2025

Annual Sustainability Report

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Foreword

2025 began with tragedy in southern California, as the January fires burned over half a million acres and tens of thousands of structures, including 300 homes of Caltech and JPL community members. While the campus itself only sustained some minor wind damage, the human impacts to the second largest metropolitan area in the United States will persist for years. A rapidly changing climate will make such unusual events more likely in the coming years, and resiliency planning for energy sources, water supplies, and the campus built environment will increase in importance.

Looking at trends and key indicators, 2025 was a banner year for improvements in materials and recycling programs. Campus diversion doubled from 2024, spurred on by an amplified staff for materials management and coordination. Green Labs also received a boost as a former volunteer leader ascended to full-time work in coordination of a growing suite of programs. Efforts from the expanded sustainability department and a working group focused on sustainable procurement produced the campus's first comprehensive Scope 3 inventory. With a full inventory for Scopes 1, 2, and 3, Caltech now has an established baseline to measure successful implementation of any and all decarbonization initiatives.

Many of the near-term action items from October 2024's Sustainable Caltech: A Plan for a Resilient Future have now been completed, and remaining items mostly have a clear path forward to meet or exceed stated goals. Energy and water planning efforts to be discussed in next year's report have Caltech headed towards a modern, low-carbon, and flexible utility system. With a new building in 2026 and more projects on the way, cross-disciplinary sustainability efforts in 2025 have the campus headed in the right direction.

Maximilian P. Christman

Maximilian P. Christman
Assistant Director of Sustainability

Pictured is an art installation in North Mudd Laboratory.

Key Performance Indicators

Energy

- **25.3** Million dollars in annual energy costs
- Campus energy intensity (kBTU/sf) **262**
- **66%** Onsite electricity generation
- Research intensity (kBTU/$ research) **6%**

Materials

- **555** Thousand dollars in total campus waste costs
- Tons of diverted materials **423**
- **20%** Campus diversion rate
- Thousand dollars in net recycling revenue **18.1**

Mobility

- **43%** Campus drive alone rate
- Campus telecommute rate **4%**
- **1,431** Commuter program participants
- Average vehicle ridership **1.84**

Water

- **2.2** Million dollars in annual water costs
- Campus water intensity (gallons/sf) **32**
- **22%** Increase from 2024 in per unit water cost
- Campus water consumed by utility plants **61%**

Built Environ.

- **13** LEED Gold or Platinum buildings
- Campus land covered by native vegetation **17%**
- **79%** Low water varietal turf on campus
- Certified Green Laboratories **32**

Emissions

- **66k** Combined Scope 1 and 2 emissions (MT CO2e)
- Tonnage of emissions per capita **28**
- **62%** Campus total emissions are Scope 3
- Reduction in regulated emissions **25%**

All arrow directions are compared to 2024 values. Color-coding indicates positive (green) or negative (red) trends.

Sustainability Plan Progress

In November of 2024, following a year and a half of work by the Sustainability Advisory Council, Caltech released its first ever comprehensive sustainability plan. This document, titled Sustainable Caltech: A Plan for a Resilient Future, set goals and direction for all areas of campus sustainability for the next 5-10 years. The plan outlines priorities in energy, water, the built environment, waste and materials, green labs, procurement, transportation, and emissions.

In four key focus areas detailed below, near term action items were identified to realize immediate progress. Caltech can proudly report that many items are complete and all others are in progress.

Energy and Decarbonization

- Pursue carbon-free power
  - Pursue largely carbon-free energy to replace the cogeneration system as a source of minimum daily power
  - Reduces Scope 1 and 2 emissions by 39%
- Study a transition to hot-water-based-heating ✓
  - Complete a detailed engineering study to further assess the viability of a transition from a steam-based, natural gas-fueled system to an electrically driven hot-water-based heating system
  - Combined with carbon-free power, can lead to 74% reduction in Scope 1 and 2 emissions and 20% campus-wide water savings

Water and the Built Environment

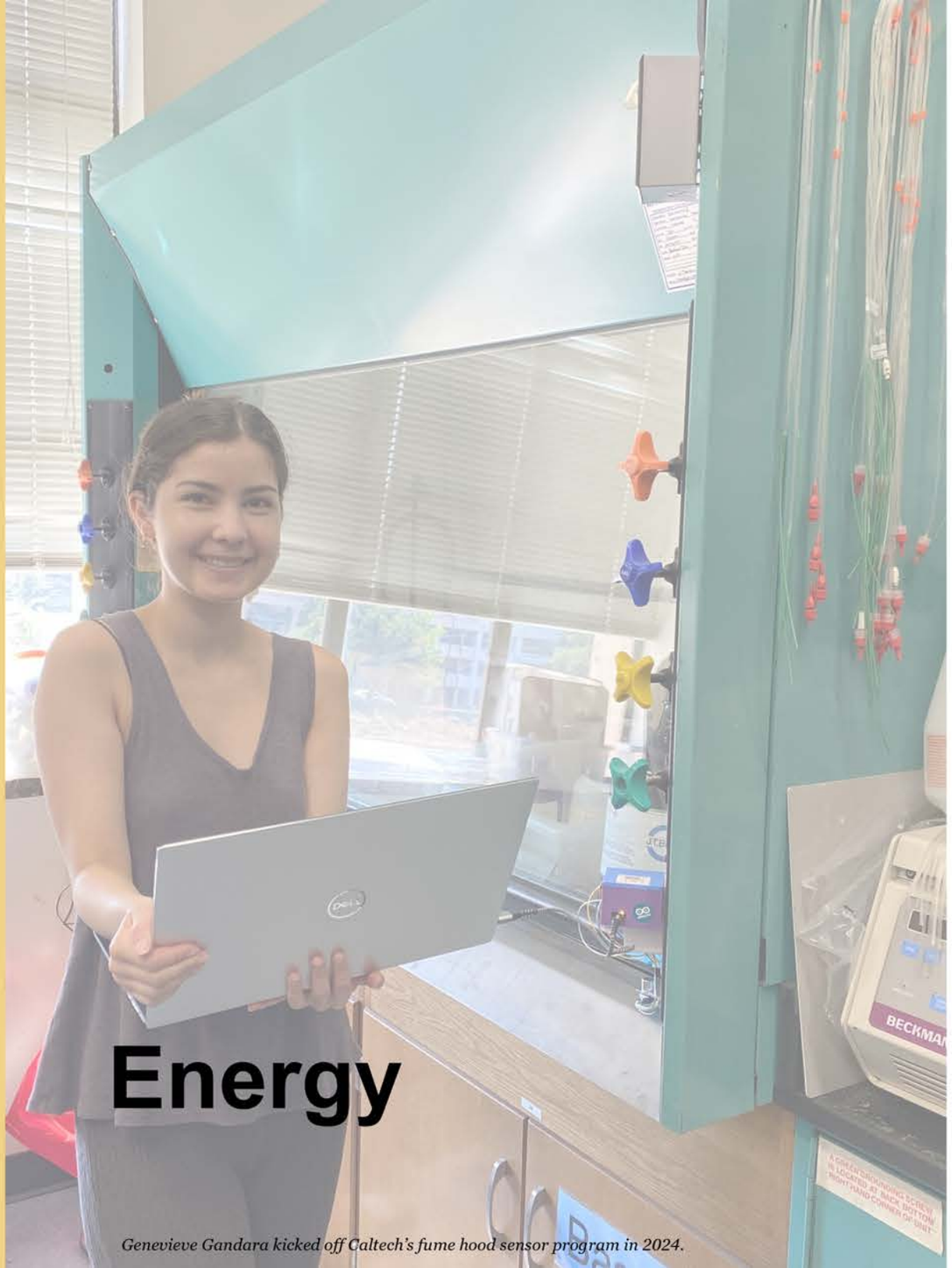
- Benchmark buildings' energy consumption
  - Benchmark energy use in core campus buildings using Energy Star Portfolio Manager to identify buildings to prioritize for repairs and sustainability improvements
- Increase recirculation of treated air ✓
  - Prioritizing the health of building occupants, return where appropriate to controlled, variable air change rates, recirculating air while protecting air quality
- Invest in core campus water metering
  - Install water meters to provide data about our largest water users, the central utility plant and satellite plant, and install meters that summarize campus use
- Increase waterwise landscaping
  - Convert little-used lawns to waterwise landscaping to save water, benefit pollinators, and improve stormwater management

Procurement, Waste/Recycling, and Green Labs

- Hire recycling staff ✓
  - Hire a recycling lead and recycling coordinator to ramp up the recycling program and identify opportunities to improve it
- Create a sustainable procurement working group ✓
  - Gather a group of experts to gather data and engage vendors, with the aim of sustainable changes to campus procurement processes
- Hire Green Labs Coordinator and provide a program budget ✓
  - Hire a full-time program coordinator to expand Green Labs initiatives to all divisions while identifying optimal sustainability investments and engaging lab users in conservation

Transportation, Scope 3 Emissions, and Reporting

- Increase pedestrian safety protections
  - In partnership with the City, increase measures to protect pedestrians on streets adjacent to campus
  - In concert, reduce bicycle and scooter theft through increased security measures
- Complete a Scope 3 emissions inventory ✓
  - Using data produced by other actions in the sustainability plan, complete a third-party verified scope 3 inventory, including purchased goods and services



Energy

Genevieve Gandara kicked off Caltech's fume hood sensor program in 2024.

Caltech aims to reduce carbon emissions and modernize its energy infrastructure. The Institute is collaborating with community partners to secure affordable and reliable supplies for the campus. Simultaneously, engineers are studying new modes of generation and improved distribution. The goal is an efficient utility system that lasts throughout the 21st century.

Highlights

Energy Progress

JAN
END OF AN ERA

Caltech closed out the final quarter of repayments to its endowment for the energy conservation investment program (CECIP), a green revolving fund that has been successfully funding energy efficiency projects for the past 15 years.

JUNE
FUME HOOD SENSOR PROJECT

Students designed motion and sash height (MASH) fume hood sensors to be installed in various CCE labs. These sensors encourage users to shut their sashes after use, which increases safety and reduces energy consumption.

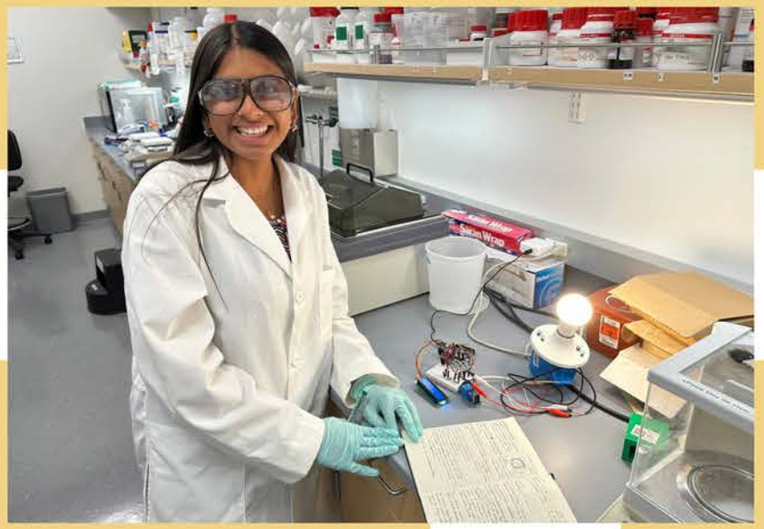
AUGUST
LAB ENERGY AUDITS

Student-led audits of lab equipment and energy consumption helped identify energy savings strategies. On average, labs can realize savings of $2.88/square foot through simple changes.

SEPTEMBER
COGEN UPTIME ISSUES PERSIST

Continuing the trend of the past 4 years, Caltech struggled to maintain consistent cogeneration operation. With an uptime of only 45% in 2025, future energy planning is focused on securing a more reliable and predictable resource.

Energy efficient freezers can still receive a rebate through the CECIP ultra-low temperature freezer program.



Aarohi Patel, summer intern, tests her homemade energy sensor in lab in advance of her energy audit walkthroughs.

Update

Energy

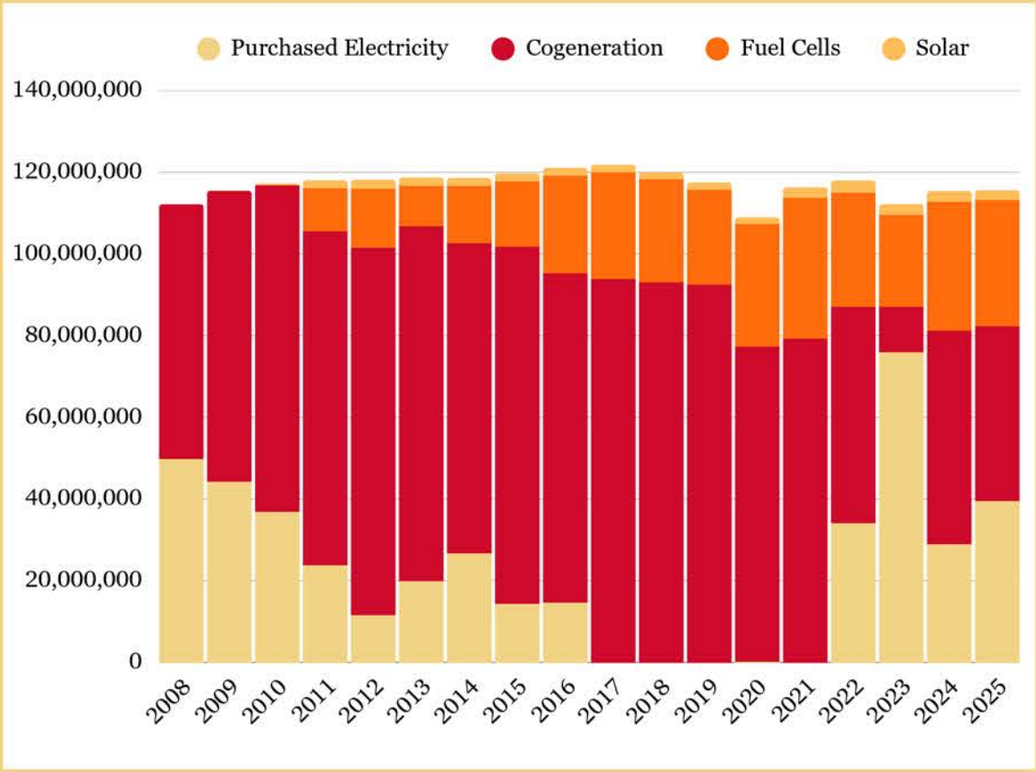
In Pursuit of Modernization and Stability

2025 continued a remarkable run of relatively steady electrical consumption for the Caltech campus. While supply sources have fluctuated throughout the years since the inception of the first climate goal set in 2008, total campus electrical needs have stayed between 110 and 125 GWh for almost two decades. This trend is not expected to continue, as the limits of energy efficiency and the proliferation of high-performance computing will drive electrical demand higher.

Caltech is already on a path to secure increased electrical distribution capacity, and outside sources are being tapped to continue the legacy of CECIP and fund continued energy efficiency initiatives. These efforts coincide with a desire to modernize the campus grid. Underneath all of these efforts lie the foundation upon which Caltech's campus energy future rests: decarbonization of electrical and heating needs. Caltech looks forward to sharing more on this coordinated efforts to achieve broad carbon neutrality goals in 2026.

Caltech's Green Labs initiatives have expanded the energy conservation discussion beyond space design and into occupant behaviors.

Total Electricity Consumption by Source



Annual Feature

CECIP Closeout

A Decade and a Half of Success

In 2015, following a successful first phase, Caltech Facilities launched a second phase of the Caltech Energy Conservation Investment Program (CECIP). This program was a green revolving fund which used the avoided costs from energy savings measures to fund energy efficiency projects. The driving purpose of the program was to implement high-return projects in conjunction with more capital intensive, complex projects that reduce utility consumption which would have otherwise been difficult to fund in existing budget pools. The overall cost to the utility budget during the project period did not change. Instead, a portion of the avoided cost covered the utility bills, and another portion is allocated to repay the cost of the projects.

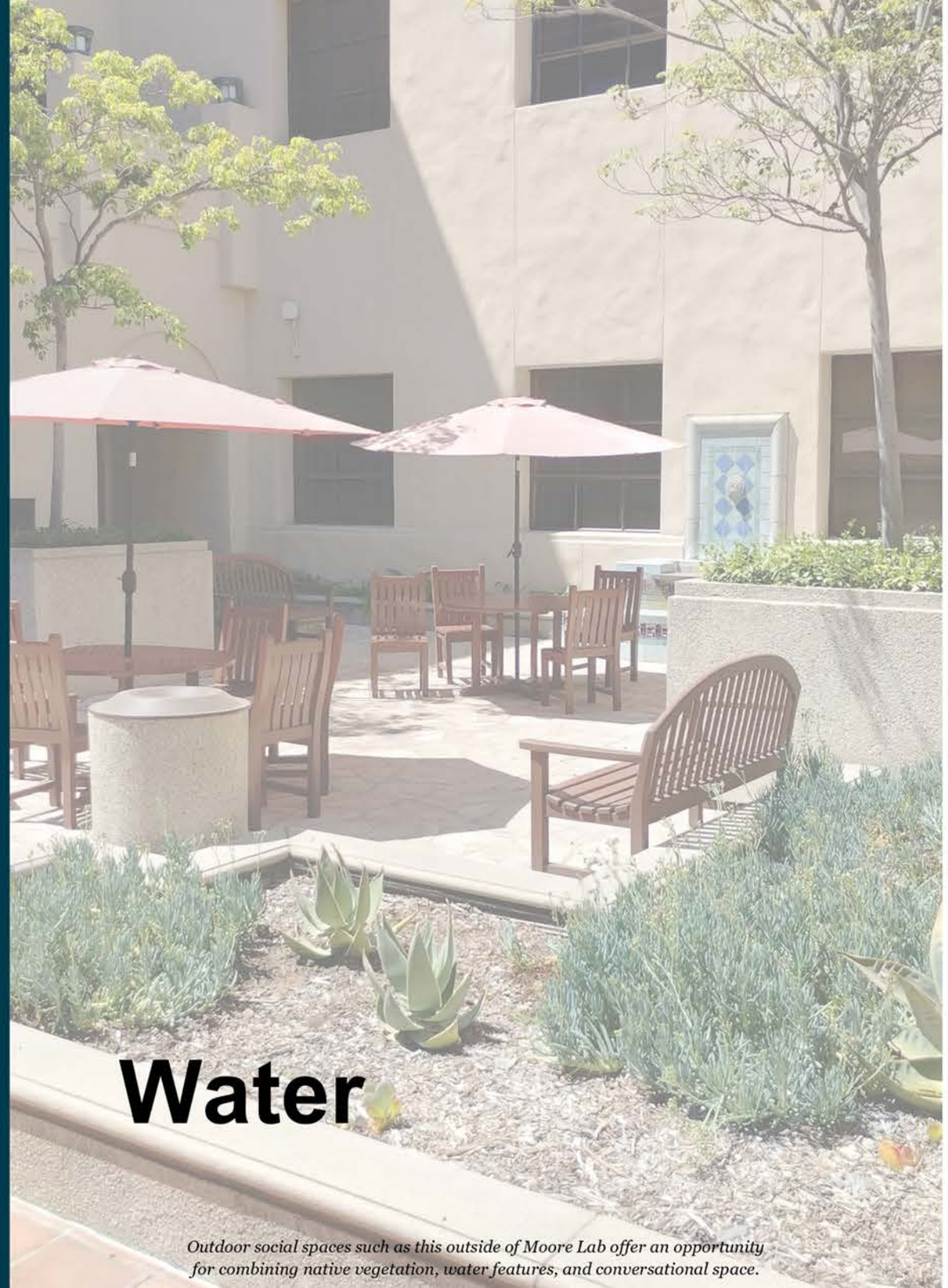
Through the CECIP II program, Caltech implemented over 35 projects that touched over 70 buildings on campus. Projects included LED lighting retrofits, mechanical upgrades to HVAC systems, and controls changes for better operations. In coordination with Caltech Sustainability, over $175,000 from the CECIP program was administered to lab groups as rebates through the Ultra Low Temperature Freezer program. The projects funded by CECIP II totaled over $10.5 million of investment. In Q2 of FY25, the cumulative savings from these projects surpassed the capital investment, reaching the "breakeven" point and concluding the need to pay back the revolving fund. Measures from these projects will continue to generate cost savings for Caltech, with an estimated $1.3 million per year in avoided utility costs.

Caltech Facilities is committed to continuing investing in energy efficiency and resource conservation projects. With the completion of the CECIP program, many of the "low hanging fruit" measures have already been completed. Caltech is working with both internal and external experts to explore novel ways of addressing energy management and reduction projects to continue improving campus operations.

$10.5M of energy efficiency investments were returned to the endowment through utility savings.

"Measures from these projects will continue to generate cost savings for Caltech, with an estimated $1.3 million per year in avoided utility costs."

A variety of energy conservation measures were implemented across campus as part of the CECIP program, including variable frequency drives on HVAC equipment and data center hot aisle/cold aisle containment.



Water

Outdoor social spaces such as this outside of Moore Lab offer an opportunity for combining native vegetation, water features, and conversational space.

To build on its progress in saving water, Caltech will continue to prioritize utility upgrades, study the possibility of using treated wastewater in utility plants, continue installations of climate-adapted plants, and revise its landscape plan. In buildings, the greatest sustainability gains will come from heightened design standards and prioritized repairs and upgrades.

Highlights

Water Progress

JANUARY
A DEVASTATING START

On January 7th, the Eaton and Palisades fires ignited. These fires burned for weeks and left a path of unprecedented destruction, causing catastrophic damage to Altadena and the Pacific Palisades. Water, or the lack thereof, played a significant role in these events.

JULY
VALUE OF WATER INCREASING

Long expected increases for water and sewer rates started to come into effect. Despite the relative scarcity of water in the southwestern U.S., California has enjoyed relatively cheap water, but rates are beginning to catch up.

OCTOBER
DATA QUESTIONS

Campus water consumption in FY25 hit new lows, with building consumption accounting for the majority of the decrease. This accomplishment is somewhat tempered by the preexisting challenge of reliable metering data, a renewed focus heading into 2026.

NOVEMBER
TURTLE PONDS GET A REFRESH

With some underground work needed as part of the new Ginsburg Center for Quantum Precision Measurement building, Facilities took the opportunity to refresh the landscaping around Caltech's famous turtle ponds.

Many underutilized campus lawns will be transitioned to native vegetation over the next two years, saving on water and maintenance.

All water-savings efforts will preserve iconic Caltech landscapes like those around the Beckman Auditorium, seen here with flowers in full bloom.

Update

Water

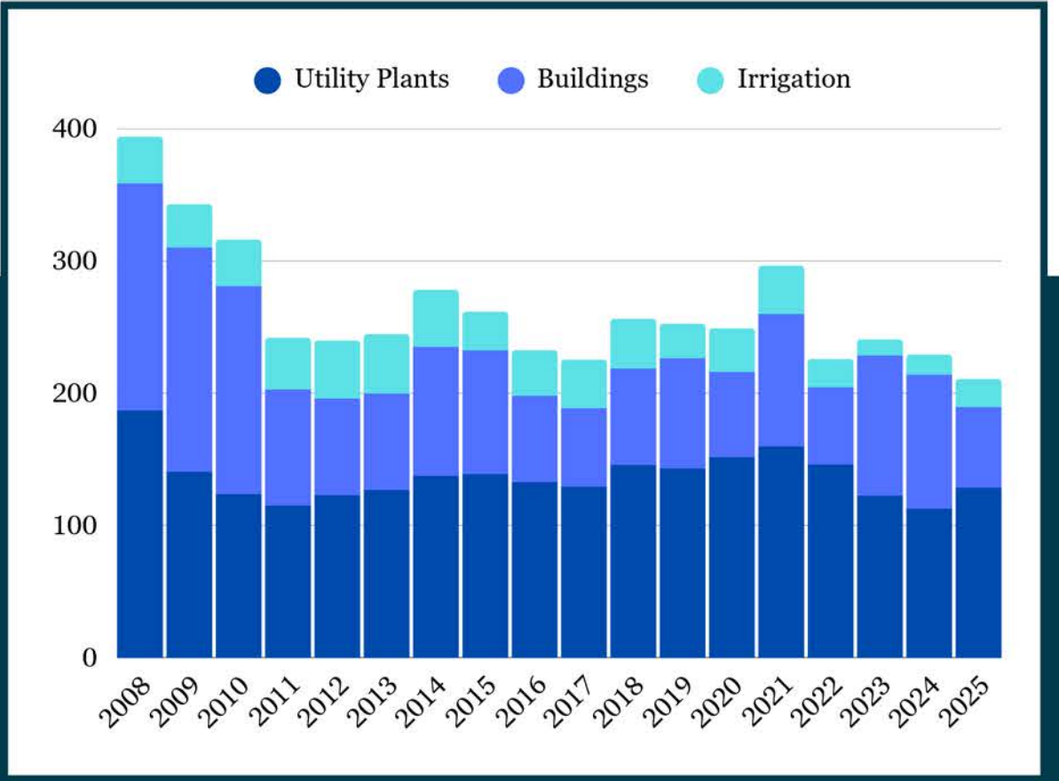
A Variety of Uses

As has been the case for a number of years, water solutions have been easier to come by for centralized uses such as utility plant and irrigation consumption. Tied directly to the production of energy in the form of chilled water, steam, and hot water, utility water consumption is well-understood, well-metered, and has seen continuous improvements over the past decade. Cooling tower and chiller upgrades are scheduled to continue as new technologies offer new efficiency opportunities. Similarly, campus-scale irrigation systems are ripe for an upgrade and will see quality improvements with better data and control over the next few years.

When the consumption patterns are more sporadic, poorly understood, and diffuse, systematic solutions can be difficult to come by. For building consumption, metering and the high cost of hardware and support continue to be a challenge. Future services agreements for data collection and analysis offer some promise down the road.

While a number of campus water chillers are relatively new, emerging technologies may offer promise to increase stability and efficiency in the replacement of older chilled water equipment.

Historical Water Consumption



Annual Feature

Eaton Fire and Climate

Unprecedented Devastation

A report on Caltech in 2025 is unfortunately not complete without a discussion of the Eaton Fire and other conflagrations in January and the devastating impact on Caltech, Pasadena, and greater Southern California communities. A perfect storm of a dry start to the winter, ample fuels from two previous wet winters, desert-like humidity levels, and the strongest Santa Ana winds in a decade created a catastrophe.

The winters of 2023 and 2024 saw rainfalls of over 100% and 50% above normal, respectively. Over the ensuing two years of growing seasons, these abnormally wet winters brought beautiful flowers and significant tree and shrub growth to the mountains and hills of Southern California. This growth built up and then was dried out during the normally moisture free summer and fall months. While rain would traditionally begin to fall again in the months of October and November, the skies were clear. When December also passed with no rain for only the second time since 1990, the hills above Pasadena and the San Gabriel Valley were in a precarious position. With an abundance of extremely dry fuels, all it took at that point was a spark to begin a wildfire. Combining these conditions with the strongest Santa Ana winds event since 2011 led to an uncontrollable situation where fire spread with no possibility of containment through the mountains and into foothill communities like Altadena.

Rebuilding and Planning for the Future

When the smoke cleared, over 500,000 acres had burned, at least 30 lives were taken, and tens of thousands of structures were destroyed or damaged. After that awful January, the Caltech and JPL communities came together and raised millions of dollars in disaster relief that was allocated to those who had lost homes. While the campus itself only sustained minor wind damage, monitoring and planning for recovery events will take on increased importance as the climate grows warmer and more extreme. Water in soils, the air, and the clouds will play a big role in our climate and weather future.

300 Caltech community members lost their homes from the January 2025 fires in Los Angeles.

"A perfect storm of a dry start to the winter, ample fuels from two previous wet winters, desert-like humidity levels, and the strongest Santa Ana winds event in a decade created a catastrophe."

The Eaton Fire's burn scar can be seen clearly from nearly 25 miles away just a week after ignition.

Materials

Summer students Aarohi Patel (right) and Bhakti Ahir Ahir (left) help transport Lomi tabletop compost to the Catalina bins for the community.

Caltech has a timely opportunity to institute sustainability and efficiency as factors in its purchases and a responsibility to decrease the amount of waste that goes to landfills. Laboratories use substantial amounts of energy and materials; Caltech's Green Labs program is the seed of an approach that can improve their sustainability and efficiency throughout campus.

Highlights

Materials Progress

JULY
GREEN LABS COORDINATOR

Caltech hired its first Green Labs Coordinator, expanding the Green Labs Program and establishing institutional support for sustainability initiatives in academic spaces.

AUGUST
OFFICE CLEANOUT PILOT

Caltech completes its first office clean-out working with Planning, Design, and Construction to assist with waste management and diversion efforts.

SEPTEMBER
PIPETTE TIP BOX RECYCLING

Caltech initiated a pipette tip box recycling program to collect these materials from all labs and recycle them through the campus recycling hauler, Allan Company.

OCTOBER
STYROFOAM RECYCLING

Caltech partnered with FoamZone and Allan Company to create a new process for sending Styrofoam to their facility for recycling. This change reduces landfill overages and improves diversion.

Polystyrene from lab deliveries is compressed and recycled from Caltech's campus-wide Styrofoam program.

Collected pipette tip boxes and wafers from labs are recycled through a new program started in 2025.

Update

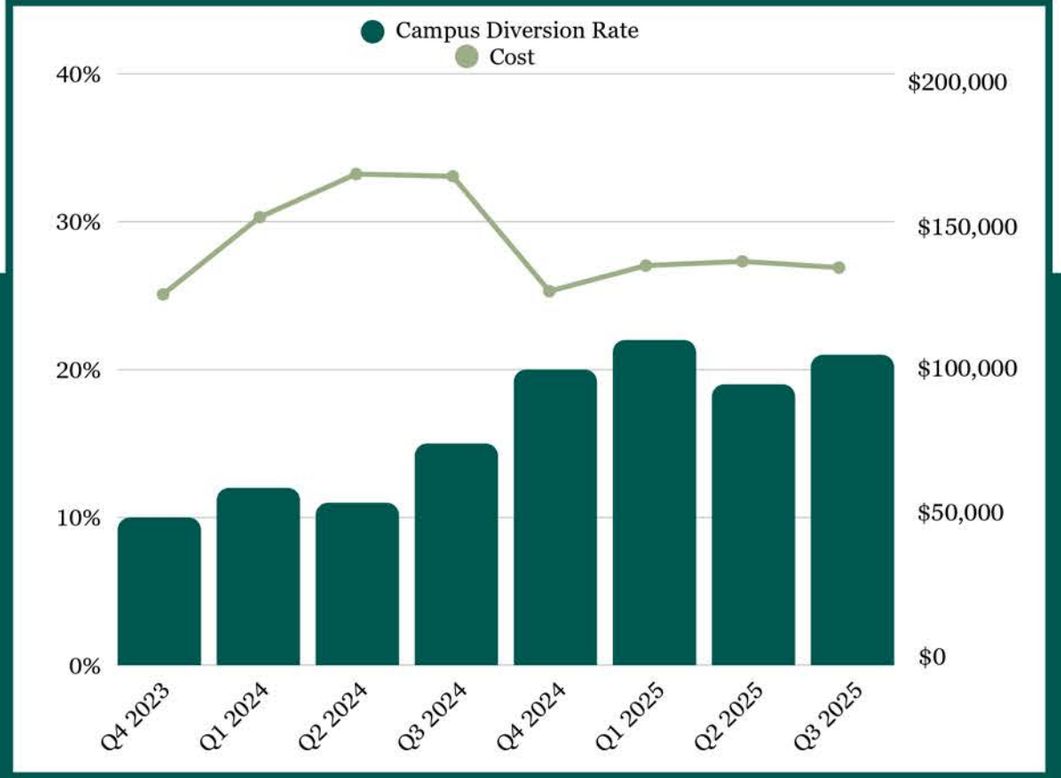
Materials

Progress from Innovation
Caltech has benefitted from expanded operational and administrative support for a slew of sustainability initiatives. In October 2024, Caltech increased the recycling team staff from two to four employees, increasing the capacity for work and on-site waste sorting. Furthermore, a new benchmark was set this year for recycling operations and diversion programs across campus. Over $180,000 in savings have been realized from switching recycling hauling responsibilities to a third-party hauler, Allan Company. They have been instrumental in expanding the types of waste streams that Caltech collects, which vary from specialized research waste to standard operational waste from daily work.

The amount of materials diverted from landfill in 2025 doubled with overall program costs decreasing compared to 2024. Novel approaches to managing Caltech's unique waste stream continue to be necessary to advance towards zero waste.

Caltech collects California Redemption Value (CRV) eligible materials, like plastics, diverting them from landfill and realizing savings.

FY2024-FY2025 Diversion vs Cost



Annual Feature

Recycling Expansion

Recycling Program Expansion
Caltech used the momentum from 2024's recycling program revitalization, utilizing additional operational support and key partnerships, to expand recycling and diversion programs on campus. Notable expansions and new offerings include Caltech's pipette tip box recycling program, Lomi composting, Styrofoam recycling, and office/lab cleanout program. The pipette tip box recycling program grew out of the Green Labs program.

A renewed partnership with recycling hauler Allan Company enabled the collection and recycling of all pipette tip boxes and wafers, regardless of brand association. Prior to this year, separate companies individually managed their respective waste streams with limited coordination. Styrofoam recycling capacity was also consolidated and expanded to a quarterly collection in a 40 cubic yard bin through Allan Company. Processed compost from the Lomi program is now being collated in Caltech's community composting collection bin at the Catalina graduate student housing complex.

Further Institutional Integration
With a pilot project conducted to clean out the old ASiC building and convert it to a multipurpose office space, Sustainability and Planning, Design, and Construction now work in tandem to save old materials from entering the landfill when a space is being renovated. Caltech works with community partners, like the Habitat for Humanity Restore, and internal channels to divert office materials and furniture from landfills. From 2025 projects alone, over $38,000 of value was saved from entering landfills. This equates to 5.5 tons of materials and provides evidence that with enhanced coordination, additional value can be extracted and retained from materials at Caltech. Expanding this program and improving circularity are key priorities for materials management moving forward.

5.5 T of materials were diverted from the landfill from an office cleanout pilot in August.

"From 2025 projects alone, over $38,000 of value was saved from entering landfills. This equates to 5.5 tons of materials..."

A selection of chairs were donated to Habitat for Humanity during the ASiC building cleanout.

Built Environment

About three dozen fume hood monitors are installed currently on campus, part of a wider push for lab-user initiated energy efficiency.

The built environment comprises elements of all facets of sustainability. Caltech continually tracks progress on building and landscaping projects. This encompasses a range of scales from small turf replacements to multi-million dollar capital projects. Caltech will continue to pursue high standards of sustainability for new buildings, lab renovations, landscaping, and other projects that impact Caltech's core campus.

Built Environment Progress

JANUARY
CQPM DESIGN SUBMITTAL

Caltech's newest building, the Ginsburg Center for Quantum Precision Measurement, began to rise out of the ground as the LEED design submittals were completed. The structure approached completion as 2025 came to a close.

APRIL
EARTH MONTH

Additional staff hired in the last quarter of 2024 and into 2025 led to a renewal of events for Earth Month, with the community favorite Plant Based Food Sampling event conneting the Caltech community to a plethora of plant-based vendors and local restaurants.

JULY
LOMI COMPOST PROGRAM

The Lomi tabletop composting program continues to be a success. It is now producing too much compost for the campus grounds, so this compost is now diverted to the Catalina composting program for the broader community.

SEPTEMBER
GREEN LABS ASSOCIATES HIRED

Six undergraduate Green Labs Associates were hired to help with energy and waste diversion efforts. Each student has their own independent research project supporting those goals.

Dining Services piloted plant-based menu items at the Plant Based Food Sampling event during Earth Month.

Green Labs currently has six Associates: Aarohi Patel, JT Tran, Tuyako Khristoforova, Ansh Tiwari, Bhakti Ahir Ahir, and Rohan Bhattarai.

Energy Efficiency and ReStore Team


Aarohi Patel


Jason "JT" Tran


Tuyako Khristoforova

Fume Hood Energy Optimization Team


Ansh Tiwari


Bhakti Ahir Ahir


Rohan Bhattarai

Update

Built Environment

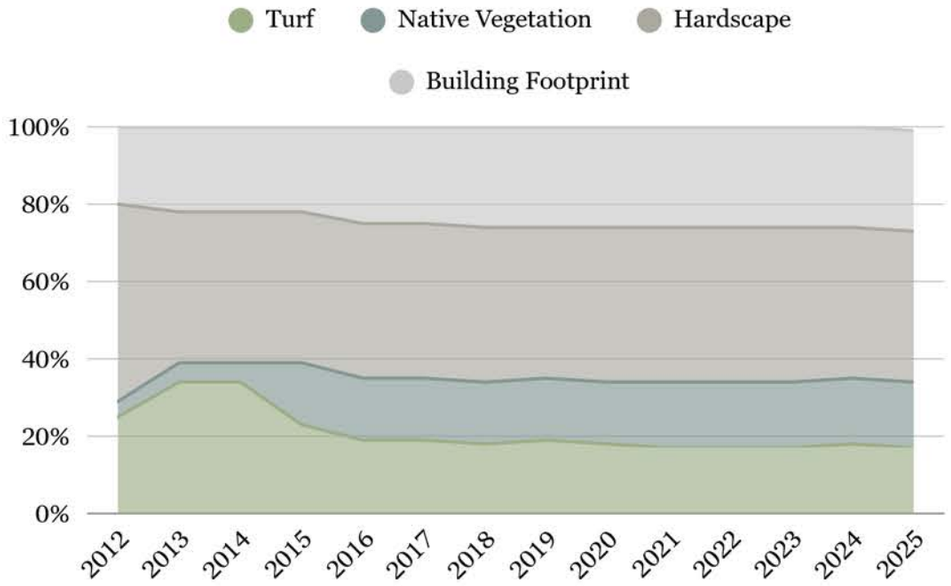
Looking Inwards

With no new major capital projects and minimal changes in campus land use, one might be inclined to think there wasn't much to talk about in 2025 when it comes to the built environment. This couldn't be further from the truth as campus behavioral and occupant engagement programs took center stage. With the hiring of the first Recycling and Materials Coordinator in October of 2024 and the first Green Labs Coordinator in July 2025, Caltech Sustainability has an expanded team to handle a growing suite of programs that maximize the impact of sustainably-designed spaces through occupant education and green labs initiatives.

From new recycling and composting programs, to student-led energy audits, to more certified green labs, and more, 2025 set the stage for a quantum leap in sustainability programming at Caltech, and students sit at the core of this progress. Through their enthusiasm and ability to be the eyes and ears of Caltech Sustainability, the campus is well positioned for continued progress into 2026 and beyond.

Cannon Design presents to the International Institute for Sustainable Laboratories crowd about the Resnick Sustainability Center's sustainable design features.

Campus Land Use Cover



Annual Feature

Energy Savings Projects

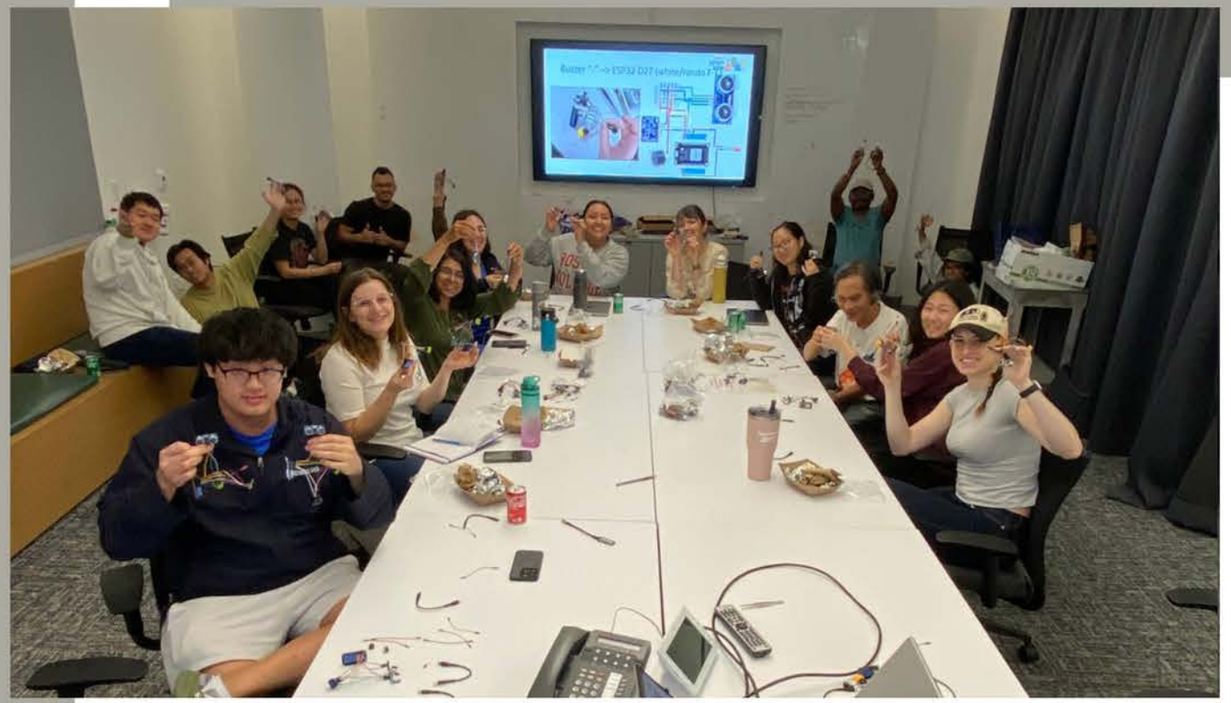
Green Labs Expands Influence to Caltech's Kornfield Lab
During the summer of 2025, Green Labs joined the Kornfield Lab to support two SURF students working on projects focusing on reducing energy consumption in laboratories.

Bhakti Ahir Ahir, a sophomore in Biochemistry, developed a fume hood Motion and Sash Height (MASH) sensor aimed at reducing energy consumption in research laboratories. Fume hoods run continuously to pull air away from users to protect them from potential hazards, with a sash that can be opened and closed depending on user requirements. As the sash is raised, the air exhaust speed increases. Each fume hood consumes about $10,000 worth of energy annually, and fume hoods that are left with their sashes open consume even more energy due to increased air exhaust speed requirements. Bhakti's sensors alarm if a fume hood has been left open and unattended for more than 5 minutes, encouraging users to shut their sash. Preliminary comparison with baseline measurements suggest these sensors will save an average of $1,200 annually per fume hood.

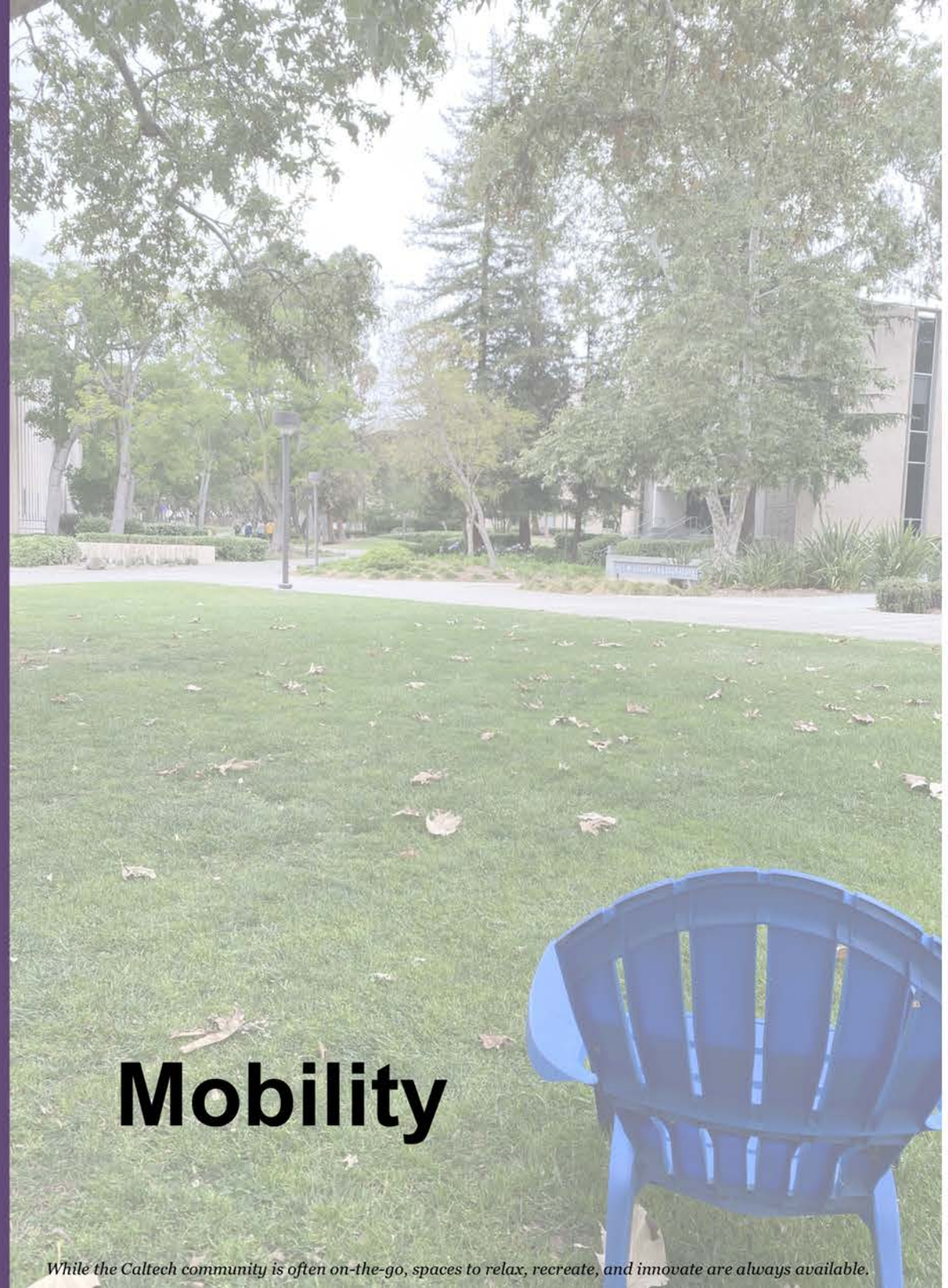
Aarohi Patel, a sophomore studying Electrical Engineering and minoring in Robotics, conducted lab energy audits by surveying and measuring the energy consumption of over 600 pieces of equipment across 7 laboratories in BBE and CCE. Aarohi produced lab-specific suggestions for energy conservation, and also conducted experiments to show the effect of suggested changes. One such experiment showed that decreasing the amount of time a -20°C freezer door is left open from 2 minutes to 1 minute reduces freezer energy consumption by 16%. From these audits, Aarohi determined that energy conservation efforts may realize an overall annual energy savings of $2.88 per square foot of laboratory space.

16% reduction in average fume hood sash height corresponds to about $1,200 in energy savings per hood.

"Each fume hood consumes about $10,000 worth of energy annually, and fume hoods that are left with their sashes open consume even more..."



Caltech Green Labs Associates teaching our Green Labs volunteer team members to build Motion and Sash Height (MASH) fume hood sensors. During this session, the team built 40 sensors that were ready to be deployed into labs.



Mobility

While the Caltech community is often on-the-go, spaces to relax, recreate, and innovate are always available.

Caltech requires participation from the campus community and sometimes community partners. This is especially true for concerns related to mobility, transportation, and scope 3 emissions. Enhancing these programs requires creativity, data, and, especially, communication among students, postdoctoral scholars, staff, and faculty. Involvement of the campus community and civic partners is well-timed as Caltech's educational curriculum and research more deeply integrate sustainability.

Highlights

Mobility Progress

JANUARY
E-BIKE PROGRAM STAYS

Continuing a collaboration from 2024 between the Caltech Library and Sustainability, a pilot e-bike program became permanent in 2025. 5 e-bikes are available for checkout by any Caltech community member.

MAY
NEW EV CHARGING VENDOR

All 147 EV chargers were transitioned from PowerFlex to a new vendor, OPF. This software transition was accompanied by hardware upgrades for Level 2 and 3 chargers at the California and Wilson garages.

OCTOBER
AVR TRENDS UPWARDS

Caltech's average vehicle ridership, a common measure of commuting efficacy, hit a new post-pandemic high of 1.84 in 2025. Up from 1.6 prior to 2020, Caltech now has almost two employees arriving to campus for each parked vehicle.

DECEMBER
COMMUTER PROGRAMS SUCCESS

Carpool and fuel efficient vehicle programs enrollment hit all-time highs in 2025. Bike and walk-to-work programs have also been successful while vanpools haven't rebounded since 2020.

OPF installed new chargers throughout campus like this fast charger in the N. Wilson garage.

Bike racks are located throughout the campus to accomodate Caltech's biking community.

Update

Mobility

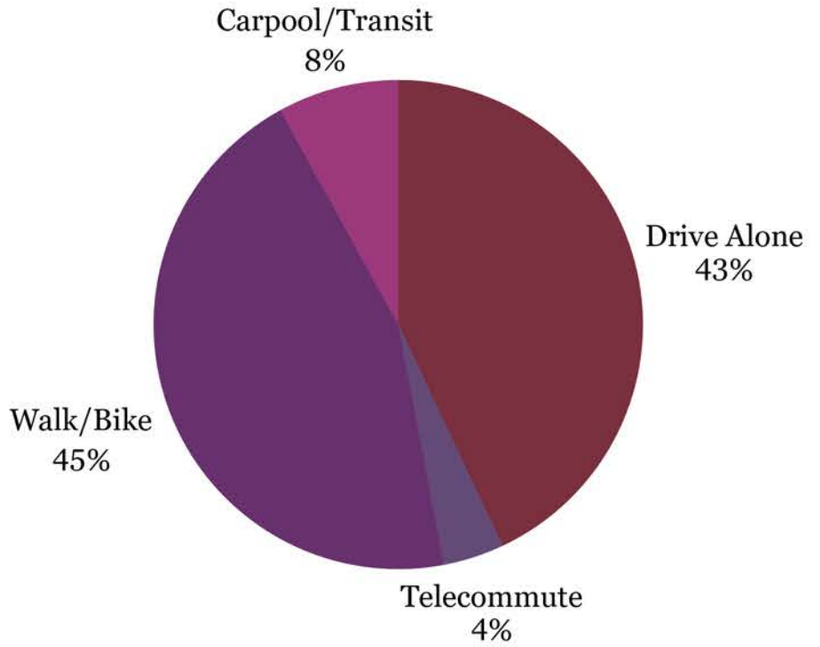
Stacking Success

In 2025, commuter programs almost universally continued to tick up in terms of community acceptance. This was reflected in the highest post-pandemic AVR of 1.84. With the exception of a struggling vanpool program, commuter incentives, metro pass enrollment, Zipcar utilization, and fuel efficient vehicle subsidies are all trending in a positive direction. A ridesharing app, highlighted in last year's report, continues to see new users try out the platform to discover new modes and flexible commuting strategies.

More so than any other section of this report, progress in mobility for Caltech relies upon partnerships with city and regional agencies. Building upon what has already been done, future efforts will involve strengthening collaborations with the City of Pasadena and advocating for improved bike safety, complete streets, and commuting corridors.

Zipcar participation is high on the Caltech campus with over 300 users, nearly 10,000 hours reserved, and almost 70,000 miles driven in 2025.

2025 Commuter Mode Breakdown



Annual Feature

Commuter Programs Rebound

Quiet Success
By most quantifiable metrics, 2025 was a very successful year for campus commuter and mobility programs. E-bike utilization remained high after the program's inception in 2024, nearly 2,500 community members have a free LA Metro Pass, and commuter programs have rebounded to beyond pre-COVID levels, with carpool, fuel efficient vehicle, and transit incentive enrollment at all-time highs.

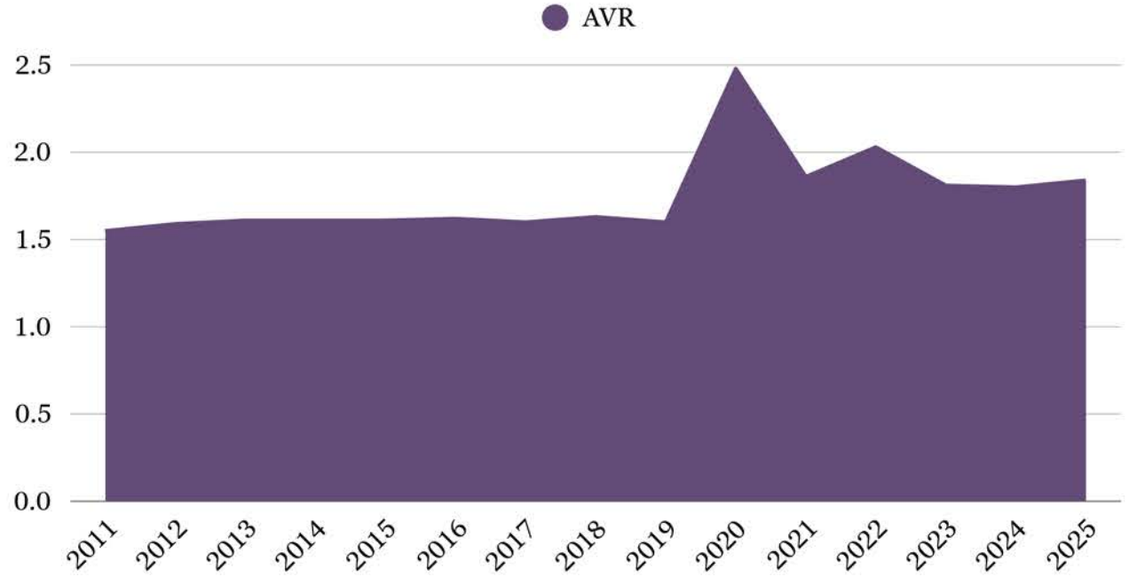
EV chargers got a full refresh with new hardware and software to better serve community needs. From May to September of 2025, the campus transitioned all 147 EV chargers from PowerFlex to OPF Energy. Similar to previous user experience, charging payment, scheduling, and initiation can be controlled via a single mobile application. Early returns have indicated a smooth transition, and EV utilization on campus remains strong.

Vanpools Needed
The one lagging program amongst this success is the vanpool program. Designed for those with longer commutes and those along common corridors such as I-10/210 and I-5, vanpool is ideal as a group of five or more can essentially eliminate all commuting-related costs from their personal budget. With Caltech providing an incentive of $100/commuter each month, vanpools are often able to cover all vehicle rental and gas costs. Vanpool commuters also have access to free, preferred parking spots in the Caltech garages.

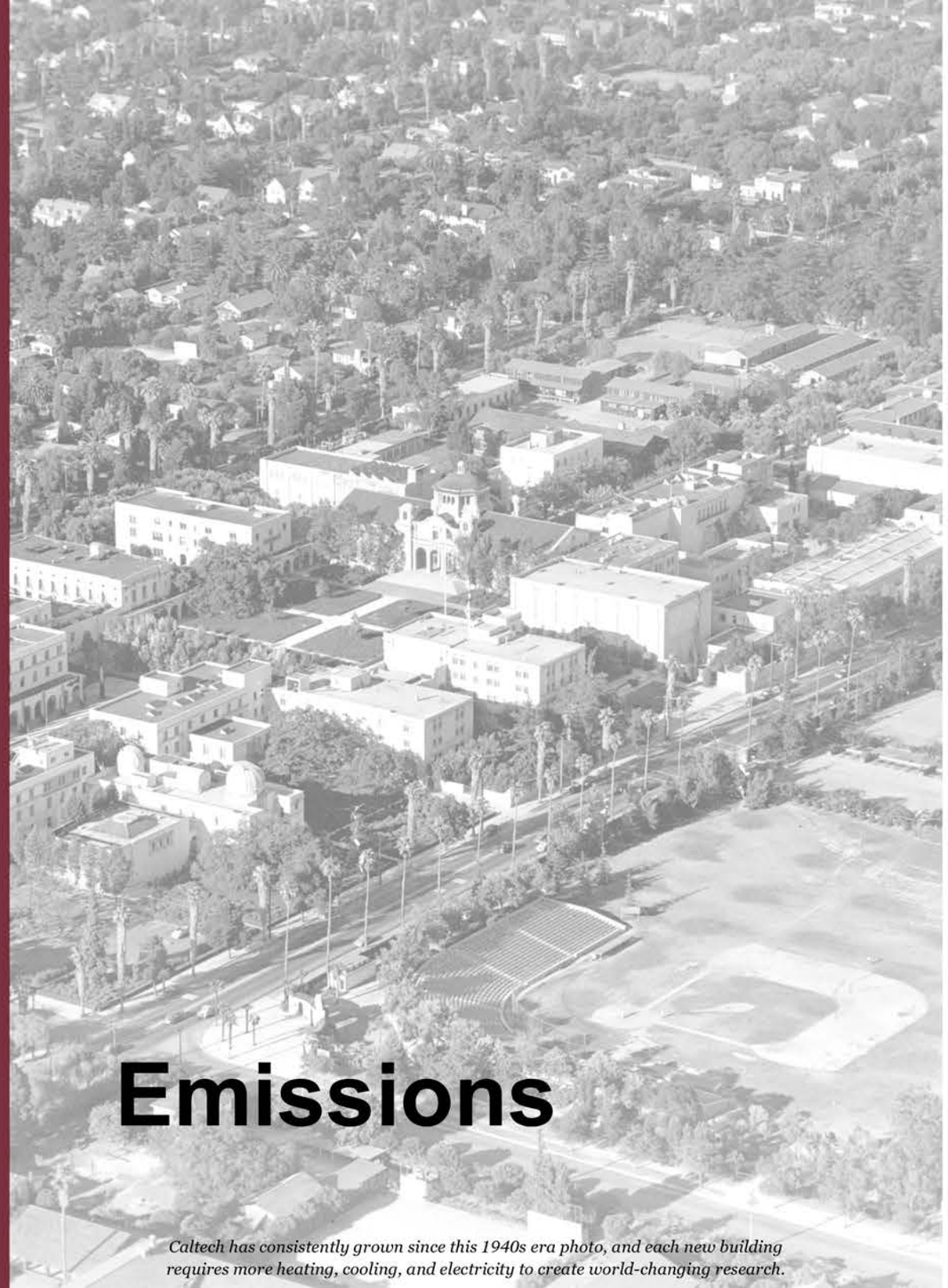
Over a dozen vans carrying close to 100 commuters used to arrive at the campus each day, but this program was hit hard by COVID, as current vanpools number just two. Caltech's Rideshare software platform offers an opportunity to begin recovering these vanpool numbers.

1.84 employees are arriving at campus per commuting vehicle.

"Commuter programs have rebounded to beyond pre-COVID levels, with carpool, fuel efficient vehicle, and transit incentive enrollment at all-time highs."



Average vehicle ridership continues to stabilize, sitting at 1.84 in 2025.



Emissions

Caltech has consistently grown since this 1940s era photo, and each new building requires more heating, cooling, and electricity to create world-changing research.

Emissions data in many ways summarizes the overall sustainability impact of Caltech's programs. While Caltech has long had a very clear picture of its direct and regulated emissions, encompassing those from on-campus energy consumption, purchases of grid electricity, and smaller value operational impacts, indirect emissions (mostly scope 3) are just beginning to come into focus. As efforts are underway to eliminate direct emissions by mid-century, Caltech is simultaneously working to better understand our indirect impact.

Highlights

Emissions Progress

JANUARY
SUSTAINABLE PROCUREMENT

Following upon the action items specified in the 2024 Sustainability Plan, a sustainable procurement working group began to meet with membership from Facilities, Procurement, and Student Affairs.

FEBRUARY
FURTHER STUDY OF HOT WATER

ARUP completed their work on a study to answer some lingering questions on research continuity and total cost of ownership related to a potential conversion from fossil fuel-based steam to electrically generated hot water for campus heating.

JULY
COMPLETE SCOPE 3 INVENTORY

Caltech Sustainability staff, in collaboration with Procurement, completed the first comprehensive Scope 3 inventory for Caltech. Following the Greenhouse Gas Protocol guidelines, all major categories were quantified using a mostly spend-based approach.

DECEMBER
REGULATED EMISSIONS FALL

As a result of lower gas turbine uptime, regulated emissions fell again in 2025. While a drop in emissions is beneficial on the surface, higher boiler utilization and greater Scope 2 emissions are needed to compensate for the reduction in electricity production.

Contrasting with other college campuses across the country, Caltech has a very small fleet and minimal transportation-related Scope 1 emissions.

With a full spend-based inventory now complete, future efforts will focus on product-specific factors for food and other purchased items to capture local impacts.

Update

Emissions

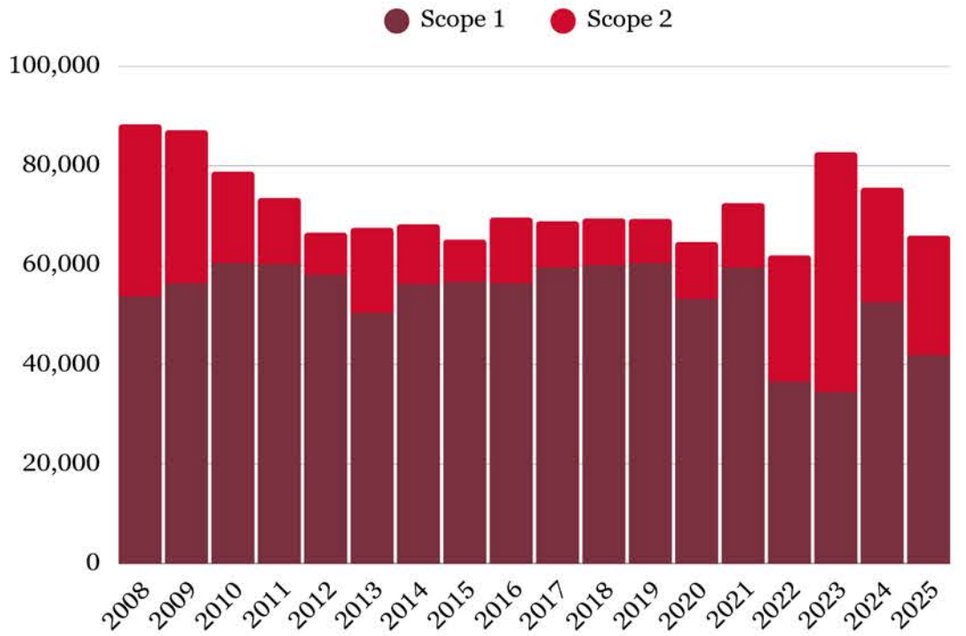
New Results and Old Challenges

With the campus now less than two decades away from the 2045 carbon neutrality goal, the race to put together a suite of Scope 1 and 2 elimination strategies continues. As the most consequential operational decision of this decade, selecting a definitive path forward on campus generation sources will unlock Caltech's decarbonization potential. While funding challenges across the higher education landscape in 2025 have complicated this challenge even further, significant strides were made in other areas of emissions.

For the first time, an expanded Caltech Sustainability team created a comprehensive inventory across all Scopes. Contrasting with previous incomplete inventories, $380 million dollars worth of purchase goods and services and over $100 million in embodied carbon from the construction of the Resnick Sustainability Center were translated into emissions values using a spend-based approach. When fully quantified, Scope 3 emissions exceed the sum total of Scope 1 and 2 emissions. This result, while perhaps surprising, is fully in-line with other organizations. Future efforts will focus on refined emissions factors and reduction potential.

Large-scale Scope 1 emissions reductions will only be possible through sources changes, but Caltech can continue to reduce baseline consumption through efficiency improvements, particularly for ventilation.

Total Historical Emissions



Annual Feature

First Scope 3 Inventory

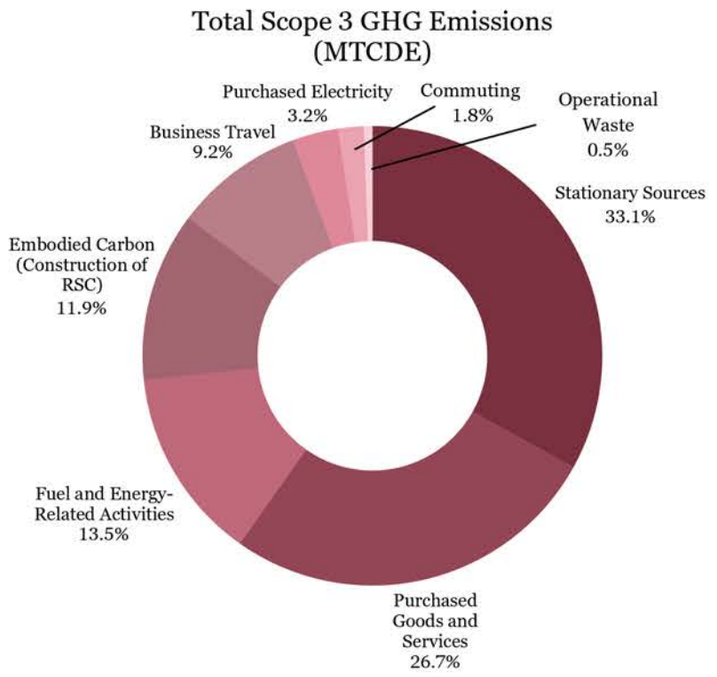
Reporting Success and Institutional Excellence
In the summer of 2025, Caltech completed its first comprehensive Scope 3 inventory. Using a reporting tool developed by The Sustainability Institute from The University of New Hampshire called SIMAP, Sustainability Indicator Management & Analysis Platform, Caltech has now categorized all carbon emissions according to the Greenhouse Gas Protocol. This benchmark sets Caltech up for reporting success and institutional excellence. Other universities in California and other states have already calculated these emissions such that Caltech had a wealth of established procedures to draw upon. With an established Scope 3 emissions baseline, Caltech now has an opportunity to define a broader strategy to reduce upstream emissions and remove them from their value chain entirely.

Sustainable Procurement Working Group
Establishing a benchmark for value chain emissions has opened up the opportunity to look into Caltech's supply chain and relationships with suppliers to reduce upstream carbon emissions. In June 2025, Caltech began work on analyzing purchased goods and services with cross departmental support from Dining Services, Student Services, Procurement, Green Labs, and Finance. Caltech is currently working with major suppliers to introduce bulk pricing and sustainable customer order lists to track and mitigate emissions from purchased goods and services. This comes as part of a larger effort by Caltech to reduce waste and optimize purchasing habits around campus by engaging with departments and purchasers to highlight the impact of purchased goods and services to the university's value chain.

Outputs of this working group so far have been the 2024 and 2025 Scope 3 inventories aligned with best practices, conducting an analysis for potential procurement related projects across departments, and beginning supplier engagement conversations.

63% of total campus emissions are categorized as Scope 3 for 2024 data.

"With an established Scope 3 emissions baseline, Caltech now has an opportunity to define a broader strategy to reduce upstream emissions..."



2024 Scope 3 Emissions categorization, completed in 2025.

Institutional Data

Metric	2025	2024	% Change
Building Square Footage	4,882,058	4,882,058	0.0%
Research Square Footage	1,942,475	1,942,475	0.0%
Population	6,058	6,041	+0.3%
Students	2,369	2,430	-2.5%
Staff	2,564	2,417	+6.1%
Faculty	1,125	1,194	-5.7%

Acknowledgements

Katie Chiu, Design & Construction
Carolann Decasiano, Human Resources
Delmy Emerson, Building and Grounds
Sal Escobar, Central Utility Plant
Emily Ewbank, Design and Construction
Neil Fromer, Resnick Institute
Mark Gatchalian, Environment, Health & Safety
Michelle Gonzalez, Financial Services
Carolann Decasiano, Human Resources
Eugene Kim, Design and Construction
Barbara Melendez, Operations and Services
Kevin Nguyen, Financial Services
Lauriane Quenee, Environmental Health & Safety
Cynthia Rowand, Procurement Services
Todd Swart, Transportation and Parking Services
Jocelyn Yamasaki, Caltech Library

Photo/Graphics Credits

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