RECYCLING 101: WASTE HIERARCHY

MOST Preferred Option

REDUCE

Reduction or waste prevention, means reducing waste at its source, and is the most preferred strategy. The waste management hierarchy places top priority on reducing or preventing as much waste generation as possible. Reduction includes lightweighting, buying in bulk and material substitutions.

REUSE

Reuse encourages products be designed in such a way so that they can be reused as much as possible to extend the life of the product. The aim is to reduce the overall use of finite, raw material resources.

RECYCLE

Mechanical recycling is a series of steps that includes collecting used items, most commonly at curbside collection, and shipping them to Material Recovery Facilities (MRF) to be sorted. Sorted materials are baled and sent to a reclaimer to be shredded and washed. The materials are then sent to a fabricator where they are melted and made into new products, then sold to end markets.

Advanced recycling is an umbrella term used to refer to processes that use heat, pressure, or solvents to break down the molecular chains of polymers into liquids or gases that can be used to make new fuels, oils, waxes, plastics and chemicals. This is used for difficult to recycle plastics.

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for Advanced Recycling and Recovery Technologies

RECOVER

Recovery refers to diverting non-recyclable materials from landfill via various non-combustion and combustion technologies.

A variety of technologies can be used to convert non-recyclable waste materials that would otherwise go to landfill into energy or fuel. This reduces the need for virgin resources. These facilities scrub emissions from being released into the environment.

DISPOSE

Landfills are the least desirable, yet most common, form of waste disposal.

LEAST Preferred Option

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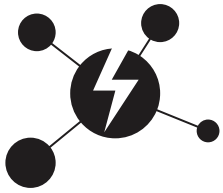
ADVANCED RECYCLING

Purification

Dissolves plastic in a solvent and then purifying the polymer by separating it from any additives and dyes used in the plastic. This process does not change the polymer on a molecular level. Typical resins used in the purification process include Polyethylene terephthalate, polyethylene, polypropylene and polystyrene.



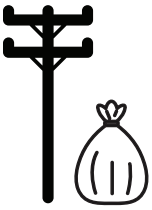
Decomposition

Breaks the molecular bonds of the plastic via solvents and heat to recover the simple molecules/ monomers from which the plastic is made. The monomers are then reconstructed into new plastics. This process is referred to as depolymerization. Typical resins used in decomposition process include polystyrene and polyethylene terephthalate.

Conversion

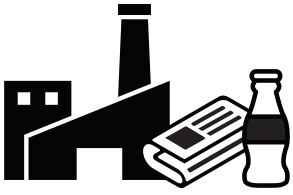
Is similar to decomposition in that it breaks the molecular bonds in the plastic, however a key difference is that the conversion process output is often a liquid or gaseous hydrocarbon that can be made into intermediates and monomers for new plastics. Typical inputs used in the conversion process are plastics (for pyrolysis) and unsorted trash (for gasification).

ENERGY RECOVERY TECHNOLOGIES



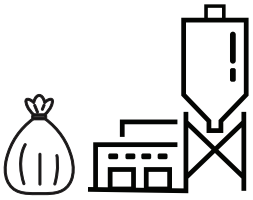
Waste-to-energy (WtE)

Include mass burn incinerators which process general trash to create steam which is either sold for use in industries, or used to turn turbines which create electricity which is put into the municipal electrical grid. After the energy is recovered, only about 10% of the volume of feedstocks remains as ash, which is sent to landfill.



Solid Recovery Fuels (SRF)

Are typically a mixture of compressed plastics and paper fibre pellets used as a fuel source in industrial kilns, boilers, and furnaces.



Cement kilns

Can use small amounts of non-recycled plastics as a source of heat in the production of cement, which helps to displace the use of virgin heat sources such as coal, coke, and natural gas.