

**Can-U-Read**

**Recycling Aluminum**

Our earth is made from lots of things.

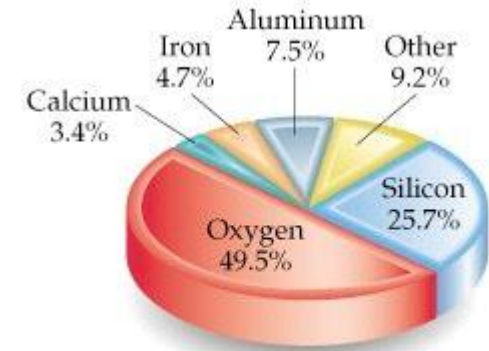
Most of the Earth is oxygen.

It get mixed into everything.

The most common metal is aluminum.

Bauxite is the ore that contains aluminum.

It's not a surprise that bauxite is a mixture of oxygen and aluminum.



Earth's crust



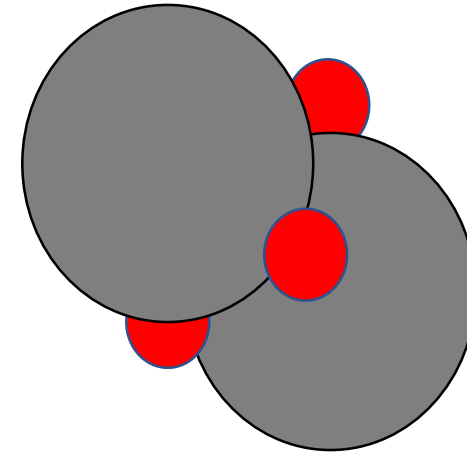
Bauxite is a molecule.

Three oxygen and two aluminum atoms make the molecule.

This is how aluminum is found on Earth.

We can't use it like this.

People have to refine the ore to clean out the oxygen.



Separating the oxygen and aluminum takes a lot of energy.

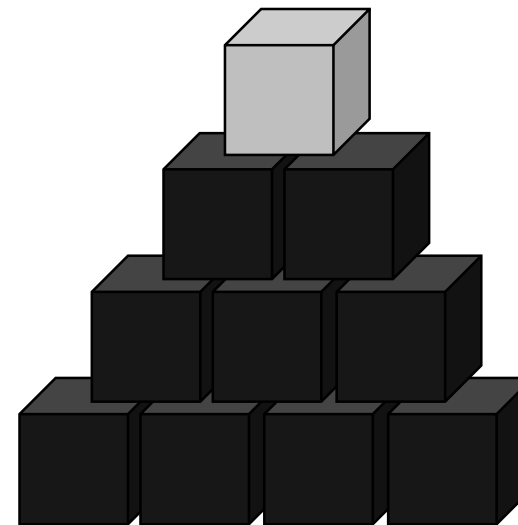
Big electric cathodes are put into the melted bauxite.

Lots of electricity is used to pull the oxygen to the cathodes.

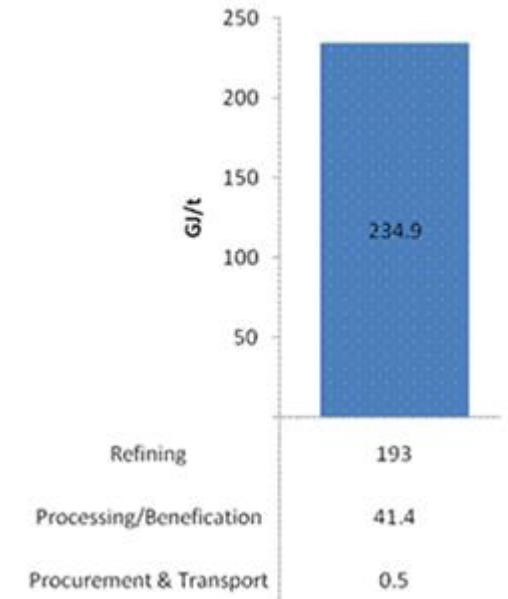
This uses so much electricity.

For every ton of aluminum costs nine tones of carbon dioxide.

This means that new aluminum is making our planet dirtier.



Energy Consumption  
for Aluminium Processing



That is the bad news, but there is lots of good news.

Recycled aluminum doesn't need to be separated from oxygen.

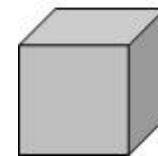
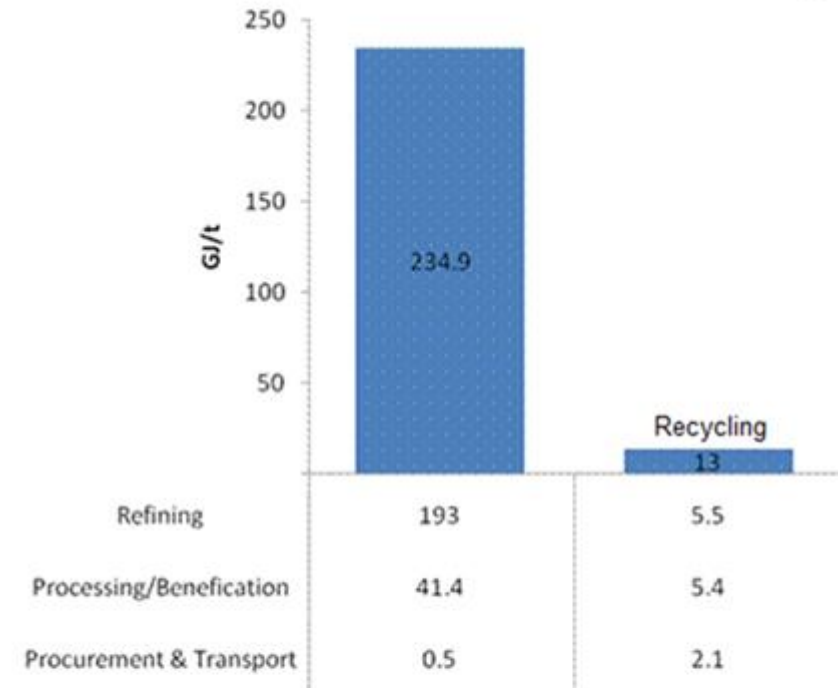
Even though people have to do a lot of work to recycle, the cost of recycled aluminum is much lower.

For one ton of recycled aluminum you only create half a ton of carbon dioxide.

So, if you use can recycle one soda can you save eight and a half can's worth of carbon.

That can keep our planet clean.

Energy Consumption  
for Aluminium Processing





The first step to recycling is to collect and sort the cans.

Aluminum cans are mixed up into all the other trash and recyclables.

People have to walk through the trash and separate anything else that is mixed in.

After that, the cans are cleaned, crunched into simple blocks, and transported to the smelter.



At the smelter the aluminum is checked again.

Everything that gets mixed in will hurt the aluminum, so people check it by hand.

It's hard to tell if iron or steel is still mixed in, so the aluminum is run under a big magnet.

Iron or steel will stick to the magnet; aluminum won't.



Some of the aluminum may be mixed with heavier metals like copper.

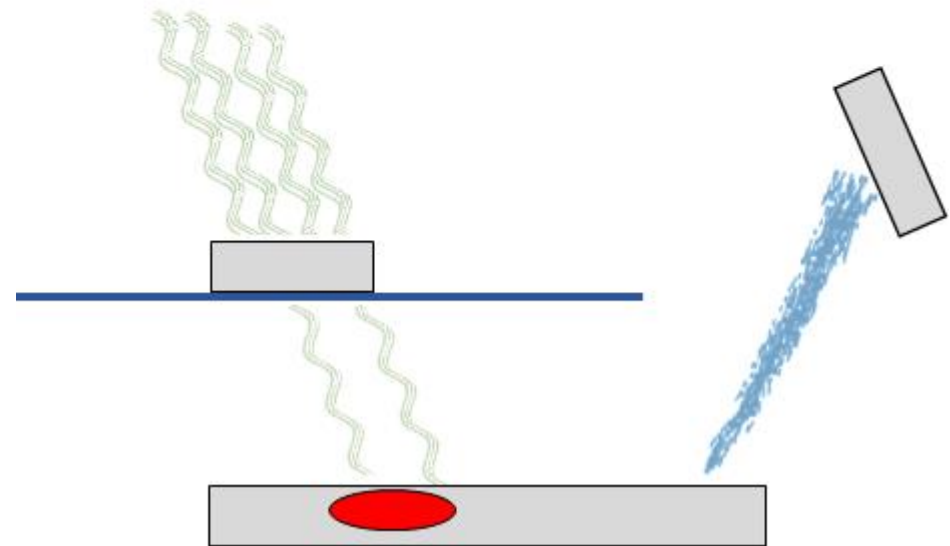
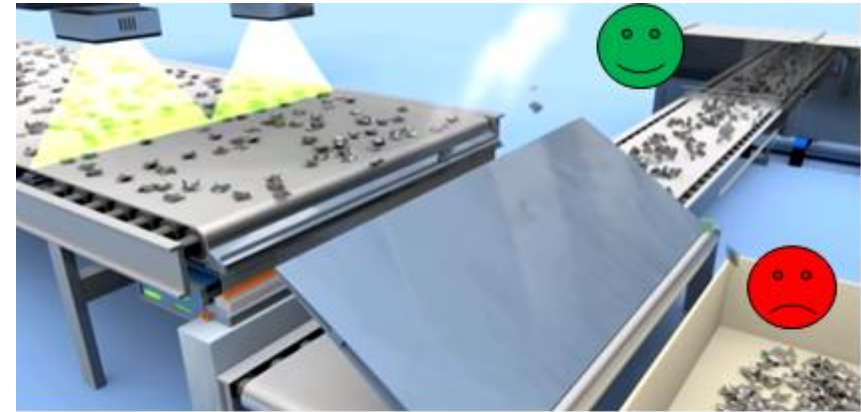
The last sorting step runs the aluminum under radiation.

If the metal blocks the radiation, it must have copper.

A computer eye can tell the difference.

The computer spits water at the bad block to throw it into another bin.

All the other aluminum goes on to the smelter.





Before melting the aluminum a machine chops it into little pieces.

The little pieces are easier to melt.

All the pieces are put into a melting pot.

Even though the sorting has been very careful, the mixture is still not perfect.

Sometimes they add more clean aluminum to “sweeten” the mixture.

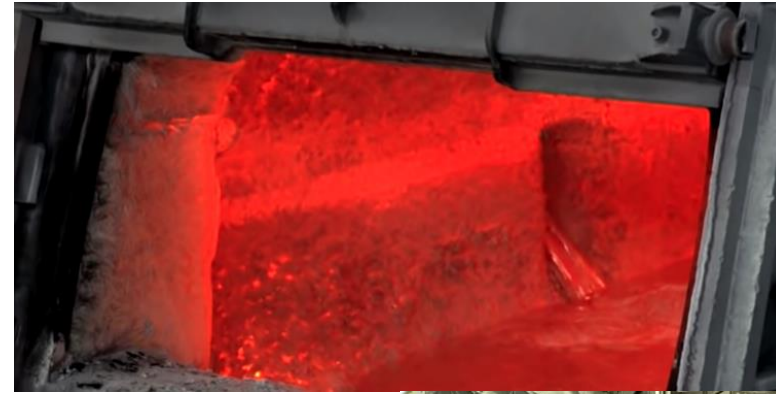


Once the aluminum starts to melt it can be taken elsewhere.

There are lots of ways to do this, but the melted aluminum flows just like water.

The aluminum flows into trays just like we used for ice cubes.

Once the aluminum cools we have ingots.



When people use aluminum, they create a lot of left-over pieces.

That scrap aluminum is really pure.

The recycled aluminum is less pure.

Sometimes it gets so mixed up that it isn't much good as aluminum any more.

We can still find places to use it; making things like window frames.





We use more than 45 million tons of aluminum each year.

About 97% of the aluminum in bauxite gets used.

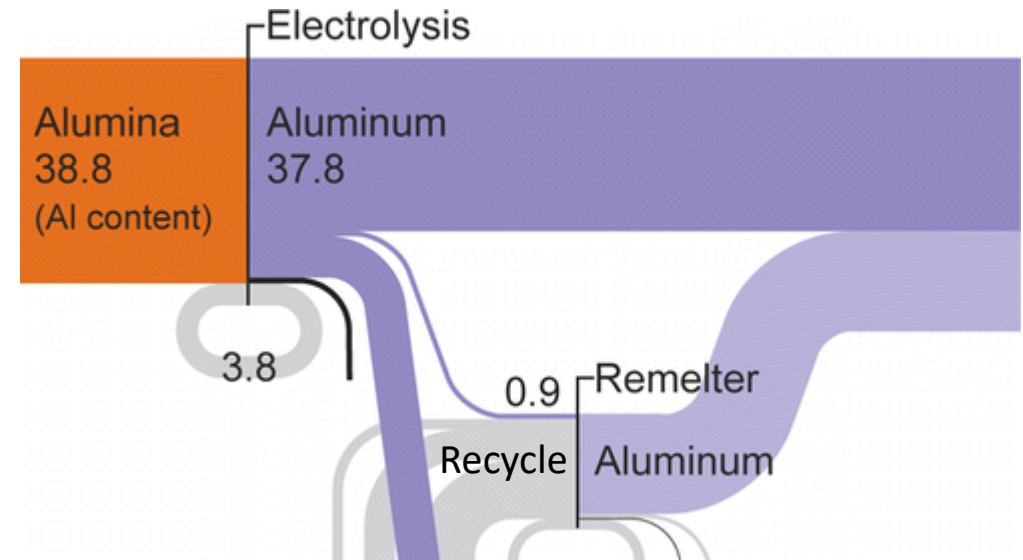
A lot of metal scrap goes right back to the smelter.

A lot of recycled material can be used to replace new aluminum.

90% pure aluminum is still as good as new aluminum.

Even 20% pure aluminum is still really useful.

So keep recycling!





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