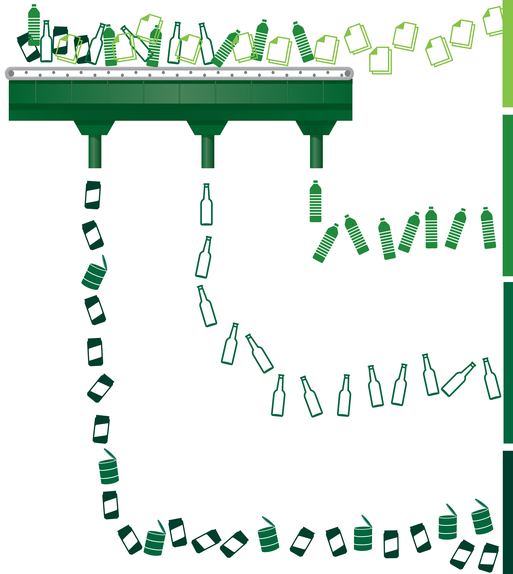
The life cycle of recycling

From the MRF and beyond

Materials recovery facility (MRF)

Collection trucks bring recyclables to a MRF. The recyclables are unloaded onto an area called the "tipping floor." Notice that this is a "single-stream" MRF. That makes recycling easier for residents and businesses since recyclables don't need to be separated for collection. However, it requires intensive processing on the back end to separate materials to prepare them for sale to end users. This is why it is essential to recycle right to prevent breakdowns in the processing lines and to ensure commodities are sellable, which is integral to recycling program sustainability.

From the tipping floor, recyclables are placed on conveyor belts where they are sorted by machine or hand into broad categories of paper, plastic, glass, and metal.



Paper

Paper recyclables are separated into 4 categories:
- Courrugated Boxes
- Old Newsprint (ONP)
- Mixed paper
- Office Mix

Paper recyclables are baled and sold primarily to paper mills.

Old newspaper is de-inked by washing and rinsing it in large vats of water. This process also separates the short fibers from the long fibers.

Some mills are able to use 100% recycled paper, while in others, recycled paper (long fibers) is combined with wood scraps from lumber mills. This is mixed to a pulp and poured onto large rollers and drained. The sheet is lifted and feb through heated rollers, then trimmed and rolled. The rolls are sent to printing plants.

Recycled Paper

Plastic

Mixed plastic containers are sorted by type and color. Air is blown into the mix to separate heavier and lighter plastics. In some facilities, plastic containers are optically scanned for separation into types, such as PET, HDPE, etc.

Textile, plastic, bottle, carpet and other manufacturers use these commodities.

Baled, recycled plastics are sent to a plastics remanufacturing plant. The plastics are ground up, washed, melted and formed into plastic pellets. The pellets are used to make containers, bottles, paint, clothing, furniture and many other consumer goods.

Recycled Plastic

Glass

Glass recyclables are crushed to form cullet, which is then cleaned of debris and contaminants. Depending on the facility, glass may be sorted by color before or after crushing, or it may be shipped to end users without sorting.

Cullet is loaded into trucks for transport to a variety of customers. It's used in a number of applications, including new containers for consumer products, road bedding, sandblasting, counter tops, and other uses.

For use in making new glass containers, the cleaned cullet is mixes with sand, soda ash, feldspar and limestone at a glass plant. It is fed into a furnace and melted at temperatures reaching 2,700°Fahrenheit. Using recycled glass in this way reduces emissions and energy usage, extends the life of plant equipment , and conserves raw materials.

Recycled Glass

Metal

Magnets are used to separate the steel from the rest of the recycling stream. Steel attracted to the magnet is removed to storage bin for baling.

Aluminum remains on the sort belt and is mechanically separated by an eddy current.

After separation, cans are crushed and baled for transport to steel or aluminum mills.

Aluminum is melted and poured into ingot molds or rolled into sheets. The ingots are used by industries to make new aluminum products.

Tin and steel are recovered through chemical and electrolysis baths. Then they are purified, melted and cast into ingots.

The steel is heated in large vats and poured onto sheets. The steel is coated with tin and shaped into cans.

The sheets are shaped into cans, siding, storm window frames and other products.

Recycled Metal

Closing the Loop

Recycled containers and products are purchased by manufacturers, who use them to produce or package their products that are shipped to retailers.

Consumers buy the products from a wide variety of retail stores. As we use the products, we create waste that begins the cycle over again.

Choose Wisely!

There is currently no economical technology for separating waste from recyclable materials.
The succes of recycling depends on you: Place recyclables in the proper recycling container.

THINK GREEN.