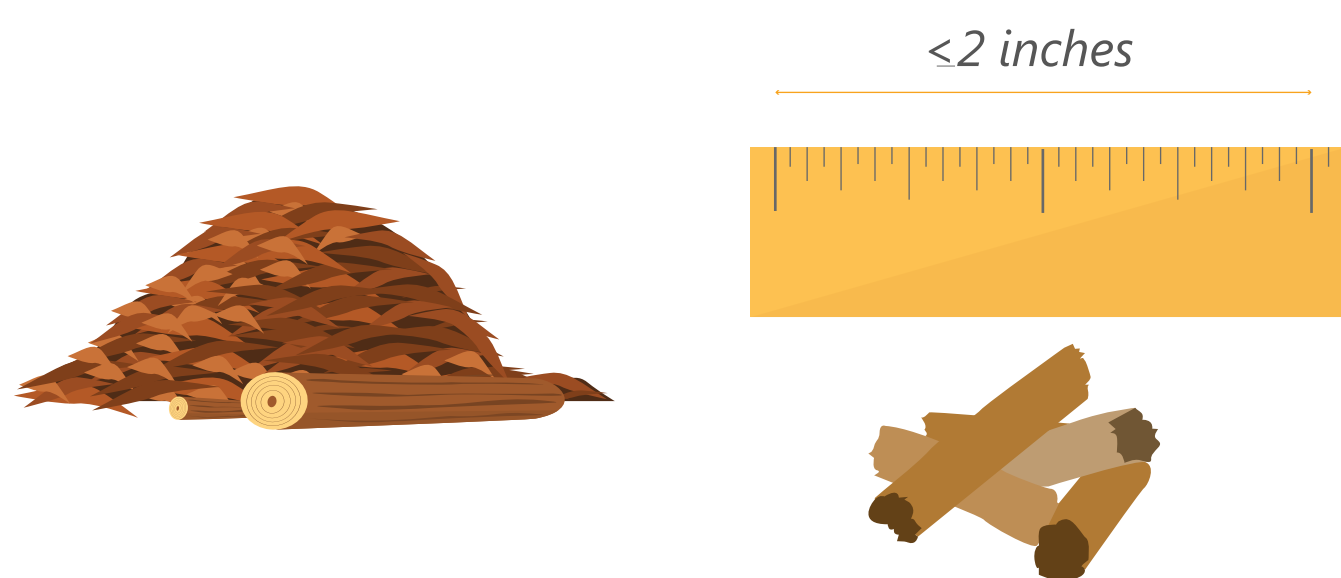


# Using gasification to make CELLULOSIC ETHANOL



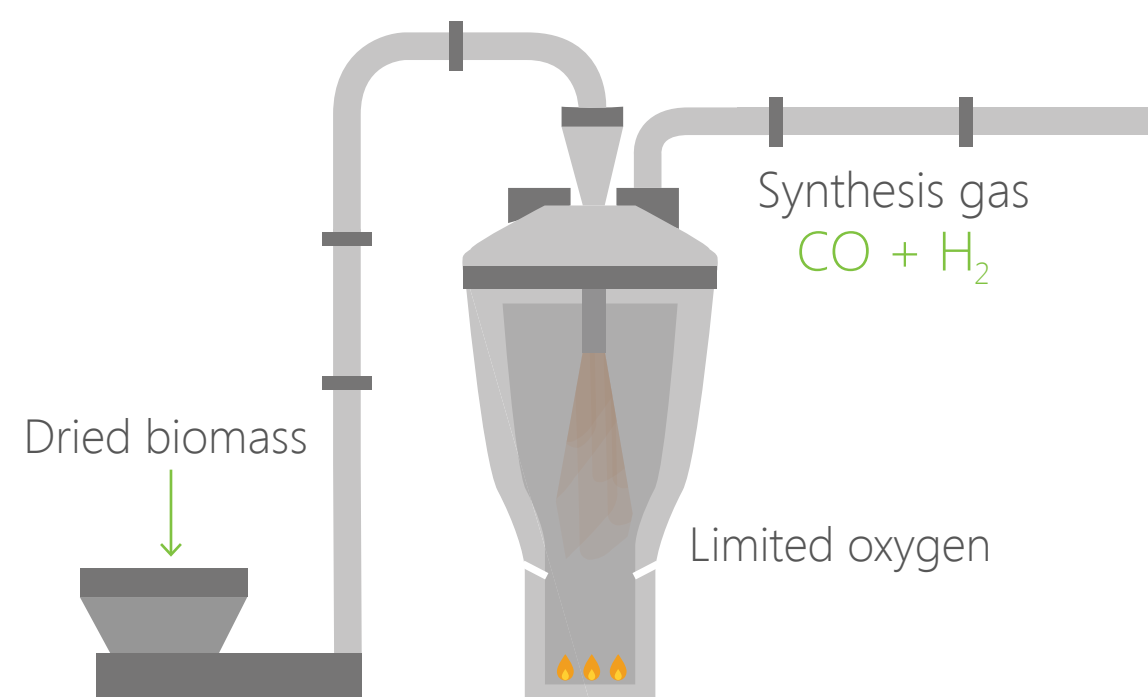
Cellulosic ethanol is an advanced biofuel. It does not compete with our food supply and is made from non-food sources such as residue from the forestry sector.

1



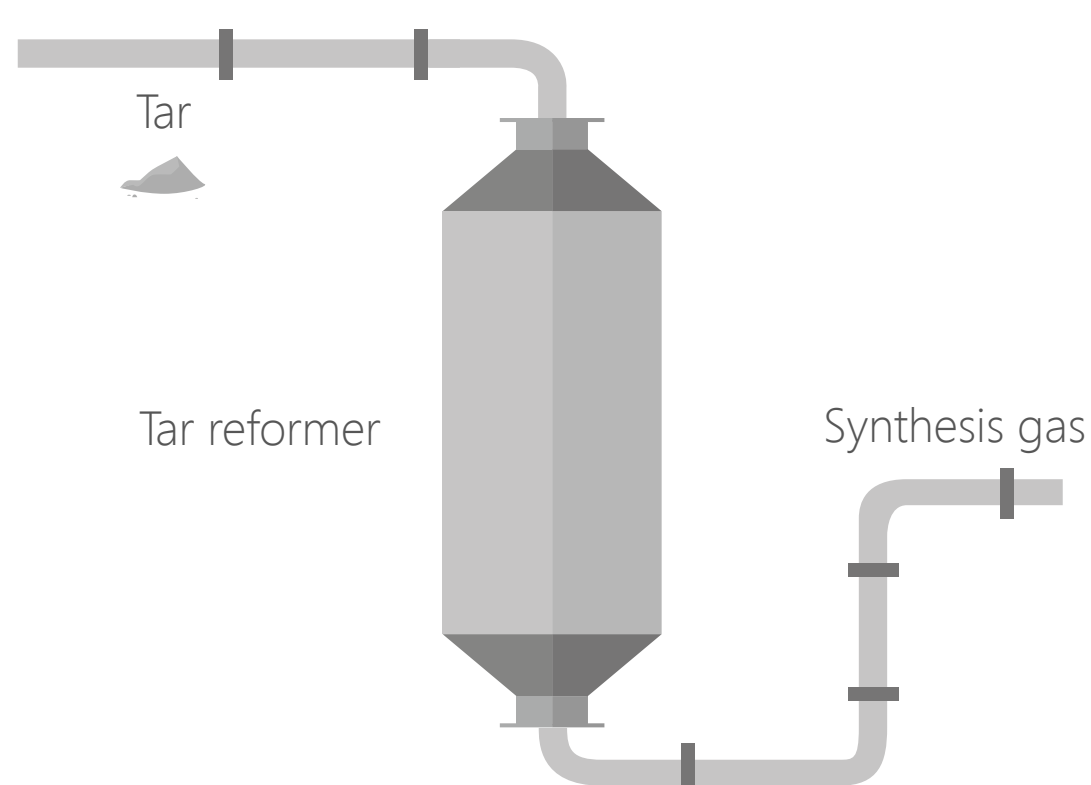
Non-food carbon-based renewable materials are dried and reduced in size. This commonly includes forest or agricultural residues or even urban waste.

2



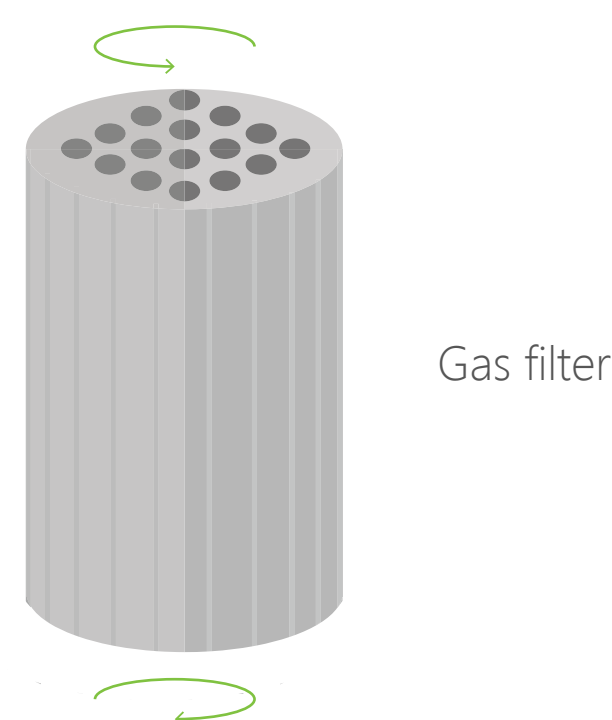
The dried biomass is 'gasified', or heated at extremely high temperatures in the presence of limited oxygen, to produce synthesis gas. This gas is primarily composed of carbon monoxide (CO) and hydrogen (H<sub>2</sub>).

3



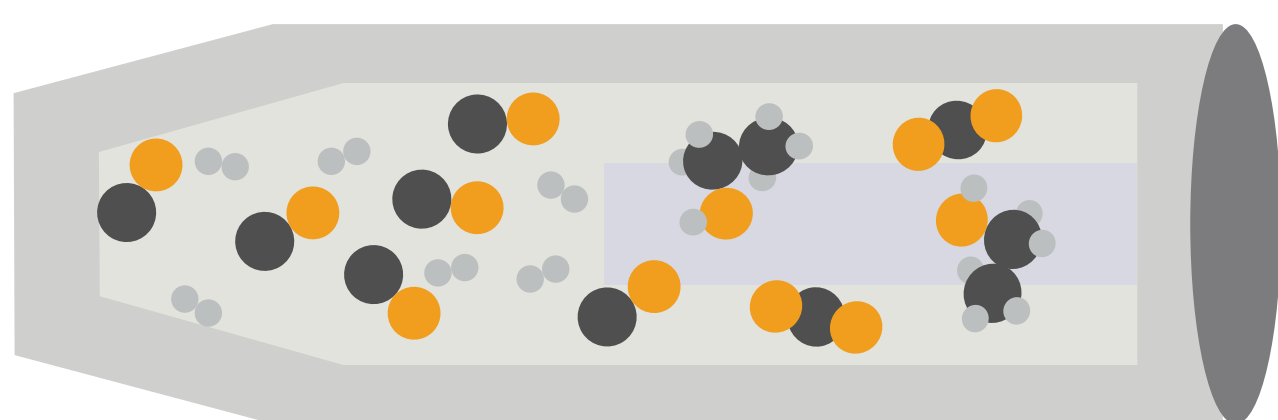
Gasification also generates tar and sulfur, which can contaminate cellulosic ethanol. Through catalytic oxidation the tar reformer converts tar into more synthesis gas.

4



The gas is cleaned to remove other contaminants. Afterwards, it is compressed.

5



A metal catalyst combines the carbon monoxide and hydrogen into cellulosic ethanol.

6



A process called phase separation isolates the cellulosic ethanol. It is now ready for use as transportation fuel.

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Adapted from information provided by the US Department of Energy.

