

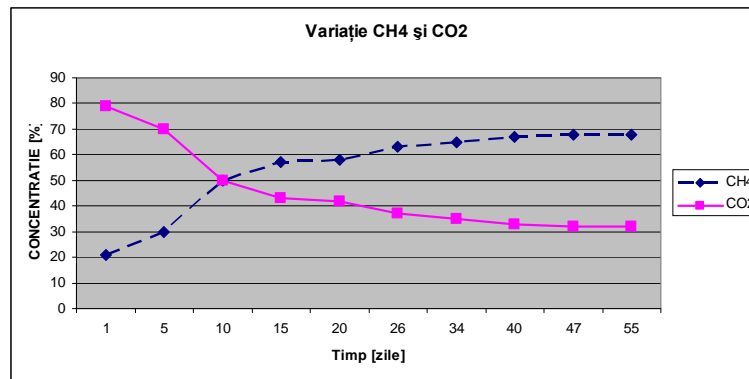
EPOC Stage 5 – Multi-criteria assessment of the proposed recovery solutions considering the obtained results; dissemination

SUMMARY

In Romania, the annual generation of a large quantity of urban waste is one of the most serious environment protection problems, for which an unsafe and inadequate waste management may represent a potential environmental risk. The various waste management practices and methods imply the emission of pollutants in the environment, leading to numerous cases of soil and underground water contamination, implicitly causing health risks for the population. The present energy crisis and excessive environment pollution has led to paying greater attention to the sources of unconventional energy.

Correlated with the necessity to use various technologies in order to produce clean energy using regenerable energy sources, in this stage of the project we have made experimental determinations on pilot installations, one for biomass waste fluidized-bed roasting, and one for producing biogas from urban waste and using it in burning processes to check the existing possibilities of using it individually or in combination with fossil natural gas, as fuel.

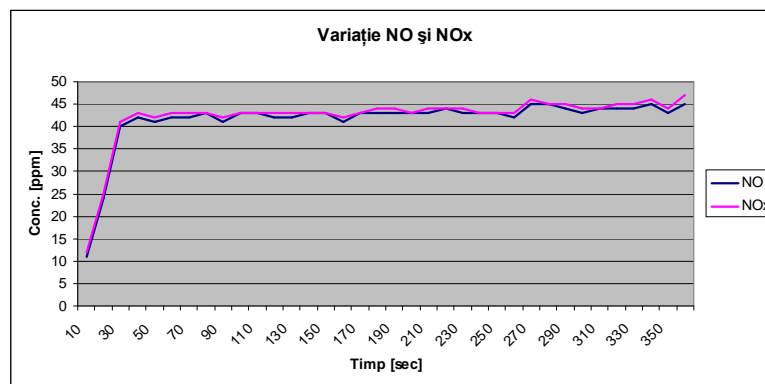
The figures show some of the experimental results obtained in the two pilot installations.



Variație – variation; concentrație – concentration; time [days]

Fig. 1 – Variation of the methane and carbon dioxide concentration over time – anaerobic digestion tank

Fig. 1 shows the temporal evolution of the CH₄ and CO₂ concentrations for one of the charges of material used, highlighting the good quality of the obtained biogas



NO and NOx variation; time [sec]

Fig. 2 – Variation of NO and NO_x emissions in the process of biogas burning

Fig. 2 shows the polluting emissions resulted from the burning of the produced biogas, stressing the degree of their reduction to negligible values from the point of view of the environment pollution degree.

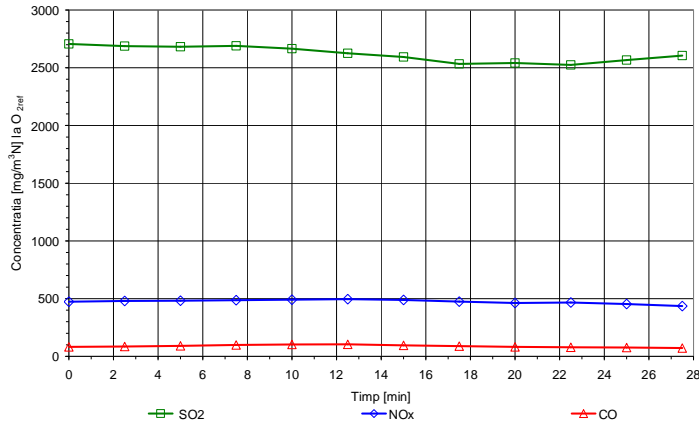


Fig. 3 – Variation of the sulphur dioxide, nitrogen oxides and carbon monoxide concentration, over time

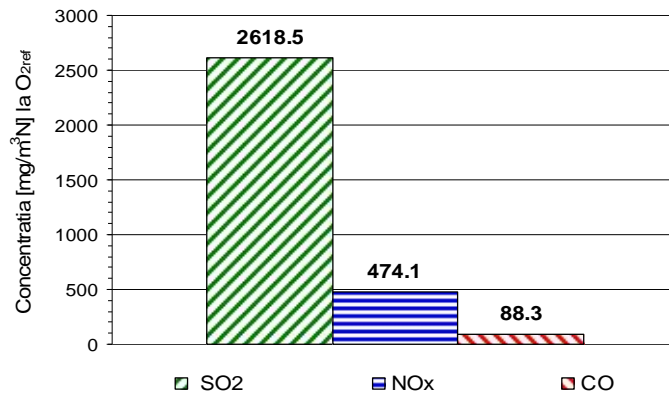


Fig. 4 – Average concentration of sulphur dioxide, nitrogen oxides and carbon monoxide

Fig. 3 și 4 show the fluidized-bed roasting process for a mixture of biomass waste with bituminous coal in the pilot installation used for this purpose, highlighting the reduction of the SO₂ and NO_x emissions, an important aspect to be taken into consideration in the case of incineration processes from the point of view of the impact on the environment.

From the results obtained on the two pilot installations we can determine the necessity and possibilities arising from the use of the technologies presented in this stage in large-scale processes, at industrial level, for the improvement of the quality of life by reducing the level of pollution, and the improvement of the air quality respectively, with a direct impact on the population, as well as for obtaining a certain degree of energetic independence and autonomy, by using local / regional regenerable resources.