

Bio-Energy

What is Bio-Energy? How can we get energy using Bio-Energy sources?

Biomass is the term given to plant and animal matter, such as, wood, straw, sewage and waste food.

Biomass comes from living things and has energy stored in it and can be used to produce energy. When biomass is burned it releases energy. The Earth's biomass is a huge store of energy, which is continually renewed by the sun through photosynthesis.

Biogas is the term given to naturally produced gas, e.g. gas given off at landfill sites as material rots. This gas can be collected and burned to release energy.

How does bio-energy work?

1. Energy Crops (biomass) – such as wood, oilseed rape and willow are grown for the purpose of fuel. In Northern Ireland, willow trees are grown and used as an energy crop. Willow trees are good because they grow quickly. When ready the trees are cut, made into wood chips or pellets and can be used in people's homes. Instead of heating a house using oil, a wood-burning boiler can be put into a house and this will heat the house!

Why is this a renewable form of energy?

It is renewable because;

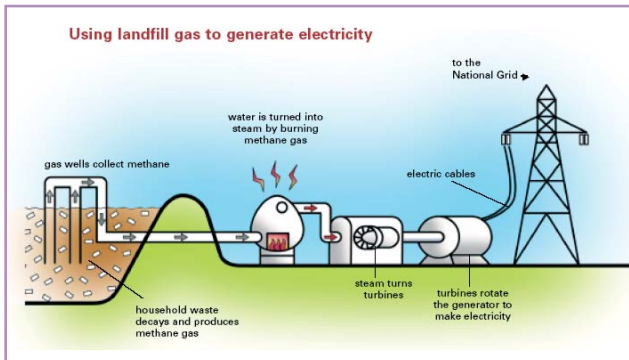
- energy crops are **sustainably managed** - as trees are cut down, others are planted.
- Energy crops are **carbon neutral** – when trees grow they use carbon dioxide (CO₂) during photosynthesis, when trees are burnt they release the same amount of CO₂ into the atmosphere. Wood can be made into **chips or pellets**, which are burned for heat.



Wood pellets

2. Waste – landfill sites, animal droppings and sewage all give off methane gas (biogas) as they rot. Methane can be burnt to produce electricity and heat. Also, waste wood, e.g. sawdust can be made into wood chips or pellets.





Source: dti

Advantages

- Bio-energy is cheaper than fossil fuels
- It helps get rid of waste, which can cause smells and pollution
- It is not using limited resources like coal, biomass cannot run out

Disadvantages

- Releases CO2
- If trees grown for fuel are not replanted, can result in deforestation
- Can be difficult to collect enough waste to generate big amounts of energy

Case Study 1

Where?

In a home in Carrickfergus

What?

Wood pellet stove – the stove provides heating for a living room, typically 2-3 hours in winter months



www.wiseuptorenewables.com

Case Study 2

What?

Wood chip central heating system – to fuel under floor heating system. Burns willow tree wood chips.

Where?

Omagh College, Co. Tyrone

CO2 savings?

Instead of using an oil heating system, there is a CO2 saving of about 126 tonnes/year!



Wood chips ready to be used to be burned to fuel the under floor heating system at Omagh College.

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