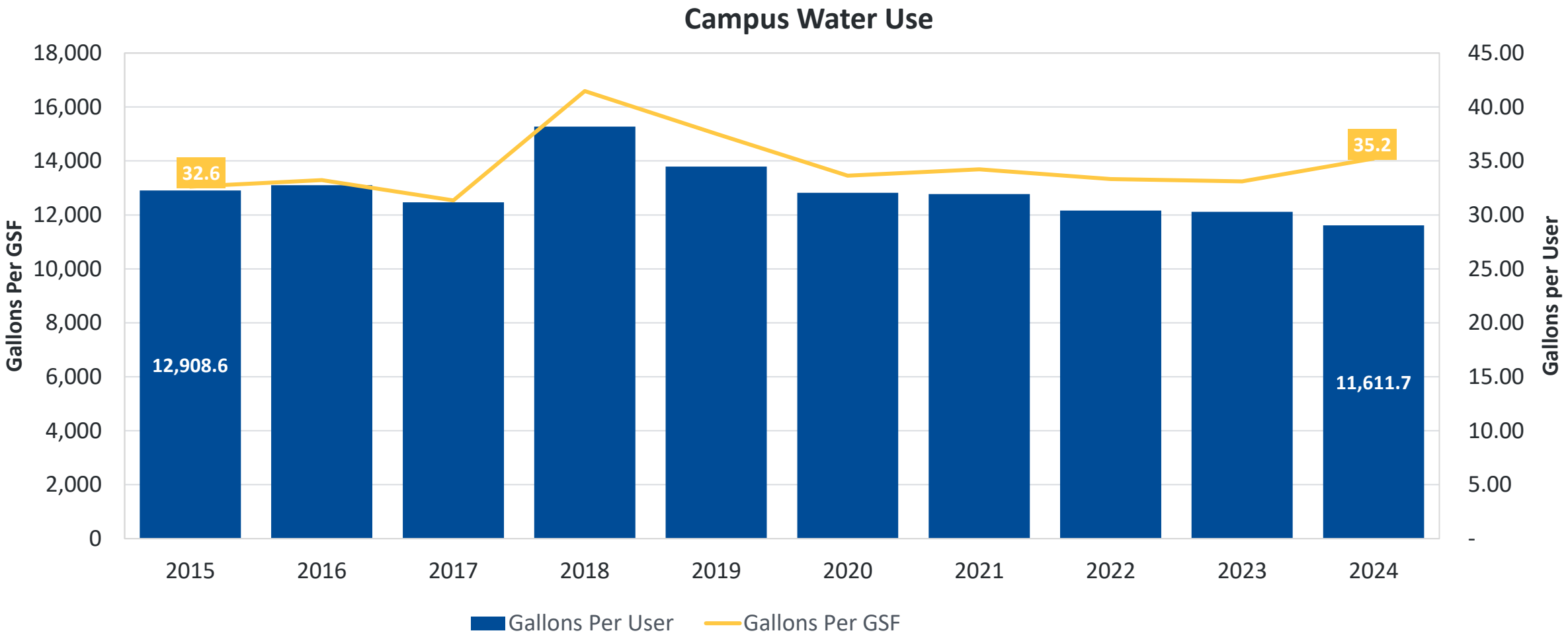
UArizona Water Use

Total water usage increased by 6% in FY24



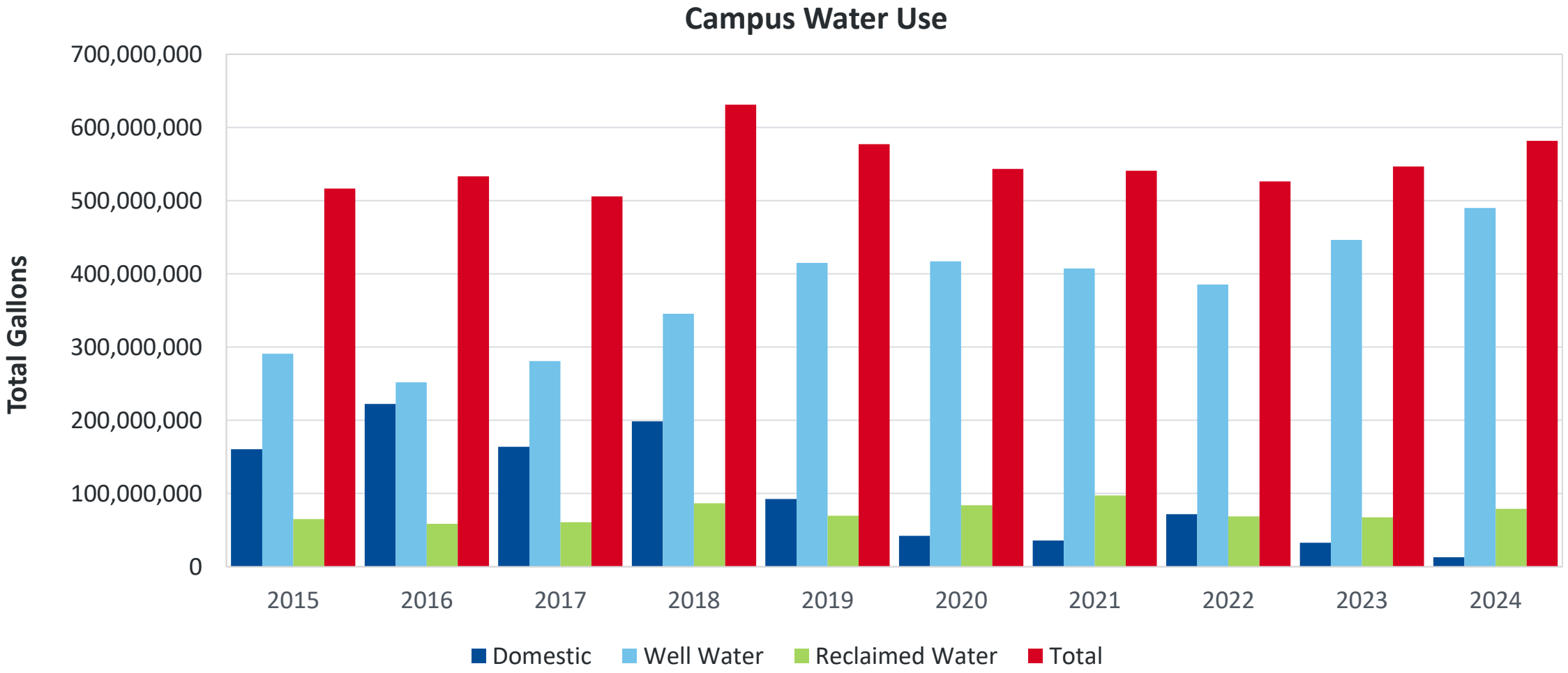
Normalized UArizona Water Use

Water usage has decreased based on user, but increased based on GSF



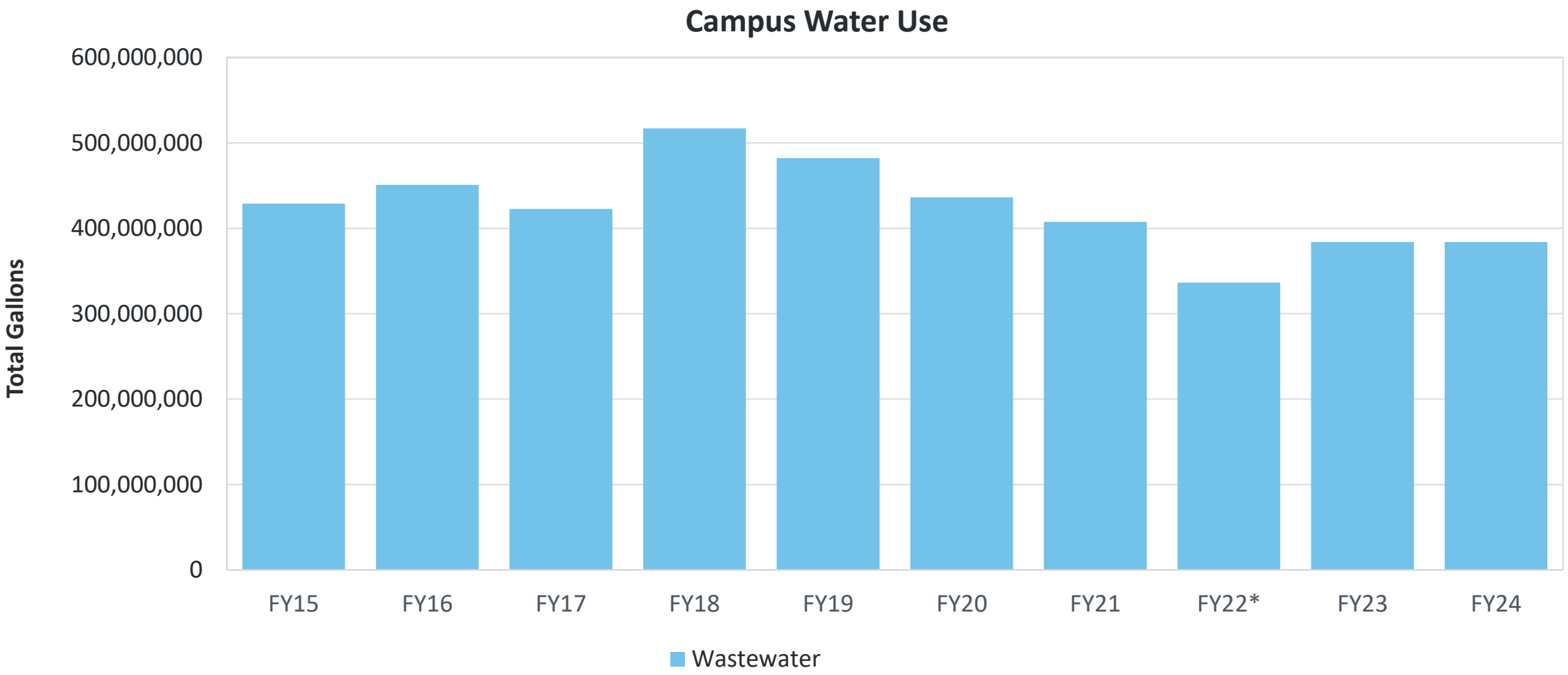
UArizona Water Use by Source

Well water usage increased by 10% in FY24; reclaimed water increased by 17%



UArizona Wastewater Over Time

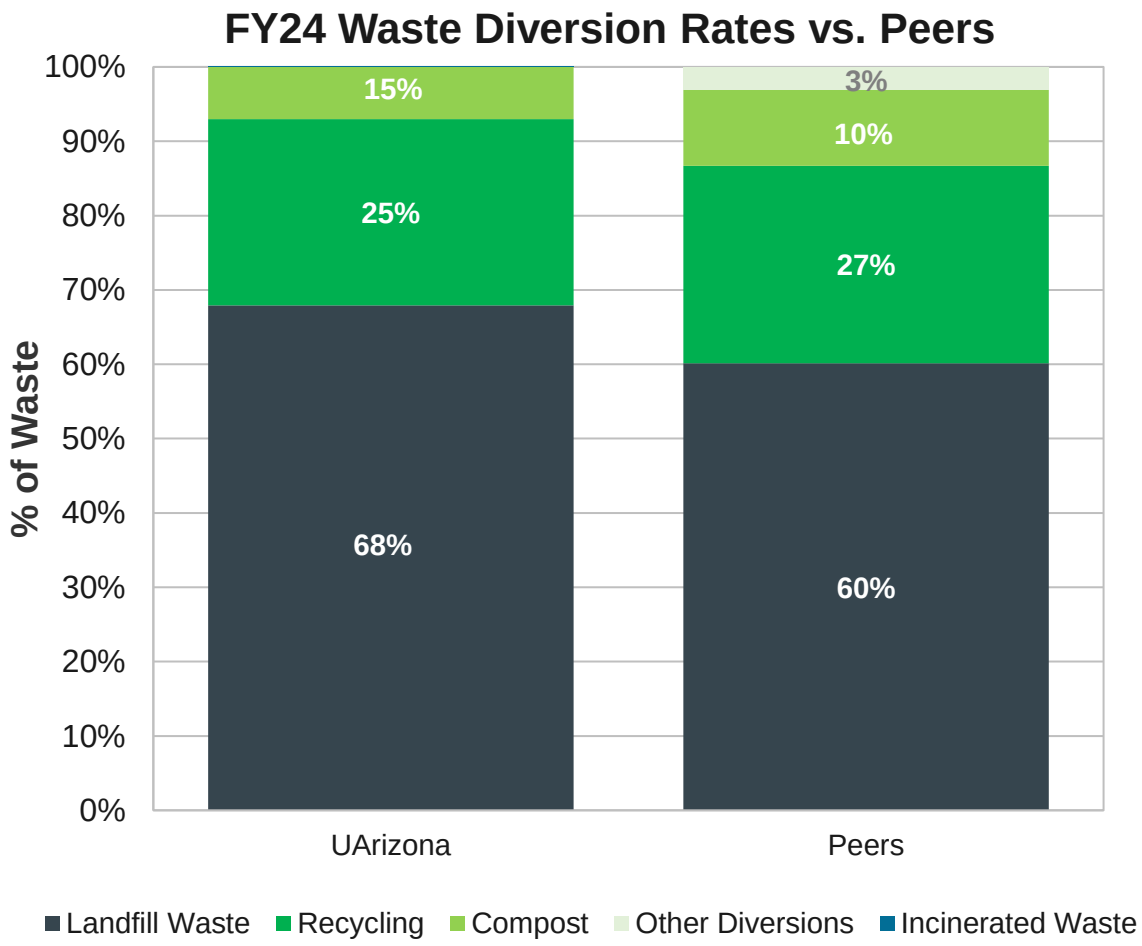
FY24 wastewater trending follows total consumption trends

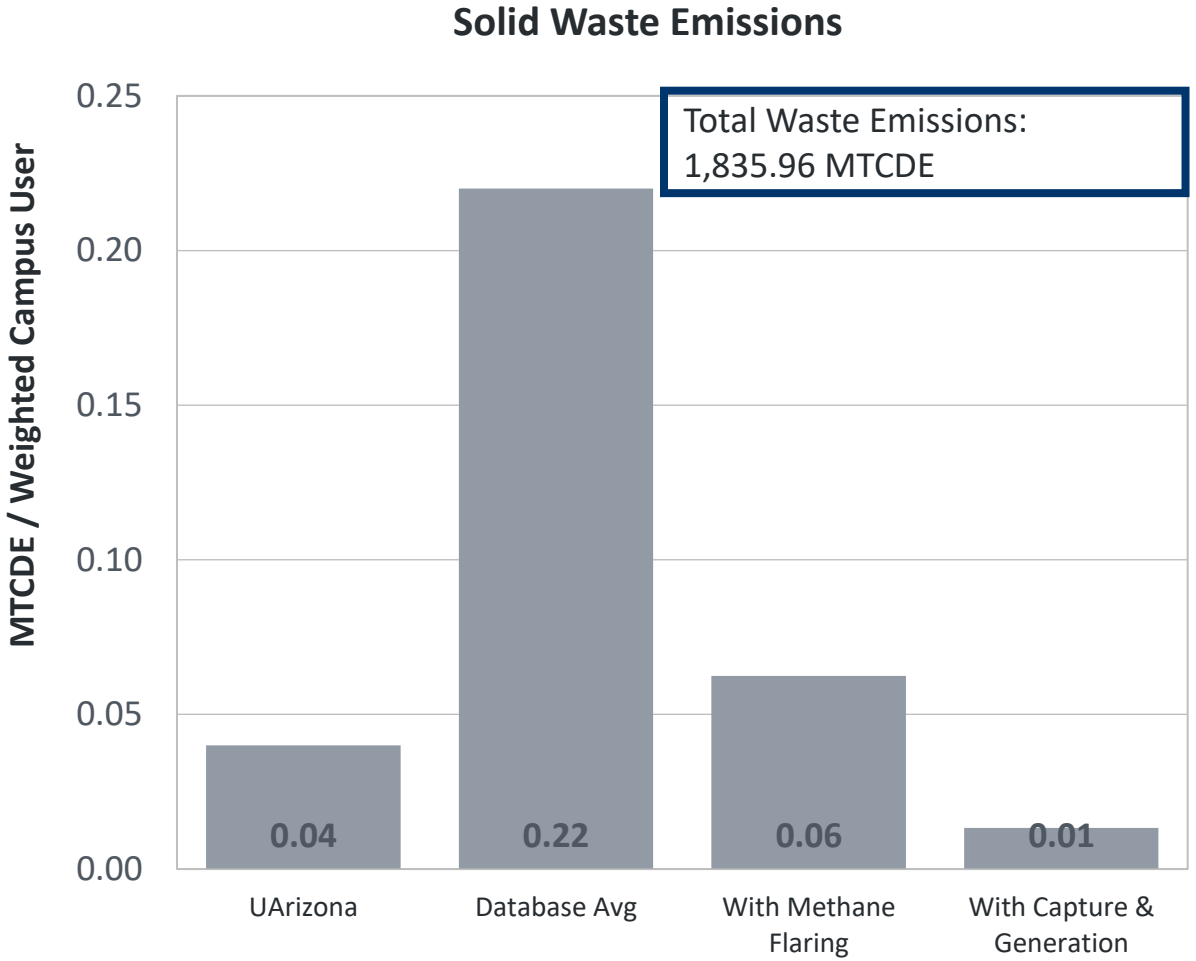


*Decrease in wastewater due to change in methodology

Scope 3: A Closer Look at Waste

UArizona composts at higher rate than peers; peers recycling at a higher rate





Commuting Mode Splits and Distances

Student Commuters

Category	Percentage	Distance
Automobile/SOV	53%	2.96
Bicycle	7%	0.54
Walk	19%	0.15
Carpool	7%	1.68
Light/Commuter Rail	3%	0.42
Public Bus	2%	1.05
Electric Vehicle	.5%	1.33
Telecommuting	1%	-

Employee/Faculty Commuters

Category	Percentage	Distance
Automobile/SOV	64%	6.49
Bicycle	11%	1.06
Walk	6%	0.70
Carpool	5%	5.45
Light/Commuter Rail	3%	1.32
Public Bus	5%	1.38
Electric Vehicle	-	-
Telecommuting	5%	-

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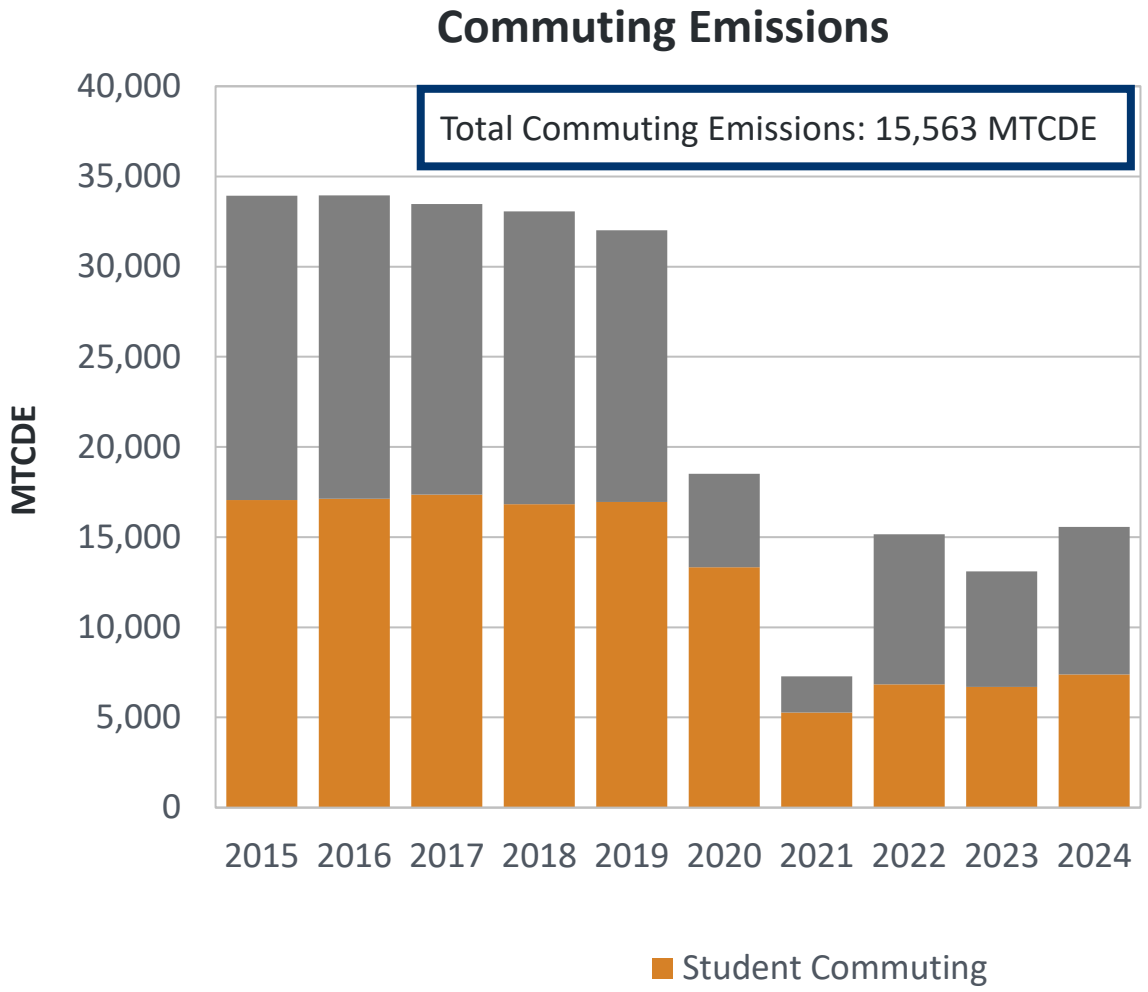
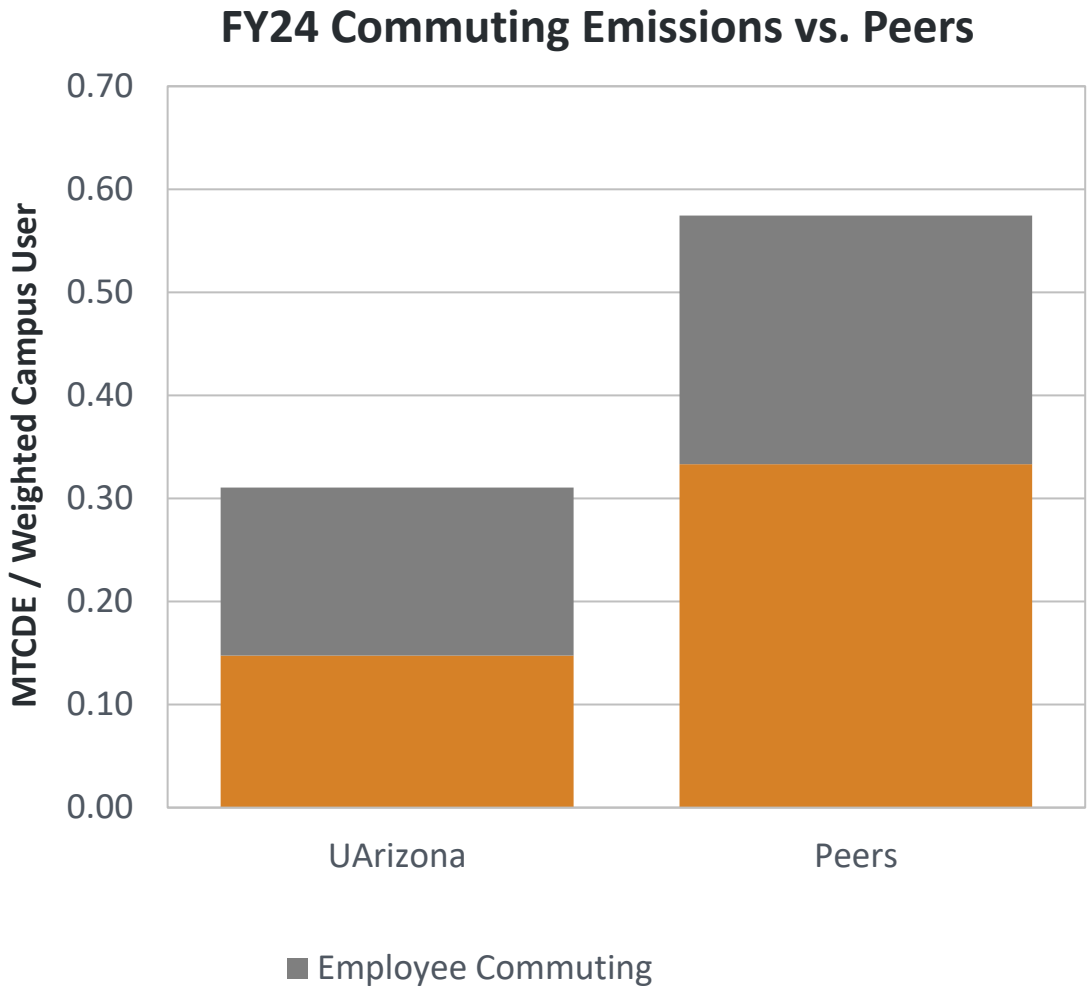
Scope 3: Total Commuting Emissions

Commuting emissions increased in FY24 but remain lower than peers





Next Steps

- Determine content to be shared with additional audiences
- Determine scope expansion

GORDIAN®
Building knowledge

Questions? Comments?