By analyzing this batch one concludes that the maximum value interval achieved for methane is 67 – 68 % by volume, and also that this value influences the CO_2 concentration.

By comparison, it results that the last two batches (corn waste batch and mix of maize and corn waste batch) produced much more biogas than the first two, and this demonstrates the importance to find further solutions to solve the problem of the difficult degradation of the ligno – cellulose chains, or at least a complex technology to reuse the second generation waste, meaning the residues from the biogas production, in these particular cases. A possible solution recommended by the literature would be an acid hydrolysis, but through the process of neutralizing the acid, the result is often a salt, that decreases the speed of the formation of mathanogenic bacteria, and thus, the biogas production is reduced.

Because the heat value of the residual waste of the biogas process is relatively high, for a full recovery of the energy potential and a better balance, it is recommended to be co-incinerated with other fuels, so that the material is reused and residual quantity are minimized. One can also imagine steady alone facilities working independent only with biogas.

After the process of anaerobic fermentation, the residual material from each batch was analyzed from the point of view of the high and low calorific values, in order to establish further utilization, mainly if it can be used in other burning processes together with other fuels, for example in case of co-combustion. The obtained values are presented in Table 3, for each batch and each reservoir.

Table 3 – High and low calorific values for the used batches of material [16]

No.	Water ash free sample	High calorific value [kJ / kg]	Low calorific Value [kJ / kg]
1	Beech dust batch, reservoir no. 1	13195	11759
2	Beech dust batch, reservoir no. 2	12987	11463
3	Linden dust batch, reservoir no. 1	13254	11843
4	Linden dust batch, reservoir no. 2	13146	11721
5	Mix of corn and maize batch, reservoir no. 1	7356	6094
6	Mix of corn and maize batch, reservoir no. 2	7335	6044
7	Grains of corn batch, reservoir no. 1	4972	3673
8	Grains of corn batch, reservoir no. 2	4936	3645

The residual material with a high content of ligno-cellulose has a larger value for both the high and low calorific value, because of the fact that the cellulose chains are difficult to break, even with the help of an initial step, experimentally accomplished, consisting of an acid hydrolysis.

4 Conclusion

Biogas is a type of unconventional energy (RES) for the future; it is one way to transform a natural available waste resource into useful energy and thus might complete the present tendency of the growing impact upon global economy and peace of the reduced available amounts of fossil fuels, in the near future.

Biomass represents an inexhaustible energy resource that can be used partly or wholly for biogas production, both by anaerobic fermentation and other processes (aerobic fermentation, gasification), related technology for anaerobic fermentation process being used in the present.

Regionally and globally, stimulated investments are linked to the achievement of plants to produce biogas, a shift in which our country should join the current conditions.

The quality of the produced biogas is closely related to the type of waste biomass used, but by utilization of the byproducts (fertilizer or fuel) the economy of the process might turn into a favorable one.

From the graphics presented it results that the origin and quality of the input raw material used is very important, related with the type of biomass, the, the duration of the batch fermentation, and also the ration between solid matter and liquid volume.

The main parameters of influence for the process of anaerobic fermentation are the temperature regime, the pH of the suspension and the type of biomass and its chemical characteristics.

Special treatments such as CO_2 capture for the increasing of the heating value of the biogas, acid hydrolysis,

Biogas is a RES that should be added as application in different areas, especially for farmers and regional advantages. The benefits go not only to the environmental protection, but also they close the financial loop of the fuel costs that, in case of biogas is remaining in the local community, the same, that generates the input raw material for its production.

Acknowledgement:
The financial provided support of the EPOC (www.mec.upt.ro/epoc) and BIO-HEAT research projects, Post-Doc Research Grant, 4D-POSTDOC (www.cm.upt.ro) co-financed by EU program as well the support of the research team from UPT are notable and also gratefully acknowledged. Measurements have been accomplished with attested methods offered by the ISO CEN accredited laboratory, www.mediu.ro.

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