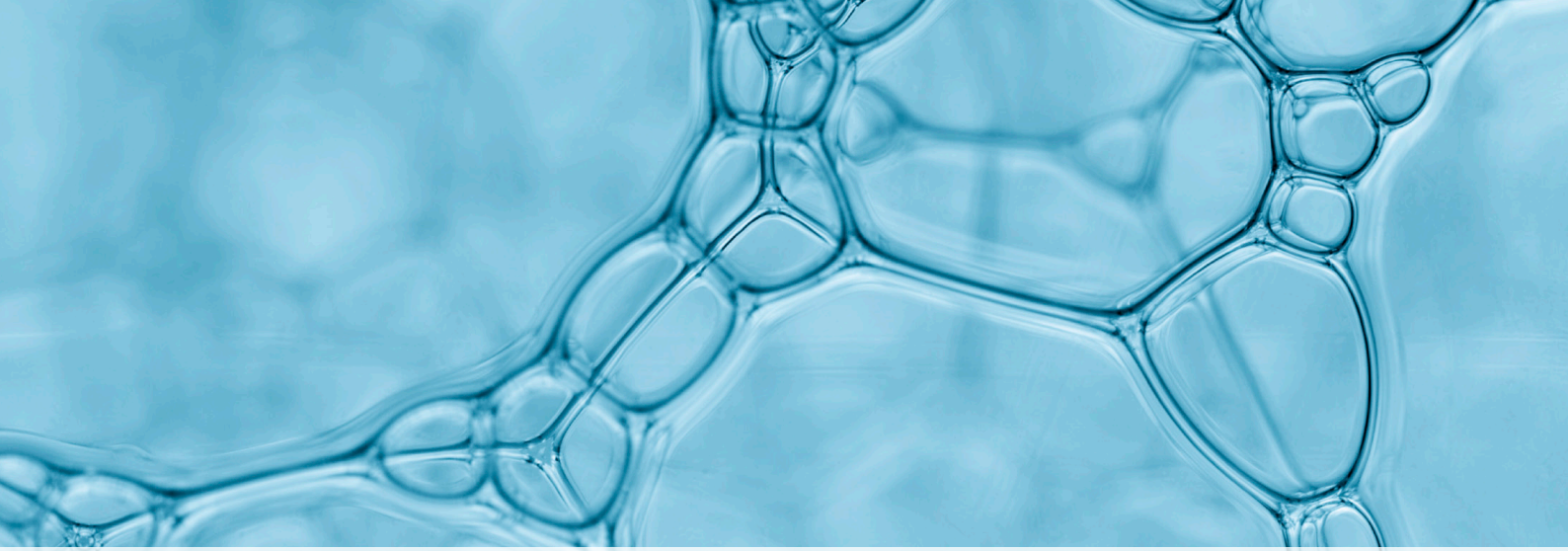

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Biofuels Overview

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Biofuels Overview

Biofuels are a wide range of fuels which are in some way derived from "biomass" or organic non-fossil plant or animal materials. The term covers solid biomass, liquid biofuels and various biogases. Biofuels are gaining increased public and scientific attention, driven by factors such as mineral oil prices, climate change and the need for increased energy security. Because of their ease of use, the liquid forms are by far the most widely used; however, the gaseous form is also beginning to have a significant presence. Likewise solid biomass is increasingly being used for the generation of electricity.

Biofuels can be produced from various feedstocks, according to various processing techniques.

The main liquid biofuels are:

1. Bioethanol which is an alcohol made by fermenting the sugar components of plant materials, and it is made mostly from sugar and starch crops such as sugarcane, sugar beet and cereal crops. With advanced technology being developed, cellulosic biomass, such as trees and grasses, are also used as feedstocks for ethanol production. Ethanol can be used as a fuel for vehicles in its pure form, but it is usually used as a petroleum/ gasoline additive to increase octane and improve vehicle emissions. Bioethanol is widely used in the USA and in Brazil.

2. Biodiesel is made from vegetable oils (such as palm oil, rape seed oil and soya oil), animal fats (such as tallow) or recycled greases (such as used cooking oil). Biodiesel can be used as a fuel for vehicles in its pure form, but it is usually used as a diesel additive to reduce levels of particulates, carbon monoxide, and hydrocarbons from diesel-powered vehicles. Biodiesel is produced from oils or fats using a process of transesterification and is the most common biofuel used in Europe.

Biofuels provided 1.8% of the world's transport fuel in 2008. Investment into biofuels production capacity exceeded $4 billion worldwide in 2007 and is growing.

First generation biofuels

So called ‘first-generation biofuels’ are biofuels made from sugar, starch, vegetable oils or animal fats using conventional technology. The basic feedstocks for the production of first generation biofuels are often seeds or grains such as wheat, which yields starch that is fermented into bioethanol, or oil seeds, which are pressed to yield vegetable oil that can be used in the manufacture of biodiesel. These feedstocks could instead enter the animal or human food chain, and as the global population has risen their use in producing biofuels has been criticised for potentially diverting food away from the human food chain, leading to the fear of food shortages and price rises.

Second generation biofuels

The goal of ‘second-generation biofuel’ processes is to extend the amount of biofuel that can be produced sustainably, by using alternative biomass consisting of the residual non-food parts of current food crops, such as stems, leaves and husks that are left behind once the food crop has been extracted, as well as other crops that are not used for food purposes (i.e. non food crops), such as switch grass, jatropha and cereals that bear little grain, and also industrial wastes such as woodchips, skins, and pulp residues from fruit pressing, etc.

Third generation biofuels

The so called ‘third generation biofuel’ or “Oilgae” is a biofuel manufactured from algae. Algae are low-input, high-yield feedstocks to produce biofuels. Based on laboratory experiments, it is claimed that algae can produce up to 30 times more energy per hectare than land crops such as soybeans.

Regulatory drivers

In Europe, the Renewable Energy Directive (RED) has set a legally-binding European target for 20% of all energy types - electricity, heat and transport fuels - to come from renewable sources by 2020.

It also includes a significant target to include renewable fuels in transport energy - a 10% goal by 2020. And, for the first time the Directive singles out a need for specific action to promote renewable heat energy. This aim is supported by the Fuel Quality Directive (FQD).

The Directive became European Law on June 5, 2009, as it was published in the EU Official Journal along with other new climate and energy measures.

Member States were expected to have finalized new National Action Plans on renewable energy by 31 March 2010.

What can Future Perfect do for you?

Future Perfect has developed a range of consultancy, verification and training solutions to assist organisations understand the biofuels markets and to meet their obligations under the RED and FQD.

If you require further information or would like to discuss please contact Future Perfect on **+44 (0)1675 446321.**