

# **Sustainable Materials Management**

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**Together, We Are Recycling!**

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# Sustainable Materials Management

## Definition

- ▶ Sustainable materials management (SMM) is a systemic approach toward using and reusing materials more productively over their entire lifecycles.
- ▶ It seeks to minimize materials used and all associated environmental impacts.
- ▶ It represents a change in how our society thinks about the use of natural resources and environmental protection.



# Sustainable Materials Management

## Why SMM?

- ▶ By examining how materials are used throughout their lifecycle, an SMM approach seeks to:
  - ▶ **Material Reduction:** Use materials in the most productive way with an emphasis on using less.
  - ▶ **Impact Reduction:** Reduce toxic chemicals and environmental impacts throughout the material lifecycle.
  - ▶ **Resource Conservation:** Assure we have sufficient resources to meet today's needs and those of the future.





# Sustainable Materials Management

## Materials Management: A new approach

- ▶ Distant Past: “Sanitation Waste Collection”
- ▶ Recent: “Solid Waste Management”
- ▶ Current: “Integrated Waste Management”
- ▶ New Direction: “Materials Management”  
>>> Zero Waste Goal! <<<



# Sustainable Materials Management

## Current: Integrated Waste Management

- ▶ Linear collection leads to disposal

### LINEAR ECONOMY



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# Sustainable Materials Management

## SMM's Lifecycle Perspective



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## Circular Economy

*“ A circular economy is one that is restorative by design, and which aims to keep products, components and materials at their highest utility and value at all times, Distinguishing between technical and biological cycles. ”*

*-William McDonough*





# Sustainable Materials Management

## Zero Waste Definition

**ZERO WASTE IS A GOAL** TO GUIDE PEOPLE IN CHANGING THEIR LIFESTYLES AND PRACTICES TO EMULATE SUSTAINABLE NATURAL CYCLES, WHERE

**ALL DISCARDED MATERIALS ARE DESIGNED TO BECOME RESOURCES FOR OTHERS TO USE.**

ZERO WASTE MEANS DESIGNING AND MANAGING PRODUCTS AND PROCESSES TO SYSTEMATICALLY AVOID AND ELIMINATE THE VOLUME AND TOXICITY OF WASTE AND MATERIALS,

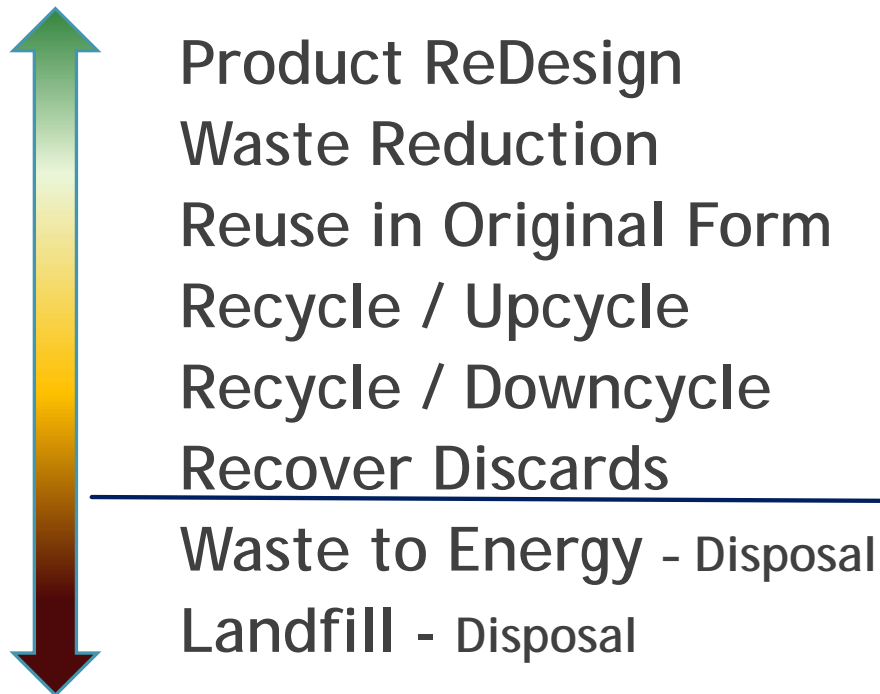
**CONSERVE AND RECOVER ALL RESOURCES,  
AND NOT BURN OR BURY THEM.**

Excerpts from Zero Waste International Alliance



# Sustainable Materials Management

## Highest & Best Use



# Sustainable Materials Management

## Product Lifecycle Impacts

- ▶ Materials have environmental impacts throughout their lifecycles.
- ▶ The major stages in a material's lifecycle are
  - ▶ raw material acquisition,
  - ▶ materials manufacture,
  - ▶ production,
  - ▶ use/reuse/maintenance, and
  - ▶ End-of-life management.





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## Material Acquisition / Extraction: Reduction

- ▶ All products are made from materials found in or on the earth. “Virgin” or “raw” materials, such as trees or ore, are harvested directly from the earth, then transported and processed.
- ▶ These activities use a large amount of energy, and burning fossil fuels to supply this energy results in greenhouse gas emissions.
- ▶ Waste Reduction in extraction through refined business practices that focus on resource efficiency.
- ▶ Reuse & Recycling uses less energy than extracting and processing raw materials,



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## Manufacturing: Product Redesign

- ▶ A product may be re-designed so it is manufactured using different, fewer, less toxic and more durable materials.
- ▶ It is designed so that at the end of its useful life it can be readily disassembled.
- ▶ The product's manufacturer maintains a relationship with its customers to ensure best use of the product, its maintenance and return at end-of-life.



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## Product Distribution: Reduce Transportation

- ▶ Finished products need to be transported to a distribution center or warehouse, then to stores and your home.
- ▶ Each stage of the life cycle of a product requires some form of transportation.
- ▶ Transportation by plane, truck, or rail all require the use of fossil fuels for energy, which can contribute to global climate change.
- ▶ *Localize Markets closer to Consumers*
- ▶ *Decentralize to focus on reduced impacts*





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## Use/Reuse/Maintenance: Reduce Energy Use

- ▶ Simply using a product may require energy
- ▶ Purchase appliances that are energy efficient—such as products with the Energy Star label.
- ▶ Reduce continuous energy use in “energy vampires” products
- ▶ Seek consumable products that are formulated to reduce energy use, such as detergents that are formulated to work well in cold water. This reduces the demand for energy needed to heat water.



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## End-of-life management:

- ▶ How we manage our goods at the end of their current life can make a big difference in our environmental footprint.
- ▶ *Question “End-of-Life” assumptions*
- ▶ *Question expiration labels*
- ▶ *Question electronic swap-out dates*
- ▶ *Question if waste is a given output*



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## End-of-life management:

- ▶ *“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

## USEPA - SMM Recommendations

- ▶ Expand efforts to promote life cycle materials management, building on current programs, including core regulatory programs.
- ▶ Build capacity and integrate materials management approaches in existing government programs.
- ▶ Accelerate the broad, ongoing public dialogue on life cycle materials management.



# Sustainable Materials Management

## **USEPA - SMM Objectives (by 2022)**

- ▶ 1: Decrease disposal rate
- ▶ 2: Reduce environmental impacts of materials
- ▶ 3: Increase socio-economic benefits
- ▶ 4: Increase capacity of state and local governments, communities and key stakeholders to adopt and implement SMM policies, practices and incentives



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## Sustainability: Balance of Three Values





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## G7 Alliance on Resource Efficiency

- ▶ Primary goal is to build on reducing GHG and increasing use of renewable energy and make operations more sustainable, energy secure and efficient.
- ▶ Sustainable Transportation - Focus on supply chain
- ▶ Use of recycled materials as raw material inputs.
- ▶ Waste materials from one process to another.
- ▶ Reduce GHG from full life-cycle.



# National Recycling Coalition

## Vision

- ▶ Waste reduction and sound management practices for raw materials in North America lead to an environmentally sustainable economy.



# NRC Statement on SMM

## Guiding Principles: SMM

- ▶ Sustainable Materials Management is a critical strategic shift away from the past strategy of waste management toward a holistic resource management system that strives to use less materials overall, reduce toxins, recover more used materials, create new jobs, and foster economic development.





# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *New Governmental Rules:*
- ▶ The National Recycling Coalition recommends the implementation of policies by all levels of government - federal, state and local - by business and industry, and by individual citizens
- ▶ which will increase the viability of waste reduction, recycling, reuse and material recovery mechanisms
- ▶ for resource conservation, environmental protection and economic development



# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *Public Policy on Conservation:*
- ▶ The National Recycling Coalition recognizes the necessity of immediate implementation of public policy decisions
- ▶ which reduce the exploitation and disposal of limited and valuable resources and encourage waste conscious decisions.



# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *Education & Professional Training:*
- ▶ The National Recycling Coalition recognizes that education and professional training are the key to affecting change that results in rational decisions to increase waste reduction and utilize recycling.
- ▶ Through a national education policy that emphasizes environmental quality, resource conservation, waste reduction, recycling and sustainable growth.





# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *Eliminate Subsidized Wasting:*
- ▶ The cost of virgin materials rarely reflects the true social and economic costs of their extraction, depletion and disposal
- ▶ Individuals have come to prefer new materials even though recycled content goods often are of equal or better quality.
- ▶ Business and industry overlook the use of recycled products and reutilization of materials because disposal has been easy and inexpensive.



# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *Product Design Policy:*
- ▶ The National Recycling Coalition further supports and endorses Product Design for Recyclability
- ▶ And encourages business and product manufacturers to redesign for reuse and recycling.



# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *National Policy:*
- ▶ The National Recycling Coalition supports and recommends a national policy that achieves
  - ▶ maximum environmental quality,
  - ▶ the use of renewable energy sources,
  - ▶ alternative fuels and
  - ▶ maximum materials recycling.





# Sustainable Materials Management

## NRC Recommendations for Action

- ▶ *Call to Action:*
- ▶ The National Recycling Coalition calls for affirmation of the economic and social worth of waste reduction, reuse and recycling
- ▶ by removing all barriers to scrap, secondary and recycled materials competing favorably with virgin materials,
- ▶ by educating consumers to make waste conscious decisions and
- ▶ by involving business and industry in aggressive research and product development to increase recycling and recyclability.



# Sustainable Materials Management

## New Term: “Recyclers+”

- ▶ Recyclers+ refers to professionals broadly involved with reuse, recycling, composting, anaerobic digestion, and extended producer responsibility.
- ▶ You are the community of Recyclers+, the experts that can engage in Sustainable Materials Management.
- ▶ Call to Action: YOU can make a difference!

**Together, We Are Recycling!**



# Sustainable Materials Management

## Discussion Question #1

- ▶ What should traditional recycling industry operators (collectors, haulers, MRF operators, etc.) do to deal with the challenges, and take advantage of the opportunities surrounding SMM?





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## Discussion Question #2

- ▶ What upside opportunities are there for recyclers (govt, business, public, manufacturers, CAFR members) arising out of the trend towards SMM?



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## Discussion Question #3

- ▶ What policies or initiatives might CAFR and its members try to encourage or adopt to help Colorado be part of the SMM movement?
- ▶ How can we encourage the State Government to get more involved with the process of reducing waste through SMM and recycling?





**WE  
ARE  
RECYCLING**



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