



## Waste Reduction Pilot

Q3 Webinar, Plastic Waste

August 12, 2020

2 – 3 pm EST

# Waste Reduction Pilot

Quarterly calls: What do we hope to get out of them?

- Spotlight Leadership – Share Best Practices
- Present Valuable Resources
- Provide a Forum to Share Challenges and Opportunities





Hannah Debelius  
ORISE Fellow, DOE

# Agenda

- 1** Introduction & Waste Reduction Pilot Program Updates
- 2** Jack DeBell – Recycling Program Development Director (ret.),  
University of Colorado Boulder
- 3** Amy Costello – Sustainability Manager, Armstrong Flooring
- 4** Q&A and Resources

# Thank you, Waste Pilot Participants

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## Industrial

- Armstrong Flooring
- AstraZeneca
- Bristol-Myers Squibb
- Electrolux
- Flowers Foods
- FMC Chemicals
- General Motors
- HARBEC
- Johnson Controls
- Los Angeles  
Department of Water  
and Power

## Industrial

- Martin Guitar
- Nissan North America
- NSK Americas
- PaperWorks Industries
- PPC Online
- Schneider Electric
- Steelcase, Inc.
- Sugar Creek Packing  
Co.
- United Technologies  
Corporation (UTC)
- Volvo Group North  
America

## Commercial

- Beaverton, Oregon
- Commonwealth Partners
- The Hartford Financial Services Group
- Jamestown, LP
- Lawrence Berkeley National Laboratory
- New Bedford Housing Authority
- Parkway
- Shorenstein Properties, LLC
- Sprint
- Tenderloin Neighborhood Development  
Corporation
- The Tower Companies
- UW Health
- The West Palm Beach VA Medical  
Center\*

\*(part of the U.S. Dept. of Veterans  
Affairs' Sunshine Healthcare Network)

# Waste Pilot Team

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## DOE

- Robert Bruce Lung, Senior Technical Advisor, BGS LLC, AMO
- Eli Levine, AMO
- Ethan Rogers, Fellow, AMO
- Hannah Debelius, ORISE Fellow, BTO

## ICF

- Clifton Yin, embedded in AMO
- Kate Rubin
- Zach Abrams

## RE Tech Advisors

- Andrea Doukakis

# Program Updates

- New [Implementation Model from Sprint](#), “Sprint’s Systematic Approach to Waste Management” and accompanying [Beat Blog post](#).
- Thanks for attending the [Better Buildings Summit!](#)
  - Recording, slides, and transcript from “Early Best Practices from the Waste Reduction Pilot” featuring presentations from Volvo and Shorenstein Properties are available [here](#).
- Look for our next quarterly call in **November 2020**.
- Monthly email bulletins and other resources on our [home page](#).

# Plastics Working Group

- Better Buildings/Better Plants is launching the first of multiple working groups for year two of the Waste Reduction Pilot
- Focused on plastic reduction, recycling, and closing the loop
- One hour kick-off in mid-September to determine focus areas and next steps
- Open to commercial and industrial partners
- Email Bruce Lung ([robert.lung@ee.doe.gov](mailto:robert.lung@ee.doe.gov))

Please go to [www.slido.com](https://www.slido.com)

using your mobile device or web browser

**Enter Event Code**

**#Waste**

# Slido Polls

Reminder:

Please go to [www.slido.com](https://www.slido.com) and  
enter event code **#Waste**

# Next Steps for DOE – Year Two

- Support pilot program and efforts:
  - Establish links between energy efficiency and waste reduction
  - Determine how DOE can contribute to waste reduction
  - Understand appropriate goals for partners going forward
  - Contribute to efforts to establish a circular economy
- Identify technology gaps that can inform R&D
- Potential solutions
  - Guidance materials
  - Case studies
  - Analytical/modeling frameworks
  - Facilitate sharing best practices
- Establish link with energy
  - Energy performance
  - Energy recovery
  - Resilience

# Today's Presenters

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**Jack DeBell**  
University of Colorado, Boulder (ret.)



**Amy Costello**  
Armstrong Flooring



## Jack DeBell

Recycling Program Development Director (ret.),  
University of Colorado Boulder

# Deep Reuse and Recycling

## Approaches and Examples from Campus

Jack DeBell  
National Recycling Coalition Campus Council  
University of Colorado-Boulder (Retired)

**August 12, 2020**

# Agenda

Credits

Examples

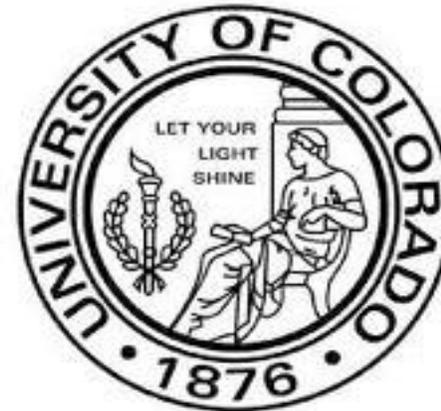
Community Computer Reuse  
Closed-loop Film Plastics

Approaches

Highest and Best Use  
Triple Bottom Line  
Domestic Market Development

Discussion

# Thank You!





<https://library.nrcrecycles.org/>

**Welcome to the National Recycling Coalition's Resource Center and Library!**

The NRC encourages your contributions to the library. Types of documents include conference proceedings you've organized or attended, webinars and documents you've published or presented, and case studies, guides, and reports you have compiled.

An NRC board subcommittee routinely reviews submissions before posting to the site.

Use the Submit Documents button to upload either a file or provide a link. You can also upload images associated with the document in a variety of formats.

Categorize your document under one or more categories that appear below. Use relevant tag words, which then build the word cloud [here](#).

Average time for submitting a pdf with an image is under 5 minutes.

For large numbers of docs or additional assistance, contact intern curators at [zerowaste@colorado.edu](mailto:zerowaste@colorado.edu)

Submit Documents



Source Reduction / Reuse



Collection



Processing



Materials



Market Development



Economics



Jobs



Legislation and Policy



Planning



Outreach and Education



Zero Waste and the Circular Economy



Historic Collections

Search...



Keywords

# Environmental Center

DIVISION OF STUDENT AFFAIRS



[Energy & Climate Justice](#)

**Zero Waste**

[Transportation](#)

[Greening CU](#)

[Applied Learning](#)

[Home](#) > [Zero Waste](#) > [Research Resources](#) > Zero Waste Lab

## Zero Waste Lab



### University of Colorado Boulder

#### About the Zero Waste Lab:

The CU Environmental Center's Applied Learning Lab for Zero Waste sponsors Internships and supports coursework to create better linkages between higher education and the sustainable materials management (SMM) industry- which broadly consists of reuse, recycling, composting companies and organizations. CU Students interested in Zero Waste academically or professionally, can get involved in several ways. Students can earn upper division internship credits through their department for CU's Zero Waste Research Internship. Students can also apply their academic work through class projects, research papers, and other faculty assignments. Several local and national projects are underway, with multi-disciplinary opportunities open on an ongoing basis. Projects underway or recently concluded:

[+ National Sustainable Materials Management Resource Center Project](#)

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[+ Campus-Industry Research in Sustainable Materials Management](#)

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[+ Closed-Loop Film Plastics Project](#)

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[+ Campus Master Planning Project](#)

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[+ Extended Producer Responsibility \(EPR\) for Off-Campus Vendors Project](#)

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[+ Turning the Page on Paper Waste Project](#)

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[+ Computers to Youth: Electronics Reuse for Colorado High School Students](#)

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[Home](#) > [Zero Waste](#) > Resources

## Resources

*In collaboration with the National Recycling Coalition's [Campus Council](#)*

Welcome to the recycling resources page developed by the University of Colorado - Boulder. On this site, you will have access to helpful curricular resources, management practices, job boards and internship opportunities, an index of recycling tools, directories of guest speakers and tours, and national research and development taking place.



**Best Practices**



**Curricular Resources**



**Job Boards and Internship Opportunities**



**Research and Development**



**Speakers and Tours Directories**



**Tools Index**

### Your Zero Waste Lifestyle

[Definition, Principles, and Policies](#)

[Waste Reduction](#)

[Reuse](#)

[Recycling](#)

[Composting](#)

[Education and Outreach](#)

### Zero Waste Resources

[Best Practices](#)

[Curricular Resources](#)

[Job Boards and Internship Opportunities](#)

[Speakers and Tours Directories](#)

[Tools Index](#)

[Extended Resources Map](#)

[Research](#)

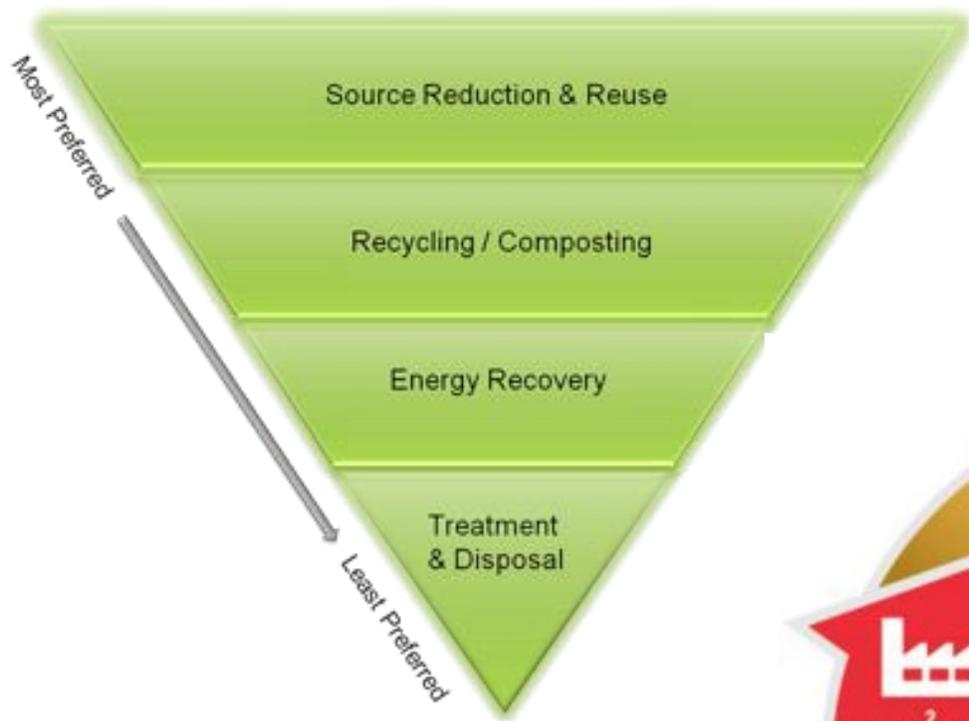
[Zero Waste Events](#)

[Opportunities](#)

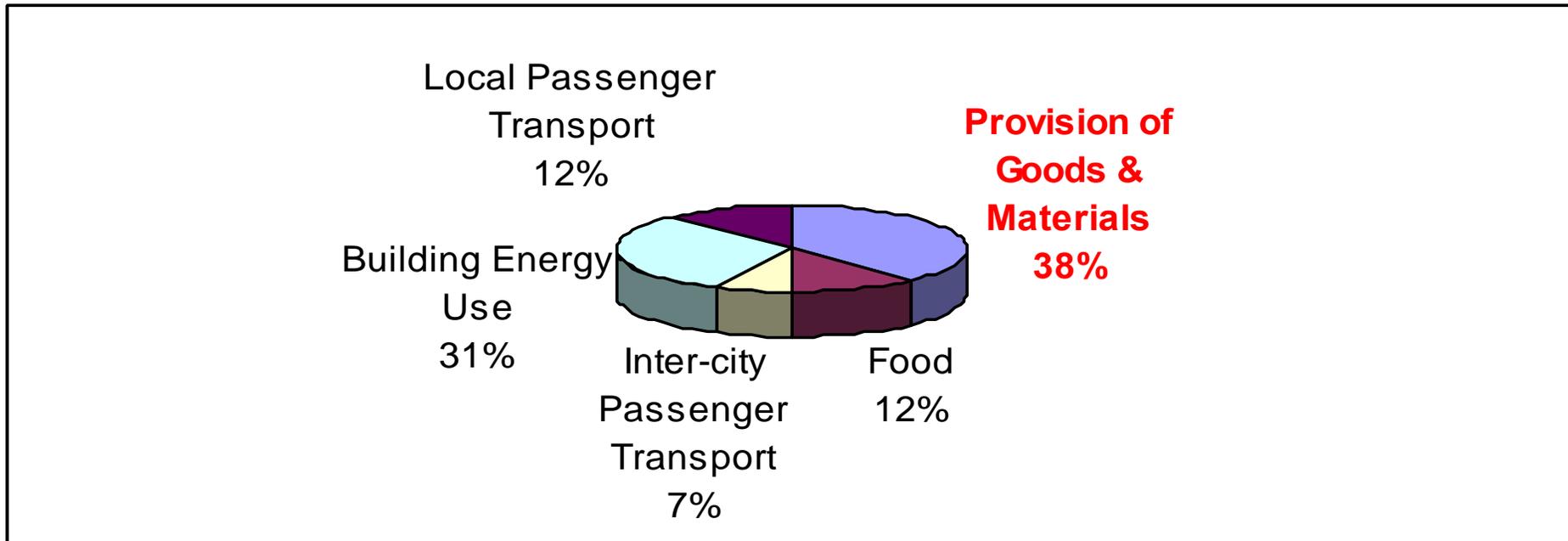
[About Us](#)

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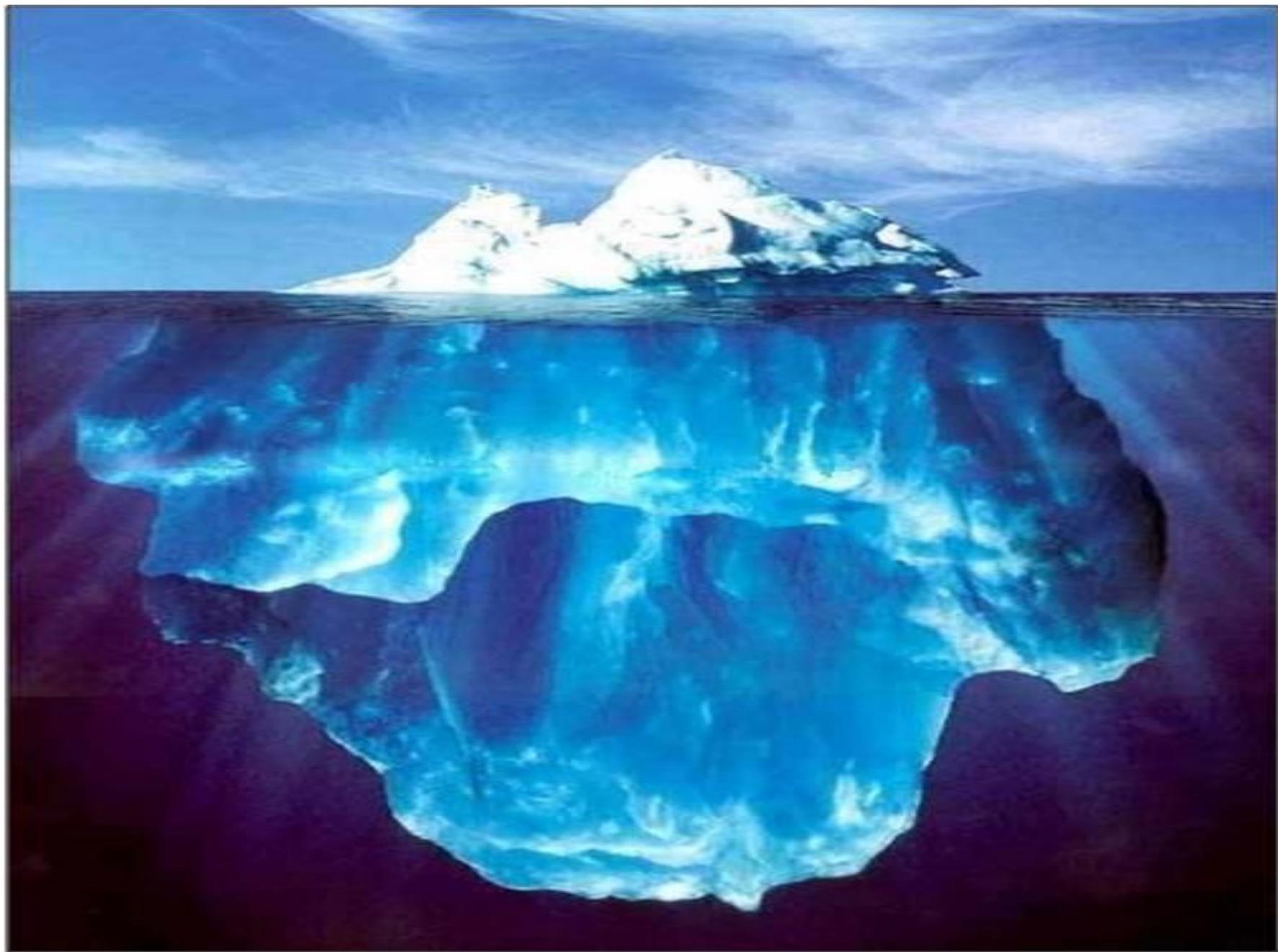
# Waste Management Hierarchy



# *US GREENHOUSE GAS EMISSIONS (EPA MTLs MGT VIEW)*



Source: USEPA (Prelim); from Allaway (ORDEQ)



# Triple Bottom-Line

Planet



Profit

People





To manufacture one computer and monitor, it takes 530 pounds of fossil fuels, 48 pounds of chemicals, and 1.5 tons of water.



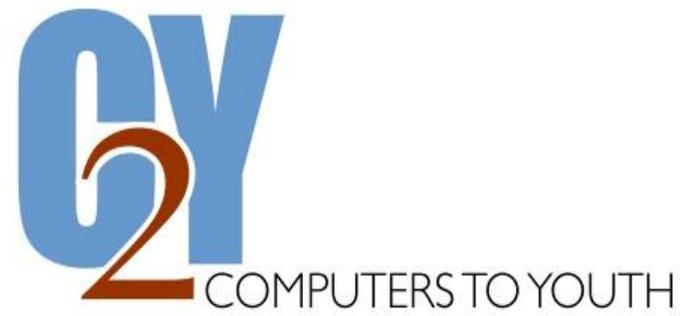
## Why Garbage Incinerators Are A Bad Deal For Communities —



Suncor is located by a poor residential neighborhood in north Denver. / Anthony Camera

## Activists Call for Polis to Expand Fight Against Environmental Racism

NELL SALZMAN | JUNE 13, 2020 | 8:30AM



# COMPUTERS TO YOUTH

Protecting the Environment - Assisting Youth



Colorado  
University of Colorado at Boulder

- ❖ CU Office of Diversity, Equity, and Community Engagement (ODECE)
- ❖ CU Property Services
- ❖ CU Environmental Center



# Recycling Plastics Beyond Bottles: **BAGS, WRAPS, & FILM**



The Association of  
Plastic Recyclers

Marketable Material, Growing Demand



## **Film Plastic “Closed Loop” Recycling Case Study – University of Colorado, Petoskey Plastics and Grainger Supply**

PROGRAM MANAGER: University of Colorado – Boulder Zero Waste Lab

WEBSITE: <https://www.colorado.edu/ecenter/recycling/resources/research-and-development-rd-centers>

LOCATION: Boulder, CO

PARTNERS: Recycler: Petoskey Plastics, headquartered in Petoskey Michigan with recycling/remanufacturing in Hartford City, Indiana. Supplier of recycled Petoskey trash bags: Grainger Supply, CU’s preferred distributor

POPULATION SERVED: The entire campus and student population benefits from recovering material generated in University stockrooms, maintenance areas, and bookstores, and then purchasing trash bags made with PCR sourced from bag/film material.

MATERIALS ACCEPTED: Flexible film packaging from campus purchasing of goods.

# Waste Stream Assessment Report

University of Colorado Boulder  
2209 Stadium Drive  
Boulder, Colorado 80309

Confidential Report  
Waste Stream Audit: April 22 - May 1, 2013  
Site Assessments: April 11, 17 and May 16, 2013

**THINK GREEN:**

# 1. Planning



## 2. Collection

✓ Collection/Recovery Points

✓ Types of Storage Containers

✓ Material Handling and Transport

✓ Quality Control

✓ Densification



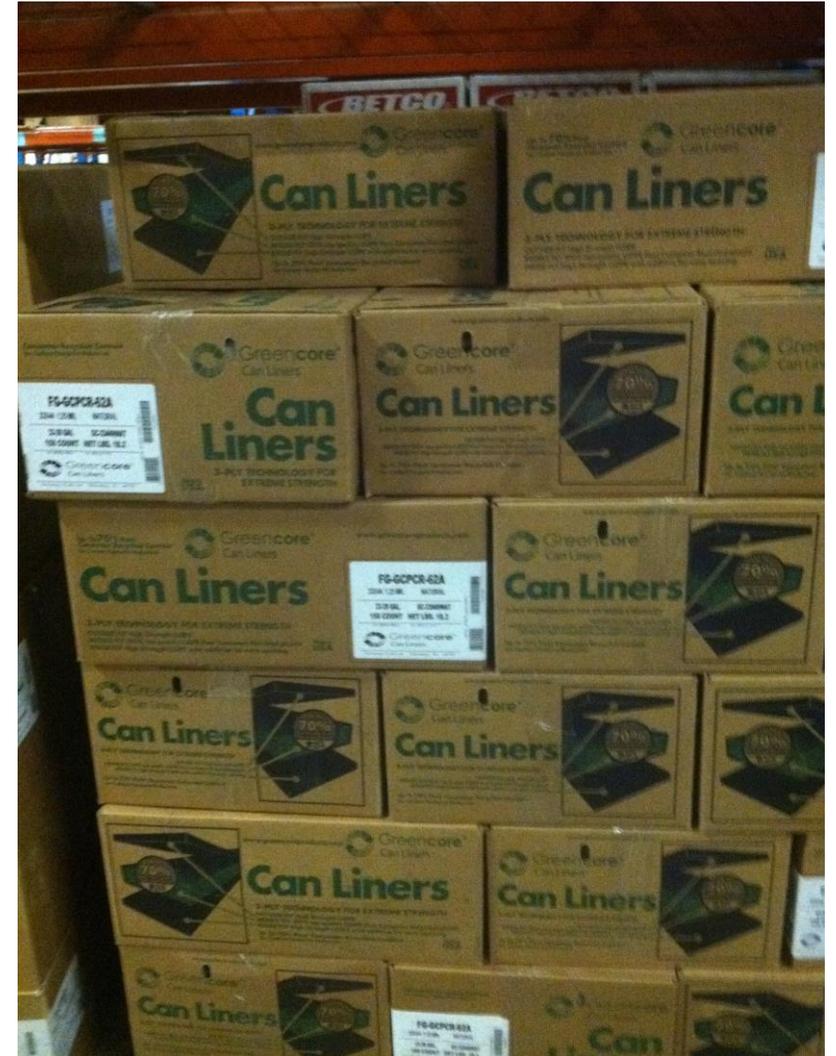
# 3. Re-Processing



Postconsumer plastic is manufactured by Petoskey into GreenPE<sup>®</sup> Resin that is then used to make Greencore brand blown film and bag products. This recycled resin is sandwiched between outer layers of virgin resin.

# 4. Sustainable Purchasing

The operating partnership between Grainger and Petoskey allows CU to purchase considerable amounts of finished, recycled product as Greencore bags.



# The Smartest Recycled Bags on the Planet®

- Costs no more than traditional bags
- Guaranteed quality and durability
- 3-ply construction
- 70% post-consumer recycled content = superior source reduction
- Reduces carbon pollution by as much as 20%
- Available in custom colors
- Green advantage without the added cost
- Perforated coreless rolls for efficient storage and handling
- EPA recommended supplier. Exceeds EPA & LEED standards

"Bags made from true PCR (Post Consumer Recycled) plastic have generally the smallest environmental impact profiles and can be considered the most 'eco-friendly' materials for waste bags..."

— IFEU Life Cycle Assessment of Waste Bags, June 2009



greencore can liners®  
Institutional and Industrial

If it's not  
**greencore can liners®**...  
it's not really green. Ask for it by name.

## Custom Sizes and Printing

We specialize in custom sizes, gauges, colors and printing.

## Stock Product Specifications

Item Code	Bags Per Case	Bags Per Roll	Rolls Per Case	Bag Rating	Bag Capacity	Bag Width	Bag Length	Bag Gauge	Bag Color	Net Case Weight	Pallet Pattern Tie/Hi
GC-3858HNAT	100	10	10	Heavy Duty	55-60 GAL	38	58	1.25	Clear	18.4	10X7=70
GC-3858HBLK	100	10	10	Heavy Duty	55-60 GAL	38	58	1.25	Black	18.4	10X7=70
GC-4348HNAT	100	10	10	Heavy Duty	55 GAL	43	48	1.25	Clear	17.2	10X7=70
GC-4348HBLK	100	10	10	Heavy Duty	55 GAL	43	48	1.25	Black	17.2	10X7=70
GC-4046HNAT	100	10	10	Heavy Duty	40-50 GAL	40	46	1.25	Clear	15.3	10X7=70
GC-4046HBLK	100	10	10	Heavy Duty	40-50 GAL	40	46	1.25	Black	15.3	10X7=70
GC-3750HNAT	100	10	10	Heavy Duty	40-44 GAL	37	50	1.25	Clear	15.4	10X7=70
GC-3750HBLK	100	10	10	Heavy Duty	40-44 GAL	37	50	1.25	Black	15.4	10X7=70
GC-3750SBLK	150	15	10	Standard Duty	40-44 GAL	37	50	.95	Black	17.6	10X7=70
GC-3344HNAT	150	15	10	Heavy Duty	33-39 GAL	33	44	1.25	Clear	18.1	10X7=70
GC-3344HBLK	150	15	10	Heavy Duty	33-39 GAL	33	44	1.25	Black	18.1	10X7=70
GC-3036SNAT	250	25	10	Standard Duty	20-30 GAL	30	36	.95	Clear	17.1	10X7=70
GC3036SBLK	250	25	10	Standard Duty	20-30 GAL	30	36	.95	Black	17.1	10X7=70
GC-2424MNAT	500	25	20	Medium Duty	10 GAL	24	24	.60	Clear	11.52	10X7=70

## Typical Film Properties/Performance Values (Standard ASTM Test Methods)

Bag Rating	Bag Gauge (mil)	Impact Strength (grams)	MD Tear (grams)	TD Tear (grams)
Medium Duty	0.60	.95	250	>500
Standard Duty	0.95 -1.2	110-130	300	>500
Heavy Duty	1.25	130-150	330	>600

**Order Lead Time:** 7-10 working days (stock products)  
14-21 working days (custom products)

**Shipping Point:** Petoskey Plastics, Inc.  
Petoskey, MI • 49770-9723

**Contact:** Cody Lounsberry - Government Account Manager  
Email: cody.lounsberry@grainger.com  
Cell: 720-879-8056



# SUSTAINABILITY SCORECARD

## A CLOSED LOOP RECYCLING PARTNERSHIP

October 2015 - October 2016

Plastic Bags Shipped	55,790 Lbs
Plastic Film Recycled	39,397 Lbs
PCR Plastic Used	39,397 Lbs
Total % of Recycled	71%
CO <sub>2e</sub> Saved	26,269 Kg

### THE USE OF POST-CONSUMER PLASTICS IN YOUR PRODUCTS EQUATES TO:

#### H<sub>2</sub>O SAVINGS



**418,735**  
GALLONS  
OF WATER  
NOT USED

#### CO<sub>2</sub> EMISSIONS



**61**  
BARRELS OF OIL  
NOT CONSUMED

OR



**2,956**  
GALLONS OF GAS  
NOT CONSUMED

**Thank You!**



Jack DeBell  
debell@colorado.edu



# Amy Costello

Sustainability Manager, Armstrong Flooring

# Recycling Overview

August 2020



**Armstrong**<sup>®</sup>  
**FLOORING**  
Inspiring Great Spaces<sup>®</sup>

# Multi-National Enterprise

- \$626 Million Annual Sales (2019)
- 60% Residential & 40% Commercial
- ~3,000 Employees
- Operate in three continents:
  - 5 US plants
  - 2 China plants
  - 1 Australia plant



# Armstrong Flooring Product Portfolio

## Residential and Commercial Resilient Flooring



**Biobased Tile  
(BBT)**



**Vinyl Composition  
Tile (VCT)**



**Sheet Vinyl  
(Homogenous/Heterogenous)**



**Luxury Vinyl  
Tile (LVT)**



**Rigid Core Tile**

**Armstrong®  
FLOORING**

# Types of Recycling



In-Plant Scrap



Post Consumer Material



Post Industrial Material

# In-Plant Scrap Recycling



Mill Plugs



Trim Scrap

# Post-Industrial Recycling

## Considerations for Acceptance:

1. Safety - SDS
2. Format of recycle
3. Color of recycle
4. Material stream availability
5. Value –binder vs. filler
6. Testing for compliance
7. Plant specific benefit evaluation
8. Lab testing/formulation (at plant)
9. Change Control/Specification



# Post-Industrial Recycling



Credit Card Scrap



Ground Film

# Post Consumer Recycling Program

On&On™

Recycling Program

>150 Million Pounds

1 register 2 confirm 3 remove 4 call us



# Recycling Infrastructure



Conveyance Equipment



Sorting Equipment



Grinding Capability



**Thank you!**

# Questions?

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*~Please unmute yourself or utilize the chat box~*



**Jack DeBell**

University of Colorado, Boulder  
[debell@colorado.edu](mailto:debell@colorado.edu)



**Amy Costello**

Armstrong Flooring  
[aacostello@armstrongflooring.com](mailto:aacostello@armstrongflooring.com)

# Questions?

Contact us:



Follow us on Twitter  
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Better Buildings Solution Center  
<https://betterbuildingsolutioncenter.energy.gov/>



Visit us on LinkedIn  
[www.linkedin.com/company/better-buildings/](http://www.linkedin.com/company/better-buildings/)



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[debell@colorado.edu](mailto:debell@colorado.edu)



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