

## UNIT 9      BIOMASS – Part 3

Watch this video about biomass and how electricity is made from it:  
<https://www.youtube.com/watch?v=HZoPNJGi6ig>

Read the sentences. Are they true or false on the basis of the video? Watch it again to decide.

- |  |       |
|--|-------|
| 1. The energy of the sun is absorbed by plants with photosynthesis, and released when they decompose or when they are burnt. | true  |
| 2. Plant waste from farms is collected and burnt to generate electricity.  | true  |
| 3. Animal waste is collected in small tanks, called digesters.   | false |
| 4. Digesters are filled with bacteria that convert waste into methane gas.   | true  |
| 5. Methane cannot be captured from landfills.  | false |
| 6. Biomass must be used carefully to prevent greenhouse gas emissions.   | true  |

Watch the video again, and complete the steps of electricity generation.

- |  |             |
|--|-------------|
| 1. The waste is burnt to _____ water.      | (heat)      |
| 2. The hot water creates _____.            | (steam)     |
| 3. The _____ of the steam spins a turbine. | (pressure)  |
| 4. The turbine powers a _____.             | (generator) |
| 5. The _____ creates electricity.          | (generator) |

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Complete the text with the most suitable words. There is one extra word.

sugarcane	bioethanol	sugar	transesterification
fuel	pure	sweet	Europe

Bioethanol is an alcohol made by fermentation, mostly from carbohydrates produced in ... (**sugar**) or starch crops such as corn, or ... (**sugarcane**). (...) Ethanol can be used as a... (**fuel**) for vehicles in its pure form, but it is usually used as a gasoline additive to increase octane and improve vehicle emissions. ... (**Bioethanol**) is widely used in the USA and in Brazil.

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 ... (**transesterification**) and is the most common biofuel in ... (**Europe**).

<https://en.wikipedia.org/wiki/Biofuel>

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**Read the text about the wood pellet manufacturing process.**

### **How are pellets made?**

Pellet mills can produce pellets from saw dust, wood chips, scrap wood and even full trees. These different forms of wood are put through a chipper or a hammer mill, which breaks them down into a consistent smaller size. Afterwards, wood chips are fed through a dryer to remove the moisture content of the raw material, especially in case of freshly cut wood.

After drying, the sawdust is pressed through dies at high pressure. A die is a metal container that gives sawdust the shape and diameter of a pellet. During this process, the sawdust gets very hot and releases its fibre that keeps the sawdust together.

When the hot, shaped sawdust is coming out of the die, it is cut into pieces of a certain length. Then it is cooled in a cooling tower. This is when the pellets become hard. After cooling, they are stored in large silos, then put into plastic bags or sold in bulk.



**In what order are these machines used in a pellet plant before pellets reach the silo?**

- ... chipper (1)
- ... hammer mill (2)
- ... dryer (3)
- ... die (4)
- ... cooling tower (5)
- 6 silo

**Write the name of the machine that is described.**

It reduces the moisture content of the raw material: \_\_\_\_\_ (dryer)

It shapes saw dust into pellets: \_\_\_\_\_ (die)



It breaks wood down into smaller pieces: \_\_\_\_\_

(chipper/hammer mill)

It reduces the temperature of the pellets: \_\_\_\_\_

(cooling tower)

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**Forum topic:**

What makes algae an attractive source of biofuel? You can watch the following video about biofuels: <https://www.youtube.com/watch?v=-ck3FYVNl6s>