

Separation at the Source

An Effective Approach to Increasing Recycling and Reducing Costs

Presented by
 TOMRA

About TOMRA

2010-2012 Best America Award
Award of Excellence / President

The Mission: To develop the leading provider of innovative recycling technology for municipalities and waste management companies. To help communities and municipalities reduce their waste and improve their recycling programs.

Over 100 million units of TOMRA's recycling products

Why Recycle?

The historical focus of recycling in the 1990s has been on keeping materials out of landfills.

Now, it's about more than that. In many states, public and water pollution is also a concern.

Helps meet the requirements of state and federal laws

Environmental Benefits

Recycling is an important part of any waste management program. It helps reduce the amount of waste that ends up in landfills, and it helps conserve natural resources.

When a product is made from recycled materials, it uses less energy and fewer resources than when it is made from virgin materials. This means that recycling helps reduce greenhouse gas emissions and air pollution.



Recycling Facts

Recycling is the most effective way to reduce the amount of waste that ends up in landfills. It also helps conserve natural resources and reduce greenhouse gas emissions.

The amount of waste that is recycled in the United States has increased significantly in recent years.

Recycling is a key part of any waste management program.

Simple Steps to Recycling

1. Sort your recycling into different categories.

2. Place your recycling in the correct bin.

3. Keep your recycling bin full.

4. Call your local recycling center for more information.

Concerns with Single Stream Recycling

Single stream recycling is a convenient way to recycle, but it has some concerns. It can be more expensive than other recycling programs, and it can be more difficult to manage. It also can be more difficult to ensure that all materials are properly recycled.

Economic Impacts on US Recycling Industry

The recycling industry is a major part of the US economy. It provides jobs and income for many people. It also helps conserve natural resources and reduce greenhouse gas emissions.

From Waste to Resources

Waste is not a problem. It's a resource. Recycling helps turn waste into resources that can be used to make new products. This helps reduce the amount of waste that ends up in landfills and helps conserve natural resources.

Value Proposition

Recycling is a valuable proposition for municipalities and waste management companies. It helps reduce the amount of waste that ends up in landfills and helps conserve natural resources. It also helps reduce the cost of waste management.

Questions

1. How can I get started with recycling?

2. What are the benefits of recycling?

3. How can I reduce the amount of waste that ends up in landfills?

Separation at the Source

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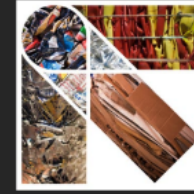


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TOMIRA

About TOMRA



TOMRA North America: Founded in 1972

Active in 9 States and 1 Province

Our Mission: To become the leading provider of advanced recycling technology for used packaging

World leader in compaction and baling solutions for solid waste materials at the source

- Installed base of over 70,000 balers around the world

Serve major food retailers and beverage producers

Why Recycle?



The historical focus of recycling (in the 1990s) has been on keeping materials out of landfills.

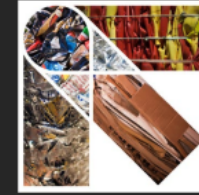
Now, it's about more than that. In recent years, public solid waste policy has shifted to focus more on...

Reducing need for virgin materials

Avoiding GHGs and production of toxics

Reducing energy use

Environmental Benefits



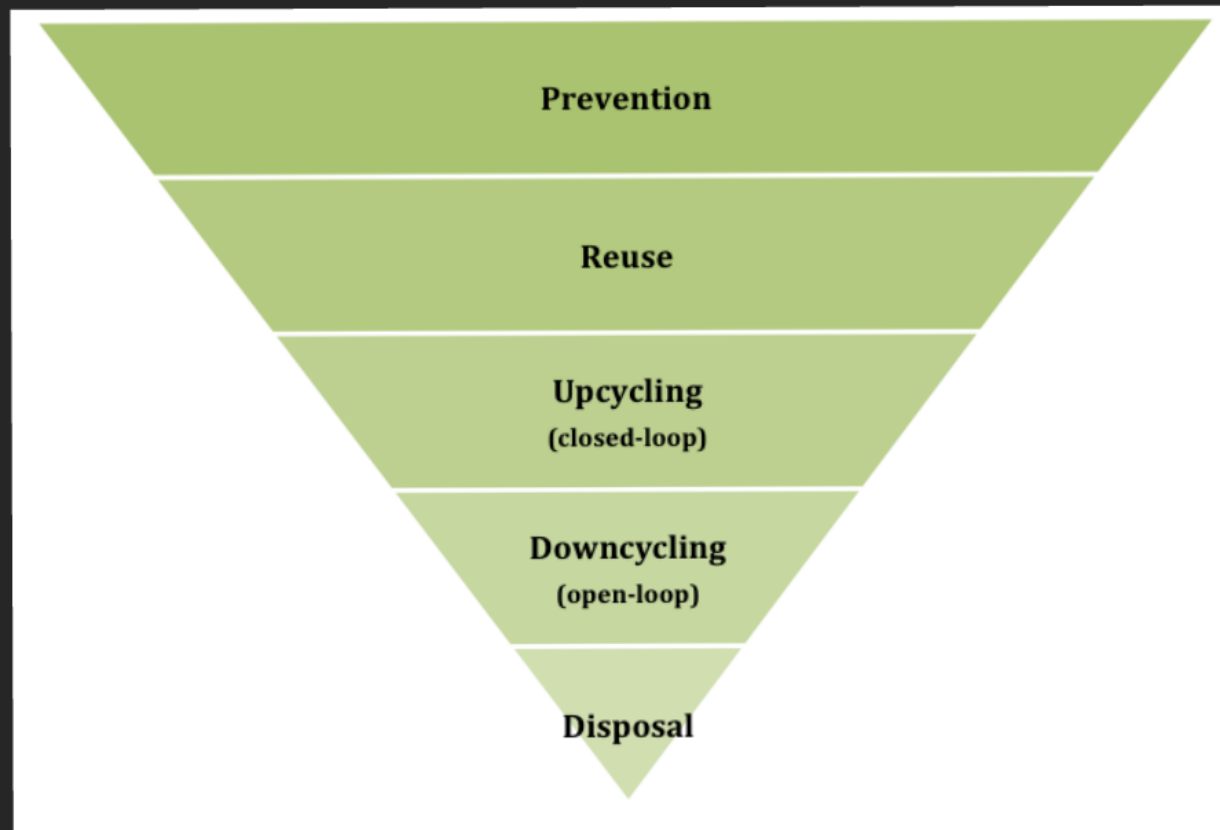
Next to conserving natural resources, the most immediate benefit from recycling are the **energy savings**.

When a product is made from recycled material, the use of virgin materials is not required. Therefore all the upstream energy and associated environmental impacts from the extraction, transport, and processing of those virgin materials are avoided.

Material Type	Energy Saved by Recycling (%)
Aluminum	95%
Glass	30%
Plastic (all resin types)	70%

But not all recycling is equal...

Recycling Hierachy



The key to achieving the environmental benefits of recycling is to keep the material circulating for as long as possible.

The upstream environmental benefit of closed loop recycling is **10 to 20 greater** than open-loop recycling.

Upcycling

Upcycling, also called "closed-loop" recycling, converts end-of-life materials into new materials or products of higher quality and increased functionality. It is about reclaiming the materials from one product and using them to produce the same (or very similar) product in a closed-loop system.

Examples of closed-loop recycling

The world's first closed-loop recycling system was developed in 1979 by the U.S. Army Corps of Engineers. It was designed to recycle 100% of the waste generated by the construction of a new highway interchange. The system was successful because it was designed to recycle the same materials that were used in the original product.



Downcycling

Downcycling, or "open-loop" recycling, is where material is reclaimed for reuse in a product of lesser quality or in some way reduces the functionality of the material. When material is downcycled, it cannot be used to make the original product.

Examples of open-loop recycling

Recycling of glass bottles into lower quality glass products, such as fiberglass, is an example of downcycling. The recycled glass is used to make products that are not as strong or durable as the original glass bottles.

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Examples of closed-loop recycling:

- Recycled office paper being manufactured into a new paper product using secondary feedstock instead of virgin fiber
- Aluminum can being turned into a new aluminum can
- Recycled glass (cullet) used in the manufacture of new glass bottles (bottle-to-bottle)
- Recycled PET resin being manufactured into new plastic containers for foods, beverages, etc.



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Examples of open-loop recycling:

- Recovered aluminum cans being manufactured into siding, automotive parts, and aluminum foil
- Recycled glass (cullet) being manufactured into fiberglass or being used as road aggregate or as substitute cover in landfills
- Recycled PET resin being manufactured into carpet and clothing fibers or other packaging materials

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Single-Stream Recycling

- Allows businesses to commingle all their recyclables in one bin
- Began in California as municipalities were looking for a way to increase diversion while keeping recycling costs down
- Becoming increasingly popular in North America



Why is it so popular?

Increased recycling participation

More material collected

Reduced transportation costs

Reduced labor costs

Despite the advantages, single-stream recycling does not show the cost advantage that was originally anticipated...

Concerns with Single Stream Recycling Collection

Increased Contamination

- In general, single-stream MRFs produce materials of lower quality, and with more residuals and outthrows
- This increase in contamination results in the material being worth less, and can reduce the recycler's ability to produce quality end products
 - e.g. On average, 40% of glass from single-stream collection ends up in landfills, while 20% is glass fines used for low-end applications (e.g. road aggregate). Only 40% is recycled into containers and fiberglass.

Increased Processing Costs

- With the growth of single stream collection, recyclers/processors have seen their costs increase, related to:
 - Cleaning and screening poorly processed materials
 - Repairing damage to equipment
 - More frequent equipment cleaning
 - Equipment replacement
 - Buying new raw material to replace those that were unusable
 - Increased disposal costs to dispose of residual materials that cannot be used
- It is estimated that paper mills spend \$5 to \$13 more per ton to process material from single-stream systems compared to material collected using cleaner methods

Lower Yield Rates

- While single-stream MRFs take in higher quantities of material compared to multi-stream MRFs, less of that material is sent for recycling.
- According to a Eureka Recycling study in Minnesota, source-separated MRFs reported losing only 1.6% of materials to residuals or outthrows, compared to 27.2% for single-stream systems.
- Plastics recyclers report that on average, material from single-stream MRFs has a yield rate of about 68%-70%, compared to bales of PET from deposit return systems which typically have a yield rate of ~85%
- Paper mills that receive materials from single-stream MRFs have contamination rates as high as 18%

In the end, with increased processing costs and lost revenues due to lower-quality material, the costs of single-stream are actually higher!

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Economic Impacts on US Recycling Industry

- Low quality recyclables are often shipped overseas where the materials can be separated for lower-costs (cheaper labor)
- Attractive low-cost overseas markets for secondary materials tightens the supply of domestically available secondary feedstock
 - Less material flowing to secondary processors and manufacturers
- Lost jobs
- Disincentive to use recycled content due to increased production costs

So, what is the best way to
manage our waste?



From Waste to Resources

"Waste" is simply resources mixed together.

To increase the chance that these resources are recycled, separation and compaction of waste materials at the source is critical.

Compaction can assist by offering space savings, which allow for less frequent pick-ups with fewer vehicles for pick up

- Saves \$ by reducing labor and transportation costs

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Value Proposition

Source separate and bale materials on-site to attain the greatest economic value for collected materials and ship directly to market



Value to Small and Mid-Sized Generators

- Baling creates efficient compaction for transportation of the commodity and offers metrics for recycling volume reporting
- Baling allows businesses to pack more and spend less when managing waste or recyclable materials

Value to Small and Mid-Sized Generators

- Based upon the options currently available to mid- and small producers, the capture rate is generally low
- Baling source separated materials on site increases weight (density) and saves space

Questions ?



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Economic Impacts on US Recycling Industry

The recycling industry is a major part of the US economy. It provides jobs and generates revenue. However, it is also facing challenges from changes in government policy and market conditions.

From Waste to Resources

Waste is not a problem, it's a resource. By recycling, we can turn waste into valuable resources that can be used to create new products.

Competition can be won by offering high quality products that are made from recycled materials.

Value Proposition

Value proposition is the unique benefit that a company offers to its customers. It is the reason why customers choose to buy from that company.

Questions

1. How can we improve our recycling program?

2. What are the benefits of recycling?