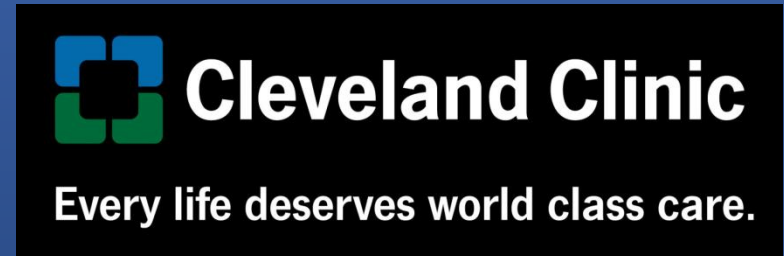


LANDFILL DIVERSION FROM LABS: PROGRESS ON UPSTREAM INNOVATIONS

Dr. Ilyssa O. Gordon, Cleveland Clinic
Kelly O. Weisinger, Emory

International Institute for Sustainable Laboratories
October 15, 2018



LEARNING OBJECTIVES

1. Learn about the environmental, social, and economic impacts of solid waste materials that come from research, healthcare, and teaching laboratories and why waste minimization and diversion from landfills is important;
2. Identify challenges and opportunities related to the diversion of solid waste materials from laboratories in diverse settings;
3. Engage in discussions on industry innovations;
4. Contribute to a brainstorming session and walk away with tangible ideas for building connections among key stakeholders, and setting and achieving goals for closing the loop on the production and disposal of laboratory materials and supplies

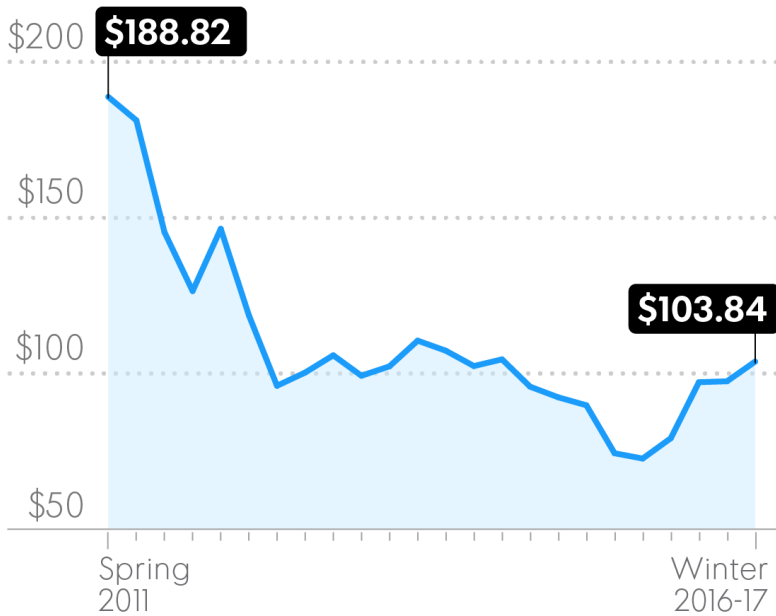
WORKING GROUP INTRODUCTION

- Established in 2015 to address barriers and share best practices related to laboratory waste diversion
- Presented at I2SL in 2016, 2017, and 2018
- In 2016 decided to focus on “upstream” innovations in two areas:
 - Supplier-side
 - Purchaser-side

STATE OF THE “DOWNSTREAM”

RECYCLED MATERIAL LOSES VALUE

Value of an average ton of recyclable material at a North Carolina sorting facility from spring 2011 to winter 2016-17:



SOURCE North Carolina Department of Environmental Quality
George Petras, USA TODAY



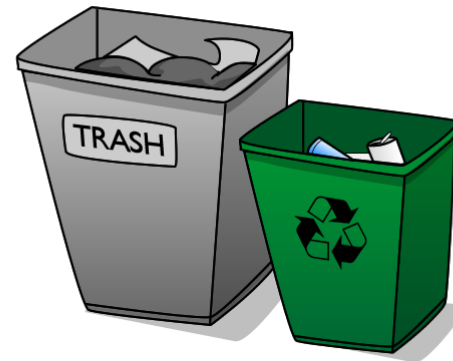
- Low oil prices lead to less demand for recycled plastic
- Thinner material innovations result in need for less raw material
- Reduction in quantities of newspaper, a valuable recycling commodity
- Sand is cheaper than recycling glass
- February 2018: China’s “National Sword”

A catalyst to explore alternative, and more sustainable, supply chains

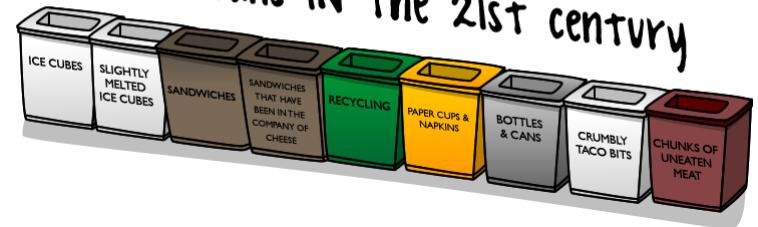
OUR FOCUS ON “UPSTREAM”



Trash cans in the 20th century



Trash cans IN the 21st century



WHY DO WE CARE?

United Nations Sustainable Development Goals



WHY DO WE CARE?



WHAT WE KNOW: SUPPLIER-SIDE

WHAT WE KNOW: BENCHMARKING

- Surveys
- Trash Sorting Events



Trash Sort: University of Washington, Dept of Environmental and Occupational Health Sciences

- Building level, over 2 weekdays in 2014
- Plastic film (16% total vol/7% by weight) and hard lab plastics (5% tot vol/5% by wt)
- Most was compostables (especially paper towels), gloves, and absorbent bench pads.
- Challenges: Glass disposal containers also used for hard plastics.

Courtesy Jen Krenz, Star Scott

<http://pprc.org/index.php/2014/blog/trash-sort-shines-light-on-uw-lab-waste/>

WHAT WE KNOW: BENCHMARKING

The **Sustainability Tracking, Assessment & Rating System™ (STARS)** is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance.

Not Laboratory Waste Specific



EMORY LABS 2017

- Recycle or Donate Lab equipment
- Surplus property exchange program or sharing event
- Styrofoam recycling
- Re-usable sharps containers
- Recycling of any lab plastics that would otherwise be landfilled (rather than red bag) and after sterilization

Courtesy K. Weisinger, Emory

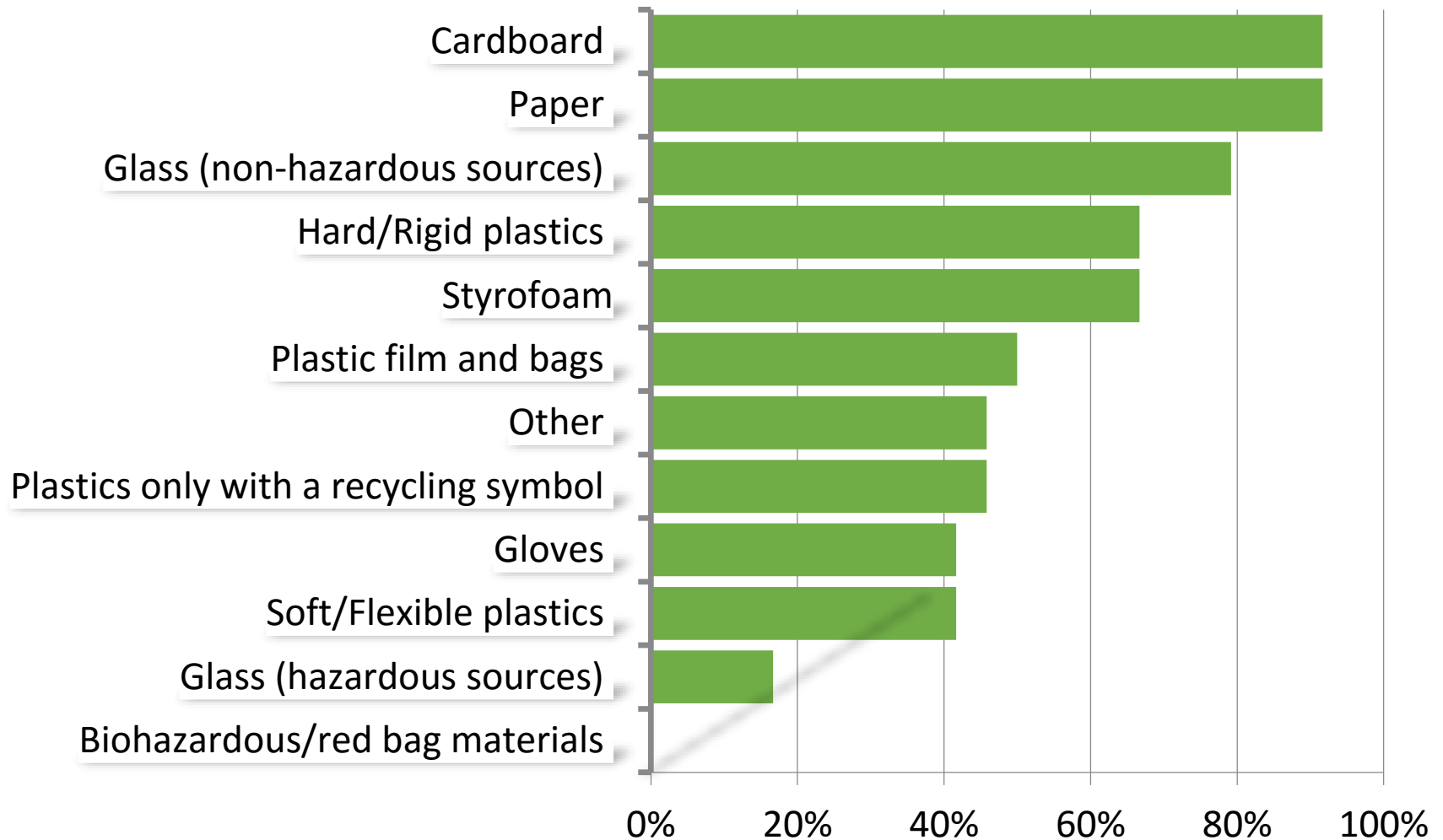
WHAT WE KNOW: BENCHMARKING

I2SL LAB WASTE DIVERSION SURVEY, OCT 2017

- Sent out to Google Green Labs Planning Group
- 24 Individual Respondents
 - USA, Canada, UK, Australia
- Facility Type
 - Academic/Research: 59%
 - Medical & Academic/Research: 29%
 - Industry, Medical, other: 4% each

GENERAL & BEHAVIORAL CONCEPTS OF LAB RECYCLING

LAB ITEMS CURRENTLY BEING RECYCLED



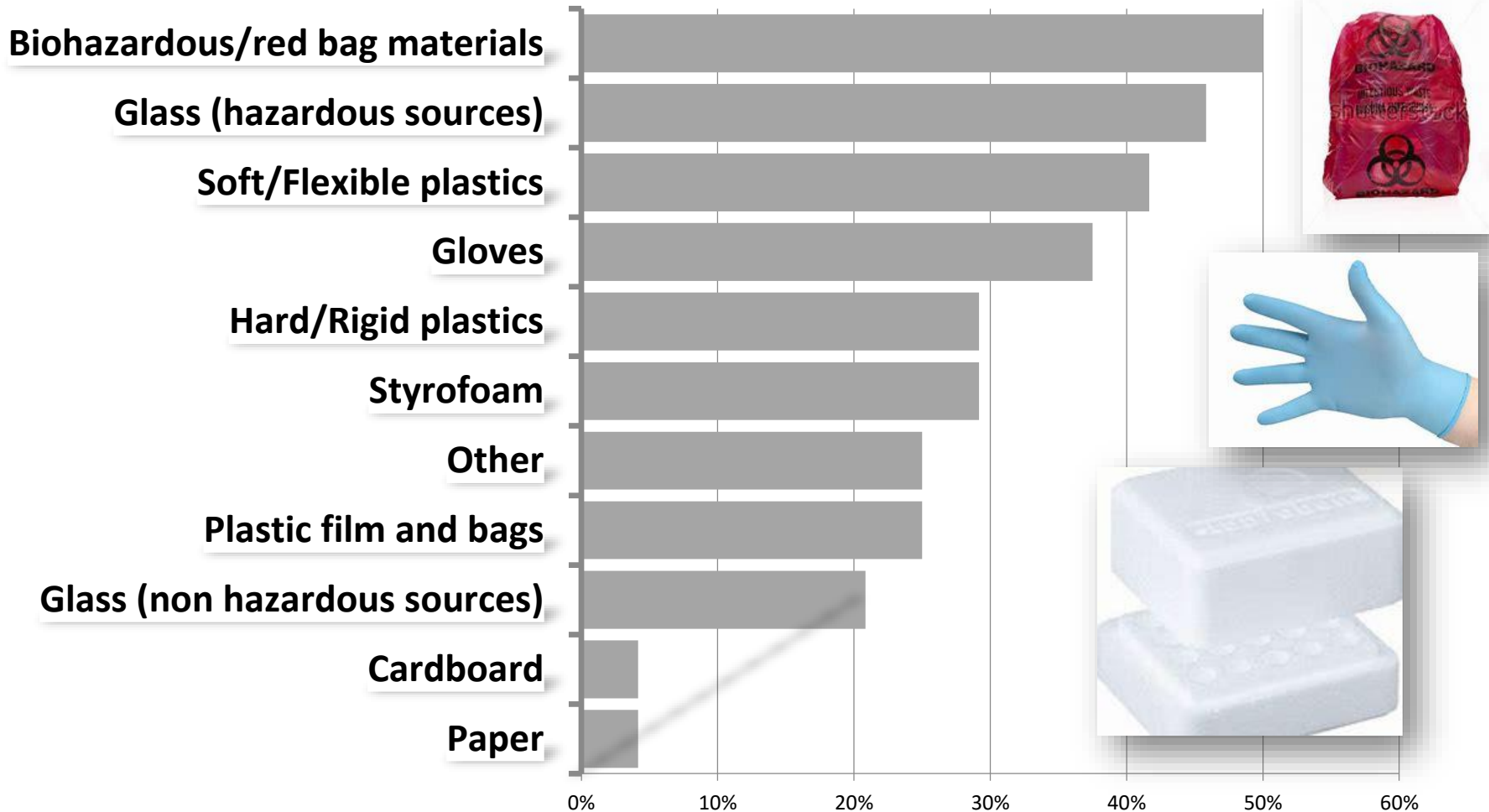
LAB ITEMS CURRENTLY BEING RECYCLED

Other:

- Batteries
- Electronics
- Safety Glasses
- Packing Peanuts
- Water purification Cartridges
- Printer Cartridges
- Solvents



LAB ITEMS WOULD LIKE TO RECYCLE BUT CURRENTLY CANNOT

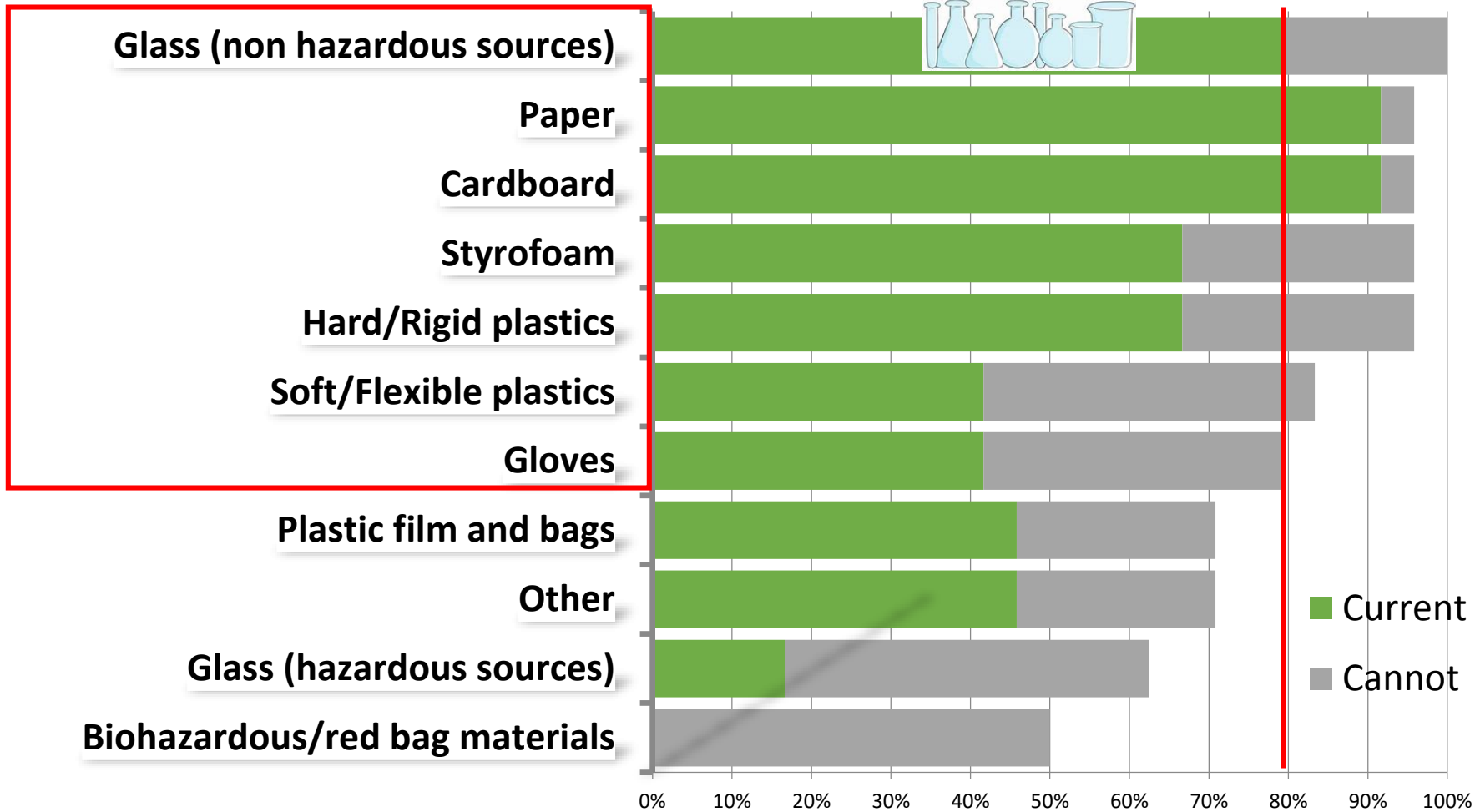


LAB ITEMS WOULD LIKE TO RECYCLE BUT CURRENTLY CANNOT

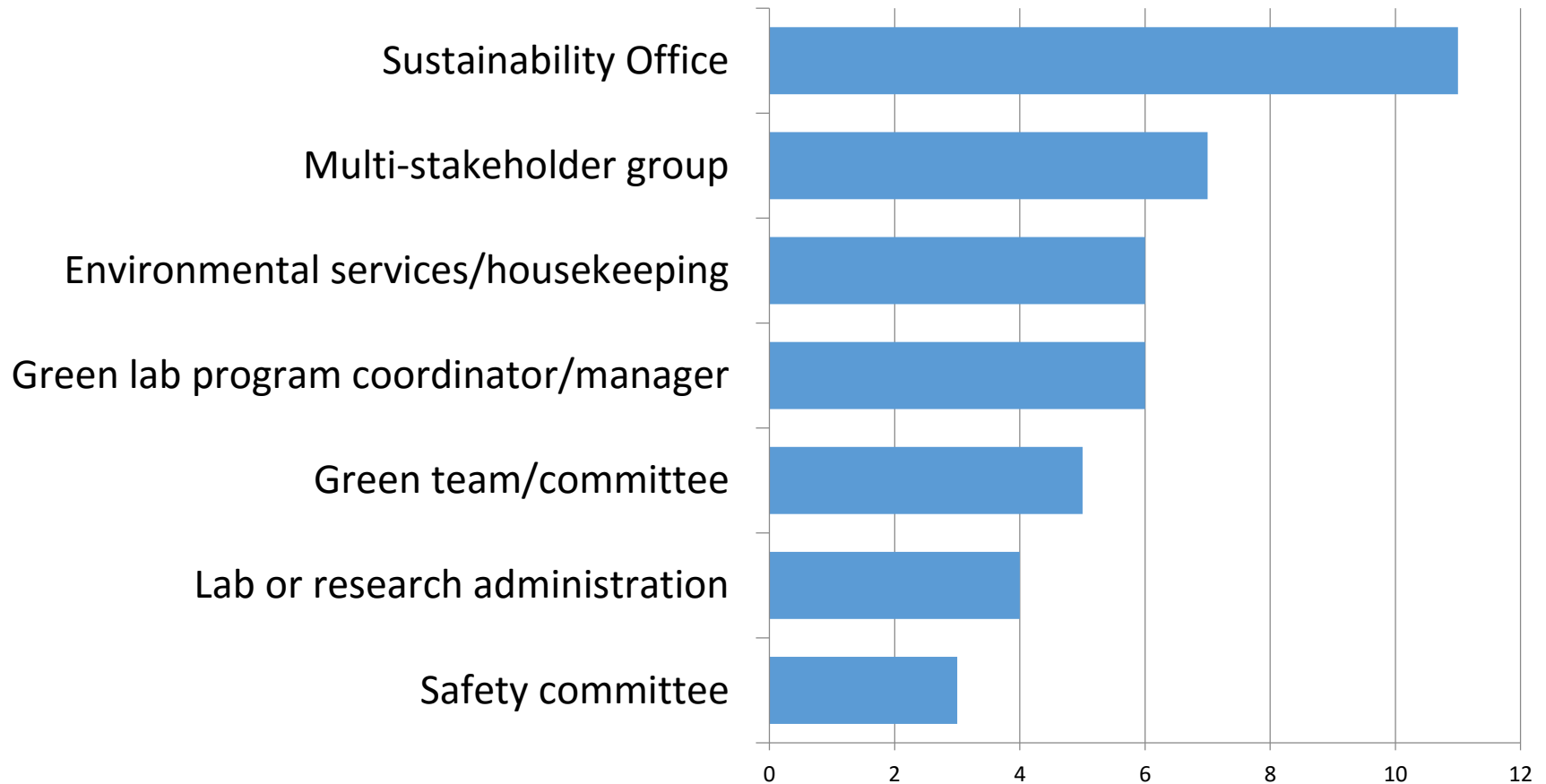
- Clean PPE/single use gowns
- Ice packs
- Gel Packs



OVERLAY – CURRENT & WOULD LIKE TO



HOW ARE LAB RECYCLING DECISIONS MADE AT YOUR INSTITUTION?



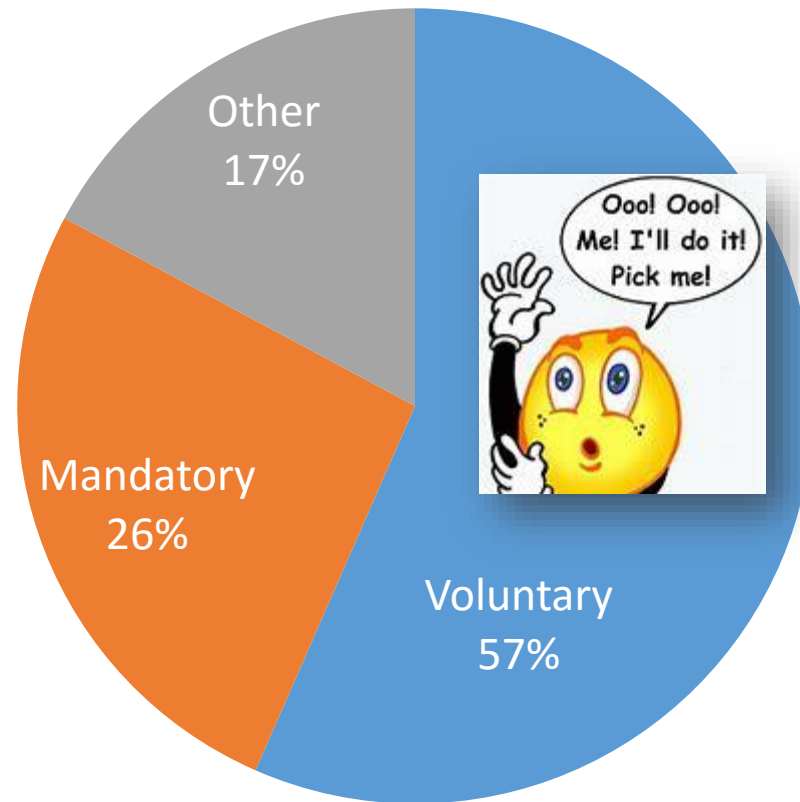
HOW ARE LAB RECYCLING DECISIONS MADE AT YOUR INSTITUTION?

Multi-stakeholder groups:

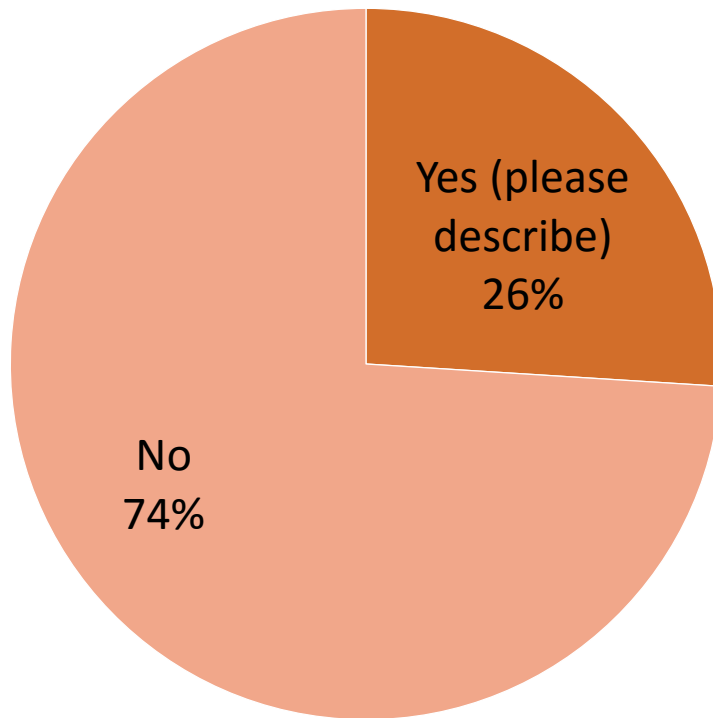
- Sustainability office, lab managers, campus administration, state legislature
- EH&S, Sustainability, Custodial, and Recycling Departments
- Facilities Recycling, EHS Sustainability/Green Labs, Sustainability; pressure from students
- Sustainability office and Facilities
- Management Recycling/Waste Management Group
- Sustainability Office, EH&S, Recycling personnel, Custodial



IS PARTICIPATION IN YOUR LAB RECYCLING PROGRAM MANDATORY OR VOLUNTARY?



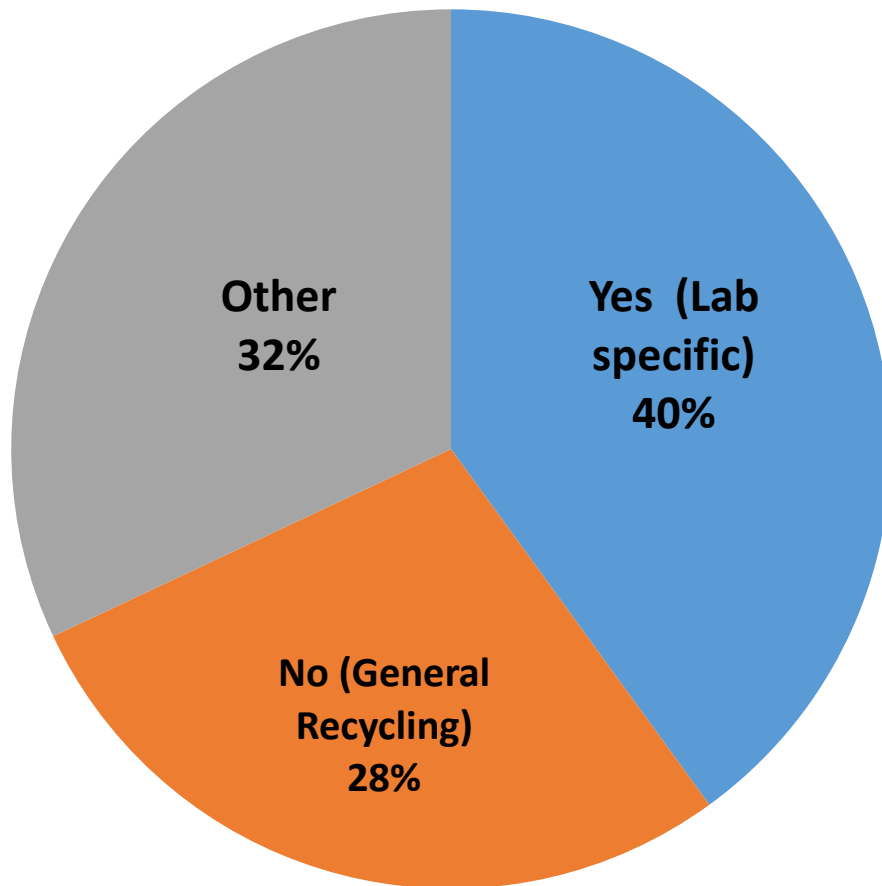
IF PARTICIPATION IN YOUR LAB RECYCLING PROGRAM IS VOLUNTARY, DO YOU OFFER INCENTIVE PROGRAMS OR CHALLENGES?



Recognition Program
Recycling contest with prizes
Funding
Free recycling bins

LOGISTICS OF LAB RECYCLING

IF YOU CURRENTLY RECYCLE LAB ITEMS, DO YOU DO SO VIA A LAB-SPECIFIC INITIATIVE?

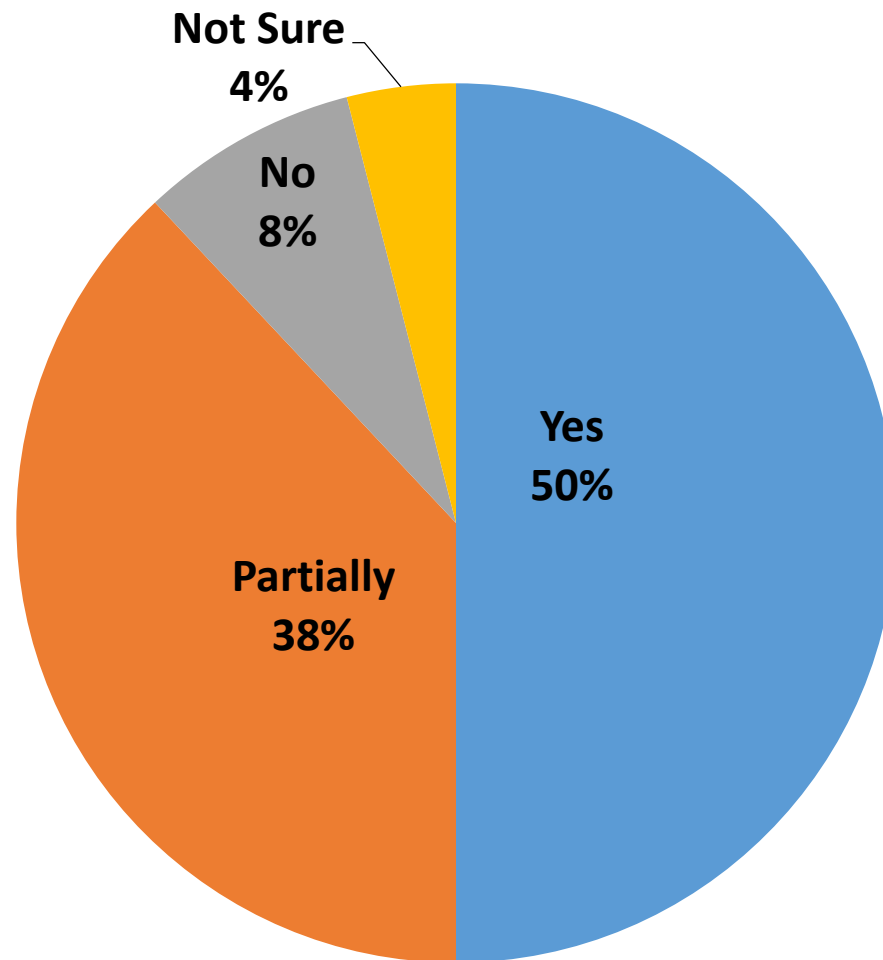


Other:

Mostly hybrid – some items separated out

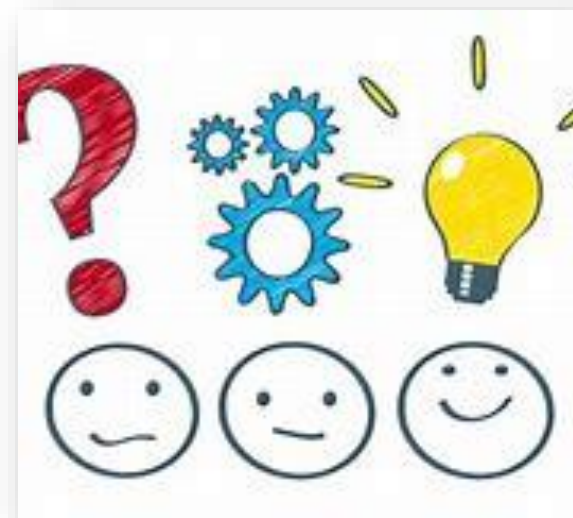
- Styrofoam
- Lab plastics

IS YOUR LAB RECYCLING PROCESSED BY YOUR REGULAR WASTE/RECYCLING VENDOR?

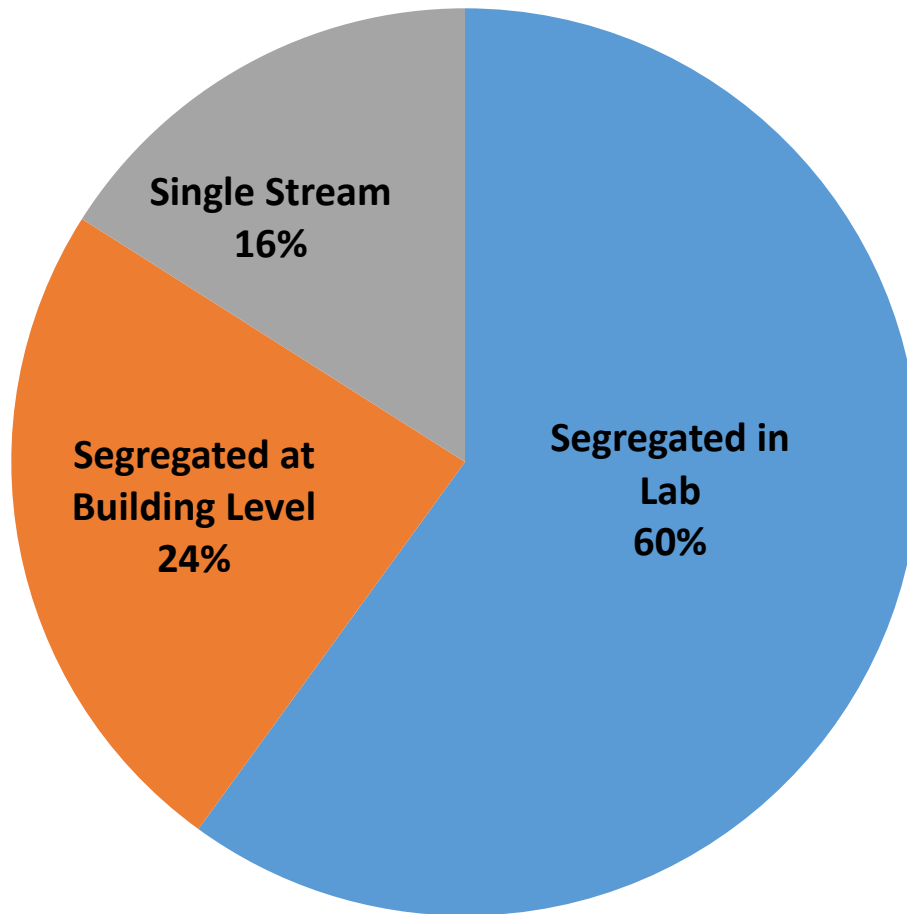


IF YOUR LAB RECYCLING IS PROCESSED BY A SPECIAL VENDOR OR HAULER, HOW DID YOU FIND OUT ABOUT THEM?

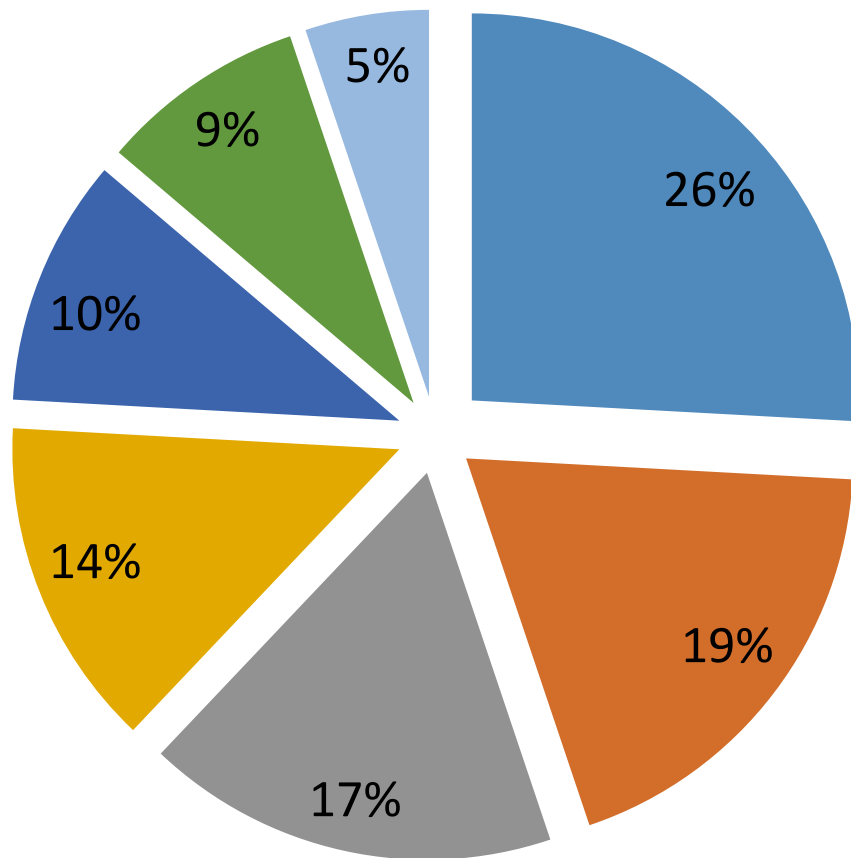
- EH&S
- General Vendor
- Web search
- Conferences
- Local Advocates
- EVS
- Affiliate



HOW IS YOUR LAB RECYCLING SEGREGATED?



IF YOU CURRENTLY RECYCLE LAB ITEMS, WHERE ARE THE LAB RECYCLING RECEPTACLES LOCATED? (CHECK ALL THAT APPLY)



- In our lab
- In the hallway outside of our lab
- On the loading dock of my building
- There is one central location for our building (lobby, etc.)
- Other
Combination depends on item
- In a utility room or nearby shared space
- We transport them ourselves to a recycling facility

LOGISTICS

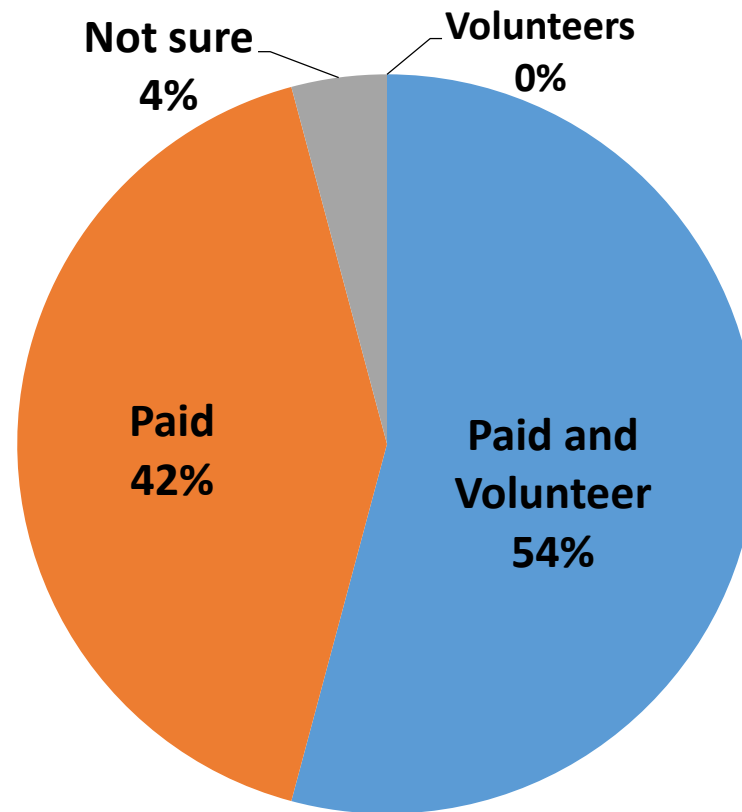
Briefly describe the transportation logistics for your lab recycling program from your **lab to the dock** (or your institution's holding facility)



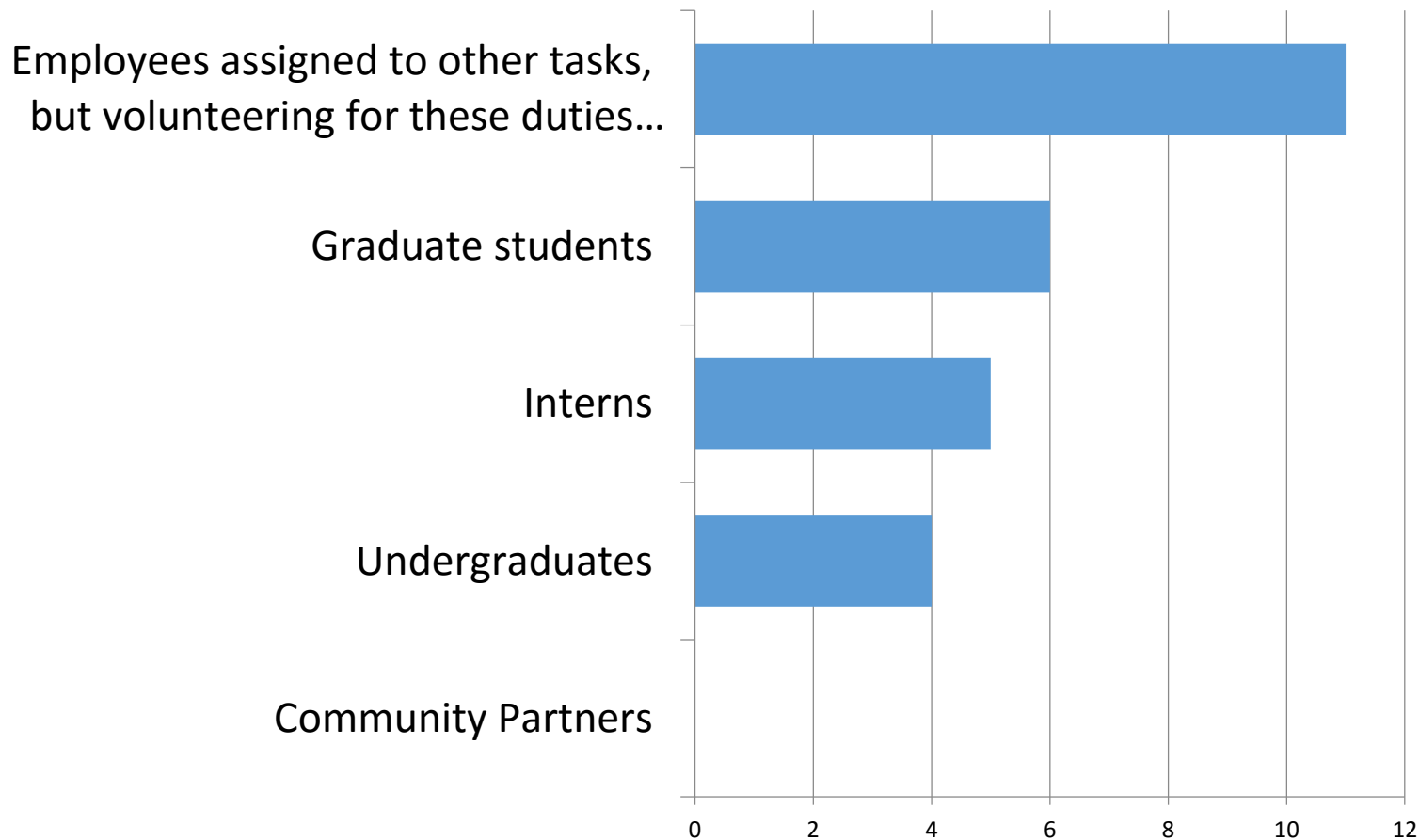
Briefly describe the transportation logistics for your lab recycling from **dock to recycling facility**



IS YOUR LAB RECYCLING PROGRAM FACILITATED BY PAID EMPLOYEES OR VOLUNTEERS?



IF YOUR LAB RECYCLING PROGRAM IS FACILITATED IN ANY WAY BY VOLUNTEERS, WHICH GROUPS ARE VOLUNTEERING?



WHAT TYPE OF METRICS ARE REPORTED FOR YOUR LAB RECYCLING PROGRAM? WHAT FORMAT AND FREQUENCY?

- Weights – building level
 - Not necessarily lab material- specific
-
- Monthly
 - Quarterly
 - Annual
 - Sustainability report
 - Funding agency report

WHAT IS THE BIGGEST CHALLENGE YOU HAVE WITH YOUR CURRENT LAB RECYCLING PROGRAM?

Behavioral

- Lack of awareness
- Lack of support from EH&S, Safety, PI, Institution
- Fear of contamination/RCRA violations
- Lack of understanding of the materials by recyclers

Circumstances

- Limited funding
- Limited staff time for training/oversight
- Limited materials accepted by local recycler
- Having to use multiple recyclers
- Space

ANY REGULATORY OR SAFETY ISSUES YOU'VE HAD WITH YOUR LAB RECYCLING PROGRAM?

Containers with residual chemical/solvent contaminant



Contamination of single type recycling bins with non-compatible items



DESCRIBE YOUR IDEAL LAB RECYCLING PROGRAM

- Culture where researchers consider recycling the norm
- Waste reduction
- Clear simple guidelines
- Single Stream
- Recycling coordinators per lab
- Regular pick-ups
- Packaging arrives as already compatible/ single type of recyclable
- Help from manufacturers of the products

LAB PRODUCT SUPPLIER WHO HAS BEEN HELPFUL IN YOUR EFFORTS TO DIVERT LAB ITEMS FROM THE LANDFILL?

- Yes: 68%
- No: 32%
- Cardinal
- Triumvirate
- RightCycle
- VWR
- Kimberly Clark
- New England Biolabs
- Thermo Fisher Scientific
- Millipore-Sigma
- Starlab
- Addgene
- E&K Scientific

SUMMARY

Recycling happens in labs.

Each program is different.

Behavioral/Cultural challenges exist.

Logistical/Market challenges exist.

Lab product suppliers/manufacturers can
be helpful.

SURVEY OF RESEARCHERS WITH MGL

MARCH-JULY 2018

- Purpose: to make the case to suppliers that end users care about landfill diversion
- 3 questions tacked to end of an energy survey by My Green Lab
- 248 respondents

WE CARE

HOW IMPORTANT IS IT TO YOU TO PURCHASE LAB PRODUCTS THAT ARE:

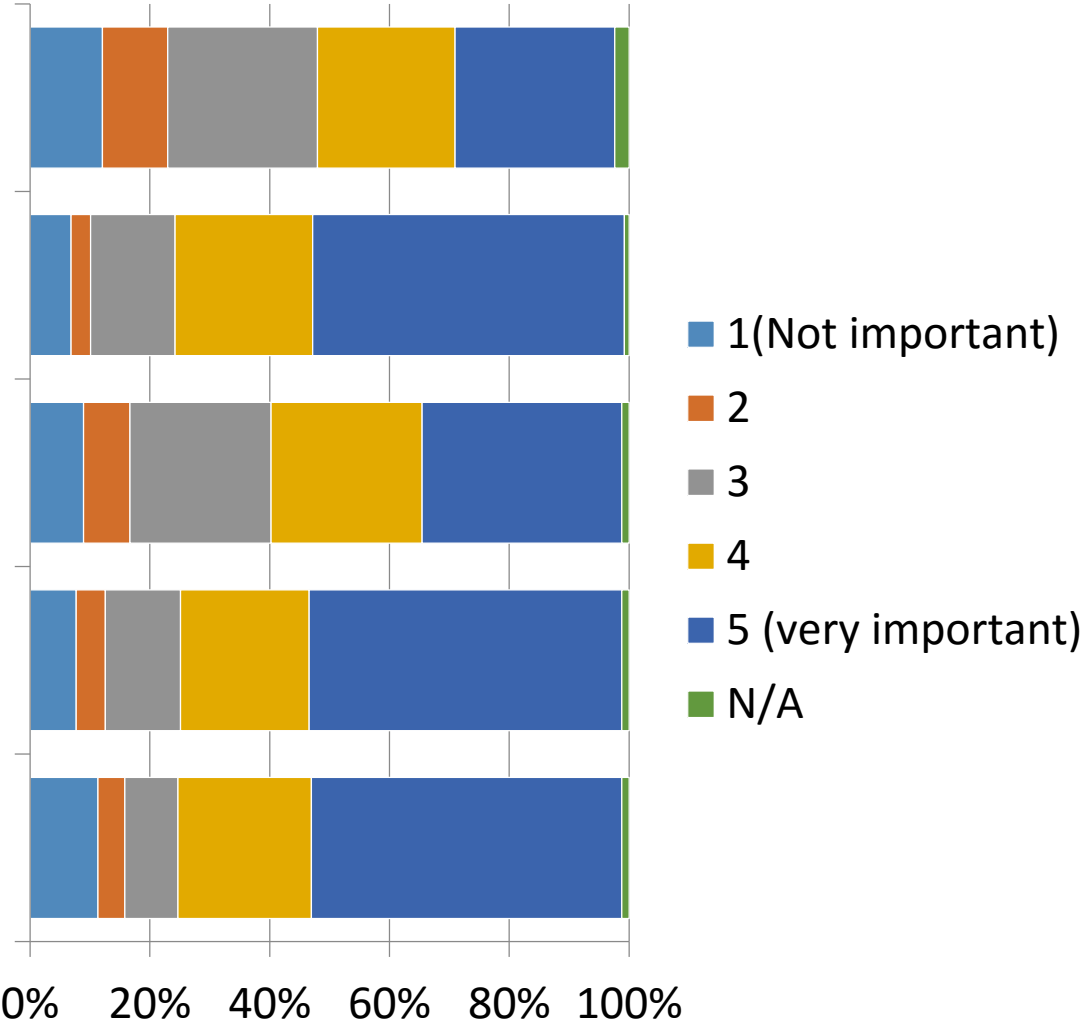
Made in a factory that is focused on sustainability (e.g. zero-waste, zero-carbon,...

energy-efficient?

made of recycled materials (either post-consumer or post-industrial)?

recyclable?

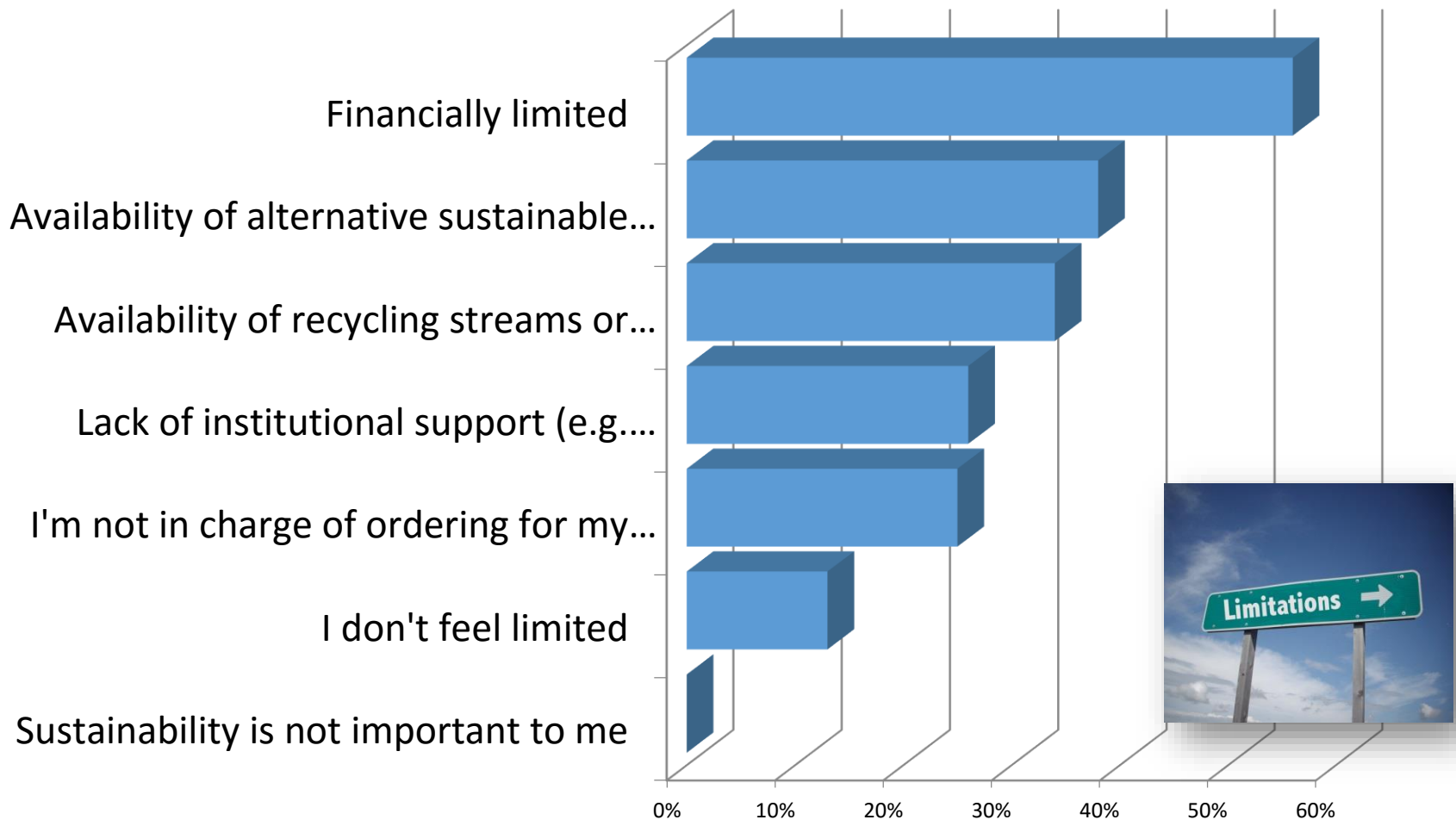
reusable?



DO YOU FEEL YOUR PERSONAL VALUES CONCERNING SUSTAINABILITY ARE REPRESENTED BY YOUR INSTITUTIONAL POLICIES AND PROCUREMENT?



DO YOU FEEL LIMITED IN ANY OF THE FOLLOWING WAYS IN YOUR EFFORTS TO BE MORE SUSTAINABLE IN YOUR RESEARCH?



LAB WASTE AUDITS THAT SUPPORT OUR MISSION

- Find solutions for hard to recycle items - what is the percentage of this waste
- Characterize the volume of waste - % from packaging.
- Share regional recycler info
- Have a central repository for lab waste audits so the data can be accumulated and collated?

WHAT WE KNOW: PURCHASER-SIDE

WHAT WE KNOW: THEMES FROM PAST CONFERENCES

- 2016 – manufacturer/supplier interviews, onsite user challenges, downstream diversion innovations
 - ❖ Key discussion theme was hard-to-recycle materials like ice packs and foam boxes
- 2017 – panel discussion with suppliers and manufacturers regarding innovations in landfill diversion of products
 - ❖ Key theme was that suppliers and manufacturers want to be engaged in this working group's work
- 2018 – summary of what we know. Your help identifying next steps.
 - ❖ One priority is supporting the ACT label

WHAT WE KNOW: SUPPLIER QUESTIONS

Qualitative data from supplier & manufacturer interview questions:

- What topics do you think provide challenges for suppliers & manufacturers?
- Are there any low hanging fruits you think should be addressed first?
- How important is it that you hear from end users on whether or not they care about sustainable products, as opposed to the institution telling you it is a priority?
- What are your firm's priorities, in terms of sustainability and waste, for this and next fiscal years?
- Are you willing to help this working group specifically address finding alternatives ice/gel packs and foam coolers?

WHAT WE KNOW: SUPPLIER ANSWERS

Supplier & manufacturer qualitative themes:

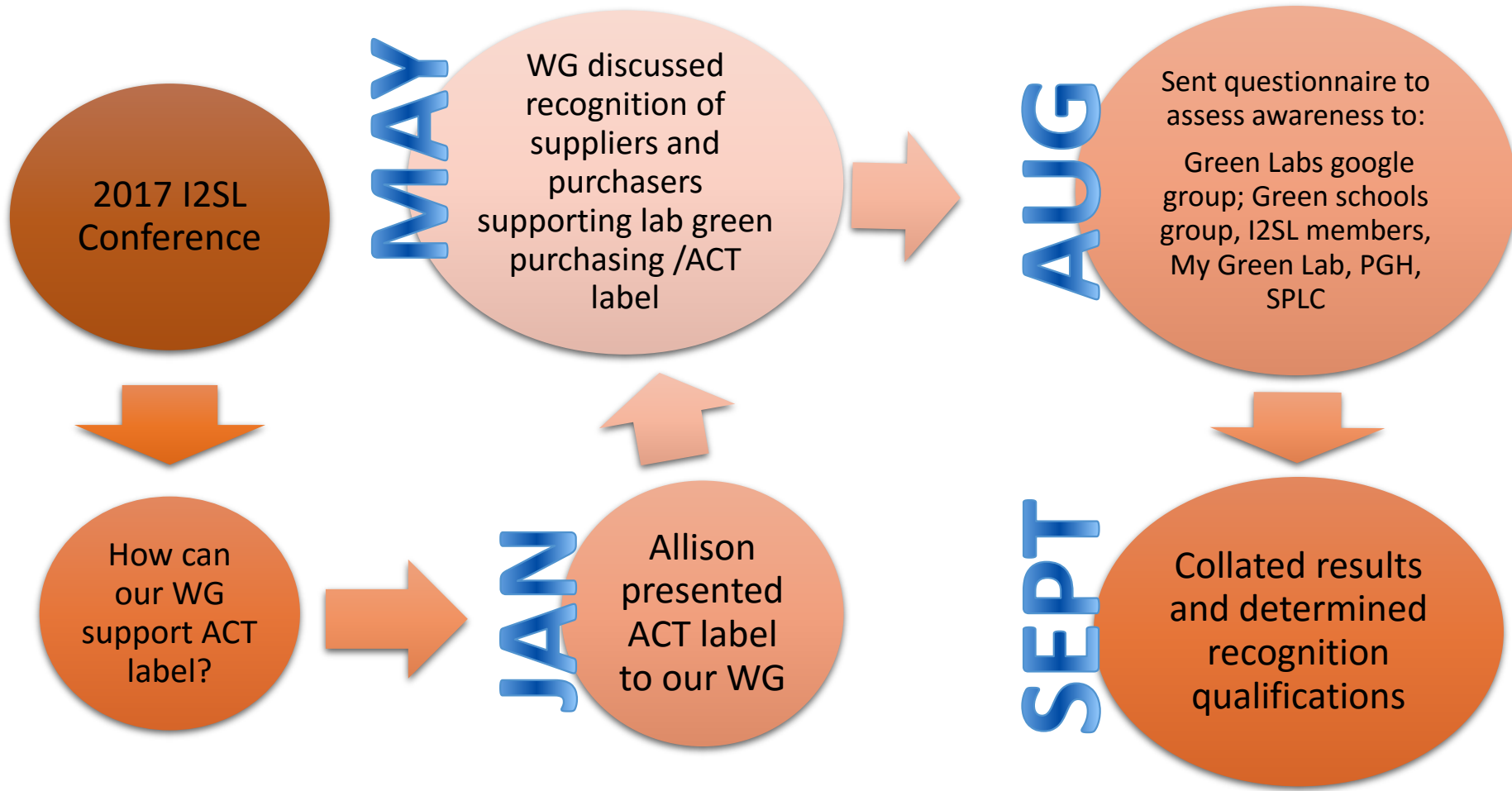
- Packaging
 - interest in using more recycled content, and doesn't affect validated work streams
 - Users are not willing to sacrifice delivery time or other pieces of experience to make efficiency
 - Cost-savings/efficiency – tension between reduced packaging and keeping costs/driving efficiency across operations
- Disposable, single-use plastics
 - generate the most feedback or complaints from customers, but reusable materials aren't well received because they don't have time or resources to decontaminate.
- Low hanging fruit:
 - Using more materials made with recycled products
 - Alternatives to Styrofoam coolers
 - Finding markets for lab-specific waste that can be decontaminated with ethanol spray (i.e. pipette tip boxes)
 - Supply centers

WHAT WE KNOW: SUPPLIER ANSWERS CONT'D

Supplier & manufacturer qualitative theme, cont'd:

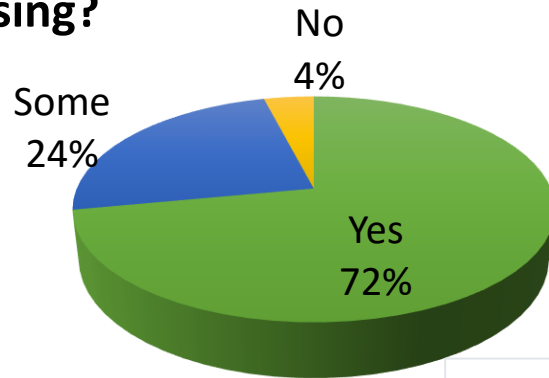
- Hearing from purchasers, rather than institutions, re: sustainability
 - Gives more leverage in a meeting and more buying power to make change within the company
 - individuals involved in RFPs also carry a lot of weight
- Engagement with working group
 - Providing feedback on new ideas
 - suppliers willing to share challenges they face in taking back and reusing gel packs, so that we could see how we might address these challenges together.
 - Hearing updates on WG progress
- Suppliers are willing to ask their suppliers to try innovations when they hear about them, i.e. sustainable packaging
- Reframe the mindset to designing for environment, end of life, and material recovery rather than settling on current state.

ACT LABEL TASK FORCE

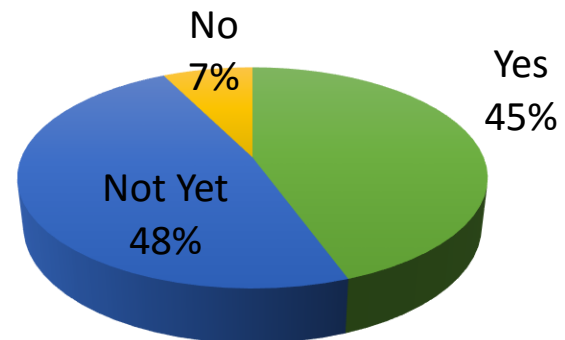


ACT LABEL TASK FORCE

Is your site interested in sustainable purchasing?



Have you worked with your institution's procurement staff on integrating the ACT label into strategic sourcing for laboratory products?



QUESTIONS?

Before we move on to facilitated discussion

DISCUSSION – BARRIERS TO PROGRESS

Guiding question: What are the top 3 barriers to reaching landfill diversion goals that our working group should prioritize?

Answers:

DISCUSSION – OPPORTUNITIES FOR PROGRESS

Guiding question: What are the top 3 opportunities for landfill diversion that our working group should pursue?

Answers:

GROUP BRAINSTORM NOTES

THANK YOU!

Ilyssa O. Gordon – gordoni@ccf.org

Kelly O. Weisinger – kelly.weisinger@emory.edu

I2SL Landfill Diversion Working Group:
i2sl.org/working/labwaste.html



EMORY



Cleveland Clinic

Every life deserves world class care.