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***Local implementation strategies for
biogas in Bulgaria***

Contribution to Deliverable D-7.3



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1. Introduction

The global energy crisis both in exhausting the fuel reserves all around the world and increasing the electricity demand forces the need for alternative approaches to solving the energy problems. The awareness of the society, the technology progress in construction of cogenerating units for energy production from renewable energy sources /RES/ is closely related to international commitments of Bulgaria. According to the commitments agreed during the negotiation process for EU membership, Bulgaria must reach indicative target of 16 % of total domestic consumption of electricity produced by RES.

In this connection, the possibilities of Republic of Bulgaria for realizing the production of energy from organic waste are enormous. The whole society should pay attention to the conditions, to inform interested parties of the municipalities, farm holdings, and other ministries.

Knowledge transfer from countries with experience in biogas production and use of biogas to countries whose biogas market is in early development, as our country is related to the implementation of international project BiG>EAST.

Currently, in Bulgaria the biogas is not used for electricity and heat production. The feeding of biogas into the grid is not yet developed as well. For the biogas injection into the grid, the most important brake is the biogas quality which must be higher to be compatible with the natural gas of the grid. The upgrading of the biogas required specialized and expensive technologies which are not enough profitable for small biogas plants. The minimal flow must be upper that 200m³ per hour according to studies).

The other brakes are:

- The lobbying by gas, nuclear and petrol companies;
- Gas transport and distribution companies bring up the principle of high precautions needs;
- The transport and distribution network management even than energy market are divided into federal and regional authorities;
- The cost of the biogas upgrading system;
- A lot of areas are not connected to natural gas network and the cost of connections are very expensive;

The European directive stipulates the non discrimination access to biogas but it is still a theory in Bulgaria. Security rules and technical specifications are needed to develop this application.

2 . Identification of obstacles and barriers

The backwardness of the biogas energy production development in agricultural sector can be explained by several factors:

Green Certificates system not well appropriate for small size unit or farm biogas production: In order to finance additional cost of green electricity production and to ensure a definite quota of green electricity is generated, transferable green certificates (GC) are issued to producers for a number of kWh corresponding to a MWh divided by the CO₂ saving rate. GC are market basic instruments with a minimum guaranteed price.

But this mechanism still has some obstacles:

- No long term guarantee for the price of the GC: Prices are guaranteed only for 10 years. It is a too short period to ensure the long period of return on investments. Moreover, lots of banks or financing organisms do not want to take risks if long terms profits made by the plant are no guaranteed.
- The calculation for GC attribution is very complicated.
- Using by-products or other feedstock than animal effluent reduces the number of GC. Energy consumption to produce energy crops, to transport waste, etc. put at disadvantage small units that need other sources of feedstock
- Need to sell electricity and heat throughout the year. The heat demand must be continuous to make the GC profitable. This requires a constant and sufficient biogas production.
- Precise accounting of input and output (for CO₂ balance) is heavy, time and costs consuming.

Investments: The total costs investments (for feasibility studies, plant installations, connection the plant to electricity grid) are too high for small farm biogas unit. The return on investments and profits are dramatically reduced all the fees. The subsidies in Walloon region are not numerous nor sufficient for small farm unit. Public aids are more centred on public institutions or authorities projects. Only 15 to 25% of subsidies are for small cooperative of farmers or small firms.

Lack of know-how and experience: few Bulgarian companies or consultancy agencies have experience in biogas. Expertise, materials and installations are often provided by foreign companies (from Germany or Austria). As there is little competition on biogas market tariff and prices remain very high. Maintenance costs are also very high and reduce profitability.

Poor awareness of the benefits: Many positive externalities linked to biogas production should be studied in order to be integrated at an economic level.

Lack of collaboration and information between the different parts involved in a project: (cooperative of) farmers, local authorities, local industries, local population. Residents are often reluctant to biogas plant in their neighbourhood fearing odours, noise, traffic or impact on the landscape. There is poor awareness of the positive externalities linked to biogas production.

Complicated administrative and legislative aspects: as some aspects depend on federal/regional competence or on different ministries the whole procedure to build a biogas unit takes very long time and requires investments.

3. Strategy development - some proposals:

Regulatory and economic issues. In order to achieve the target of use of biofuels to produce electrical and heat energy and to allow free entry to the biogas production and markets for all the interested parties we propose the following strategy developments:

- To improve the financial support by the Green certificate system and aids;
- To deliver green certificate during a longer period (during all the operation time of the plant?) to ensure return on investment and to guaranty the amount of these certificates.

- -To adapt green certificate system to heat production
- To grant subsidy to farmers which send their effluents, energy crops and grass mowing to biogas units
- To subsidy (totally?) the feasibility studies by public authorities
- To allocate the cost of the connection of small size plant to the electric grid to the grid manager company

The substrate

- To elaborate a clear regulation about the authorized substrates with rationalization and simplification of application and controls.
- To distinguish the agricultural biogas plant from waste treatment plant to avoid heavy waste regulation? What about animal waste?
- To improve and regulate the use of agro-food industry co-substrate
- To secure the source of substrate supply

The use of digestate

- To clarify the legal status of digestate as a agricultural manure
- The digestate should be considered as a mineral fertiliser because Nitrogen is quite totally mineralised after the process. This consideration should give an additional interest of this product.

To develop the feeding of biogas into the grid

- To deliver origin certificate to Green gas
- To encourage the cogeneration system to improve the biogas production and the methane content by plant.

4. Proposed action plan

It is proposed to develop actions in the following directions:

- To identify an organism that could train employees in order to make opportunity studies with the collaboration of municipalities before sending the proposition to the Regulator - people, making free of charge feasibility studies. The organism could be in charge of the management of training courses for (future) workers in the biomethanation field.
- To promote the development of three-party project (farmers-industries-municipalities) for the improvement of the quality of the inputs and the valorisation of the outputs (gas, heat).
- To change the legislation concerning the use of organic waste, to promote a quality system based on Quality Insurance instead of Quality Control. It would diminish the costs for the farmers.
- To regulate the use of digestate in economic and environmental aspects.
- To improve the use of heat with the development of three-party projects or with a subsidy for heat grids.
- Other alternatives than electricity for biogas?
- The possibility to develop new subsidies (for biogas or heat).
- To inform the public (TV program for example)
- To promote financial agencies that invest in sustainable development

There were identified several important problems that the action plan has to resolve. The weaknesses concern the return on investments of the plants, the supplying of raw materials with a high methane potential and the utilisation of the digestate.

Important guidelines are:

- The choice of another economic model: the current model is not appropriate for biomethanation investment; the supplying of raw materials with high methane potential is not sure to the medium/long term. So, a model less expensive, using more raw materials with a poor level for the biogas production would be discussed and promoted.
- The modification of the nitrogen status: for the moment, in Europe, nitrogen in the digestate is considered as organic. If nitrogen could be considered as mineral, the utilisation of the digestate would be optimised.
- The use of biogas: for the moment, biogas is converted into electricity and heat. The two others possibilities to develop and promote are injection into the grid (legislation is changing for the moment) and biofuel.
- The use of heat: the loss of money due to the not optimal use of heat in the plants could be reduced by the development of heat grids, by subsidies (or other alternatives) or, during the elaboration of a plant project, by thinking about a way to use the heat (drying shed for instance).
- The creation of a group with experts/professionals in biomethanation technology. It would follow project by project the communicational aspects of a new plant. These persons could also be in charge of the identification of new sites for opportunity studies and for the development of training activities for biomethanation workers. Moreover, actions are especially identified for the Bulgarian Authorities. They concern the legislation:
 - Evolution of the legislation concerning the use of digestate on or into the soil.
 - Evolution of the legislation for the use of organic wastes in plants.