



Meeting Summary
December 10, 2019

Council Members Present:

Carlo Colella, Vice President for Administration and Finance (Chair)
John Zacker, Interim Vice President for Student Affairs
Maureen Kotlas, Executive Director, Department of Environmental Safety, Sustainability & Risk
Scott Lupin, Assoc Dir., Environmental Safety, Sustainability & Risk, & Dir., Office of Sustainability
MaryAnn Ibeziako, Director, Engineering and Energy, Facilities Management
Bryan Quinn, Director of Technical Operation, Department of Electrical & Computer Engineering
David Cooper, Assistant Director of Operations, Division of IT
Joe Sullivan, Professor and Associate Dean, College of Agriculture and Natural Resources
Eric Wachsman, Prof., Materials Science and Engineering and Director, Energy Research Center

Meeting start time: 10:15am

Meeting Highlights

Welcome and Introductions

Carlo Colella welcomed the Council members and called the meeting to order.

Dining Services and Sustainability — Presentation

Scott Lupin introduced Colleen Wright-Riva, Director of Dining Services, and Allison Tjaden, Assistant Director of New Initiatives, to the Council.

UMD's Dining Services Overview:

- 7th largest self-operating dining service in the nation
- \$70 million operating budget, with funding allocated to sustainable initiatives
- Between 1,500 to 2,000 employees working for them in seven lines of business:
 - o Residential Dining Halls: (60% of program)
 - 9,000 students with Anytime Dining Plans
 - 2,500 students with Optional Dining Plans
 - Between 27,000 to 30,000 meals served daily
 - o Full-Service Restaurant
 - o Concessions
 - o Catering Services
 - o Convenience Stores
 - o Cafes
 - o Food Court

Green Dining:

- Sustainability starts with the students and Green Dining aims to have a major sustainable impact every year, working with students to bring their ideas to life.
- Sustainability Fund has awarded "game-changing grants" (Terp Farm, Anytime Dining, and Ocean Friendly Campus)
- In 2012 began Sustainable Food Committee to shift campus food system
 - o Committed to 20% sustainable food by 2020 — currently 28.35% by 2018

- Programming to engage community in fair, local, and humane procurement:
 - The Farmers Market
 - Terp Farm: a partnership with AGNR (and initially funded by the Sustainability Fund) that integrates sustainable food with operations, learning, and student leadership
 - Campus Pantry: started in 2014 to address hunger on campus and has more than 800 visitors a year
- A 2017 study in partnership with the Counseling Center showed that 20% of UMD's students are food insecure. Moving forward, Dining Services plans to address this problem with the Hunger Free Campus Wide Workgroup.
- Menus of Change Research Collaborative:
 - 245 principles of radical and rapid transformations in the food system to address critical food and environmental issues
 - Collaborate on campus (with academics and research) and across the country within the research collaborative; this year brought on their first Graduate Fellow
- Ocean Friendly Campus Initiative: removed plastic bags and small plastic items from campus dining system
 - Working with students to launch a culture of reuse, not just substitutes
- First University to sign the Cool Food Pledge:
 - A World Resources Institute led program to encourage organizations to reduce greenhouse gas emissions relating to food procurement
 - Three step process:
 - Commit to science-based targets to reduce greenhouse gas emissions of food purchasing
 - Work with WRI and students to plan how to accomplish commitments
 - Implement programming around campus
 - The Cool Food Pledge signatory group plans to reduce its collective emissions 25% by 2030
- Competing for Food System Vision Prize through the Rockefeller Foundation: Envisioning Regenerative and Nourishing Food Futures for 2050

Council questions and discussions included the Food Recovery Network, a student-run program started in 2011 now spans more than 300 university campuses, as well as novel ways to donate food to the Campus Food Pantry including Visitor and Guest Dining Swipes and "Dining Dollars." Over the next five years, Dining Services projects their biggest challenge will be to address food insecurity on campus, in line with the UN Sustainable Development Goal of Zero Hunger, and other sustainable food issues.

Fleet Workgroup Report — Funding Formula Recommendation

Scott Lupin and Sally DeLeon from the Office of Sustainability presented on the requested Funding Proposal for the Carbon Neutral Fleet Workgroup Report. The recommendation suggested a temporary surcharge beginning in FY21 of 20 cents per gallon of fuel, generating around \$134,000 a year for ZEV infrastructure and to purchase carbon credits. The surcharge would include an annual review by key stakeholders who would be responsible for ensuring correct collection and use of the surcharge as well as presenting their recommendations to C. Colella at the end of the year. The surcharge would be stored in the existing Greenhouse Gas Reduction Fund and would be administered by Motor Transportation Services.

Potential issues included a disproportionate impact on the Department of Transportation Services (DOTS) as the Shuttle-UM program consumes more than 60% of the campus fleet's fuel, or \$75,000 of the fund. The rest of the fund would come from Solid Waste Management (\$3,800) and other departments (no more than \$500 per department). John Zacker stated that it is likely that DOTS would spread the increased cost to students (a suggested \$2 student fee increase).

Council discussion addressed the disproportionate impact of the surcharge on Shuttle-UM and the economic feasibility and environmental impact of the fund, ZEV infrastructure planning, and the benefits of reserved funding for carbon credits.

The Council requested further research into return on investment (potential for GHG emission reduction) per dollar spent toward ZEVs. It was decided that the ZEV infrastructure study is needed to better understand the business case for setting a surcharge like this.

Sustainability Fund Project Review

Calvin Burns, Undergraduate Student Representative, presented on potential Sustainability Fund Projects following a brief overview of available funds and pre-allocated sums.

Projects, Discussion, and Council Verdicts:

1. Including Estimates of Campus Forest Carbon in UMD's Climate Action Plan. **Approved by Council**
 - a. Using the original forest study as background knowledge, this project aims to understand the carbon flux of the campus forest (sequestration, storage, and general footprint). This project would provide a quantifiable number for our greenhouse gas reporting and inventories.
 - b. The project is co-funded by the Geography department who is providing faculty and administrative support.
 - c. The Sustainability Fund Council suggests funding the first year of the project, requiring the project managers to seek other sources of funding and, if needed, return for the next round of funding depending on the success of the project.
2. Student Knowledge and Behavior Toward Food Date Labeling: Integrating Innovative Research with Education to Reduce Food Waste on Campus. **Rejected by Council**
 - a. Research project that focuses on understanding student perceptions of current food labeling systems, then identifying the best mechanisms to educate students on the correct interpretation of food labels.
 - b. Limited impact on campus, and other literature exists on this topic, however could potentially impact students living off-campus and student matriculating out of the university setting.
3. QUEST- Compology Collaboration on Waste and Recycling Sensor Data. **Approved by Council**
 - a. QUEST Faculty funding request to study and optimize fuel costs of solid waste management through real-time monitoring of dumpster fullness.
 - b. Co-funded by Facilities Management who is paying for half of the project, as well as a new data source shared with the campus network.
 - c. Potentially includes labor savings as there could be fewer trips to collect empty dumpsters.
4. Food Recovery Network. **Approved by Council**
 - a. A one-time funding project to help the Food Recovery Network expand their operations within the SGA funding structure.
 - b. Project would help cover the costs of first 60-days of FRN's operations next fall so that they can transition their budgeting cycle from 30 days to 60 days and expand their operations beyond what they can support with only \$1500 a month (which is the maximum budget SGA allows for organizations on a 30-day budget cycle).
5. Monitoring Effects of Campus Creek Stream Restoration on Water Quality. **Tabled by Council until February Meeting**
 - a. A project to study the water quality impacts of recent stream restoration projects. There would be an immediate environmental benefit with data available for both class and campus operation use.
 - b. **Contingencies:** Changing the study from daily monitoring for one year to weekly monitoring for three years; Better understanding the cost of equipment, especially if the project has been occurring for the past few years; Ensuring the project receives appropriate permitting from ESSR and other EPA regulated departments.
6. Rain Barrels for Sustainable Greek Living. **Approved by Council**
 - a. Project to place 42 rain barrels by 2021 around Fraternity and Sorority houses to manage stormwater runoff.
 - b. **Contingencies:** Appropriately use water (irrigation, grey water, etc.); Pest Management implemented and other risk mitigations (mold, bacteria, etc.)
7. react REGENERATED, 2020 Solar Decathlon Middle East. **Approved by Council**
 - a. Abstention: Brian Quinn

- b. The Sustainability Fund Council decided they would like to only fund long-term or permanent, tangible aspects of the house that students could interact with during or after the competition ends. Plans include turning the house into a sustainability laboratory or communal place following it's presentation in the competition.

Adjourn 12:00

Appendix of Meeting Handouts and Attachments:

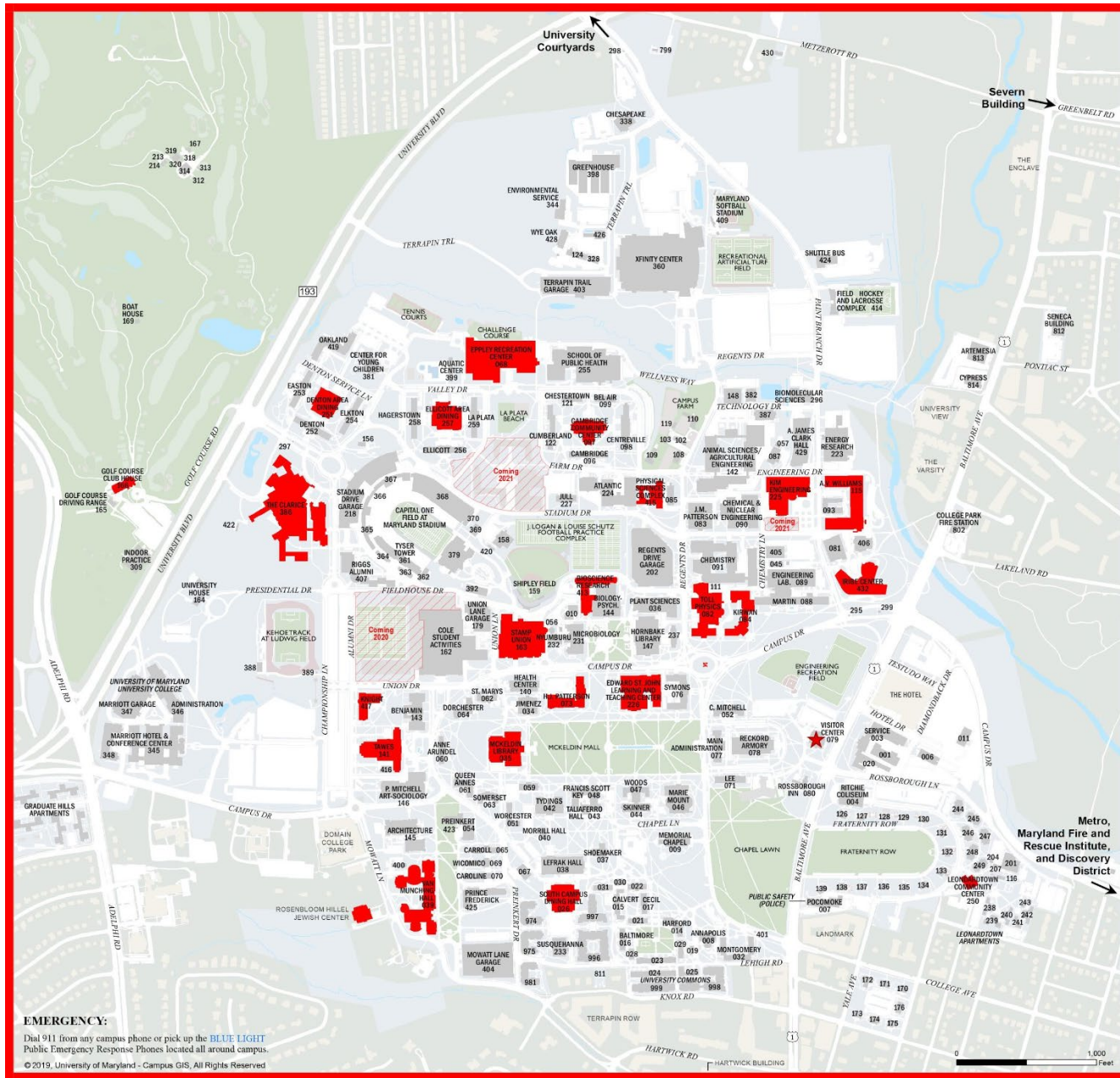
Appendix A: Dining Presentation

Appendix B: Carbon Neutral Fleet Work Group – Funding Recommendation

Appendix C: Sustainability Fund Presentation

Appendix D: Carbon Credit Report

Appendix E: SGA & Fund Committee Presentation





Trends in Sustainable Dining

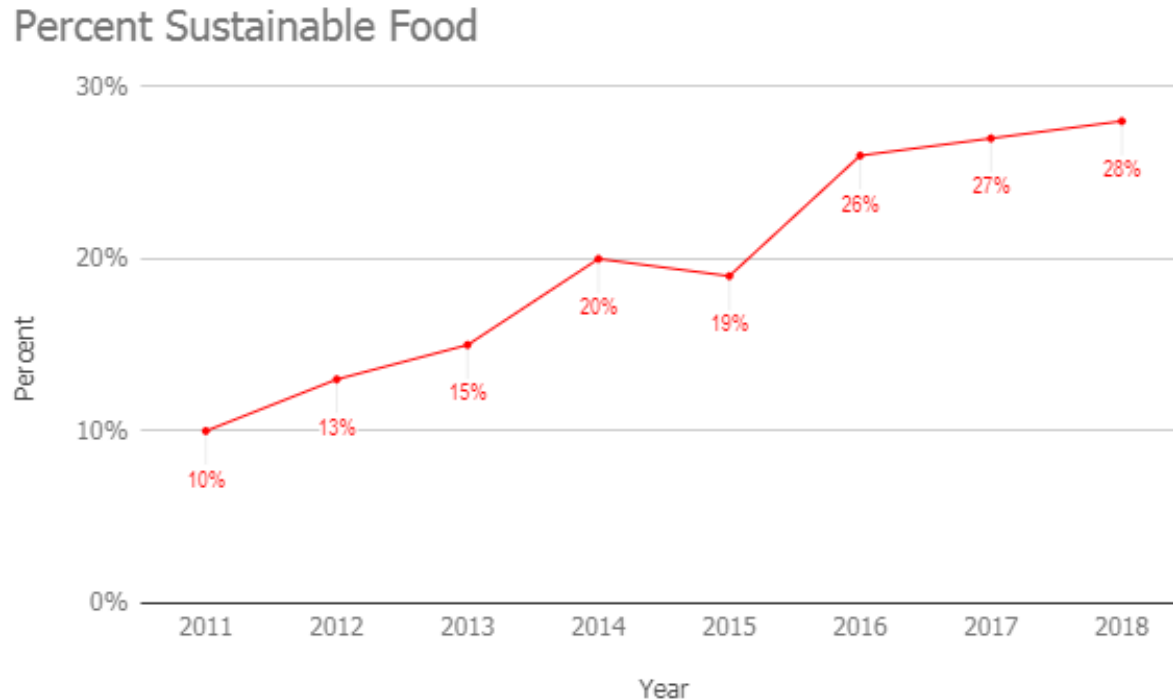
- 2009 - Replace Styrofoam packaging with compostable
- 2011- Launch of the Food Recovery Network
- 2012 - Sign the Sustainable Food Commitment
- 2012 - Opening day of the Farmers Market
- 2013 - Open Green Tidings Mobile Dining
- 2014 - Awarded Sustainability Fund Grant for **Terp Farm Project**
- 2014 - Open UMD Campus Pantry
- 2015 - Achieved 20% Sustainable Food purchasing
- 2016 - Awarded Sustainability Fund Grant for **Anytime Dining** & launched program
- 2018 - Accepted to Menus of Change University Research Collaborative
- 2019 - Awarded Sustainability Fund Grant for **Ocean Friendly Campus Initiative** & launched program
- 2019 - Became first university signatory of the Cool Food Pledge

Student Leadership



Sustainable Food Commitment

- Goal set in 2012: 20% sustainable food by 2020
- Currently 28.35% (Fall 2018) sustainable food



— UNIVERSITY OF MARYLAND —



Farmers Market



local • fresh • eats





umd
campus pantry

distributing emergency food to terps in need

PRINCIPLES

OF HEALTHY, SUSTAINABLE MENUS

MENUS OF CHANGE
The Business of Healthy, Sustainable, Delicious Food Choices



HARVARD
T.H. CHAN

SCHOOL OF PUBLIC HEALTH
Department of Nutrition

BE **TRANSPARENT** ABOUT SOURCING AND PREPARATION

BUY *Fresh* **AND SEASONAL**, **LOCAL** **AND GLOBAL**



LEVERAGE **GLOBALLY INSPIRED, PLANT-FORWARD** CULINARY STRATEGIES



FOCUS ON **WHOLE, MINIMALLY PROCESSED** FOODS

GROW EVERYDAY OPTIONS,
WHILE HONORING SPECIAL OCCASION TRADITIONS



— LEAD WITH —
MENU MESSAGING AROUND FLAVOR

REDUCE PORTIONS, EMPHASIZING CALORIE QUALITY OVER QUANTITY

DESIGN HEALTH AND SUSTAINABILITY INTO OPERATIONS AND DINING SPACES



MAKE **WHOLE, INTACT GRAINS** THE NEW NORM
LIMIT POTATOES

MOVE LEGUMES AND NUTS TO THE CENTER OF THE PLATE



CHOOSE **HEALTHIER OILS**

GO **"GOOD FAT," NOT "LOW FAT"**

SERVE MORE KINDS OF **SEAFOOD, MORE OFTEN**



REIMAGINE DAIRY IN A SUPPORTING ROLE



USE POULTRY AND EGGS IN MODERATION

REDUCE ADDED SUGAR

CUT THE SALT: RETHINK FLAVOR DEVELOPMENT FROM THE GROUND UP



— SERVE LESS —
RED MEAT, LESS OFTEN

SUBSTANTIALLY REDUCE SUGARY BEVERAGES. INNOVATE REPLACEMENTS

DRINK HEALTHY: FROM WATER, COFFEE, AND TEA TO (WITH CAVEATS) BEVERAGE ALCOHOL



WELCOME TO OUR OCEAN FRIENDLY CAMPUS



DO YOU HAVE
AN ANYTIME
DINING PLAN?

Pick up your **FREE**
reusable Chico® bag
and use/reuse it on
and off campus!

Bring your UMD ID
to one of these Shops
and claim your bag!

24 Shop
South Commons Shop
North Convenience Shop





The University of Maryland
has joined

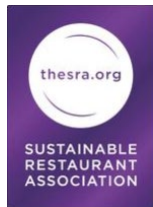
THE COOL FOOD PLEDGE

to put climate-friendly foods on the menu

CoolFoodPledge.org

The **Cool Food** Pledge

A movement to help companies, restaurants, universities, hospitals, and public facilities provide delicious food while slashing food-related greenhouse gas emissions



WORLD
RESOURCES
INSTITUTE



CLIMATE**FOCUS**



CNCA
CARBON NEUTRAL CITIES ALLIANCE



PRACTICE
Greenhealth



Initial cohort of signatories serves >100M meals/year
Aiming for 50 signatories by end 2019 serving >1B meals/year



UC San Diego Health



Overlook
Medical Center
ATLANTIC HEALTH SYSTEM



Genentech
A Member of the Roche Group



UCSF Health

Premium Burgers

UW Health
University of Wisconsin
Hospital and Clinics

Morgan Stanley

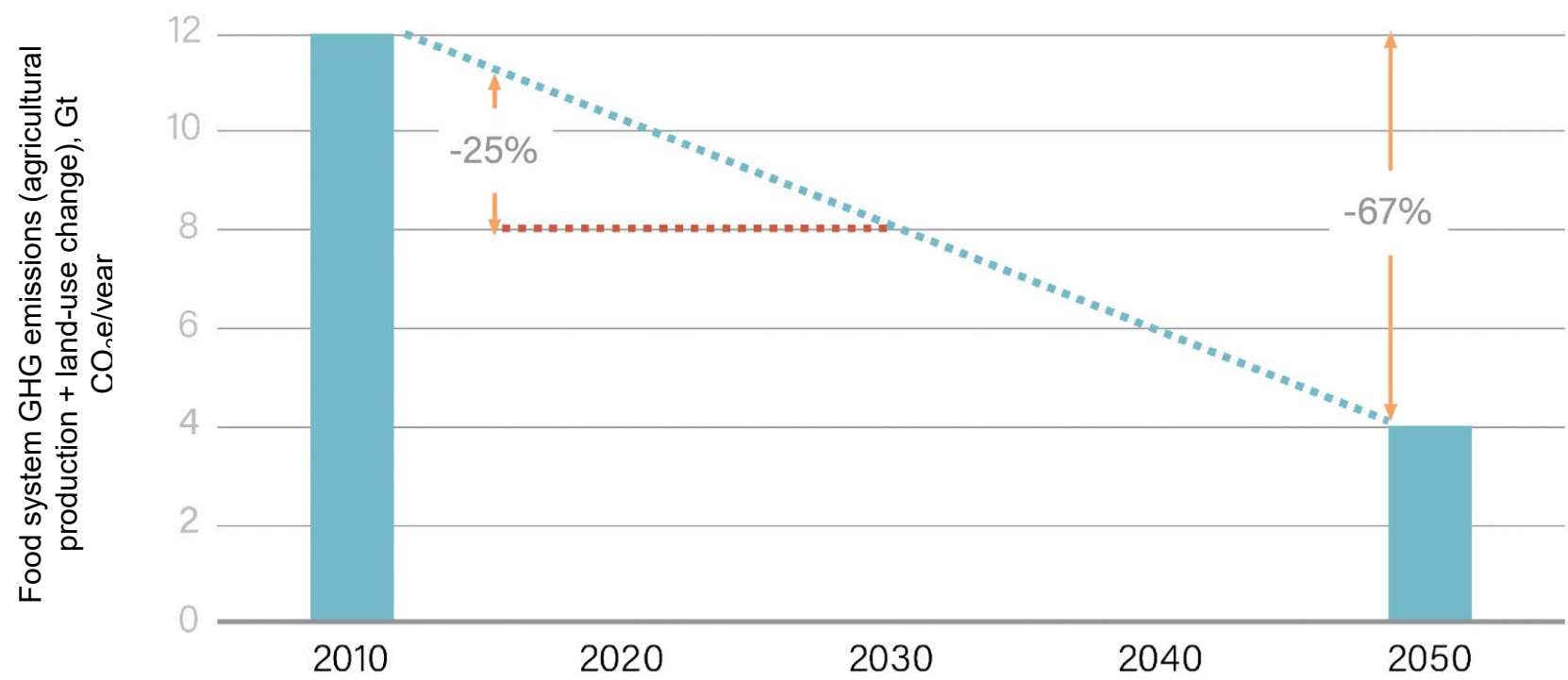
wework

How the Cool Food Pledge works

The Cool Food Pledge helps universities:

1. **Pledge** support of a science-based target for diet-related GHG emissions reduction,
2. Develop the best **plan** to bring about change, and
3. **Promote** successes

Pledge: Universities pledge to **provide delicious food that is better for the planet** and commit to a *collective* target of reducing food-related GHG emissions by 25% by 2030



Sources: Searchinger et al. (2018), Science Based Targets Initiative (2017).

Envisioning Regenerative and Nourishing Food Futures for 2050



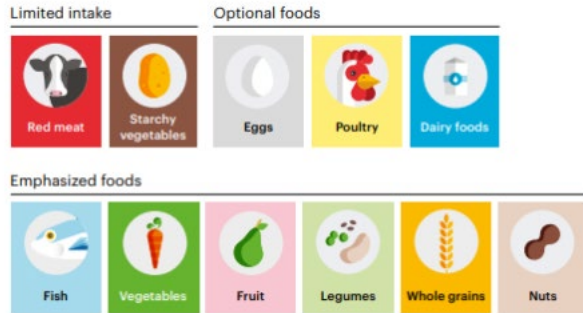
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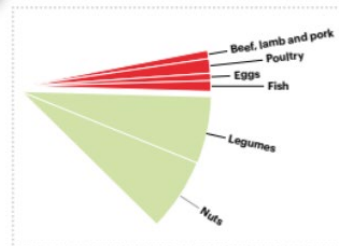
Supplemental Slides

Healthy and Sustainable Diets

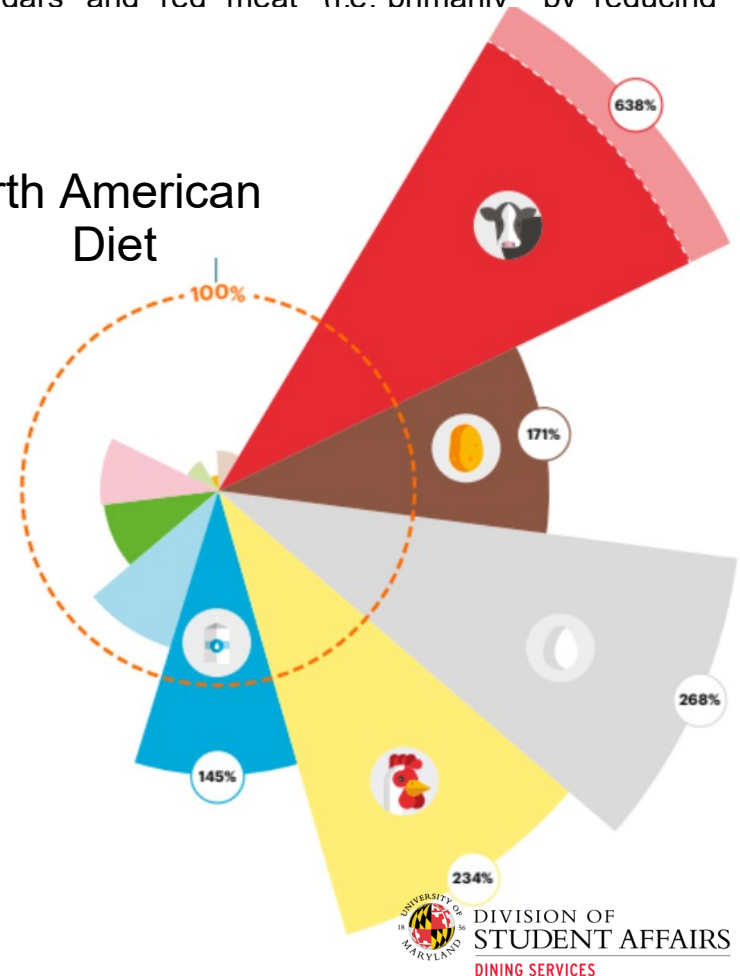


Transformation to healthy diets by 2050 will require substantial dietary shifts. This includes a more than doubling in the consumption of healthy foods such as fruits, vegetables, legumes and nuts, and a greater than 50% reduction in global consumption of less healthy foods such as added sugars and red meat (i.e. primarily by reducing excessive consumption).

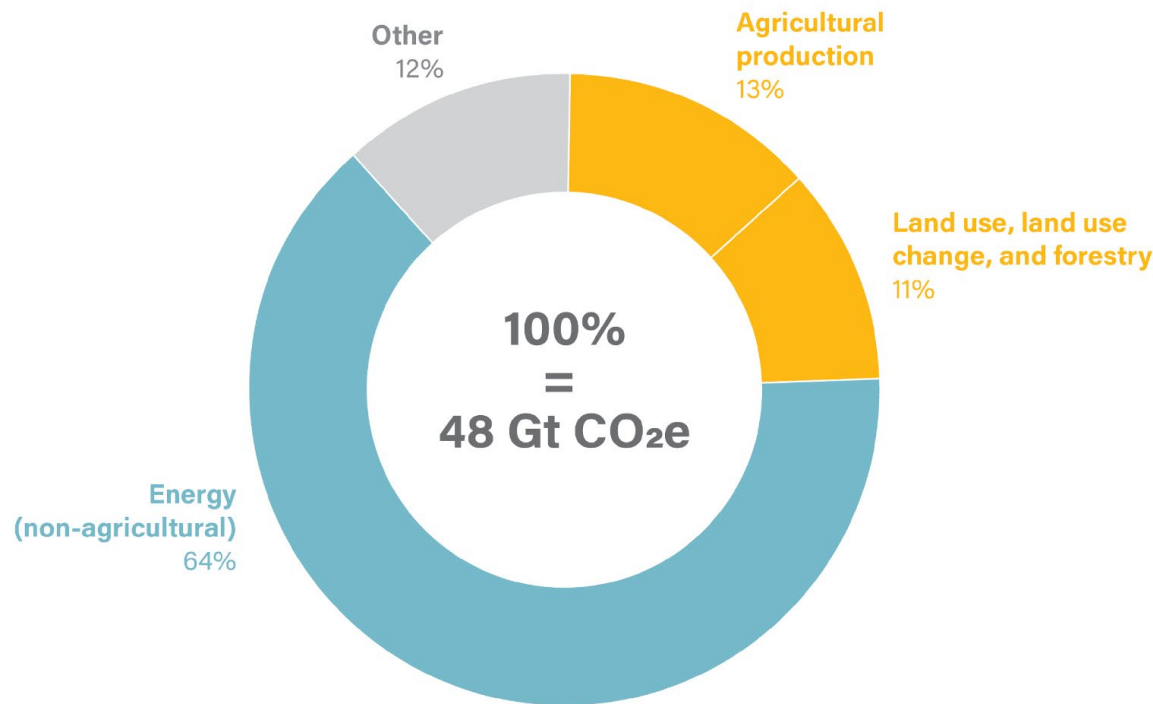
Planetary Health Diet



North American Diet



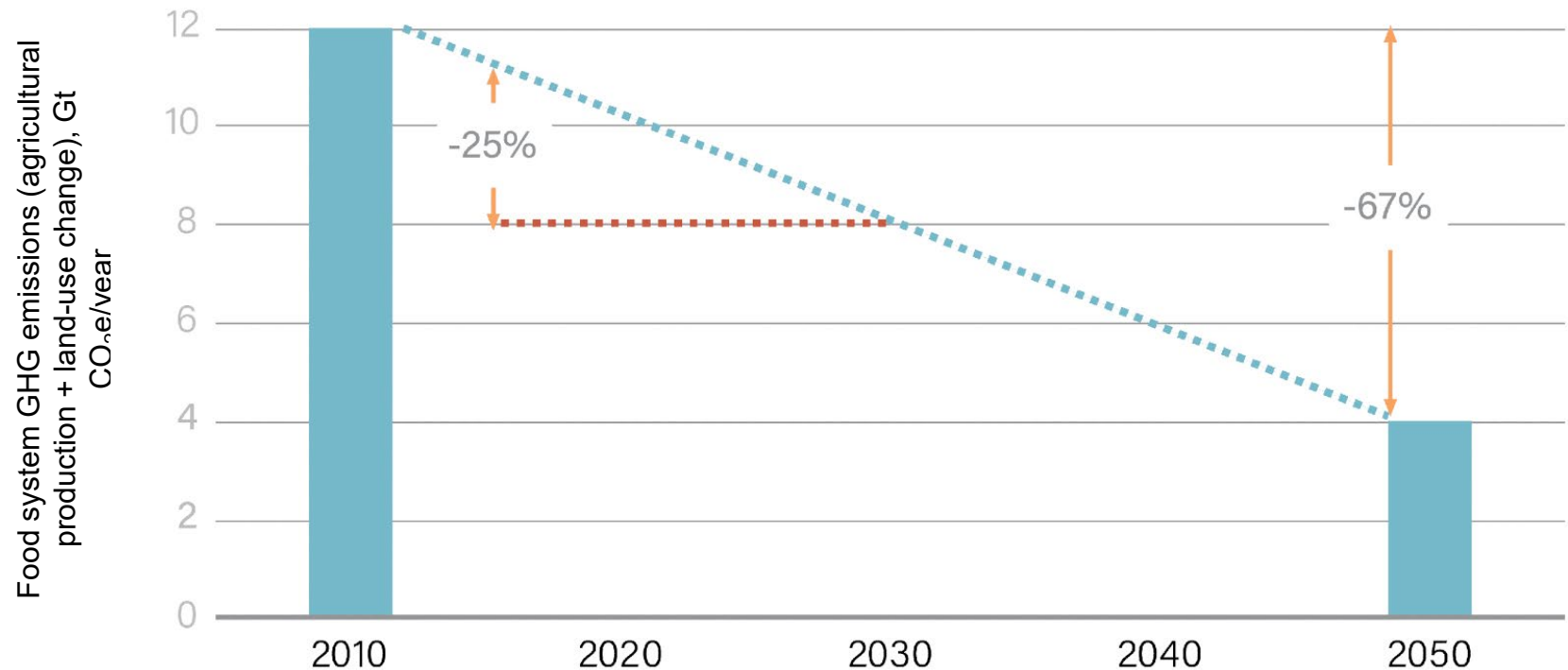
Agriculture and land-use change account for nearly a quarter of all greenhouse gas (GHG) emissions



Notes: Data are for 2010. "Agricultural production" includes energy emissions from on-farm energy consumption as well as from manufacturing of farm tractors, irrigation pumps, other machinery, and key inputs such as fertilizer. It excludes emissions from the transport of food. "Energy" excludes the emissions from agricultural energy sources included in "agricultural production."

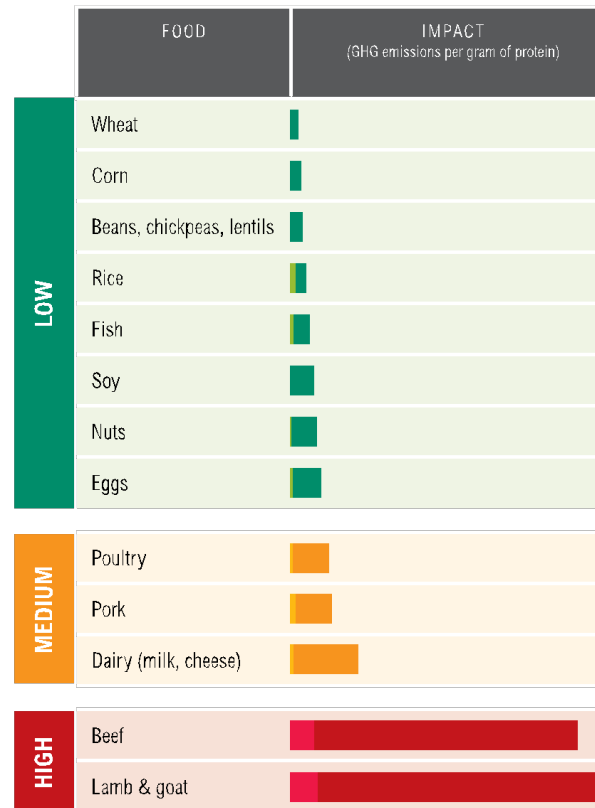
Sources: WRI analysis based on UNEP (2012), FAO (2012), EIA (2012), IEA (2012), and Houghton (2008) with adjustments.

The world needs to reduce GHG emissions from agriculture by two-thirds even while feeding 9-10 billion people



Sources: Searchinger et al. (2018), Science Based Targets Initiative (2017).

Plant-based foods have a smaller climate footprint



Note: Lighter shade shows emissions from agricultural production, darker shade shows emissions from land-use change. Source: World Resources Institute (2016).

Plan: Develop a plan for shifting offerings toward plants

The **Cool Food** team will help signatories develop a plan for serving more sustainable food while meeting other dining-related targets

For example:

- Increase availability of delicious plant-rich dishes
- Blend plants into meat-based dishes
- Replace meat with plant-based meat alternatives
- Adapt menu layout to promote plant-rich choices
- Improve the descriptions of plant-rich dishes to make them sound more appealing
- Inform diners of the benefits of eating more plants



Photo: Chris Ralston

Draft Funding Proposal to Implement Carbon Neutral Fleet Work Group Recommendations

During its meeting on November 7, 2019, the University Sustainability Council requested that the Office of Sustainability (OS) develop a funding proposal to implement the recommendations in the Carbon Neutral Fleet Work Group Report. Of the Report's seven recommendations, four have financial implications:

- Funding a ZEV Infrastructure Plan: One-time expense
- Purchasing ZEVs and ZEV Infrastructure: Near-term expenses
- Offsetting Emissions Associated with Fleet Fuel Consumption: On-going expense
- Using Total Cost of Ownership for New Vehicle Purchases: Long-term savings

This funding proposal focuses on these four recommendations.

Part I: Funding ZEV Purchases and Associated Infrastructure

The Sustainability Council approved the Report's recommendation to use a 10-year total cost of ownership (TCO) for purchasing new vehicles. Some zero-emissions vehicles (ZEVs) have lower TCO than comparable internal combustion engine vehicles (ICEVs) due to lower fueling and maintenance costs for ZEVs. State and federal incentives for ZEV purchasing can also reduce purchase prices. Using a TCO approach will generate savings for the university within the first 10 years of ownership of every new vehicle purchased. However, these savings are not expected to be a source of funding for the initial years of the program.

For this reason and to incentivize the transition to ZEV purchases, it is proposed that UMD implement a fossil fuel surcharge per gallon of gasoline and diesel pumped on campus and through designated fuel cards for UMD fleet vehicles starting in FY21. A fossil fuel surcharge could be a source of initial funding, encourage campus units to reduce fossil fuel consumption in existing fleet vehicles and transition more quickly to ZEVs. This surcharge could be established in two parts. The first, a ZEV Transition Surcharge, and the second, a Carbon Surcharge. It is recommended that the total surcharge begin at 20 cents per gallon to generate an estimated \$134,000 annually. This is expected to be sufficient to fund the early years of transition and pay for verified carbon credits. The following rates are recommended:

<u>Name</u>	<u>Rate</u>	<u>Revenue</u>
ZEV Transition Surcharge	\$0.14/gallon	\$ 94,000 in FY21 ¹
Carbon Surcharge	<u>\$0.06/gallon</u>	<u>\$ 40,000 in FY21²</u>
Total:	\$0.20/gallon	\$ 134,000 in FY21

A ZEV Transition Surcharge could pay for a consultant to develop a ZEV Infrastructure Plan, subsidize purchase prices of ZEVs to make their 10-year TCO competitive with comparable ICEVs, and fund

¹ Based on 668,968 gallons of gasoline and diesel pumped on campus in 2018.

² UMD fleet emissions equaled 8,273 MTCO₂e in 2018 including 608,579 gallons of gasoline and diesel pumped on campus, 158,896 gallons of gasoline and diesel purchased on fuel cards or reimbursed for privately-owned vehicle usage, and 57,018 gallons of gasoline and diesel purchased by units at non-centralized campus locations. Surcharge is based on 8,273 MTCO₂e / 668,968 gallons pumped at MTS and DOTS fuel stations on campus or off campus with university fuel cards controlled by Motor Transportation Services, so the surcharge on pumped fuel pays the carbon offset cost for all pumped, purchased, and reimbursed fuel.

equipment and labor costs associated with installing ZEV infrastructure on campus. The Sustainability Council voted in November 2019 to prioritize the development of a ZEV Infrastructure Plan, which is estimated to cost \$50,000, but could cost more when UMD develops a comprehensive scope of work and obtains pricing. The Administrative Modernization Program has offered to take the lead on this project. If the project begins in FY20, then an alternative funding source will need to be identified to cover the consultant costs in its first year. If a ZEV Transition Surcharge is implemented in FY21, then revenue collected through the surcharge during FY21 could reimburse the alternative funding source for expenses incurred in FY20.

In the second and subsequent years of the transition, the ZEV Transition Surcharge revenues could be used to subsidize purchase prices of ZEVs and pay costs associated with installing ZEV infrastructure starting in FY22. It is expected that annual revenue from this surcharge would be relatively stable for a few years if the rate remains at \$0.14/gallon. Although the quantity of fuels pumped on campus has grown over the past decade, that quantity could start to level off as the Fleet Modernization Program begins implementing its projects, old fleet vehicles are replaced with ZEVs/more fuel-efficient models, and some of the demand for Shuttle-UM is met by the Purple Line. UMD can expect to collect approximately \$90,000 per year from this surcharge.

Relative to carbon mitigation during the transition, UMD has already established the practice of using an internal carbon fee to integrate carbon costs in decision-making, generate revenue for carbon credit purchasing, and help the university achieve its goal of carbon neutrality. A carbon surcharge is currently assessed on air travel. The university also purchases verified carbon credits to address emissions from fuel burned to supply thermal energy in new buildings and major renovations, and emissions from undergraduate student commuting. Implementing a carbon surcharge on fossil fuels used by the UMD fleet is consistent with this approach. UMD would use Carbon Surcharge revenue, beginning in FY21, to purchase verified carbon credits to offset all greenhouse gas emissions associated with UMD's fleet operations.

The estimated cost for offsetting all of UMD's fleet emissions in FY21 is \$37,000 if emissions remain at or around 2018 levels (8,273 MTCO_{2e}) and assuming an average carbon credit price of \$4.40 in that year. Market analysts expect the price of verified carbon credits will increase annually beginning in 2020 when many organizations around the world increase demand for credits to meet carbon reduction goals. As such, UMD may need to adjust its carbon surcharge rate for FY22 and future years.

Part II: Budgetary Impact on Campus Units

A combined surcharge rate of \$0.20/gallon of gasoline or diesel is expected to have a nominal budgetary impact on most campus units. The majority of fuel pumped centrally on campus is diesel. A total of nine campus units used the diesel pump on campus in 2018. Of those nine units, only two would have a budgetary impact greater than \$500: FM - Solid Waste, estimated cost is \$3,800; and DOTS - Shuttle-UM, estimated cost is \$73,000.

Shuttle-UM alone uses 60% of all fuel and 94% of all diesel pumped centrally on campus. Although most of UMD's fleet emissions are associated with Shuttle-UM, this valuable transit service reduces UMD's gross emissions by minimizing the number of private vehicles that students, faculty, and staff use for

commuting. A budgetary impact of \$73,000 for Shuttle-UM represents a 2% increase on this unit's operating budget (\$3,625,370 in FY19 according to DOTS' 2018 Annual Report).

Part III: Implementation

The University Sustainability Council and Vice President for Administration and Finance (VPAF) should consider implementing a fossil fuel surcharge beginning in FY21. As part of the implementation, it is recommended that:

- A new ZEV Infrastructure Fund account be established to collect revenue from the ZEV Transition Surcharge and distribute funds to campus units for ZEV expenses (as described in the Carbon Neutral Fleet Work Group Report). A campus unit responsible for this fund and the logistics of collecting supporting data by units operating fueling stations will need to be established. OS may establish a workgroup of key stakeholders to accomplish this task.
- Revenue from the Carbon Surcharge should transfer to the existing Greenhouse Gas Reduction Fund, which is used to make annual verified carbon credit purchases or, when applicable, to fund campus projects that cost-effectively reduce direct emissions. OS will utilize this funding and report annually to the Sustainability Council on verified carbon credits purchased to offset fleet emissions.
- Approximately 20% of the gasoline supplied by Motor Transportation Services (MTS) for UMD's fleet vehicles is pumped off campus using designated fuel cards. It is recommended that MTS include the fossil fuel surcharge when they bill units for gasoline pumped using the fuel cards. MTS would transfer the collected funds (approximately \$12,000 a year) directly into the new ZEV Infrastructure Fund account each July after the close of the fiscal year.

Part IV: Periodic Review of the Fossil Fuel Surcharge

OS will consult with key stakeholders annually to review the fossil fuel surcharge and determine if any adjustments are needed to cover program costs. OS will make a recommendation to the VPAF if an adjustment to the surcharge is appropriate. It is likely that UMD could gradually reduce and ultimately phase out the fossil fuel surcharge in future years. This will be based upon the installation of sufficient ZEV infrastructure, the ZEV TCO is competitive with ICEV TCO without a subsidy, other sources of revenue become available, and the carbon footprint of UMD's fleet is reduced.



Proposed Projects: Fall 2019



Statistics

FY19 Revenue	\$338,000	Total in Fund	\$301,718
FY19 Carry-Forward	\$33,975	Total Requested 11 projects	\$431,514.27
Mini-Grant Transfer	\$15,257	Total Recommended	\$177,810.45 (59%)
Carbon Offsets Transfer	\$55,000	Remaining in Fund	\$123,907.55 (41%)



Projects Recommended

1. Including Estimates of Campus Forest Carbon in UMD's Climate Action Plan
2. Compology Collaboration on Waste and Recycling Sensor Data
3. Food Recovery Network
4. Rain Barrels for Sustainable Greek Living
5. Student Knowledge and Behaviors Toward Food Date Labeling: Integrating Innovative Research with Education to Reduce Food Waste on Campus
6. reACT REGENERATED, 2020 Solar Decathlon Middle East
7. Monitoring Effects of Campus Creek Stream Restoration on Water Quality

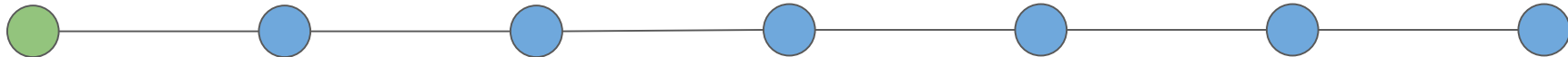
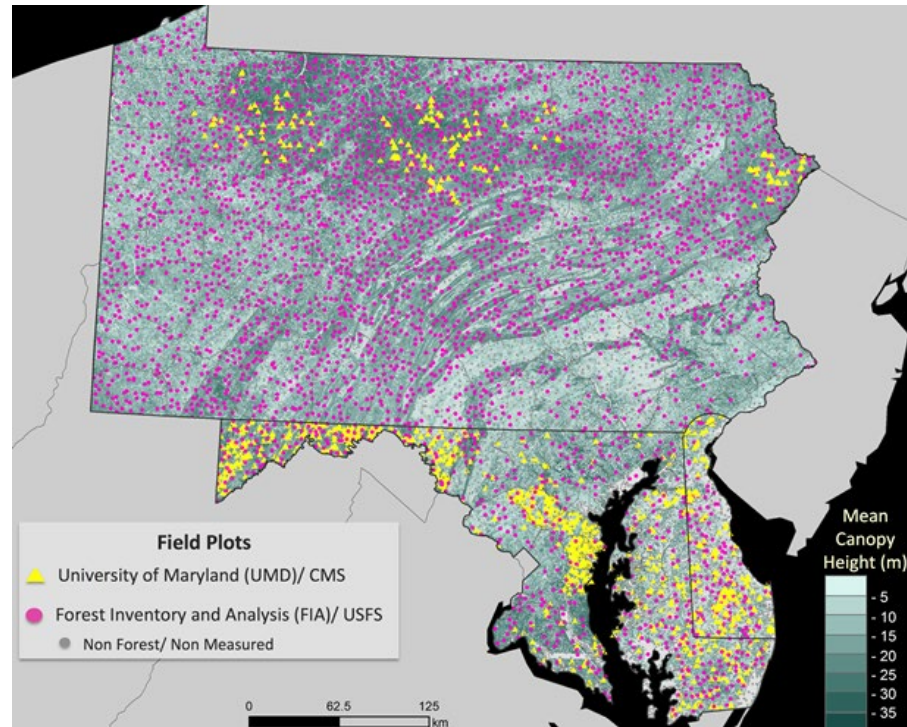


Including Estimates of Campus Forest Carbon in UMD's CAP

Requested: \$80,292.00

Submitted by: Rachel Lamb, GEOG
Graduate Student

SFRC recommendation: \$27,861.00



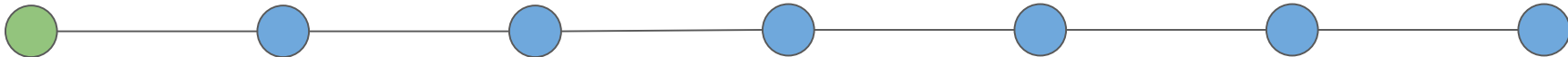
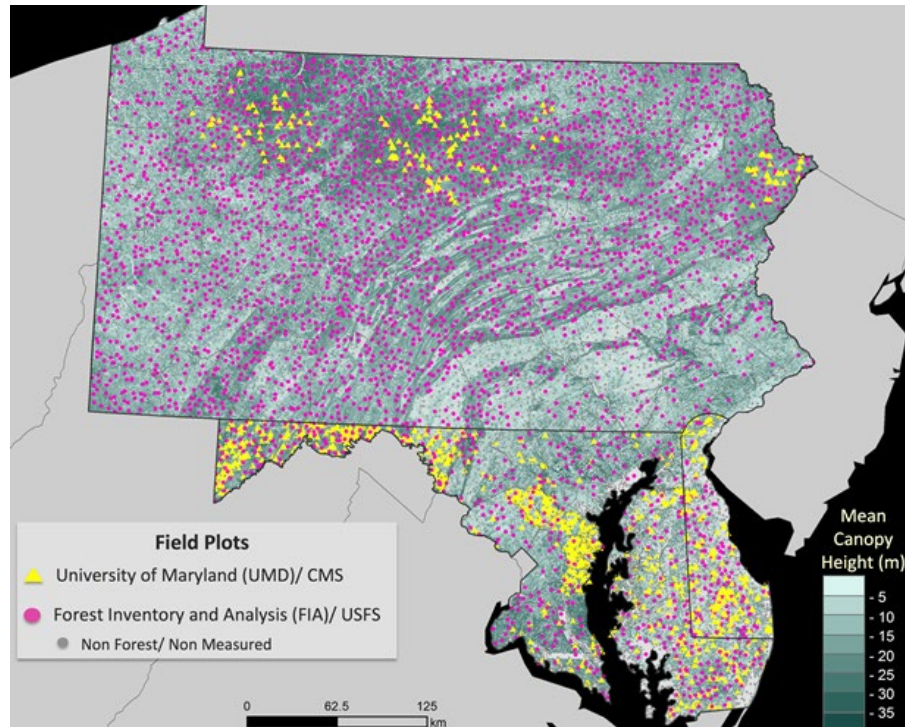


Including Estimates of Campus Forest Carbon in UMD's CAP

Summary: Develop a remote sensing methodology to calculate land-based carbon to incorporate to the campus' carbon footprint.

Benefits

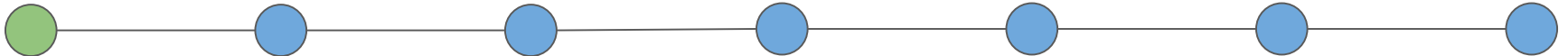
- Get data about carbon sequestering by our forests
- If applicable, adjust UMD offset purchases and expenses





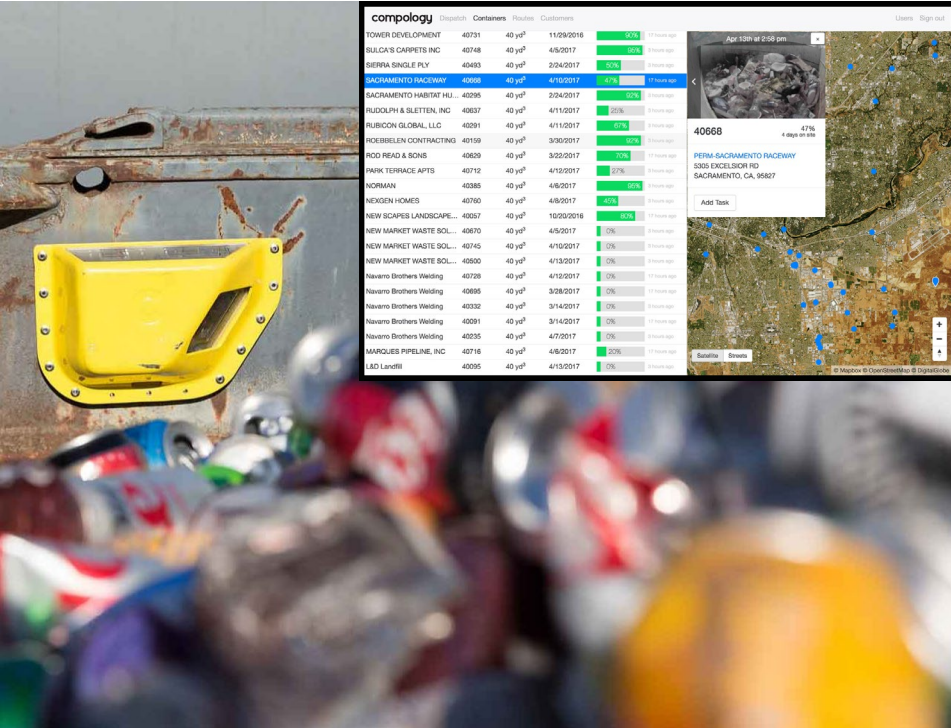
Recommended Budget

Item	Cost
4 Undergraduates Stipend (1280 hours)	\$16,640
1 Graduate Student Stipend (200 hours)	\$5,192
Faculty Fringe Benefits	\$1,179
Research Materials	\$3,400
Computer System Support	\$950
Other	\$500





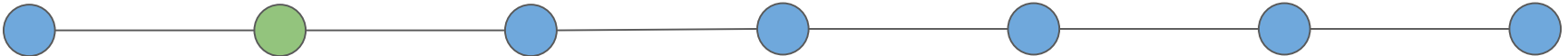
Compology Collaboration on Waste and Recycling Sensor Data



Requested: \$6,000.00

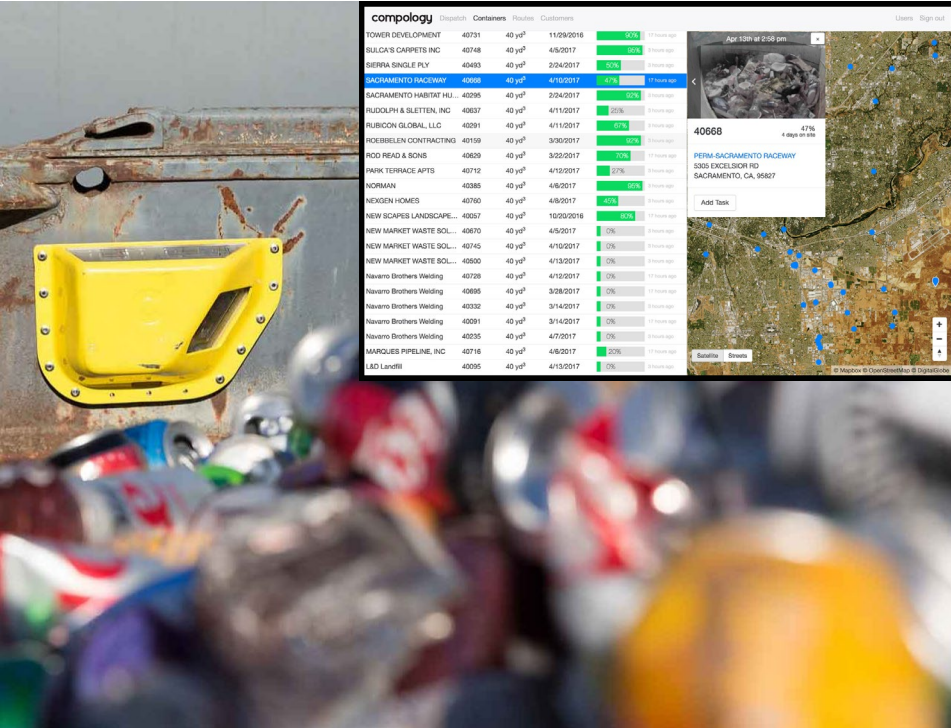
Submitted by: Dr. Joseph Bailey,
QUEST Faculty

SFRC recommendation: \$3,000.00





Compology Collaboration on Waste and Recycling Sensor Data



Summary: Install two Compology Starter Packs on UMD dumpsters to collect/analyze real-time data on its contents and management.

Benefits

- Improve waste and recycling management on campus through real-time updates
- May lead to cost reduction

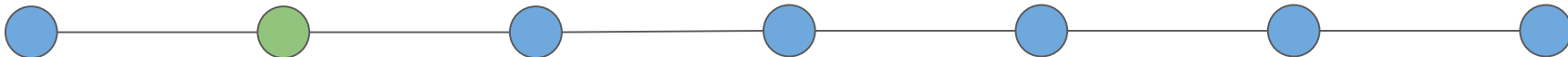




Recommended Budget

Item	Cost
Starter Pack w/Installation	\$3,000

Each pack has 5 cameras, mounting hardware, fullness + contamination SaaS for 1 year. FM will pay for one of the packs, so they adjusted their request to \$3,000



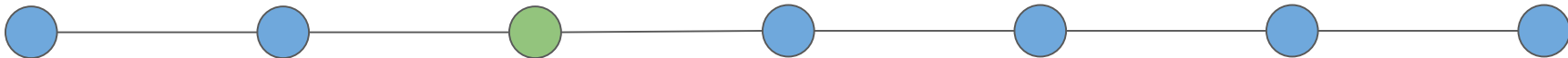


Food Recovery Network

Requested: \$4,541.25

Submitted by: Yuzhu Shi, CMNS
Undergraduate Student

SFRC recommendation: \$4,541.25





Food Recovery Network

Summary: Cover the cost of operations for the first 60 days of the semester to request >\$1,500 from SGA to expand operations.

Benefits

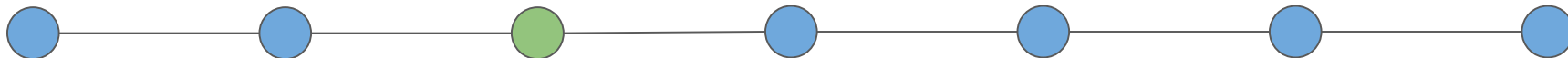
- Reduce UMD food waste
- Reduce food insecurity in the DMV area





Recommended Budget

Item	Cost
Aluminum Lids (x75 cases of 50)	\$1,638.75
Aluminum Pans (x75 cases of 50)	\$2,902.50





Rain Barrels for Sustainable Greek Living



Requested: \$15,065.00

Submitted by: Heidi Biffel, Greek Life Staff

SFRC recommendation: \$15,065.00





Rain Barrels for Sustainable Greek Living



Summary: Purchase 42 rain barrels. Two for each of the 21 UMD-owned fraternity and sorority houses, and have student-led installation.

Benefits

- Reduce stormwater runoff around Greek housing
- Increase student awareness about stormwater management





Recommended Budget

Item	Cost
50 Gallon Rain Barrel (x42)	\$7,140
50 Gallon Rain Barrel Stand (x42)	\$2,520
Universal Diverter System (x42)	\$1,680
Fasteners, Downspout Connections	\$840
Tools (including saw, drill, level, measuring tape, screw driver, PPE)	\$334
Educational Signage on Upcycled Road Signs	\$550
Student Employee Stipend (x2)	\$2,000

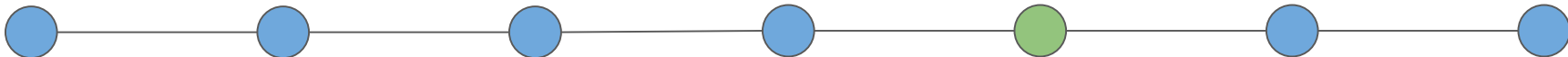




Requested: \$20,490.00

Submitted by: Dr. Debasmita Patra,
ENST Faculty

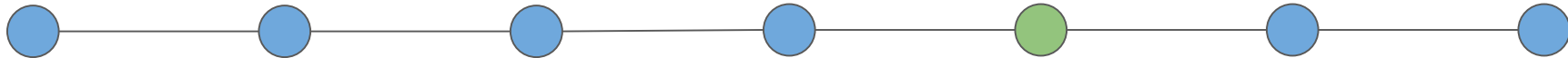
SFRC recommendation: \$14,965.00





Benefits

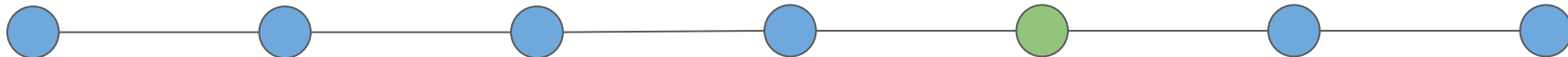
- Develop an effective, targeted education approach to improve date labeling observance
- Reduce food waste by students





Recommended Budget

Item	Cost
15 Students Stipend (1,000 hours)	\$12,000
Doughnuts (x300)	\$300
Posters (x4)	\$240
In-house Graphic Designer	\$1,000
Video	\$1,425





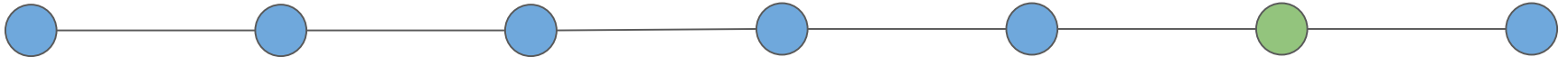
reACT REGENERATED, 2020 Solar Decathlon Middle East



Requested: \$100,000.00

Submitted by: Patricia Cossard

SFRC recommendation: \$60,000.00





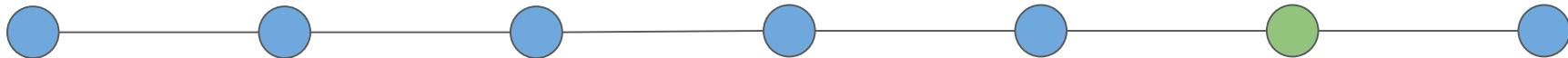
reACT REGENERATED, 2020 Solar Decathlon Middle East



Summary: Regenerate and adapt the modular, net-zero house 2017 reACT for the 2020 Solar Decathlon.

Benefits

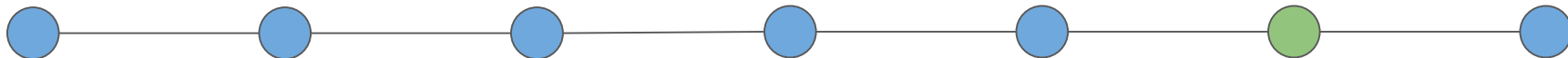
- Advance research of resilient adaptive climate technology
- Produce outreach educational materials for local schools
- Install the house by APP school





Recommended Budget

Item	Cost
Architectural materials for Greenhouse repair	\$8,000
Solar Thermal Installation	\$5,000
Living Systems (Materials and Equipment for Hydroponics)	\$30,000
PV & Batteries (~30 PV panels, racking, L-ion batteries, wiring, etc.)	\$17,000



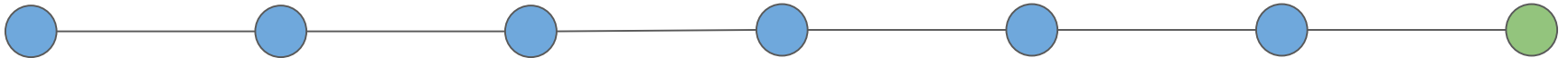


Monitoring Effects of Stream Restoration on Water Quality

Requested: \$47,200.00

Submitted by: Dr. Sujay Kaushal,
GEOL Faculty

SFRC recommendation: \$47,200.00



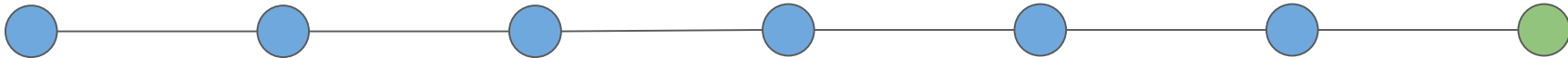


Monitoring Effects of Stream Restoration on Water Quality

Summary: Monitor water quality to determine the environmental impacts of the Campus Creek Restoration Process, which used Regenerative Stormwater Conveyance (RSC)

Benefits

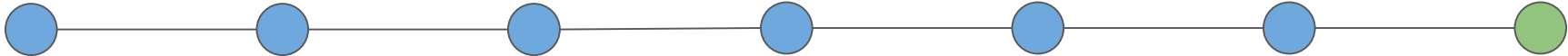
- Recommend to either continue to use RSC or change methods





Recommended Budget

Item	Cost	Item	Cost
HDPE Bottles	\$750	Streamwater Sample Processing	\$5,000
Water Quality Analyses	\$15,000	Groundwater Well Set-up	\$500
Gas Tanks	7,000	Groundwater Well Sampling	\$200
Reagents	\$5,000	Groundwater Sample Processing	\$5,000
Field Meters	\$6,000	EPA Certified Standards	\$2,000
		Stream Sampling Equipment	\$750



Summary of Initial Public Procurement Process for Verified Carbon Credits

Prepared November 27, 2019

Background

The University of Maryland (UMD) elected to offset carbon emissions from air travel and undergraduate student commuting beginning in CY2018. A Carbon Offset Work Group had previously made recommendations to the Sustainability Council regarding criteria for the selection of verified carbon credits that were adopted. The Office of Sustainability worked with the departments of Procurement and Strategic Sourcing and Engineering and Energy to issue a Request for Proposals based on the accepted criteria. In 2019, two contracts were awarded to ensure that UMD can obtain the required carbon credits, meet all of the criteria, and explore developing new projects. NativeEnergy and WGL Energy were each issued three-year contracts with the possibility of renewal for up to five years. The contracts can be utilized by other public entities and institutions of higher education.

Summary of Carbon Credit Purchases for CY 2018

The total amount available for purchasing verified carbon credits to offset unavoidable greenhouse gas emissions in CY 2018 was \$286,879.13. The Comptroller collected \$236,879.13 through the carbon neutrality surcharge on air travel in 2019 and deposited this amount into Greenhouse Gas Reduction Fund. The University Sustainability Fund deposited \$50,000 into the Greenhouse Gas Reduction Fund to offset emissions associated with undergraduate commuting in CY 2018.

UMD spent \$204,487.50 on verified carbon credits sourced from NativeEnergy and \$72,865.15 on verified carbon credits sourced from WGL Energy, for a total cost of \$277,352.65. As detailed in the Sustainability Progress Report presented to the Sustainability Council on October 10, 2019 and in the Carbon Neutral Commuting Report presented to the SGA Sustainability Committee on November 14, 2019, UMD purchased verified carbon credits from three types of projects in 2019:

- Methane capture from landfills in the Chesapeake Bay Watershed coupled with financial support for the Chesapeake Bay Foundation's climate change programs that focus on tree planting in Maryland (priced from \$3.90 to \$4.25 a ton)
- Capture of naturally occurring methane released from unmined coal beds on Ute tribal land in Colorado (priced at \$5.50 a ton)
- Wind power to satisfy growing demand for electric power in India (priced at \$2.00 a ton)

UMD was able to leverage pricing to purchase a buffer of 58,350 carbon credits that will be saved for future years to mitigate costs as market analysts expect voluntary carbon credit prices to increase beginning in CY 2020 due to impending societal carbon reduction targets. From CY 2017, UMD also retained 7,199 MT-CO₂e in verified carbon credits from methane capture at regional landfills and was able to use these to offset some CY 2018 emissions and all air travel emissions that were reported late for CY 2017.

Summary Table of Carbon Credits Retired to Offset Emissions for CY 2018

UMD retired a total of 60,927 MT-CO₂e of verified carbon credits to offset emissions from CY 2018. The table below reports quantities, sources and average prices for credits retired to neutralize portions of UMD's emissions.

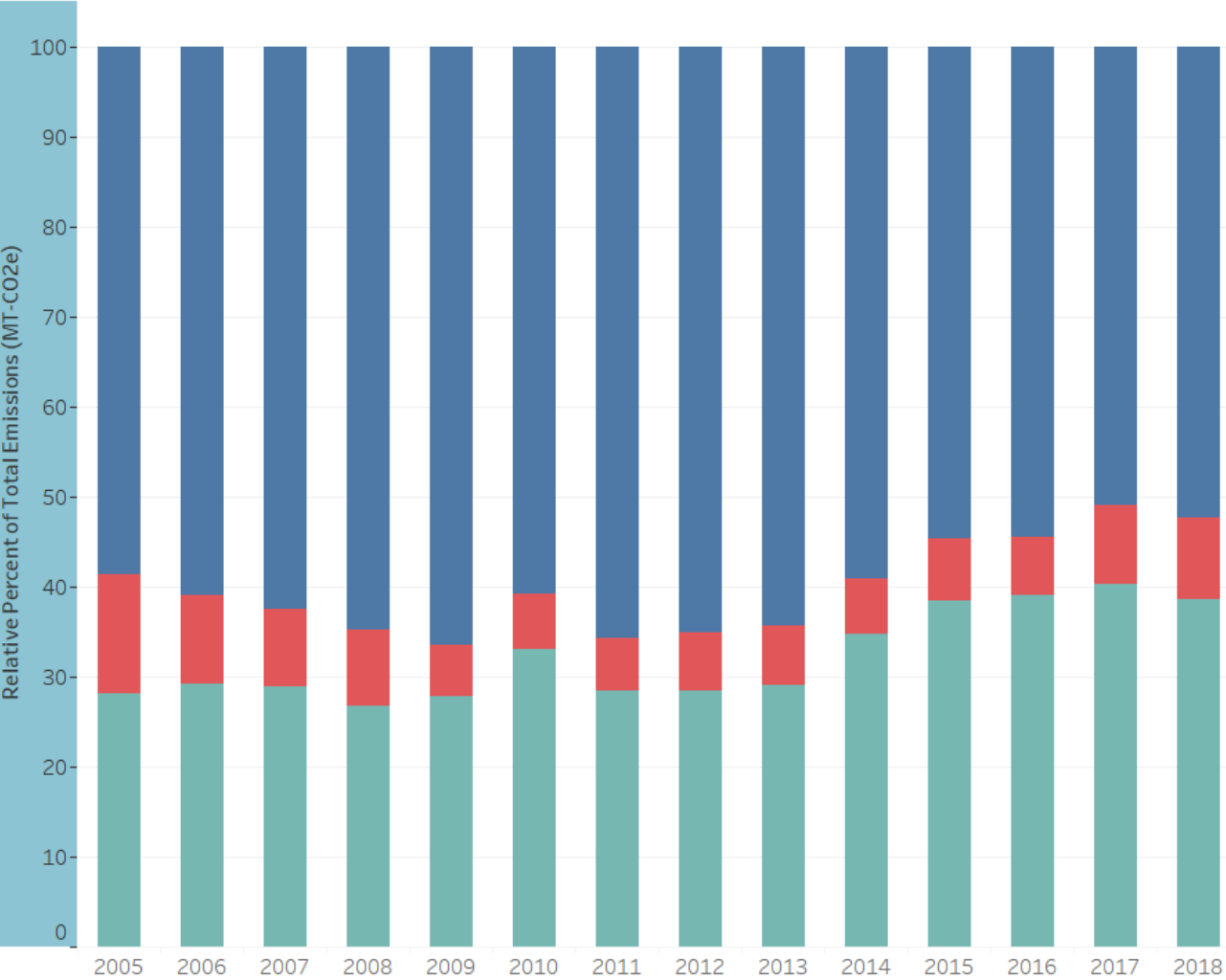
Emissions Source	2018 Emissions (MT-CO ₂ e)	Credits Retired (MT-CO ₂ e)	Avg. Price per Credit
<i>UMD Business Flights</i>	34,640	Landfill Methane: 16,117 India Wind: 18,523 Total: 34,640	\$2.92
<i>Study Abroad Flights</i>	13,477	Landfill Methane: 3,500 India Wind: 9,977 Total: 13,477	\$2.58
<i>Undergraduate Commuting</i>	12,810	Ute Methane: 3,445 Landfill Methane: 3,445 India Wind: 5,920 Total: 12,810	\$3.55



Carbon Neutral Commuting

Report to Undergraduate Students
2018-2019

Relative Percent of Total Emissions: Transportation, Energy, and Operations/Waste Management



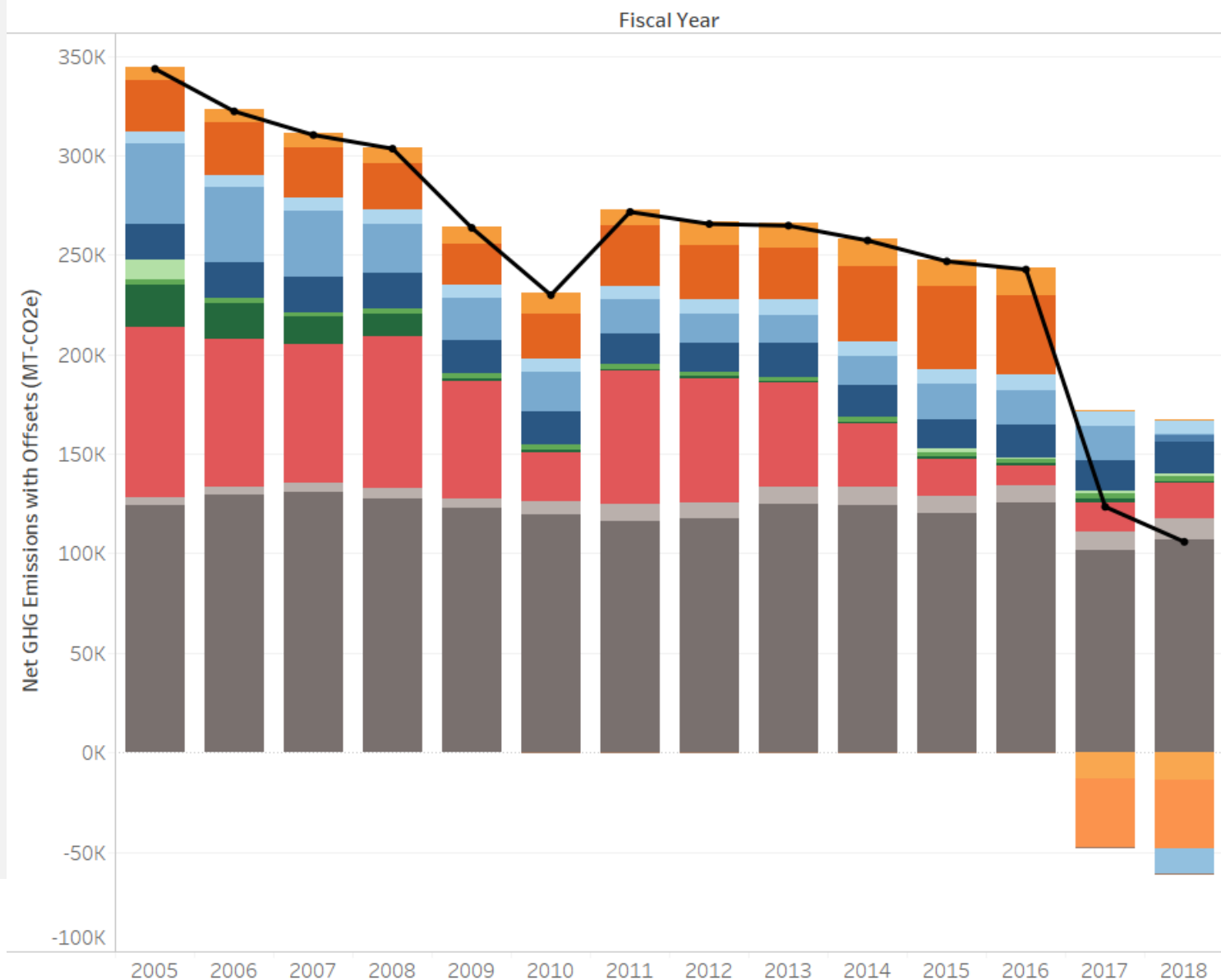
Sum of Percent (as whole number) of Annual GHG MTCDE Total for each Calendar Year. Color shows details about Type of Emission Source. The view is filtered on Type of Emission Source, which keeps Energy, Operations/Waste and Transportation.

Type of Emission Source

- Energy
- Operations/Waste
- Transportation



University of Maryland Greenhouse Gas Emissions (MT-CO2e)



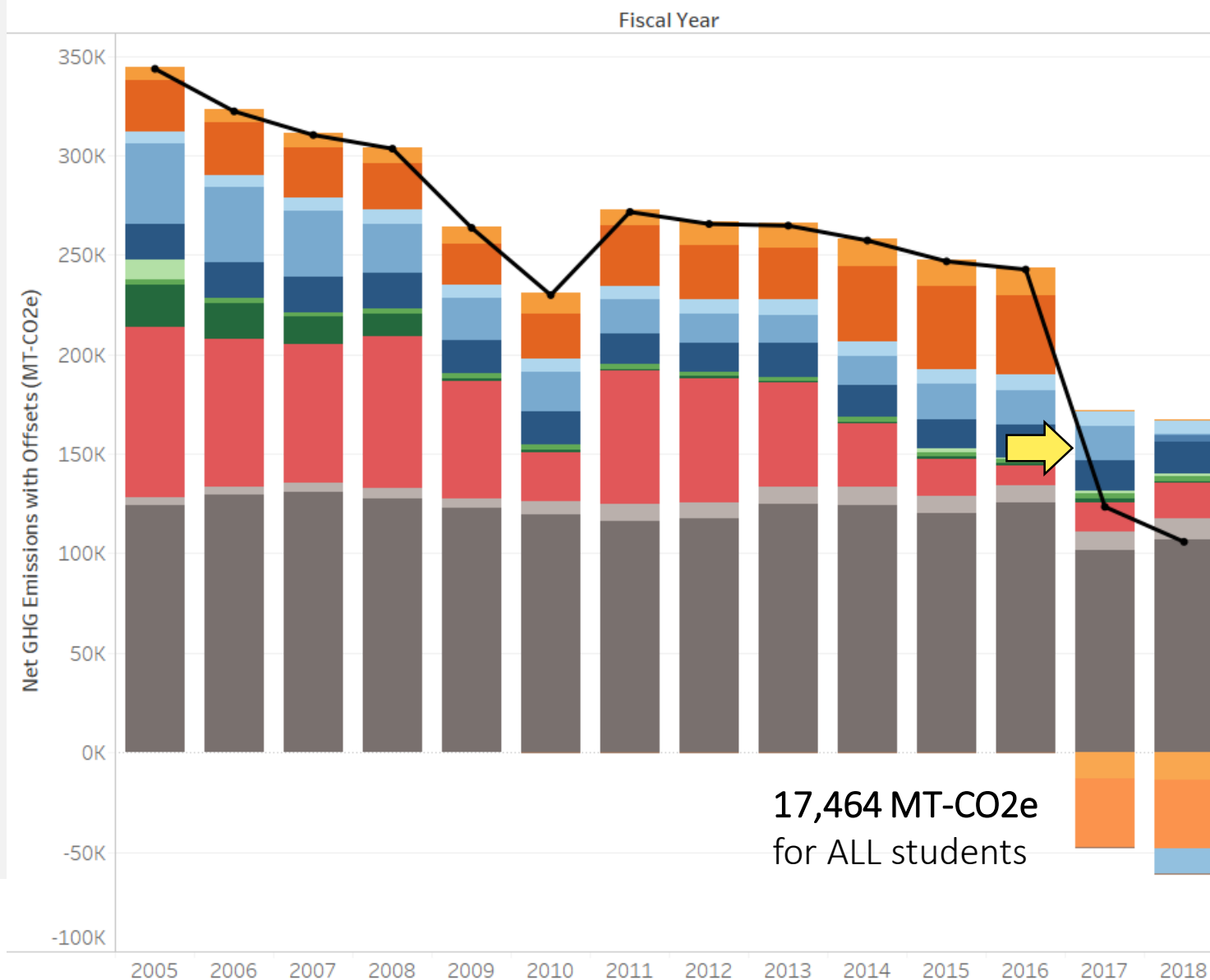
The trends of sum of Net GHG MTCDE (w/ Offsets) and sum of Net GHG MTCDE (w/ Offsets) for Fiscal Year. For pane Sum of Net GHG MTCDE (w/ Offsets): Color shows details about Source. The data is filtered on Type of Emission Source, which keeps Energy, Offsets, Operations/Waste and Transportation.

Source

- Study Abroad Air Travel
- Directly Financed Air Travel
- Campus Fleet
- Undergraduate Student Commuting
- Graduate Student Commuting
- Faculty/Staff Commuting
- Refrigerants & Chemicals
- Fertilizer & Animals
- Solid Waste
- T&D Losses
- Purchased Electricity
- Other On-Campus Stationary
- Co-gen Steam
- Compost Offset
- Student Commuting Offset
- Directly Finance Air Travel Offset
- Study Abroad Air Travel Offset



University of Maryland Greenhouse Gas Emissions (MT-CO2e)

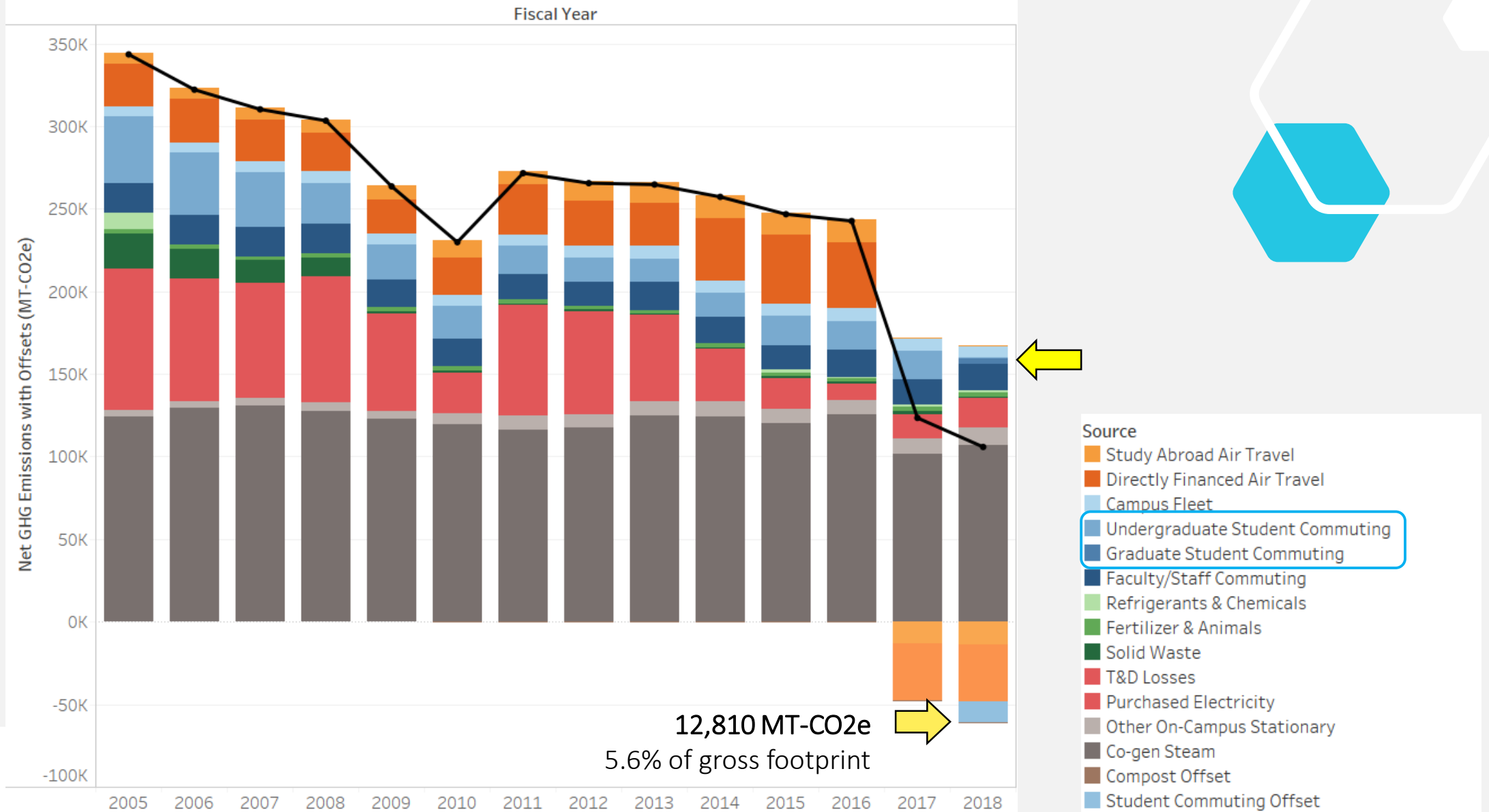


The trends of sum of Net GHG MTCDE (w/ Offsets) and sum of Net GHG MTCDE (w/ Offsets) for Fiscal Year. For pane Sum of Net GHG MTCDE (w/ Offsets): Color shows details about Source. The data is filtered on Type of Emission Source, which keeps Energy, Offsets, Operations/Waste and Transportation.

Source

- Study Abroad Air Travel
- Directly Financed Air Travel
- Campus Fleet
- Undergraduate Student Commuting
- Graduate Student Commuting
- Faculty/Staff Commuting
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University of Maryland Greenhouse Gas Emissions (MT-CO2e)



The trends of sum of Net GHG MTCDE (w/ Offsets) and sum of Net GHG MTCDE (w/ Offsets) for Fiscal Year. For pane Sum of Net GHG MTCDE (w/ Offsets): Color shows details about Source. The data is filtered on Type of Emission Source, which keeps Energy, Offsets, Operations/Waste and Transportation.

2018 Verified Carbon Credits

- Metered projects
- Pass Additionality Tests
- 2017 and 2018 vintage years
- Methane Capture
 - Local Landfill gas to Electricity
 - Natural Unmined Coal Beds
- Clean Power (outside of US)



Carbon Credit Co-Benefits

- Financial and Service Support of Chesapeake Bay Foundation
- Tree plantings in Maryland



Carbon Credit Co-Benefits

- Financial and Service Support of Chesapeake Bay Foundation
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- Support for Tribal Nation (aligns with ReAct Solar Decathlon House)



Carbon Credit Co-Benefits

- Financial and Service Support of Chesapeake Bay Foundation
- Tree plantings in Maryland
- Support for Tribal government (aligns with ReAct Solar Decathlon House)
- Climate Justice link (Energy Poverty)





Contracts for Carbon Credit Purchasing and Development



A Public Benefit Corporation



CHESAPEAKE BAY FOUNDATION

Saving a National Treasure



Natural Methane Capture and Use with Southern Ute Indian Tribe



[Read more about this Project on Native Energy's website](#)

Renewable Wind Power to Address Energy Poverty in India



[Read more about this Project on Native Energy's website](#)



2017 Carbon Offset Portfolio

Protecting the Chesapeake Bay and Increasing Maryland's Resilience to Climate Change

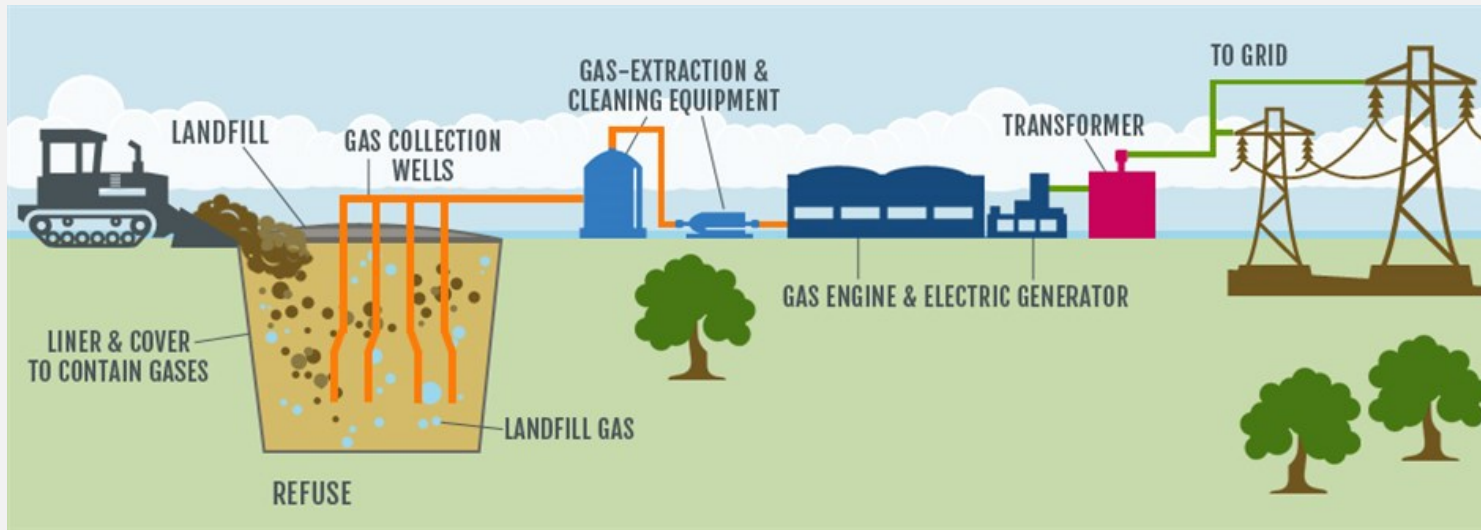
- Tree plantings throughout Maryland in partnership with the Chesapeake Bay Foundation
- Verified offsets from projects that capture methane emissions at regional landfills

Student Involvement: Academic and Extracurricular

- Carbon Management class in School of Agriculture & Natural Resources worked with the Chesapeake Bay Foundation to quantify carbon sequestration at tree planting sites
- Alternative Breaks trip to Chesapeake Bay Foundation greenhouse to plant sycamore seedlings for use at tree planting sites



Landfill Methane Capture and Use with VA and PA Landfills

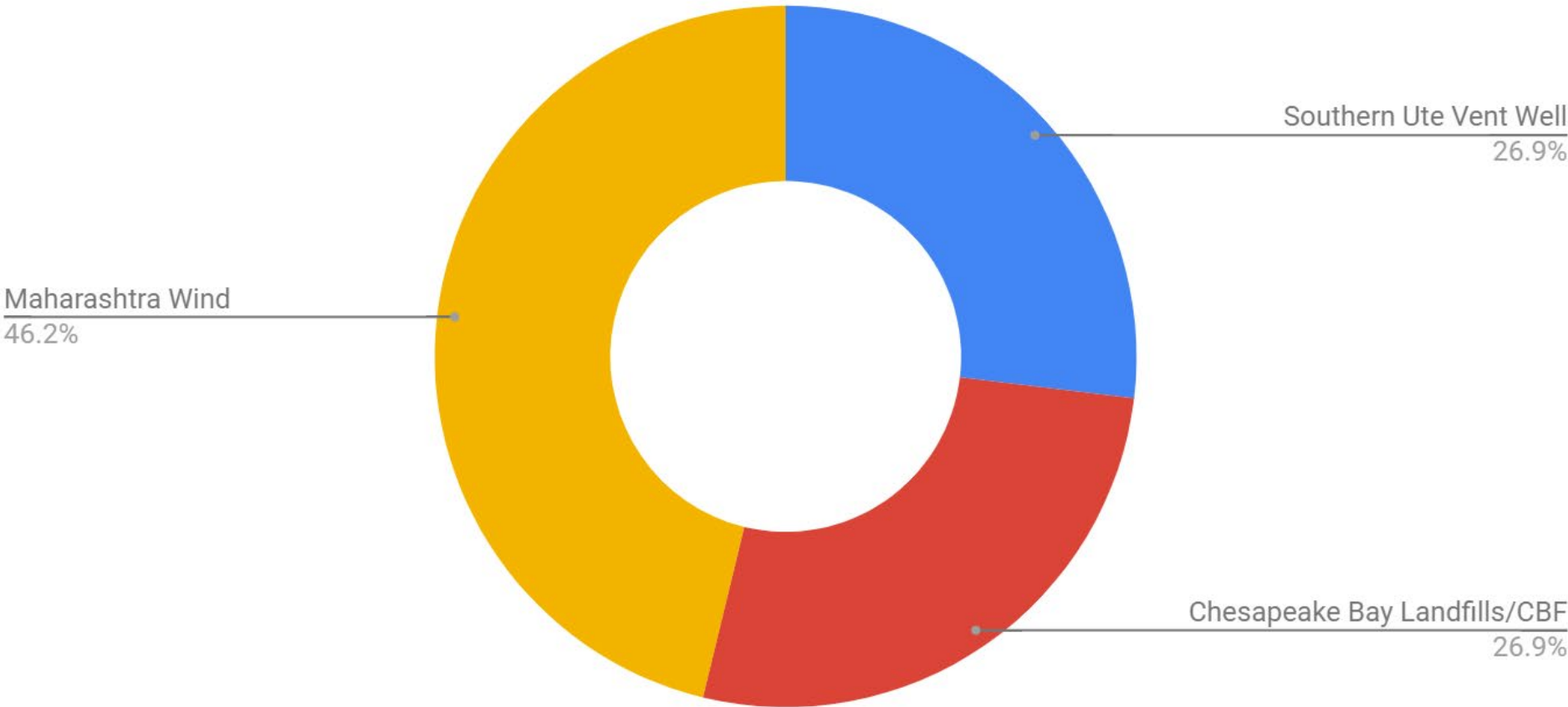


[Learn more about one of these projects](#) in a Henrico County Public Relations Video titled *From Garbage to the Grid: A Powerful By-Product of Henrico's Trash*

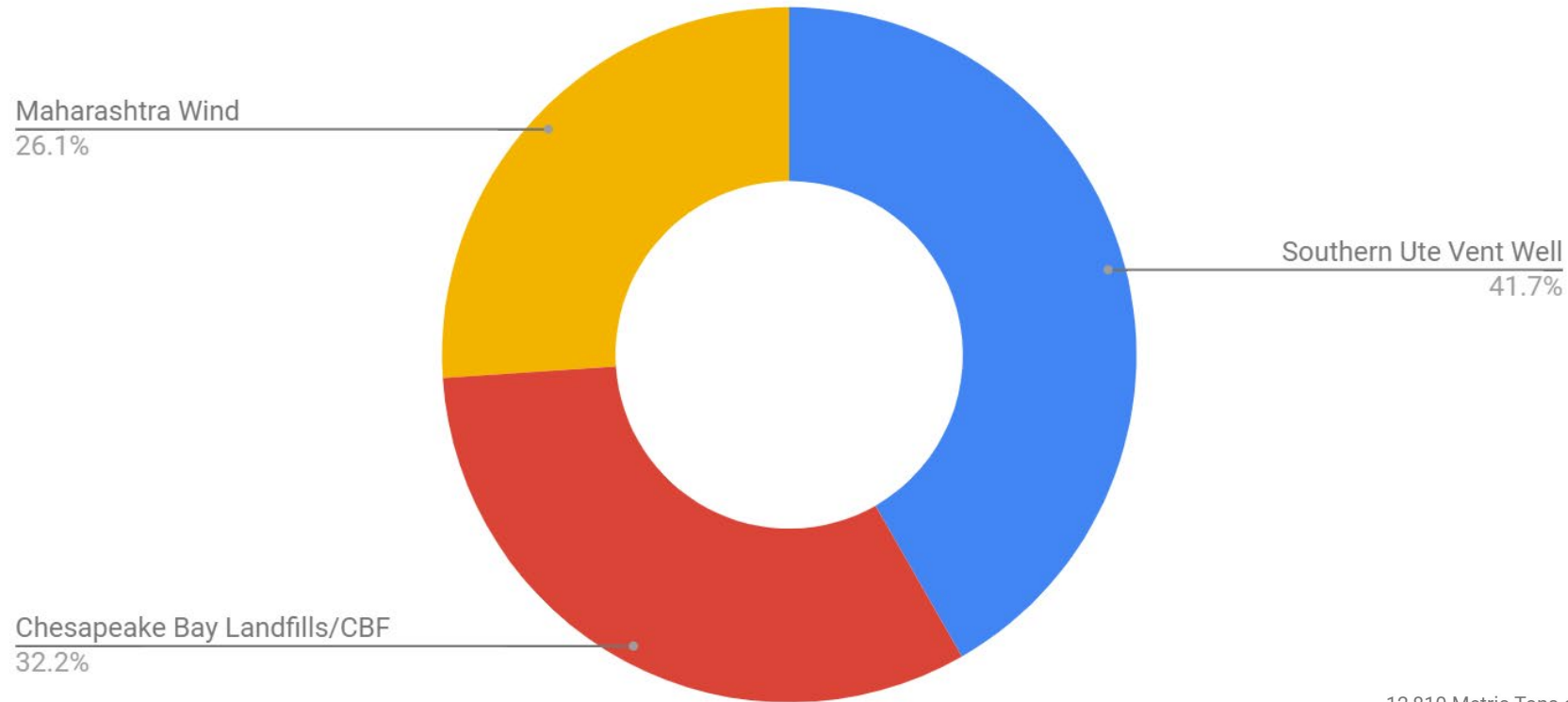


Undergraduate Student Commuting Emissions from Permitted Commuter Vehicles

12,810 Metric Tons of Carbon Dioxide Equivalent were Offset for CY 2018



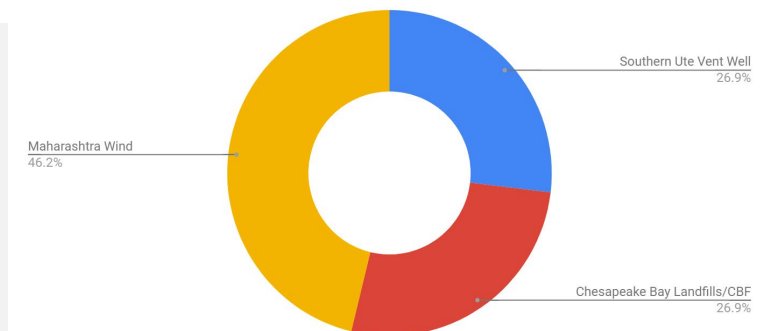
\$45,428.75 spent from University Sustainability Fund for Carbon Credits



\$50,000 was set aside from 2018 Sustainability Fund

\$4,571 will be returned to 2019 Sustainability Fund

12,810 Metric Tons of Carbon Dioxide Equivalent were Offset for CY 2018



Offsetting the 2019 Commuter Footprint

- Forecast Footprint of 13,000 Metric Tons CO₂-e
- Average cost of carbon credits was \$3.55 per ton for 2018
- Inflation Rate of 10% gives average cost of \$3.91 per ton
- Administration is using \$4.00 per ton to project carbon credits costs for 2020

Using **\$3.55** as an expected cost per ton, the Fund should set aside **\$46,150**

Using **\$3.91** as an expected cost per ton, the Fund should set aside **\$50,830**

Using **\$4.00** as an expected cost per ton, the Fund should set aside **\$52,000**