Can-U-Read

Recycling Plastic

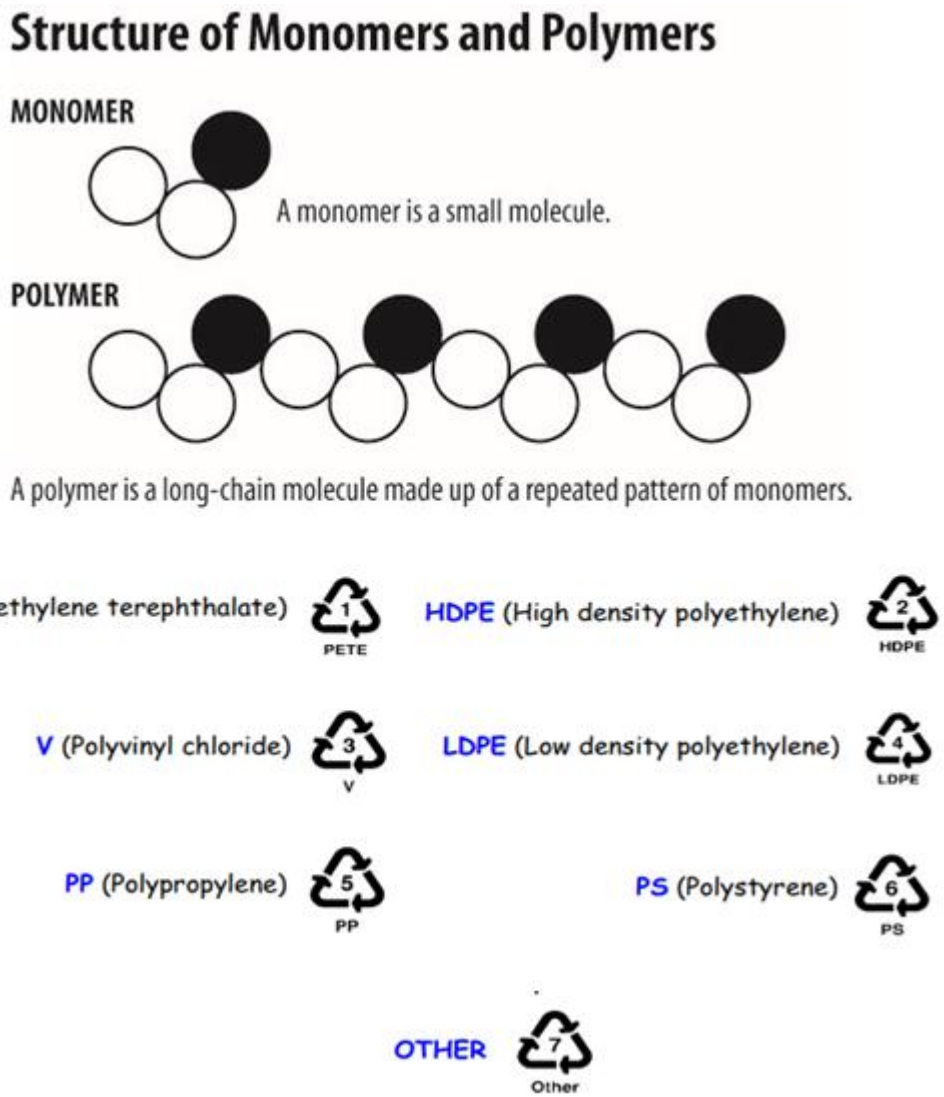
Plastics are polymers.

The world **POLY** means they are made from sticking together many small molecules.

The Society of The Plastics Industry (SPI) defines 6 unique types of plastics.

Most of the plastics you can recycle have either a 1, 2, or 3.

Chemists are working to find new ways to recycle the other plastics.



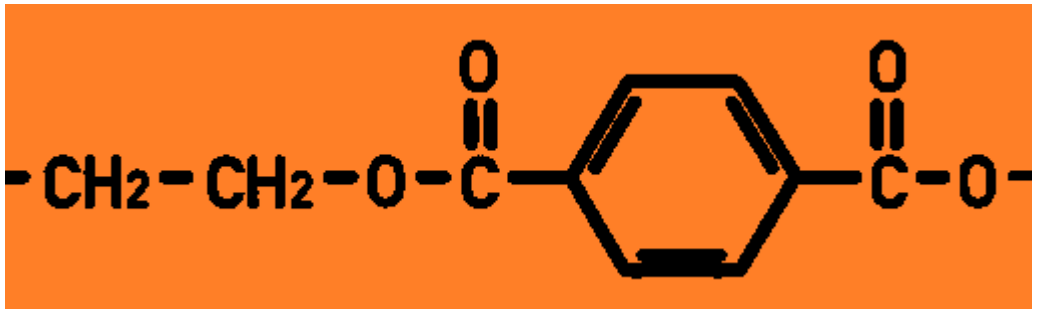
The first type is PET.

PET is easy to melt and mold into any shape.

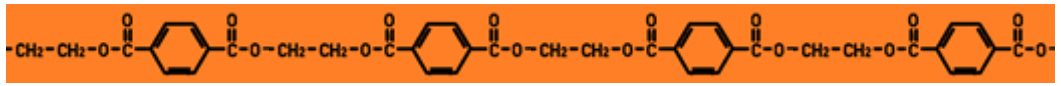
It is see-through, flexible, and light weight.

It is ideal for plastic bottles, jars, and containers.

ethylene terephthalate



POLY(ethylene terephthalate)



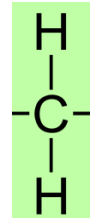
The second type is HDPE.

HDPE can also be melted and molded into bottles.

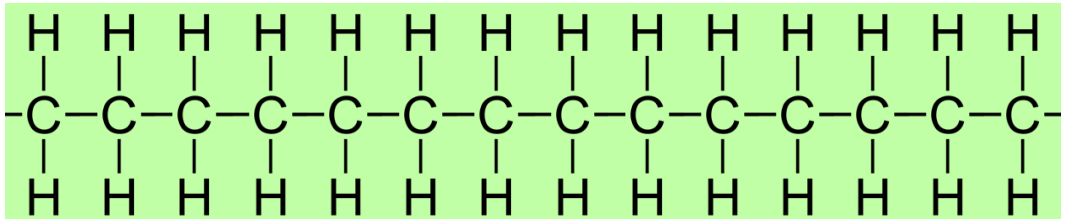
HDPE is not see-through, but it is still flexible and much stronger.

Heavier bottles like milk jugs, detergent bottles, and motor oil bottles can be made.

ethylene



High density **POLY**ethylene



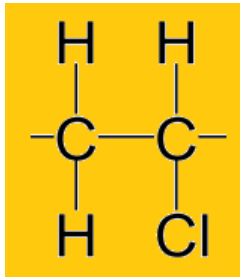
The third type is PVC

If PVC melts it makes dangerous chemicals.

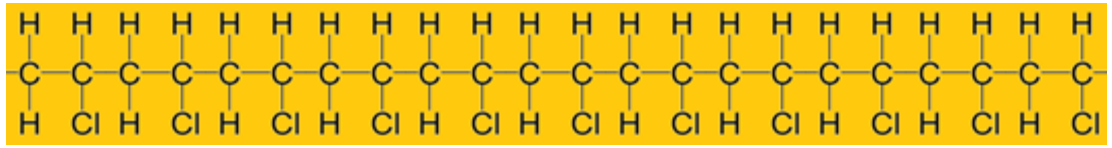
PVC can be colored and it is extremely strong.

It can be used for pipes and lids to go on the softer bottles.

vinyl chloride



POLY(vinyl chloride)

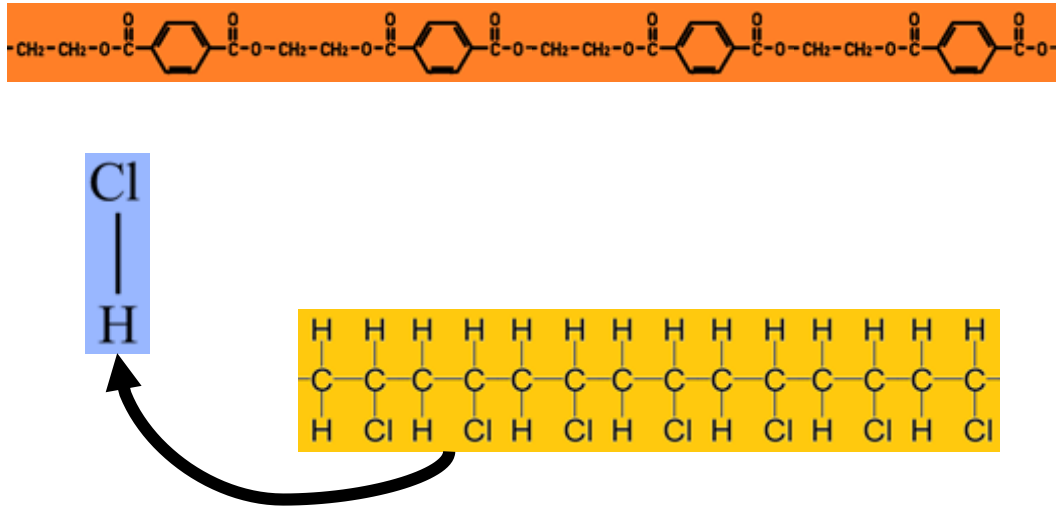


Recycling different plastics is hard.

For instance PET can be remelted under a high heat.

If there is any PVC mixed in, it makes a dangerous acid.

Sorting the different plastics is very important.



At first the plastic comes in mixed with other trash.

It can be whirled around with air to separate it by size.

The air can also separate foil, paper and other materials that are lighter than the plastic.

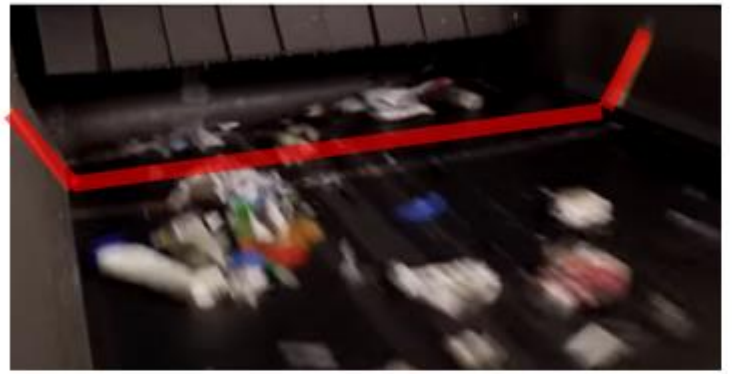
The mixed plastic that comes out still needs to be sorted.

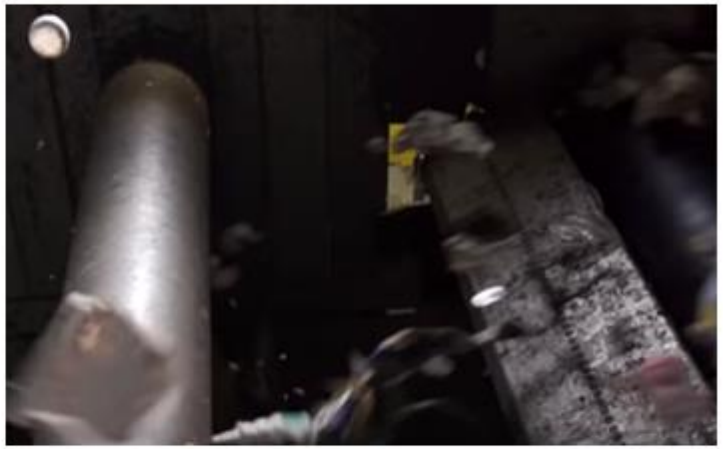
The plastic is rolled over infrared sensors.

The sensors can tell the types of plastic apart.

They use jets of air to kick each type out.

What is left over is so mixed or dirty that it can’t be used for recycling.





The blocks of sorted plastic are 94% to 98% pure.

They take the blocks to a recycler who cleans, chips, and sorts again.

The chips are all different colors.

If they were melted together the color would be a yucky gray.

They sort chips by color, so the colors stay pretty.

This stream of chips is pure white.

In one hour they make 800 kg of plastic flakes.

These flakes are 99% pure so they can be used to make things.

Right now the plastic can be used to make non-food containers.

Soon they may make recycled plastic clean enough for food.

Recycling is about a cycle.

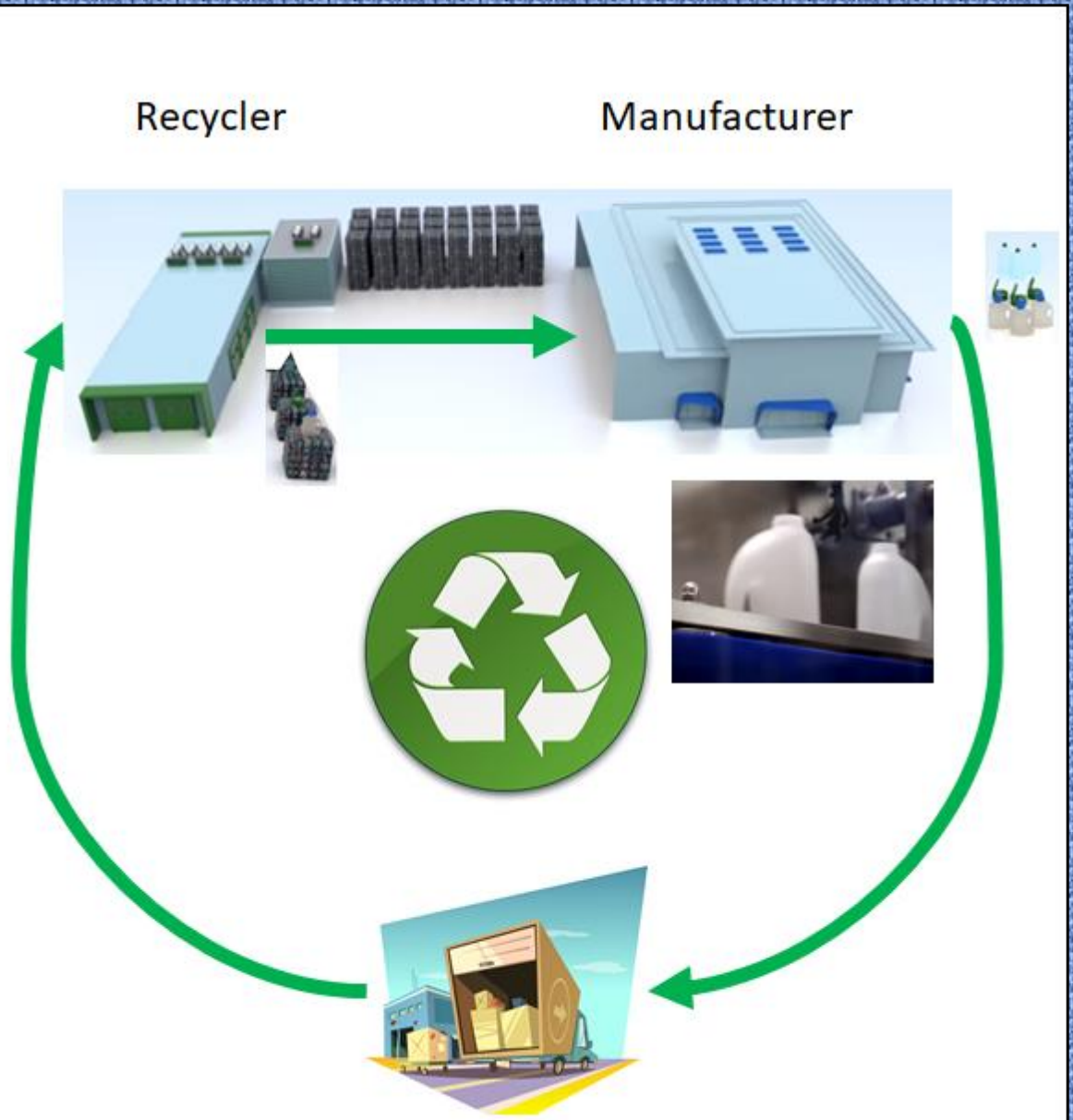
A bottle is made by the manufacturer.

The bottle is used and thrown away.

The bottle is recycled into plastic chips.

The chips are used to make a bottle.

If the cycle is complete, then no new plastic needs to be made.



Unfortunately, the cycle is not complete from mixed recycling.

Right not only 20% of new bottles can be made from recycled materials.

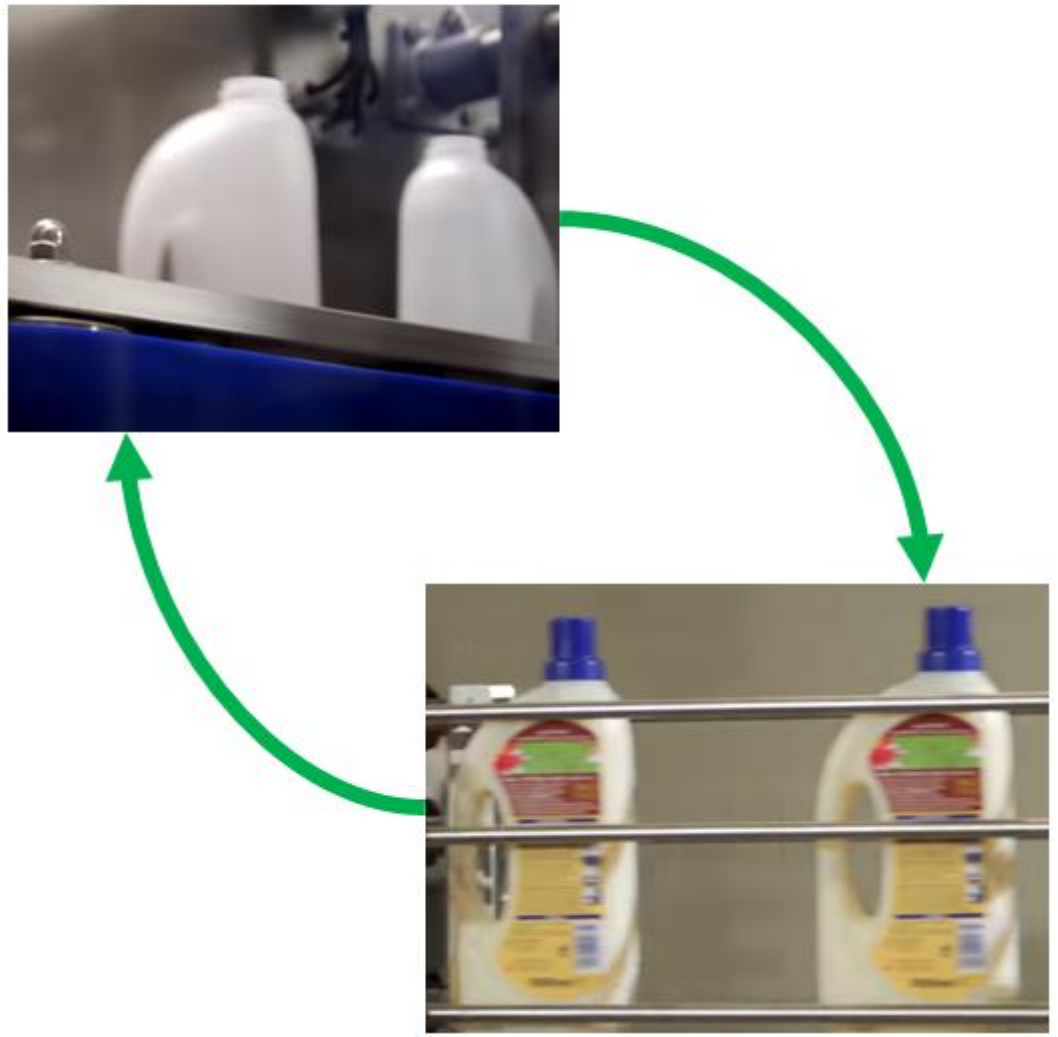
When people pre-sort all their bottles even more PET can be recycled.

As people become better at recycling, more people will want the material.

With more buyers, the recycling process will grow.

As it grows, the price of recycling will go down and people will make more profit.

This is a positive feedback loop.



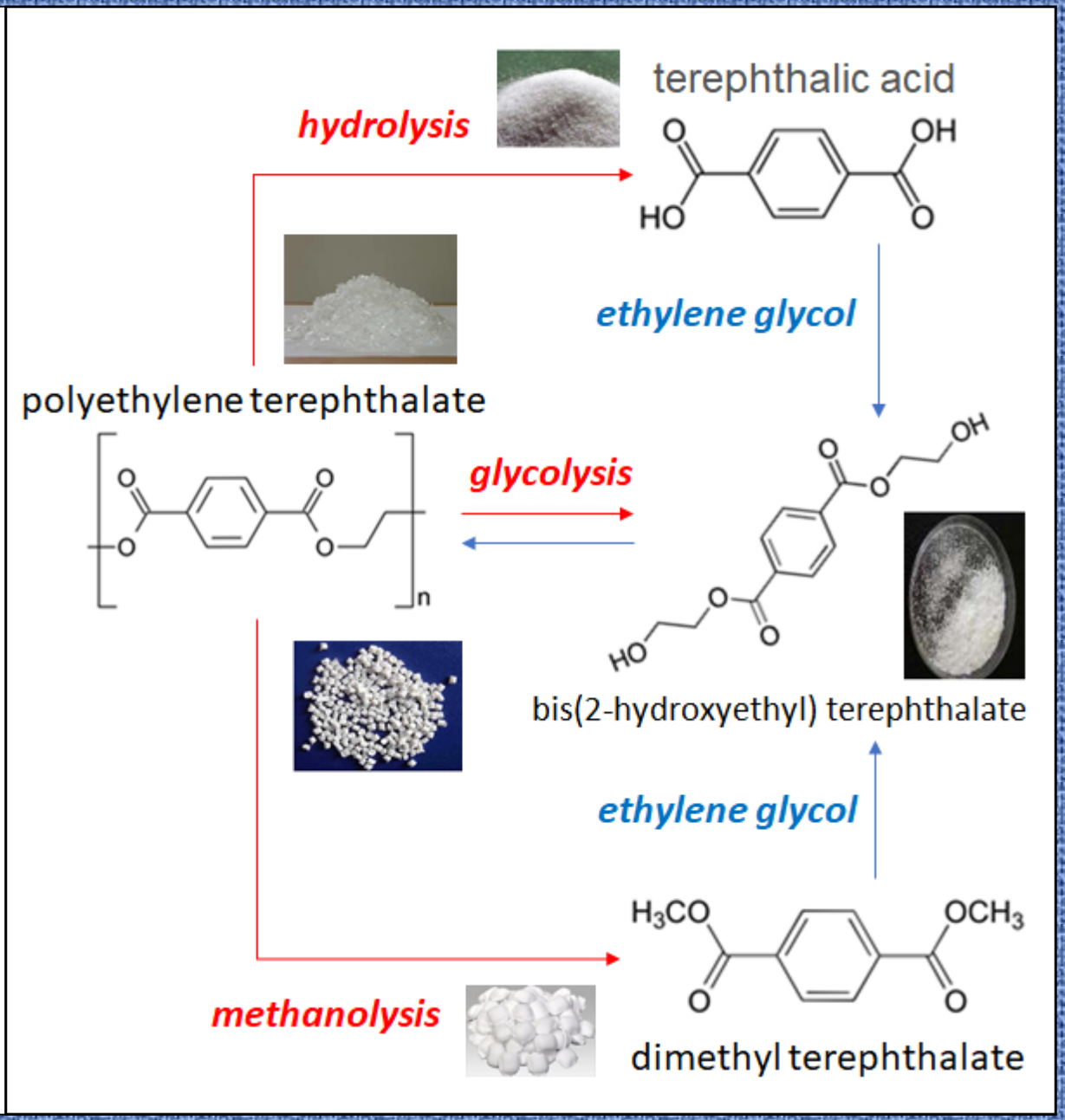
There are other chemical recycling processes.

If you take PET you can use three different paths to get to BHET.

BHET can be made into many different kinds of plastics.

This makes the PET into anything else.

This recycling is really expensive, but it is better than remelting.



Another kind of recycling is “downgrading”.

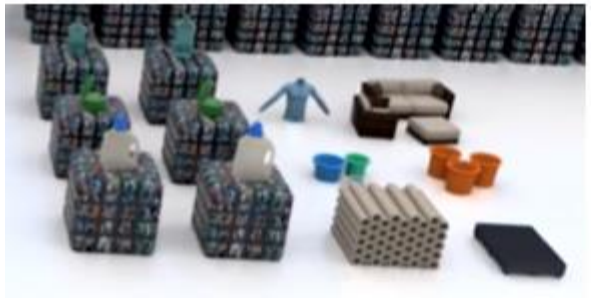
If you take plastics and make them into useful things, that is good.

- Clothes
- Buckets
- Pipes

These things can never be recycled again.

That plastic is useless for any other work.

Some of the impure plastics go into these products.

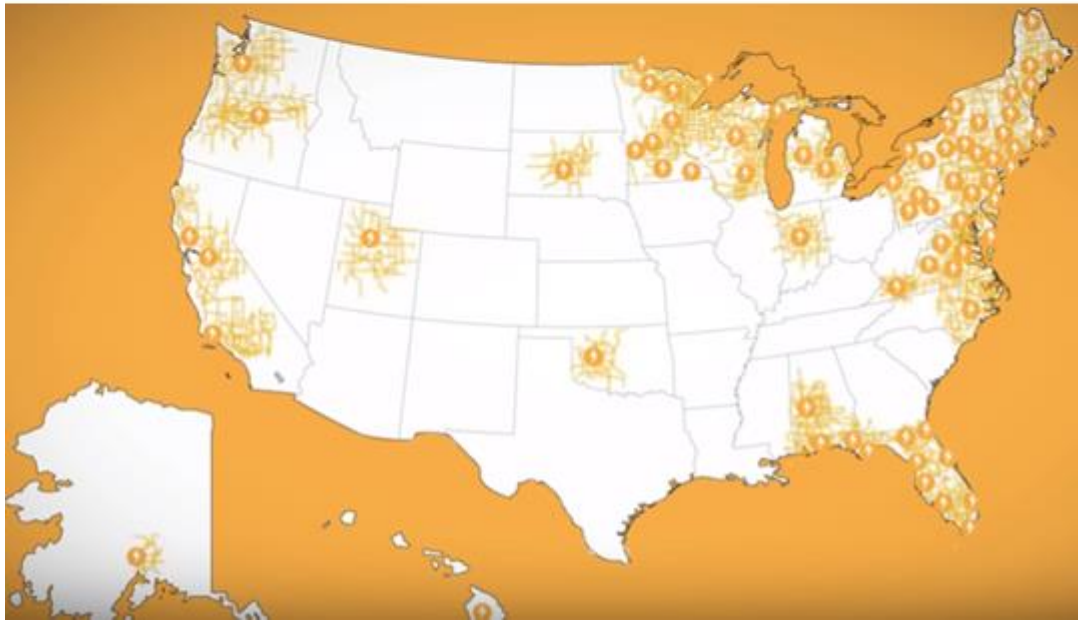


The worst and messiest plastics are no good for making things.

Instead they can be burned to create electricity.

This is called energy recovery.

There are lots of places across the US where plastics fuel the electric grid in the area.



Plastics are really useful.

We can make so many things with plastics.

Chemistry will help us to find better ways, cleaner ways, cheaper ways, to reuse the old plastics.

One day we will complete the cycle of plastic products.

If we are to clean our oceans, we need to make the plastic trash valuable.

People need plastic, but right now it is easier to make new plastic.

We can make the ocean a natural resource.

One day people will be paid to fish plastic from the ocean.