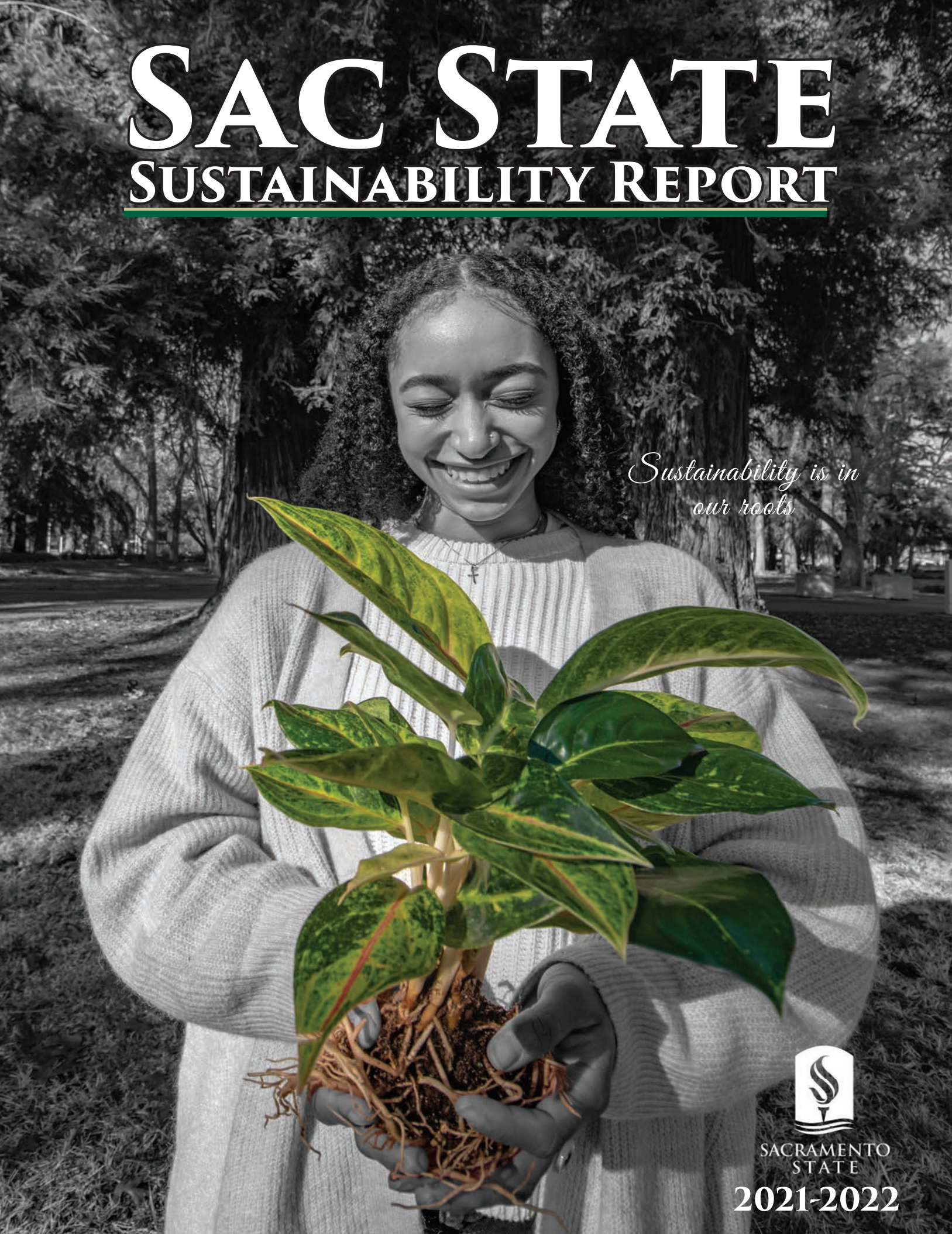
SAC STATE
SUSTAINABILITY REPORT



SACRAMENTO STATE

2021-2022

TABLE OF
CONTENTS

Message From

The President

"We continue to partner with local and state government agencies and non-profit organizations, and to engage in community partnerships that will improve the health of our region"

Dr. Robert S. Nelsen

At Sacramento State, we are committed to doing our part, individually and institutionally, to slow climate change and reduce our impact on the planet. We have become all too familiar with the disastrous effects of climate change, as droughts, floods, and wildfires devastate not just members of our Hornet Family, but people and communities around the world. To stem the potentially catastrophic effects of climate change we must all do our part to reduce waste, energy and water usage, and be efficient in how we use all resources.

In 2016, Sacramento State established a 2040 Carbon Neutrality goal that will help us to reduce our carbon footprint by achieving incremental milestones. One way we are working to meet our goal to reduce campus greenhouse gas emissions is by constructing new solar energy systems on the top of two of our parking structures and a surface lot. Once these new solar projects are complete, we will generate enough energy to meet the minimum peak demand for energy usage on campus.

We are on track to meet our goal of reducing greenhouse gas emissions by 100% from 1990 levels by fully operating campus using electricity and renewable energy by 2040. There is much more work to be done, and it is work that cannot be done alone. Slowing climate change will require not only reducing our campus greenhouse gas emissions but doing our part to help reduce Sacramento's emissions as well. This work requires widespread collaboration and strong partnerships, yet another reason that our Anchor University initiative is so important. We continue to partner with local and state government agencies and non-profit organizations, and to engage in community partnerships that will improve the health of our region. For example this year Environmental Studies Department Chair, Dr. Wayne Linklater was awarded a $10,000 grant to study air quality in some of Sacramento's most underserved communities.

This is just one of many examples of how the Hornet Family is working to address the needs of our community by engaging in research, service learning, and community engagement. I am proud of the work being done by our students, faculty, and staff, and look forward to building on these successes in pursuit of our zero waste and carbon neutrality goals. I am confident that we will not only attain these goals on campus, but assist the region in meeting their goals as well. Sac State is No. 1 in

Sustainable Development Goals

The Sustainable Development Goals (SDGs) are a set of 17 global goals set forth by the UN to achieve a more sustainable future for all.

The goals act as a blueprint and urge countries to end poverty, improve health and education, tackle climate change, reduce inequality, and preserve our oceans and forests.

Sac State's commitment to sustainability supports the UN's urgent call for peace and prosperity for people and the planet outlined by these 17 goals.

Sacramento State's Pledge to Sustainability

Here at Sacramento State, we have a joint effort to make sustainability a priority. Students, faculty, and staff are working together, not just to make the campus more sustainable, but to create a culture where sustainability is second nature.

At Sac State, we're working to reduce our environmental impact, but more importantly, to create a place where student's innovative ideas can be explored and sustainability pioneers can grow.

Learn More

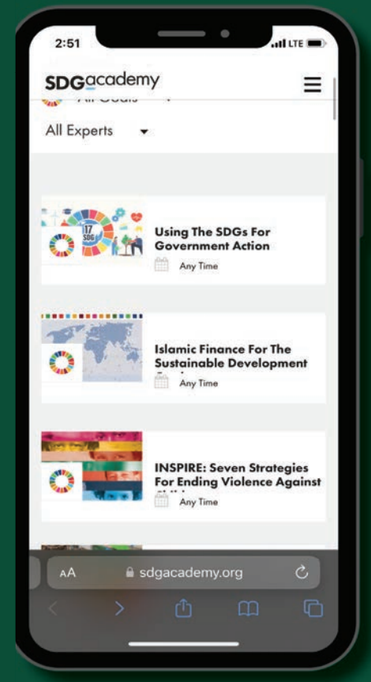
Join the SDG Academy

Sac State is the first CSU to become an official member of the UN Sustainable Development Solutions Network (SDSN) and is taking steps to implement the 17 SDGs.

As a member of the SDSN, all Sac State students, staff, and faculty have free access to the SDG Academy. The SDG Academy is a flagship platform with educational resources on sustainable development.

The Academy offers multiple courses designed to target the 17 sustainable development goals. Courses include Sustainable Cities, Global Public Health, Measuring Sustainable Development, One Planet One Ocean, and Climate Change: The Global Impact.

In addition, the Academy offers a two-course professional program as well as a master's degree in Sustainable Development through a partnership between the SDG Academy, University College Dublin, and Sunway University.



SDG Academy

Sac State is creating a place where students can develop innovative ideas and where sustainability pioneers can grow. Scan the QR Code below to view the courses offered and the additional support provided by the SDG Academy.

sdgacademy.org

Community Engagement

The Anchor Institute

Sac State is proud to be an anchor institute! Anchor institutes seek to improve the longevity of the health and social welfare of their surrounding community by partnering with non-profit organizations, local and state government agencies, and engaging in community-driven projects.

Environmental Studies Department Chair, Wayne Linklater received a $10,000 grant from Second Nature to conduct air quality research in Sacramento's most impacted communities. The research will correlate the relationship between air quality and respiratory illness.

Sac State is working with Breathe California and United Latinos to establish air-monitoring zones in South Sacramento and North Highlands. These areas are historically known to have less tree coverage and high exposure to air pollution from regional proximity to highways and industrial areas. Although California has strict vehicle emission standards, exhaust from cars and trucks largely contributes to air pollution. Major roadways and interstates bring chemical pollutants and particulate matter into nearby neighborhoods. Children who go to school and live near densely populated roadways have higher rates of asthma than children who live farther from roads. Additionally, long-term exposure to air pollution can also contribute to cardiovascular disease in the elderly and those with pre-existing health conditions.

This research initiative strives to bring community awareness to air quality conditions in at-risk communities in order to educate and inform residents on future policies and resources to improve their quality of life.

South Sacramento has 15.86% less tree coverage than East Sacramento.

Sacramento UTC Assessment, 2016

Community Engagement

STEM-POWER

Sac State is continuously working to address community needs and priorities by engaging in service learning, research initiatives, community engagement, and community empowerment throughout the Sacramento Region.

In 2018, Sac State received a five-year $ 3.5 million grant from the U.S. Department of Education to launch STEM-POWER, a collaborative education preparation program for faculty, teachers, and student teachers. Towards the end of summer 2022, the College of Education and local teachers engaged in a week-long program focused on the participatory action learning of STEM. The purpose of the event was to cultivate a new style of learning by creating a more hands-on approach to teaching STEM in order to increase diversity and collaboration among students.

The event welcomed a total of 110 Sacramento educators who learned about bio-conservation and how soil, plants, and pollinators contribute to a healthy garden and support niche ecological systems. Teachers sampled the compost generated at Sac State's BAC Yard and measured soil temperature.

A hands-on approach and visual representation of STEM in action offered new teaching techniques to local educators and encouraged them to extend beyond the wall of the classroom and learn from the surrounding natural environment.

Schools are now looking to community partners such as Soil Born Farms to help educators build gardens in their schools with the common goal of improving STEM education.

"We had great feedback from our participants-they learned about pollination, carbon capture, different types of sustainable gardens, and much more, and took many ideas for use back in their own classrooms."

-Dr. Susan Baker, Project Director for STEM-POWER

Community Engagement

Sustainable Communities

Sac State has partnered with SMUD's Building Sustainable Communities Program which focuses on enhancing the quality of life of Sacramento residents through innovative energy solutions and energy equity for all.

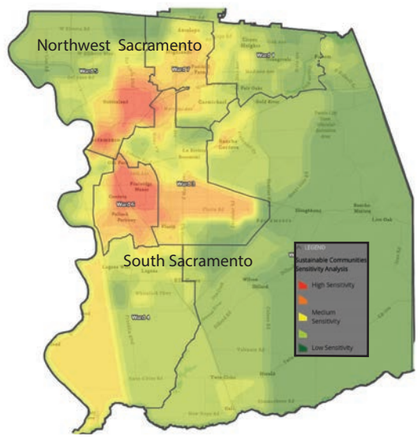
SMUD's sustainable communities program is determined to bring environmental equity and economic vitality to all communities with priority attention to disadvantaged communities. These communities are listed as a highly sensitive group on SMUD's Sustainable Analysis Map indicated in red.

The program aims to align regional investments toward the goal of creating and supporting healthy, vibrant, and economically sustainable neighborhoods.

Sac State was awarded a 100K grant from SMUD's Sustainable Communities program to make improvements to our tiny house.

The 184 sq. ft tiny house is located in the Garden and is entirely off-grid. The tiny house is equipped with 1920 watts of rooftop solar and battery storage. SMUD fundings will allow for the installation of an induction stove top and live-stream the energy usage of the tiny house. The tiny house will include educational tools to showcase sustainable living and the power of electrification. In addition, the garden will be used as a living lab to educate visitors on food insecurity, and how to grow and harvest fresh fruits and vegetables that are locally sourced.

SMUD's Sustainable Community Analysis



Sac State's Sustainable Tiny House

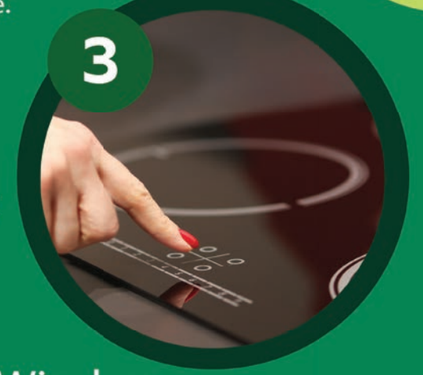
Sustainable Communities Tiny House

Tiny but Mighty

The tiny house will provide quantitative data on energy usage and water consumption to educate users.

Rooftop Solar

The rooftop is equipped with six solar PV panels. Energy is inverted to an alternating current (AC) from battery storage to power the tiny house.



Appliances

The tiny house has a wall mounted AC, 6 LED lights, and an induction stove that will be installed in 2023.

Passive Windows

There are eleven passive windows which allow sunlight to pass through and provide thermal heating for occupants as well as natural light.

Sustainable Garden

The tiny house is located next to the Garden which is pesticide free and utilizes sustainable gardening methods. Produce is distributed to the ASI food pantry.

Student Involvement

The Garden

The Cap Radio Garden is located on the west end of Sac State and is comprised of raised planter beds, bee hives, and a bioswale rain capture system. The garden helps to bring awareness to food scarcity in the community and is tended by student assistants and Grounds Management.

The ASI Food Pantry helps to provide food and basic necessities to Sac State students at zero cost. All food grown at the Cap Radio garden is sent to the ASI food pantry to help alleviate financial difficulties and food insecurity for Sac State students.

BAC YARD

Compost is created in the BAC Yard from food waste at campus eateries

Kevin Sanchez
BAC Yard Student Assistant
Environmental Science

Compost Delivery

Compost from the BAC Yard is delivered to the CapRadio Garden

Healthy compost provides more nutrients and protects against plant-damaging microbes

Cap Radio Garden

The garden is managed by the Sac State grounds team and student assistants

The garden has drip irrigation installed to minimize water loss from evapotranspiration

Integrated Pest Management (IPM) removes unwanted insects from the garden, while attracting beneficial ones

Ella Titova
Garden Student Assistant
Nutrition and Food

ASI Food Pantry

The grounds team and student assistants drop off fresh produce to the ASI Food Pantry

Drip systems are more efficient than sprinklers or hand watering methods

Garden & ASI Pantry

Student Involvement

AMPlified Urban Forest

For the second year in a row, Sac State participated in AMPlified Urban Forest. This tree-planting event aims to increase the number of trees in the Sacramento area and improve air quality. This year Sac State focused on planting underutilized trees as a way to diversify Sac State's urban canopy. These trees will improve the air and contribute to community wellness, on and off campus.

Student Involvement

TREE PLANTING WORKSHOP

30 Attendees

- Learn how trees contribute to community wellness
- Discussion of tools to sustain and maintain new trees

TREE PLANTING EVENT

150 Attendees

- Tree planting demonstration & speaker panel
- 55 trees planted
- Installation of support stakes throughout campus

TREE LABEL IDENTIFICATION

2 Attendees

- Grounds student assistants attached tree identification labels
- Tree care and maintenance

"Adding underutilized species allows people to see how these new species respond to the environment they're in, which can help in the selection of new species for future tree planting."

-Erik Skall (Grounds & Landscape Manager)

Student Involvement

Earth Week

Earth Day is recognized and celebrated on April 22nd each year. It marks the anniversary of the birth of the modern environmental movement in 1970. It is one of the largest secular observances in the world, celebrated by more than a billion people every year as a day of action to change human behavior and create global, national, and local policy changes.

This year Sac State celebrated Earth day with a number of in-person events. The campus kicked off the week with some relaxing yoga in the garden. Tuesday featured Ride Your Bike to Work Day, with Peak Adventures giving away free water bottles for those who participated. Wednesday celebrated the importance of plants with a free succulent planting workshop. Thursday celebrated our natural world with a special planetarium showing of Ice World, highlighting the importance of water in our everyday lives. Friday and Saturday focused on cleaning up trash on our campus and at the local American River.

In addition to the daily celebrations of Earth Week, the Office of Sustainability launched a campus-wide waste reduction app called

HORNET REUSE

COMING SOON

Hornet Reuse. The app gave students, staff, and faculty a way to share items with each other. The platform operated like a free marketplace where users could post items they no longer needed or request items in return. The app was a success, in the first 4 months after it launched hundreds of items were diverted from the landfill. Sadly, in late August the company that operated the app went out of business, and with it went Hornet Reuse. However, a new app partner has been established and Hornet Reuse will be returning in 2023.

SAC STATE'S EARTH WEEK

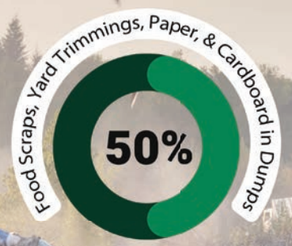
Waste Management

Senate Bill 1383

In Sacramento, 5.3 percent of greenhouse gas emissions are associated with solid waste generation and disposal in landfills. The City of Sacramento is committed to helping its residents and businesses reduce waste, while increasing the diversion of recycled and compostable materials that would otherwise end up in landfills.

Californians send more than 6 million tons of waste to landfills each year. Landfills are among California's largest sources of methane, a greenhouse gas 80 times more potent than carbon dioxide. Landfills emit methane when organic materials such as food scraps decompose. Immediate reductions in methane emissions will help to slow down the rate of climate change.

In order to reduce methane emissions, California implemented a state-wide organic waste recycling mandate under Senate Bill (SB) 1383. To comply with the mandate issued on January 1, 2022, the campus invested and deployed a three-stream waste system. The bins separate trash, mixed recyclables, and post-consumer food waste. The three-stream bins allow Sac State to be in compliance with SB 1383 and help the campus work towards our 2030 zero waste goal.



Californians throw out 6 million tons of waste each year

Tri-Bin Recycling System

- Laminated paper, photos
- Padded envelopes, plastic bags
- Snack wrappers, straws, mirrors
- Sponges, shoes, clothing, styrofoam

- Clean paper based products
- 1-3 labeled plastics
- Regular and multi-colored glass
- Clean aluminum and metal

- Food scraps
- Food soiled paper
- Green waste (grass, branches, leaves)

Waste Sorting Guide
3 Stream Waste Management Plan
www.csus.edu/sustainability

Waste Management

Zero Waste Goal

In an effort to reduce campus-wide emissions from landfills, Sac State has developed a 2030 Zero Waste Goal. Zero waste refers to the conservation of all resources without threatening the environment or human health. Sac State aims to reduce solid waste disposal by 90% by 2030. In order to meet this goal a waste characterization study was conducted to learn about campus waste and what improvements can be made.

Student assistants have created and conducted successful waste audits on 20 campus buildings. Detailed surveys conducted on campus displayed waste-stream contamination. Results signified that the general university body does not understand how to properly dispose of waste on campus. Initially, a waste findings experiment was performed to understand what was being thrown in the waste bins. In the study, 55 types of items were observed ranging from textbooks to aluminum foil and yard waste. The six most commonly disposed of items were notebook paper, plastic straws, thin film plastic, single-use coffee cups, soiled paper, and plastic containers.

Student assistant works on waste audit signage

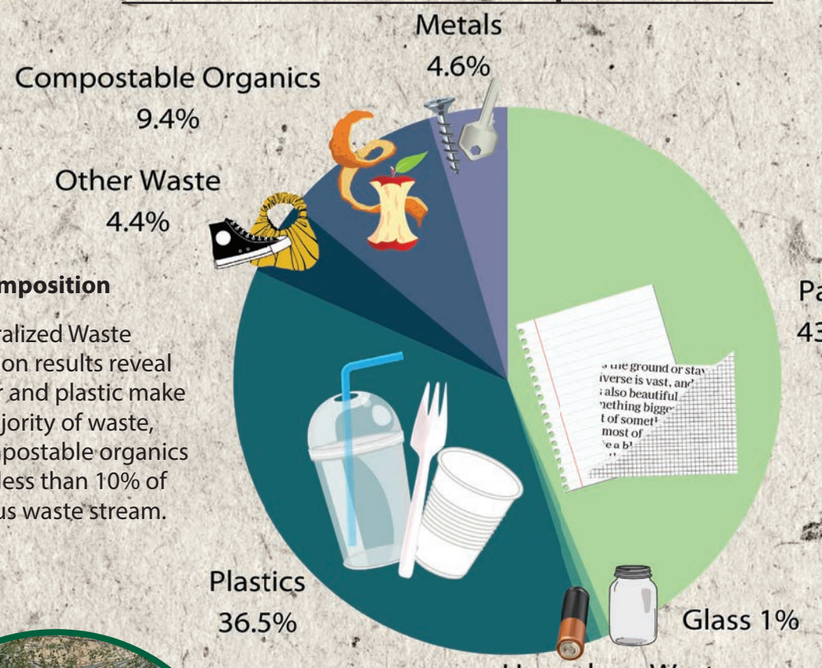
Most Commonly Disposed of Items

Waste Management

Waste Composition

The second audit was a generalized waste characterization study. Waste was broken down into seven categories: paper, glass, plastics, metals, compostable organics, hazardous waste, and others. The graph below depicts the percentage of the seven general waste materials identified. Reports showed that contamination existed in all three of the bins (landfill, compost, recycle), suggesting room for improvement and education in the campus community.

Generalized Waste Composition



Waste Composition

The Generalized Waste Composition results reveal that paper and plastic make up the majority of waste, while compostable organics comprise less than 10% of the campus waste stream.

The most commonly disposed of materials are paper and plastics, which together make 80% of the school's total waste stream.

Waste Management

Campus Surplus

Campus Surplus collects office furniture that is no longer needed and stores the furniture in the surplus warehouse for future office use.

New furniture is often purchased unnecessarily, while older or used furniture is thrown out.

10.6 Metric tons of e-waste diverted

948 Office Furniture items reused

The Surplus Office Furniture Warehouse is located on Arboretum Way across the street from Property & Receiving Services.

About Surplus

Traditionally, office items that are in good to new condition are thrown away before they are end of life. Any department with surplus office furniture that is no longer needed can fill out a Facilities Work Order request to have the items moved to the warehouse. Likewise, any department looking for office furniture can visit the warehouse to view available items free

Sac States Cost Savings Associated with 2021-2022 Office Surplus

$27,800 cabinets reused

$110,500 office desks reused

$134,400 office chairs reused

A total of **$272,700** worth of furniture reused in 2021-2022

A total of **$620,133.25** saved from all Campus Surplus operations in 2021-2022

Scan for Campus Surplus

www.csus.edu/surplus-property

Energy Management

Campus Solar

Sac State recently established a power purchase agreement (PPA) for the construction of an additional 2.5 MW solar system on a surface lot and on top of two parking structures, in addition to the pre-existing 0.5MW of solar PV systems on the campus. Once complete the university's on-site generation will be able to meet the campus's minimum peak demand for energy usage on campus.

2.5 MW of New Solar

Sac States PPA helps support the campus's 2040 carbon neutrality goal while integrating more renewable energy into the campus grid. After this project is complete, our total power from renewable sources will be about 17-20% per year, and we will be 30% renewable when solar is at its highest production over the summer months.

1.4MW
Parking Lot 10
3,979 solar panels

.4MW
Parking Structure 3
1,000 solar panels

.7MW
Parking Structure 5
1,886 solar panels

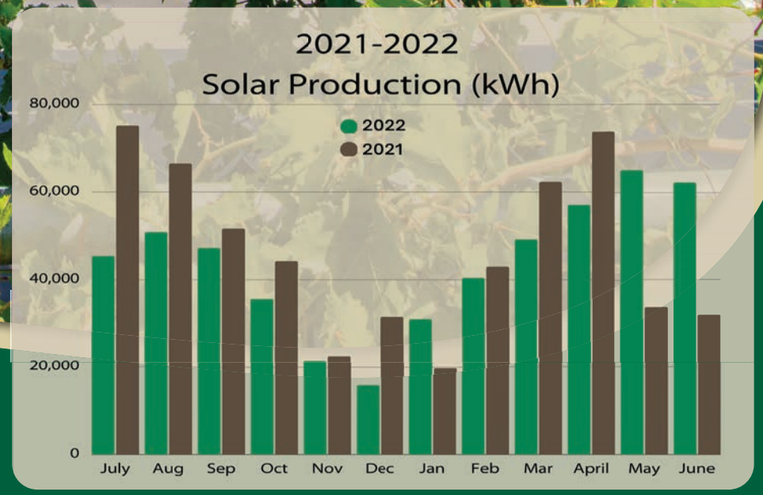
Power Purchase Agreement (PPA)

1. A solar PPA is a financial agreement where a developer arranges for the design, permitting, financing and installation of a solar energy system on a customer's property at little to no cost.

2. The developer sells the power generated to the customer at a fixed rate that is typically lower than the local utility's retail rate.

3. This lower electricity price serves to offset the customer's purchase of electricity from the grid while the developer receives the income from these sales of electricity as well as any tax credits and other incentives.

20%
of energy used on campus will be renewable & generated on-site.



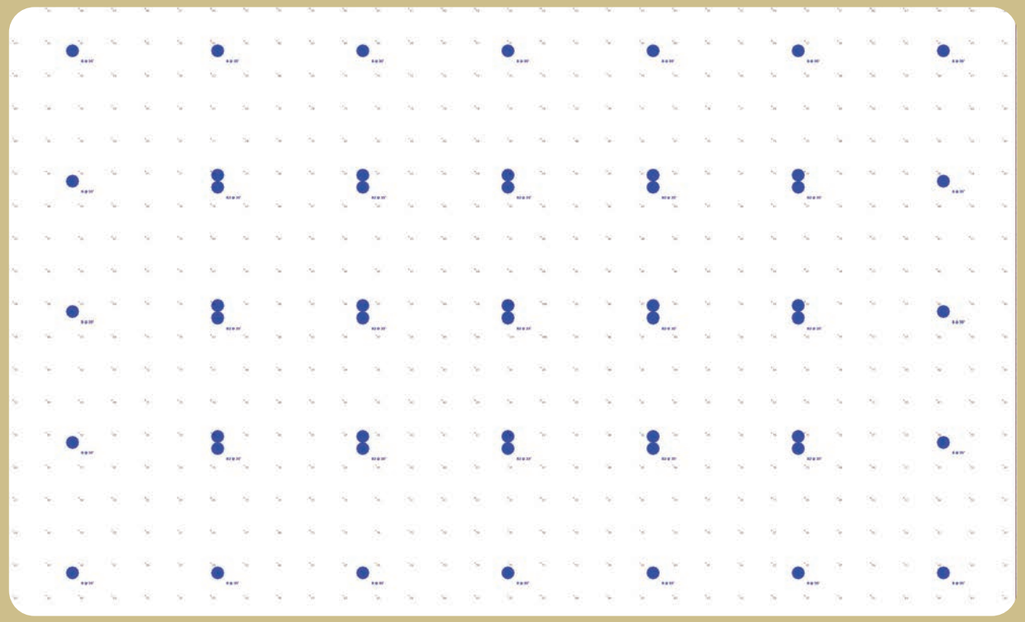
Scan to visit the Sustainability Dashboard for more information.
https://www.csus.edu/sustainability/

Energy Management

Yosemite Lighting Upgrade

In order to achieve carbon neutrality by 2040, Sac State regularly engages in energy efficiency and greenhouse gas (GHG) reduction projects. Tackling energy efficiency projects helps to reduce the energy usage of buildings, which reduces Sac States scope 2 emissions. Pursuing energy efficiency measures campus-wide also decreases operating costs, as utility rates continue to increase.

Yosemite North Gym recently had a major lighting upgrade. The previous 250-watt metal halide lights were replaced with new Lithonia high bay LED lights. The NCAA requires 80 ft candles in gyms utilized for school sporting events. The previous lights did not meet NCAA lighting requirements, emitting only 30-40 ft candles. The new LEDs installed have 90-95 ft candles, meaning they more than doubled the brightness of the gym, saving 7500 watts per hour, and are NCAA



Single dots represent the installation of one lamp, while two dots represent the installation of two lamps in order to meet NCAA foot candle requirements. This project was entirely done in-house by our amazing campus electrical team.

The new lighting control systems have dimming capabilities and motion sensors built into the fixtures.

NEW LED lights increase the brightness by 50%

The lighting upgrade saves 7,500 watts per hour

Lamp life increased from 5,000 hrs to 50,000 hrs

Sac State's
Environmental Footprint

CATEGORY	2022	2021
LANDFILL	1,078,670 lbs	310,740 lbs
COMPOST	436,402 lbs	493,013 lbs
RECYCLE	453,796 lbs	163,447 lbs
WATER	545,148,918 gal	194,197,618 gal
GAS	1,287,614 therms	831,591 therms
ELECTRICITY	40,608,566 kWh	31, 927,421 kWh
RENEWABLE ENERGY	2,533,245 kWh	3,488,367 kWh
SCOPE 1 EMISSIONS	7,234 MT	4,650.25 MT
SCOPE 2 EMISSIONS	9,587.41 MT	7,560.38 MT
SCOPE 3 EMISSIONS	1,737.03 MT	910.66 MT

The 2019-2021 school year was an unprecedented time as Covid-19 shut down campus operations, overall reducing emissions. The 2022 Environmental Footprint is expected to be higher as campus operations have resumed.

Learn More

Upcoming Projects

Sac State's Sustainability team continuously works on new projects to meet campus goals. Here's a look at the upcoming 2023 campus projects!

Lighting Upgrade
Library & Stairwell Lighting

The building stairwells and remaining library space will be upgraded with LED's as part of an energy savings and efficiency project.

Waste Management
Zero Waste Plan

A campus-wide plan to assist clients, contractors, and affiliates with the proper protocols for waste management.

Pesticide Free
Integrated Pest Management

The Sustainability Steering Committee is working on a campus-wide plan to eradicate pesticides and herbicides on campus

Utility Management
Building Meter Upgrade

Manually read water and gas meters will be transitioned to automated cellular signals that more accurately report metering data.

Sustainable Buildings
LEED Gold Art Lab

A new art sculpture lab will replace the existing building. The new lab will be LEED Gold and feature mix-media studios and metal fabrication.

Waste
Hornet Reuse

The reboot of a new and improved Hornet Reuse app. The app is designed as a free marketplace for Sac State students, staff, and faculty.

Sac State

Acknowledgments

Thank you to all the content contributors provided by Grounds & Landscape Services, Facilities Management, and University Communications.

Created by Sac State Sustainability

Author: Mercedes Navarro-O'Hara
Photography: University Communications, Ryan Todd
Content Contributor: Jennifer K. Morita, Cynthia Hubert, Dixie Reid, Nicole McDavid, Erik Skall, Eric Solberg, Ryan Todd, Laura Gonzalez-Ospina, and Joshua Maddox

Sac State Sustainability

SACRAMENTO STATE
Grounds & Landscape Services


SACRAMENTO
STATE
Redefine the Possible
"To be without trees would, in the most literal way, to be without our roots."
-Richard Mabey