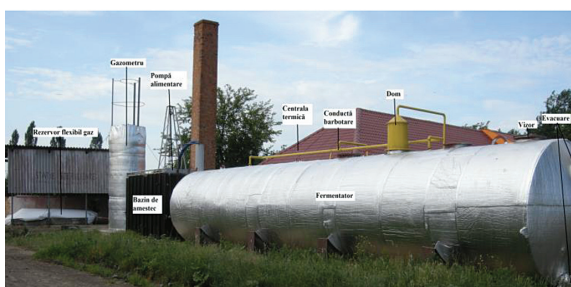


**Goal of the project:** The main objective of the project is to perform research and development activities in support of innovation in the field of biogas production. A major shift in the energy policy of both countries could only come from positive practices, together with best practices exchange. In order to reach this major objective, the partners will try to identify possible improvements of the biogas production in both liquid and solid phase.

**Short description of the project:** By the end of the project, the partners will have undertaken several joint research projects aiming at providing added value for the field. The goal is to connect technology, policy, industry, education, finance and public services in order to increase the understanding of the challenges brought



by the immense consume of energy, combined with the limited character of the resources. This can be an opportunity for fundamental change in the way the world produces and consumes energy. The synergy between the project partners has a multiplication effect on both sides of the border.

**Implementation period:**

01.06.2012-30.11.2013

**Research centre** for Thermal Machines and Equipments, Transportation and Environmental Pollution Control

**Project implemented by:** The department for mechanic machines, equipment and transportation from UPT in partnership with the University from Szeged, USAMVB Timisoara and Alapítvány Foundation from Szeged.

**Main activities:** Studies connected with fermentation of pre-treated and hydrolyzed biomass as way to increase the biomass conversion ratio and energy capitalization of biogas. Based on the previous detailed investigations appropriate suggestions will be made on the use and monitoring of the proper microbiological community to be employed for the anaerobic digestion of various organic waste substrates. Methods will be optimized and recommended for the characterization of the biogas production technologies from a microbiological point of view and interested users will be educated to carry out the necessary tests.



Recommendations will be formulated for the future advancement of the biogas biotechnology, such as the large scale production of the key microbes and enzymes to be employed. Integrated biogas technology descriptions will be provided for a number of applications such as the liquid phase anaerobic degradation of the treatment of solid organic household waste.

*"At every level the greatest obstacle to transforming the world is that we lack the clarity and imagination to conceive that it could be different"*

Roberto Unger

### Results:

- Study regarding the energy capitalization of biogas
- Study regarding the existing technologies in the field of biogas production
- Testing different substrates at small scale and inside a pilot installation
- Report concerning the fermentation of pre-processed biogas
- Technological description of novel biogas improvement technologies



Some elements of the new technology developments will represent intellectual properties and will be protected accordingly. Other results of the joint scientific activity may belong to the public domain and will possibly be published in recognized international scientific journals by the Partners and will be presented at domestic and international conferences. Training in modern molecular biology techniques will be carried out on individual basis. There will be presented and disseminated the final results and conclusions over the undertaken activities and a final report will be delivered.

### Fields of interest:

The main fields of interest connected with the project applicability and implementation are: biotechnology (analytical characterisation for the chosen substrates); overall characterisation of process in regards to anaerobic fermentation general parameters (temperature, pH, produced

quantities, partial composition of biogas in terms of methane and CO<sub>2</sub> percentages); ways of potentially optimize biogas production both in terms of the used materials and process control.

### Financed through/by:

Hungary-Romania Cross-Border Co-operation Program 2007-2013 ([www.hurocbc.eu](http://www.hurocbc.eu)) and is part-financed by the European Union through the European Regional Development Fund, Hungary and Romania, Action 2.2.2. Realization of joint research projects, contract id HURO/1001/193/2.2.2.

### Research team:

*UPT team:* Prof. Dr. Eng. Ioana Ionel, Dr. Eng. Adrian Eugen Cioablă, Dr. Eng. Laurențiu Călin, Dr. Eng. Ramon Balogh, Dr. Eng. Daniel Bisorca, Dr. Eng. Delia Călinoiu.

*USAMVB team:* Assist. Prof. Dr. Vintila Teodor, Dr. Eng. Neo Simina.

*Szeged University and Alapítvány Foundation from Szeged team:* Prof. Dr. Kornél L. Kovács, Dr. Zoltán Bagi, Peter Heffner.

### Applicability and transferability of the results:

The results obtained during the joint research project can be further tested and potentially applied (after thorough consideration) inside semi – industrial or low scale installations for determining the real potential of the different types of materials used for obtaining biogas.

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