

Sustainable Materials Management for Recyclers



How Recycling Managers Can Best Contribute to Achieving Sustainable Materials Management



February 18, 2015

David Allaway, Oregon Dept. of Environmental Quality

Sustainable Materials Management for Recyclers



Overview

- What is “materials management”?
- Materials management and discards management compared
- How does recycling contribute to sustainable materials management



Materials Management: 2 Working Definitions (US EPA)

“Materials management is an approach to using and reusing resources most efficiently and sustainably throughout their lifecycles. It seeks to minimize materials used and all associated environmental impacts.”

“Materials management refers to the life cycle of materials as they trace their course through the economy, from raw material extraction to product manufacture, transport, use, source reduction, reuse, recycling, and disposal.”

Sustainable Materials Management for Recyclers



Materials Management: A “Life Cycle” View





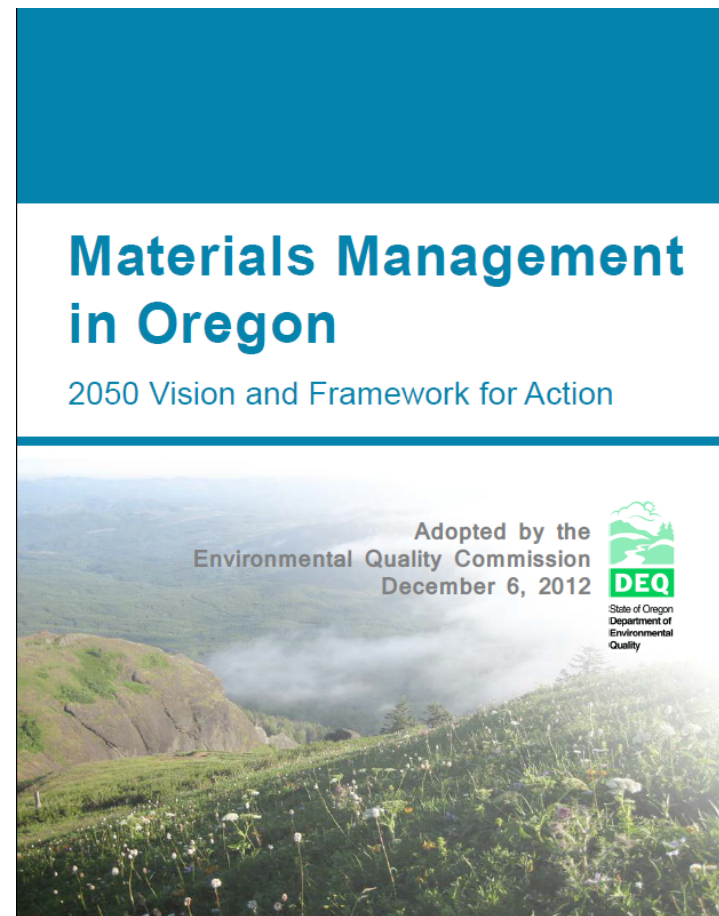
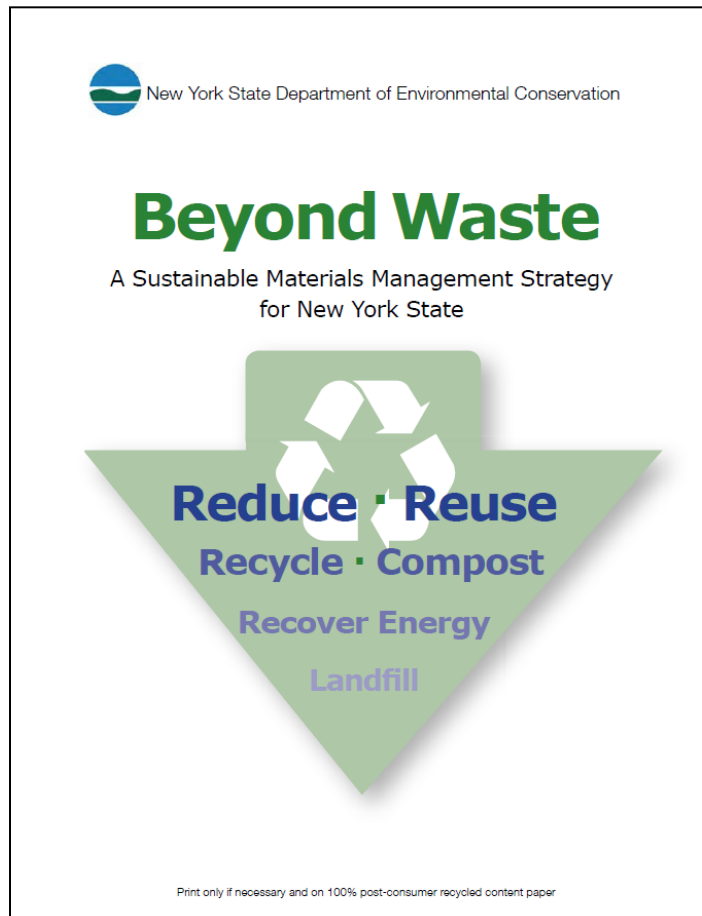
“Discards management” and “materials management” compared

	Discards Management	Materials Management
Goal	Managing discards	Sustainability
Lifecycle	Primarily downstream	All stages
Environmental scope	Emissions from waste facilities; resource conservation from recovery	All pollutants, resources
Partners	Waste generators, waste industry, users of recovered material	Everyone involved in the life cycle of materials

Sustainable Materials Management for Recyclers



Materials Management?



Sustainable Materials Management for Recyclers



Why Materials Management?

- **Answers Complex Questions about Choices and Impact -** Everyday, people make choices about products and services:

- Which products do we buy?
- What are they made of and how are they made?
- How do we use them?
- What do we do with stuff when we're through with it?

All of these choices have environmental consequences – some large, some small, almost all unseen.

- **Multi-attribute** - Very narrowly focused attributes like “recyclable”, “biodegradable”, or “organic” don’t tell us about all of the other potential environmental impacts that occur in all stages of the life cycle.
- **Offers Inter-related Solutions** - SMM requires interaction between programs that deal with a wide range of media (air, water, etc.) to identify and address "hotspots" which cause major environmental impacts.

Source:
US EPA (2015)



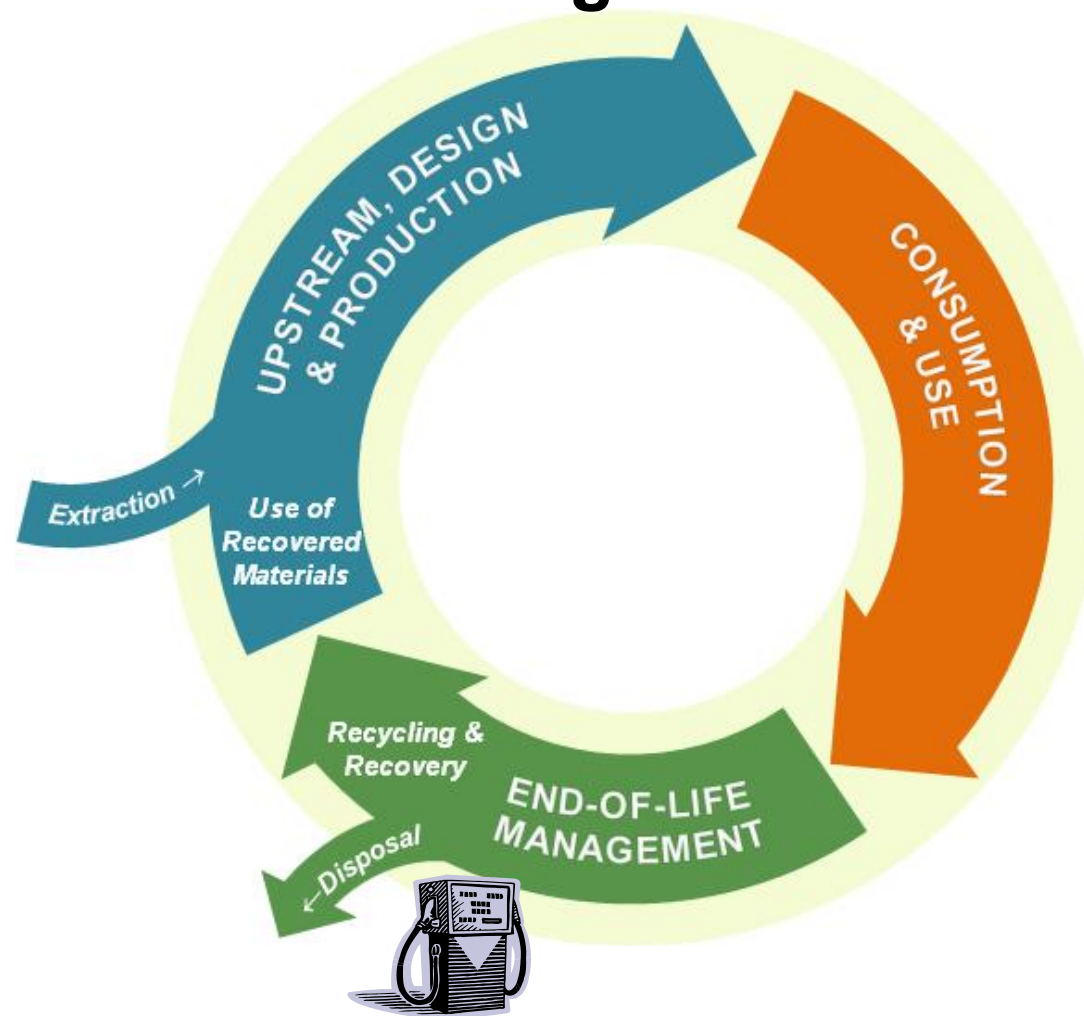
From “Discards Management” to “Materials Management:

- A full view of impacts across the life cycle
- A full view of actions across the life cycle

Sustainable Materials Management for Recyclers



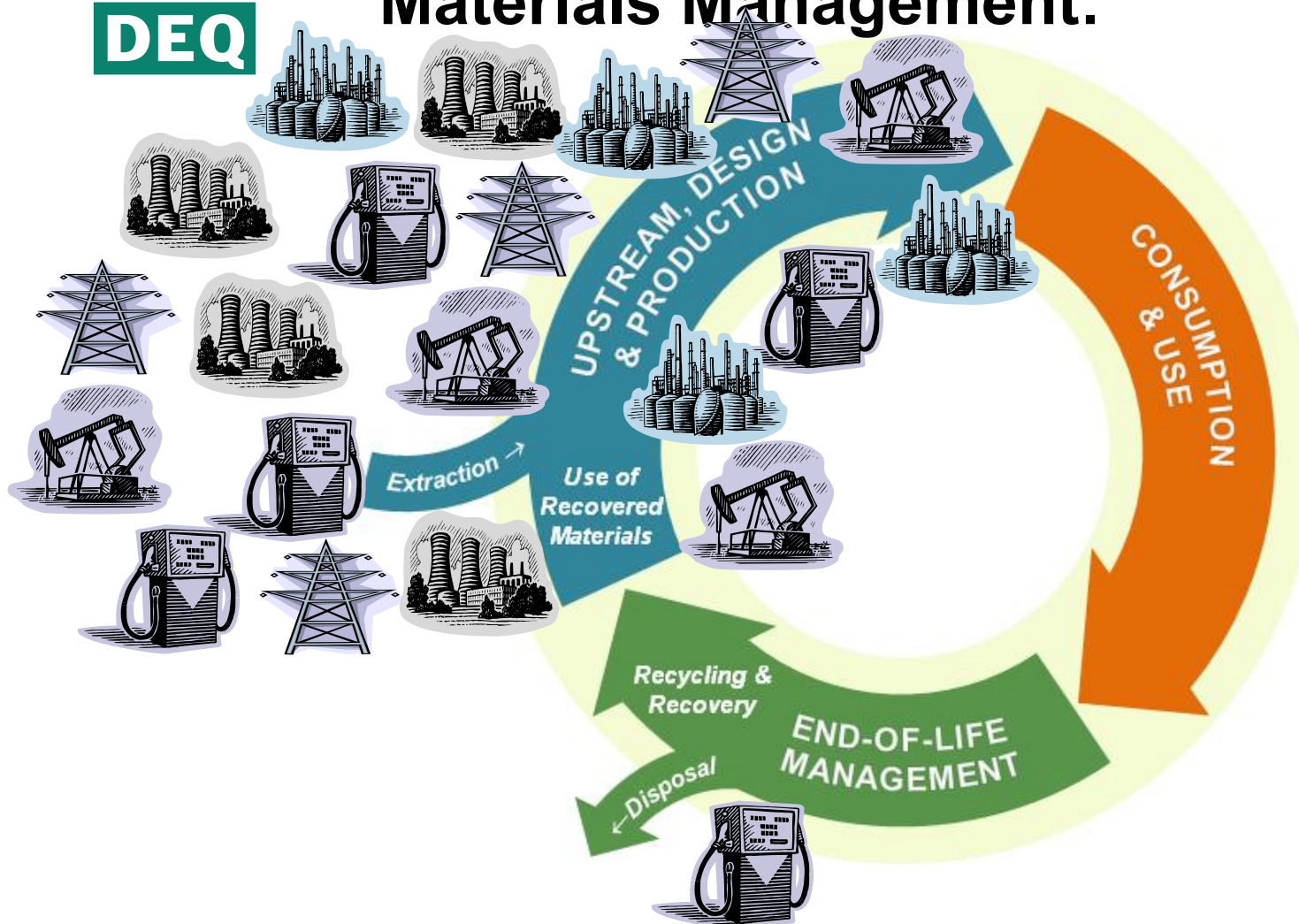
From “Discards Management” to “Materials Management:



Sustainable Materials Management for Recyclers



From “Discards Management” to “Materials Management:





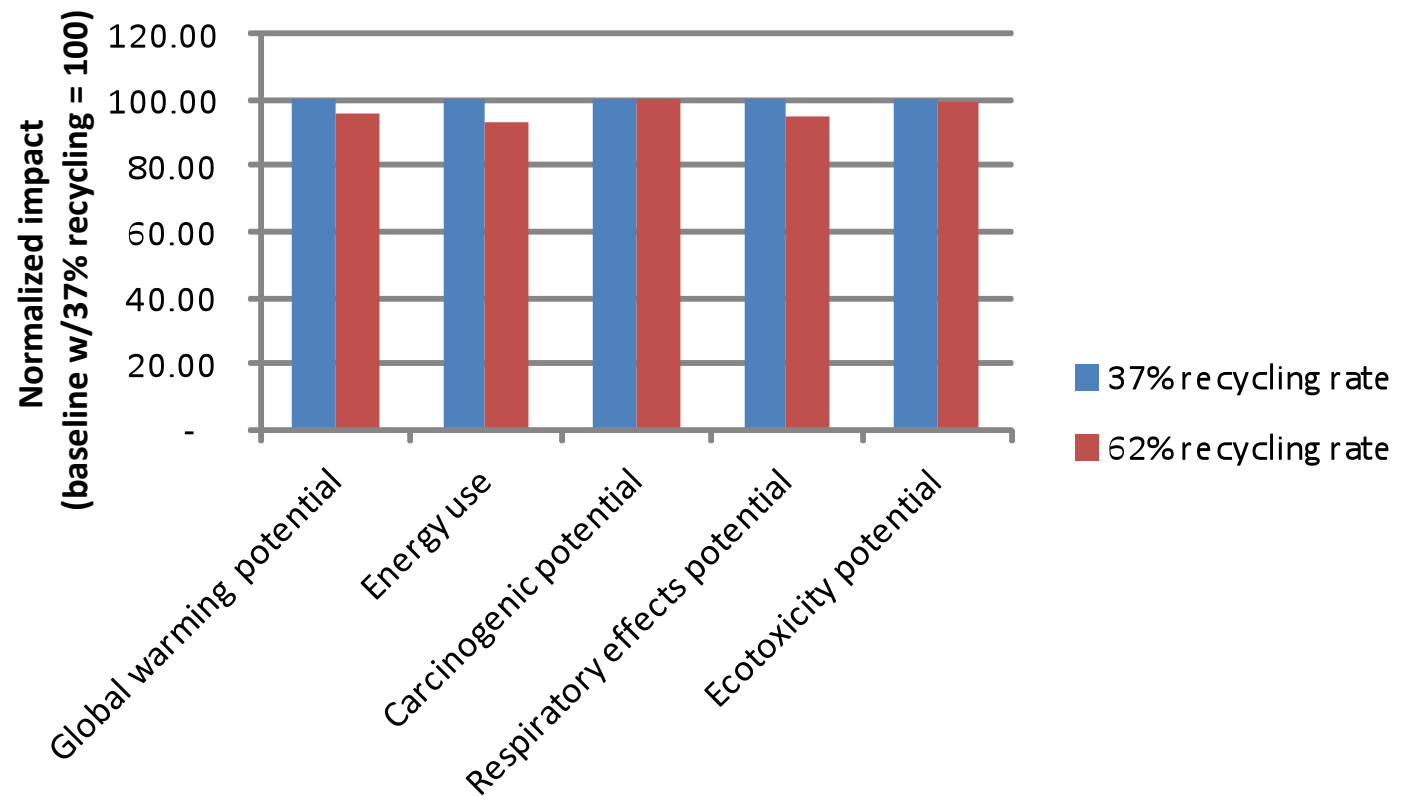
From “Discards Management” to “Materials Management:

- A full view of impacts across the life cycle
- A full view of actions across the life cycle
 - Why? Because most impacts are “upstream”

Sustainable Materials Management for Recyclers



Example of Actions Across the Life Cycle: PET Water Bottles

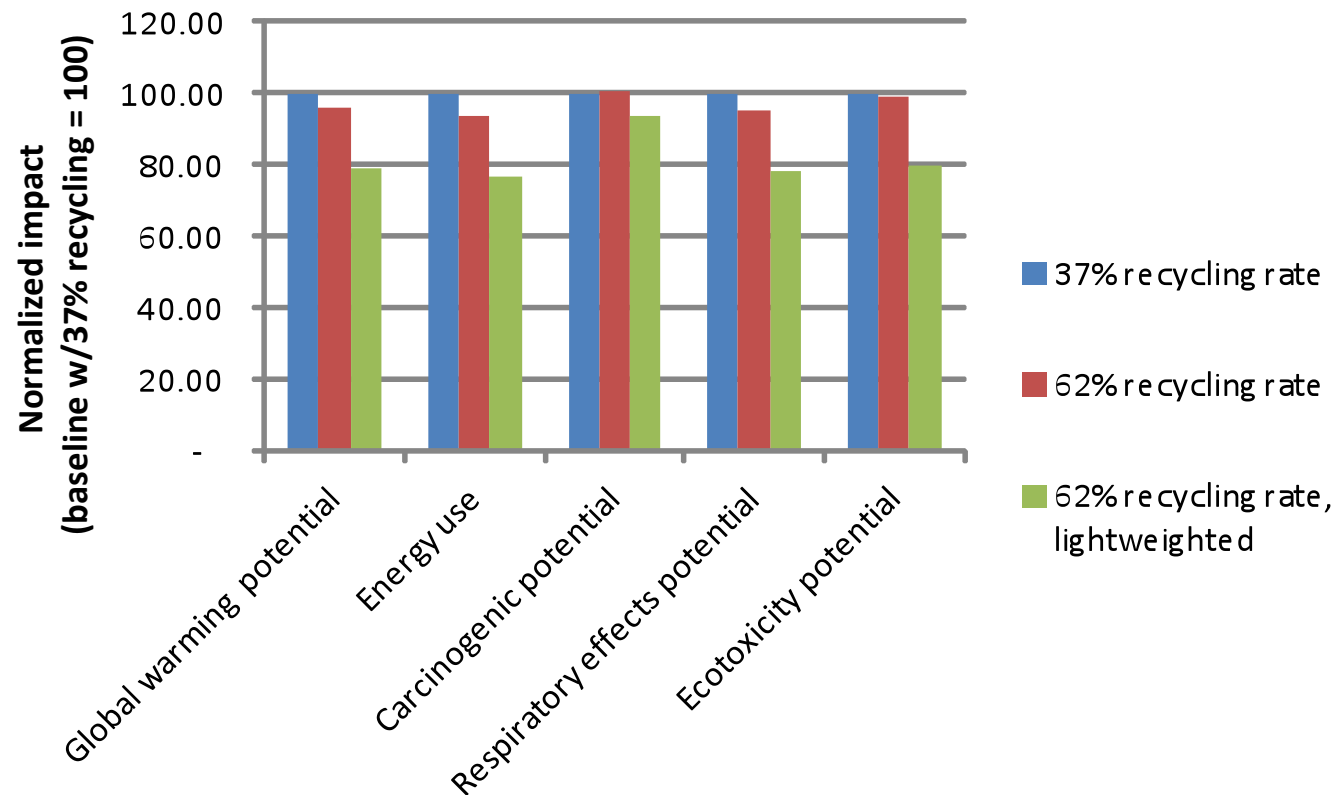


“Baseline” = PET, half-liter, 13.3 grams, 0% post-consumer recycled content (PCR), on-site molding, purified municipal water (reverse osmosis, ozone and uv), 50 miles to retail, 5 miles home-to-retail, co-purchase w/24 other products, no chilling.

Sustainable Materials Management for Recyclers



Example of Actions Across the Life Cycle: PET Water Bottles

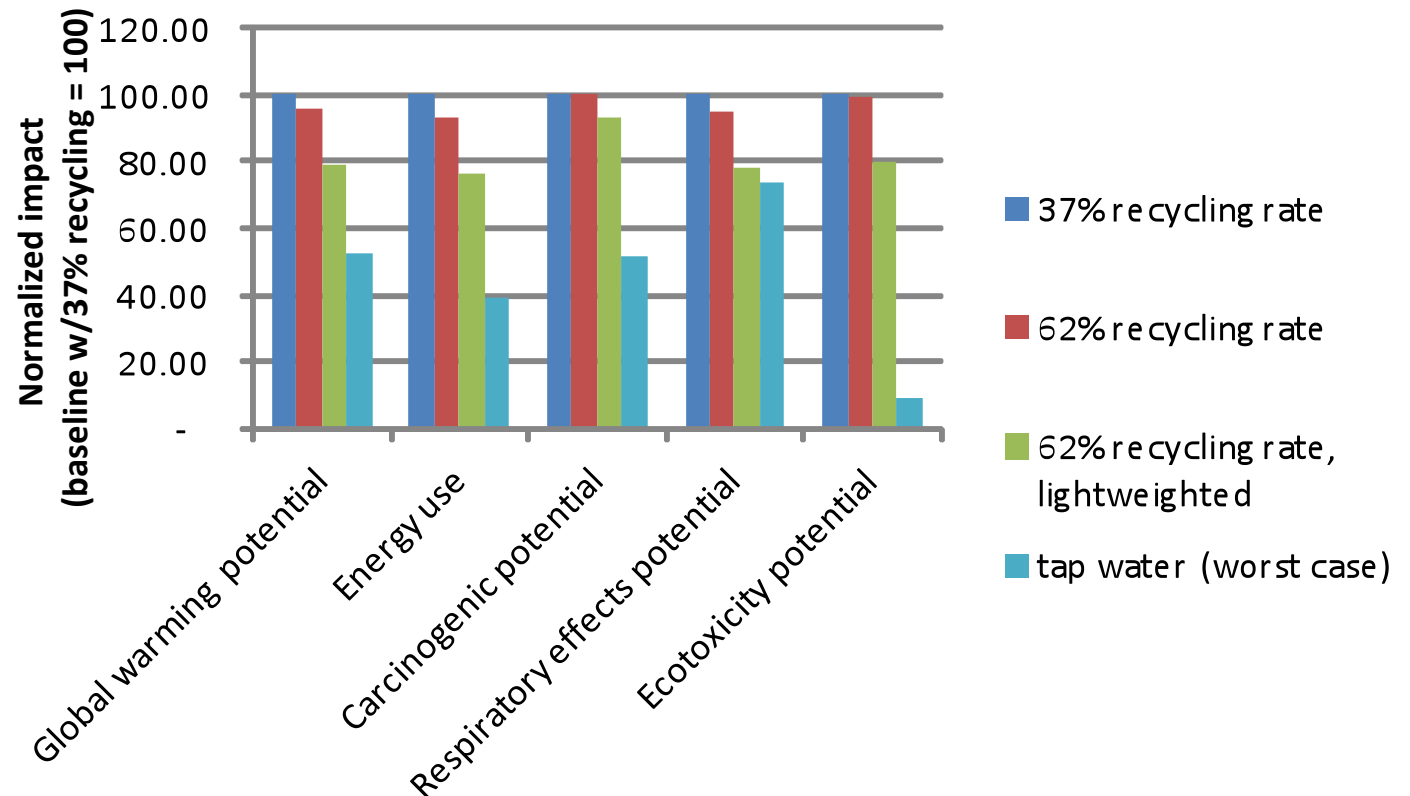


“Baseline” = PET, half-liter, 13.3 grams, 0% post-consumer recycled content (PCR), on-site molding, purified municipal water (reverse osmosis, ozone and uv), 50 miles to retail, 5 miles home-to-retail, co-purchase w/24 other products, no chilling.

Sustainable Materials Management for Recyclers



Example of Actions Across the Life Cycle: PET Water Bottles

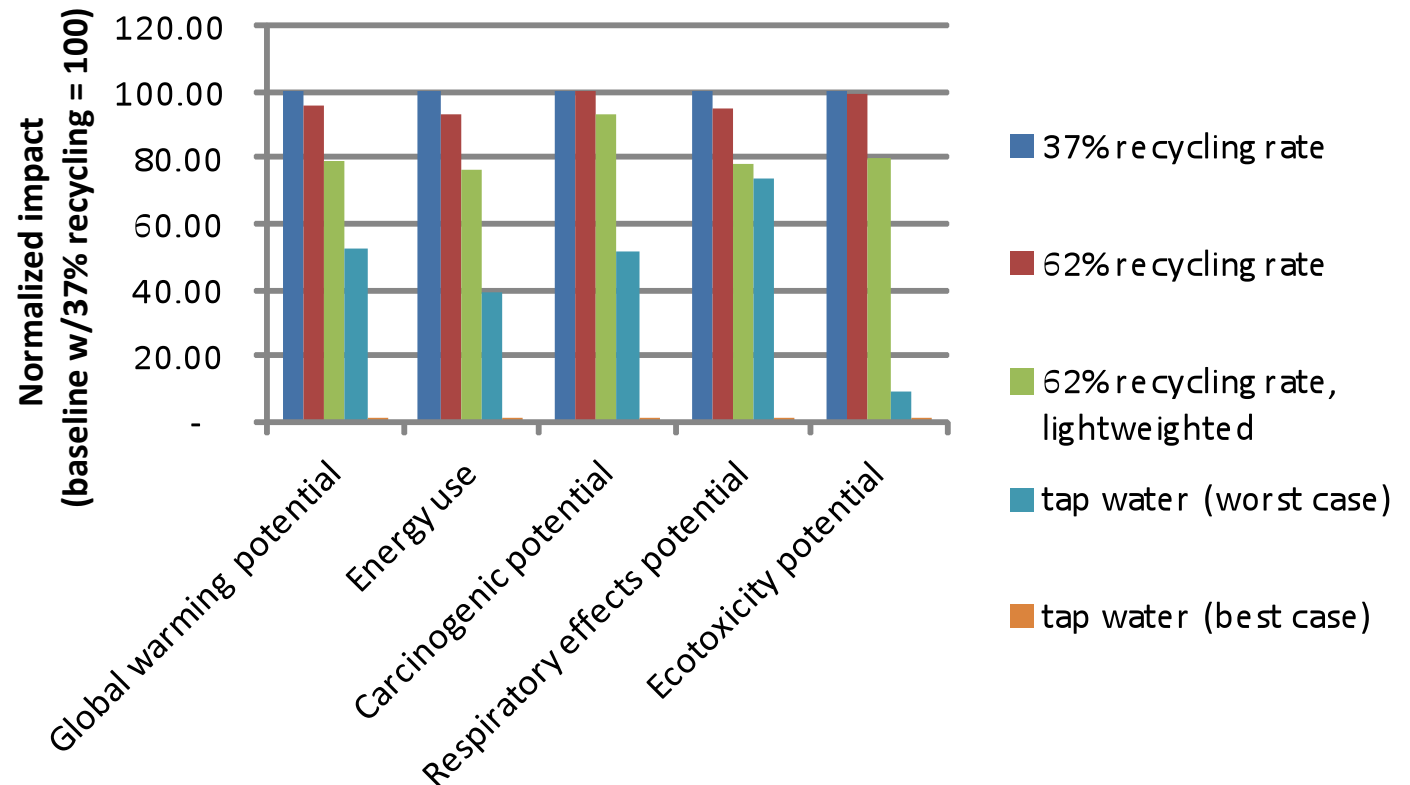


“Baseline” = PET, half-liter, 13.3 grams, 0% post-consumer recycled content (PCR), on-site molding, purified municipal water (reverse osmosis, ozone and uv), 50 miles to retail, 5 miles home-to-retail, co-purchase w/24 other products, no chilling.

Sustainable Materials Management for Recyclers



Example of Actions Across the Life Cycle: PET Water Bottles

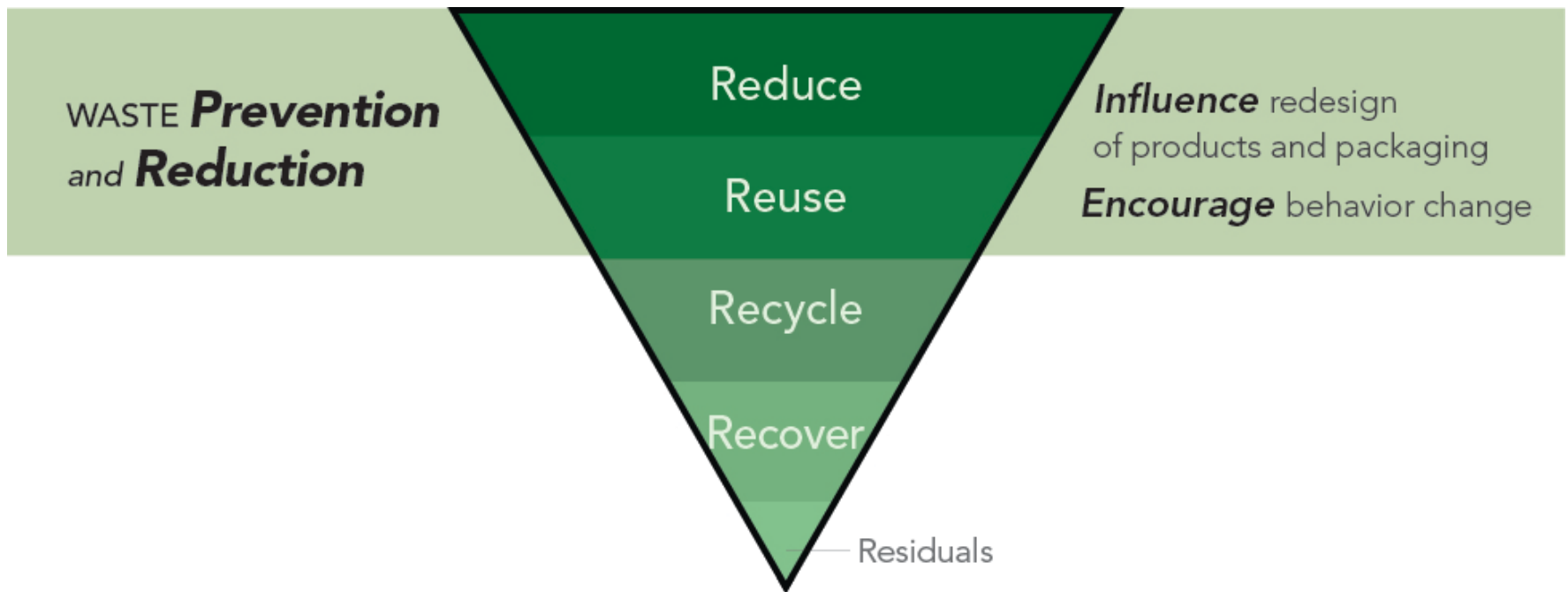


“Baseline” = PET, half-liter, 13.3 grams, 0% post-consumer recycled content (PCR), on-site molding, purified municipal water (reverse osmosis, ozone and uv), 50 miles to retail, 5 miles home-to-retail, co-purchase w/24 other products, no chilling.

Sustainable Materials Management for Recyclers



The “Solid Waste Management” Hierarchy



Sustainable Materials Management for Recyclers



Materials Management



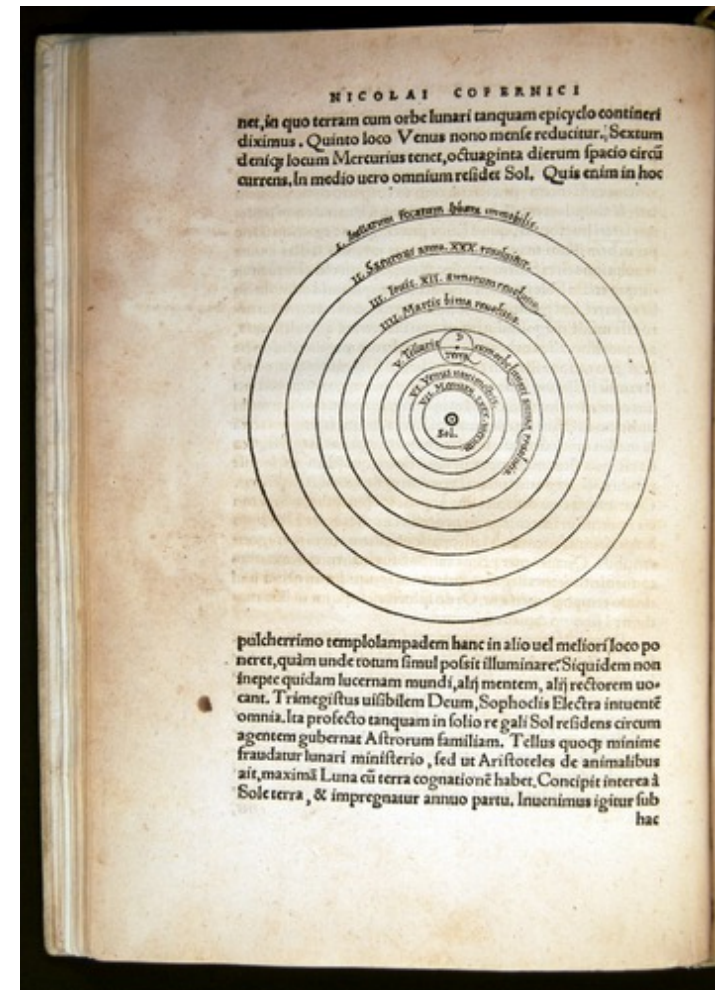
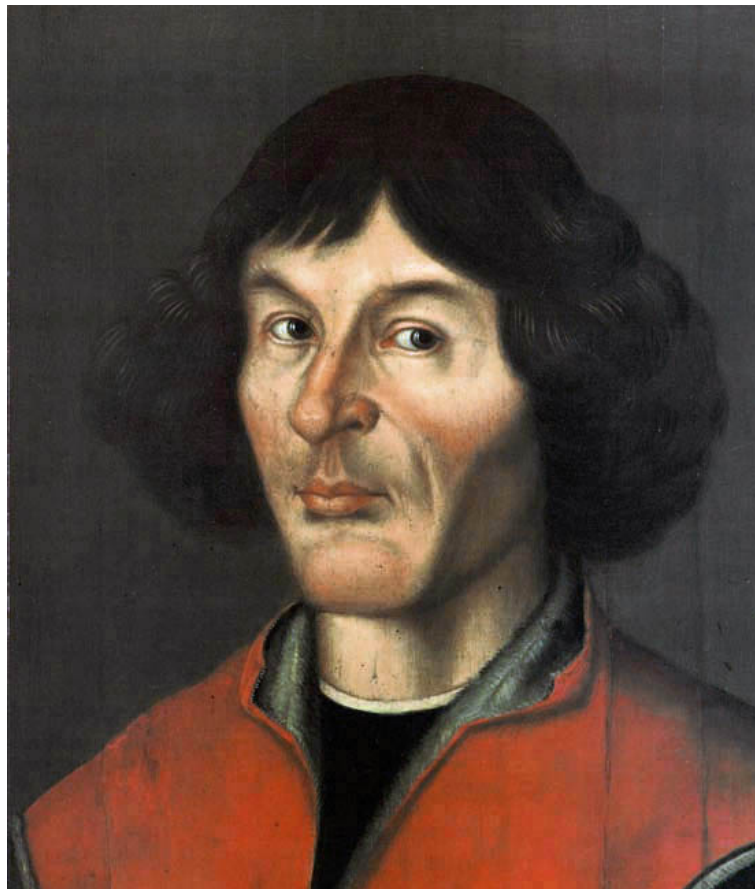
Sustainable Materials Management for Recyclers



Sustainable Materials Management for Recyclers



Nicolaus Copernicus





World View #1: Recycling is Independent of Other Life Cycle Stages

- The life cycle of materials consists of several discrete parts (production, transportation, end-of-life, etc.)
- If each part is optimized (independent of its effects on the larger system), the whole system is optimized
- Recyclers should maximize recycling



World View #2: “Systems Thinking”




- The life cycle of materials consists of several discrete parts (production, transportation, end-of-life, etc.)
- Recycling is a *means* to an *end*, not an end in-and-of-itself
- Recycling may effect the rest of the system
- Recycling should be maximized but only to the extent it achieves the broader end (e.g., resource conservation), and only after considering how it effects the big picture (whole system)

Sustainable Materials Management for Recyclers



Design for Recycling? Design for Prevention? Design for Environment?



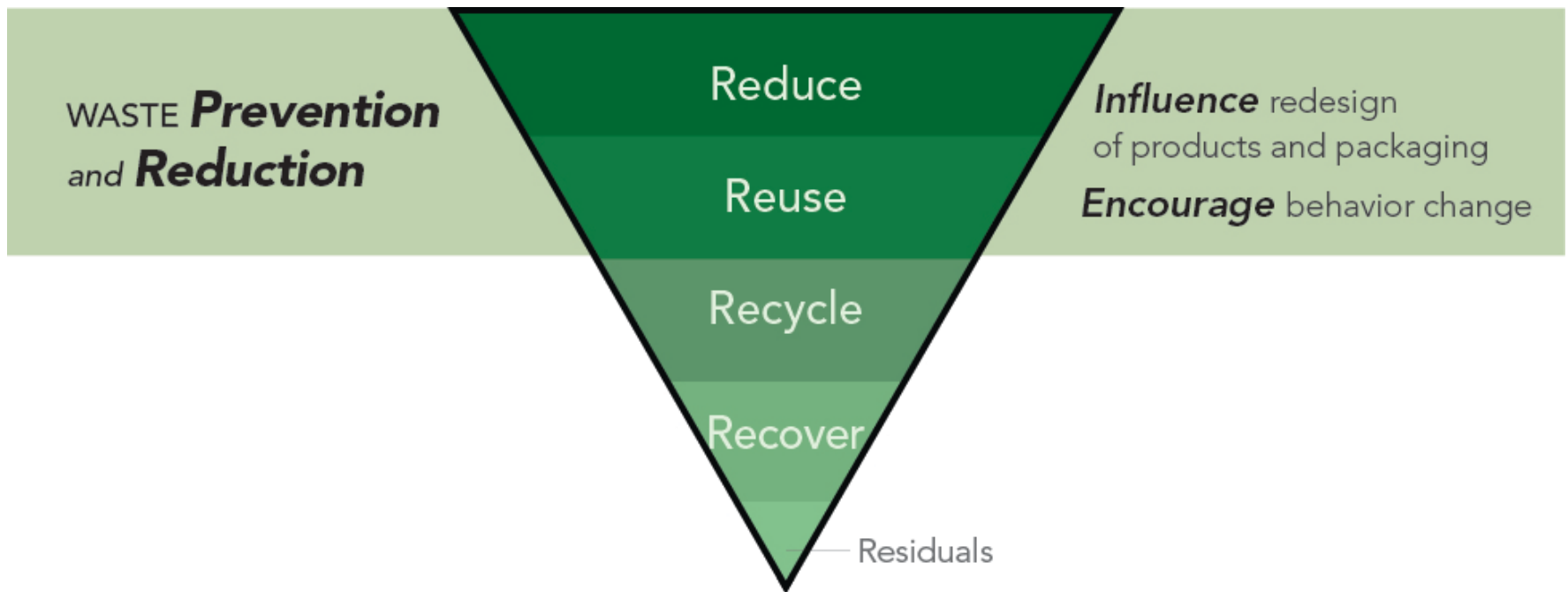
Coffee Packaging (11.5 oz product)	Material	Package Weight	Recyclable by Consumers?	Energy Used (MJ/ 11.5 oz)	GHG Emissions (lbs CO ₂ e/ 11.5 oz product)*	MSW Waste Generated (lbs./ 100,000 oz. of product)
	Steel can, plastic lid	~4 oz.	Yes	4.21	0.33	1,305
	Plastic container and lid	~3 oz.	Yes	5.18	0.17	847
	Flexible pouch	~0.4 oz.	No	1.14	0.04	176

Source:
US EPA

Sustainable Materials Management for Recyclers



The “Solid Waste Management” Hierarchy



DEQ Waste Prevention Strategy:

www.deq.state.or.us/lq/sw/wasteprevention/wpstrategy.htm



Food for Thought

“The environmental goals that motivate recycling are often best served by less rather than more recycling – that is, by preventing the generation of waste in the first place.” -Frank Ackerman (in “Why Do We Recycle?”)

“Picking up and reclaiming scrap left over after production is a public service, but planning so that there will be no scrap is a higher public service.” - Henry Ford



Sustainable Materials Management for Recyclers



Thank You

David Allaway

Oregon Dept. of Environmental Quality

allaway.david@deq.state.or.us