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Biogas is produced by microorganisms, such as methanogens and sulfate-reducing bacteria, performing anaerobic respiration. Biogas can refer to gas produced naturally and industrially.

In soil, methane is produced in anaerobic environments by methanogens, but is mostly consumed in aerobic zones by methanotrophs. Methane emissions result when the balance favors methanogens. Wetland soils are the main natural source of methane. Other sources include oceans, forest soils, termites, and wild ruminants.[6]

The purpose of industrial biogas production is the collection of biomethane, usually for fuel. Industrial biogas is produced either;

Manufacturing of biogas from intentionally planted maize has been described as being unsustainable and harmful due to very concentrated, intense and soil eroding character of these plantations.[8]

There are two key processes: mesophilic and thermophilic digestion which is dependent on temperature. In experimental work at University of Alaska Fairbanks, a 1000-litre digester using psychrophiles harvested from "mud from a frozen lake in Alaska" has produced 200-300 liters of methane per day, about 20-30% of the output from digesters in warmer climates.[9]

Biogas can be explosive when mixed in the ratio of one part biogas to 8-20 parts air. Special safety precautions have to be taken for entering an empty biogas digester for maintenance work. It is important that a biogas system never has negative pressure as this could cause an explosion. Negative gas pressure can occur if too much gas is removed or leaked; Because of this biogas should not be used at pressures below one column inch of water, measured by a pressure gauge.[citation needed]

Frequent smell checks must be performed on a biogas system. If biogas is smelled anywhere windows and doors should be opened immediately. If there is a fire the gas should be shut off at the gate valve of the biogas system.[13]

Landfill gas is produced by wet organic waste decomposing under anaerobic conditions in a similar way to biogas.[14][15]

The waste is covered and mechanically compressed by the weight of the material that is deposited above. This material prevents oxygen exposure thus allowing anaerobic microbes to thrive. Biogas builds up and is slowly released into the atmosphere if the site has not been engineered to capture the gas. Landfill gas released in an uncontrolled way can be hazardous since it can become explosive when it escapes from the landfill and mixes with oxygen. The lower explosive limit is 5% methane and the upper is 15% methane.[16]

The methane in biogas is 28[17] times more potent a greenhouse gas than carbon dioxide. Therefore, uncontained landfill gas, which escapes into the atmosphere may significantly contribute to the effects of global warming. In addition, volatile organic compounds (VOCs) in landfill gas contribute to the formation of photochemical smog.

Biochemical oxygen demand (BOD) is a measure of the amount of oxygen required by aerobic micro-organisms to decompose the organic matter in a sample of material being used in the biodigester as well as the BOD for the liquid discharge allows for the calculation of the daily energy output from a biodigester.

Another term related to biodigesters is effluent dirtiness, which tells how much organic material there is per unit of biogas source. Typical units for this measure are in mg BOD/litre. As an example, effluent dirtiness can range between 800 and 1200 mg BOD/litre in Panama.[citation needed]