

CSUDH Annual Sustainability Report

FY 2017-2018

July 1, 2017- June 30, 2018

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Executive Summary



Figure 1- CSUDH student volunteers in front of the carbon cube display at October Sustainability Month.

Campus Sustainability Highlights:

In the 2017-2018 fiscal year (FY), California State University Dominguez Hills (CSUDH) made several important strides towards supporting sustainability on campus. A few prominent accomplishments include:

Awards/Accomplishments:

- Earned a 2017 statewide Best Practice Award in HVAC Design/Retrofit and Commissioning at the California Higher Education Sustainability Conference.
- Earned additional statewide Best Practice Awards in 2018 for Data Driven Communications and Battery Storage respectively. These awards will be presented in July at the California Higher Education Sustainability Conference.
- Hired CSUDH's first-ever sustainability coordinator in August of 2017.

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- Ongoing management of a student intern team of eight grant and campus-funded interns in addition to one volunteer intern in working on on-campus sustainability projects.
- Attracted approximately \$24,000 in outside grant funding over the course of the academic year:
 - \$13,000 from Chancellor’s Office for a Campus as a Living Lab (CALL) grant to support launch of the on-campus Farm.
 - Under the guidance of the CSUDH Sustainability Coordinator, a student Sustainability Intern earned \$6,250 in ASI Greenovation grant money to launch a Net Zero Innovation Center at the Central Plant. The project involved adding solar panels, water-saving features, and vermicomposting, and more to the outdoor picnic table area to create a learning center for the campus community on sustainability.
 - Earned \$4,500 worth of student internship funding from the Water Resources Policy Institute (WRPI) to hire a CSUDH student to work on green waste composting research and help with launch of the on-campus Farm.



Figure 2- Sustainability Interns working on the newly launched Campus Urban Farm.

Projects:

- Received Presidential Cabinet approval for an on-campus farm that is currently providing a living laboratory space for faculty and students, as well as serving as a vehicle for exploring food production for distribution to food insecure students. The Campus Urban Farm engaged 70 student volunteers and two-service learning classes

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during the spring semester after launching in February. This represents 476 volunteer service hours completed at the Farm in just a three month period!

- Launch of a Net Zero Innovation Center at Central Plant in April 2018 in conjunction and with support from ASI, the California State Student Association (CSSA), and students from the Office of Sustainability.
- Improvement of the campus recycling program in terms of marketing, signage and receptacle distribution. The campus also added commercial organics recycling service in May of 2018. This is supplemented by a curb-side drop off bin for composting on-site at the Campus Urban Farm.
- The Sustainable Landscape Committee, a working group established in the fall of 2017 under the auspices of the general Sustainability Committee, completed a campus Sustainable Landscape Plan outlining guidance and campus standards for managing state-side and faculty/student-run landscapes on campus.
- Installation and launch of a 1MW battery storage project on campus, making it the single biggest battery storage project in Southern California.
- Completed lighting retrofits of parking lots 4a and 4b to Enlighted LED technology, increasing visibility and safety in those lots.
- Expanded LED lighting to the dressing rooms of the University Theater and underground campus tunnels to increase occupant comfort and save energy.



Figure 3- A CSUDH student demonstrating how to use the bicycle blender display at CSUDH's 11th Annual Earth Day Festival.

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Engagement:

- Reached over 400 students, faculty, and staff during the five-week long 2017 October Sustainability Month campaign. This initiative won a 2018 Best Practice Award at the California Higher Education Sustainability Conference for its innovative approach to outreach.
- Reached 220 students, faculty, and staff during the three-week long 2018 March Race to Reduce campaign. An additional 42 students from 35 different units participated in the Race to Reduce energy competition in Housing Phase I and II. This represented the first-ever energy competition to be conducted on campus at CSUDH.
- Organized CSUDH's 11th annual Earth Day on April 19th, bringing a record number of vendors, campus departments, and student groups together as well as a Farmer's Market for the event. 135 students from 7 different classes also participated in the bingo card game activity at the event for extra credit options worked out with professors ahead of time.
- Directly engaged 16 academic courses over the academic year in sustainability activities and research projects to infuse sustainability into the curriculum. These efforts engaged 274 students and led to collaborations with 14 faculty members from a variety of academic departments including Biology, Earth Sciences, Chemistry, Marketing, Communications, and Philosophy.



Figure 4- Passers-by admiring the Tesla display at CSUDH's Earth Day Festival.

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

-UN World Commission on Environment and Development, 1987

Sustainability Planning & Policies

Sustainability Planning:

Sustainability Staff

The Office of Sustainability consists of a full-time Sustainability Coordinator (hired in August of 2017) and significant support and supervision by the Campus Energy Manager and Director of Facilities. The Office is housed under Facilities Services. The Office also supports a team of 3-9+ paid and volunteer student interns at any given time during the academic year.

Sustainability Committee

The Sustainability Committee is an open group that consists of 40+ student, staff, and faculty members from Facilities Services, upper administration, Academics, and Auxiliaries. The Committee meets monthly during the school year in an open town-hall format which all campus community members are encouraged to attend.

Working Groups

The Sustainability Committee also hosts three specific committees/working groups that meet outside of the monthly meetings to work on initiatives:

- **Sustainable Landscape Committee:** Works on development and enforcement of a Sustainable Landscape Plan that provides guidance on plant palettes, irrigation requirements, ecosystem function, and landscape maintenance issues on campus.
- **Earth Day Committee:** Organizing committee for planning around CSUDH's annual Earth Day held the first Thursday of Earth Week every year.
- **Faculty Working Group:** Faculty group that collaborates to identify and support courses that infuse sustainability into the curriculum.

Guiding Policies:

In evaluating which sustainability initiatives are highest priority for the campus, the Office of Sustainability considers each project in the context of several overarching policies and goals.

Zero Net Impact Campus Goals

To achieve true sustainability, the campus must aim to reduce its environmental impact by addressing its consumption and usage of natural resources. To that end, CSUDH sustainability initiatives are largely designed to drive progress towards three major net zero goals:

- Improve the energy efficiency of campus facilities and increase renewable energy generation with the goal of someday achieving a net zero energy bill for the campus.
- Strive for the highest possible diversion rate to non-landfill sources with the goal of becoming a zero waste campus. Reduce waste volume overall by integrating source reduction approaches into campus operations.
- Achieve net zero water consumption with the goal of only consuming water, regardless of source, equal to the amount that would be delivered to the same area based on natural rainfall.

Net Zero Concepts and Definitions

Net Zero and Net Positive (NZ/NP) strategies emphasize taking a systems approach to reduce water, energy, and waste footprints in installations and communities. These NZ/NP strategies provide long-term solutions for sustainability and resilience by meeting the environmental objectives of clean air and water, and reducing or eliminating waste sent to landfill, while ensuring the long-term viability of resources is not only maintained but also improved. At their core, NZ/NP strategies represent "sustainability in action".

Net Zero means consuming only as much energy as is produced, achieving a sustainable balance between water availability and demand, and eliminating solid waste sent to landfills.



Achieving **Net Zero Water** means limiting the consumption of water resources and returning it back to the same watershed so as not to deplete the resources of that region in quantity or quality over the course of the year.



Achieving **Net Zero Energy** means producing, from renewable resources, *as much* energy on site as is used over the course of a year. Achieving **Net Positive Energy** means producing, from renewable resources, *more* energy on site than is used over the course of a year.



Achieving **Net Zero Waste** means reducing, reusing, and recovering waste streams to convert them to valuable resources with zero solid waste sent to landfills over the course of the year.

Definitions adapted from US Army Office of the Assistant Secretary of the Army for Installations, Energy, and Environment.

Figure 5- EPA definitions of Net Zero Concepts (<https://www.epa.gov/water-research/net-zero-concepts-and-definitions>)

2014 CSU Chancellor's Sustainability Policy

CSUDH strives to support the targets set forth by the 2014 CSU Chancellor's Sustainability Policy, available here: <http://www.calstate.edu/cpdc/sustainability/policies-reports/documents/JointMeeting-CPBG-ED.pdf>



Figure 6- CSUDH is a member of the Association for the Advancement of Sustainability in Higher Education (AASHE).

AASHE STARS Reporting

To provide transparency and a general benchmark for measuring the sustainability performance of CSUDH against other higher education institutions, CSUDH participates in the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment & Rating System (STARS).

Currently, CSUDH is poised to submit its first AASHE STARS report in the 2018-19 FY. Projections of current points estimate the campus will achieve a Bronze rating once submitted.

Utilities & Services

Utilities include energy, water, and trash/recycling services. Since there is a delay in utility bill reporting, annual consumption is reported in calendar year for 2017 (unless otherwise stated) below.

Utility Consumption & Greenhouse Gas Impact

For the 2017 calendar year, the campus used 17,124,702 kWh of electricity and 1,005,582 therms of natural gas, 113,298 CCF or 84,746,904 gallons of water, and generated 587 tons of non-diverted solid waste (stateside property only).

As part of statewide reporting requirements, CSUDH is reporting data to the Chancellor’s Office on its Scope 1 and Scope 2 emission sources based on FY. This results in the following greenhouse gas trends for the 2016-17 FY:

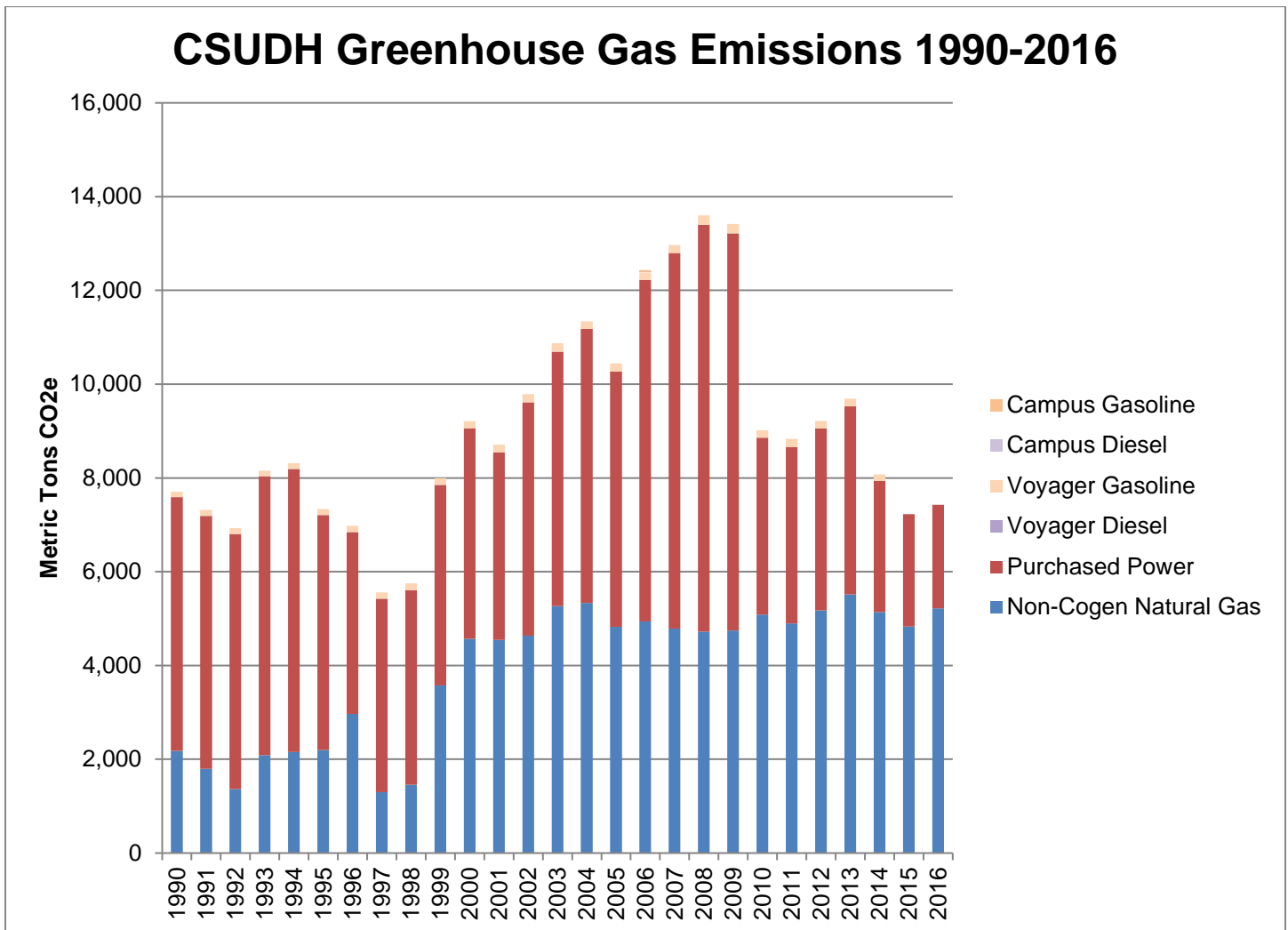


Figure 7- CSUDH Greenhouse Gas Emissions reporting since 1990.

In support of the Chancellor’s Office’s greenhouse gas reduction goals, the campus uses 1990 FY levels as its baseline for comparison on greenhouse gas.

Currently, CSUDH is under its 1990 levels (7,707 tons total) for the 2016-17 FY (7,427) by 280 tons despite a significant increase in the number of buildings, square footage, and enrolled students since 1990. As Central Plant will be upgrading several key assets in the context of improving energy efficiency and supporting the general trend towards electrification, these reductions are likely to continue.

Energy

Over time, campus reporting has improved its data tracking from additional on-campus entities that do not report their utility costs to campus Finance. This results in a general increase that begins to stabilize in 2016 which is when all known entities began reporting their energy consumption.

Electricity: Overall, electricity usage for the campus has gone up, but natural gas consumption has gone down proportionally despite campus growth as a result of the general trend towards electrification of campus energy assets. This results in reduced greenhouse gas impact for the campus as a whole.

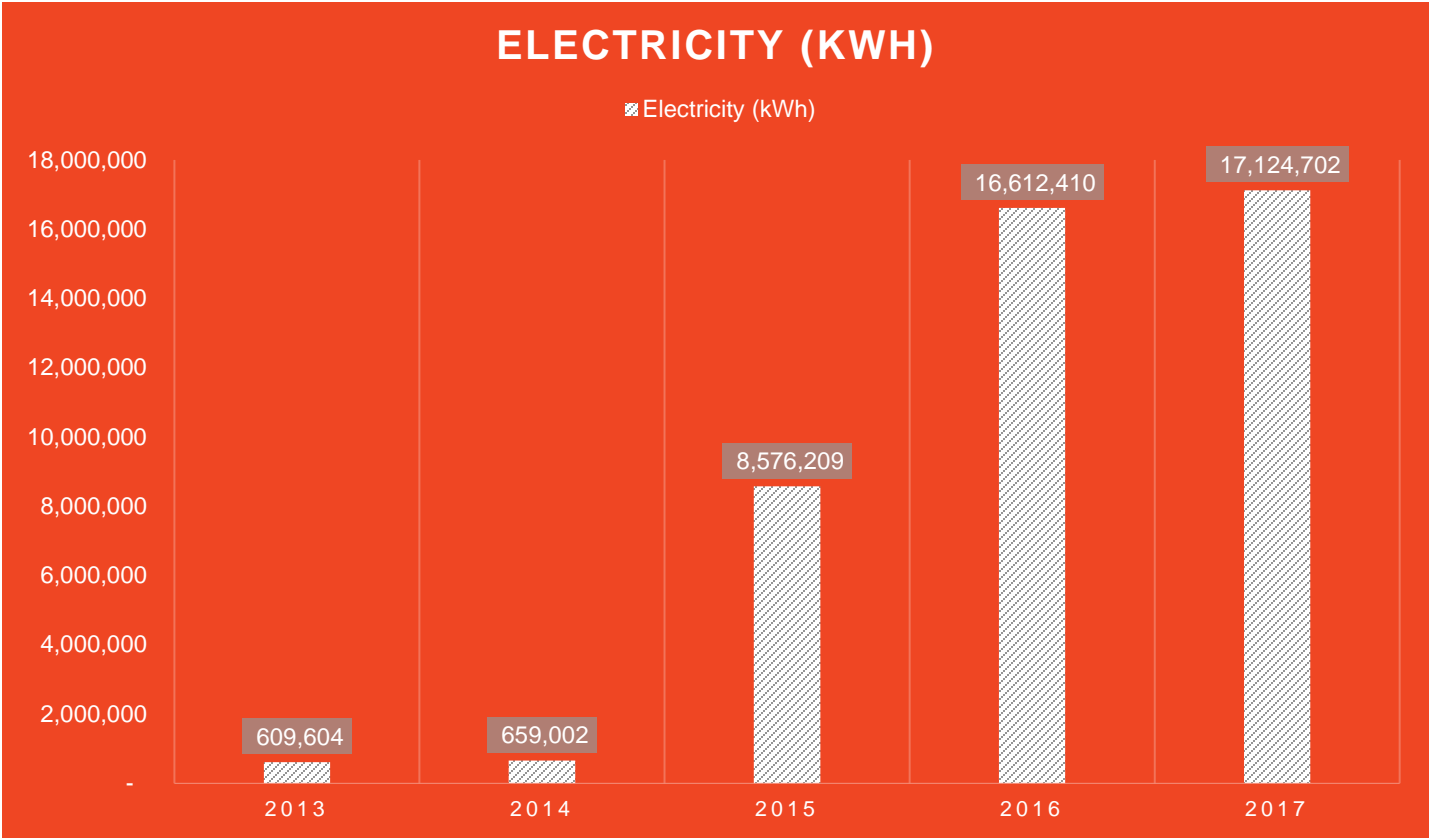


Figure 8- Campus electricity consumption by calendar year for CSUDH.

Natural Gas: Natural gas consumption has stabilized over time due to the continued electrification of natural gas assets (despite campus growth). In the context of campus greenhouse gas reduction goals, this consumption is projected to decrease significantly over time.

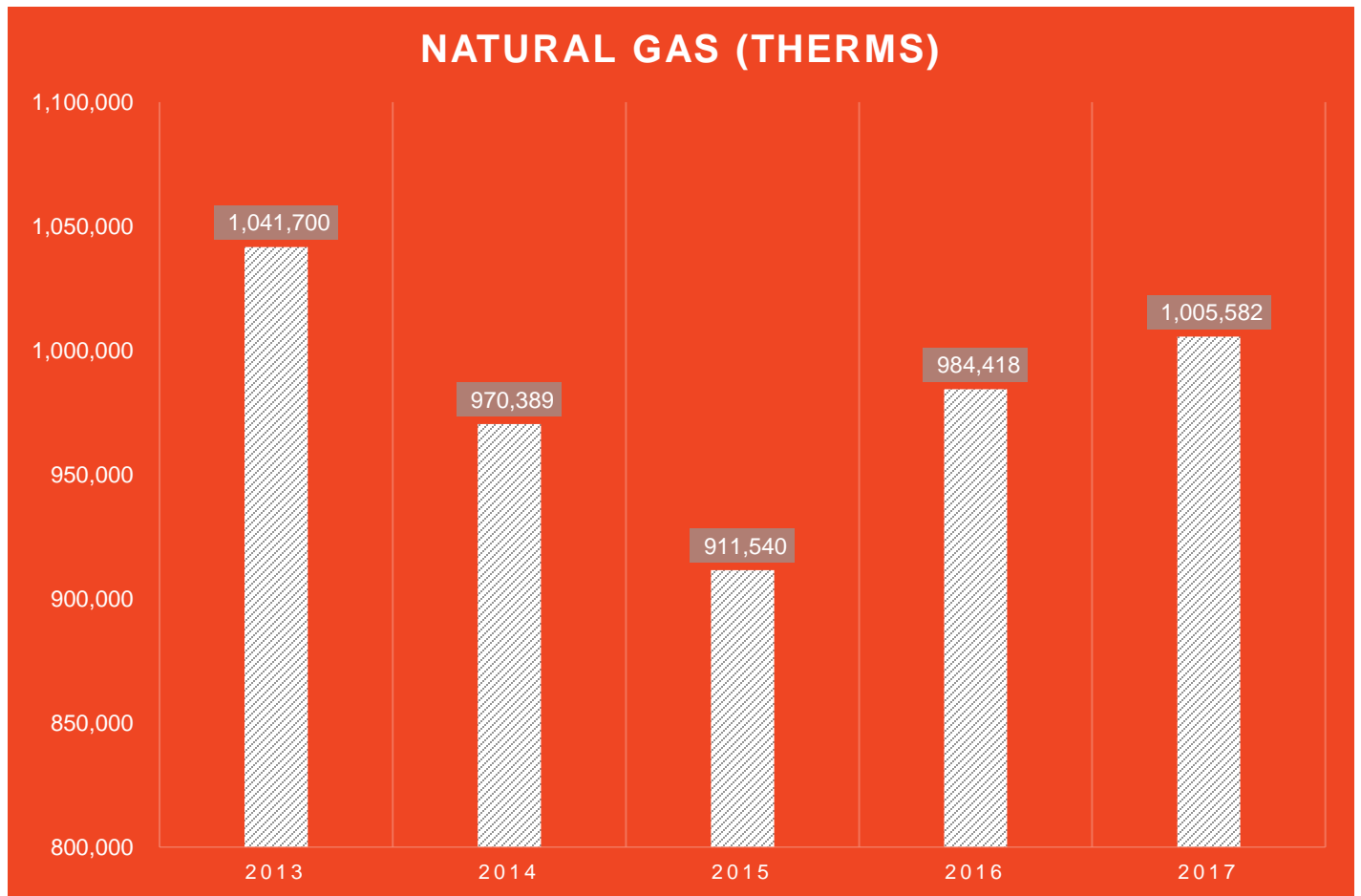


Figure 9- Campus natural gas consumption by calendar year for CSUDH.

Energy Efficiency Initiatives:

Central Plant supplies 90% of the heating and cooling load to the campus, and takes a major leadership role in driving energy efficiency efforts on campus. Their approach to the task involves piloting innovative new technologies, supporting ongoing retrofits and upgrades of campus lighting and other assets, supporting detailed energy tracking and monitoring,

and regular commissioning projects to continually drive down campus energy consumption despite a growing campus.



Figure 10- Aerial view of the CSUDH 1MW/4 Hour battery storage unit.

Projects:

- Central Plant/HVAC Upgrades:
 - In October of 2018, Central Plant replaced an old leaky cooling tower with a new energy efficient model that saves both water and power.
 - Belimo Smart Energy Valves were installed on the air handler coils for Welch Hall, Library South, Student Health Center, Gym, Natural Science and Mathematics, and LaCorte Hall with more valves scheduled to go in next fiscal year.
 - This FY, the aging 3 million BTU water heater in the College of Education was replaced with an efficient 1 million BTU water heater.
- In January 2018, Central Plant's 1 MW/4 Hour Battery Storage project came online for the campus. This battery storage installation, the largest of its kind in Southern California, releases energy during peak demand periods, reducing the campus' time-of-use costs to the tune of \$80,000 in projected savings per year. This project has won several awards for its use of an advanced artificial intelligence program to optimize performance on this

already cutting-edge technology including a 2018 Innovation Award from Smart Energy Decisions and a 2018 Best Practice Award from the California Higher Education Sustainability Conference.

- As part of an ongoing project supported by funding through the Chancellor's Office, Central Plant continued retrofitting pneumatic valve controls to DDC controls in LaCorte Hall, and will be conducting additional retrofits throughout the campus from there. This significantly improves control over HVAC delivery to those buildings, and assists in modernizing critical campus infrastructure.
- Central Plant continues to install new building level sub-meters for electricity, water and natural gas, bringing new data into campus analytics to ensure efficient campus operations. Electricity and natural gas sub-metering for all campus buildings is nearly complete. Water meters will continue to be installed throughout the 2018-2019 FY.
- Wherever possible, Central Plant continues to convert areas with outdated lighting to the latest in LED lamp and control technology. This FY, the following locations were upgraded to LED lighting on campus:
 - In the University Theater, 120 65W incandescent bulbs were replaced with 15W LEDs around the dressing rooms in October of 2017, greatly improving lighting quality while also reducing heat load. This was a significant upgrade to occupant comfort, as the bulbs were located directly around the mirrors the actors were using to prepare makeup. The project is anticipated to save 13,140 kWh and \$1,608/year for the campus
 - In the workrooms and equipment spaces of the campus tunnels in November of 2017, Central Plant replaced 50 65W incandescent bulbs with 15W LEDs, significantly improving light quality as well as saving an anticipated 936 kWh and \$150/year.
 - During the spring semester of 2018, Facilities Services completed install of LED fixtures in parking lots 4A and 4B, replacing 44 100W HPS lamps in those lots. Enlighted LED controls, to be installed over the summer of 2018, will save an additional 50% in energy once in place.

Water

While approximately 90% of the campus uses reclaimed water for its irrigation needs, with this percentage slated to increase with the possible conversion to reclaimed water by CAMS and in Parking Lot 7, CSUDH's progress towards Chancellor's Office water efficiency goals is determined by water consumption volume regardless of source. Therefore, water efficiency initiatives related to outdoor irrigation still represent a key element in ensuring CSUDH's success in achieving campus net zero water and Chancellor's Office water efficiency goals.

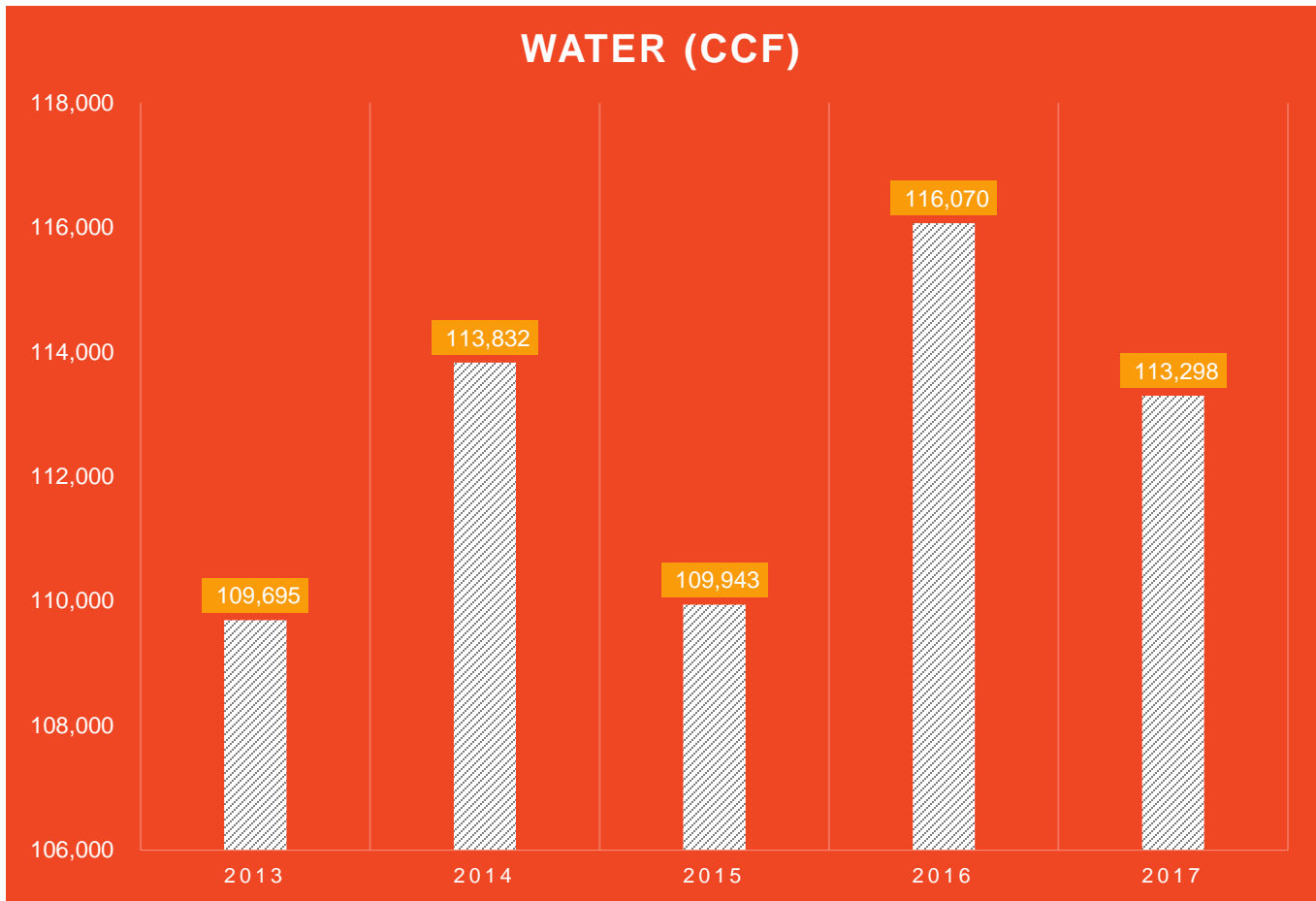


Figure 11- Campus water consumption by calendar year for CSUDH.

In terms of more ambitious goal-setting, approximately 80,228 CCF falls on the stateside-maintained grounds on campus (170 acres) based on an annual rainfall rate of 13" per year. This means that CSUDH still has 33,070 CCF in reduction measures to pursue before achieving a net zero water balance for the campus. This aligns very closely with the Chancellor's Office goal of 10% water conservation from 2013 CY levels which represents a 2016 goal of 82,270 CCF in consumption. This consumption would need to go down to 76,785 CCF by 2020 to reach the Chancellor's Office goals for 20% water conservation by 2020.

The total irrigated landscape area for the campus is approximately 170 acres, which has a calculated Landscape Water Budget of 113,424 CCF (84,841,152 gallons) per year. The historical landscape water use for the campus is 121,604 CCF (90,959,792 gallons) per calendar year. Water budgets are determined by month to factor in weather, so the campus was able to stay within its water budget during the summer months, but over-used during certain times of the year. This represents an above-budget usage of 22,792 CCF (17,048,416 gallons), mostly occurring during the winter months (January, February, March, October, and December).

Comparison of Landscape Water Budget vs. Historical Water Use												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Landscape Water Budget	3,112	3,519	8,169	11,793	12,721	13,644	14,672	14,618	10,652	8,902	6,528	5,094
Historical Water Use	7,590	13,107	8,545	11,281	10,063	11,404	11,950	11,641	7,970	13,447	5,707	8,899
Usage Above Budget	4,478	9,588	376	-	-	-	-	-	-	4,545	-	3,805
Total Site Landscape Water Usage Above Budget: 22,792 HCF or 17,048,416 gallons												

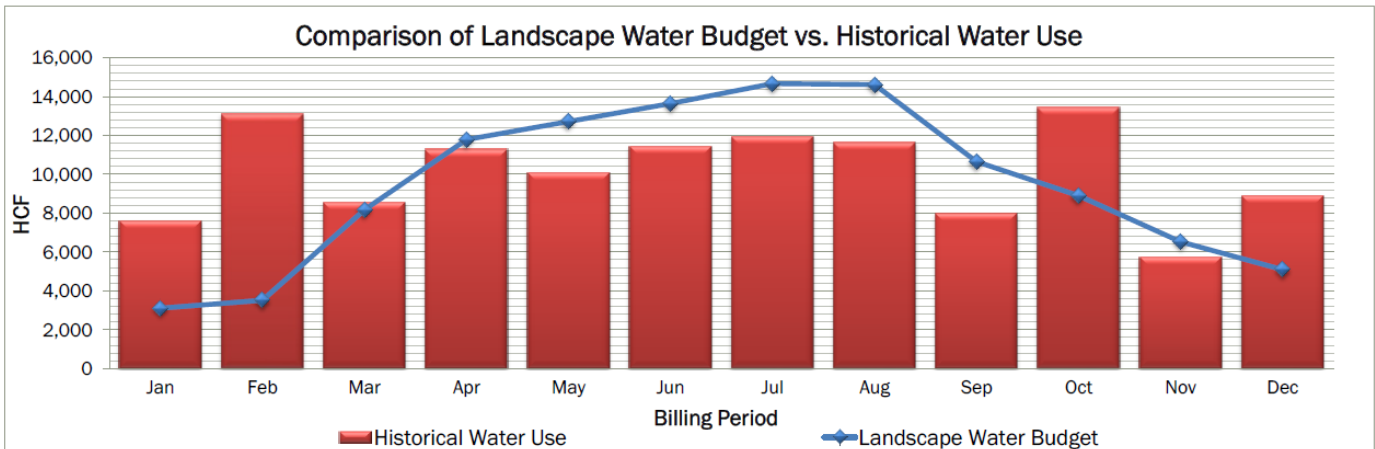


Figure 12- Campus Water Budget (p. 7 of CSUDH MWD Report)

The irrigation audit provided by the Metropolitan Water District (MWD) in spring of 2018 provided recommendations as follows on how to address this 17 million gallon per year excess:

Water Efficiency Measure	Units	Initial Cost	Rebates & Incentives	Water Savings (Gal/Yr)	Water Savings (HCF/Yr)	Annual Savings ¹	Simple Payback ² (Years)
Recommendations for Landscape Improvements							
Replace Unused Areas of Lawn with Drought Tolerant Plant Material (sq ft)	101,400	\$377,208	\$0	10,841,512	14,494	\$41,519	9

Recommendations for Irrigation System Improvements							
Fix Irrigation Systems Problems	25	\$524	\$0	2,561,152	3,424	\$9,809	Immediate
Replace Spray Nozzles with Rotary Nozzles	300	\$1,500	\$600	142,868	191	\$546	2
Redesign with Drip Irrigation	101,400	\$24,336	\$0	3,351,040	4,480	\$12,833	2
Totals:		\$ 403,568	\$ 600	16,896,572	22,589	\$ 23,188	17.4

1. Cost savings are based on a water rate of \$2.975 per CCF (January 2017 rate)
2. The total simple payback period is based on the total implementation costs and the total savings amount (the bottom line), it is not an average of the payback periods of each recommended measure.
3. *Rebate amounts are subject to change.

Figure 13- Campus Recommendations (p.8 of MWD Report)

The largest contribution would be to remove the under-utilized lawn areas and replace with drought-tolerant plant material (10.8 million gallons), followed by irrigation efficiencies and improvements (6.2 million gallons).

Indoor Fixtures:

- The Office of Sustainability and Facilities Services have identified the second floor restrooms of Welch Hall as a candidate for a green restroom retrofit over the summer and fall of 2018. These restrooms will be outfitted with EPA WaterSense-rated automatic sensor faucets, toilets, and urinals to demonstrate the latest in water efficiency technology. This will also be complemented with water conservation signage and feedback surveys to gain campus support for water conservation efforts as well as valuable feedback on these new fixture models.

Outdoor Irrigation:

- The Office of Sustainability in partnership with Facilities Services has held planning meetings with Cal Water, West Basin, and Metropolitan Water District (MWD) to proactively pursue rebate opportunities and take advantage of conservation resources in the 2018 calendar year.
- Via the Sustainable Landscape Plan, the Sustainable Landscape Committee has set aggressive campus standards for irrigation, exceeding state Model Water Efficient Landscape Ordinance (MWELO) requirements for landscaping by not allowing special exemptions for reclaimed water usage. Outdoor irrigation is now held to the same standard of efficiency regardless of water source.
- Per request from the campus, MWD conducted a professional irrigation audit of campus landscaping on April 10, 2018 to identify potential water savings opportunities. Their report, delivered in June 2018, identified several opportunities for converting lawn to drought-tolerant plantings, fixing sprinkler systems, and more efficient

irrigation practices that Grounds will be evaluating for integration in the next fiscal year. Full implementation of all recommended measures is estimated to reduce landscape water use by approximately 16.8 million gallons per year, representing a cost savings of \$23K annually.

- Grounds has also been reigniting the efforts to fix the CalSense irrigation control system for the campus, and worked with IT to restore basic connectivity and functionality to allow remote irrigation control. They are also working on integrating local weather data into CalSense to allow for more accurate weather-based monitoring and irrigation for maximum efficiency.



Figure 14- View of the faculty/student-run Butterfly Garden, a recognized landscape under the Sustainable Landscape Plan

Sustainable Landscaping

In the fall of 2017, the Sustainability Committee formed a dedicated working group, the Sustainable Landscape Committee, to provide guidance and support for sustainable landscaping on campus. Meeting monthly during the school year, and once during the summer break, the Sustainable Landscape Committee addresses a variety of issues related to campus landscape including faculty/student-run gardens. It also includes representation from Facilities Services, students, and faculty to ensure a balanced and strategic approach to campus landscaping.

- On March 23, 2018, the Committee approved a final draft of the Sustainable Landscape Plan that sets forth standards for complying with the state Model Water Efficient Landscape Ordinance (MWELO), planting choice recommendations on stateside Grounds, tree care policies, and maintenance agreements for faculty/student-run gardens. A copy of this plan is available on the CSUDH Sustainability website at: <https://www.csudh.edu/sustainability/campus-initiatives/landscaping/>
- In the spring of 2018, the Committee also approved standardized signage for all the recognized faculty/student-run gardens under the Committee's jurisdiction. These waypoints are designed to enhance recognition for these living laboratory spaces and provide historical information on these gardens. A paid Native Garden Intern is also spending summer of 2018 creating plant signage for ecologically significant plants in the gardens to further enhance the value of these gardens as an educational tool.

Faculty/Student-Run Landscape:

There were a few additions and changes to the ownership and maintenance agreements for existing gardens as well as the creation of additional faculty/student-run landscape areas during the 2017-2018 FY:

- In spring of 2018, Housing approved terms to have the Ocean-Friendly Garden included as a faculty/student run landscape through the Biology Department with recognition under the Sustainable Landscape Plan.
- The Campus Urban Farm was approved in February 2018, adding a unique faculty/student-run living laboratory to the campus (*see dedicated Campus Urban Farm section in the Academics section of this report*).
 - The Campus Urban Farm also created an Earth Day Grove on April 19, 2018 as part of the Earth Day festivities, establishing a tradition that a fruit tree will continue to be planted every year on Earth Day henceforth. These fruit trees will be managed under the direction of the Campus Urban Farm.
 - Partnering with the Biology Department, the Campus Urban Farm also manages a native plant garden designed to attract pollinators around its fence. Maintenance for this native plant garden is under the jurisdiction of the Campus Urban Farm, though it collaborates with the Biology department/Native Plant Intern for support on care.

Facilities Services Initiatives:

Facilities Services, in addition to participating in the Sustainable Landscape Committee and serving as enforcers of the Sustainable Landscape Plan, continues to implement sustainable landscaping practices on stateside property:

- Grounds actively uses grasscycle management practices to reduce the need for watering and waste disposal of organic material.
- Grounds also partners with the student-run Campus Urban Farm to re-direct green waste from landscaping activities to the on-site composting system there whenever possible.



Figure 15- Students from the spring GEO 420 class assisting in a waste audit of campus waste streams.

Waste Management

In the 2017-18 academic year, Facilities Services supported a large revamping of its existing waste management program to encourage campus progress towards net zero waste.

Source Reduction:

- To try and mitigate the rush of bulky items that get left in the trash as a result of move-out in Housing, the Office of Sustainability created marketing collateral and a move-out survey for Housing that identified potential demand. The survey also let users know about a planned pick-up by Salvation Army to encourage preemptive donations of items residents intended to dispose of. 33 student residents filled out the survey.

General Recycling

- In October 2018, Facilities Services ordered 3 yard commercial mixed recycling dumpsters through Republic Services to be delivered to Physical Plant, LaCorte Hall, Social Behavioral Sciences, Natural Sciences & Mathematics, University Theater, Child Care Center, and Extended Education. This was complemented by a

simultaneous roll-out of Marketing-designed recycling guidance signs on campus exterior recycling bins by the Office of Sustainability.

- Throughout the year, the Office of Sustainability provided recycling guidance to the campus via educational events and communications including:
 - Campus-wide e-mail announcements, directing campus users to the Office of Sustainability-designed “Recycling 101 Guide” infographic detailing the locations of the mixed recycling dumpsters and guidance on materials.
 - Updates to the Office of Sustainability website to address recycling guidance specifically.
 - In-person tabling events dedicated to recycling training during the first week of March for Race to Reduce Month. This involved hosting a recycling station in front of the Loker Student Union on March 5th and 8th where visitors could learn how to recycle appropriately in exchange for prizes. This engaged 50 campus users overall.
- Rubbermaid sales representatives assisted the campus with a detailed inventory count identifying areas in need of new bins. They also worked with the Office of Sustainability to conduct a professional waste assessment on April 25th. Nine students also participated in the waste sort activity as part of their GEO 420 class for extra credit. The resulting reports helped identify potential diversion rates for organics and mixed recycling at NSM and the LSU.



Figure 16- An example of the new mixed recycling dumpsters on campus.

Organics Recycling

- In compliance with California AB 1826 law, Facilities Services and the Loker Student Union partnered to split costs for a commercial organics recycling dumpster through Republic Services which was delivered in May 2018.
- As part of the Water Resources Policy Institute (WRPI) USDA-funded grant, the WRPI Intern is conducting on-going student research into different methods of on-site composting using campus generated material. This includes clippings from landscaping activities by Facilities Services as well as food scraps brought to the Farm by campus users via the curb-side drop-off bin. (See the *Internships* section of this report for more information on this project).
- Between May and June 2018, the Office of Sustainability distributed a campus-wide faculty/staff survey requesting feedback on campus users' thoughts on existing recycling coverage as well as their receptivity/preference for a future campus organics recycling collection program. 119 employees responded to the survey with the following results:
 - Feedback and support for an organics recycling program was highly positive, with 75% of users interested in a collection system in common areas near their offices.
 - 95-97% of users think recycling is of high importance, and are willing to recycle more if provided with sufficient access. Currently only 60% of users feel the recycling coverage/access is adequate.
- Eight Net Zero Waste bins featuring a three stream system (landfill, mixed recycling, and compost) arrived in June 2018. Starting in the fall, these bins will be rotated periodically to different campus buildings to pilot an organics scraps recycling program, solicit feedback on the program, and collect field data on how to best implement a net zero waste program for the campus.

Hazardous Waste Management

- In the fall of 2017, the Office of Sustainability provided marketing for the existing battery bucket program to highlight the importance of collecting campus-generated batteries separately for recycling. This included working with Marketing to develop custom signage for placement on Facilities Services-provided battery pails for use by campus offices. The Office of Sustainability also included this service in its marketing, greatly increasing the number of offices that now have a battery collection receptacle available to its staff. (Previously these buckets were only in four locations. As of this report, there are now at least 10 participating offices with the Recycling Coordinator continuing to distribute battery buckets upon request).



Figure 17- Newly branded battery collection buckets provided by the campus.



Figure 18- The Toro Express provides regular shuttle service to major mass transit centers near campus.

Transportation

As a commuter campus, CSUDH continues to make efforts to reduce the environmental impact of transportation by CSUDH students, staff, faculty, and visitors. Initiatives towards this end for the 2017-2018 FY include:

- Hiring of a Rideshare Analyst to support programs designed to encourage ridesharing and alternative transportation amongst students and employees on campus.
- The planned addition of a bicycle plan and pedestrian plan to the ongoing campus Master Planning process.
- Continuation of the campus Toro Express shuttle which provides free, regular drop off and pick-up to and from major mass transit hubs near campus.
- Continuation of the electric vehicle parking and zero emissions vehicle program which provides preferred parking for these vehicles when registered through the program.
- Continuation of the TAP card program which provides a 51% discount for TAP card re-loads for campus employees and students utilizing the Metro system.

Procurement

As an entity with significant purchasing power, the campus has great influence over the embedded environmental impacts from the items it buys. By supporting and utilizing suppliers and vendors that incorporate waste reduction, recycled materials, and/or other environmentally friendly materials and practices, the university can support sustainability on a much larger scale. The campus also has an economic and environmental responsibility to attempt to encourage re-use as well as the use of recycled content in its purchases. This fiscal year, the campus pursued the following initiatives:

- Adopted the CSU system-wide Staples Auto Sub program which automatically switches products purchased through the campus Staples account (the designated office supplier for the university) to greener alternatives.
- Campus Dining also is conducting an internal review of its suppliers and vendors, incorporating sustainable food options as part of its evaluation. It also conducted several Food Advisory Forum meetings over the spring semester to solicit feedback on improving food options, including adding more vegan and vegetarian-friendly options.

Academics/Green Workforce Development



Figure 19- Energy Manager Kenny Seeton conducting an Energy Efficiency 101 lecture for CHEM 103 students.

Courses

Integrating sustainability concepts into the curriculum and supporting sustainability courses is critical in ensuring students graduate with a strong understanding of their role as global citizens.

- As part of AASHE reporting requirements, the Office of Sustainability completed CSUDH's first-ever academic inventory of its sustainability-related courses. This involved a line-by-line review of all the courses offered during the 2017-2018 academic year to evaluate whether these courses could be considered a sustainability course, or if it was a course that integrated sustainability principles.
- Based on this evaluation, approximately 5% of undergraduate courses and 1% of graduate courses offered at CSUDH integrate sustainability and/or are considered sustainability courses.

Academics/Green Workforce Development

- The full inventory database is available on the Office of Sustainability website at <https://www.csudh.edu/sustainability/campus-initiatives/academics/>

Office of Sustainability Academic Infusion Initiatives

The Office of Sustainability worked with several faculty members during the academic year to help integrate sustainability principles and projects into coursework. This ranged from the Sustainability Coordinator and/or Energy Manager guest-lecturing particular courses, leading classes on tours of sustainability features, to arranging sustainability activities for students as part of their coursework and class projects.

Description	Date	Students	Class Code
Tom Norman- MKT 350. Presented on Net Zero principles and requested recycling help. Students committed to writing a recommendation report and administering a survey to gauge student perceptions about recycling.	11/13/2017	25	MKT 350
Nancy Robek and Andrea Zarembek- CHEM 102. EE 101 presentation and Central Plant Tours	11/27/2017- 12/1/2017	50	CHEM 102
Parveen Chietri- GEO 420. Recycling presentation and class project/report.	2/12/2018	14	GEO 420
Yann Abdourazakou- SEH 330. Tour of Central Plant to understand facilities operations.	3/12/2018	17	SEH 330
Andrea Zarembek- Chem 103. EE 101 presentation and Central Plant Tours.	3/2/2018 and 3/9/2018	24	CHEM 103
Paul Fornelli- COMM 110. Class team project to develop marketing materials for the Office of Sustainability	Spring 2018	6	COMM 110
Earth Day bingo card activity: Nancy Armstrong, John Menary, Jeff Cope, Cheyenne Cummings, Parveen Chhetri, Sheela Pawar, John Keyantash, Ashish Sinha, Kelley Dawdy Extra credit for visiting Earth Day booths to fill out educational free-response bingo card.	4/19/2018	135	ANT 371, EAR 100, GEO 100, GEO 412, GEO 420, PHI 120, SMT 312, SMT 314, SMT 415, SMT 416
Parveen Chietri-GEO 420. Extra credit waste assessment activity with Rubbermaid.	4/25/2018	9	GEO 420

Academics/Green Workforce Development

To encourage and support additional infusion of sustainability into academics, the Office of Sustainability also hosted two faculty workshops over the course of the academic year: one on September 6th attended by 11 faculty members that provided a forum to discuss resources and needs, and another attended by 14 faculty and community members on February 9th in conjunction with the Farm curriculum planning workshop to discuss integrating this new living laboratory resource into courses.



Figure 20- Office of Sustainability interns from the 2018 spring semester.

Internships & Service Learning

In addition to having coursework related to sustainability, students can greatly enhance their understanding of sustainability through hands-on service learning and internships working on sustainability projects.

The Office of Sustainability works collaboratively with several departments to support a variety of paid and voluntary internships:

Academics/Green Workforce Development

- Water Resources Policy Institute (WRPI) Internship: This USDA-funded internship is sponsored by the WRPI branch based out of CSU San Bernardino that funds student interns to work on resource conservation projects. In October of 2017, the Sustainability Coordinator successfully applied to have an intern work on a research project to identify a system for composting greenwaste from Facilities Services operations on-site as well as launch the proposed Campus Urban Farm. CSUDH student Alicia Salmeron was recruited and hired in December of 2017 as a result.
- Sustainability Internships: Starting in September of 2017, the Office of Sustainability partnered with the Center for Service Learning, Internships, and Civic Engagement (SLICE) to recruit and mentor a variety of student interns from different disciplines to work on sustainability projects.
 - This included two volunteer interns the fall semester from Biology and Physics respectively as well as a for-credit intern (identified below) from Health Services.
 - In the spring semester, one volunteer intern (Physics major) returned and an additional five students were recruited: three from the Earth Sciences department, one from Biology, and one from Public Administration.
- Native Plant Internship: To help support maintenance in faculty/student-run native gardens on campus, the Office of Sustainability began managing a dedicated paid intern funded out of the Biology Department in spring semester 2018.
- CALL Grant Internship (Farm): As part of the successful application for Campus as a Living Lab grant funds from the Chancellor's Office earned in Fall 2017, funds for an additional intern were set aside for Spring 2018 to support the launch of the Campus Urban Farm. That intern, a Sociology graduate continuing at CSUDH in the Sociology master's program this fall, is managed by the Office of Sustainability.
- For-Credit Interns: Internships performed in exchange for academic credit are important elements of a robust internship program as well. This fiscal year, the Office of Sustainability supported one for-credit intern from Health Services as part of the HSA 320 internship course during the fall semester.

Green Workforce Development

In addition to educating employees and students on the importance of sustainability, the campus can also take a role in encouraging the development of workforce skills in the green jobs industry.

To that end, the Office of Sustainability collaborated with the campus Career Center to host two events this academic year specifically designed to encourage the development of the green workforce:

- On October 10th and 11th, the Office of Sustainability hosted an "I Love Green Jobs" activity at the Career Center's Healthcare and STEM and government job fairs respectively. This involved providing students and employers interested in green jobs with a free sticker that said "I Love Green Jobs" with a tagline to ask more to encourage

Academics/Green Workforce Development

conversations towards that direction. Participants were also entered for a gift bag raffle. At the first career fair on the 10th, 18 students and employers participated, while 20 participated at the second career fair on the 11th.

- On January 30th, the Office of Sustainability organized a dedicated Green Career Panel as part of the Career Center's programming that week. The panel included account representative Michael Kung from SoCal Gas, account representative Lisa Hannaman from Southern California Edison, Jennifer Kim from Physicians for Social Responsibility (a nonprofit), and campus Sustainability Coordinator Ellie Perry. The panel was attended by 18 students.

Living Laboratory Spaces

To further fulfill the educational mission of the university, the campus can use its built infrastructure as a “living laboratory” to further support student learning. This fiscal year, the campus made huge strides in launching two new living laboratories specifically designed to teach students about sustainability principles.



Figure 21- Faculty champion Jenney Hall next to newly planted beds at the Campus Urban Farm.

Academics/Green Workforce Development

Campus Urban Farm

The proposal for the Campus Urban Farm was approved by Presidential Cabinet in February of 2018. The proposal also had the financial backing of the Chancellor's Office via a Campus as a Living Lab grant for \$13,000, awarded in early January 2018 to support its launch. As a result, the Campus Urban Farm was able to launch incredibly quickly.

A former campus nursery located next to Physical Plant, the Campus Urban Farm occupies a footprint of approximately .11 acres with 30'x 80' of available growing space. The current site is fully-enclosed with a gate and has a sidewalk encircling the main growing area. It has access to potable water and electricity.

As of this report, the Farm currently employs two paid student interns to work on outreach and operations respectively, consists of 10 raised planting beds producing food for campus community members, and engaged 70 student volunteers and two different service-learning courses in the spring semester for a total of 476 hours of community service. Two professors also used the Farm for class events, furthering its role as an educational space for the campus.

The Farm also attracted in-kind materials donations from Kellogg (for 40 bags of potting soil) and the Scott's Company (10 pallets of potting soil) this fiscal year to assist with start-up.

The mission of the Farm is to serve as a resource for:

- Providing free and/or affordable produce to food-insecure students
- Providing a living laboratory space for faculty and students to integrate sustainability into their coursework and research.
- Providing an outdoor classroom space and event venue to support relationship-building in the community, both on-campus and off.
- Piloting a campus composting program to support efforts to keep campus green waste on-site.

Moving forward, the Farm will continue to pursue initiatives, funding sources, and outreach activities to fulfill these primary goals.



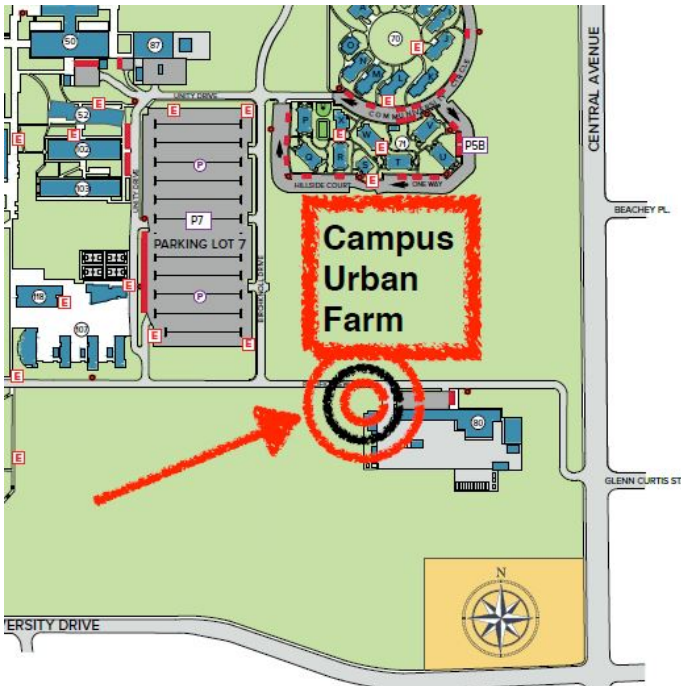
Figure 22- Volunteers organizing produce from the Campus Urban Farm.



Figure 23- Sociology major Jeanette Zimmerman and her son Josiah watering some vegetable sprouts at the Urban Farm

Academics/Green Workforce Development

The Farm is located next to Physical Plant and is generally open to the public 7am-4pm Monday through Friday during the semester.



The Campus Urban Farm accepts volunteers throughout the school year. Interested volunteers are encouraged to sign up for an orientation training via the following survey: <https://goo.gl/forms/KIseunU5xaRu2JnI3>

Campus users can also request a planting bed during the academic year. The Farm is also available for events, tours, and lectures. It features an outdoor classroom area with solar power and seating. To request a bed, space, tour, event, or other engagement, fill out the following online request form. Requests for student or faculty research projects using the Farm are also accepted here: <https://www.surveymonkey.com/r/dhfarmuse>

The Farm also releases a quarterly newsletter (subscribe here: <http://eepurl.com/drGE6X>) and regularly posts to Instagram @dhubanfarm.

Figure 24- Location of the Campus Urban Farm.

The CSUDH Campus Urban Farm also received positive news coverage over the course of the spring 2018 semester due to its innovative work to engage students in urban agriculture:

Chancellor's Office publication on April 23, 2018: <https://www2.calstate.edu/csu-system/news/Pages/Green-Jobs-of-the-Future-Hands-on-Learning.aspx>

CSUDH Campus News Center publication on April 24, 2018: <https://news.csudh.edu/urban-farm/>



Figure 25- ASI members attending the Net Zero Innovation Center launch.

Net Zero Innovation Center

The CSUDH Net Zero Innovation Center is a demonstration site featuring net zero energy, water, and waste innovations in what was formerly the outdoor picnic table shelter at CSUDH's Central Plant. The space is now equipped with solar panels, batteries, energy monitors, and an LED TV display capable of showing live energy consumption. It also has net zero water/waste and efficiency displays including a rain gutter/rain barrel system, living wall, vermicomposter, and recycling guidance display. It's designed to function as a living laboratory, educational space, and inspiration to students to integrate sustainable living and practices in their daily lives.

This project was a result of a volunteer student intern applying for, and successfully earning, a California State Student Association (CSSA) Greenovation grant for \$6,250 to secure start-up funds for the project with collaboration by ASI. This grant paid for key materials such as the solar panels, vermicomposter, rain barrel, and signage while Central Plant contributed additional in-house labor and supporting materials towards the project.

Academics/Green Workforce Development

On April 26, ASI helped to inaugurate the launch of this new campus space, inviting 40 staff, faculty, and students to witness the event. This new living laboratory will be used as a resource for faculty to bring their students to explore sustainability technologies and concepts, a host location for campus events related to energy and sustainability topics, and a workshop space for students to experiment with new sustainability technologies for many years to come.



Figure 26- ASI President Justin Blakely and Sustainability Intern Brandon Jones opening the Net Zero Innovation Center to the public.

Engagement



Figure 27- Students posing at the photo booth with their sustainability pledges as part of Race to Reduce Month.

Outreach Campaigns

This FY, the Office of Sustainability supported two distinct educational campaigns for the whole campus in the fall and spring semester respectively:

- **October Sustainability Month** was a five-week effort to rally the campus around National Campus Sustainability Month through a series of tabling events and activities related to sustainability. Over 400 people were reached through this campaign. The activities included:
 - Week 1- A carbon cube display made of 10'x10'x10' PVC pipe to represent the daily CO2 emissions of an average person was set up in front of the Loker Student Union next to a table where passers-by could pledge to reduce their carbon footprint. In exchange for prizes, 101 students and staff wrote their pledges on sheets of scratch paper and clipped them to the cube for everyone to see during this one-day event.

- Week 2- The Office of Sustainability hosted a green activity raffle that engaged 38 students at the Career Center's existing job fairs on October 10th and 11th. (See Green Workforce section for more information).
 - Week 3- In collaboration with the Center for Service Learning Internships and Civic Engagement (SLICE), the Office of Sustainability hosted a native plant care training workshop attended by 15 students with emeritus Biology professor Connie Vadheim on October 17th. At the same time, the Office also tabled on the East Walkway, offering 50 visitors a chance to make their own free native seed bombs out of recycled paper. This was followed by a community day of service on October 19 that engaged 41 volunteers in maintenance tasks in the faculty/student-run gardens.
 - Week 4- The Office of Sustainability tabled on October 24th to educate the campus on energy, water, and recycling respectively that engaged 61 students in an educational quiz on these services.
 - Week 5- Central Plant held its annual Open House and Tour event on Halloween, offering tours of the campus tunnels all-day on the half hour. This event engaged 91 visitors from all parts of campus including the Child Development Center/Infant Toddler Care Center.
- The **March Race to Reduce campaign** placed a larger emphasis on engaging the campus in sustainability activities designed to reduce campus resource consumption. This involved a three-week campaign just before spring break as a lead up to Earth Day that engaged 220 passers-by and 35 student residents from Housing:
 - Week 1: On two different days, interns from the Office of Sustainability hosted a recycling training table in front of the Loker Student Union where students could learn how to correctly sort their trash in exchange for prizes. 50 students participated in this activity.
 - Week 2: Sustainability interns hosted a DIY photo booth where students could hold up written pledges committing to actions that would reduce their environmental impact and have their photo taken for posting on Instagram. 50 students participated over the course of the two days this activity was offered.
 - Week 3: Bike Blender smoothies were offered for free to students in front of Central Plant in exchange for their best guess on how many smoothies could be blended with 1kWh of energy. This helped quantify their understanding of kWh values, and provided valuable outreach to the 120 people who stopped by for a smoothie during this one day event.
 - From February 21-March 21, students in Housing had the opportunity to participate in CSUDH's first-ever energy competition. 35 residents in an equal split across Phase I and Phase II competed to reduce electricity in Phase I and natural gas in Phase II. This resulted in a reduction of 373 kWh, 64 therms, and ~700 lbs of CO₂ equivalent from the previous month's baseline.
 - Students, faculty, and staff were encouraged to submit their nominations for Green Hero awards during the month of March which were designed to recognize outstanding members of the campus community in terms of their contributions to sustainability. The Earth Day Committee selected and awarded the candidates at the campus Earth Day Festival the following month.



Figure 28- Sustainability Coordinator Ellie Perry with the winners of the student, faculty, and staff Green Hero Awards at CSUDH's 11th Annual Earth Day Festival.

Additional Campus Outreach

In addition to formal campaigns, the Office of Sustainability pursued several other outreach initiatives to further sustainability education to the campus:

- Partnering with Human Resources, the Office of Sustainability began providing hard copies of the staff Green Guide tri-fold flyer that orients faculty and staff to sustainability services on campus for inclusion in the folders at New Employee Orientation. This ensures all incoming staff have access to this guide.
- In order to have a greater presence at new student orientation events, the Office of Sustainability participated in the New Student Orientation (NSO) fairs for freshman on June 8, 9, 15, 16, and 22nd. At the Office of Sustainability table, incoming students could learn more about volunteer opportunities and the sustainability features of the campus. As a result of this outreach, 68 people signed up to receive information on upcoming volunteer opportunities and began following the CSUDH Sustainability page on Instagram.

Community Outreach

The largest sustainability event catered to reaching the outside community specifically is the annual Earth Day Festival. This FY's 11th annual festival was the largest on record, bringing in 35 unique vendors and organization as well as a Farmer's Market as participants. In addition to high volumes of foot traffic (approximately 2,000+ in visitors every year), this year the Office of Sustainability hosted a dedicated extra-credit activity where students could fill out an educational free-response bingo card based on features and vendors present at the Festival. 135 students from 7 different classes participated in this activity. Other notable features of the Earth Day Festival agenda included:

- A greater diversity and number of vendors and organizations than ever before including the City of Carson, Home Depot, Republic Services, Southern California Edison, SoCal Gas, Cal Water, several nonprofit organizations, campus departments, and student clubs.
- Speaker tent that had faculty and staff guest speakers on a variety of sustainability topics.
- Green Hero Award Ceremony that awarded Chief of Staff to the President Rod Hay, part-time lecturer Cheyenne Cummings, and student Alicia Salmeron with glass globes to recognize their individual staff, faculty, and student contributions to sustainability on campus.
- The event also featured an e-waste, Soles4Souls, and Farm compost drop-off to encourage visitors to go zero waste. Vendors selling food were also directed to use recyclable or reusable packaging to further reduce waste from the event.
- A tree-planting event that planted an orange tree in the new "Earth Day Grove" located next to the Loker Student Union loading dock. This area will be the home of future fruit trees as part of a new annual tradition to plant a tree every Earth Day moving forward. These trees are watered by Campus Urban Farm interns with potable water to ensure the tree will produce fresh edible fruits for the campus.



Figure 29- Teddy Toro and the Planet saying hello to visitors at Earth Day.



Figure 30- Volunteers planting in the Earth Day Grove.

Recommendations & Goals

Greenhouse Gas Reduction & Energy Goals:

While the campus has achieved the Chancellor's Office's immediate goal of reducing greenhouse gas emissions to 1990 levels by 2020 thanks to a long history of aggressive energy efficiency efforts, it will need a variety of continued and ambitious initiatives in order to achieve the next step of an 80% reduction from 1990 levels by 2040.

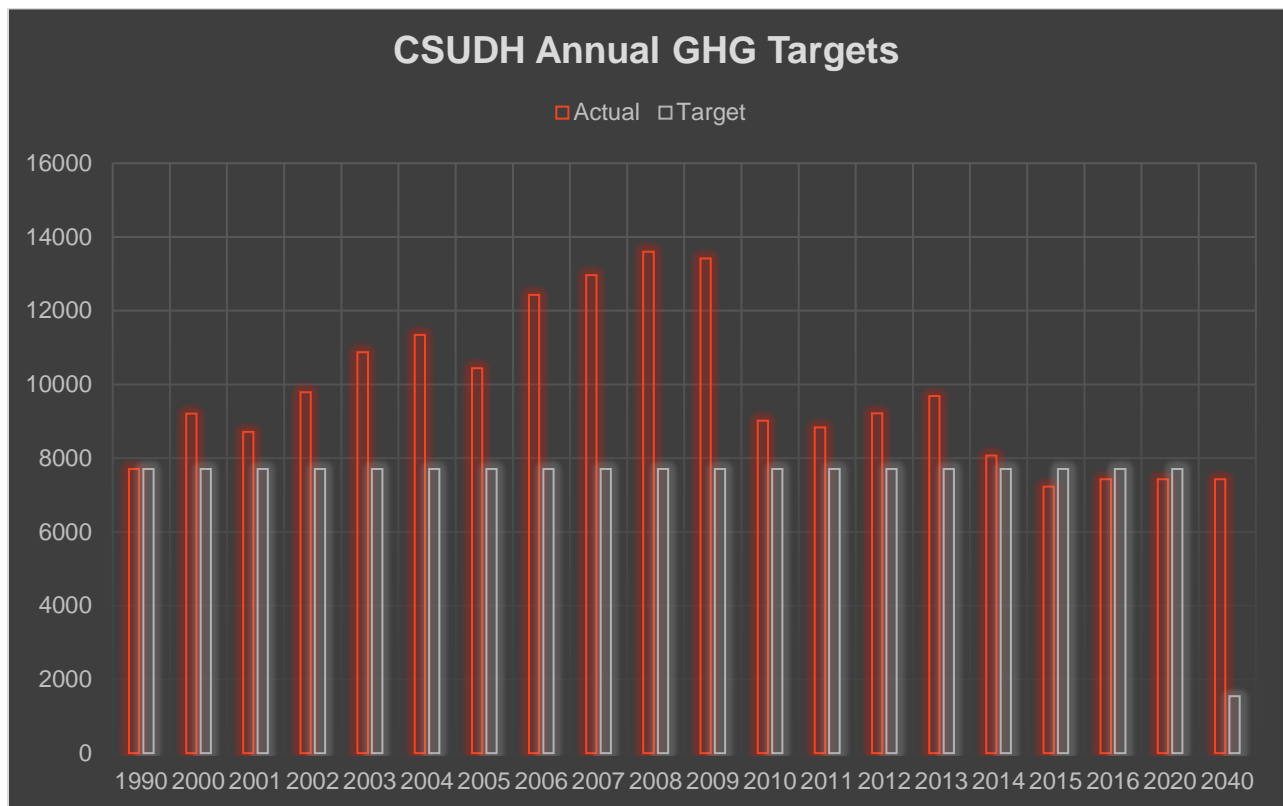


Figure 31- CSUDH greenhouse gas (GHG) emissions and targets.

This target will be near impossible to achieve without the integration of a significant amount of renewable energy resources into the campus mix. Currently, there are no significant renewable energy assets on-campus, which severely limits this effort. Additionally, if CSUDH is to ever become a net zero energy campus, this investment is an absolute prerequisite to ensure there are sufficient renewable energy sources on-campus to off-set its consumption.

Additionally, the campus will need to pay close attention to the projected increase in energy load from new buildings being constructed in the near future. The campus currently has an ambitious building construction schedule that will add two administrative/classroom buildings as well as another 500 beds to Housing in residential housing which will significantly

Recommendations & Goals

increase Scope 2 emissions from electricity demand. Ensuring these buildings are held to the highest LEED standards, and encouraging building design to *exceed* minimum Title 24 compliance requirements will also help in this effort. Factoring in formal LEED certification into the bidding process, not just informal equivalence, will also hold future buildings accountable to energy performance standards in addition to supporting campus sustainability efforts to increase its portfolio of certified and 3rd party-recognized efficient buildings. Currently only one building of the three proposed have built in formal LEED certification into its construction.

In order to think strategically about CSUDH's positioning as a possible sustainability leader amongst the CSU's, the campus will also need to begin addressing its Scope 3 emissions (i.e. employee and student travel). This will require significant effort to manage and measure, especially given CSUDH's population which is 95% commuter-based.

Water Recommendations & Goals:

The campus is not currently on target with any of its recommended water conservation goals or targets. For CSUDH to achieve upcoming Chancellor's Office goals related to water conservation and/or Net Zero Water principles, it will have to undertake initiatives that will reduce water consumption by 25,542-33,070 CCF per year (assuming a 2017 CY level of consumption) which equates to approximately 19-24 million gallons per year.

Goal	CCF Goal	Actual CCF Consumption	CCF Difference
<i>Chancellor's Office: 10% reduction from 2013 CY levels by 2016</i>	98,726	116,070 (2016 CY)	17,344 (over)
<i>Chancellor's Office: 20% reduction from 2013 CY levels by 2020</i>	87,756	N/A	25,542 reduction needed from 2017 levels
<i>Net Zero Water: Consumption equal or less than natural precipitation</i>	80,228	113,298 (2017 CY)	33,070 (over)

Table 1- Campus water consumption in relation to water conservation targets.

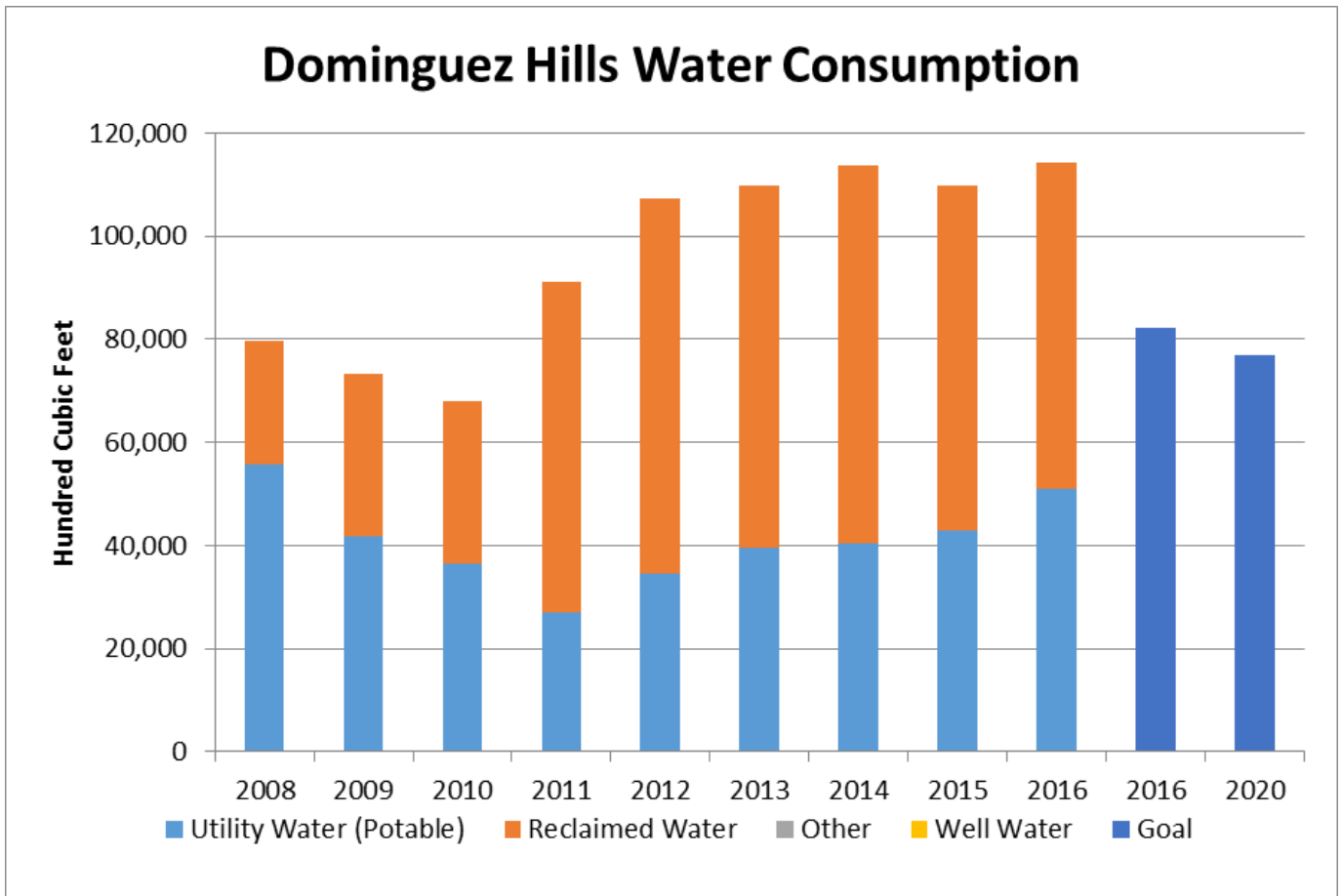


Table 2- Comparison of campus water consumption by source to goals.

While the campus has made an important first step by using reclaimed water for the majority of its irrigation needs, it will still need to ramp up its water efficiency measures to achieve these goals. This includes serious consideration of the irrigation recommendations suggested by the Metropolitan Water District report and measures such as converting turf areas to drought-tolerant landscaping, fixing the CalSense irrigation system for the campus, and addressing leaks and broken heads. These changes represent a potential 17 million gallons of water in annual projected savings which could make up a large component of the difference.

Reducing water from irrigation will also need to be supplemented by more aggressive standards for indoor potable water use. This could involve setting a campus standard for the efficiency of indoor water fixtures on campus, and ensuring ongoing retrofits of existing fixtures to water-saving models. One approach could be to enforce the use of EPA WaterSense fixtures in all bathroom retrofits, and adding additional control technologies such as automatic sensors and dual-flush toilet handles to campus restrooms.

Recommendations & Goals

Central Plant is also attempting to address its cooling tower water consumption through a pilot of water-capture technology which would recycle waste condensate water from the campus air handlers, and pump the water back to the cooling tower. As the cooling tower consumes 30,000 gallons of potable water a day, this 1 million gallon a year water-saving project could help the campus get very close to achieving its water saving goals in conjunction with an aggressive portfolio of irrigation efficiency and turf conversion projects.

The Office of Sustainability will also be piloting a green restroom program in the fall of 2018 which could provide a learning pilot for implementing these technologies on a wider scale as well as create water conservation signage and educational campaigns that could roll-out to the campus as a whole.

Waste Recommendations & Goals:



Figure 32- Rubbermaid waste audit in spring of 2018, an example of the type of outreach events to be continued by the Office of Sustainability in the 2018-2019 FY.

Recommendations & Goals

As a state entity, CSUDH is obligated to achieve the minimum diversion target rates set by CalRecycle to stay in compliance. For the 2017 calendar year, CSUDH exceeded the minimum target rates as follows:

Goal	Target Per Capita Disposal Rate (lbs/person/day)	Actual Annual per Capita Disposal Rate (lbs/person/day)	Disposal Rate Difference (lbs/person/day)
<i>Cal Recycle Diversion Rates for Employees (2017 Calendar Year)</i>	2.90	2.22	0.68 (beyond target)
<i>Cal Recycle Diversion Rates for Students (2017 Calendar Year)</i>	0.30	0.29	0.01 (beyond target)

Table 3- Campus waste disposal rates in relation to CalRecycle targets.

However, the Chancellor's Office sets forth even more ambitious targets than this, using a rolling average to determine a reduction target of 50% in disposal rate by 2016 and an 80% reduction by 2020. Using a per-capita evaluation of daily pounds (lbs) of trash/student/day, CSUDH only achieved a 0.35 lbs/student/day disposal rate in 2016 when it needed to achieve a 0.20 lbs/student/day disposal rate to stay on target with this goal.

In 2017, the campus achieved a student disposal rate of 0.29 lbs/student/day which demonstrates significant improvement, though it will need to continue to act aggressively to reduce this rate down to 0.08 lbs/student/day by 2020 to achieve the 80% reduction target.

Recommendations & Goals

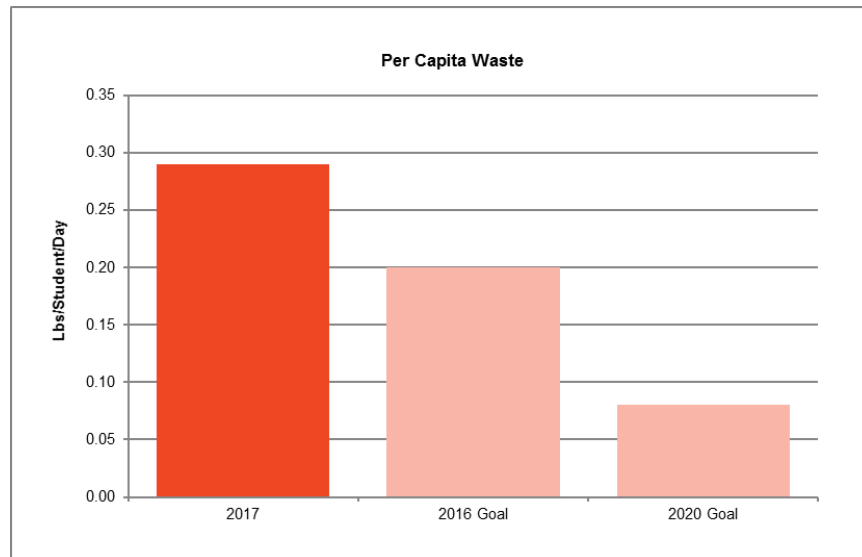


Table 4- Per capita waste values for CSUDH students in the context of 2016 and 2020 Chancellor's Office targets.

The campus also achieved an employee disposal rate of 2.22 lbs/employee/day in 2017 and would need to reduce this rate down to 0.74 lbs/employee/day by 2020 to achieve the 80% reduction target.

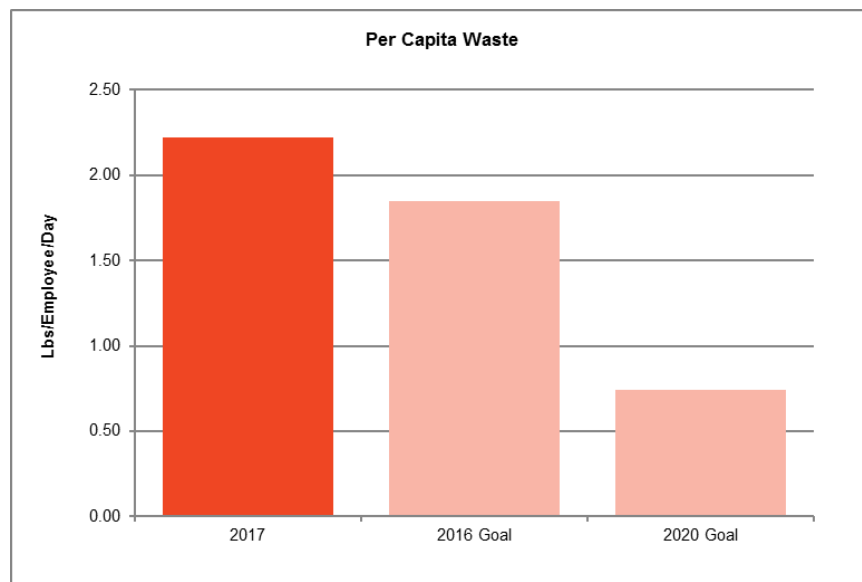


Table 5- Per capita waste values for CSUDH employees in the context of 2016 and 2020 Chancellor's Office targets.

The difference in actual and target per capital disposal rates in comparison to the Chancellor Office goals is summed up as follows:

Recommendations & Goals

Goal	Target Per Capita Disposal Rate (lbs/person/day)	Actual Annual per Capita Disposal Rate (lbs/person/day)	Disposal Rate Difference (lbs/person/day)
	Employees: Students	Employees: Students	Employees: Students
<i>Chancellor's Office: 50% reduction in solid waste disposal rate by 2016</i>	1.85 : 0.20	2.63 : 0.35 (2016 CY)	0.78 : 0.15 (over)
<i>Chancellor's Office: 80% reduction in solid waste disposal rate by 2020</i>	0.74 : 0.08	2.22 : 0.29 (2017 CY)	1.48 : 0.21 reduction needed from 2017 levels

Table 6- Campus waste disposal rates in relation to Chancellor's Office waste disposal rate targets.

Striving towards net zero waste to ensure zero solid waste is sent to landfills will require an even more ambitious set of initiatives.

Currently, the campus recycling program struggles from lack of resources, most notably the limited staffing dedicated to recycling collection. There is only one full-time Recycling Coordinator providing coverage to the entire campus in terms of collection pick-ups, which severely limits the campus' ability to offer more recycling bins to campus users. Based on staff survey responses, only 60% of staff feel they currently have adequate access to recycling in their offices.

Solving the staffing issue is further complicated by the fact that commercial organics recycling is mandated in the state of California by [AB 1826](#). While the campus is in compliance as it has procured organics recycling service, there are currently no collection bins to support its use. For organics recycling to actually succeed as a program, the campus will need to dedicate staffing resources to ensure there is a collection program for campus buildings to divert food scraps accordingly.

The Office of Sustainability is piloting a small scale organics recycling pick-up program with paid student interns in the fall of 2018, but this does not serve as a long-term solution, nor would it satisfy the scale of a formal campus organics recycling program were it to go campus-wide.

Despite adding large scale commercial mixed recycling service and organics recycling service this FY, the campus diversion rate continues to suffer from a lack of data reporting based on weight for trash pick-ups. As the campus does not receive data on weights from its sources, as all trash is commingled with other sources by the hauler, it is forced to calculate trash weights based on volume of pick-ups regardless of whether the bins are full or not. It is highly advisable

Recommendations & Goals

that the campus build in a requirement for this data by weight into a future RFP when overhauling its trash services provider contracts.

Other Programs and Projects:

In terms of other initiatives and areas that will continue to enhance sustainability on campus, there is significant opportunity to pursue valuable programs and projects for the 2018-2019 FY. Suggestions include:

- Support future data reporting for AASHE STARS to push the campus towards a Silver rating. This would require:
 - Aligning Campus Dining food reporting data with Real Food Challenge Standards
 - Formally integrating sustainability into learning outcomes for academic departments and courses.
 - Greater enhancement of mass and alternative transit programs offered to the campus including adding bicycle resources and support to campus infrastructure.
 - Building up on-site renewable energy resources and 3rd party certifying campus buildings.
- Complete Tree Campus USA Certification for the 2018 calendar year.
- Implementing a Green Labs program to reduce fume hood sash heights and/or encouraging de-commissioning of unused fume hoods to save energy.
- Organizing source reduction initiatives such as a furniture salvage program or free item exchange for the campus, and encouraging the reduction in packaging and utilization of single-use items such as plastic water bottles.
- Supporting outreach efforts that will continue to raise the level of basic sustainability literacy and understanding of sustainability principles for the entire campus.

Contact Information



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Additional questions? Contact Sustainability Coordinator Ellie Perry at eperry@csudh.edu or (310) 243-2303

Information on the Office of Sustainability

California State University, Dominguez Hills and other state institutions are major consumers of energy and natural resources. The university has a responsibility to be a wise steward of scarce resources by reducing the use of non-renewable resources, increasing energy efficiency, and as part of the larger CSU system, promoting continued economic and ecological viability in California. CSU Dominguez Hills is on the cutting edge of sustainability efforts by an urban campus, and is actively providing leadership in engaging faculty, students and staff in on-campus sustainability efforts. We are looking at ways to increase partnerships and funding to support the educational, research, and public service missions of the university as they relate to sustainability.



Please consider the environment before printing this report.