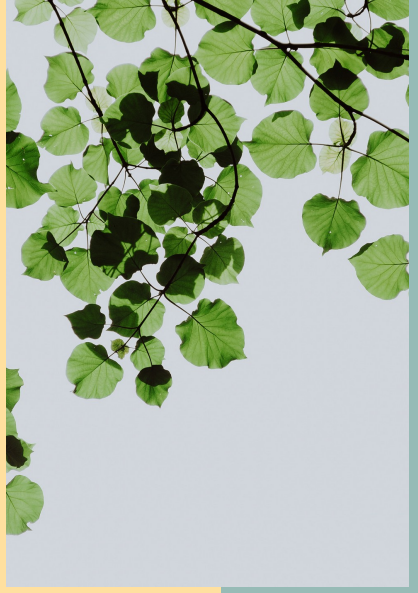
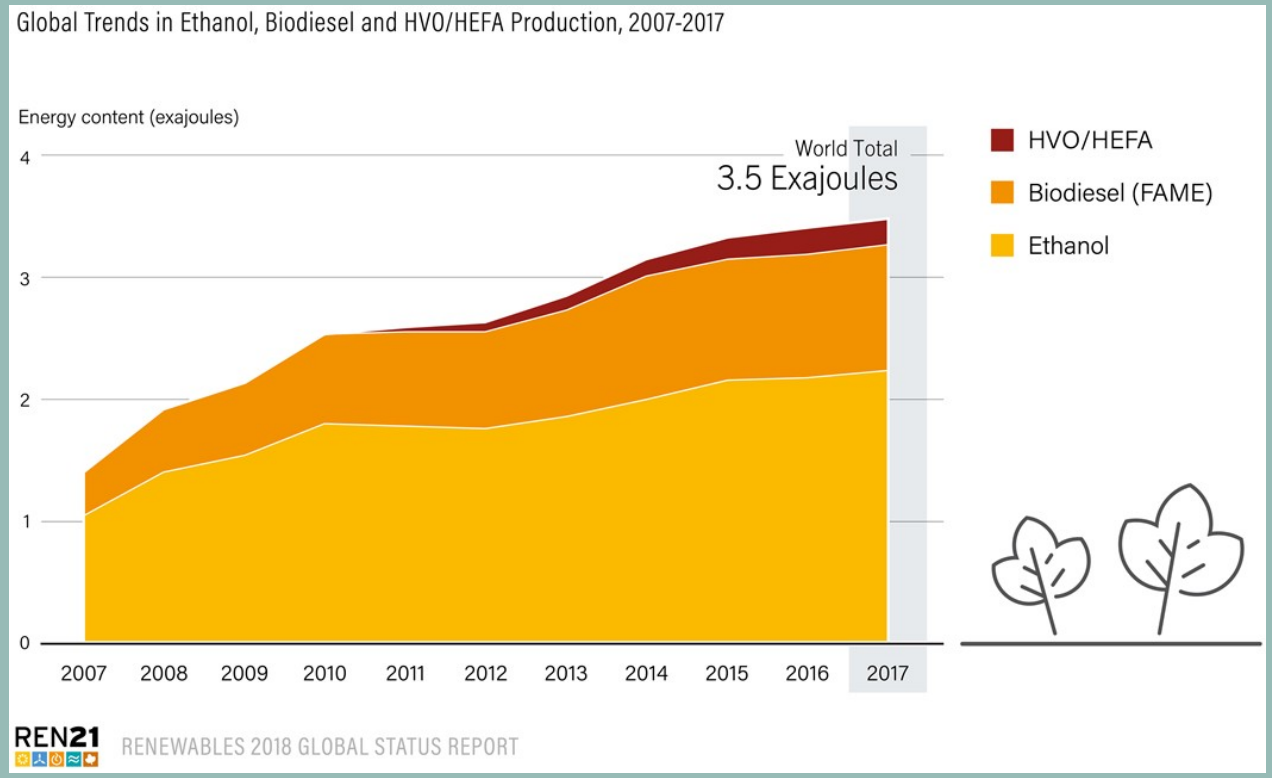

BIODIESEL PRODUCTION



Some Statistics About Biodiesel



Total biofuel production between 2007-2017

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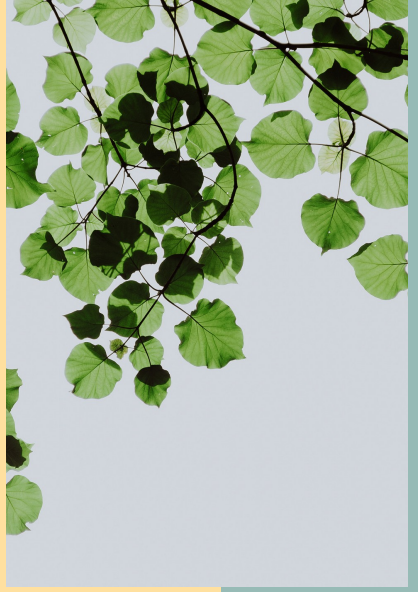
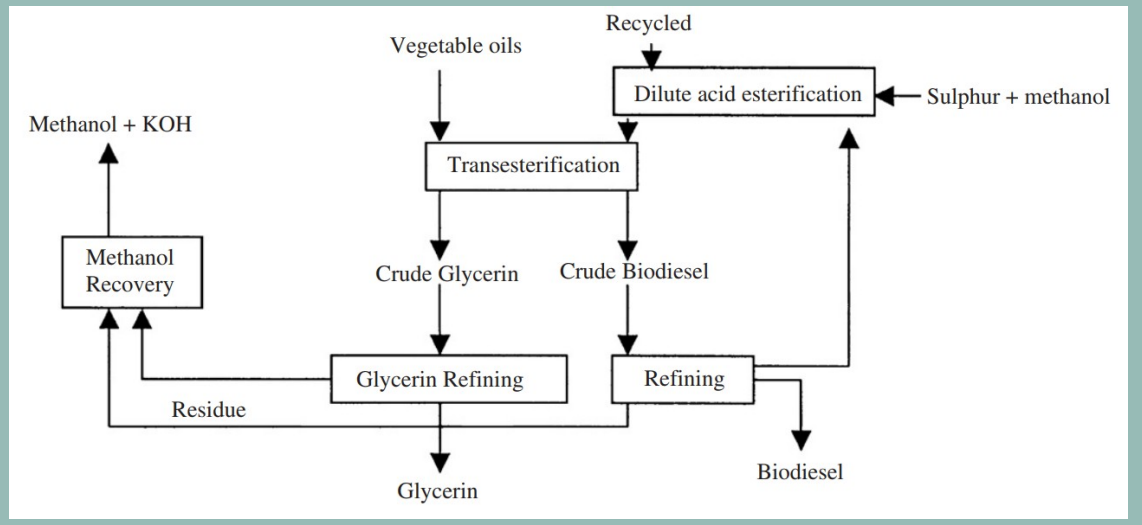


Biodiesel Production Methods



Basic scheme for biodiesel production[6]

The dominant technologies, which enable us to use oil and fat feedstock types as fuel in diesel engines, are usually described as direct use or blending of oils, micro-emulsion, pyrolysis and transesterification. Transesterification being currently mentioned by various researchers as the most preferable due to better quality of fuel produced.[7]

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Biodiesel Production Methods

The major source of feedstock for making biodiesel is soybean in the United States in 2017.

Source: E.I.A.

1- Pyrolysis

Pyrolysis refers to a chemical change caused by the application of thermal energy in the absence of air or oxygen, or by the application of heat in the presence of a catalyst, which results in cleavage of bonds and formation of a variety of small molecules. Pyrolysis is conducted at temperature range of 400–600 ℃. The process produces gases, bio-oil, and a char depending on the rate of pyrolysis. Based on the operating conditions, the pyrolysis process can be divided into three subclasses: conventional pyrolysis, fast pyrolysis and flash pyrolysis. Fast pyrolysis is the one used for production of bio-oil.[7]

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Biodiesel Production Methods

Animal fat is a source for biodiesel production.
Source:delameredairy

2- Dilution/Blending

Direct uses of vegetable oils have generally been considered not satisfactory and impract both direct and indirect diesel engines. The high viscosity, acid composition, free fatty aci content, as well as gum formation due to oxidation and polymerization during storage and combustion, carbon deposits and lubricating oil thickening are obvious problems. Oil deterioration and incomplete combustion are the two severe problems associated with the use of vegetable oils as fuels. In such cases, it is helpful to dilute vegetable oils with such materials as diesel fuels, solvent or ethanol. Dilution results in reduction of viscosity and density of vegetable oils. Addition of 4% ethanol to diesel fuel increases the brake therma efficiency, brake torque and brake power, while decreasing the brake specific fuel consun They also argued that since the boiling point of ethanol is less than that of diesel fuel, it c assist the development of the combustion process through an unburned blend spray[7]

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