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The University of Arizona FY23 Greenhouse Gas analysis

April 2024

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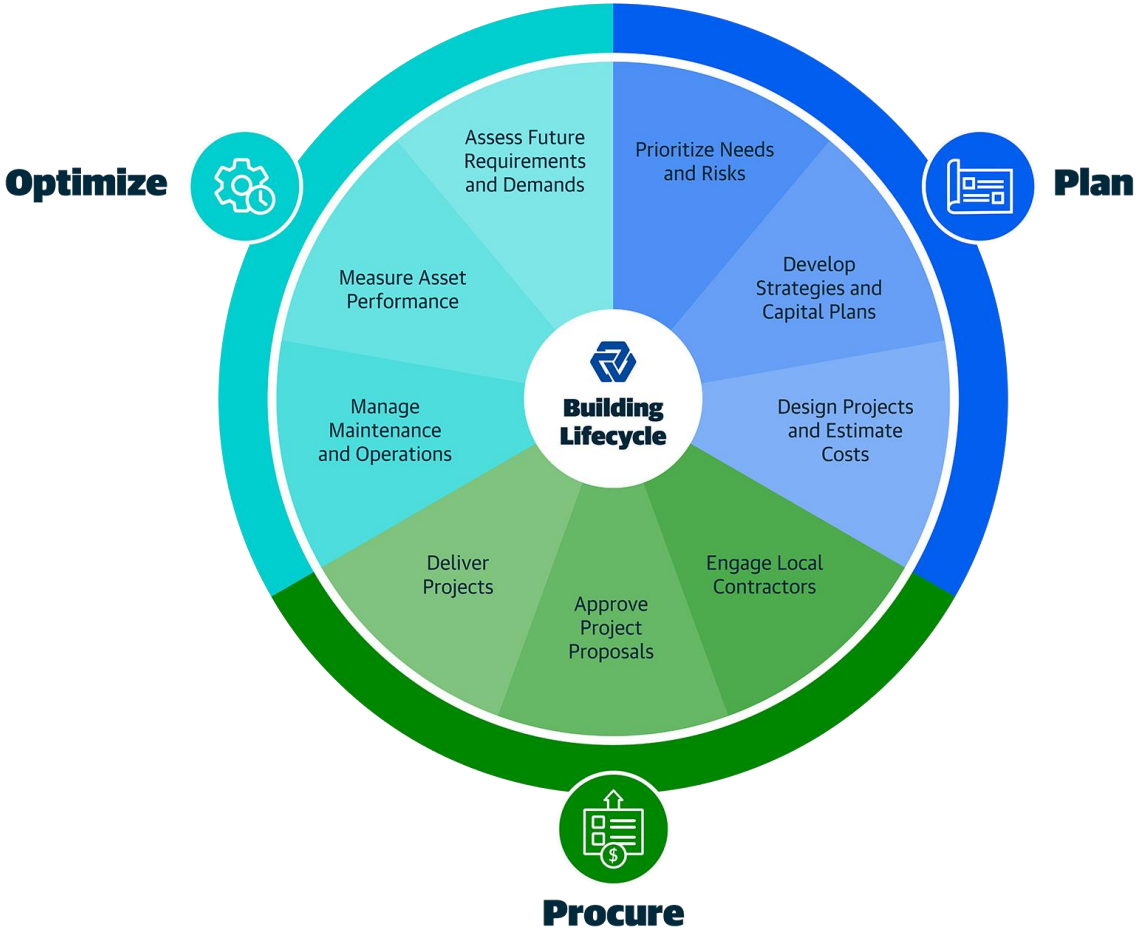
Effectively Manage the Entire **Building Lifecycle**



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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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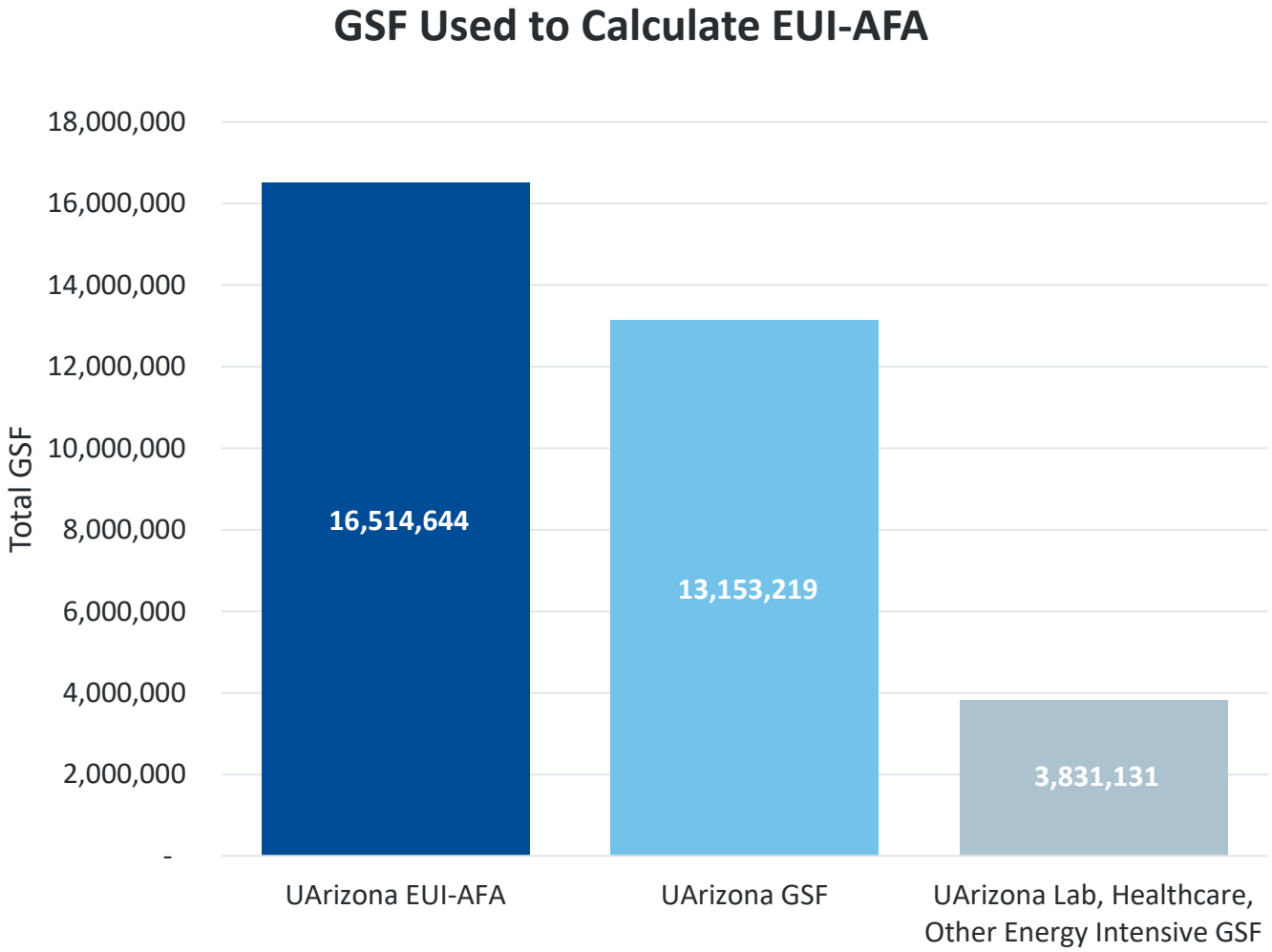
Components of UArizona's Emissions Profile

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

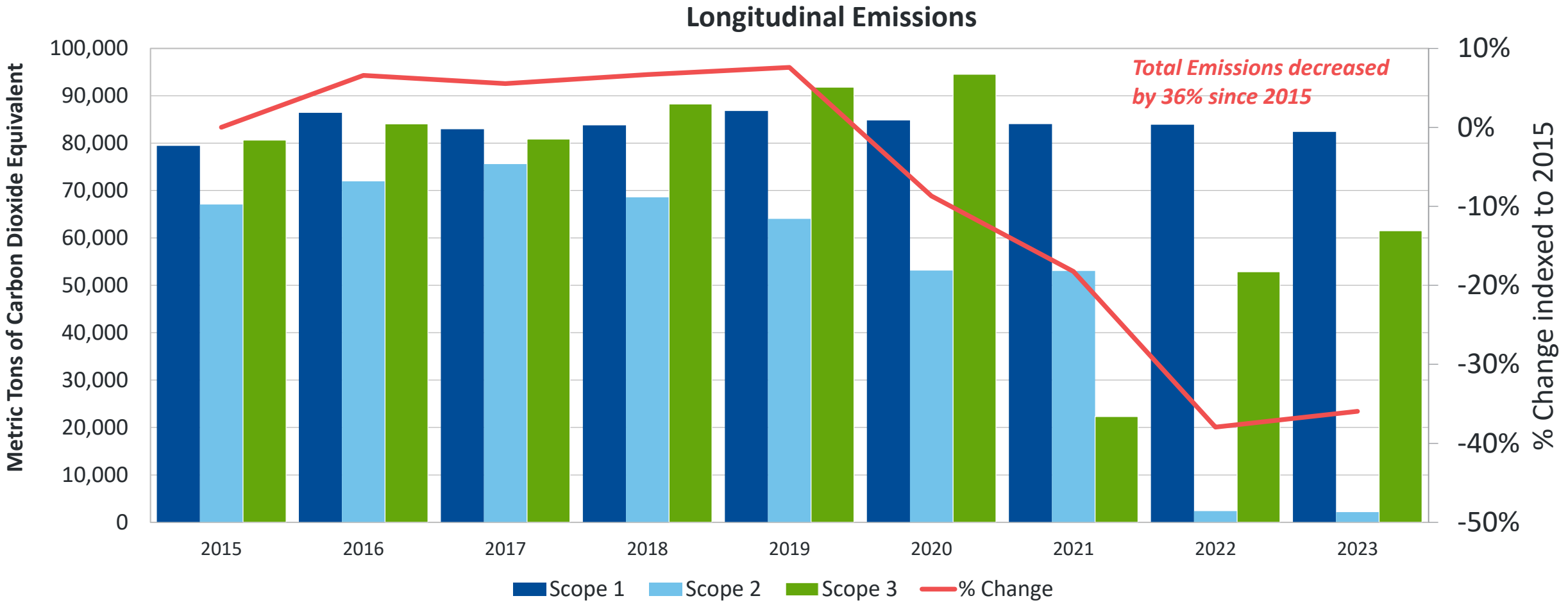


- Scope includes main campus in Tucson and designated Outlying Properties within the city of Tucson.
- Parking Garages are excluded from total GSF
- Laboratory, Healthcare, and Other Energy Intenstive GSF is broken out for EUI-AFA adjustments

Emission Summary

Longitudinal Emissions by Scope

Total emissions increased by 5% in FY23 from prior year



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.

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

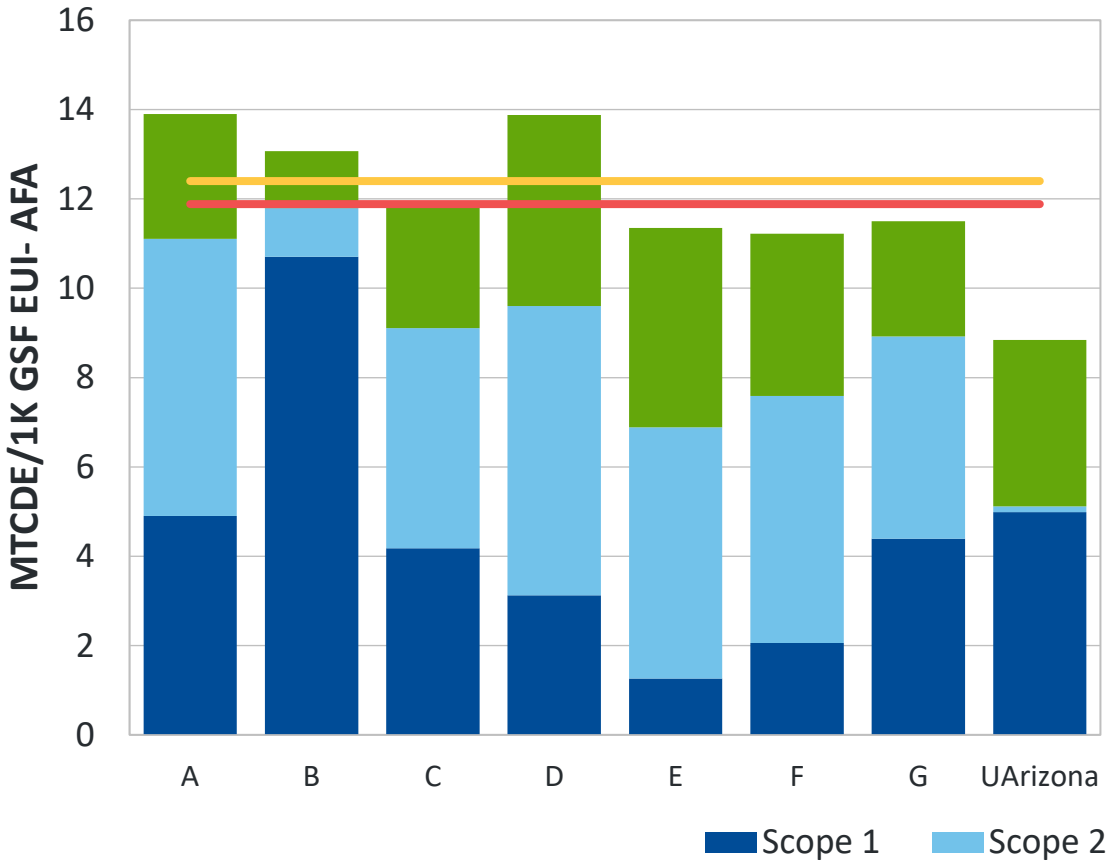
A = student residents onsite
B = employee residents onsite
C = other residents onsite/staffed hospital beds

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

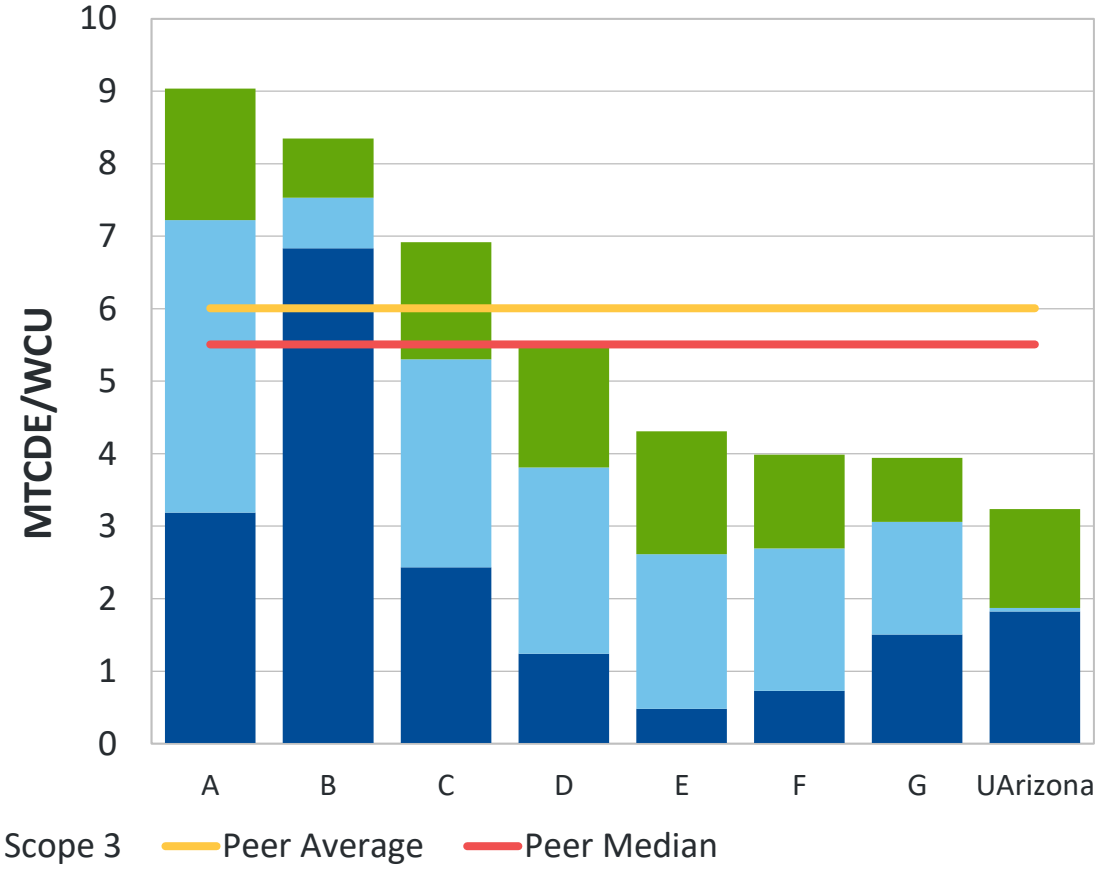
FY23 Gross Emissions per Space and Campus User

Main campus Scope 2 neutrality leads to emissions significantly below peers

Gross Emissions
MTCDE/1K EUI – Adjusted Floor Area



Gross Emissions
MTCDE/Weighted Campus User



Scope 1 Scope 2 Scope 3 Peer Average Peer Median

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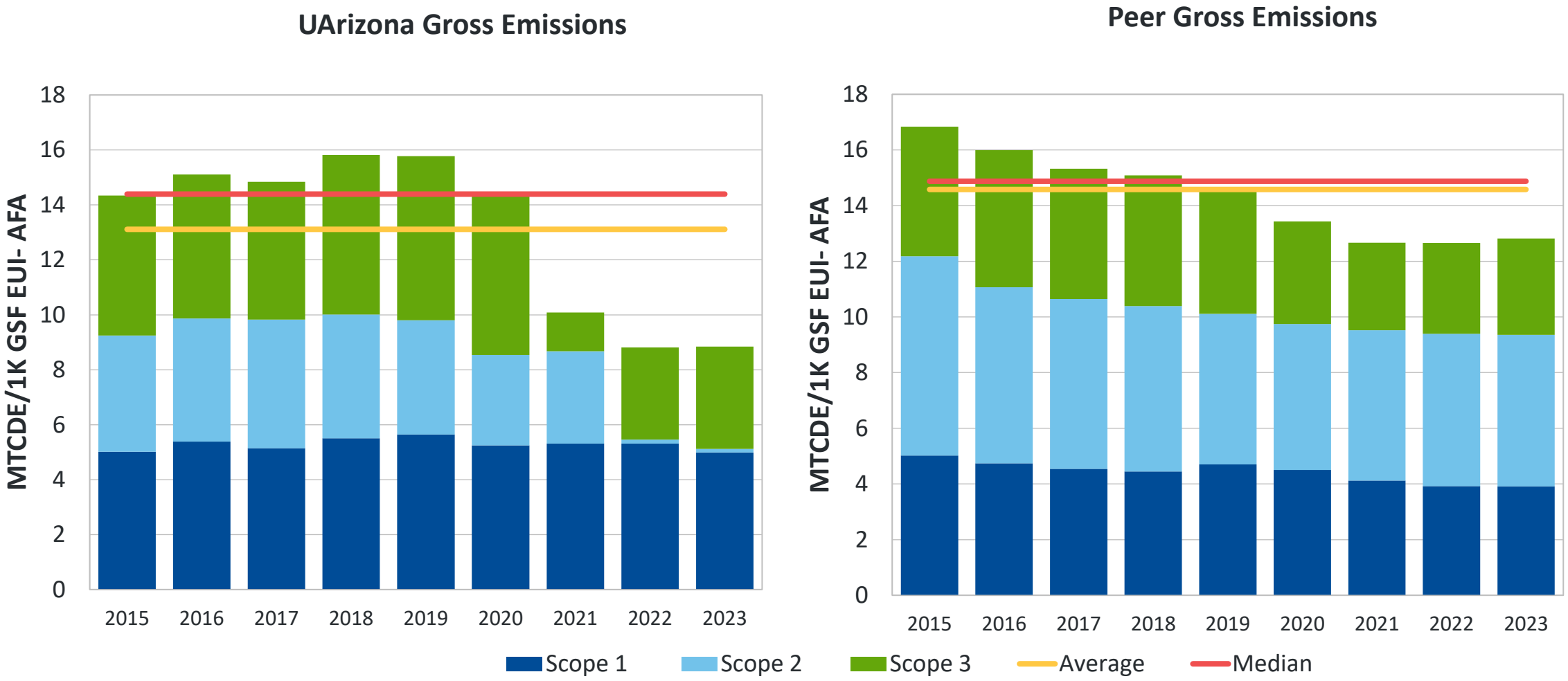
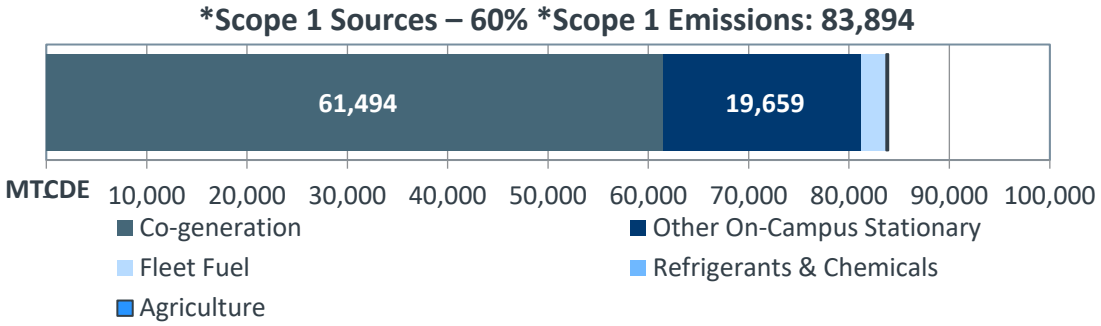
Trending Gross Emissions Normalized by Space

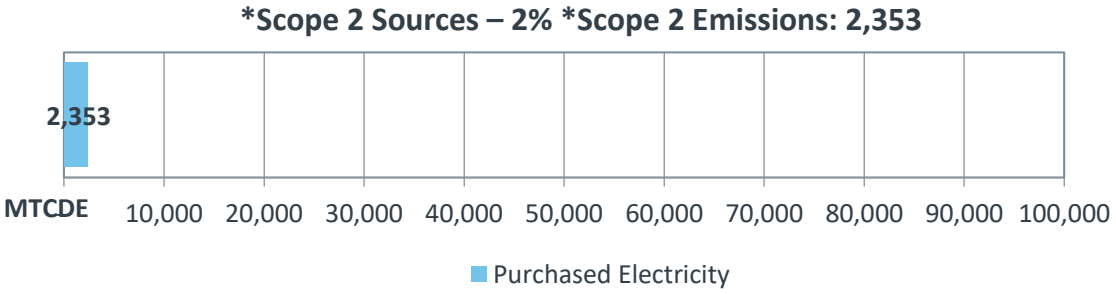
Scope 3 increases lead to a minor bump into total normalized emissions, similar to peers

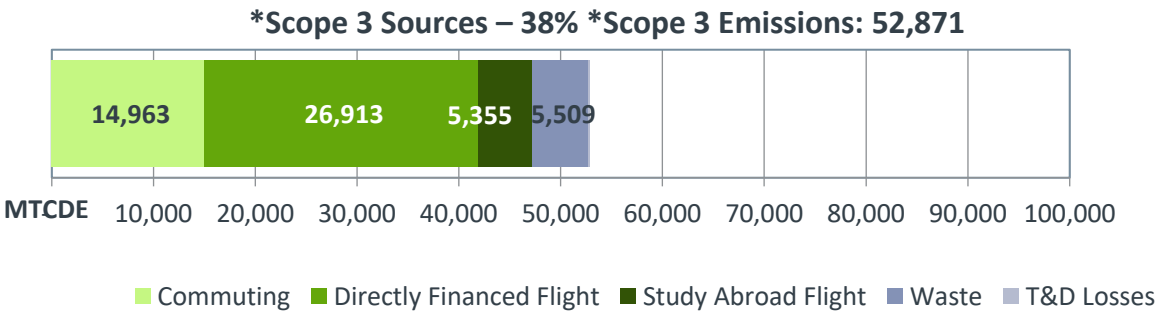


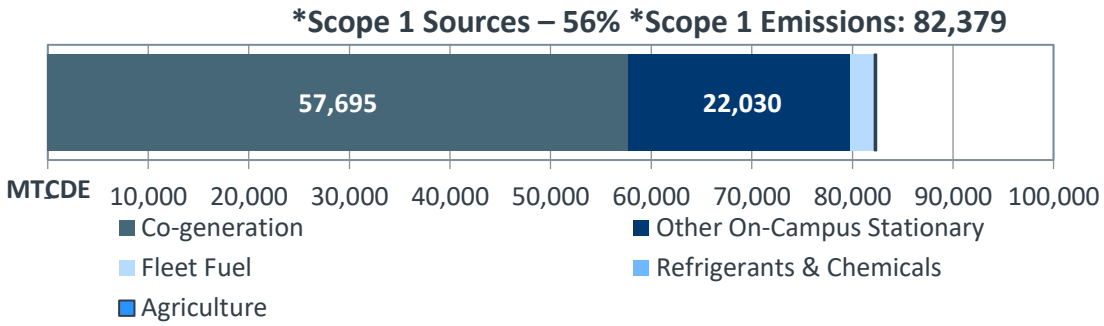
FY22 vs FY23 Distribution of Emissions by Level of Control

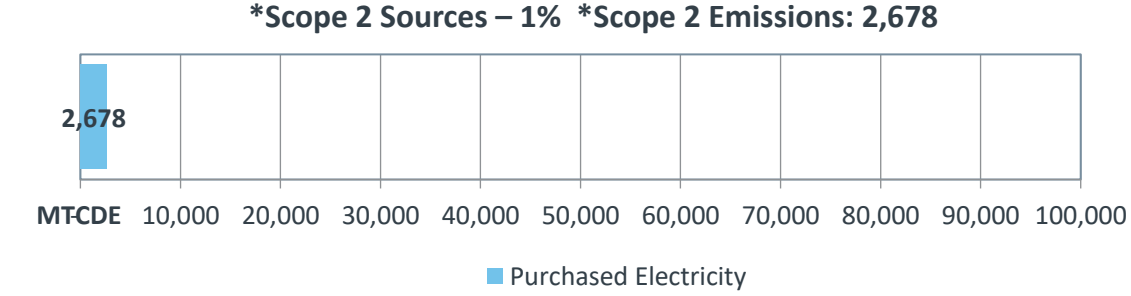
Total FY22 emissions: 139,118 MTCDE Total FY23 emissions: 146,046 MTCDE

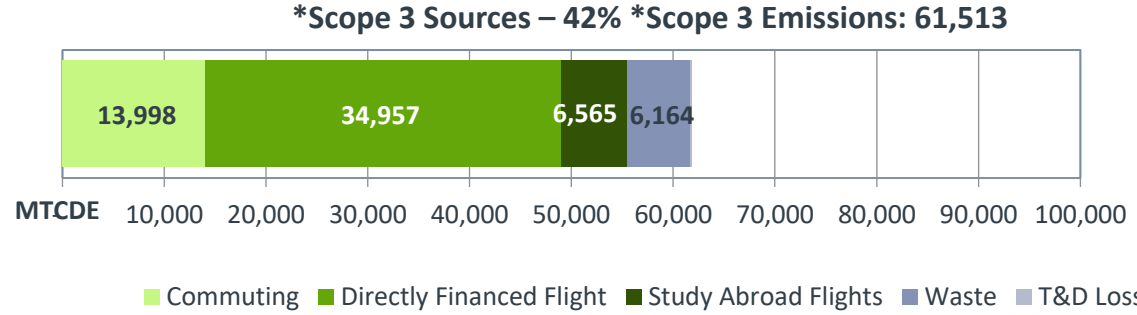






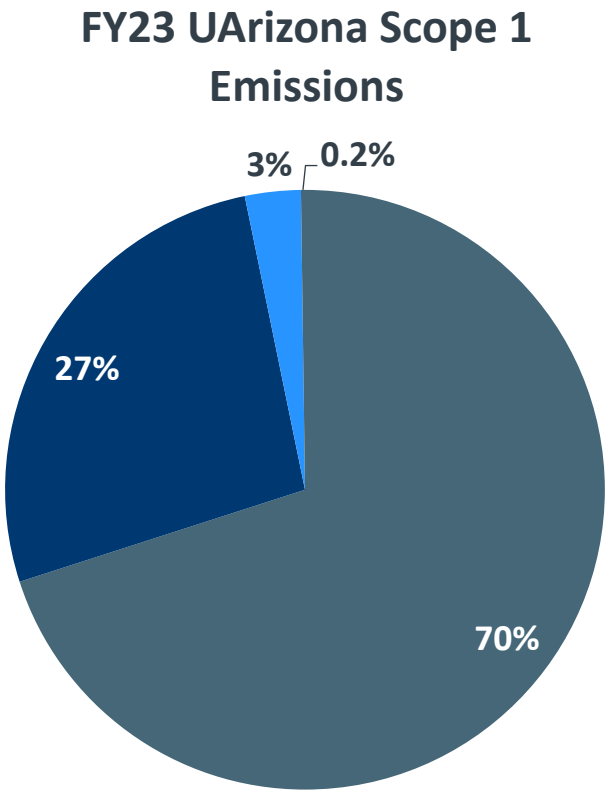


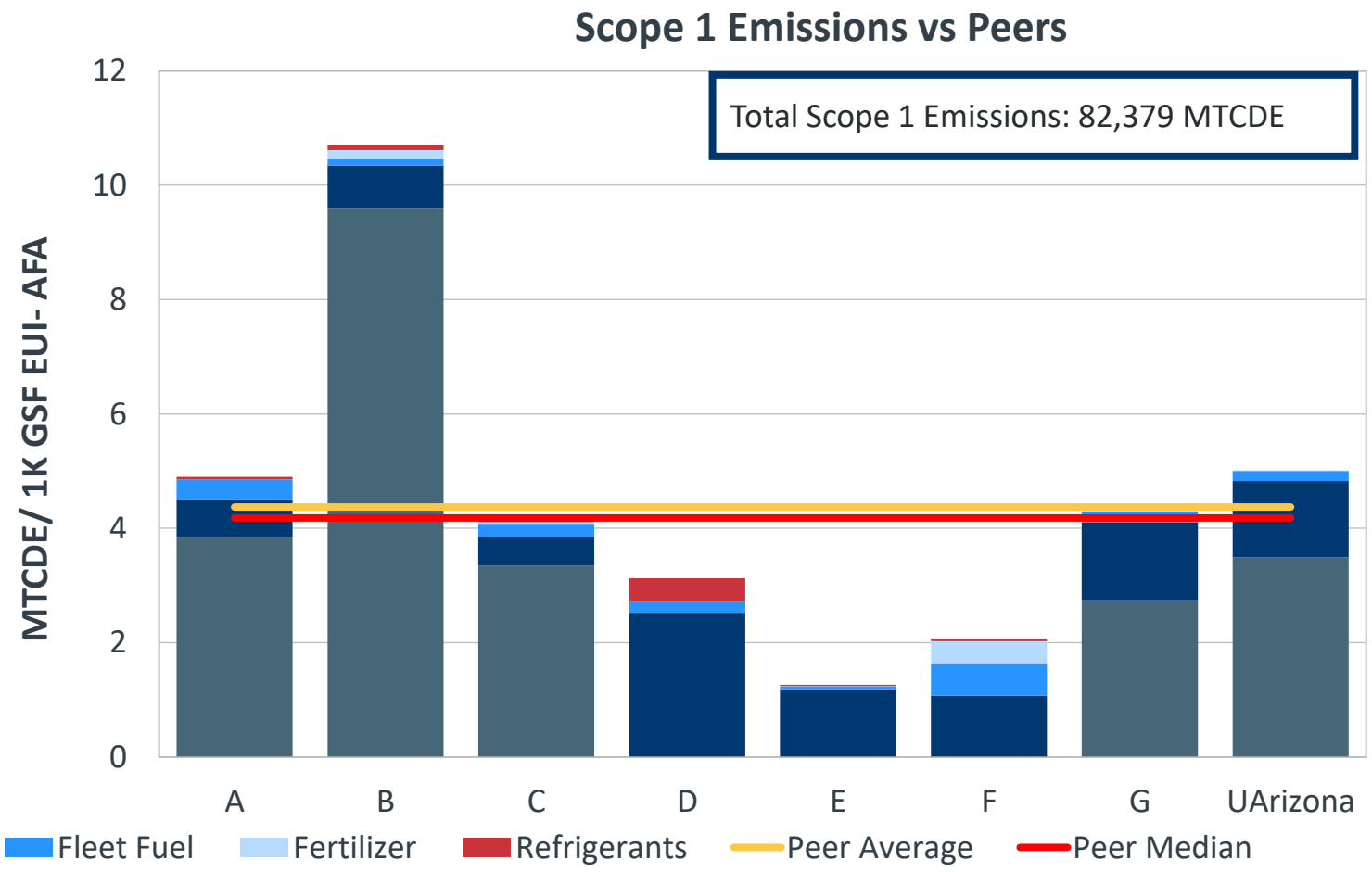




Scope 1: Direct Emissions

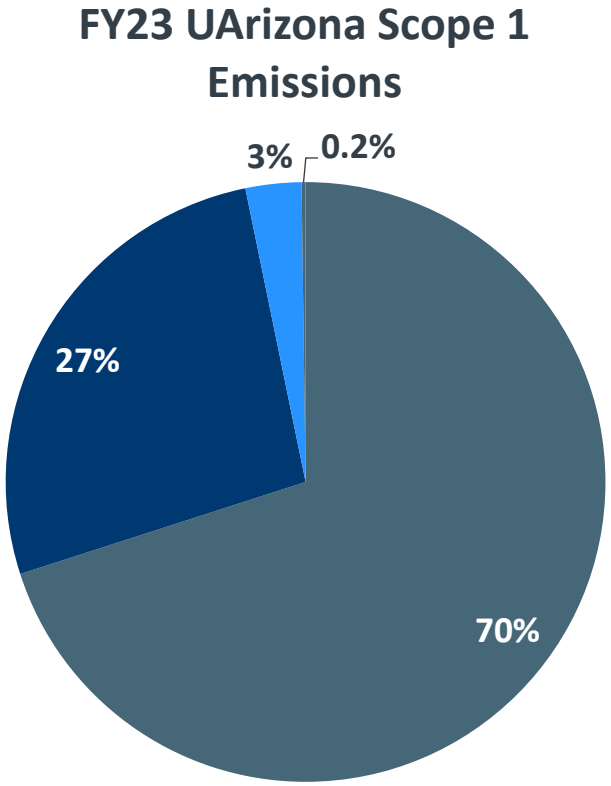
UArizona's scope 1 emissions are higher than the peer average and peer median

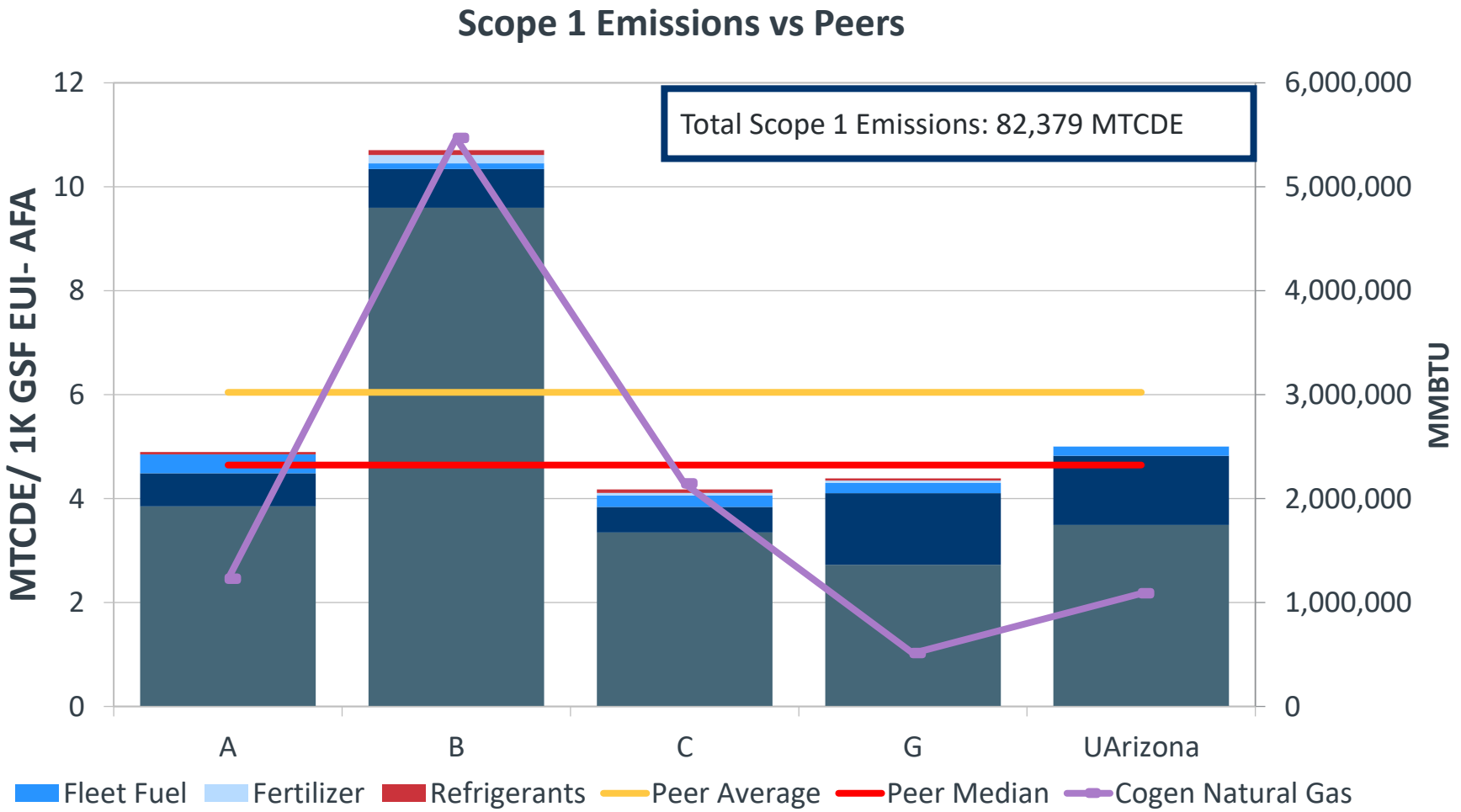




Scope 1: Direct Emissions- Cogen Comparison

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

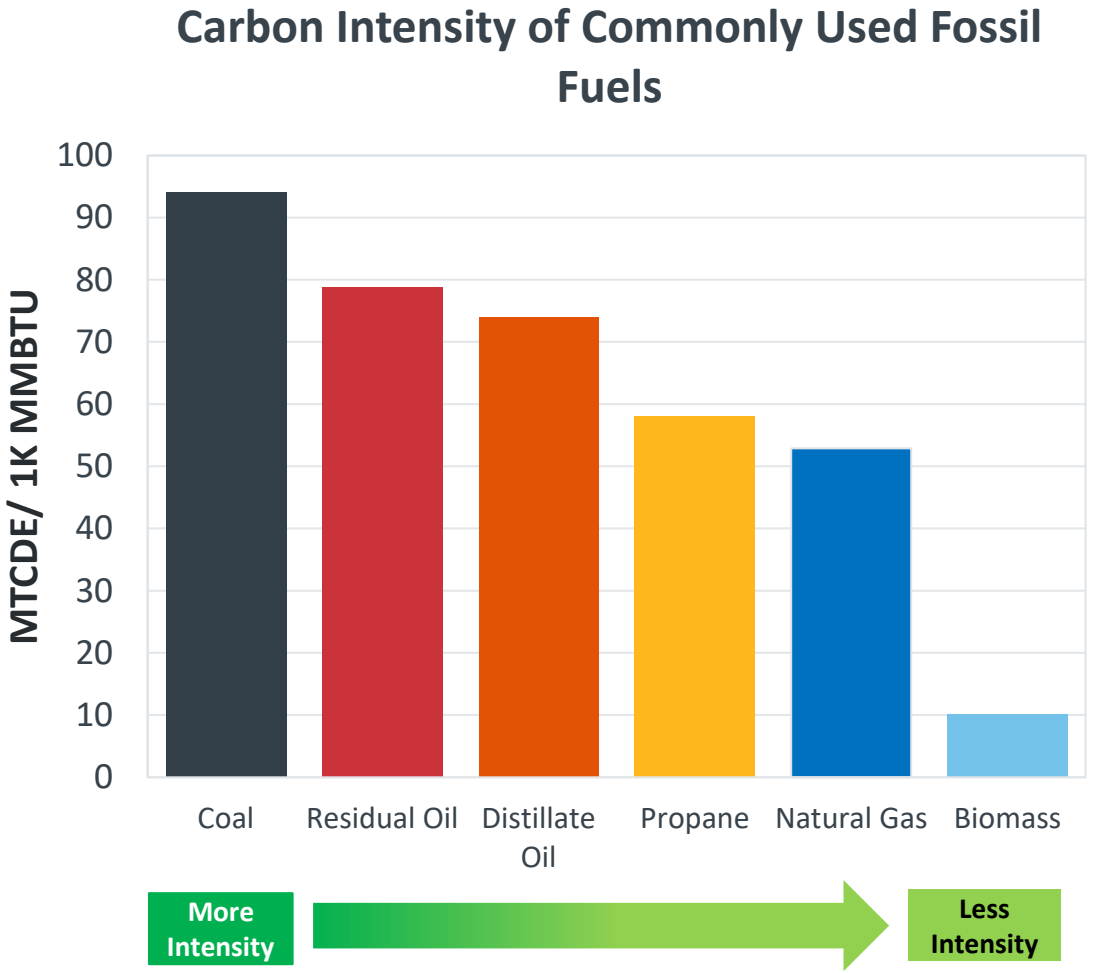


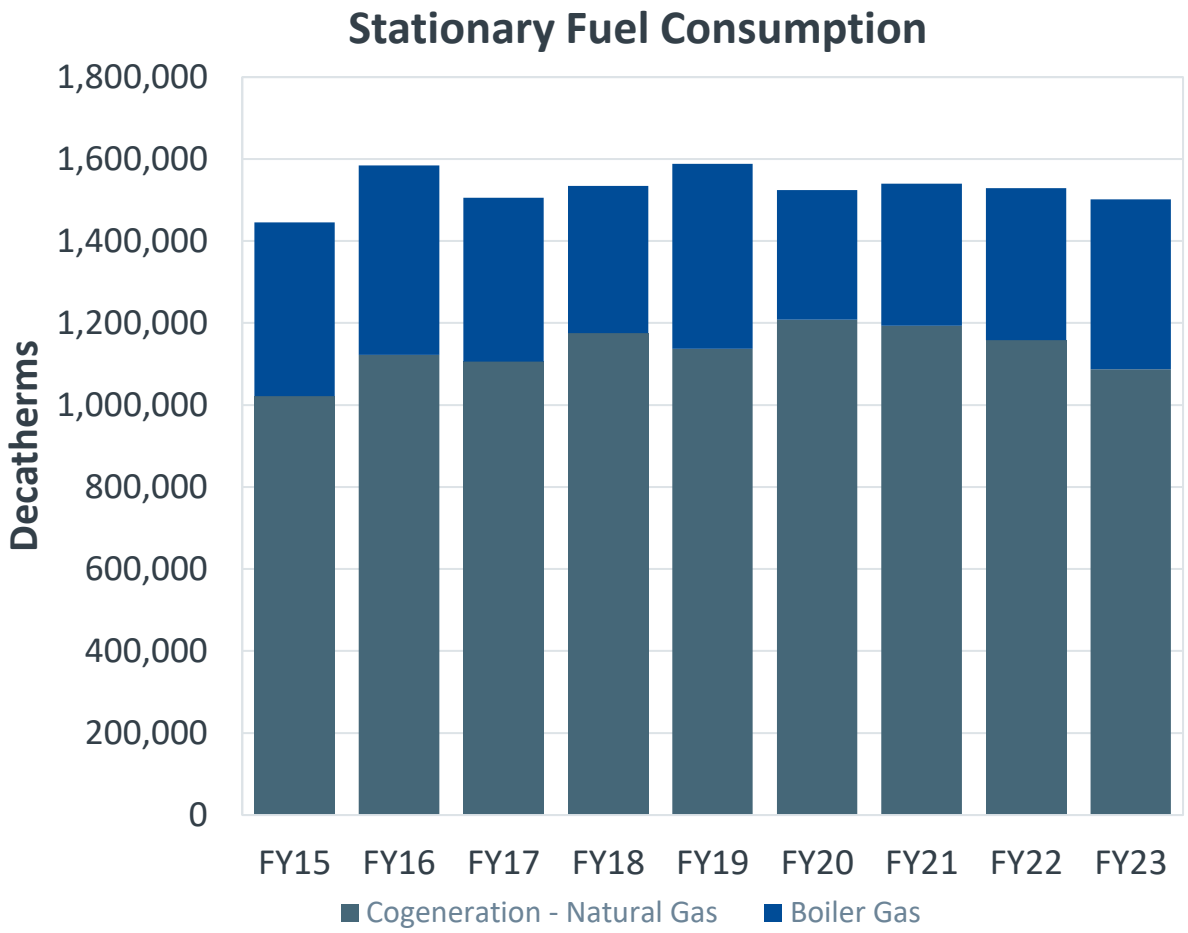


Slide does not account for rate of plant generation

Scope 1: Stationary Fuel Consumption

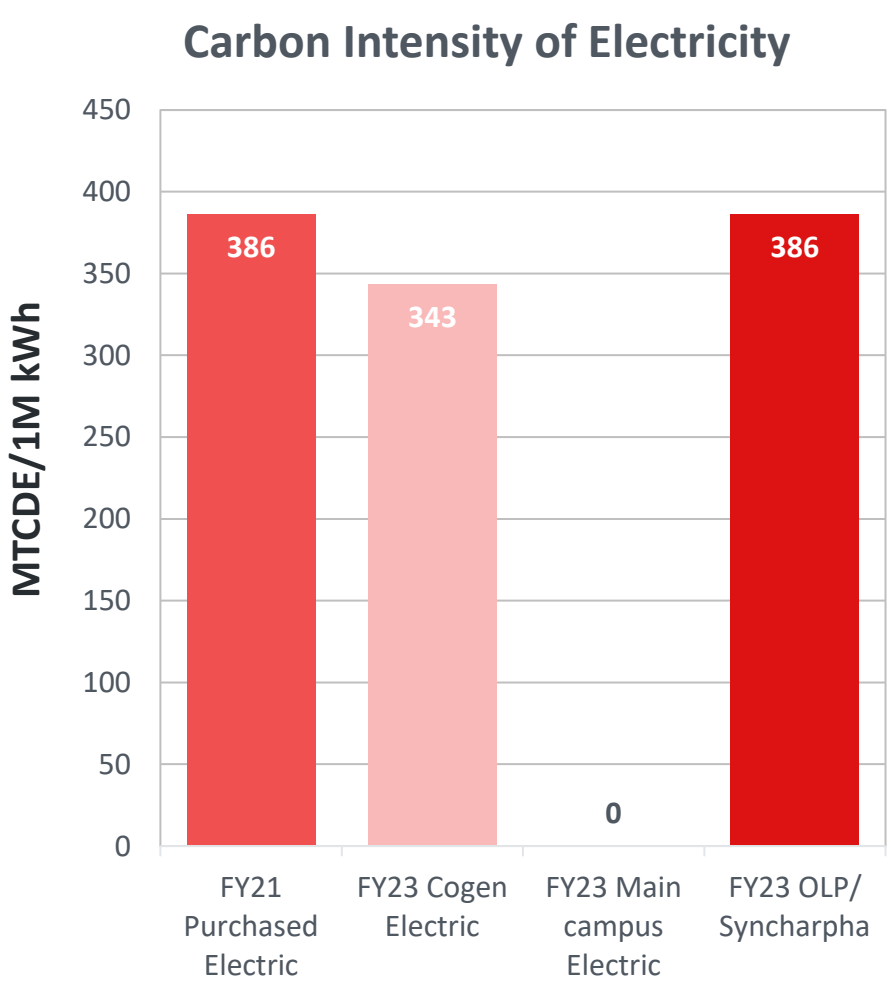
Natural gas consumption has decreased by 5% since FY19 peak

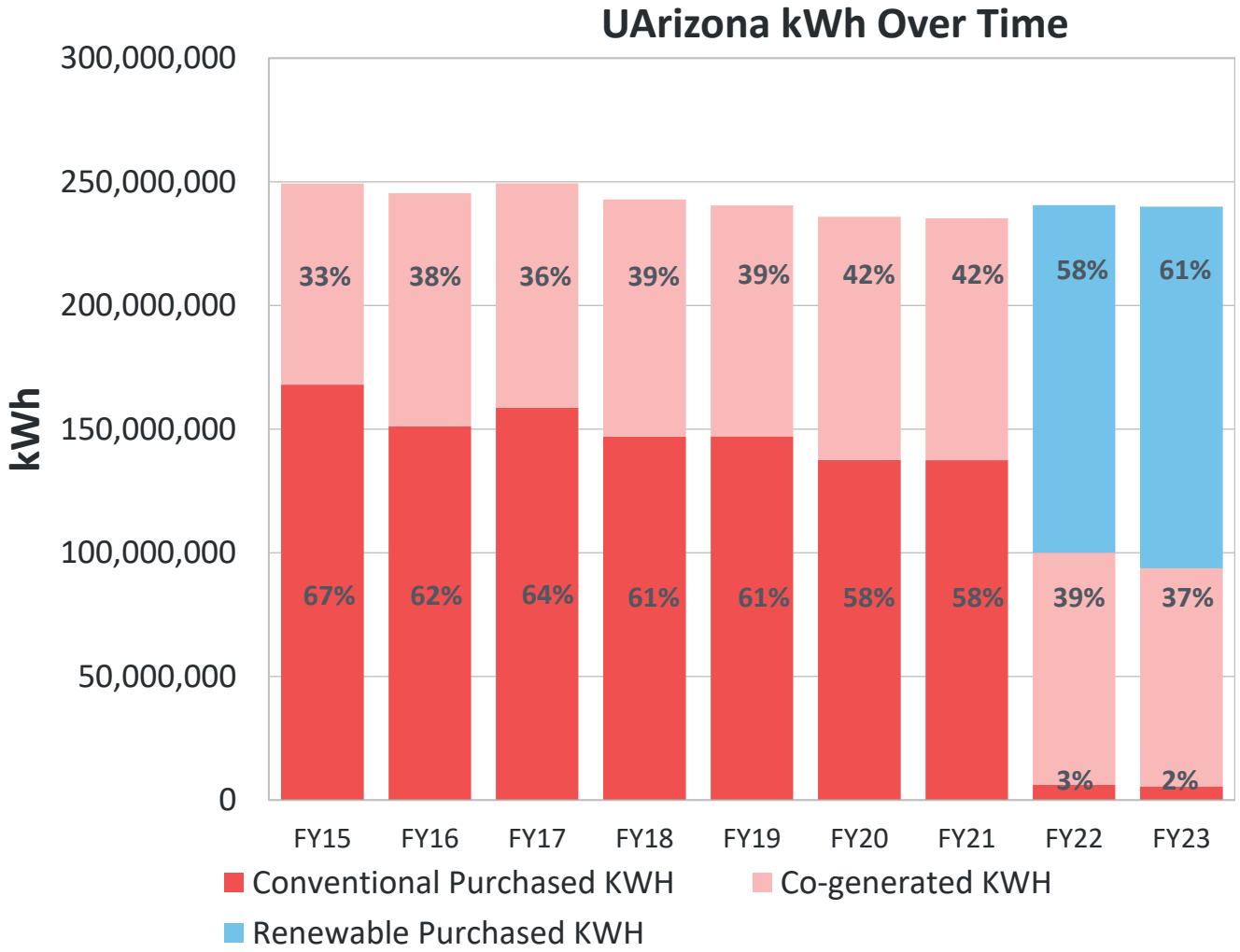




Scope 1&2: Campus Electric Consumption

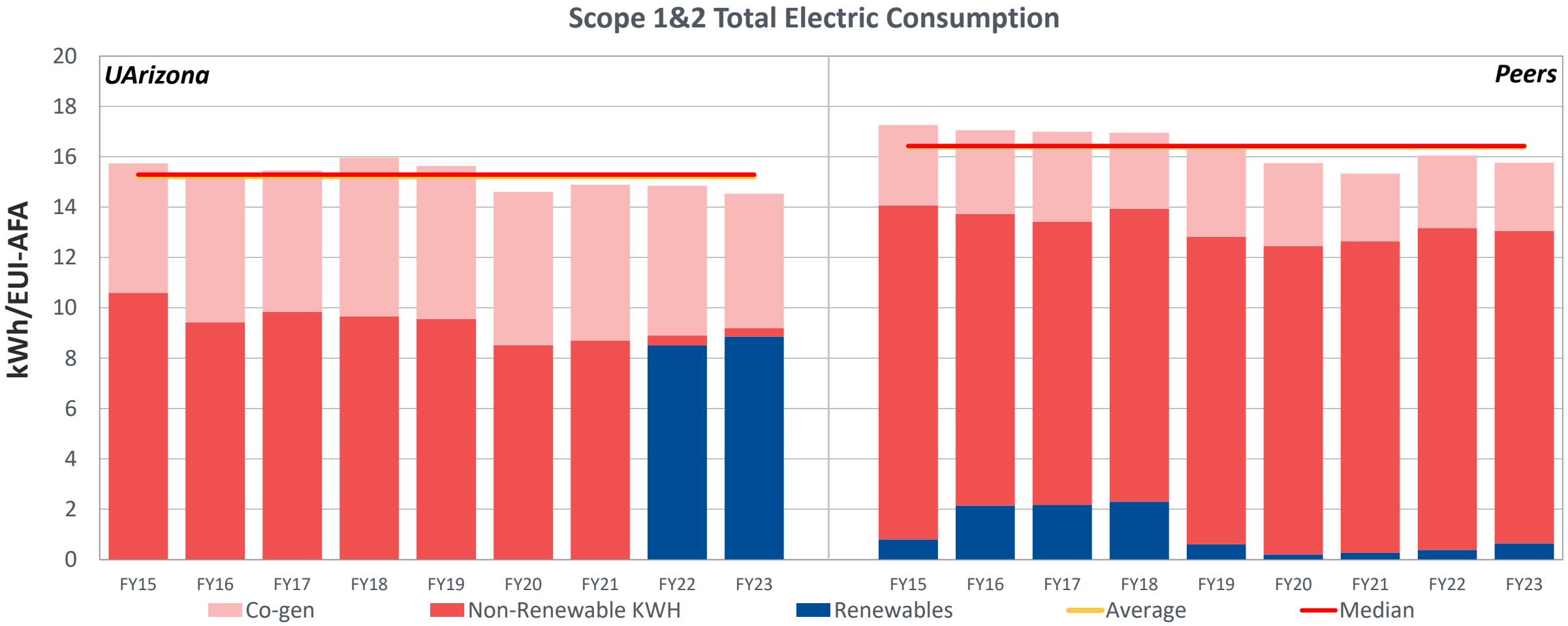
Outlying Property (OLP) and Syncharpha electricity is only source of scope 2 emissions





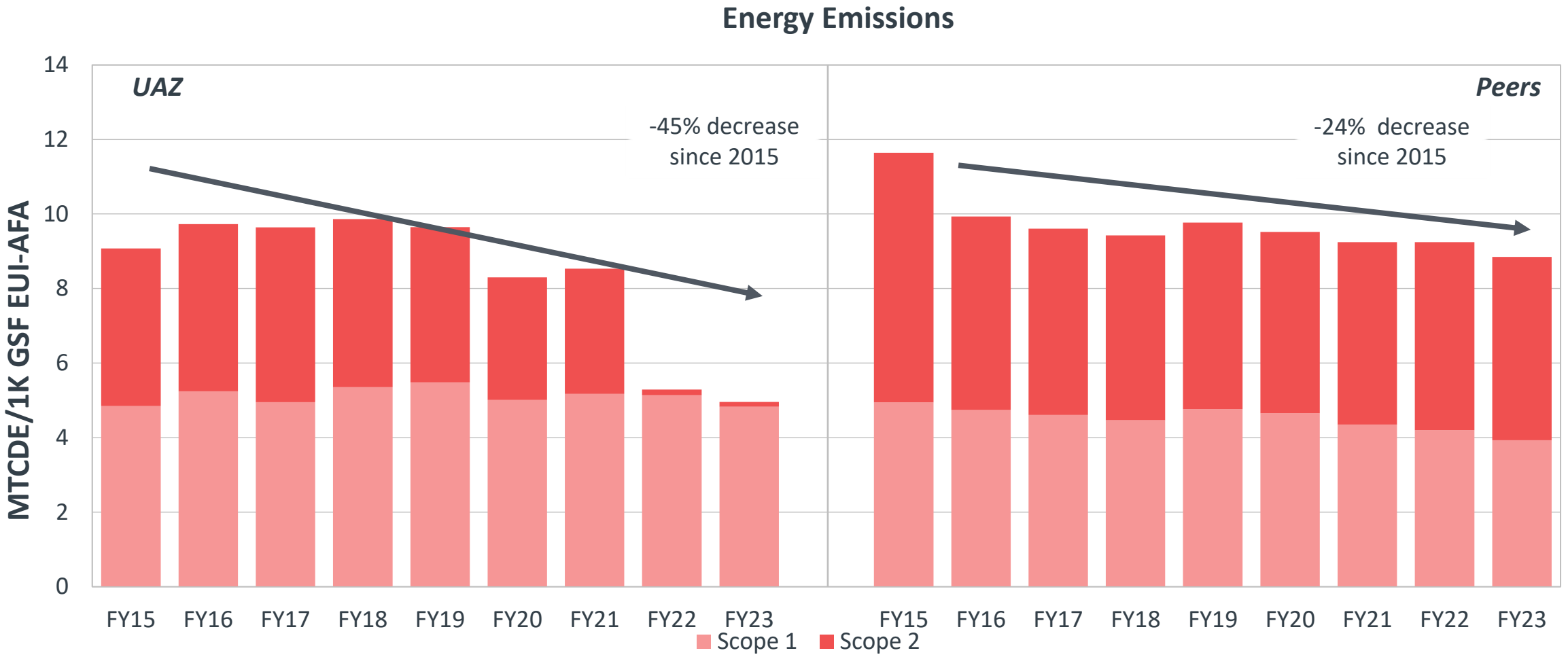
Scope1&2: Total Electric Consumption vs. Peers

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



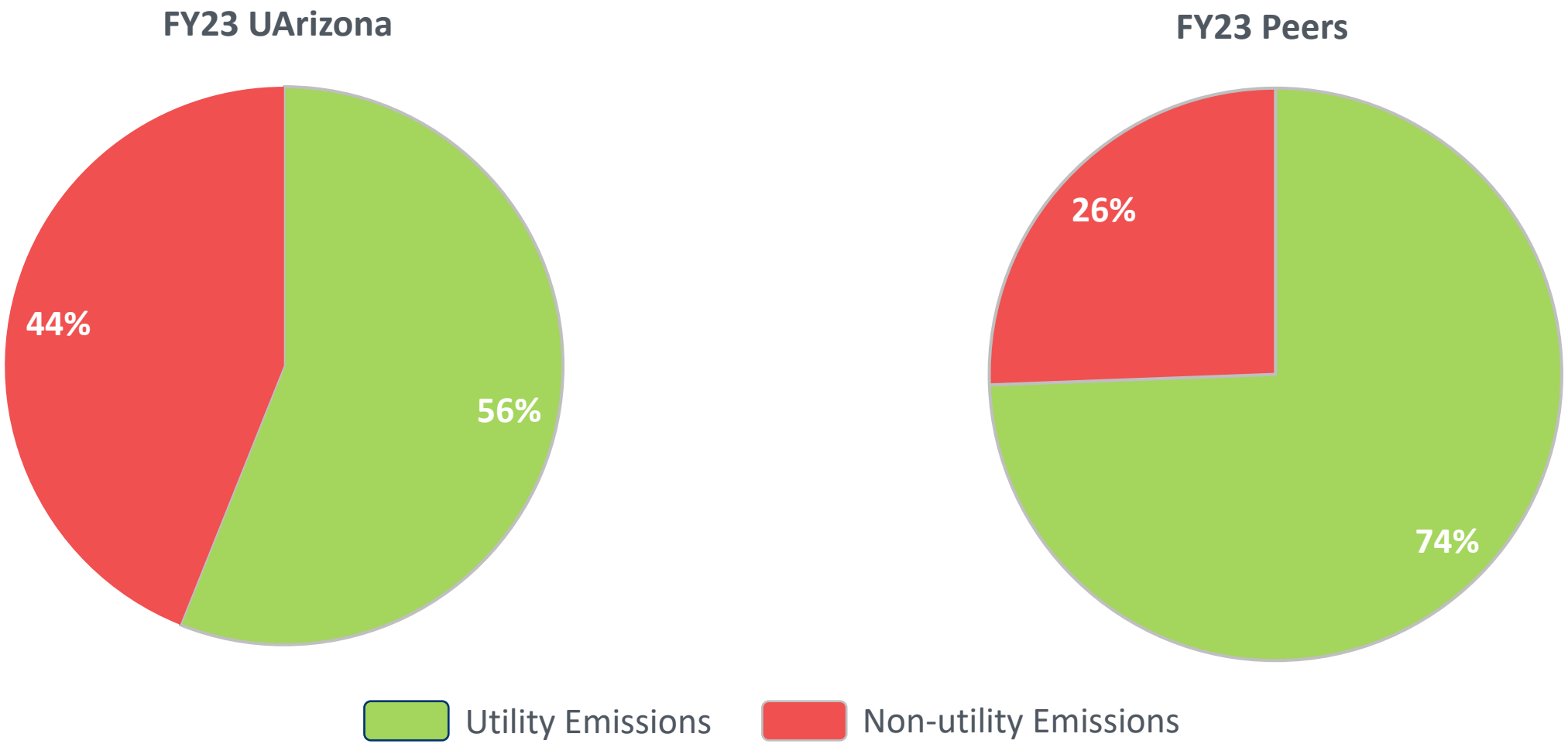
Energy Emissions vs. Peers

Total energy emissions: 84,533 MTCDE (Scope 2: 2,153 MTCDE, Scope 1: 82,379 MTCDE)



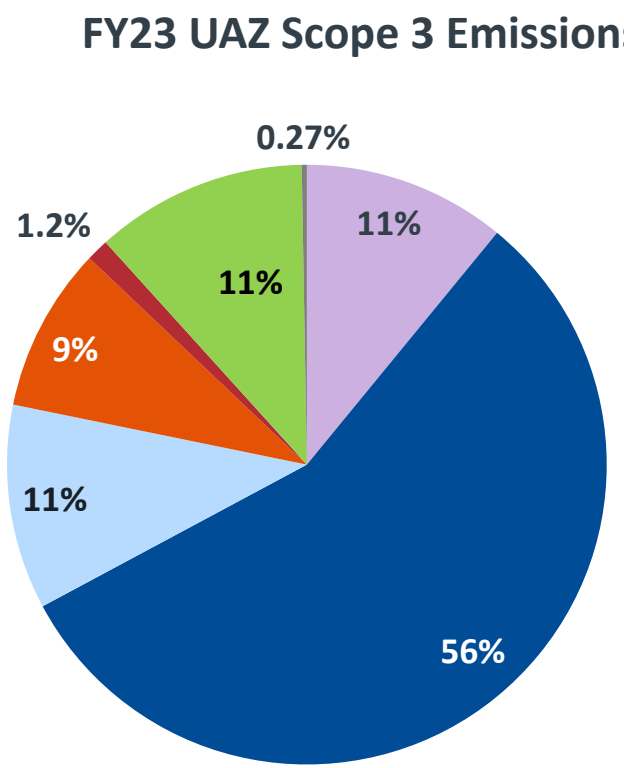
Current Emission Profile – Utility vs. Other

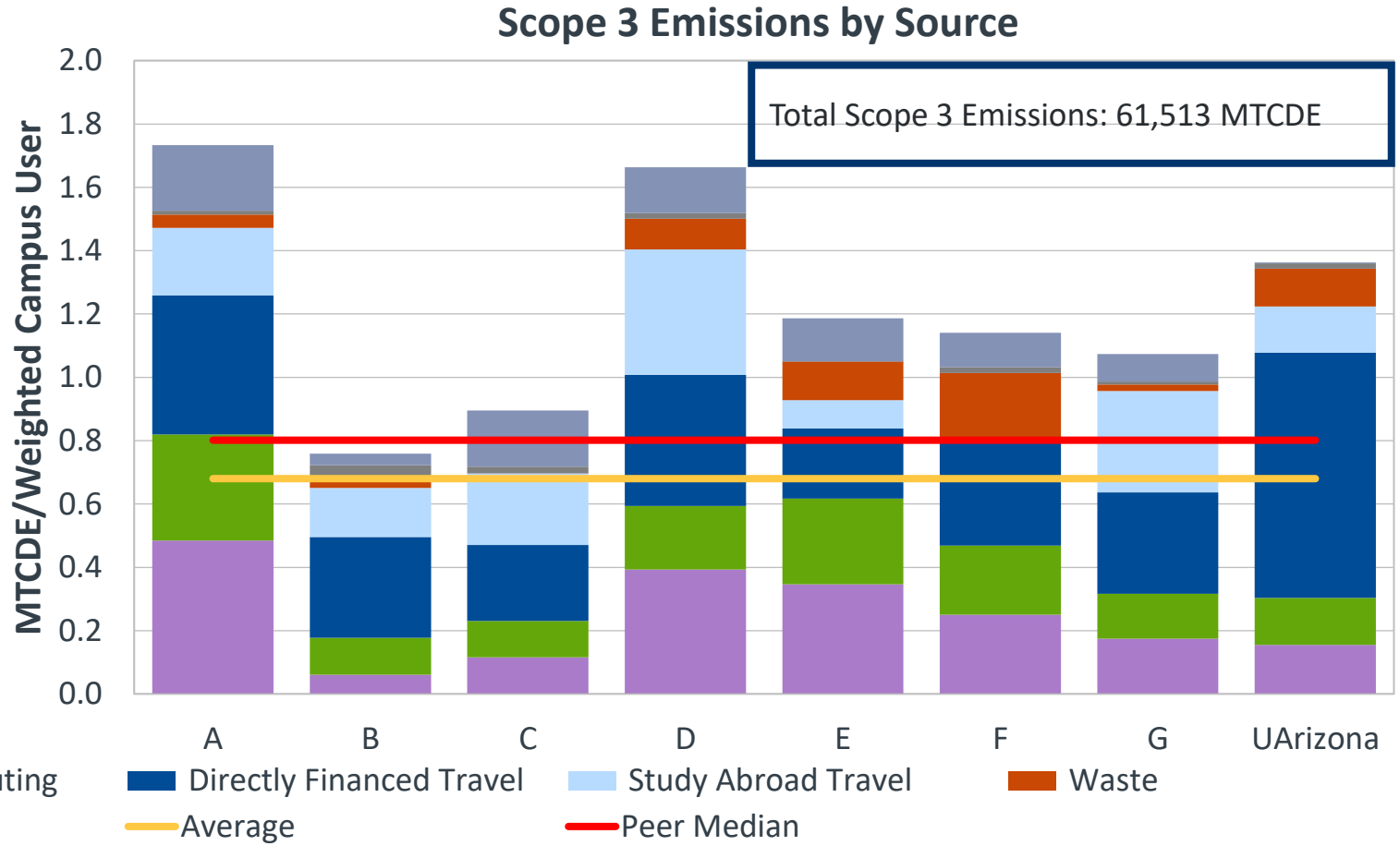
UArizona's profile is comprised of less utility-related emissions than peers on average



Scope 3: Indirect Emissions Overview

Uarizona's Scope 3 emissions are higher than peers due to greater directly financed travel emissions





Peers arrayed by density

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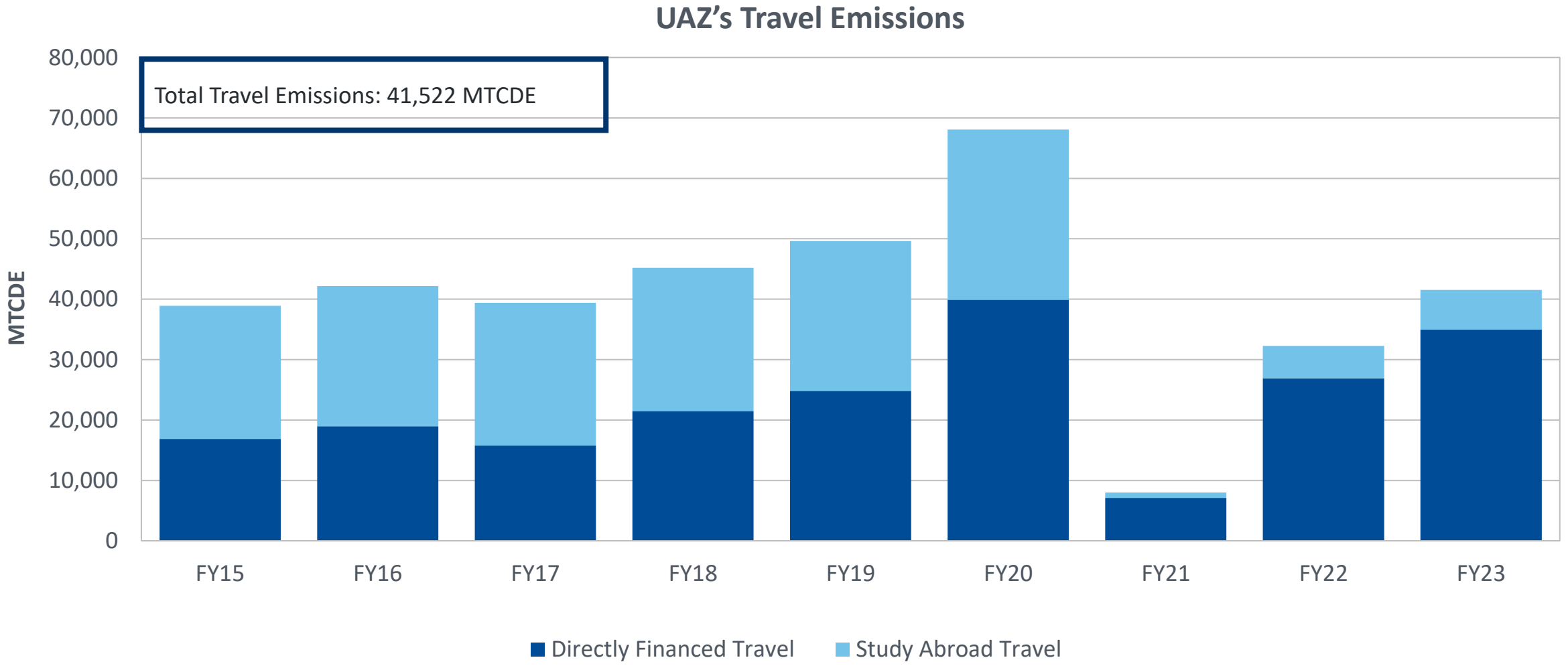
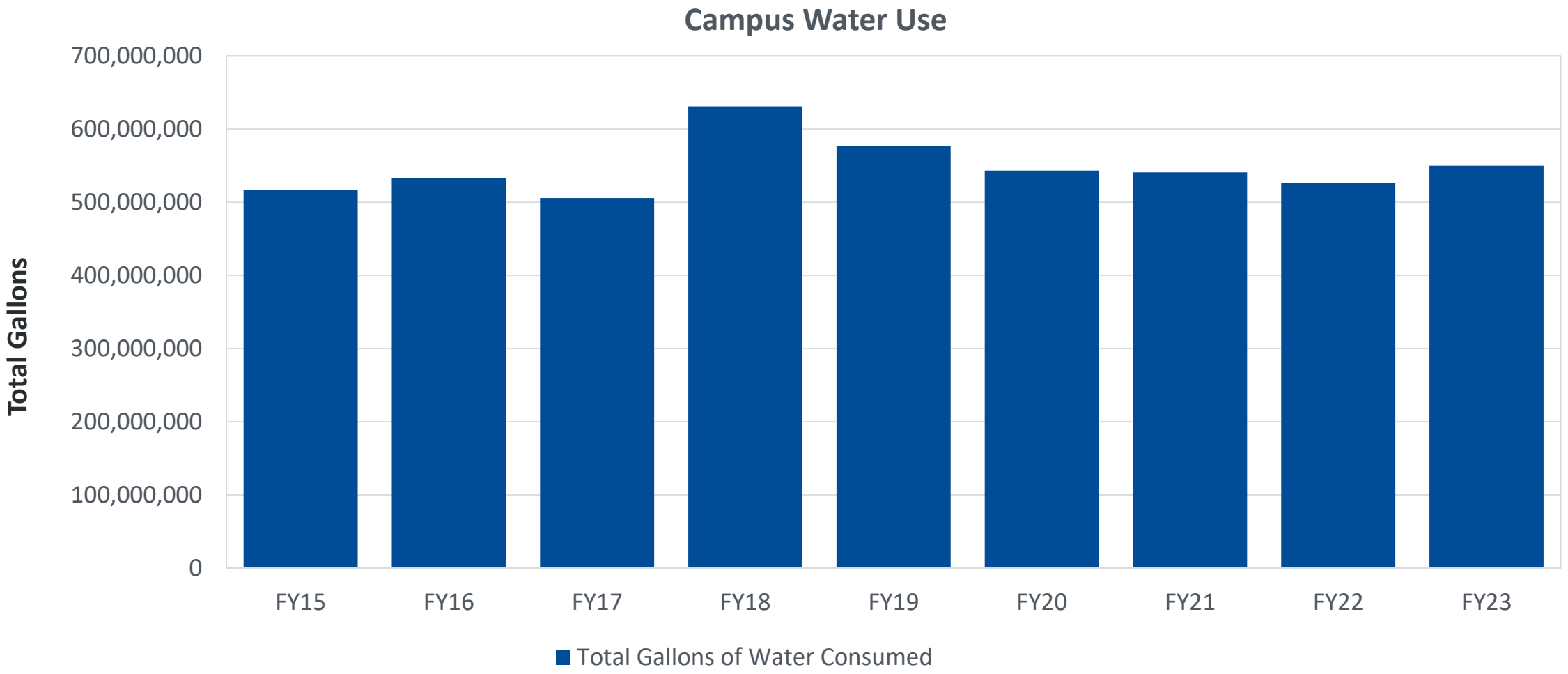
Travel Profile (Air Miles Flown)

Directly financed travel emissions increased by 28% in FY23



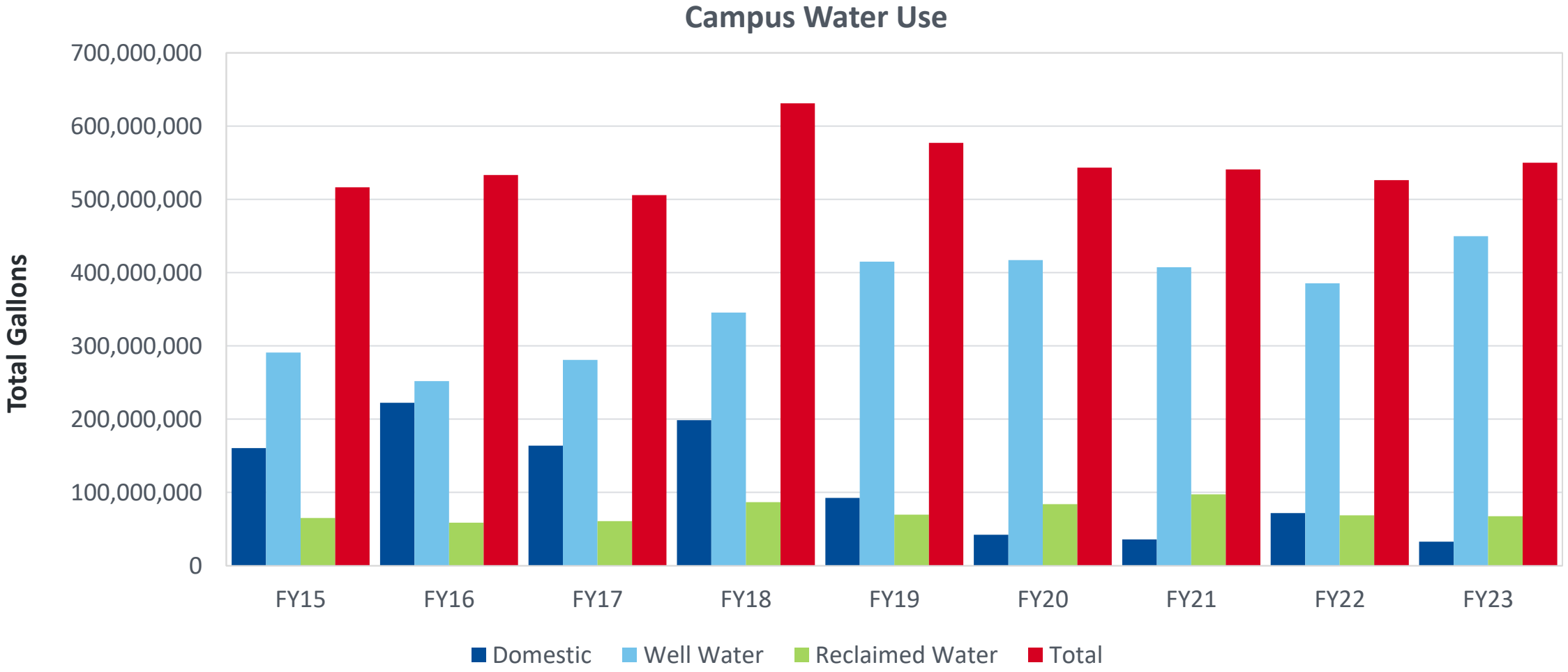
UArizona Water Use

Total water usage increased by 5% in FY23



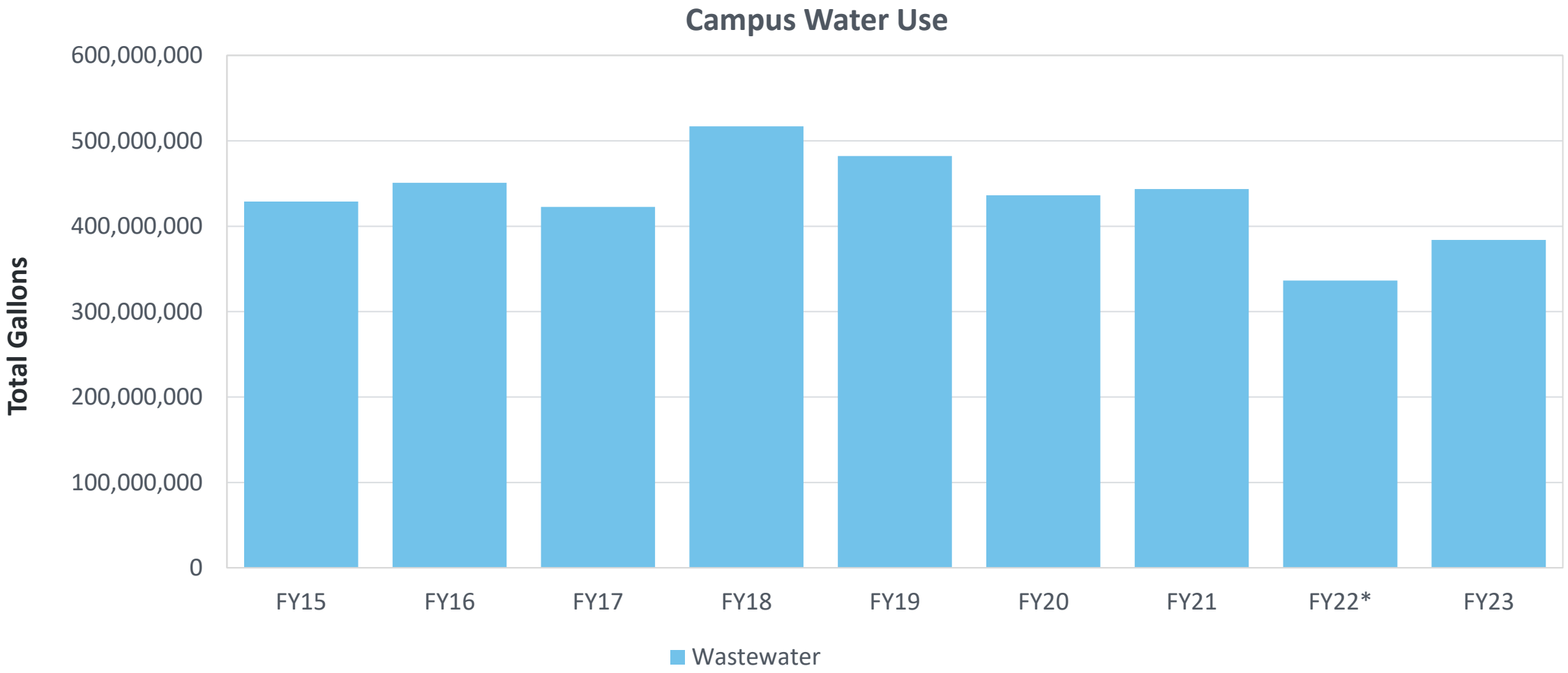
UArizona Water Use by Source

Well water usage increased by 16% in FY23, primary source of increased water consumption



UArizona Wastewater Over Time

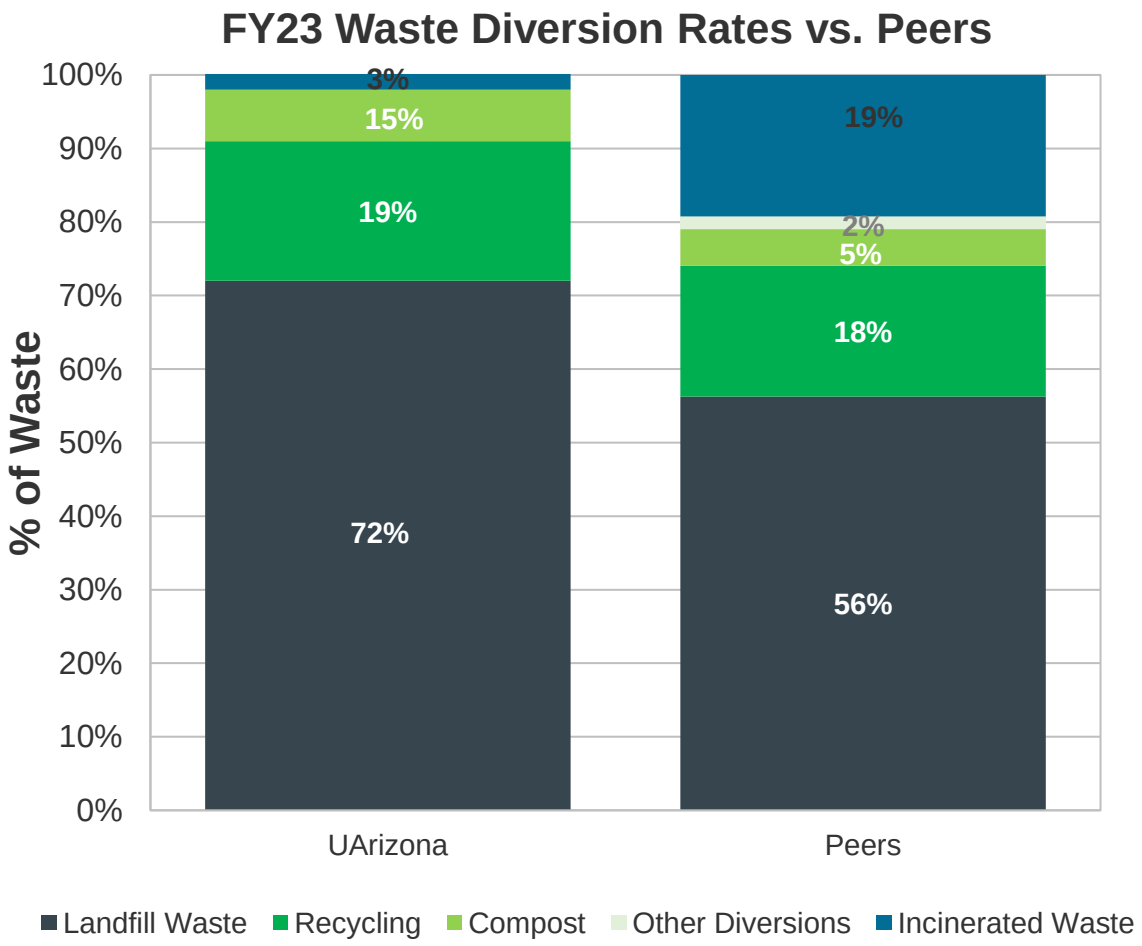
FY23 wastewater consumption increased due to greater water usage on campus

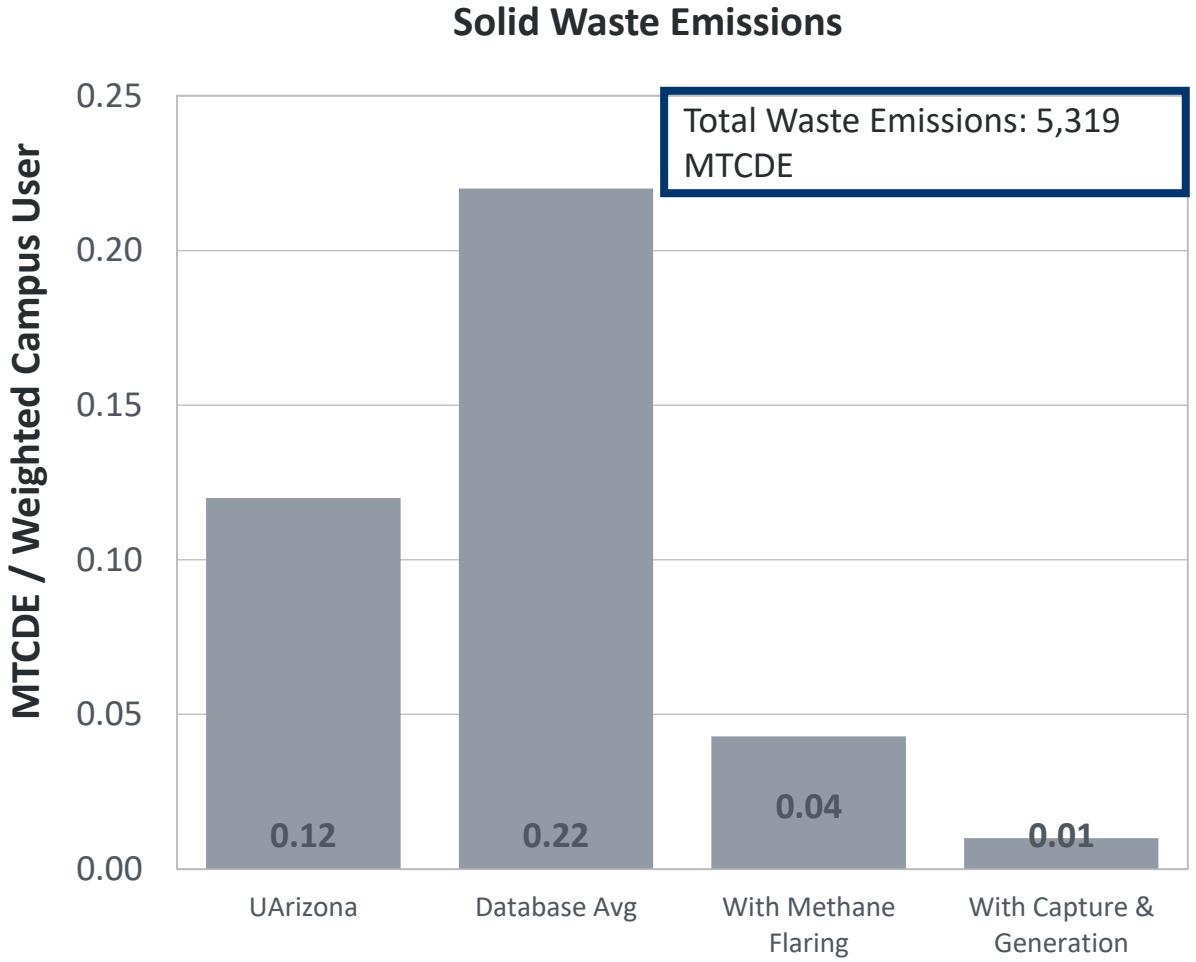


*Decrease in wastewater due to change in methodology

Scope 3: A Closer Look at Waste

UArizona recycles and composts at higher rate than peers





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%	-

Faculty Commuters

Category	Percentage	Distance
Automobile/SOV	51%	6.49
Bicycle	4%	1.06
Walk	3%	0.70
Carpool	12%	5.45
Light/Commuter Rail	2%	1.32
Public Bus	2%	1.38
Electric Vehicle	4%	7.37
Telecommuting	25%	-

Staff Commuters

Category	Percentage	Distance
Automobile/SOV	51%	6.49
Bicycle	4%	1.06
Walk	3%	0.70
Carpool	12%	5.45
Light/Commuter Rail	2%	1.32
Public Bus	2%	1.38
Electric Vehicle	4%	7.37
Telecommuting	25%	-

Scope 3: Total Commuting Emissions

Improved data collection methodology reduces student commuting emissions