

Comments to “The bioenergy delusion” by Katja Garson (21st May 2019)

<https://theecologist.org/2019/may/21/bioenergy-delusion?fbclid=IwAR3A9iVb80eiFwj5YYlZgg9QVxiM0xkM3TqZq0Uc71ZLaYDO1B2FwCDyOrY>

“Replacing fossil fuels with bioenergy only takes us backwards, continuing our addiction to burning and extraction, and causing extensive ecological damage.”

I totally agree with the author that

”Burning biomass is just another path to environmental destruction”.

At the same time, I wish that the term bioenergy was given a fair definition. With the help of definition, we can explain the possibilities of achieving a transition to fossil-free and sustainable society where negative impact on health, environment and climate is minimized.

Bioenergy is the energy of life. Bioenergy is the solar radiation energy that during photosynthesis has been captured by plants and stored in the plants' biomass. In other words, the solar radiation energy is transformed during photosynthesis into bioenergy. As everyone knows energy can only be transformed from one form to other.

Unfortunately, bioenergy is used with methods that damage everything alive. Thermal processes as combustion, thermal gasification and pyrolysis of organic material creates for health, environment and climate dangerous emissions. These processes destroy microorganisms living on and in organic material, thus they have negative effect on biodiversity.

The plants living on land or in water are primary producers. Most of the higher plants need at least 16 chemical elements to grow and to caught suns radiation energy and convert it to bioenergy. Carbon (C), oxygen (O) and hydrogen (H) comes from carbon dioxide (CO₂) and water (H₂O). Ca, Mg, S, Cl, Fe, B, Mn, Zn, Cu, Mo and stimulating elements Co, Cr, Ni, V, Sn, Li, F, Se, Si, etc. receive plants from soil liquid.

It is obvious that most living organisms receive bioenergy from plants via various food chains as biofuel necessary for growth, movement and heat. In nature there are no waste, microorganisms transfer all residues to various forms of energy (methane, alcohols, etc.) and to new building blocks containing all the chemical elements important for plants.

Humans can utilize microbial transformation of bioenergy in residues coming from now living plants and animals by building biogas plants. There bioenergy is converted by microbial transformation into biogas that contain energy rich methane (CH₄), carbon dioxide (CO₂) and small amount of other gases. Energy in biogas is possible to convert by various engines to electricity (about 30 %) and heat (about 65 %). Heat if needed can be transformed to cold. This energy transformation causes only 5 % energy losses and very few emissions when compared with thermal transformation of various types of renewable organic materials.

There is always some bioenergy left in the digestates/biofertilizer's that contain partly decomposed organic material and microorganisms. Since a large proportion of chemical elements carbon, oxygen and hydrogen are converted to biogas, biofertilizers contain more

concentrated plant nutrients. Losses are minimized as substrate conversion takes place in a closed system.

Losses that currently occur during the collection and pre-treatment of incoming materials and in the after-treatment of biofertilizers can be remedied with improved technology and methods.

Biofertilizers contributes to carbon sink in soils and is important for soil organisms that help plants to absorb nutrients. Biofertilizers positively affects the soil's physical, chemical and biological properties i.e. the fertility of the soil.

By increasing the production of biogas and biofertilizers in local high-tech biogas plants, we can positively influence 10 of the global targets 2030 directly and the other 7 indirectly.

It is a great mystery why there are still biogas plants that use methods that do not support microorganisms (for example over optimal water content), are polluting, have an unhygienic working environment, are expensive to build and are often unprofitable. It is time for transition to local biogas plants that respect the needs of biological processes.

We must protect both air and water from pollution. The use of water to transport waste should be radically restricted by the rapid application of other methods of transport.

There are prototypes of hygienic device for collecting urine, stools and toilet paper as well as food waste without water. These types of waste, which with current management contaminate water and air and create economic losses, can instead be packaged at the source in starch biomaterials. Transport to the local biogas plant is both hygienic and prevents the release of bioaerosols and various gases that cause losses of bioenergy and plant nutrients.

More on the website www.biotransform.eu.

Everyone is welcome to read about suggestions for

- a) international definitions,
- b) hygienic collection toilet without water,
- c) biogas plant OSAD,
- d) proposals to EU projects that were not heard, etc.

All texts can be freely used with reference to the source.