



# Caltech

## Green Labs Action Plan

### 2023 and Progress Report

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## 1. Summary

The Green Lab Action Plan aims to provide a framework for Caltech to achieve climate and sustainability goals. The Institute has committed to supporting sustainable practices, including facilitating the Green Labs in their endeavour to make labs more sustainable and efficient.

Green Labs supports Caltech's sustainability commitments. As labs are estimated to produce over [5.5 million tons of plastic waste a year](#), it is increasingly important for labs to become more sustainable. To meet this goal, Green Labs is promoting reduction, reuse, and recycle programs for plastics and other types of waste in labs on campus, as well as green chemistry to reduce the hazardous waste production in the Institute. Green Labs also supports Caltech's goals to reduce emissions from fossil fuel combustion, commuters, and travel. Further, Green Labs supports efforts to reduce water usage on campus by recycling water where possible, changing flora on campus to be more water-friendly, and reducing lab burden on water through actions like only running autoclaves when loads are full. Other actions Green Labs aims to support include sustainable purchasing, encouraging all of Caltech to purchase items such as 100% recycled office supplies, and working with vendors to reduce the cost of sustainable consumables and equipment such as ultra-low-temperature freezers.

Green Labs aims to focus on developing behavioural changes throughout campus by providing resources and Guides with helpful and targeted information in six key areas: 1. Energy Efficiency, 2. Water Conservation, 3. Waste Reduction, 4. Sustainable Procurement, 5. Communications and Outreach, and 6. Resource Development. As this is the first Action Plan developed for Green Labs, this document will help serve as a guide for Caltech to develop sustainable laboratory practices without compromising scientific integrity. Implementation will require engagement of the entire campus, and will bridge work done by the Biosafety Offices, Health and Safety Offices, Facilities, Sustainability, and the Resnick Institute. This allows normalization of sustainable practices while increasing the safety, efficiency, and sustainability throughout the entire campus.

## 2. Introduction: About Green Labs

As biologists, we are challenged to protect our environment and advocate for sustainable practices to protect the very thing we study: life on Earth. Caltech Green Labs aims to meet this challenge by proposing lab practices that are energy efficient and resource efficient, without compromising research objectives. This group aims to create an equitable and inclusive space, where we can incentivise a discussion among staff, students, and faculty, and utilize their talents to promote innovation and normalization of sustainable laboratory practices. The Caltech Green Labs group ultimately aspires to be a resource for sustainable lab practices including energy efficiency, water conservation, green chemistry, waste management, sustainable purchasing, and sustainable education. These resources will strengthen the Caltech community and further the Institute's goal to positively impact the community at large.

### Goals:

- Demonstrate Caltech's commitment to promote sustainable and inclusive environment
- Work with BBE and Caltech to better integrate and adopt sustainable practices, especially in research groups
- Improve general knowledge and transparency of existing campus sustainable practices and resources
- Increase awareness, advocacy, and education about sustainable initiatives and best practices
- Participate in sustainable events held on Caltech campus
- Establish a Green Labs website
- Develop a Green Labs Guide
- Pilot sustainable initiatives within appropriate research groups and report findings
- Decrease energy and water usage
- Reduce waste production, especially of single-use plastics in labs
- Decrease hazardous waste production and promote innovation by engaging in green chemistry
- Encourage sustainable purchasing

### 3. Caltech Lab Setting and Engagement

Green Labs encourages all labs to participate and be recognized as champions of sustainability. In this way, participants will not only be benefiting the environment, but will also be making their labs more innovative, efficient, cost-effective, and safe. Participating labs will gain greater access to resources and networks dedicated to sustainability. Green Labs members will also be able to assess their labs with comprehensive tools that provide greater understanding of how your lab works, evaluate where your lab is already achieving sustainability goals, and assess areas where your lab has the potential to become more efficient and sustainable.

Interested labs are assessed through an [easy survey](#), with points given for sustainable practices. This informs your lab's initial Green Lab Score. After various categories are assessed for strength or weakness, labs are encouraged to make adjustments. Once adjustments have been completed, labs are scored again, and this final assessment informs your final Green Labs Certification Score. When you submit your final assessment, your lab is given a "Certified Green Lab" plaque!

In January 2023, we began our Certification journey with just 2 labs Certified. As of January 2024, there were 14 labs Certified, with that number growing every month!

#### Benefits of voluntary participation:

- Reduce overhead costs
- Increase research efficiency
- Reduce carbon footprint and pollution
- Recognition for sustainability efforts on grants
- Strengthen team building and community
- Prolong equipment life
- Greater access to sustainability resources and funding
- Recognition as lab sustainability champion
- Increase scientific innovation
- Enhance lab visibility and attractiveness to students

### Caltech

#### Green Lab Certification Dashboard

Current Level	Gold
Total Points	25
Points Needed to Achieve Next Level	5

Leaf Level	Points Required
Bronze	5
Silver	15
Gold	25
Platinum	30



What categories are you strongest/weakest in?

Category	Total Points Achieved	Total Points Available	Progress
Commitment	2	2	100%
Administrative	2	2	100%
Education	2	2	100%
Energy/Refrigeration	6	13	46%
Materials	6	7	86%
Purchasing	4	6	67%
Water	3	4	75%
TOTAL	25	36	69%

## 4. Strategy and Vision

Green Labs aims to outline an Action Plan for each of the following six areas of interest: 1. Energy Efficiency, 2: Water Conservation, 3: Waste Reduction, 4. Sustainable Procurement, 5. Outreach and Recruitment, and 6. Resource Development.

This plan establishes achievable Action Items, Implementation Strategies, and Targeted Goals for each area of interest.

To keep our group accountable, we have added a “Progress Report” to indicate how successful various Action Items were, what progress was made, if there were any hurdles or issues we need(ed) to overcome, and what plans are moving into 2024.

In setting out goals for 2023, Green Labs seeks to better provide actionable ways for Caltech labs to improve their sustainable practices. By focusing on simple, often inexpensive, behavioural changes or practices, Green Labs aims to increase innovation, safety, and efficiency, all without compromising research goals.



## Energy Efficiency

Action Item	Implementation Strategy	Targeted Goal	Progress Report
Develop ON/OFF signage for equipment	<ol style="list-style-type: none"> <li>Develop stop “sign system” and implement in Green Labs               <ol style="list-style-type: none"> <li>Never turn off</li> <li>Ask before turning off</li> <li>Turn off when done</li> </ol> </li> <li>Provide stickers or printouts of three “stop sign” labels</li> </ol>	<ol style="list-style-type: none"> <li>Propose program to BBE and ask for funding to develop and print stickers</li> <li>Produce newsletter for BBE</li> <li>If successful, incorporate stickers into welcome package for new Green Labs members</li> </ol>	<p><b>COMPLETED – WORK WILL CONTINUE IN 2024</b></p> <p>Stickers are created on using the TechHub Cricut and are a reward for completing Green Labs Certification.</p>
Develop ULT freezers: develop information to encourage adjustment from -80°C to -70°C	<ol style="list-style-type: none"> <li>Collect resources about energy savings associated with temperature change</li> <li>Collect information on safe-keeping of samples stored at -70°C</li> <li>Working with facilities and building managers, inventory ULT freezers storing samples at -70°C to encourage others</li> </ol>	<ol style="list-style-type: none"> <li>Produce an updated newsletter for BBE email and website</li> <li>Develop inventory of ULTs and update website with inventory, working alongside facilities and building managers</li> </ol>	<p><b>COMPLETED – WORK CONTINUES IN 2024, DATA POSTED IN 2024</b></p> <p>A study is underway, comparing samples held at -80°C, -70°C, and -20°C. Results should be available Fall 2024.</p>

Action Item	Implementation Strategy	Targeted Goal	Progress Report
Outlet timers	<p>1. Collect resources about energy savings and risks associated with utilizing timers</p> <p>2. Inventory equipment utilizing outlet timers</p>	<p>1. Develop a pilot program for BBE approval involving the purchase, distribution, and tracking of timers</p> <p>2. Produce a newsletter</p> <p>3. If successful, incorporate timers into welcome package for new Green Labs members</p>	<p>COMPLETED - ADDED TO GUIDE IN 2023 AND UPDATED IN 2024, AND PLANS TO INCORPORATE INTO PRIZES FOR GREEN LABS CERTIFICATION</p> <p>If successful, incorporate timers into welcome package for new Green Labs members.</p>

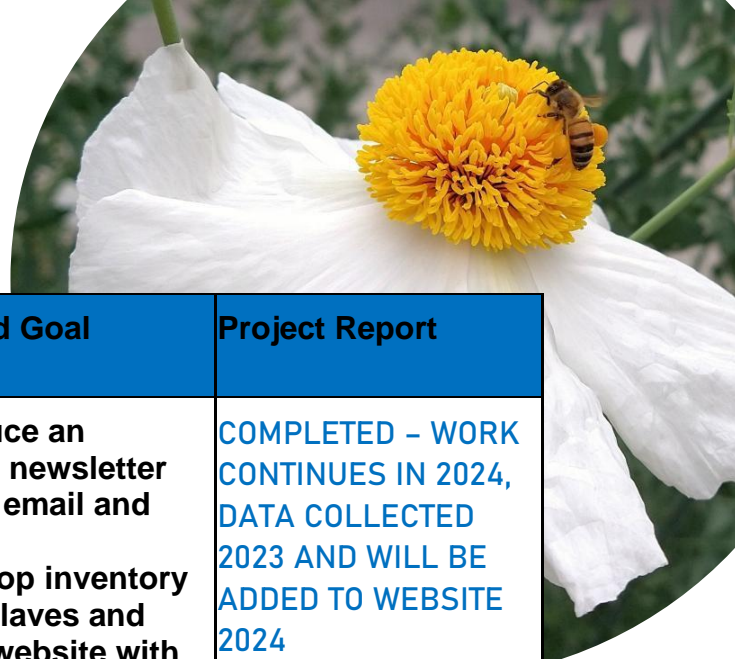
# Progress Report: Energy Efficiency 2023

In addition, Green Labs also:

1. With the help of facilities, conducted a survey of the -80 °C ultra-low temperature freezers on campus. Cost-savings projections were developed to encourage the transition to -70 °C transition, as well as encourage users of old ultra-low temperature models to transition to newer, more efficient models that are energy-star rated. The results of this work will be posted on the Green Labs website by the end of 2024.
2. With the help of facilities, completed an audit of the numbers of fume hoods that are on campus (including comparing those that are alarmed and those that are not). Cost savings projections were developed to encourage shut the sash initiatives, including the investigation of how much alarms could cost to be installed on each unalarmed fume hood on campus. The results of this work will be posted on the Green Labs website.



# Water Conservation



Action Item	Implementation Strategy	Targeted Goal	Project Report
Autoclave usage	<ol style="list-style-type: none"> <li>1. Collect resources about energy savings and water efficiency</li> <li>2. Collect information about lab behaviours and identify areas where labs could be encouraged to use autoclaves only when full, only run the autoclaves once a week instead of multiple times, and/or share an autoclave with another lab</li> <li>3. Working with facilities and building managers, inventory autoclaves with single and multiple users</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce an updated newsletter for BBE email and website</li> <li>2. Develop inventory of autoclaves and update website with inventory and opportunities for sharing the resource, working alongside facilities and building managers</li> </ol>	<p>COMPLETED – WORK CONTINUES IN 2024, DATA COLLECTED 2023 AND WILL BE ADDED TO WEBSITE 2024</p> <p>Green Labs produced forms for labs to record their load sizes and frequency, with the goal of running this pilot running during 2024 (perhaps during the summer); once completed, we will ask labs to share the autoclave loads or to wait to run only full loads.</p>
Autoclave retrofits	<ol style="list-style-type: none"> <li>1. Collect resources about energy savings and risks associated with retrofitting autoclaves with water efficiency technology</li> <li>2. Collect water and energy usage measurements and before and after installation and cost savings</li> <li>3. Working with facilities and building managers, inventory autoclaves with and without retrofits</li> </ol>	<ol style="list-style-type: none"> <li>1. Develop a pilot program for BBE approval involving autoclave retrofits</li> <li>2. Produce a newsletter for BBE</li> <li>3. If successful, develop new strategies for adopting other retrofits and explore funding opportunities to retrofit more/all autoclaves, working with facilities and building managers</li> </ol>	<p>NOT FEASIBLE IN 2023, ADDED TO 2024 GUIDE, DECIDED TO FOCUS ON REDUCING USAGE INSTEAD OF RETROFITS</p>

Action Item	Implementation Strategy	Targeted Goal	Project Report
Water restrictors	<ol style="list-style-type: none"> <li>1. Collect resources about energy savings and risks associated with utilizing water restrictors</li> <li>2. Collect water usage measurements and compare water usage before and after installation and cost savings</li> <li>3. Working with facilities and building managers, inventory taps using water restrictors</li> </ol>	<ol style="list-style-type: none"> <li>1. Develop a pilot program for BBE approval involving the purchase, distribution, and tracking of restrictors</li> <li>2. Produce a newsletter</li> <li>3. If successful, incorporate restrictors into welcome package for new Green Labs members, coordinating with facilities for installation</li> </ol>	NOT FEASIBLE IN 2023, ADDED TO 2024 GUIDE

# Progress Report: Water Conservation 2023

In addition, Green Labs also:

1. Presented on water initiatives to a group of architects and Green Labs representatives to other universities during a tour of the Chen building on campus.

# Waste Reduction

Action Item	Implementation Strategy	Targeted Goal	Progress Report
Styrofoam and tip box recycling program	<ol style="list-style-type: none"> <li>1. Collect resources about Styrofoam and tip boxes, investigate different recycling options</li> <li>2. Poll labs to find where recycling/share points are most needed</li> <li>3. Develop consistent signage to be distributed and posted at share points</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce newsletter with resources and recycling/share points information</li> <li>2. Post and implement recycling/share points in various locations across BBE</li> <li>3. Monitor for one year, and reassess locations and effectiveness of program</li> </ol>	PARTIALLY COMPLETED - GREEN LABS DID BEGIN A TIP BOX AND WAFER RECYCLING PROGRAM, BUT WERE UNABLE TO PURSUE STYROFOAM RECYCLING IN 2023, ADDING TO PLANS FOR 2024.
Ice pack recycling program	<ol style="list-style-type: none"> <li>1. Collect resources about ice pack usage and investigate different recycling options</li> <li>2. Poll labs to find where recycling/share points are most needed</li> <li>3. Develop consistent signage to be distributed and posted at share points</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce newsletter with resources and recycling/share points information</li> <li>2. Post and implement recycling/share points in various locations across BBE</li> <li>3. Monitor for one year, and reassess locations and effectiveness of program</li> </ol>	NOT COMPLETED - WORKING WITH LOCAL VENDORS DIFFICULT, CONTINUING IN 2024

Action Item	Implementation Strategy	Targeted Goal	
Lab recycling signage	<ol style="list-style-type: none"> <li>1. Collect resources about recycling</li> <li>2. Develop consistent signage to be used in lab-specific settings, and coordinate with facilities to make signage consistent</li> <li>3. Work with facilities to develop pickup strategies</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce an updated newsletter for BBE email and website</li> <li>2. If successful, incorporate signage into welcome package for new Green Labs members, coordinating with facilities for implementation</li> </ol>	COMPLETED - PRODUCED AND APPROVED, AVAILABLE ON WEBSITE
Develop an online Recycling Guide	<ol style="list-style-type: none"> <li>1. Collect resources and develop a Recycling Guide to be posted on website, including locations for recycling services</li> <li>2. Develop strategies for wet labs, dry labs, and teaching labs</li> <li>3. Investigate transparency of Caltech recycling programs</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce a Recycling Guide and appropriate lab-specific signage be posted online, with resources and tips for waste reduction</li> <li>2. Work with facilities for implementation</li> <li>3. Monitor for one year and reassess, adjust signage as needed</li> </ol>	COMPLETED - SEE GREEN LABS GUIDE AND SIGNAGE REFERENCED ABOVE, WORK CONTINUES IN 2024
Encourage sustainable food options at BBE and lab functions	<ol style="list-style-type: none"> <li>1. Investigate what kinds of foods are favoured at BBE and lab functions</li> <li>2. Investigate sustainable food alternatives and advertise them on our website, especially favourability of vegetarian options if they are given as default</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce a newsletter and resources on our website about sustainable food items and vendors</li> <li>2. Encourage BBE to adjust policy encouraging sustainable food practices, including possibly asking that vegetarian options be default</li> <li>3. Monitor for one year and reassess, adjust online options</li> </ol>	COMPLETED - MADE TWO GUIDES (ONE FOR LUNCH RESTAURANTS AND ONE FOR BREAKFAST AND COFFEE AND DESSERT), AND MADE VENDOR AGREEMENT FORM

# Progress Report: Waste Reduction 2023

In addition, Green Labs began two pilot programs targeting waste reduction:

1. Pipette tip box recycling for TipOne and Genesee brands (over 1000 lbs diverted in less than 1 year).
2. Composting in laboratory lunch rooms (diverting over 600 gallons of food waste from the landfill using the Lomi composter, with all compost utilized by the Caltech Grounds for the gardens on campus).





# Sustainable Procurement

Action Item	Implementation Strategy	Targeted Goal	Progress Report
<p><b>Education</b></p>	<ol style="list-style-type: none"> <li>1. Collect resources and develop a sustainable purchasing guide based on lab needs with helpful hints</li> <li>2. Develop strategies for wet labs, dry labs, and teaching labs</li> <li>3. Work with procurement to develop strategies for promoting sustainable purchasing</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce a guide and with resources and tips for eco-friendly purchasing, and post on our website</li> <li>2. Work with purchasing for implementation</li> <li>3. Monitor for one year and reassess, adjust guide as needed and poll purchasers/lab managers to see if there are other things we could add or request purchasing to work with us</li> </ol>	<p>COMPLETED IN 2023, WORK CONTINUES IN 2024</p> <p>Produced a guide with resources and tips for eco-friendly purchasing, and posted online, incorporated into the Clean Up Event launching in 2024.</p> <p>Want to continue working with purchasing and labs to modify the list and investigate ethical considerations of products.</p>
<p><b>Vendor outreach and event(s)</b></p>	<ol style="list-style-type: none"> <li>1. Reach out to vendors known for eco-friendly products and ask if they would participate in an eco-friendly event</li> <li>2. Work with Caltech procurement and BBE to have an event focused on eco-friendly purchasing</li> </ol>	<ol style="list-style-type: none"> <li>1. Work with BBE to advertise and run an event focused on sustainable purchasing</li> <li>2. Collect purchaser comments and investigate needs for the future during the event to improve utility</li> </ol>	<p>COMPLETED - CONTINUING THIS WORK IN 2023, CREATED VENDOR AGREEMENT RESOURCE</p> <p>Want to work with BBE to advertise and run an event focused on sustainable purchasing.</p>

Action Item	Implementation Strategy	Targeted Goal	Progress Report
Vendor incentives and opportunities	1. Investigate incentive programs for purchasing sustainable products (that are perhaps more expensive than traditional products)	1. Partner with BBE procurement and vendors to establish Caltech-wide discounts on sustainable products 2. Monitor usage of quotes or discounts and adjust according to polls or comments	COMPLETED - CREATED VENDOR AGREEMENT RESOURCE, WORK CONTINUES IN 2024
Develop equipment and chemical share program	1. Poll purchasers and lab managers on what kinds of equipment they would like to share 2. Develop an equipment and chemical share tool/program	1. Partner with purchasers and lab managers to develop a tool or email to share chemicals and equipment 2. Monitor usage and adjust as needed	COMPLETED - ROLLED OUT IN 2024 FOR OUR LAB CLEAN UP EVENT Incorporated into the Clean Up Event, looking for physical space to house items. For now, this program is only an online database.

## Progress Report: Sustainable Procurement 2023

In addition, Green Labs also:

1. Investigated what the “green leaf” means on TechMart, asking for more training on that platform to search for sustainable products.
2. Purchased (or were gifted) several sustainable products that labs tried out in their labs (including biodegradable gloves, pipette tips made from recycled materials, bio-based conical tubes, stackable pipette tip refills, and more).
3. Developed a digital-only chemical/equipment/glassware share program and incorporated it into the Clean Up Event launched in 2024. We hope to find a permanent space for this share program in 2024.

# Communications and Outreach

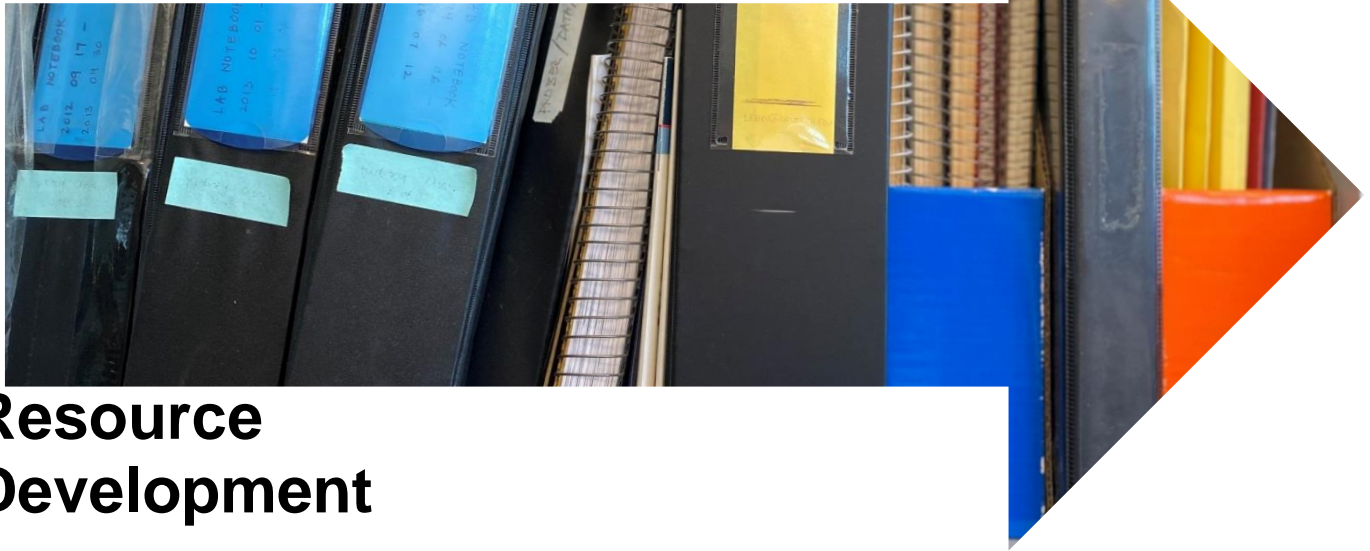
Action Item	Implementation Strategy	Targeted Goal	Progress Report
Outreach	<ol style="list-style-type: none"> <li>1. Write newsletters of our work for the BBE quarterly email</li> <li>2. Post newsletters and resources online</li> <li>3. Coordinate with IonCaltech and Caltech Weekly to post newsletters there as well</li> <li>4. Investigate other outreach avenues such as Slack, Facebook, or Instagram</li> </ol>	<ol style="list-style-type: none"> <li>1. Assess visibility and access to information and adjust as needed</li> <li>2. Create website with all resources (after approval of BBE)</li> <li>3. Assess traffic and work with BBE newsletter, IonCaltech, Caltech Weekly etc to enhance visibility</li> </ol>	<p><b>COMPLETED - INCORPORATED INTO BBE AND CCE NEWSLETTERS, HIGHLIGHTED IN CALTECH WEEKLY, CONTINUE THESE EFFORTS IN 2024</b></p> <p>Would like to continue making resources available and growing our base (including listserv users, website visits, etc).</p>
Green Labs Certification Program	<ol style="list-style-type: none"> <li>1. Encourage members to participate in the Green Labs Certification program</li> <li>2. Assess the spreadsheet and see if there are obvious barriers to completing the certification</li> </ol>	<ol style="list-style-type: none"> <li>1. Post links to Sustainability website GLCP</li> <li>2. If necessary, implement changes to make certification easier</li> <li>3. Goal of adding 1 new lab by 2024</li> </ol>	<p><b>COMPLETED - WENT FROM 2 LABS TO 14; 2023 UPDATE TO GREEN LABS CERTIFICATION FORMS, CONTINUE TO UPDATE 2024</b></p>



# Progress Report: Communications and Outreach 2023

In addition, Green Labs also:

1. Modified the website to be more user-friendly and will continue to update it regularly.
2. Listserv growth continues, and modification to the email layout helped increase readability of the monthly emails.
3. Created numerous posters for advertisement of events.
4. Participated in several events with the Graduate Student Council, Women in BBE, Chemistry and Chemical Engineering graduate students, in order to spread the word about Green Labs and expand our user base.
5. Green Labs hosted two Certified-exclusive events to celebrate sustainability excellence.
6. Asked for members of the community to present at our Lightning Talks Event, held in April, for suggestions and lightning-talk presentations on sustainable initiatives they would like, or have, developed. Several of these ideas were incorporated into the plans for 2024 including the Lomi composting project, and pipette tip box recycling.
7. Presented information on Green Labs Certification and Green Labs to BBE PIs, as well as to the Lab Manager's group on campus.
8. Presented at the International Institute for Sustainable Laboratories (I2SL), showing how a grassroots movement can occur with limited resources.
9. Presented our work to the Sustainability Council, where we asked for advocacy for a full-time employee position to be created, as well as asked for continued support of our group.



# Resource Development

Action Item	Implementation Strategy	Targeted Goal	Progress Report
<p><b>Develop a website</b></p>	<ol style="list-style-type: none"> <li><b>1. Collaborate with members to consolidate relevant resources and post information (including Action Plan, Green Labs Guide, newsletters, signage, meeting minutes, calendar of events, useful resources, and group contacts) in one easy-to-find location</b></li> <li><b>2. Create a user-friendly website with easily accessible resources alongside Caltech IT</b></li> <li><b>3. Ensure accountability and monitoring tools are available</b></li> </ol>	<ol style="list-style-type: none"> <li><b>1. Work with BBE and sustainability to consolidate and post resources as completed and approved</b></li> <li><b>2. Adjust website as resource library grows and continue to ensure information is easily accessible</b></li> <li><b>3. Accountability and monitoring will be conducted by the Green Labs group and BBE and reported annually</b></li> </ol>	<p><u>COMPLETED - ALL WORK HAS BEEN POSTED FROM 2023, AND WILL CONTINUE TO BE UPDATED IN 2024, MEETING REGULARLY WITH BBE TO ASSESS PROGRESS AND NEEDS</u></p>

<b>Action Item</b>	<b>Implementation Strategy</b>	<b>Targeted Goal</b>	<b>Progress Report</b>
Develop an Action Plan	<ol style="list-style-type: none"> <li>1. Develop an Action Plan to be posted on our website</li> <li>2. Include relevant areas of interest and information about the group and our plans</li> </ol>	<ol style="list-style-type: none"> <li>1. Work with BBE and Sustainability to develop and implement an Action Plan for 2023</li> <li>2. Post online when complete and work with BBE, IonCaltech, and Caltech Weekly to post information regarding development of this plan and establishment of our group</li> </ol>	<p><u>COMPLETED - AVAILABLE FROM EARLY 2023, AND WILL BE UPDATED WITH REPLIES TO ALL ACTION ITEMS EACH YEAR</u></p>
Develop a Green Labs Guide	<ol style="list-style-type: none"> <li>1. Gather Caltech- and California-specific resources to develop a Green Labs Guide with all categories described above included, to be posted on the website</li> <li>2. Develop strategies for wet labs, dry labs, and teaching labs</li> <li>3. Include information on sustainable office purchasing throughout</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce and publish a Green Labs Guide in modules</li> <li>2. Work with BBE and Sustainability to develop a finalized completed Guide for Fall 2023</li> <li>3. Monitor and assess effectiveness after one year by asking lab members not involved GL to assess success, adjust Guide as needed</li> </ol>	<p><u>COMPLETED - REVAMPING FOR 2024</u></p>
Develop Recycling Signage	<ol style="list-style-type: none"> <li>1. Develop universal lab-specific signage for various kinds of recycling bins</li> </ol>	<ol style="list-style-type: none"> <li>1. Work with facilities to assess and implement</li> <li>2. Assess effectiveness and accept feedback</li> <li>3. If effective, will include in welcome package</li> </ol>	<p><u>COMPLETED - WORKED WITH EHS AND WILL CONTINUE TO MODIFY IN 2024</u></p>

Action Item	Implementation Strategy	Targeted Goal	Progress Report
Hire a full-time Green Labs Coordinator by 2024	1. Ask BBE to start collaborating with other Divisions and Sustainability to set aside funding for a full-time GLC 2. Compile resources and ideas for how this person can facilitate GL initiatives across Caltech	1. Hire a GLC by 2024 2. Roles would include collaborations with all Divisions, EHS, security, procurement, new faculty, etc	NOT COMPLETED - HAVE ASKED SUSTAINABILITY AND BBE FOR ADVOCACY, HAVE DONE THE MATH FOR COST-SAVINGS THIS ROLE COULD PROVIDE

# Progress Report: Resource Development 2023

In addition, Green Labs also:

- Disseminated monthly Green Labs tips, and from those developed a website page (Green Labs Clean Up Event) with these resources highlighted and encouraging labs to clean their spaces, including how-tos, inventory lists, FAQs, and more. This event will run January – April.

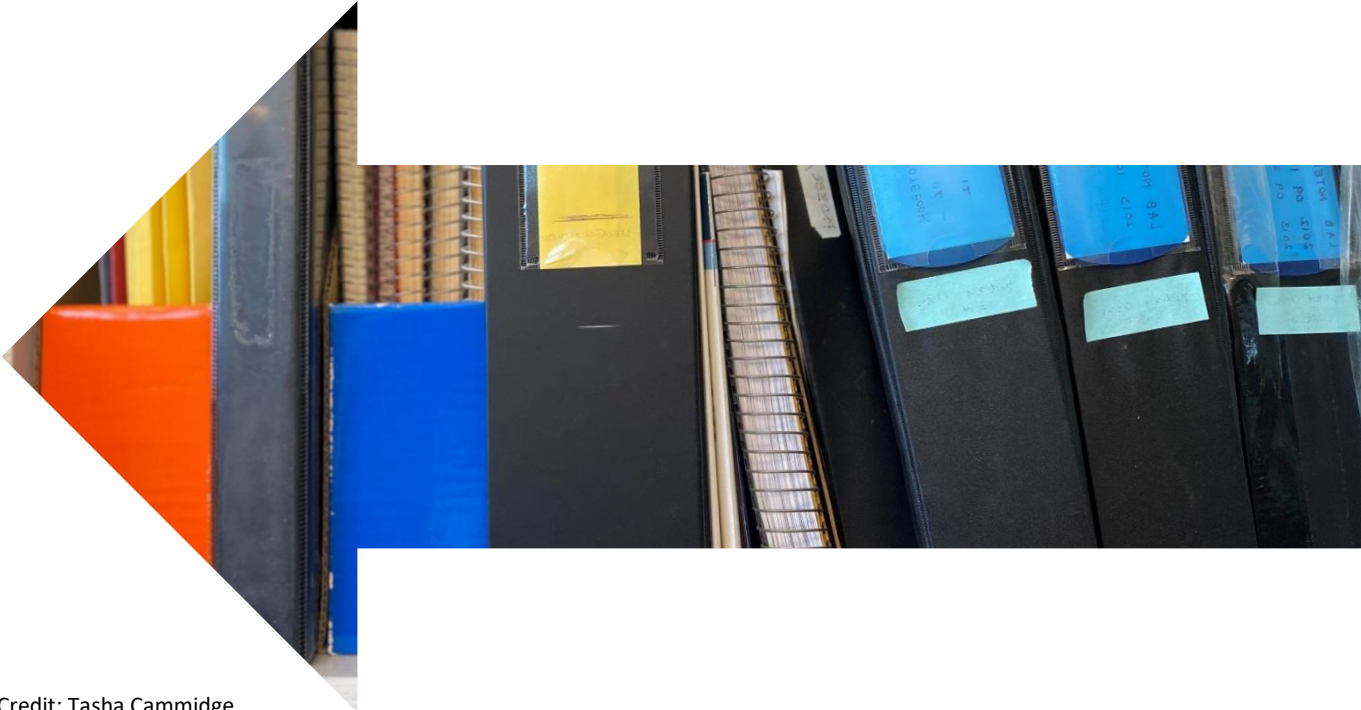


Photo Credit: Tasha Cammidge

## 5. Monitoring and Reporting

Each strategy outlined in this Action Plan will be implemented and monitored by Green Labs. This group is focused on changing behaviour in laboratories on campus to encourage normalization of eco-friendly lab practices and culture at Caltech. Each data-driven Action Item will be assessed and reported to the Caltech community.

Progress and updates will be reported annually to the Sustainability Office. Each Action Item will be evaluated for success, and advice will be given as needed, in future years as to how to improve.

## **Green Labs Members:**

Altyn Rymbek	Prober Lab
Anne Yeokyoung Kil	Pachter Lab
Elisa Gonzalez	CCSL
Elisha Mackey	Gradinaru Lab
Emily Echevarria	Prober Lab
Erick Bonilla	Grant Manager, BBE
Gina Mancuso	Anderson Lab
James Linton	Elowitz Lab
Jasmine Emtage	Prober Lab
Karen Lencioni	OLAR
Kate Malecek	Berkeley Lights Beacon Instrument
Mate Borsos	Gradinaru Lab
Matthew Langley	Elowitz Lab
Michelle Ravel	CCSL
Neehar Kondapaneni	Perona Lab
Sarah Torres	Sternberg Lab
Sina Boeshaghi	Pachter Lab
Tasha Cammidge	Prober Lab
Vijaya Kumar	Research Technician
Wen Chen	Sternberg Lab
Yvette Garcia-Flores	Mazmanian Lab

## **Special Thanks:**

Division of Biology and Biological Engineering  
Caltech Biosafety Offices  
Caltech Health and Safety  
Caltech Facilities  
Caltech Sustainability Offices  
OLAR / IACUC  
Caltech Procurement  
Women in BBE  
Graduate Student Council  
Carrie Metzgar – University of California Irvine  
Kathryn Ann Ramirez Aguilar – University of Colorado Boulder

Tasha Cammidge – Writer and photographer  
Gerard Coughlin – Photographer  
Jasmine Emtage – Photographer  
Brianna Garcia – Photographer  
Vijaya Kumar – Editor and photographer  
Sarah Torres – Editor and photographer