THE UNIVERSTIY OF ARIZONA

Sustainability Solutions

Gordian FY19 REPORT

Sustainability Solutions

Scope 1:

- Emissions from: Natural gas, Vehicle Fleet, Refrigerants, & Fertilizer
- Scope 1 comprises 37% of total emissions
- University of Arizona has seen a 9% increase in Scope 1 Emissions since FY15

Scope 2:

- Emissions from: Electricity
- Scope 2 comprises 30% of total emissions
- University of Arizona has seen a 4% increase in Scope 2 Emissions since FY15

Scope 3:

- Emissions from: Commuting, Air/Ground/Study Abroad Travel, Solid Waste, Wastewater, Paper Purchasing, & Electricity Transmission and Distribution Losses
- Scope 3 comprises 33% of total emissions
- University of Arizona has seen a 17% increase in Scope 3 Emissions since FY15

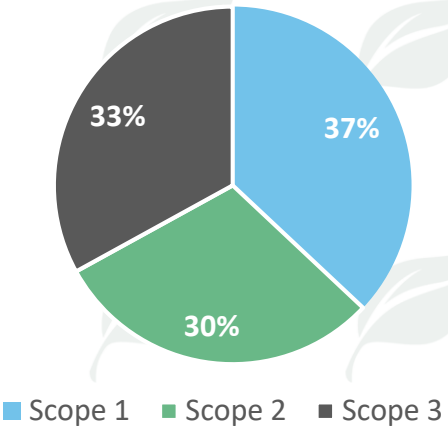
Key Takeaways

Since FY15, The University of Arizona has increased total emissions on campus by 10%. Scope 1 accounts for 37% of emissions, followed by Scope 2 at 30%, and lastly Scope 3, which makes up 33% of output in FY19. Scope 3 has increased at the largest rate since FY15.

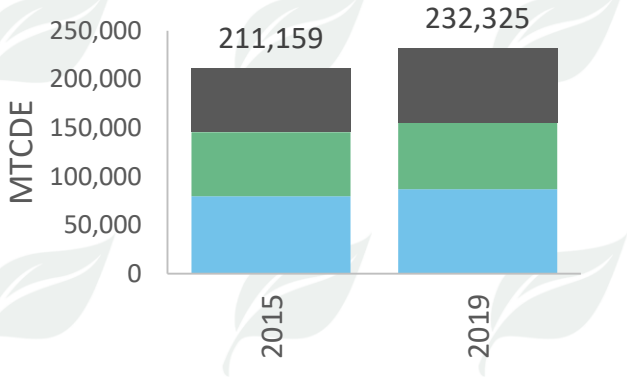
Scope 1 sources are where The University of Arizona has the most operational control since these sources of emissions are occurring on campus. Building efficiency and operational changes present an opportunity for improvement to reduce Scope 1 emissions. Scope 2 emissions are heavily influenced by the fuel mix of the grid. While changes can be made to increase efficiency and reduce consumption, the cleanliness cannot be changed. However, The University of Arizona will enter a Power Purchasing Agreement (PPA) with Tucson Energy for 100% solar purchased power. This PPA will result in The University of Arizona reaching Scope 2 neutrality in FY22 and bypassing any grid concerns.

Scope 3 emissions primarily occur off campus and are driven by human behavior. The University of Arizona will need to modify theses behaviors to mitigate this ever-increasing proportion of emissions.

FY19 Net Emissions by Scope



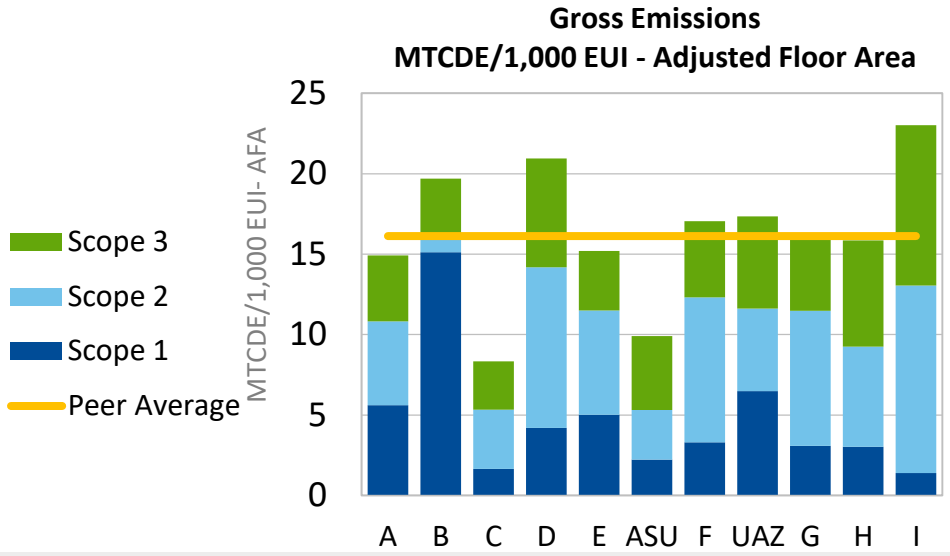
Total Net Emissions Over Time



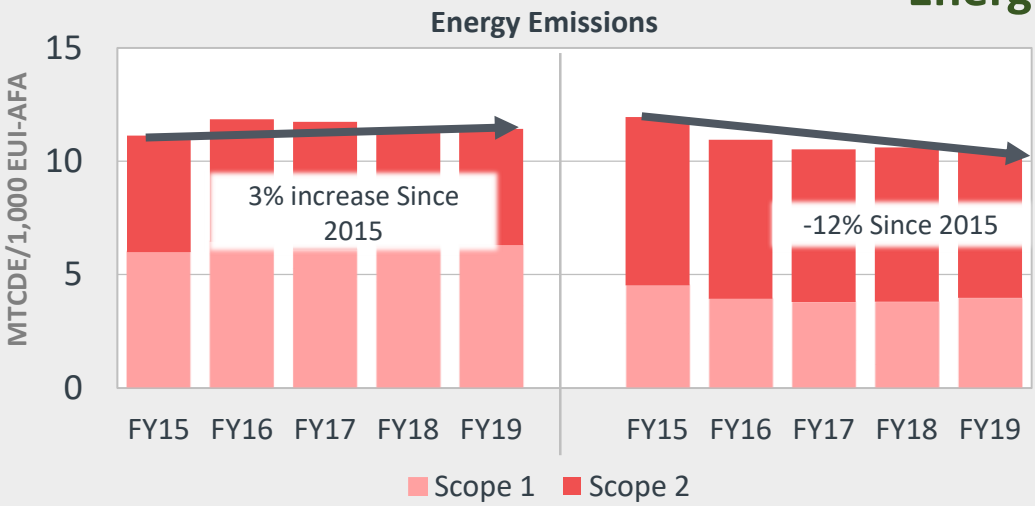
Using Peers as Case Studies for Emission Reduction

Normalizing emissions allows us to make a level comparison. When normalizing there are two preferred methodologies to use: emissions per total users, or per 1,000 EUI Adjusted floor area. With space having increased by 5% and total emissions by 10%. This increase would lead us to hypothesize that the new space is highly energy intensive.

When normalized by space, The University of Arizona's emissions are above the peer average in FY19, if emissions continue to trend upwards that disparity will grow.



Energy Emissions Above Peers

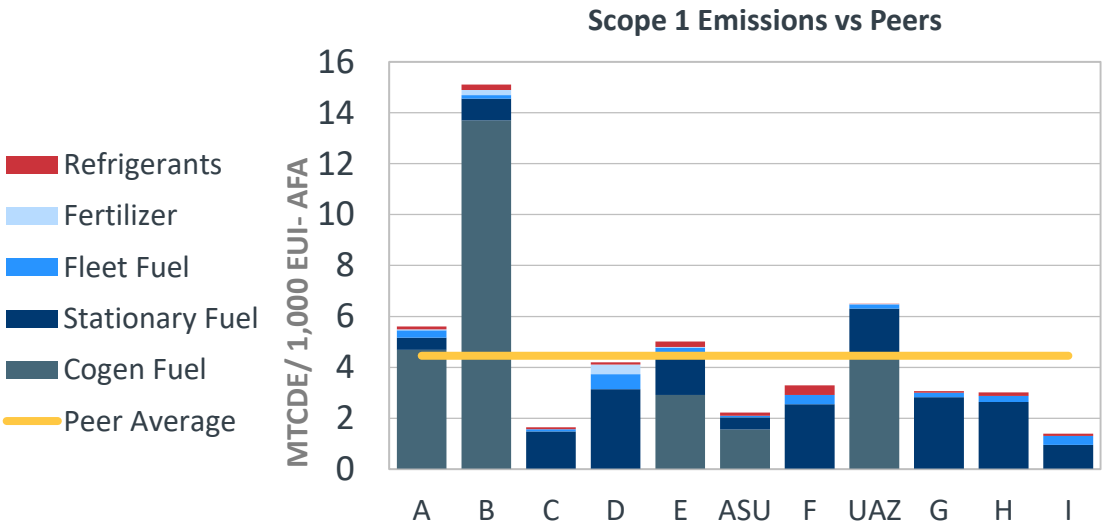


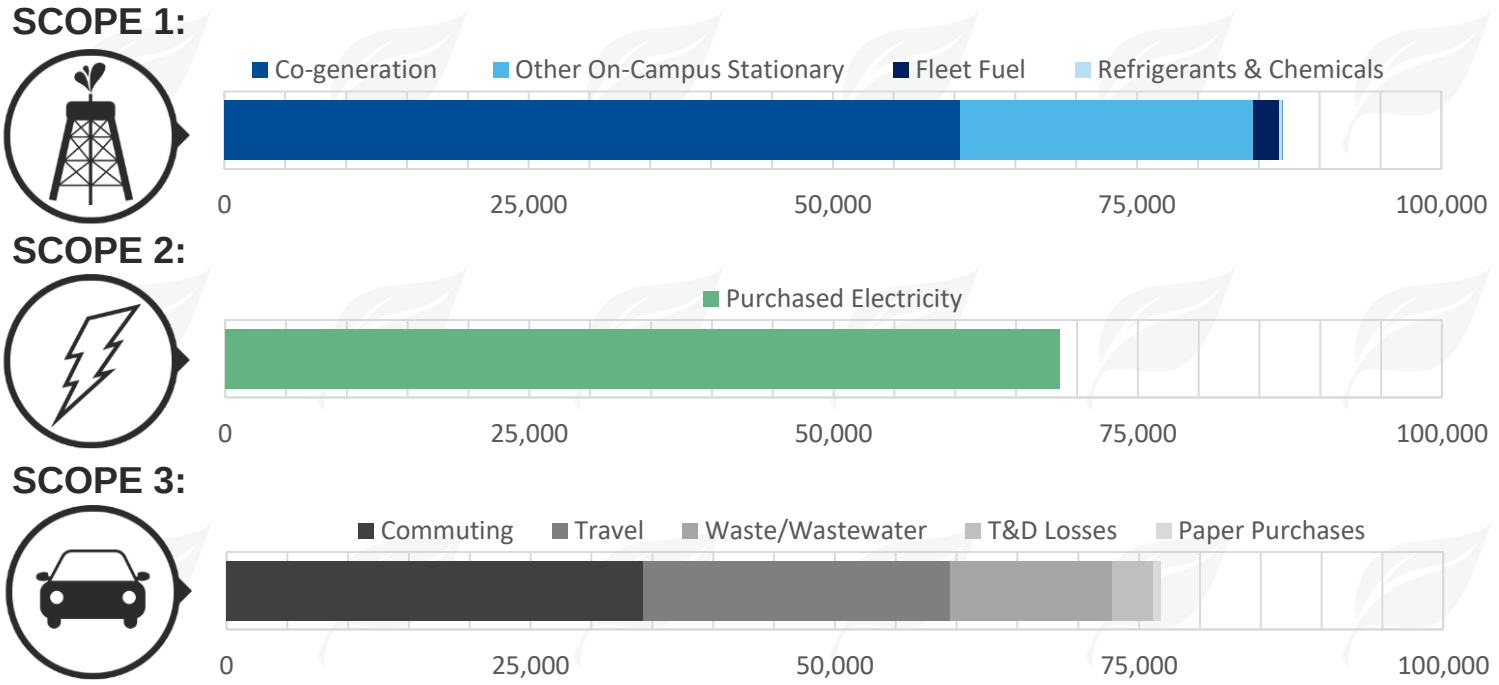
The University of Arizona's energy emissions have increased since the baseline year of assessment. Whereas peers have decreased their utility emissions. Peers have accomplished this by seeing decreases in both Scope 1 and Scope 2 emissions equally. While The University of Arizona has seen their Scope 2 emissions also decrease during this time, their Scope 1 emissions have increased by 5%, which contribute to the overall rise in utility emissions.

Peer Strategies to Reduce Emissions

The University of Arizona Scope 1 emissions were higher than the peer average by 46% in FY19. Of total Scope 1 emissions Cogen natural gas and building natural gas (Utilities) make up 97% of Scope 1 emissions. Due to future Scope 2 emissions being neutralized peer strategies to reduce Scope 1 emissions are highlighted below:

- Implement a carbon neutral new building policy.
- Implement a comprehensive Building Automation Management program.
- Major renovations must be built to LEED Silver standard
- Install comprehensive utility metering
- Prioritize energy efficiency in capital planning
- Installation of an anerobic biodigester





Emissions Impact with Space and Enrollment Increases

The University of Arizona has increased in campus GSF but have seen their emissions increase twice that of GSF. Seeing as this upward trend correlates with an increase in Scope 1 emissions by 9% Gordian recommends prioritizing upgrades in building efficiency. Based on our annual facilities assessment there is an identified 20 million dollars of control related projects. These projects should be fully funded, and all building automations should be transitioned from pneumatics to DDC.

While total campus FTE's increased by 1% Scope 3 emissions have increased by 17% since FY15. Gordian recommends establishing a tiered carbon offset program to fully offset travel emissions in three years. To address commuting emissions Gordian recommends expanding the bike share program and incentivizing carbon free modes of transportation.

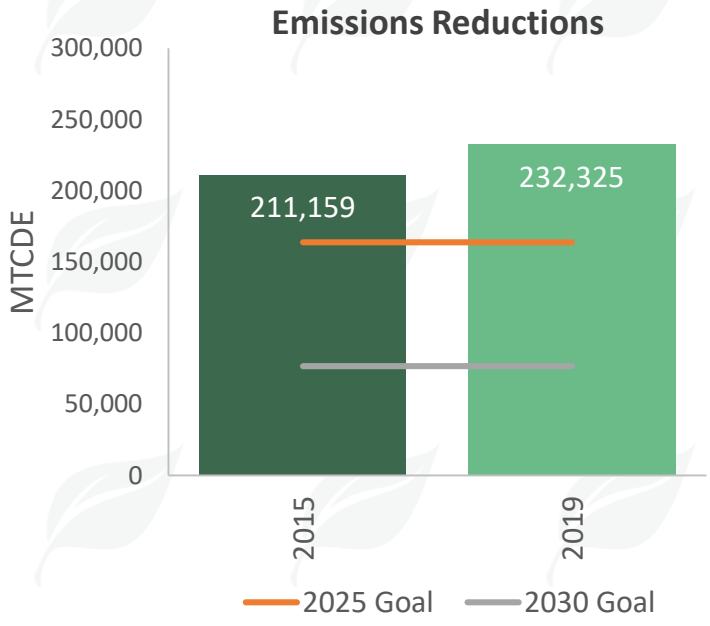
Since 2015:

Total Building GSF Increased +5%

Campus FTEs Increased +1%

Total Emissions Increased 10%

Progress Towards Emissions Reduction Goal



As of FY19 The University of Arizona does not have a comprehensive climate plan, although there is a date of carbon neutrality set for 2040. The first step in successfully reaching neutrality is to establish a series emission reduction goals, which are attainable and actionable. Gordian has established the 2025 goal on achieving Scope 2 neutrality, which will happen in FY22. The next goal, based upon operational control would be the achievement of Scope 1 neutrality in 2030. As Scope 3 is the most difficult arena to manage Gordian has determined that ten years after reaching Scope 1 neutrality is a feasible timeframe to implement significant behavior change and limit the need for offset purchases.