



# Opportunities for Reducing the Use of Single-Use Plastics at Brookhaven National Lab.

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# Plastics Pollution...Cause for Concern

## Topics:

- Background
- Define the Problem
- BNL's Plan

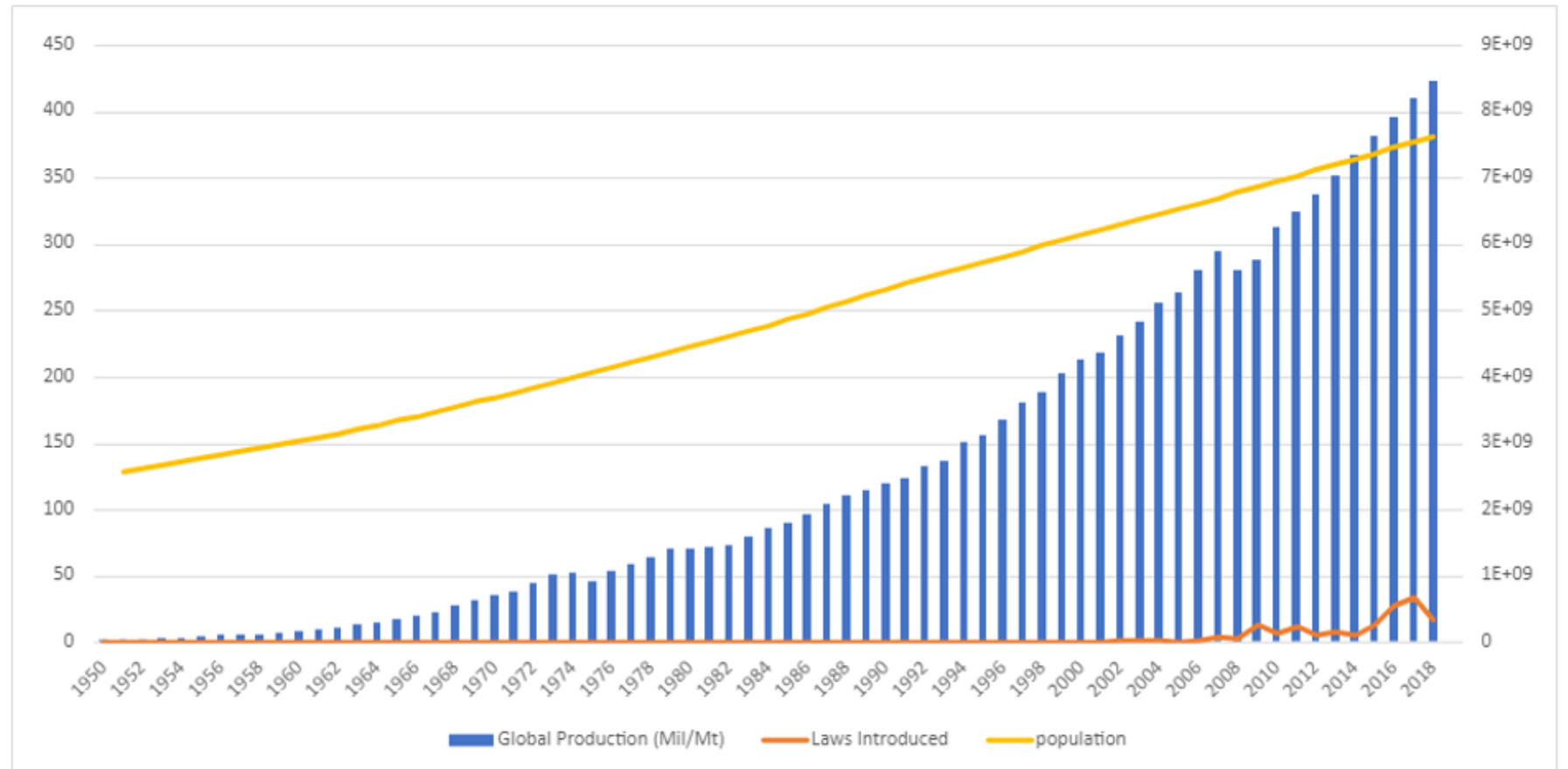


# Background

# How We Got Here

The first plastic was originally created in the late 1800's.

1950's Modern mass production of plastics begins.



Graph credit: Open Access Government, <https://www.openaccessgovernment.org/the-plastic-timeline-how-did-we-get-here/102481/>

# What is Plastic?

Long chain polymer not created by nature.

plas·tic

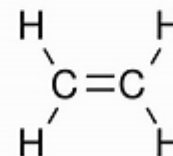
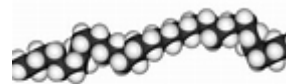
[ˈplɑːstɪk] 

NOUN

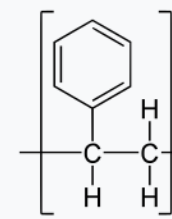
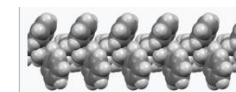
1. a synthetic material made from a wide range of organic polymers such as polyethylene, PVC, nylon, etc., that can be molded into shape while soft and then set into a rigid or slightly elastic form:

*"bottles can be made from a variety of plastics"*

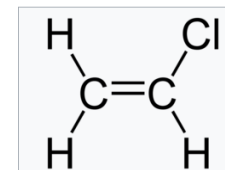
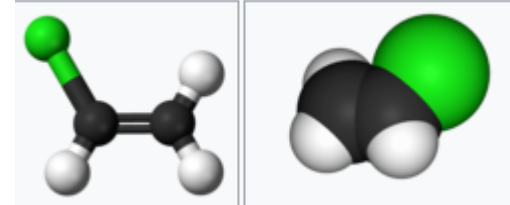
Polyethylene



Polystyrene



Vinyl Chloride



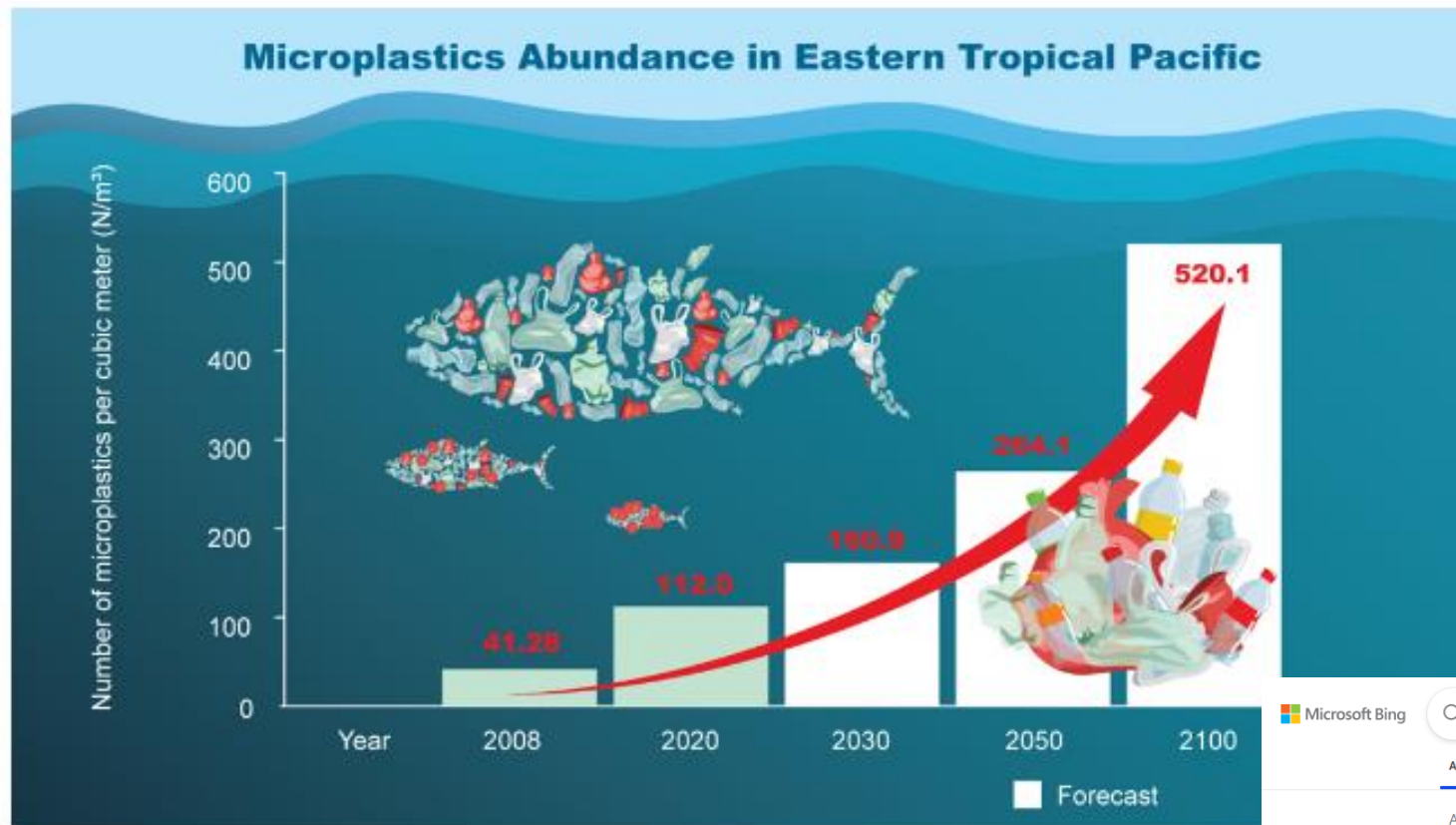


# Define the Problem

According to the EPA, about **300 million tons** of plastic gets disposed of each year. Only about **9%** gets recycled leaving **273 million tons** getting **landfilled** or **incinerated** where they **may** take **tens to hundreds** of years to decompose. (Actual lifetime of various plastics is not well understood)

**Half** of those plastics are **single-use plastics**.

# Litter...and its Impact



Microsoft Bing

are we eating plastics

ALL SHOPPING IMAGES VIDEOS MAPS CHAT MORE

About 6,950,000 results Any time

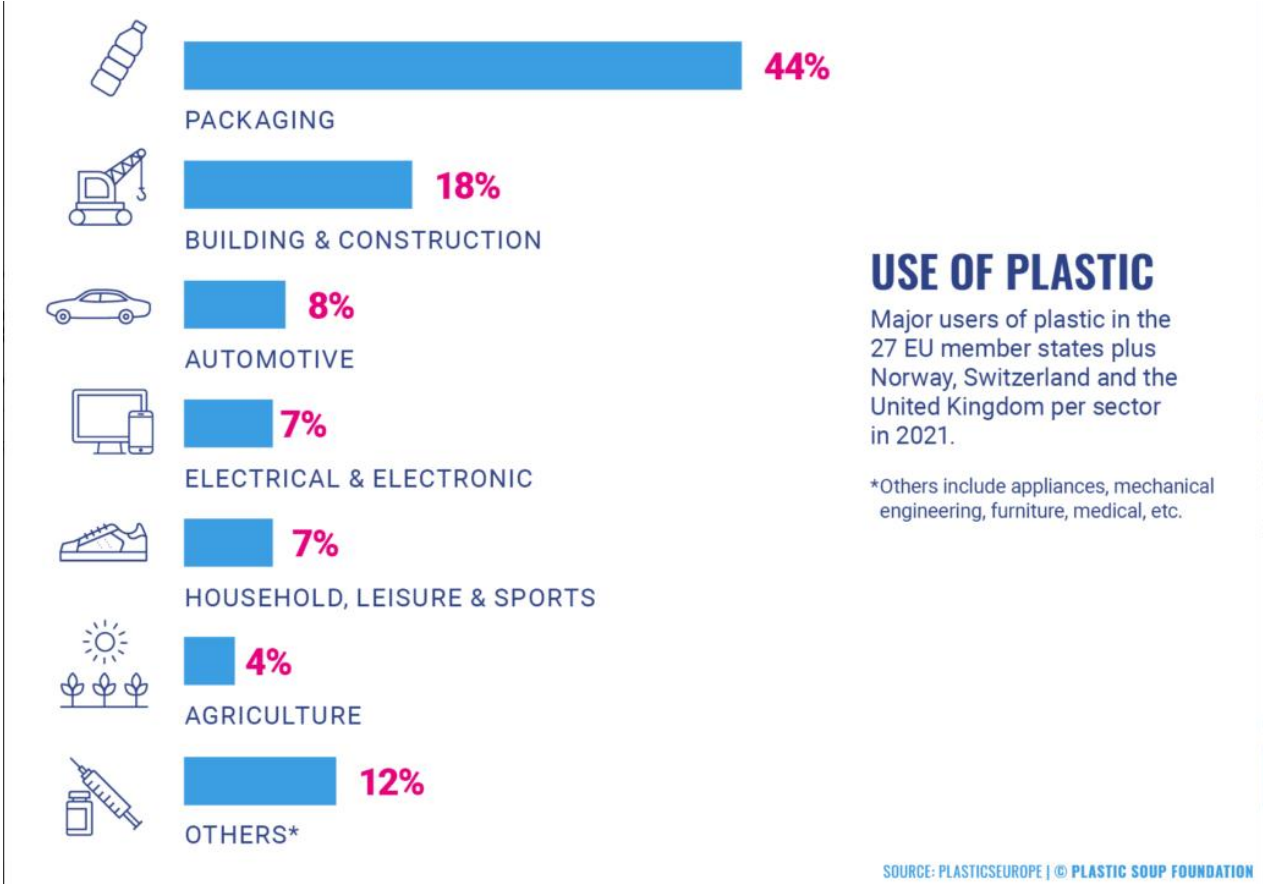
## Yes

According to 3 sources

A 2019 joint study by Dalberg and the University of Newcastle in Australia has revealed the extent of humans eating plastic: **every week we eat** –

Recent studies have revealed the extent of how much plastic we are ingesting. A pilot study which took place in October 2018 found

# Overall Use Of Plastic (Europe)





# What's on the Beaches? (Europe)

[www.citytosea.org.uk/top-10-single-use-plastic-items-on-seashores/](http://www.citytosea.org.uk/top-10-single-use-plastic-items-on-seashores/)



Where should  
BNL focus its  
efforts?

## THE SINGLE-USE PLASTIC MOST FOUND ON OUR BEACHES

Beach clean data from across the UK (collected by the [incredible Marine Conservation Society](#) and their army of volunteers), [Europe](#) and from [around the world](#) reveals the same patterns and the same items cropping up time and time again.



1. PLASTIC BOTTLES AND LIDS



2. CIGARETTE BUTTS



3. COTTON BUD STICKS



4. CRISP PACKETS AND SWEET WRAPPERS



5. PERIOD PRODUCTS



6. PLASTIC BAGS



7. PLASTIC CUTLERY AND STRAWS



8. COFFEE CUPS AND DRINKS CONTAINERS



9. BALLOONS



10. FOOD CONTAINERS AND FAST FOOD PACKAGING

Single-use plastic products such as plastic cutlery, drink bottles, food wrappers and cigarette butts make up almost half of all sea litter! Flushed plastic such as wet wipes, menstrual products and cotton buds are also a massive issue. We're literally flushing the health of our oceans down the pan. Read more about [Unflushables](#) and [how to be a good a\\*\\*hole](#).

# Define the Problem

# Federal Response

## Acquisitions — purchasing requirements addressed:

- Energy & water efficiency
- Biobased products
- Non-ozone depleting products

Lead content

**NEW!!**

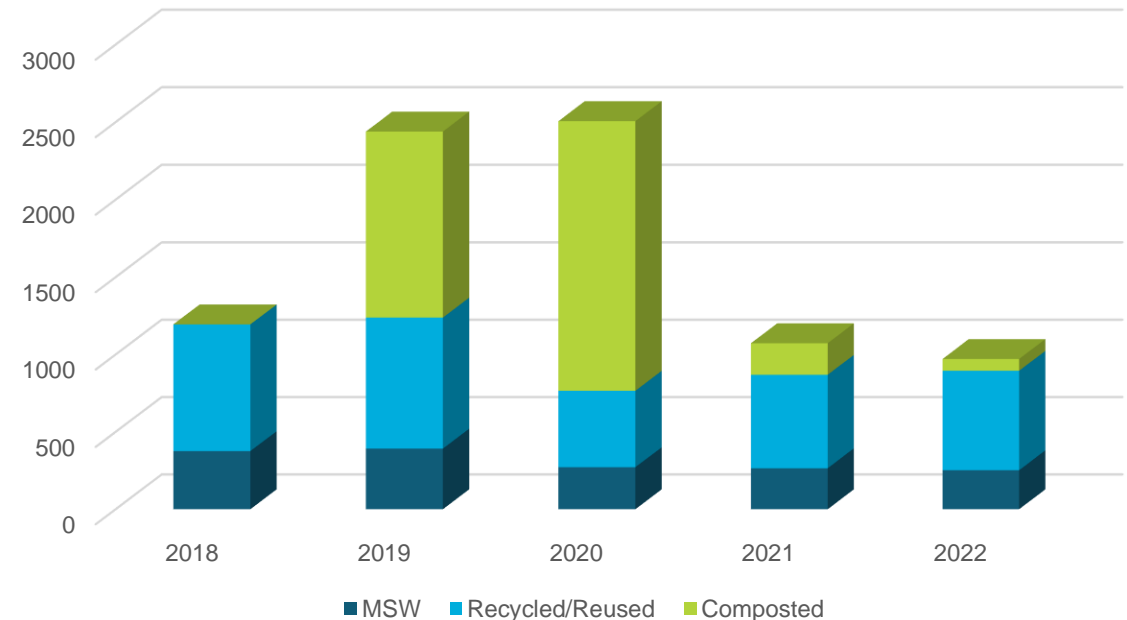
Less toxic alternative products

- **Phasing out use of single use plastics.**

## Waste Reduction

### NetZERO

Waste Diversion from Landfills



#### In terms of:

- Carbon emissions
- Tons of Waste Landfilled (vs Energy Recovery)

# Acquisitions & Procurement - Performance

**GREENBUY PROGRAM**  
*Fiscal Year 2022*  
**Brookhaven National Laboratory**  
 Is recognized for achieving Gold leadership level goals in  
*Sustainable Acquisition of*  
 15 products in 6 different categories

**90 GreenBuy**

**Ingrid Kolb** Digitally signed by Ingrid Kolb  
 Date: 2023.04.14 17:11:48 -04'00' 04/14/2023

Ingrid Kolb  
 Chief Sustainability Officer Date

**GreenBuy Superior**  
 Awarded for earning GreenBuy Gold seven times

**Brookhaven National Laboratory**  
 Office of Science

2022	Gold	15 products/6 categories
2021	Gold	18 products/7 categories
2020	Gold	13 products/6 categories
2019	Gold	11 products/7 categories
2018	Gold	12 products/7 categories
2016	Gold	14 products/7 categories
2015	Gold	11 products/7 categories

**90 GreenBuy**

**EHSS**  
 Office of Environment, Health, Safety and Security

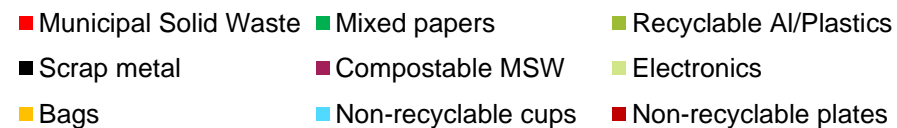
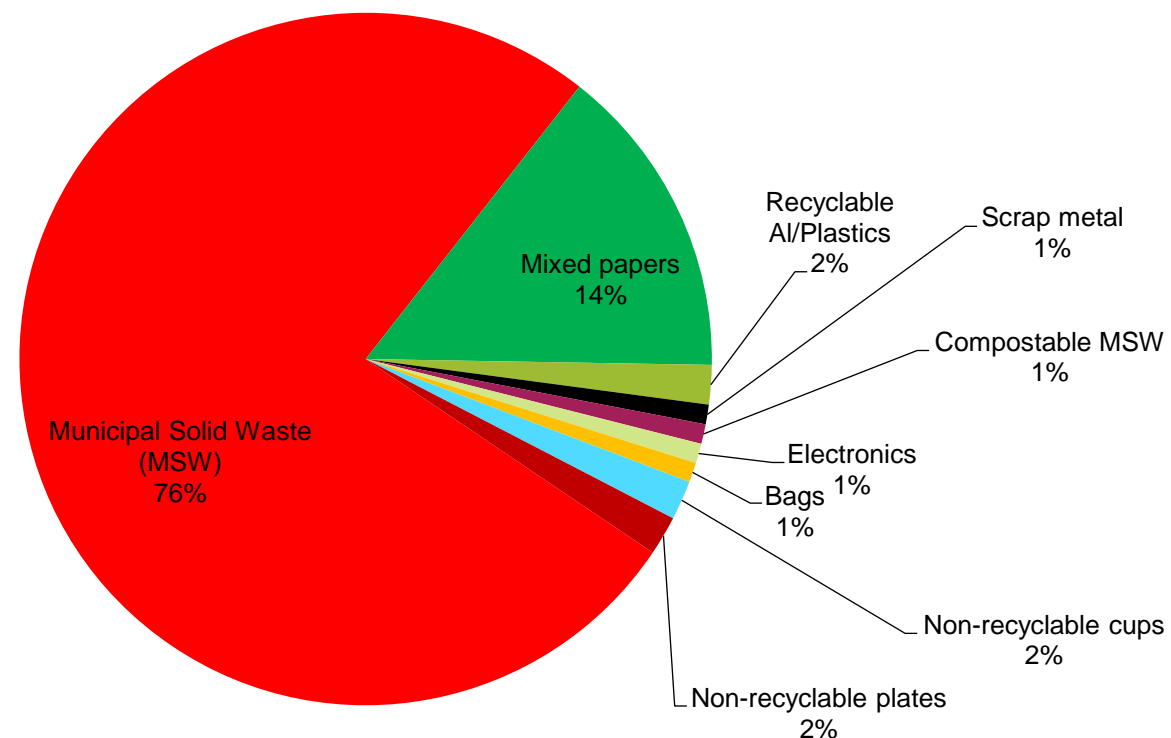
# BNL Waste Stream

## 2015 Dumpster Dive

Inventoried the contents of dumpsters from:

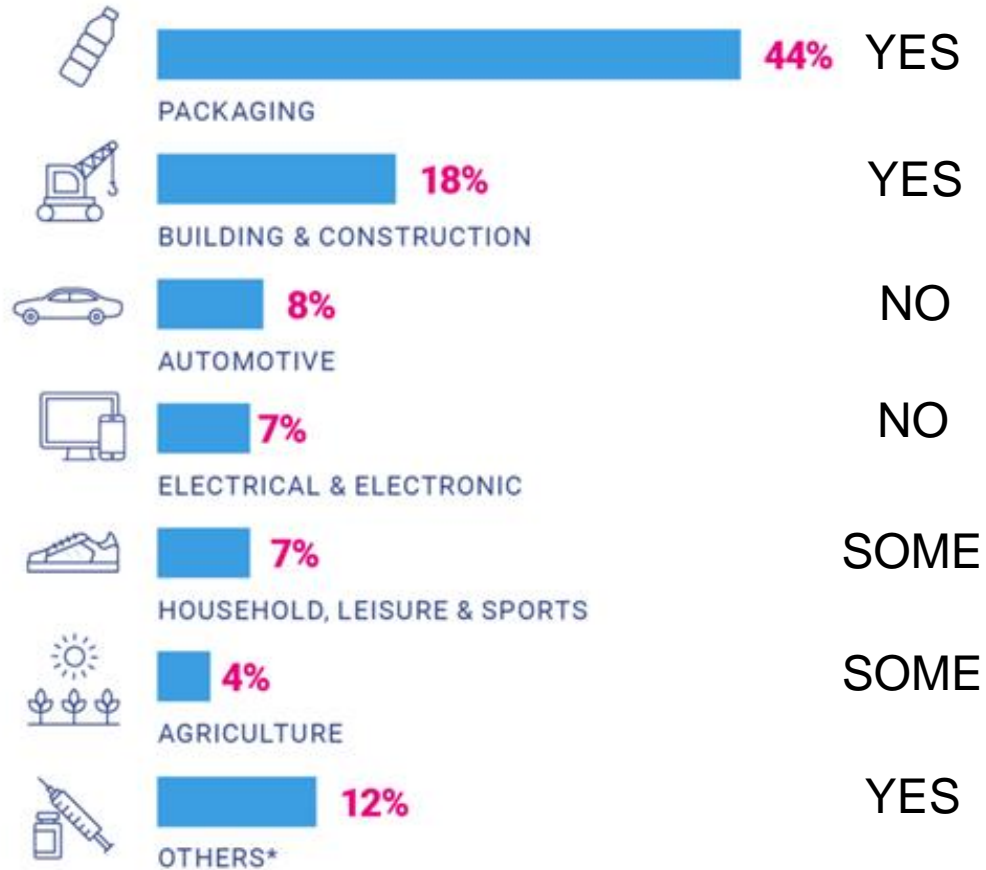
- Building 510 (Physics)
- Building 400 (Research Support Building)
- Building 460 (Director's Office)

All mostly administrative offices and desk work.





# Other BNL Sources of Single Use Plastics



# Why Not Expand Recycling Options?

**Segregated  
Waste  
Streams**

♻️ **Recycle with TerraCycle**



✓ Kimtech™ nitrile gloves



**Recycle from Anywhere**

<https://www.terracecycle.com/en-GB/brigades/gloves>

## Contamination



Paper  
Backing



Mixed  
materials



**Flexible plastics (bags) clog  
recycling equipment**

**Recycling is more expensive  
than making virgin plastic...**

Plastics sorting  
machine



**...and the quality of the  
reclaimed plastic isn't as  
good.**

**Lots of research in this area – hopefully, recycling options expand in the future.**



# BNL's Plan

# BNL Action

## Current Efforts:

- Adding water bottle fills to existing drinking fountains.
- Educate staff (Listening Session).
  - Feedback: better define the problem.
- Research into available reduction options in laboratories.

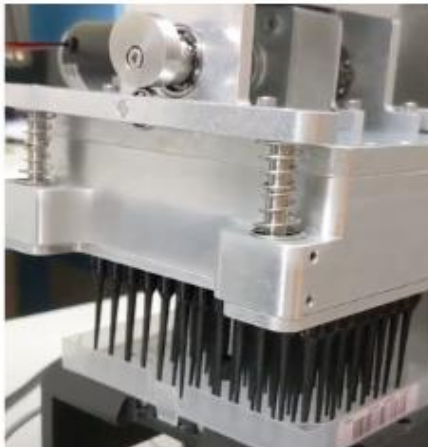
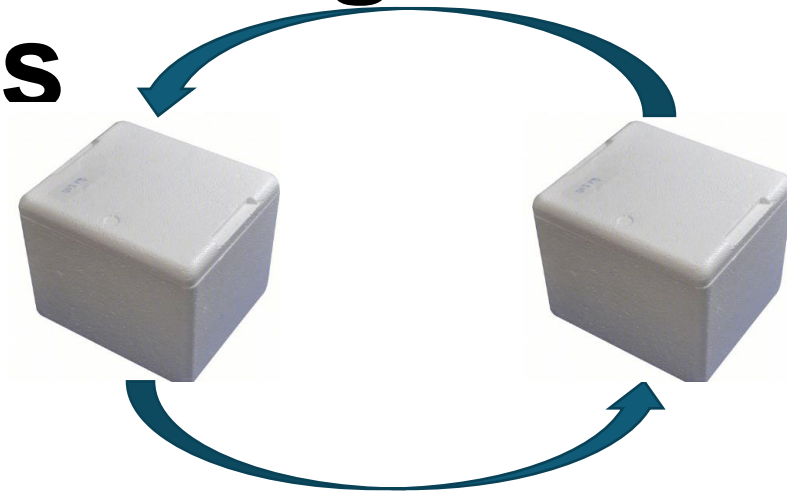
## Near Term Efforts:

- Negotiate no use of single use plastic utensils and dishware on any future cafeteria contract.
- “Garbage Free Lunch” display in BERA Store.
- Reach out to work with scientists directly to establish pilot reduction programs.
- Future “dumpster dives” this year.



# Opportunities to Reduce Single Use Plastics in Laboratories

- Pipette Tip Cleaning
- Pipette Repair
- Use of Biobased Pipettes
- Plate Washers
- Chilled Sample Cooler Return/Reuse
- Return to use of glassware



<https://ionfieldsystems.com/>



<https://www.eppendorf.com/>



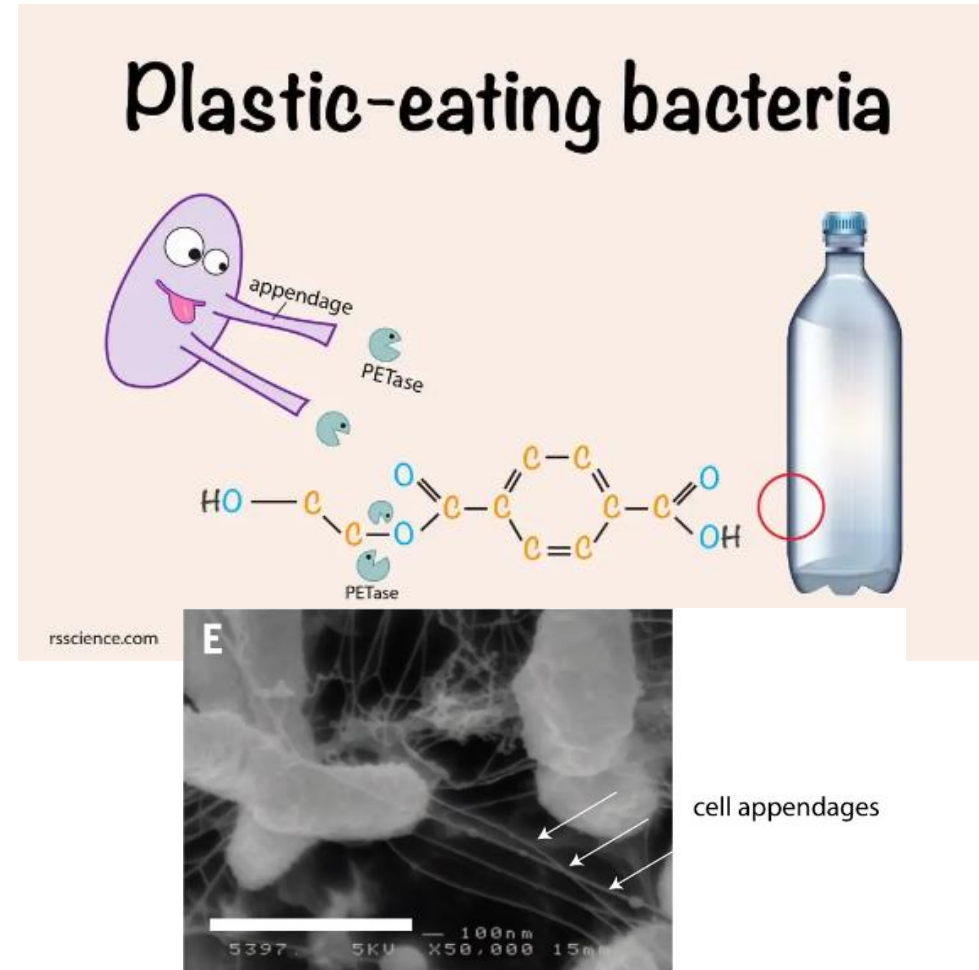
# Hope for the Future.....

Plastic waste is an issue now, but there's hope for better management in the future.

Just remember the story of coal.

Trees (cellulose) were once new to this world too with no microbes capable of biodegrading it. Until, one day, they learned how.

That's why, today, there is a layer of coal around the world that represents the period that those cellulose-eating microbes didn't exist. And that's also why there is only one layer of coal.



# BNL Is Working On It...

We will continue working with the enthusiastic group from the listening session to evaluate options for reduction.

We'd be happy to update the CAC in the future on progress.

