Using fast-pyrolysis to make BIO-OIL

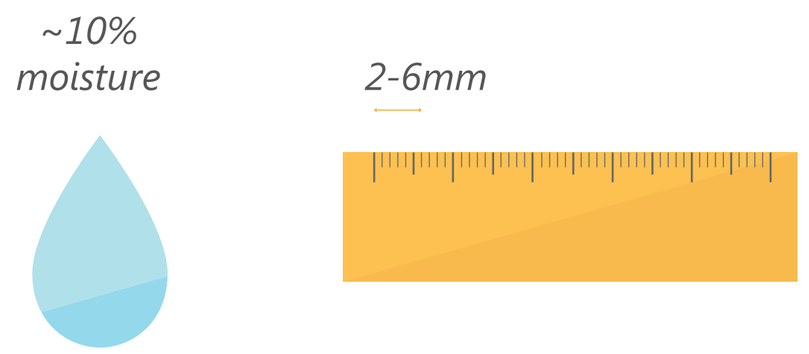
Advanced conversion processes

Bio-oil is an advanced biofuel that is similar to crude petroleum. It can be directly burned for heat and power, or upgraded to transportation fuels like gasoline, diesel and jet fuel.

1

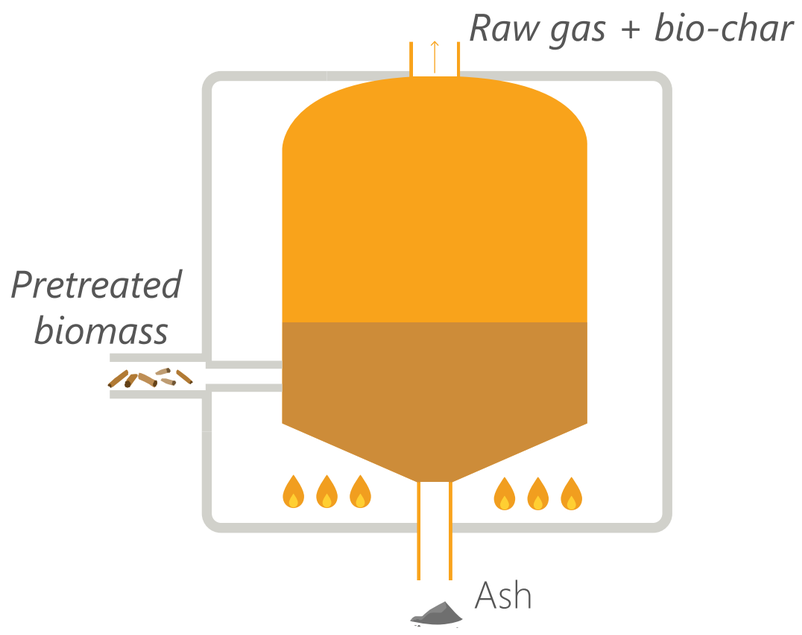
Wood residue, grasses, and other types of biomass can be made into biofuel through a process called pyrolysis.

2



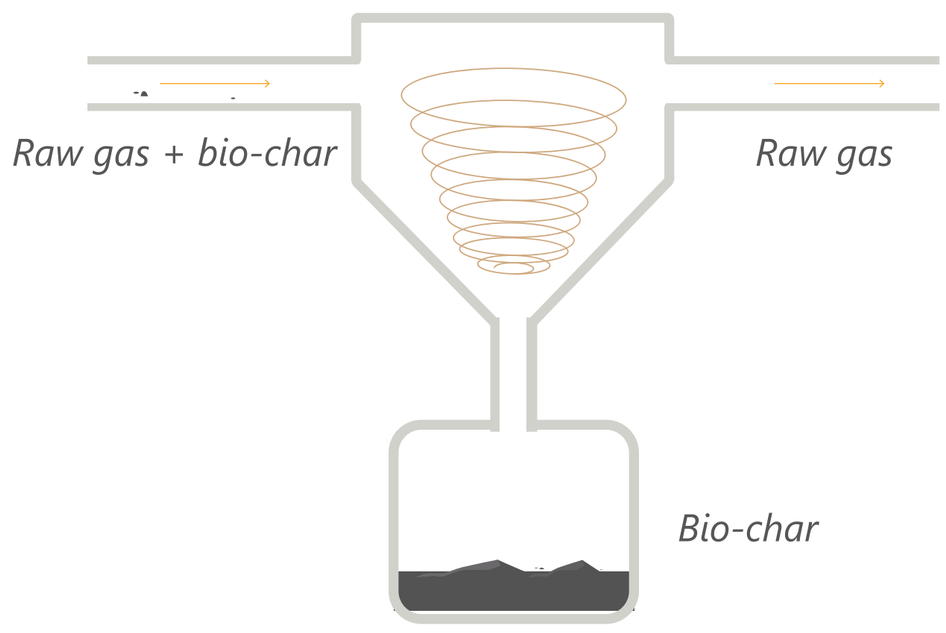
Before it can be placed in a reactor, the biomass must have a low moisture content and be ground up into fine particles. This improves the efficiency of the process.

3



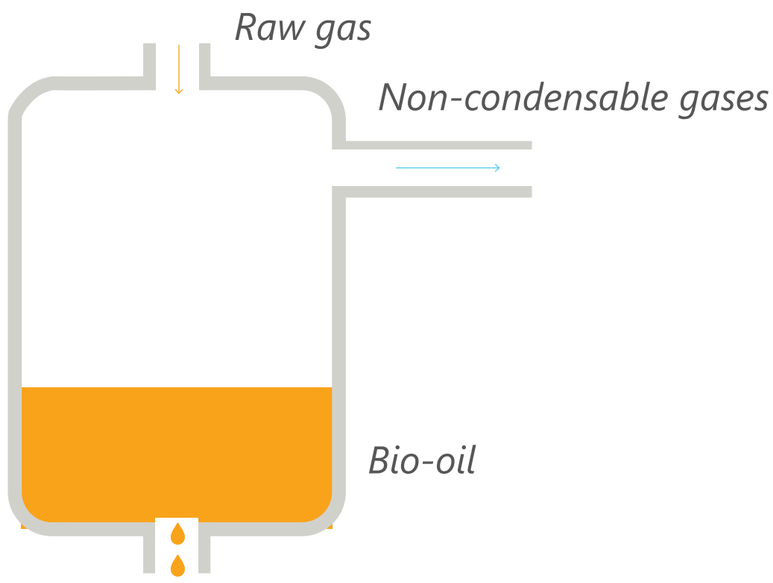
The biomass is subjected to high pressure and heat in an oxygen-free reactor. This produces solid bio-char, non-condensable gas, and gases that can be condensed into liquid bio-oil.

4



The solid bio-char is removed from the gases. Bio-char is a solid biofuel that can be burned to provide heat for the pyrolysis reactor or used as a replacement for coal.

5



The raw gases are condensed into bio-oil. Non-condensable gases such as carbon monoxide can be recycled to fuel the pyrolysis reactor.

6

The bio-oil is extracted and can be burned as a fuel for boilers and furnaces or upgraded into the desired molecule sizes for transportation fuel at other refineries.

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