



# Subject Areas Biomass

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## 2E Products

General biomass is an extremely versatile starting material. You can use the various plants and fruits as food, as animal feed, as fuel for heat generation, as fertiliser, as an additive or base of creams and lotions and as fuel for mobility purposes.

Many of the uses listed overlap with other areas, so that any by-products created may be used as starting material in another branch.

We offer three devices in the biomass field, which provide a practical representation and illustration of the fundamental processes. Use of any by-products created is also possible. For example, with CE 640 on the biotechnological production of ethanol, you gain ethanol as the main product and mash as the by-product. You can either discard the mash or use it as substrate in the CE 642 biogas plant. When you operate the biogas plant, you receive biogas as the main product and a high-quality fertiliser, the digestate, as a by-product. This digestate is low in odour compared to manure and the nutrients are better absorbed by plants.

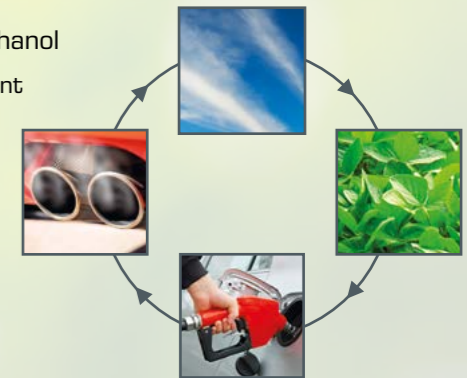
The main product of the CE 650 Biodiesel Plant after the optional purification process is biodiesel. With optional treatment of the by-products you can also obtain glycerin, which is used in the food and cosmetics industries, and a portion of additives.



### Bioethanol

#### CE 640 Biotechnological Production of Ethanol

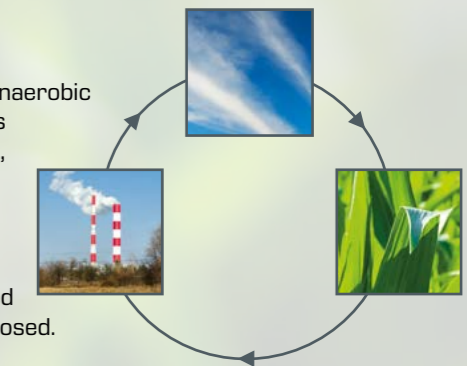
The anaerobic degradation of plant components (e.g. potatoes) through enzymes and yeasts can produce bioethanol, which can be used as a fuel. The waste gas is in turn absorbed by the plants and the circuit is closed.



### Biogas

#### CE 642 Biogas Plant

Biogas can be produced by the anaerobic degradation of plant components (e.g. maize) through biomass and, for example, be converted into electricity in combined heat and power plants and the waste heat used for heating purposes. The waste gas is in turn absorbed by the plants and the circuit is closed.



### Biodiesel

#### CE 650 Biodiesel Plant

Both glycerin and the desired biodiesel are obtained with the transesterification of plant-based oils, and with the help of a few additives. The waste gas is in turn absorbed by the plants and the circuit is closed.

