

# Biofuels and Bioplastics

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# What Are Biofuels And Bioplastics

- Biofuels
  - Biofuels are fuels derived from organic material
- Bioplastics
  - Bioplastics are a type of plastic that is derived from biological substances rather than petroleum

# Biofuels

# How Biofuels Are Made

- Biofuels can be derived directly from plants or indirectly from agricultural, commercial, domestic, and/or industrial wastes.
- Biofuels
  - Some biofuels are made through the conversion of biomass through thermal, chemical or biochemical conversion.
- Biodiesel
  - Biodiesel is commonly produced by the transesterification of the vegetable oil or animal fat feedstock
- Bioethanol
  - Bioethanol is made through a fermentation process

# Carbon Neutral Biofuels

- The amount of carbon dioxide released from biofuels is equal to the amount absorbed by the plants used to produce it.
- Fossil fuels are used in the production of biofuels this means that they are not actually carbon neutral.

# Common Uses Of Biofuel

- Ethanol is used in petrol engines as a replacement for gasoline.
  - Ethanol has a smaller energy output than gasoline.
- Ethanol can also be used as fuel in a bioethanol fireplace.
- Biodiesel can be used in diesel engines as a replacement for diesel.
  - Pure biodiesel can reduce emissions up to 60%.

# Bioplastics

# How Are Bioplastics Made

- How PLA Bioplastic is made
  - Process/mill corn to produce dextrose
  - Ferment the dextrose to get lactic acid
  - Convert lactic acid to lactide
  - Polymerize lactide to form long chain molecules
- How bio-derived polyethylene is made
  - Fermentation of biomass such as sugar cane to get ethanol
  - Process to form ethylene
  - Then processed to create bio-derived polyethylene or 'green polyethylene'



# Common Uses Of Bioplastics

- Bioplastics are commonly used for disposable items such as packaging and straws.
- Bioplastics are commonly used in non-disposable applications such as carpet fibers and plastic pipes.
- PLA is also being used in medical implants that can dissolve in the body which reduces the need for a second surgery to remove implants.
- They are used to replace many common plastics such as polyethylene.

# Pros And Cons Of Biofuel/Bioplastic

- Not all bioplastics are biodegradable.
- In order to produce biofuels/bioplastics more crops such as corn would be required.
- It takes more people to produce bioplastics and biofuels.
- The use of biofuels could help reduce the price of fuels.
- It could also result in higher income for farmers.