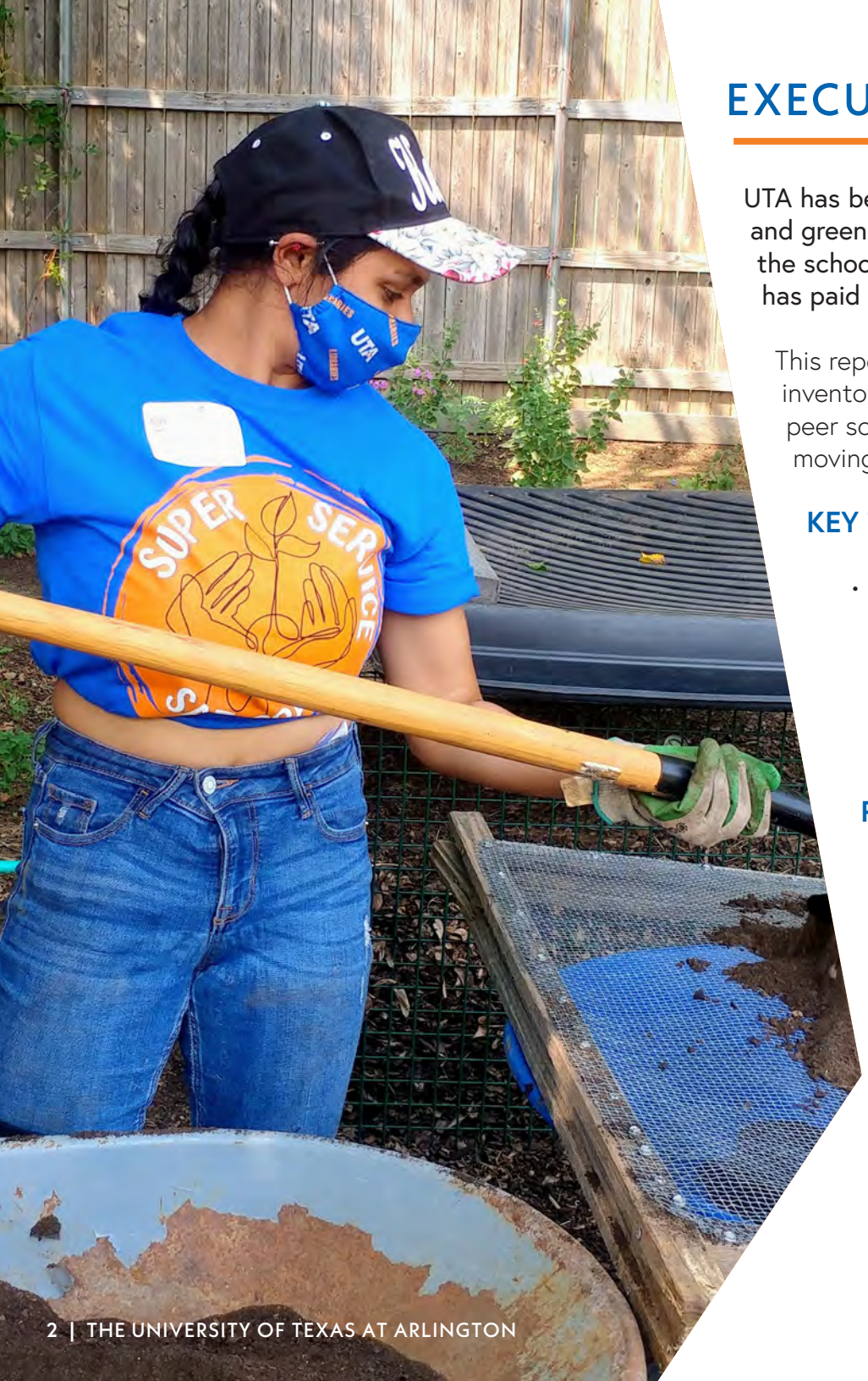
FISCAL YEAR 2022 GREENHOUSE GAS EMISSIONS INVENTORY REPORT

UTA Office of Sustainability



EXECUTIVE SUMMARY

UTA has been making great strides forward across many sustainability metrics, and greenhouse gas emission reduction is no exception. This report shows that the school's dedication to reducing emissions despite their campus expansion has paid off.

This report contains the results of UTA's 2022 greenhouse gas emission inventory, an analysis that compares these results to past years and to UTA's peer schools, and recommendations for how to use this information effectively moving forward.

KEY TAKEAWAYS

- UTA's overall emissions are decreasing, driven by a decrease in emissions from electricity
- UTA has the lowest total emissions of its peers and continues to lead when those numbers are normalized to account for differences between campuses

RECOMMENDATIONS

- Commission a decarbonization study to create a comprehensive and financially viable strategy for reaching carbon neutrality
- Improve data tracking practices, specifically in fugitive and Scope 3 emissions
- Explore the potential of on-site solar energy by conducting a solar feasbility study

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LAND ACKNOWLEDGEMENT

University of Texas at Arlington respectfully acknowledges the Wichita and Affiliated Tribes upon whose historical homelands this University is located. Their ancestors resided here for generations before being forcibly displaced by U.S. settlers and soldiers in the mid-1800s. We recognize the historical presence of the Caddo Nation and other Tribal Nations in the region; the ongoing presence and achievements of many people who moved to the area due to the Indian Relocation program of the 1950s and 1960s; and the vital presence and accomplishments of our Native students, faculty, and staff.

INTRODUCTION

Climate change has emerged as one of the most urgent challenges of the twenty-first century. With extreme weather events, rising ocean levels, drought, flooding, disease, poor air quality, diminished natural habitats, and adverse effects on human physical and mental health, the impacts of climate change are impossible to ignore.

The driving force behind climate change is the immense quantity of greenhouse gasses emitted by burning fossil fuels, creating methane gas through landfills, and releasing other chemicals into the atmosphere via anthropogenic activities. These gasses trap heat from the sun in the earth's system, warming our world at an unprecedented pace. As we work to combat the irreversible change we've caused and to reduce further damage to the climate system, institutions of higher education have emerged as important leaders in driving sustainable solutions.

Institutions such as the University of Texas at Arlington (UTA) are uniquely positioned to make deep emission reductions in their own operations while educating and supporting the climate leaders of the future. Attending a university that is leading in mitigation work is an invaluable experience for students, one that has far-reaching implications.

The first step in mitigating climate change is tracking emissions that are contributing to the climate crisis. In 2022, UTA underwent a greenhouse gas emission inventory, highlighted in this report, which also includes proposed recommendations for taking swift and impactful action to decrease greenhouse gas emissions.

DEFINITIONS

AASHE STARS	the Association for the Advancement of Sustainability in Higher Education (AASHE) runs the Sustainability, Tracking, Assessment and Rating System (STARS), which is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance
climate change	a change in global or regional climate patterns, in particular a change apparent from the mid- to late 20th-century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels
fugitive emissions	result from the direct release of greenhouse gas compounds into the atmosphere of from various types of equipment and processes, such as refrigeration and air conditioning systems, fire suppression systems, and the purchase and release of industrial gases
greenhouse gasses	any gas that has the property of absorbing infrared radiation (net heat energy) emitted from the earth's surface and reradiating it back to the earth surface, thus contributing to the greenhouse effect
Scope 1 emissions	direct greenhouse gas emissions occurring from sources that are owned or controlled by the institution, including combustion of fuels to produce electricity, steam, heat, or power using equipment in a fixed location such as boilers, burners, heaters, furnaces, incinerators and combustion fuels by institution-owned cars, tractors, buses, and other transportation devices
Scope 2 emissions	indirect greenhouse gas emissions that are a consequence of activities that take place within the organizational boundaries of the institution, but that occur at sources owned or controlled by another entity; includes purchased electricity, purchased heating, purchased cooling, and purchased steam
Scope 3 emissions	all indirect emissions not covered in Scope 2; examples include purchased goods and services, capital goods, waste generated in operations, business travel, commuting (employee and student), end-of-life treatment of sold products, downstream leased assets, franchises, and investments

METHODOLOGY

The primary tool used for this work was the University of New Hampshire's Sustainability Indicator Management & Analysis Platform (SIMAP), a greenhouse-gas tracking tool that is widely used within the higher education community. This platform performs calculations on raw data that result in emission information for carbon dioxide, methane, and nitrous oxide. This data is then aggregated into the common unit of metric tons of carbon dioxide equivalent, or $MTCO_2e$.

The fiscal year 2020–2022 data presented in this report was collected by UTA's Sustainability Coordinator Bhargavi Jeyarajah. Dravid Sabarish gathered data for fiscal year 2017–2019. After the collection process was completed, GreenerU, a consulting firm based in Massachusetts, conducted the analysis.

GreenerU used a few assumptions in the data analysis process due to the unavailability of certain information:

1. Refrigerant emissions were calculated using the screening method, available for reference on page 12 of the Greenhouse Gas Inventory Guidance for fugitive emissions. A factor of 10% was used as an assumed percentage of refrigerant lost each year from the total capacity of equipment. This resulted in a significant increase in fugitive emissions as compared to past years, as fiscal years 2017–2019 used a different calculation method. Starting in fiscal year 2023, facilities will begin tracking refrigerants more closely, yielding more accurate calculations in the future, likely resulting in lower estimated emissions.

2. Diesel and distillate oil #2 are the same substance, since SIMAP only has the option to calculate emissions for the latter as a stationary source.

3. The nature and purpose of gasoline combustion on campus was unknown, so the emission factor for motor gasoline was used.

4. The small amount of diesel used in the campus fleet in fiscal year 2022 was absorbed into SIMAP's "Stationary Source: Diesel" category, resulting in the fiscal year 2022 value for "Transportation Source: Diesel Fleet" coming to zero.

RESULTS

The table below (Table 1) displays the results from SIMAP after UTA's raw data was entered. The rest of this report will use this data to draw conclusions about UTA's strengths and areas of improvement through comparisons to past years and to a peer group.

Table 1. — Scopes 1 and 2 greenhouse gas emissions ($MTCO_2e$) by source, fiscal years 2017–2022*

Scope	Source	2017	2018	2019	2020	2021	2022	2017–22 change
1	Stationary source: natural gas	16,670.9	18,851.0	21,160.7	20,623.4	20,718.3	21,026.7	26.13%
1	Stationary source: diesel	83.8	41.1	35.0	64.4	62.2	26.4	-68.46%
1	Stationary source: gasoline	3,863.3	3,500.2	3,021.0	2,548.0	2,311.3	2,350.1	-39.17%
1	Stationary source: solar	0.0	0.0	0.0	0.0	0.0	0.0	0.00%
1	Transportation source: gasoline fleet	828.2	745.4	637.0	559.7	507.7	516.2	-37.67%
1	Transportation source: diesel fleet	8.7	7.6	2.9	1.4	0.6	0.0	-100.00%
1	Refrigerants and chemicals	595.8	331.8	372.9	3,863.9	4,065.3	4,225.8	609.24%
2	Purchased electricity	54,567.5	52,078.5	49,094.8	43,923.7	40,290.5	43,702.1	-19.91%

* Data from the University of New Hampshire's Sustainability Indicator Management & Analysis Platform (SIMAP)

ANALYSIS: KEY TAKEAWAYS

#1: EMISSIONS ARE DECREASING

Between FY 2017 and FY 2022, total greenhouse gas emissions at UTA decreased overall (see Fig. 1). During this timeframe, emissions from natural gas increased (see Fig. 2) and emissions from purchased electricity decreased until FY 2022, when they increased again.

Given that purchased electricity accounts for 61% of UTA's emissions, the fluctuation of purchased electricity usage has a greater impact on total emissions than any other source. Natural gas, refrigerants, stationary gasoline usage, and mobile sources make up the other 39% (see Fig. 3).

Figure 1. — UTA's greenhouse gas emissions broken into Scopes 1 and 2 from FY 2017 to FY 2022

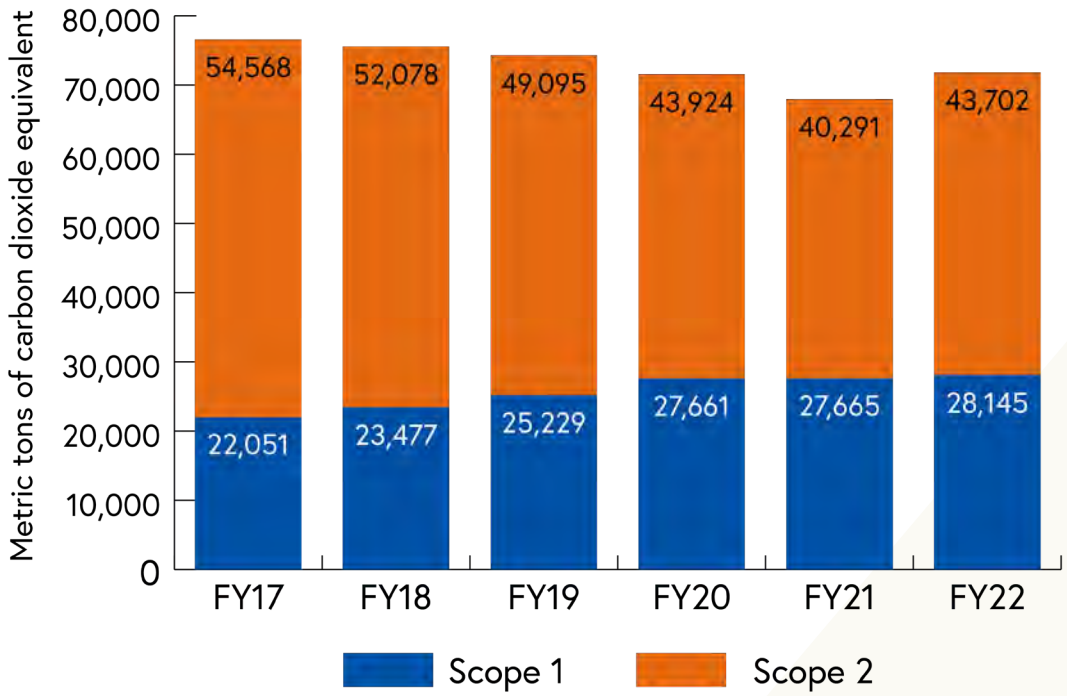


Figure 2. — Greenhouse gas emissions over time by source, fiscal year 2017–2022

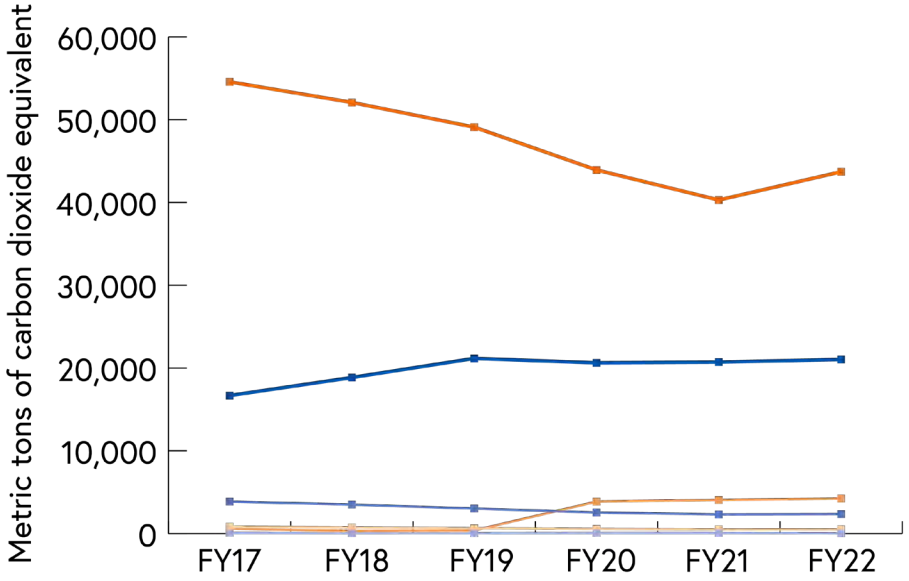
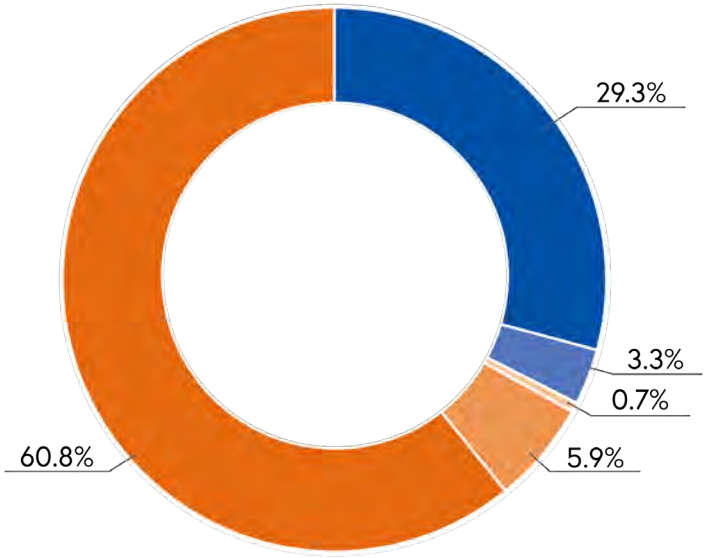
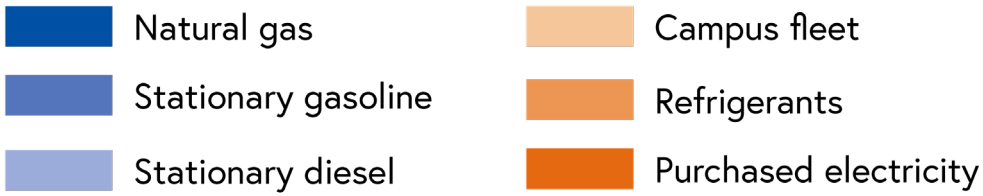


Figure 3. — Greenhouse gas emissions by source, fiscal year 2022





Another important note is that UTA's campus underwent an expansion in size from 2010 to 2022. Despite this expansion, the greenhouse gas emissions per square foot have been cut by almost a third in this time (see Fig. 4), indicating the success of low emission practices on campus when construction increases are neutralized. When looking at total emissions, without accounting for the larger size of the campus, there is a net decrease from 2010 to 2022 (see Fig. 5). While there was a net increase in total emissions between 2010 and 2019, starting in 2020 emissions dipped below 2010 emissions.

Despite the larger size of the campus, current emissions are below those from a decade ago, when the campus was smaller.

Figure 4. — UTA's greenhouse gas emissions per square foot from 2010 and 2022

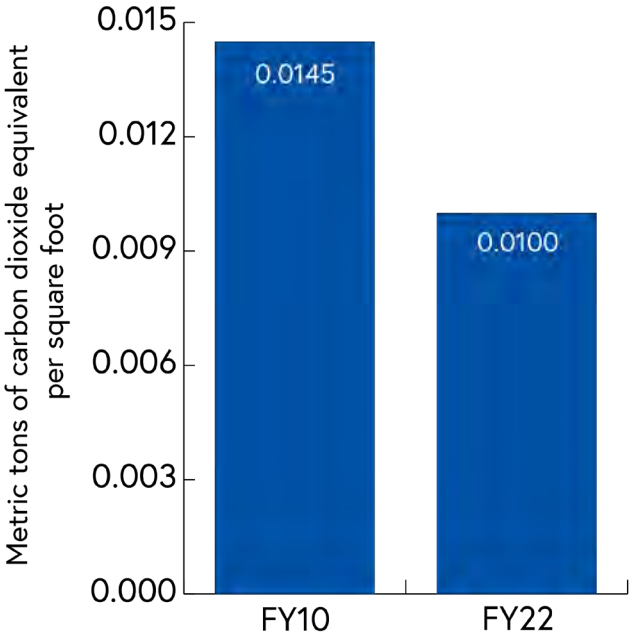
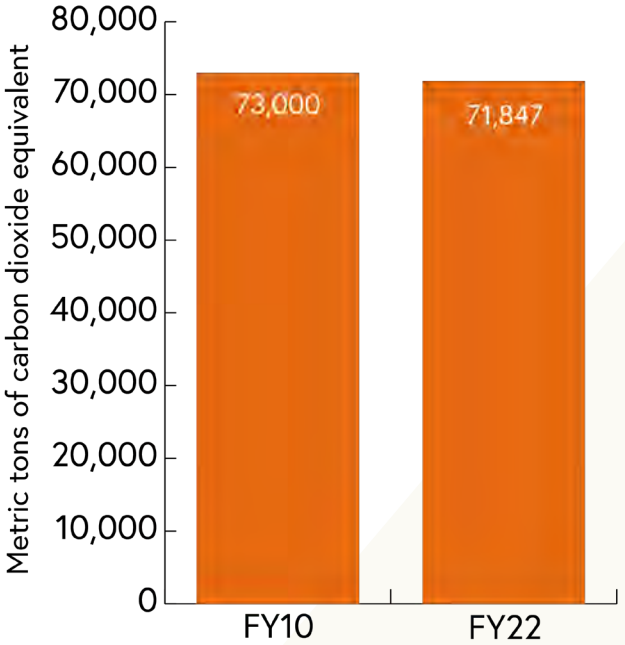


Figure 5. — UTA's total greenhouse gas emissions from 2010 and 2022



ANALYSIS: KEY TAKEAWAYS

#2: UTA HAS THE LOWEST TOTAL EMISSIONS OF ITS PEERS

UTA's FY 2022 emission data was analyzed in comparison with a group of peers: Texas A&M University, University of Texas Austin (UT Austin), University of Texas San Antonio (UT San Antonio), and University of Texas Dallas (UT Dallas). University of Texas El Paso, University of Texas Rio Grande Valley, and the University of North Texas do not have greenhouse gas emissions data publicly available.

Compared to this peer group, UTA has the lowest total emissions (see Fig. 6). These numbers were normalized in two ways to account for population and square footage differences between campuses. When the total emissions data is normalized by weighted campus user, UTA remains the lowest emitter of their peer group, followed closely by UT Dallas (see Fig. 7). When the data is normalized by gross square footage, UTA is the second lowest emitter of the group, edged out by UT Austin (see Fig. 8).

Figure 6. — UTA's greenhouse gas emissions compared to peer institutions, using the performance year as reported in AASHE STARS

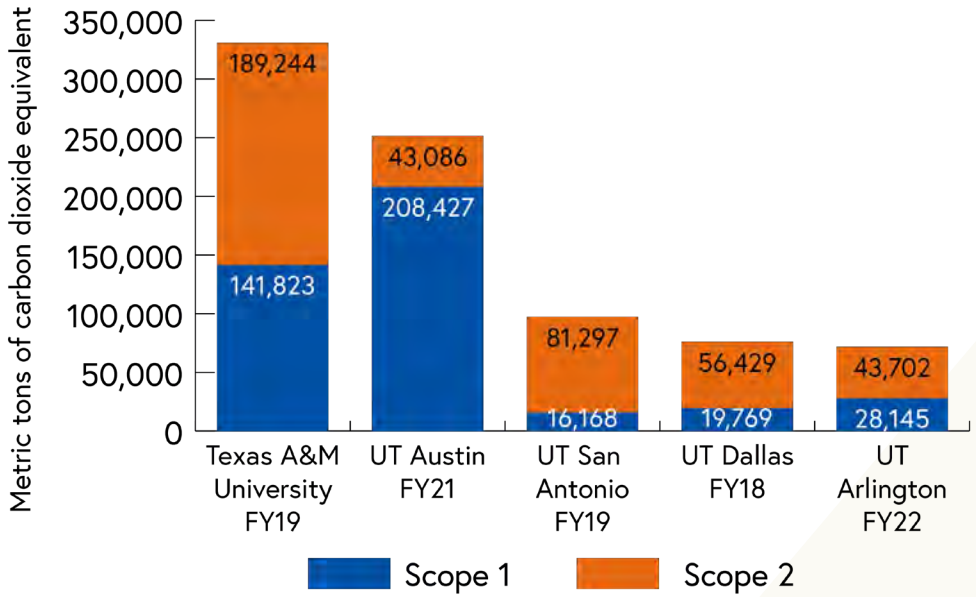


Figure 7. — UTA's greenhouse gas emissions per weighted campus users compared to peer institutions using the performance year as reported in AASHE STARS

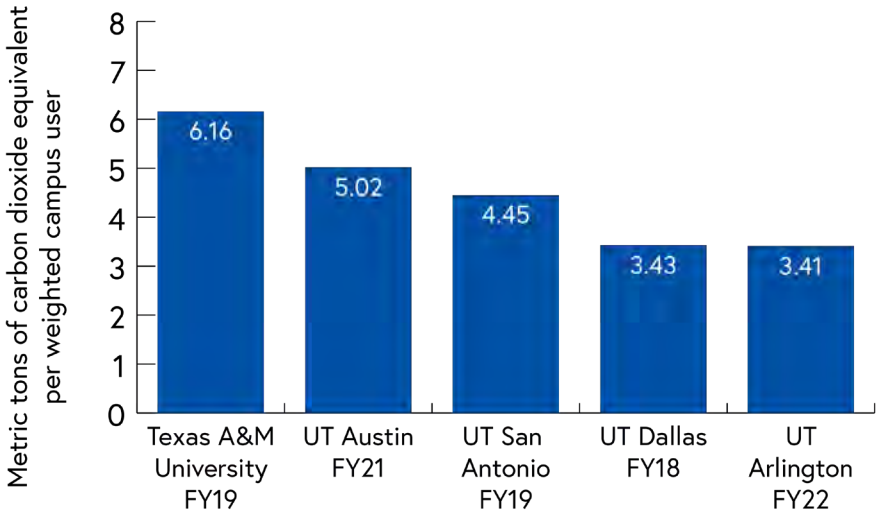
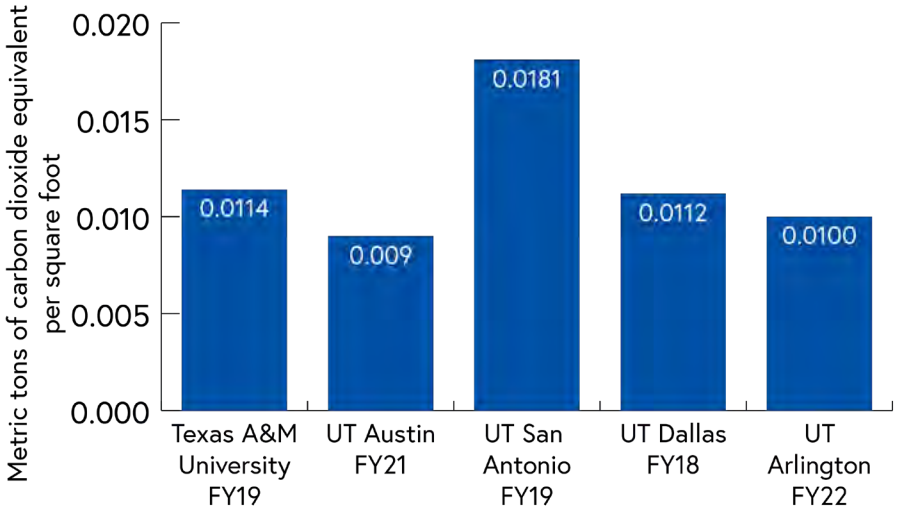


Figure 8. — UTA's greenhouse gas emissions per square foot compared to peer institutions using the performance year as reported in AASHE STARS



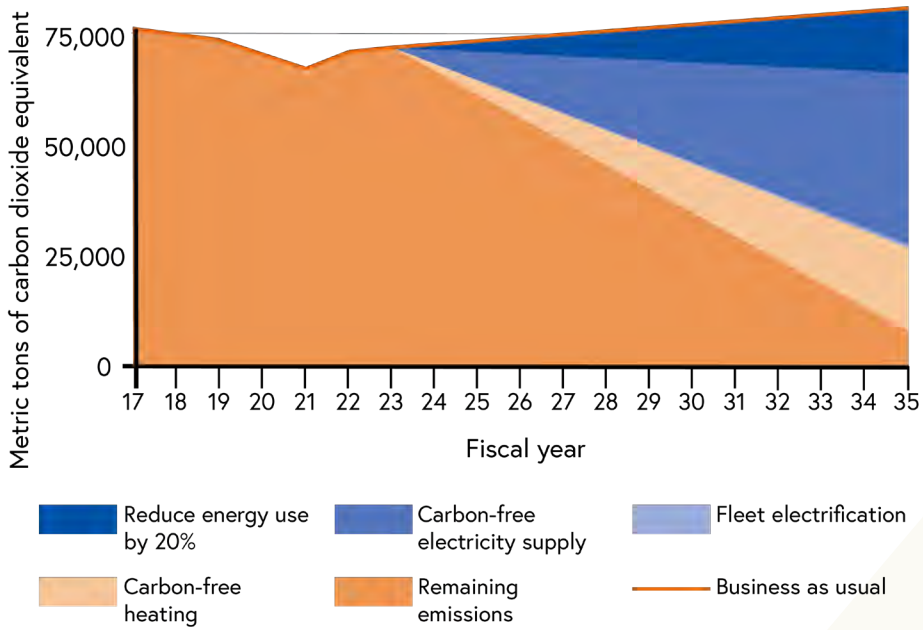
RECOMMENDATIONS

#1: Commission a decarbonization study

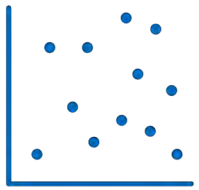
UTA is in a great position to begin ambitious decarbonization work. As stated in the analysis section, UTA is ahead of most of its peers in this area and is no longer undergoing campus expansion initiatives. The below graph (see Fig. 9) shows the differences that can be made in UTA's total emissions by implementing standard decarbonization strategies. This graph is not a projection of emissions, but rather a visual representation of how much of an impact each strategy could have. Note that the remaining emissions in 2035 are primarily from refrigerant leakage and stationary gasoline use.

GreenerU recommends that UTA commissions a decarbonization study to create a strategy for implementing similar strategies. Having a comprehensive and financially viable plan to reach carbon neutrality would put UTA on track to stay at the forefront of their peers in the future.

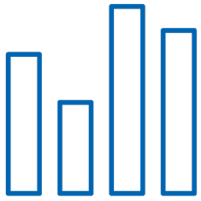
Figure 9. — The impact of decarbonization strategies on UTA's business as usual emissions from FY 2017 to FY 2035



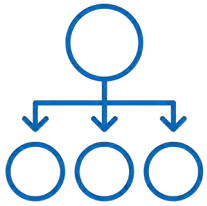
#2: Improve data tracking



Track fugitive refrigerant emissions
In the future, tracking refrigerant emissions more closely will yield more accurate, and most likely lower, results. The screening method was used for the FY 2020–2022 calculations due to insufficient data for a different, more precise method. Facilities is currently working to track refrigerants more closely with the hope of having more accurate data for FY 2023.



Investigate emission sources
A significant portion of UTA's FY 20–22 Scope 1 emissions was from stationary gasoline use on campus. Finding out what this gasoline is used for and how to most accurately represent it in the emissions inventory would give UTA a more complete picture of their emissions. This is not a common source for universities to have in their inventories, and thus warrants some investigation.



Begin tracking Scope 3 emissions
Scope 3 is a large portion of any institution's emissions. UTA did not have the data available to make these calculations as they are complex and still being developed. UTA should begin the data tracking process for commuting and air travel now so that this information is available when the next greenhouse-gas emission inventory is completed. UTA should also begin to look into the data needed to calculate emissions from purchasing, since that will be one of the largest sources of emissions for the university.

#3: Explore on-site renewable energy, especially solar

As part of this greenhouse gas emission inventory, GreenerU did a shallow dive into the potential of using solar energy to power UTA's campus. The conclusion of this research was that UTA has a large capacity for on-campus solar. Given this potential as well as other options for powering the campus renewably, GreenerU recommends that UTA commissions a solar feasibility study to assess potential ways forward.