FACT SHEET

Biomass energy

What is biomass energy?

Biomass is biological material (plant and animal) that can be used for fuel. Using biomass is an indirect use of solar energy which was absorbed in the process of photosynthesis and in supporting animal life. Decomposing plant and animal matter produces methane which is helpful to burn as a fuel, and rubbish dumps with domestic waste also provide methane.

How is it used?

Biomass feedstock from a variety of crops can be used as fuel for direct heating or thermal electricity generation. In doing so they replace fossil fuels – and the same amount of carbon dioxide generated during combustion is recaptured by photosynthesis as the plants grow again.

A major effort for scientists is to find ways in which biomass can be grown without taking up valuable farmland for growing crops. For example, they are looking at using wood and farm waste such as straw to make the biofuels. Scientists are even experimenting with growing algae on sewage ponds to produce oil and biomass while cleaning up the water. They are also experimenting with using the carbon

dioxide from power stations to grow algae so that the carbon from the carbon dioxide goes into the algae and the oxygen is released into the air. The hard part is dong this without using too much energy in the machinery that is used to grow the algae.

Challenge

Growing, harvesting, and transporting biomass is expensive if a reliable supply is to be sustained. For this reason, the major biomass generators in Australia are all in the sugar-cane growing region, where there is a regular supply and existing transport infrastructure. Once collected into one place, electricity generation from biomass is similar to using fossil fuels, with some additional cost depending on the type of crop.

Loss of natural habitats and food-growing areas when they are replaced with biomass crops has become a major issue in all countries where biomass energy is significantly used. Careful planning and management should involve representatives of all affected sectors of society, which requires adequate government processes.

Source: CSIRO CarbonKids Curriculum Unit, Sustainable Energy for All, pages 25-32

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These educational resources are designed to introduce teachers and students to Australia's use of 'clean energy' as one of the carbon dioxide mitigation options available for achieving significant reductions in atmospheric carbon dioxide emissions. Whilst not an exhaustive educational resource, it is intended to raise the awareness of school-aged students about our changing climate, clean energy practices and applications and the other alternative energy technologies that reduce greenhouse gas emissions.

The materials in this educational resource have been developed by Angela Colliver from CSIRO Education.

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