

CALIFORNIA STATE UNIVERSITY, SACRAMENTO

SUSTAINABILITY REPORT 2015



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Introduction

University is about life-long learning, connection, and exposure; student life at Sacramento State is no different and this incredibly diverse campus prepares students for their future with a broad worldview and interdisciplinary understanding. One such understanding that the University imparts on its students is the severity of climate change and the need for everyone, no matter their field of study, to combat this threat. The University acts as a model for students by tracking its carbon emissions and promoting sustainability efforts.

Sustainability is a socio-economic process defined by three overlapping pillars of economy, society, and environment. Sacramento State seeks to enact sustainable policies and projects that improve each of these pillars for the health of the University, its students, and the community it serves.

This report acts as a baseline, for the year in which it details, to highlight the sustainable efforts of the University as well as identify areas of improvement. By actively reviewing the impact that Sacramento State has on the environment, we can strive to be better and ensure a green future.

Redefine the Possible™



Statement of Sustainability

Message from the President



At Sacramento State, we promote the highest standards of environmental stewardship. Our mission supports leadership for sustainability as we continue to explore opportunities and new initiatives through innovative and collaborative means.

Robert S. Nelsen

President

Demographics & Diversity

Sustainability & Diversity Matters

To successfully build a sustainable society, diverse groups need to be able to come together and work collaboratively to address sustainability challenges. Higher education opens doors to opportunities that can help create a more equitable world. A diverse student body, faculty, and staff provide rich resources for learning and collaboration.

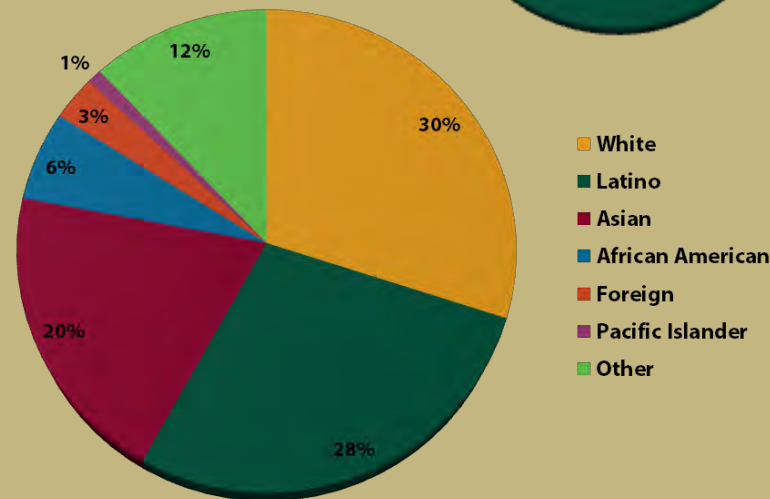
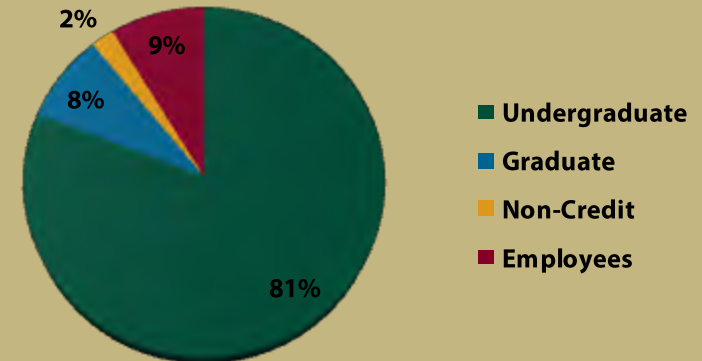
In support of continued growth of a diverse campus family, and upholding standings as the 7th most diverse university campus west of the Mississippi River, Sacramento State is committed to making higher education available to anyone who desires it while supporting long-term sustainable changes.



Redefine the Possible™

Academic Demographics

Undergraduate	26,648
Graduate	2,701
Non-Credit	710
Employees	2,874



New Diversity Office

President Nelsen continues to increase campus diversity with the creation of the Office of Equity, Diversity, and Inclusion and a permanent Diversity Council consisting of students, faculty, and staff.

Increased Diversity Budget

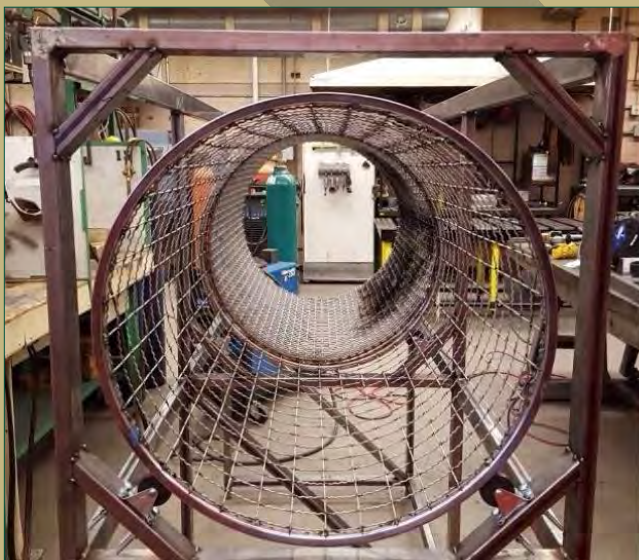
The University is putting more money toward diversity efforts. Sacramento State is allocating an additional \$30,000 to its Multi-cultural, Women's Resource and PRIDE centers.

Academics

Hands-on Sustainability Learning

As part of their undergraduate senior project, mechanical engineering students, as well as other student groups across campus, have designed and developed a variety of technology that not only has heavy emphasis on sustainability, but are being implemented in campus operations:

- **Trommel System:** System filters any contaminants from finished vermicompost and will be used at the campus composting yard.
- **Composting Tube:** Specially designed composting technology provides fast and more efficient processing through the tube versus traditional means.
- **Muffin Monster Food Grinder:** A group of students retrofitted a donated muffin monster to include a support stand and loading shoot to ensure safe operation at the composting yard.



Solar Decathlon

Sacramento State students participated in the U.S. Department of Energy Solar Decathlon, where they built a cost effective and energy efficient "smart" home coined the Reflect Home. This multi-departmental project facilitated student learning and strived to discover the future of sustainable housing.



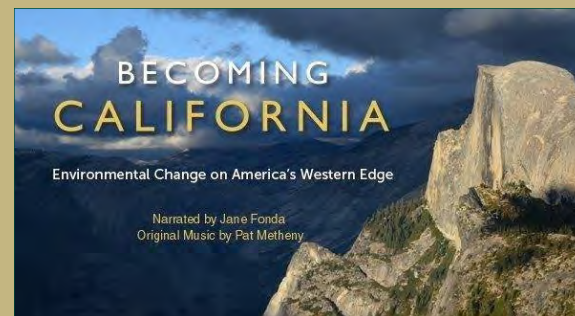
Campus as a Living Laboratory Grant

Dr. Kelly Thompson of Family and Consumer Sciences was the recipient of the Campus as a Living Laboratory Grant. With this \$12,000, Dr. Thompson has integrated sustainability concepts into her Food Production and Sustainability (FACS 110) course including water conservation, sustainable food practices, and composting. Students were able to work with the Sustainable Technology Optimization Research Center (STORC) to sustainably grow food for the course.



Sustainability Research

Dr. James Baxter produced an environmental film entitled "Becoming California" which won two regional Emmy awards. He also published two papers highlighting the relationship between the media and environmental learning.



Campus Engagement

Sustainable U Exhibit

Sac State Sustainability presented a journey into the cultural shift towards a greener campus in a pictorial exhibit presented in the Exhibit Lounge, University Union. The exhibit ran from April 20 – May 21 to coincide with Earth Day. The idea of ‘Sustainable U’ was our depiction of the choices individuals are making to ensure sustainability is the responsibility of all. Students, faculty, and staff of Sacramento State posed for pictures pledging to make our University the most green it can be and to share that ‘U’ too can make a difference! Photos exhibited highlighted campus sustainability efforts in the areas of: Academics, Dining Services, Energy, Landscaping, Planning/New Construction/Renewal, Recycling/Waste Management, Transportation, and Water Conservation.



Sustainability Manager Hired

Sac State Sustainability added the role of a Sustainability Manager in 2015 to further strengthen the University's commitment to growing a culture of sustainability. This rounds out the team of six full-time employees focusing 100% on sustainability including a Sustainability Manager, an Energy Analyst, a Sustainability Analyst, a Recycling Coordinator and two Recyclers, as well as our committed student assistants and interns.



Campus Food Drive

Spring of 2015 wrapped up the largest ever campus food drive led for the first time by Sac State Sustainability. With an initial goal of 6,500 lbs, collections of both monetary and food donations far surpassed the goal bringing in 9,189 lbs of food! All donations went to benefit Sacramento Food Bank and Family Services. The 2014/2015 food drive culminated with the Sustainability Team volunteering their time at a distribution and sorting center warehouse for Sacramento Food Bank to assist in organizing donations from the drive for distribution.

Food Day 2015

Student Health and Counseling Services collaborated with campus and community partners to host Sacramento State's annual Food Day on Oct. 20. Food Day inspires students, faculty, and staff to change their diets and our campus food policies. Festivities included cooking demonstrations by Natural Foods Co-op, a screening of Food Chains: The Revolution in America's Fields, with a panel discussion following the film moderated by Lesley McClurg, Capital Public Radio's Food and Sustainability Reporter, and a keynote speaker Douglas Gayeton, author of *The New Face of Food and Farming in America* and project leader of The Lexicon of Sustainability.

Waste & Recycling

Reusables at Housing and Residential Life

Beginning 2015, every student in residence at the University's Residential Housing is given a reusable to-go container for food, a reusable cup, and a reusable bag to carry everything in. These items can be used at the campus Dining Commons where students can use these items to take their food to go. This is part of a larger plan to institute a similar program at other campus eateries.

Audits

In an effort to ensure that campus waste is being recycled properly, Sac State Sustainability conducted trash and recycling can audits that led to several changes in the layout of bins across campus.

Zero Waste Event

The campus' first-ever large-scale zero-waste event was conducted at the 2015 Clean Air Partnership Awards Luncheon hosted by Breathe California of Sacramento-Emigrant Trails. Procurement planning, proper signage, and training of the catering staff ensured the event met its zero-waste goals, including composting of the hops and barley table centerpieces for the Sierra Nevada beer themed event coined "Sustainability on Tap."

Did you know?

Greens served in the salad at the 2015 39th annual Clean Air Partnership Awards Luncheon at Sacramento State were grown right here on campus by aquaponics!

Waste Generated and Minimized

In 2015, Sacramento State generated 2,392 tons of waste! However, **over 50%** of the waste generated was recycled, reused, or composted.

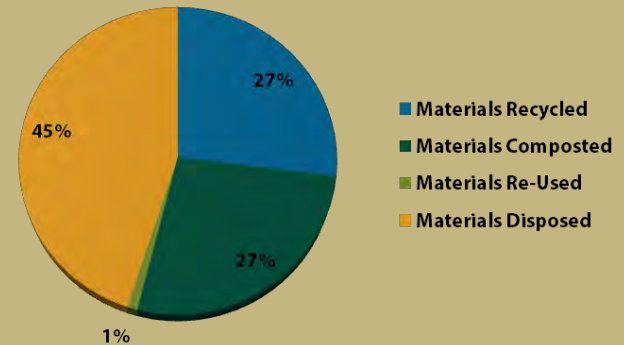
In 2015, Sacramento State disposed of **200 fewer tons** of waste in comparison with 2014!

Waste Generated By the Numbers (August 1, 2014 - July 31, 2015)

- Materials recycled: 469.06 Tons
- Materials composted: 639.13 Tons
- Materials reused, donated or re-sold: 1.08 Tons
- Materials disposed in a solid waste landfill or incinerator: 1,180.90 Tons

Food Collections at Dining Commons

Beginning Fall 2015, Dining Services began collecting all post-consumer food waste from the Dining Commons at Housing and Residential Life, diverting 26.5 tons of food waste within the first semester.



Did you know?

Long before local and state regulations required it, the Union Store stopped automatically offering plastic bags to its customers in an effort to reduce plastic bag waste.

Procurement

Dining

Dining Services is regularly working to identify possible improvement at Sacramento State in order to develop and enhance its sustainable practices. They identify and track organic, biodegradable, recyclable, and Rain Forest Alliance products. They also create and maintain their own sustainability reports as a means of achieving campus sustainability goals with Dining.

University Purchasing

The University has implemented rigorous sustainability guidelines when purchasing all products. These guidelines include promoting local goods and purchasing products made from recycled or renewable resources. The goal of these guidelines is to help the CSU system meet its environment goals and stimulate market demand for greener products.



Campus Surplus Auctions

In order to divert campus waste, the Procurement Department participates in Campus Surplus Auctions. Surplus equipment in working order is first offered internally via campus auctions, if the item remains, it can then be offered to the public through Public Surplus Auctions. In 2015, this program diverted more than **26 tons** of potential waste and generated approximately **\$52,000!**

Highlights:

70% of cleaning and janitorial products purchased were Green Seal or EcoLogo certified.

All office paper must be at least 30% post-consumer recycled content.



Highlights:

17% of dining services purchases were local and community based!

Goals:

Increase the purchase of recycled and sustainable goods by 15% by 2018.



Landscaping

Landscape Management

Sacramento State comprises 300 acres, 25 of which include undeveloped land. To sustainably maintain the campus landscape, the campus master plan dictates the reduction of turf and the use of native and drought tolerant plants for landscaping projects.

Low Impact Development (LID)

In 2015, Sacramento State's Office of Water Programs (OWP) and Facilities Management teamed with the City of Sacramento to install new stormwater management devices on campus. The project removed large areas of turf and included the construction of 25 LID stormwater capture and treatment devices on campus. The devices included bioretention planters, bioswales, rain gardens, rooftop disconnects, porous pavement, and a green street. The devices are designed to capture and treat over 13 acre-feet of stormwater runoff every year and increase ground water used for campus irrigation.

American River

The campus is located adjacent to the beautiful American River, which is a protected area. The University is currently working with the Department of Water Resources, Central Valley Flood Protection Board, and the American River Parkway Advisory Committee to assess any anticipated impacts to the flora and fauna of the American River and surrounding ecosystem as a result of the Student Housing Phase II project.



Highlights:

In Fall 2015, we collected approximately **90 cubic yards** of leaves to compost on-site for mulch!

A new composting facility has been created to compost our campus' **400-450 tons** of green waste on-site.

Did you know?

An acre of trees absorbs enough CO₂ over one year to equal the amount produced by driving a car 26,000 miles!¹



Tree Campus USA 2015

There's nothing greener than a tree and this campus has over 3,000 of them, including 1,200 located in our University Arboretum at the North end of campus. The Tree Campus USA program recognizes colleges and universities nationwide that establish and maintain community forests. Sacramento State is a four-time Tree Campus USA award recipient and was most recently recognized in April of 2015.

Transportation

Hornet Shuttles

Sacramento State created a closed-loop system through a comprehensive organic waste diversion program benefitting our Hornet Shuttle system. The campus sends organic waste collected in Housing and Residential Life's Dining Commons to the local Clean World anaerobic digestion facility where the material is made into bio-compressed natural gas (bio-CNG). This bio-CNG is used to power the fleet of campus shuttles creating a sustainable transportation source for the entire campus community.

Compressed Natural Gas (CNG), which emits 95% less pollution (depending on the pollutant) than a gasoline or diesel fueled vehicle is almost always significantly less expensive than petroleum, which means reduced fuel costs for Natural Gas Vehicle operators.

Did you know?

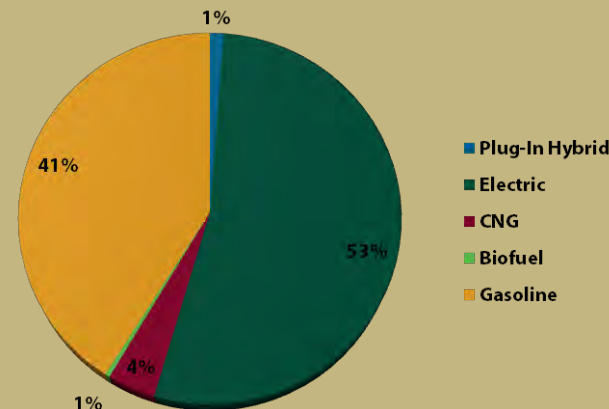
Sacramento State has 135 campus vehicles that run on 100% electrical power!

Campus Parking Changes

Due to the two-year construction for the new student housing development that began in 2015, Sacramento State lost approximately 400 parking spaces. This reduction created a great opportunity to encourage more sustainable commuting options such as carpooling, bicycling, public transit, and walking to campus. Sacramento State is providing incentives such as a reduced price parking permit and secured bicycle compounds.

Parking Heat Maps

University Transportation & Parking Services implemented parking heat maps to show where parking spaces on campus are available. These heat maps will reduce greenhouse gas emissions and alleviate campus traffic congestion. The University is currently working on creating large digital signs to display the heat maps.



Did you know?

Sacramento State added 3 new bike compounds in 2015 near Moraga & Sinclair, Benicia Hall and Mendocino Hall.

University Fleet

Plug-In Hybrid	3
Electric	135
CNG	10
Biofuel	1
Gasoline	104



Water Conservation

Low Impact Development (LID)

As a result of the implementation of Sacramento State's stormwater management system, 3.2 million gallons of rainwater were harvested by the University in 2015. There are currently 7 bioretention devices that treat stormwater runoff from larger parking lots. These devices use 12-24 inches of amended soil to filter stormwater.

Porous pavement has been installed throughout campus including walkways and along Jeb Smith Drive. Porous pavement allows stormwater to percolate through the surface which is then filtered by soil.

Downspouts at Calaveras Hall were disconnected and the rooftop runoff is now directed to two rain gardens. Rooftop runoff from portions of the campus' WELLness Center is directed via porous paving on the subsurface. There are also other areas throughout campus where rooftop runoff is directed to existing landscaped areas exclusively for irrigation purposes. Water usage from the five irrigation wells has been reduced up to 40% by these practices.

Irrigation

Sacramento State converted the existing sprinkler heads to low-gallon sprinkler heads and integrated all irrigation controllers to the Rainbird Maxicom irrigation control system. The Maxicom system is now connected to the campus weather station to automate weather related shutdowns and startups to conserve water used for irrigation.

Landscaping

Two additional landscaped areas of campus (Benicia Hall and The WELL) were converted to xeriscape, which requires far less irrigation than turf. Additionally, wood chips and mulch are utilized throughout the campus, primarily under trees, to retain moisture.

Infrared Faucet Study

In 2015, Sac State Sustainability student assistant Alyssa Harmon assisted in an experiment and compiled a report to test if automatic water faucets actually conserve water. Her study found that using infrared faucets result in a reduction of approximately 54% of water use with a .35 aerator compared to manual faucets using .5 aerators. Retro-fits throughout campus are under discussion.



Highlights:

The Office of Water Programs and the American Basin Council of Watersheds (ABCW) hosted the fifth Sacramento Regional LID Conference. The 2015 event was successful with close to 200 attendees learning about strategies for integrating LID into sustainable planning.



Energy Conservation

Energy Competition at Residential Housing

Jenkins Hall took first place in the first Sacramento State energy reduction competition at Housing and Residential Life through the Campus Conservation Nationals. All six residence halls competed with each other to see which buildings' students could save the most energy. The competition ran from April 6th to April 24th and was part of Housing's Green Games, a program that encourages residents to engage in sustainability related contests each year.

Energy Conservation Awareness Day

In 2015, Sacramento State hosted its eighth consecutive Energy Conservation Awareness Day. Energy Conservation Awareness Day is an annual event on the Sacramento State campus that seeks to inform event attendees of simple changes to their daily behaviors that help conserve energy and reduce their utility bills. Attendees learn about sustainability and are introduced to energy conservation alternatives such as electric bikes and solar cookers.



Solar

Sacramento State's roof-mounted PV solar systems on The WELL and the University Library continue to shine. In 2015, The WELL system produced **16%** of the total electricity required for the building and the Library system produced about **40%** of the total electricity required for the building. Sacramento State also has solar hot water heater systems on American River Courtyard, Riverfront Center, and Yosemite Hall.

Greenergy

The year 2015 marked the 6th year Sacramento State has participated as a green power partner in Sacramento Municiple Utility District (SMUD)'s Greenergy program, which meets the minimum environmental and consumer protection standards established by the non-profit Center for Resource Solutions. Sacramento State purchases a portion of SMUD's Greenergy product which is certified, and SMUD keeps the Renewable Energy Credits to offset electricity usage with renewable resources.

Total Energy Consumption by Buildings in MMBtu

	2014	2015
	250,017	257,086

Grid Purchased Electricity MMBtu

	2014	2015
	149,871	146,999

Highlights:

Sacramento State's renewable energy portfolio makes up 7% of the campus' total energy usage!

We purchase our natural gas from the Department of General Services via Pacific Gas & Electric.



Did you know?

A laser beam ensures energy efficiency during cooking in our Dining Services. When cooking steam rises into the hood and passes through the laser beam, it triggers the fan to turn on! This measure keeps the hood fans from running constantly.

Awards & Recognition

STARS

The Sustainability Tracking, Assessment & Rating System is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. Sacramento State was recognized as a **STARS Gold institution** based on Sacramento State's efforts in 2015.

2016 CASQA Award

The California Storm Water Quality Association Award recognizes outstanding projects that advance the storm water quality management profession. Sacramento State won this award for its 2015 project entitled: *Implementation of the City of Sacramento Low Impact Development Standards on the Campus of California State University - Sacramento*; this project was spearheaded by the Office of Water Programs.

2016 CHESC Best Practice Award

The California Higher Education Sustainability Conference Best Practice Awards competition is meant to highlight achievements and projects that California campuses have made in the field of sustainability. Sacramento State won two 2016 Best Practice Awards from achievements accomplished in 2015. These include the **Best Practice Award for Innovative Waste Reduction** and the **Best Practice Award for Sustainable Food Systems**.



Re-Fuel Your Fun

The Refuel Your Fun Program was enacted to provide 11lb refillable propane cylinders to the community. Sacramento State was **recognized by the California Product Stewardship Council** as the first college campus in California to participate in the program. Since the pilot program at Sacramento State, two additional campuses have joined the program, including Stanford University and San Jose State University. Sacramento State has been used as the university template for bringing the "Re-fuel Your Fun" program to schools across the nation. Beginning June 2016 this program will be implemented nationwide, using the Sacramento State model.

LID - 2015 Urban Development Project of the Year

The American Society of Civil Engineers (ASCE) Sacramento Section awarded the 2015 Urban Development Project of the Year to the campus Low Impact Development project! This project included constructing 25 LID stormwater capture and treatment devices on campus.



Greenhouse Gas Emissions Report

Sacramento State carefully tracks our direct (Scope 1) and indirect (Scope 2) carbon emissions. We are a campus of approximately 30,000 faculty, staff, and students; with a population of this magnitude it is our responsibility to minimize our carbon footprint. By regularly tracking Scope 1 and Scope 2 greenhouse gas (GHG) emissions we are able to compare our carbon output to other Universities, identify areas for improvement, and mitigate our impact on the planet.

Scope 1 includes direct emissions from sources that are owned or controlled by Sacramento State. Scope 1 GHG emissions include combustion of fuels to produce power and combustion of fuels by institution-owned transportation devices.¹

Scope 2 includes indirect emissions that are a result of operating the University, but are owned and controlled by an outside entity, such as purchased electricity, heating, cooling, and steam.¹

Sacramento State does not currently track Scope 3 emissions on a regular basis. Scope 3 emissions are defined as all indirect emissions not covered in Scope 2. Scope 3 GHG emissions include purchased goods and services, emissions generated by University travel, commuting, and waste generated in operations.¹

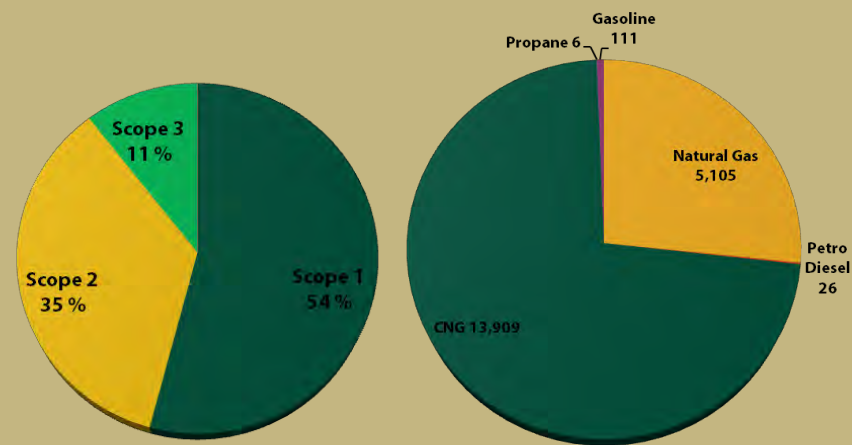


Carbon Emissions:

MT of CO ₂ E	2015
Scope 1 Natural Gas	5,105
Scope 1 Petro Diesel	26
Scope 1 Compressed Natural Gas	13,909
Scope 1 Propane	6
Scope 1 Gasoline	111
Scope 2 SMUD (electricity)	12,499
Scope 3 Waste	3741



To complete our carbon assessment for 2015, we used a 3rd party carbon calculator to estimate the metric tons of carbon emitted from University waste.² In completing this report, we have identified tracking Scope 3 emissions as an area for improvement in campus sustainability measures. Subsequent reporting will be calculated with Second Nature's GHG calculator with reporting through the Carbon Commitment.



Scope 1 carbon emissions in MT of CO₂E.

Carbon Offset:

The Sacramento State campus has over 3,000 trees! These trees range from giant Sequoias to new saplings. A single tree can sequester between .002 and .111 metric tons of CO₂ per year!³ This equates to a carbon offset of approximately **230 MT CO₂E per year**.



^{1, 2, 3} See Appendix

Vision for the Future

Sacramento State is committed to a sustainable future. To honor this statement, President Nelsen signed the Second Nature Carbon Commitment in April of 2016. This document requires that the University develop a Climate Action Plan to achieve carbon neutrality and submit an annual evaluation of progress. The plan must include a target date for carbon neutrality, indicators for tracking progress, actions to make carbon neutrality part of the curriculum, and actions to expand research in carbon neutrality.

The University has several plans already being implemented that will reduce its carbon emissions. One goal is to divert 100% of organic waste within the near future.



Finally, Sacramento State has implemented a campus-wide sustainability policy that seeks to integrate sustainability into the curriculum, reduce greenhouse gas emissions to 1990 levels or lower by the year 2020, promote the use of alternative transportation, and increase the CSU system-wide self-generated energy capacity to 80 megawatts by 2020.

Through policies, plans, and actions, Sacramento State will play a fundamental role in shaping our sustainable community.



Acknowledgements

Faculty Acknowledgements

Without dedicated faculty committed to enriching students' learning experiences by threading sustainability into their curriculum, many of the projects, awards, grants, and recognition of our 2015 sustainability achievements would not have been possible. The following faculty are receiving special acknowledgement for their commitment to growing campus sustainability:



Dudley Burton, Ph.D.
Environmental Studies



Brook Murphy, Ph.D.
Environmental Studies



Rustin Vogt, Ph.D.
Mechanical Engineering



Michelle Stevens, Ph.D.
Environmental Studies



Kelly Thompson, Ph.D.
Family & Consumer Sciences



Christine Flowers, MS, M.Ed.
Environmental Studies

Report Acknowledgements

This report was brought to you by Sac State Sustainability.

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Sustainability Report Authors, Layout & Design: Kristina Cullen, Alyssa Harmon

Campus Sustainability Efforts: It is a pleasure to work with such a diverse and energetic campus community committed to sustainability. A special thank you to the numerous students, faculty, and staff who make sustainable choices a priority everyday.

Appendix

Information for this sustainability report was obtained from data collected for STARS, the Sustainability Tracking, Assessment & Rating System and other sources. The STARS report and all of its data can be found at the following website:

<https://stars.aashe.org/institutions/california-state-university-sacramento-ca/report/2016-05-09/>

Scope 3 GHG emissions were calculated using the University of New Hampshire's Campus Carbon Calculator. Subsequent reporting will be calculated with Second Nature's GHG calculator. We entered in the following waste data to approximate Scope 3 GHG emissions:

2015	Units	
Incinerated Waste (Mass Burn)	0.3	Short Tons
Incinerated Waste (RDF)	631	Short Tons
Solid Waste (No CH ₄ Recovery)	1,080	Short Tons
Wastewater (Septic)	68,235,844	Gallons

The Campus Carbon Calculator then estimated our Scope 3 carbon emissions as 3,740.9 MT CO₂E. This estimation does not represent Sacramento State's total Scope 3 carbon emissions. Only Scope 3 emissions from food waste have been reported.



To calculate Sacramento State's carbon offset from trees, we utilized a paper by Escobedo et al. which stated that trees can sequester between .002 and .111 metric tons of CO₂ per year. Their sequestration estimate is based on the age, height, diameter, and species of the tree. Because Sacramento State has trees that vary in all of these factors, we took the average estimated sequestration and multiplied it by the number of trees on campus, yielding a carbon sequestration rate of 230 MT CO₂E per year. It should be noted that this number is a rough estimate and the University hopes to more accurately quantify its carbon offset in the future.

¹STARS AASHE. (2014). *STARS 2.0: Technical Manual*. Philadelphia, PA: AASHE.

²University of New Hampshire. (2014). *Campus Carbon Calculator*. Retrieved from: <http://campuscarbon.com/CampusCalculator.aspx>.

³Escobedo, F., Seitz, J. A., & Zipperer, W. (2015). Carbon sequestration, storage, and offsets by Gainesville's urban forest. *School of Forest Resources and Conservation Department*, <https://edis.ifas.ufl.edu/pdffiles/FR/FR27200.pdf>





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Sustainability Report 2015

