
University of Tennessee, Knoxville
**SUSTAINABILITY
MASTER PLAN**

2020-2030



WAIT!

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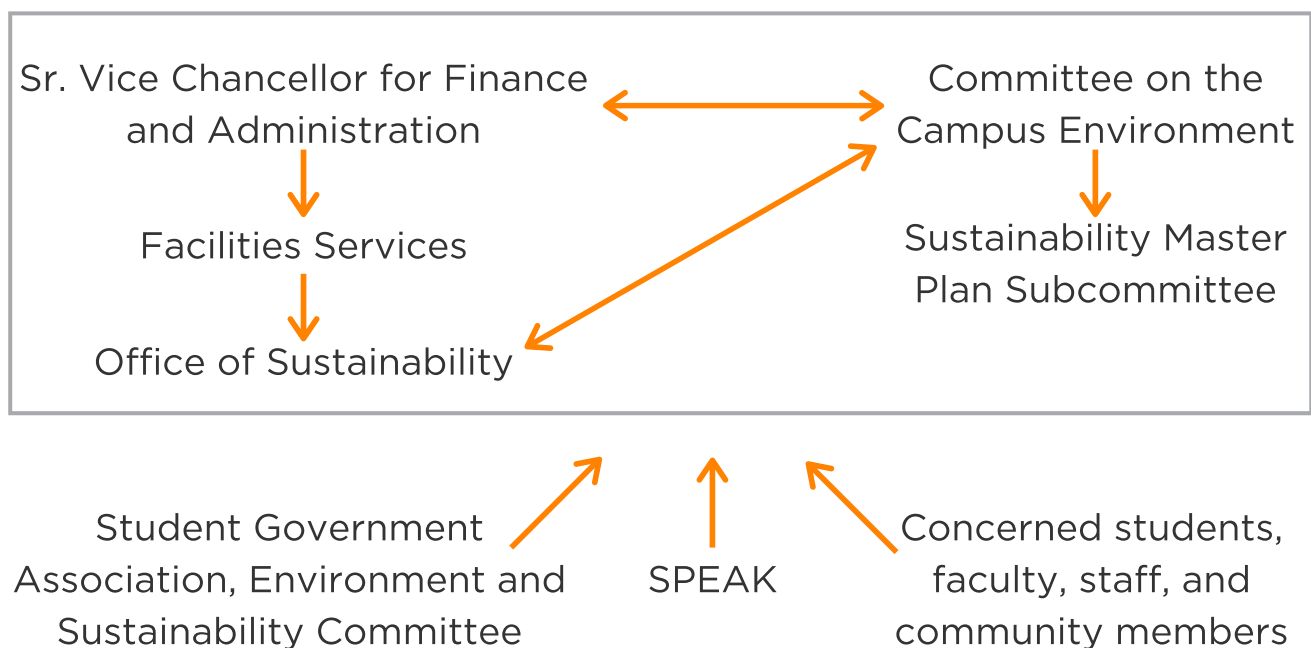
BACKGROUND

Former Chancellor Loren Crabtree signed the American College and University Presidents' Climate Commitment (ACUPCC) on behalf of the University of Tennessee, Knoxville in the fall of 2007. He commissioned the writing of the campus' first Climate Action Plan that same year.

The first Climate Action Plan was published in 2010 and focused on steps towards carbon neutrality. This plan is meant to act as an update to that plan, but has been approached from a more holistic lens.

This Sustainability Master Plan is our vision to achieve carbon neutrality and zero waste as soon as possible, as well as reduce the university's all-around environmental impact. The goals that follow will serve as a guide for the next 10 years for Facilities Services, the Office of Sustainability, and their on- and off-campus partners, with the expectation that potential project lists will be revisited after 5 years.

ACCOUNTABILITY MECHANISMS



RENEWABLE ENERGY CREDITS (RECs)

In 2017, the University of Tennessee, Knoxville was recognized by the EPA as the #1 Green Power Purchaser among colleges and universities in the nation. That year, the university used a portion of the Student Environmental Initiatives Facilities Fee (Green Fee) to purchase 250,070,000 kWh or 250,070 RECs, accounting for 106% of our total electricity use. These RECs allowed UT to claim wind energy produced in Illinois and Tennessee to offset greenhouse gas (GHG) emissions tied to energy usage on campus, meaning that the University of Tennessee, Knoxville technically ran on 100% green power for FY 17.

While the purchase of RECs invests money into the renewable energy industry, it is not guaranteed that the RECs purchased produce new renewable energy or contribute to new renewable energy projects. It is likely that the megawatts of renewable energy associated with the REC would exist whether or not the university had purchased it.

After extensive discussion in early 2019, the Student Environmental Initiatives Committee (SEIC) felt that this was not the most appropriate use of funds intended to reduce the university's energy consumption and decided to discontinue the purchase of RECs for the Knoxville campus. The spike in UT's GHG emissions for FY 18 and FY19 is directly associated with this decision.



These funds, amounting to approximately \$160,000 per year, will be put towards energy efficiency and renewable energy projects moving forward.

2010 CLIMATE ACTION PLAN HIGHLIGHTS

2010

Composting program started to take off, processed 1177.24 tons of waste in FY18

2012

Sustainability Major created within the Department of Geography

2013

Invested green fee money into major energy efficiency project, leading to the establishment of the Green Revolving Fund that uses savings from efficiency projects to fund more efficiency projects

2015

Transitioned steam plant away from coal to natural gas

2016

Installation of 17 electric vehicle charging stations powered by 3 solar arrays on campus and photovoltaic array on the 11th street garage

2018

Gradually increased the campus waste diversion rate from 9% in FY07 to 33% in FY18

2010 CLIMATE ACTION PLAN HIGHLIGHTS

2018

Establishment of the Alternative Fuel Vehicle Assistance Program through the Green Fee, with 7 new electric vehicles and 6 new charging stations funded so far

2019

Creation of the Energy Management Unit within Facilities Services tasked with reducing utility usage

2019

TVA fuel mix has officially broken 50% carbon-free

2019

The Office of Sustainability and UT Recycling merged, eliminating redundancies and allowing AmeriCorps members to take on new focus areas in transportation and program development

2020

Chancellor Plowman signed the Zero Waste Commitment, committing to increase UT's waste diversion rate to 50% by 2030

THE PATH TO CARBON NEUTRALITY



The University of Tennessee, Knoxville became a signatory of the ACUPCC in FY 08. As such, FY 08 was selected as the baseline year for measuring the university's existing and future GHG emissions reduction and carbon offset efforts.

Accordingly, UT Knoxville will strive to meet the following target dates and interim milestones for achieving carbon neutrality:

By FY 20-21, reduce/offset GHG emissions to 20 percent below FY 07-08 levels

By FY 30-31, reduce/offset GHG emissions to 40 percent below FY 07-08 levels

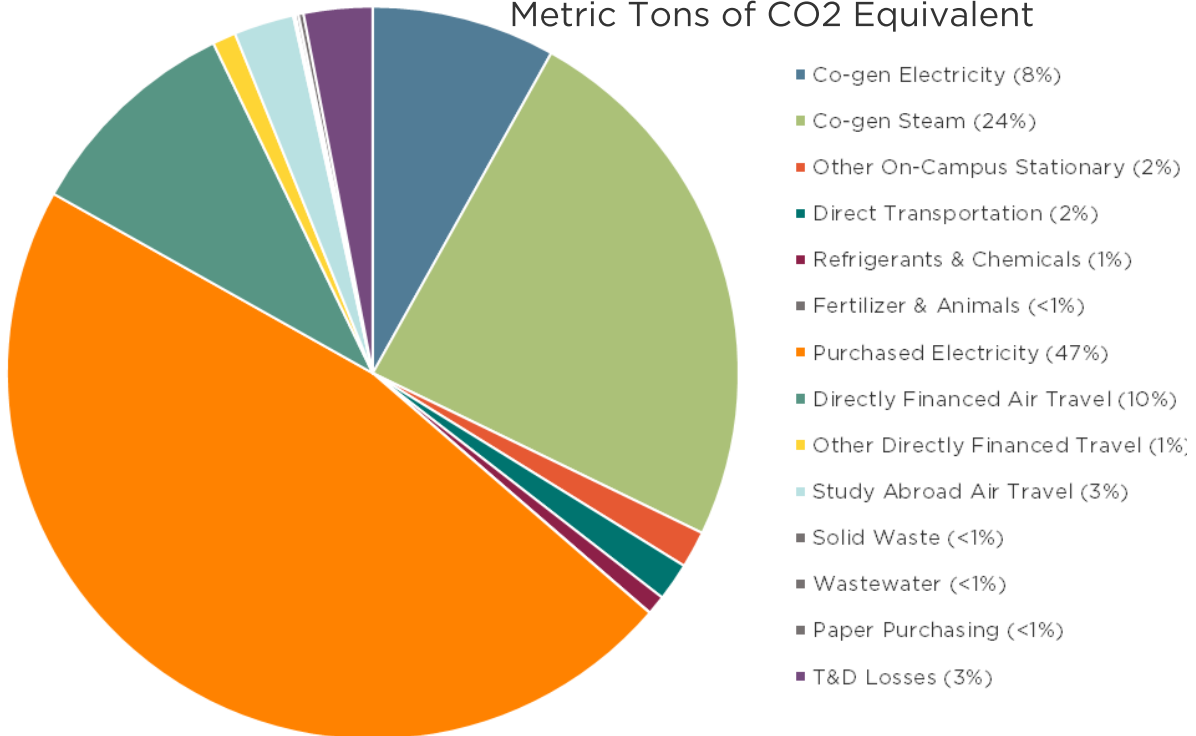
By FY 40-41, reduce/offset GHG emissions to 60 percent below FY 07-08 levels

By FY 50-51, reduce/offset GHG emissions to 80 percent below FY 07-08 levels

By FY 60-61, achieve carbon neutrality (zero net GHG emissions)

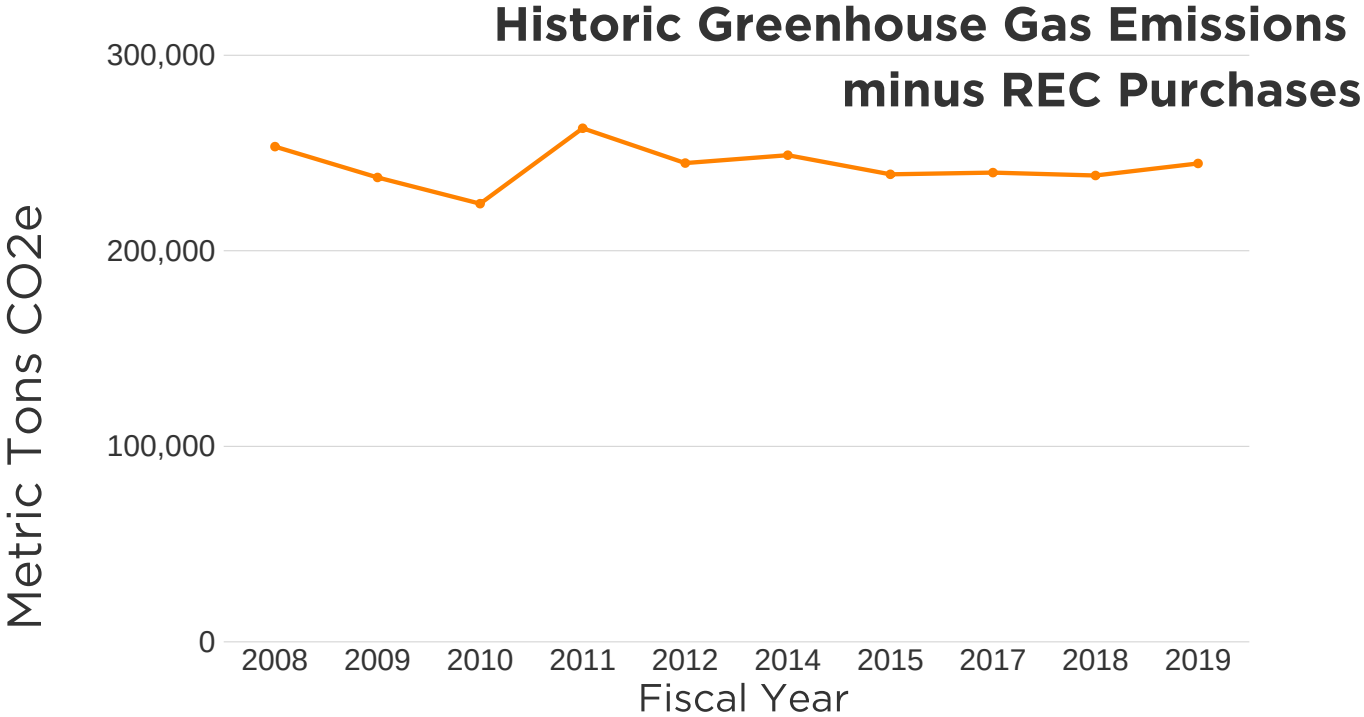
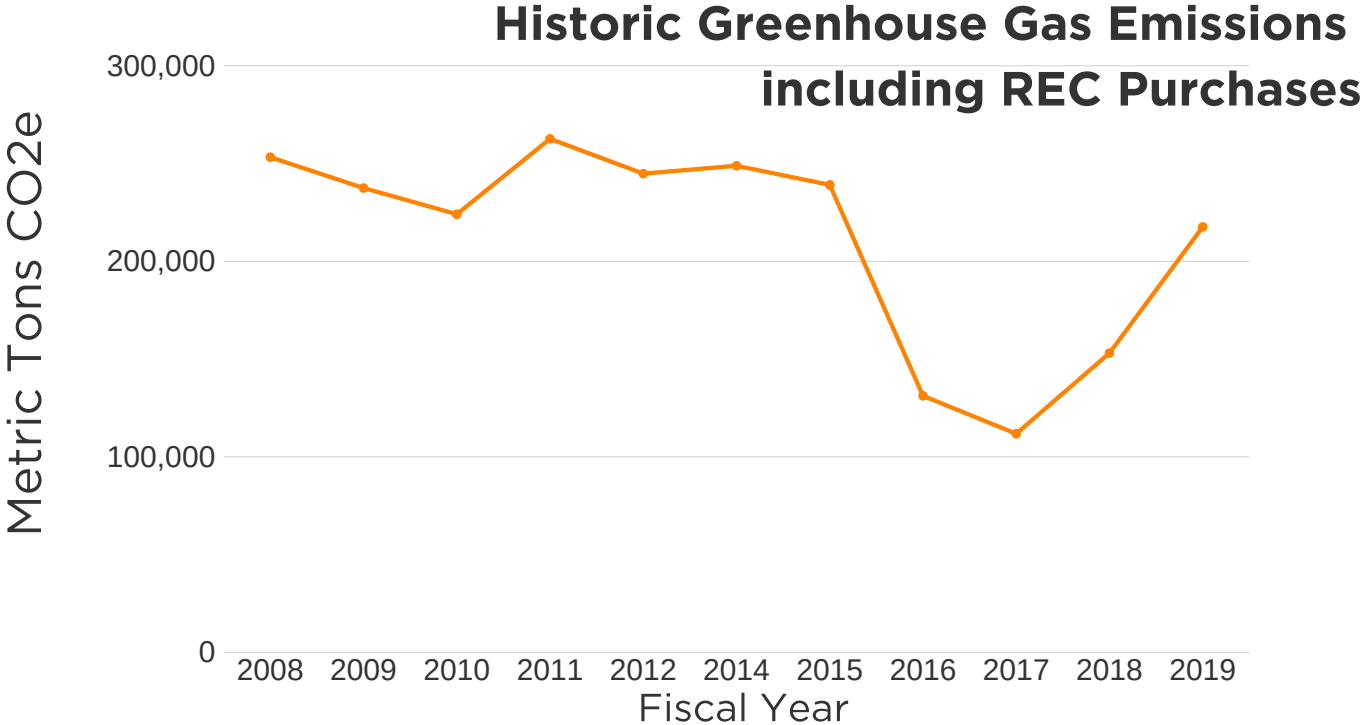
FY19 UTK Greenhouse Gas Emissions

Metric Tons of CO2 Equivalent



The first portion of this plan addresses direct contributors to our emissions portfolio: energy, transportation, and waste.

THE PATH TO CARBON NEUTRALITY



A VISION FOR A MORE SUSTAINABLE AND GLOBALLY ENGAGED CAMPUS



In the fall of 2019, the University of Tennessee, Knoxville became a signatory of the Declaration on University Global Engagement, a joint effort from the United Nations Institute for Training Research and the Association of Public and Land-grant Universities. Through this declaration, the university has made a formal commitment to deepen our students' understanding of "the most pressing economic, social, and environmental challenges facing our world today," as outlined in the Sustainable Development Goals.

Adopted in 2015, the Sustainable Development Goals are "a universal call to action to end poverty, protect the planet, and improve the lives and prospects of everyone, everywhere." In January 2020, the United Nations Secretary-General put forth a call for all sectors of society to engage in a Decade of Action to achieve the 17 Sustainable Development Goals by 2030.

The Sustainability Master Plan as a whole outlines the University of Tennessee's intended contribution to the success of the Decade of Action, aligning the targets set forth in the Plan within the same 2030 timeframe set by the UN. By reducing the university's overall impact, we will fulfill our commitment as signatory of the Declaration on University Global Engagement and make our campus a living laboratory for our students, faculty, and staff to learn from and develop the innovative solutions needed to solve these global challenges.

ENERGY



Reduce energy consumption to 1992-93 levels by 2030

Fiscal Year 1993

15 kWh

per square foot

Fiscal Year 2019

16.1 kWh

per square foot



Increase renewable energy procurement to make up at least 20% of total electricity use by 2030

FY19 Total
Renewable Energy Use

53,000 kWh

FY19 Total Purchased
Electricity

238,924,919 kWh

Pursue energy efficiency projects with the goal to grow the Green Revolving Fund to \$1 million

Based on FY19 usage, achieving these goals would lower the university's carbon footprint by approximately 19%.

Solar array atop the 11th Street Parking Garage



How can I help?

Conserve energy! Turn off lights when not in use and set your computer to turn off after 30 minutes of inactivity.

ENERGY

Current Initiatives

- Conduct energy building envelope audits using thermal drones to identify energy-saving building upgrades
- Finish installation of building utility meters
- Energy efficiency projects funded through the Green Revolving Fund, including LED retrofits

Potential Projects

- Create a campuswide, building-specific energy dashboard
- Expand the energy manager program to include more engineers assigned to buildings in specific regions of campus
- Develop an energy efficiency project plan with the Energy Management unit and the Energy Task Force within Facilities Services
- Inventory all motion light sensors on campus and identify highest impact locations for new installations
- Add more full-time staff to the Building Commissioning Team
- Install solar panels in locations on campus without grid access (compost site, Grow Lab, etc.), over all viable campus parking areas, and on structures on Steam Plant Hill and the new area on Concord Street
- Identify viable locations for on-site wind turbines
- Integrate agrivoltaics on viable UTIA farm and grazing land
- Explore participation options with TVA's Green Invest program to invest in a new renewable energy project in the region
- Explore options for geothermal heating and cooling in new buildings and renovation projects
- As technology progresses, explore options for battery storage to pair with onsite renewable energy generation

Policy Opportunities

- Implement mandatory campuswide energy saving sleep and computer monitor power-down settings on all non-essential university computers, with exceptions for those requiring remote access
- Require all new buildings to be designed to LEED Silver standards or higher, at least one level above the currently mandated LEED Certified standard
- Require all new construction to include rooftop solar installations
- Explore options for internal carbon pricing related to electricity consumption

TRANSPORTATION



Transition 10% of university-owned vehicles to electric or alternative fuel by 2030

FY19 Total Electric and Hybrid Vehicle Count

36

Currently

2.9% of Total Fleet

Increase the total amount of pedestrian and bike-friendly travelways on campus

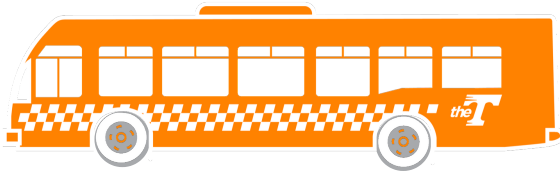
Reduce the total amount of transportation fuel used by UT fleet vehicles by 10% by 2030

FY19 Total Fuel Consumption:

20,582

397,309

Gallons of Diesel Gallons of Gasoline



How can I help?

Green your commute! Explore ways to walk, bike, or take public transit to campus at least once a week.



TRANSPORTATION

Current Initiatives

- Alternative Transportation Coordinator AmeriCorps Member within the Office of Sustainability has conducted baseline data collection and research
- Administer a commuter behavior survey
- Apply for Bicycle Friendly University certification
- Extension of the Pedestrian Walkway from current terminus behind Hess Hall to the front of Fred Brown Residence Hall, which will include the addition of dedicated bike lanes

Potential Projects

- Install idling reduction technology into all university-owned trucks and other most frequently used vehicles
- Create idling reduction incentive program
- Conduct audit of all university-owned vehicles, starting with the Facilities Services fleet, to develop a strategy for right-sizing the fleet
- Prepare RFP for 2023 transit contract renewal to require all-electric or alternative fuel buses
- Implement pilot faculty and staff program for semester-based, subsidized Knoxville Area Transit (KAT) bus passes
- Conduct study on the City of Knoxville's electric scooter pilot program's impact on car trips taken from Fort Sanders and other student housing areas to campus
- Expand the Dean of Students Office UT to West TN program to provide bus service home over breaks to other commonly traveled areas

Policy Opportunities

- University-wide anti-idling policy that includes requirement of idling alarms to be turned on in all university vehicles with GPS technology installed
- Require a "right-sizing" assessment for all new university vehicle purchases
- All new golf carts/club cars purchased must be electric
- Eliminate parking permit access for freshmen who live on campus, or alternatively, restrict parking pass access for students who live in the Fort Sanders area or within a specified radius of a bus stop that services campus.
- Create an additional fee on parking passes for oversized vehicles, provide priority parking to compact cars
- All new parking structures and lots must include electric vehicle charging stations
- Require departments to purchase carbon offsets for all UT-sponsored air travel
- Explore options for internal carbon pricing related to fuel consumption

WASTE

Achieve 50% waste diversion by 2030...

Fiscal Year 2007

9%

diversion from
landfill

Fiscal Year 2018

33%

diversion from
landfill

**...while reducing overall waste generation
as much as possible**



SUSTAINABILITY MASTER PLAN



**Follow the EPA's Food Recovery Hierarchy to
address food insecurity on campus by recovering
food from university events and dining operations
whenever it is feasible and safe to do so**

Smokey composting on Big Green Friday in 2019

How can I help?

Keep a reusable
container, mug, utensil
set and bag in your
backpack or at your
desk so you're ready for
anything that comes up
throughout the day



WASTE

Current Initiatives

- My Tiny Trash
- Hand dryer installations
- Bin and signage standardizations
- In-depth building waste audits and characterization studies
- Food service composting and expansion to office spaces
- Reusable to-go container pilot program
- Establishing a permanent Free Store location on campus
- Institutionalization of food recovery procedures
- Develop a recovered food notification app

Potential Projects

- Improved construction and demolition waste tracking
- Expansion of hard-to-recycle material collection
- Expansion of compost collection to public campus spaces and stadium
- Reusable office supply exchange program
- Lending library of common household items for students
- Stakeholder training programs
- Available material notification system
- Food share kitchens on campus
- Targeted point source reduction of food waste
- Surplus expansion and enhanced communication to students and community members

Policy Opportunities

- Enforce printing minimization policies across all campus computers/printers
- Require events of a certain size and catered by Aramark to be zero waste events
- Implement a glass bottle ban on game days
- Standardize lost and found procedures, bike impoundments so that goods held for a certain amount of time are redirected to the Free Store
- Remove single-use disposables (plastics and non-recyclables/non-compostables) from all Vol Dining locations, stadium concessions, and campus convenience stores
- Environmentally-preferable purchasing policy, including guidelines for the type of promotional “SWAG” that can be purchased by departments; more vegan/vegetarian and local food requirements for dining operations

LAND + WATER USE

Reduce the total amount of potable water used per square foot to 2013-14 levels by 2030

Fiscal Year 2014 Usage
3.8 Cubic Feet per Square Foot

Fiscal Year 2019 Usage
4.6 Cubic Feet per Square Foot



Transition 40% of landscaping equipment to electric models by 2030

1 electric model piloted in 2019

Increase the total green infrastructure, pollinator gardens, and native plant gardens on campus

Making Progress:

UT has greatly reduced its water usage from a peak of 9.4 cubic feet of water per square foot in Fiscal Year 1983!

Bioswales lining Volunteer Boulevard



How can I help?

Report leaks, broken sprinklers, and malfunctioning heating and cooling equipment to the Facilities One Call Line 865-946-7777

LAND + WATER USE

Current Initiatives

- Green Fee funds have been allocated for low-flow fixture replacements in high traffic areas
- Weather station recently installed by Landscape Services will be able to modify the amount of water used for irrigation based on rainfall
- Piloting an electric robotic lawn mower on the lawn behind Art & Architecture
- Upcoming approved green infrastructure projects:
 - Green roof: UTIA Ellington and Engineering Services Building
 - Bioswales: continuation down the second half of Volunteer Boulevard from the UT Drive intersection to Cumberland Avenue
 - Stormwater Garden: Henson Hall, will collect stormwater for regional irrigation
 - Rain Gardens: funding acquired for two new rain garden locations on campus
 - Installation of prefabricated modular stormwater treatment wetlands in Third Creek to catch microplastics and oils before they enter the Tennessee River
- Conducting assessments of the approximately 19 miles of shoreline owned by UT to identify areas with the most critical erosion
- Goats on the Greenway project is targeting invasive species removal along the Third Creek Greenway
- Bee Campus USA commitments: new pollinator garden slated for area outside of Strong Hall and native wildflower meadow along Third Creek
- Abide by commitments set forth by Tree Campus USA
- Developing a land care map highlighting sustainable campus landscape features

Potential Projects

- Restoration of shoreline on UT's Forks of the River property to remediate erosion issues
- Flood mitigation project on Second Creek to prevent pollution
- Install flow sensors and master valves on all irrigation systems to better measure and control water use
- Explore options for electrifying landscape equipment fleet and sourcing renewable energy to charge equipment
- Identify new locations to add pollinator gardens with native plantings in collaboration with UT's Bee Campus USA committee
- Explore options for onsite carbon offset projects, as in Working Woodlands project
- Require green roofs on all new buildings where rooftop solar is not viable

ENGAGEMENT



Increase student, faculty, and staff knowledge of and engagement with campus sustainability initiatives and global climate change issues

Make clear the connections between environmental sustainability and social justice in the sustainability work done on campus

The Sustainability Master Plan Playbooks provide ways that every member of campus can help make this Plan a reality!



How can I help?

**Learn about sustainability!
Take a class, schedule a training with the Office of Sustainability for your office or student org, or check out our Sustainability Learning Resource guide.**



ENGAGEMENT

Current Initiatives

- Re-launch the Green Office Program to engage faculty and staff with campus sustainability
- Conduct campus climate change survey to assess attitudes about climate change
- Launch the sustainability portal, a tool to connect faculty, staff, students, and community members around Knoxville working on sustainability issues
- Establishment of the Hunger Studies Working Group and the Student Basic Needs Coalition, both working to address food insecurity on campus
- Numerous annual sustainability events and campaigns organized by the Office of Sustainability

Potential Projects

- Include at least one required sustainability course in the General Education requirements
- Launch a Chancellor's Challenge campaign addressing campus zero waste goals
- Establish a Green Labs program
- Develop an "Eco-Reps" peer education component to the Sustainability Internship Program
- Work with the Office of New Student and Family Programs to develop a sustainability-focused orientation module and/or an in-person sustainability-focused orientation presentation
- Incorporate sustainability training into all new employee orientation sessions
- Establish a Student Basic Needs Center that houses Smokey's Pantry, the Free Store, a Food Share Kitchen, and any other relevant resources
- Develop resources to help off-campus students lower their utility bills and transportation costs
- Expand the use of the Make Orange Green campaign to other campus departments engaged with sustainability work
- Collaborate with the Office of Community Engagement and Outreach on new sustainability projects
- Create a Make Orange Green app or MOG section in the UT app
- Establish a graduation pledge, possibly through the sustainability major, for students to receive an additional cord or pin for pledging to take environmental and social impacts into account in their post-grad endeavors
- Incorporate the Drawdown Ecochallenge into Office of Sustainability outreach efforts

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Committee on the Campus Environment
Geography 206, Spring 2020 Class
Office of Sustainability Student Interns, Spring 2020 Cohort
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