

Project: BiG>East

(EIE/07/214)

Report on barriers for biogas implementation in Romania

Deliverable 3.2



Dr. Mihai Adamescu, Dr. Augustin Ofiteru

**MANGUS SOL,
BUCHAREST, ROMANIA**

Date: 08.03.2009

With the support of:



The sole responsibility for the content of this publication lies with the authors. It does not represent the opinion of the Community. The European Commission is not responsible for any use that may be made of the information contained therein.

Contents

Introduction	3
1. Market barriers for biogas implementation	4
1.1. <i>Market barriers for agricultural biogas projects</i>	<i>8</i>
1.2. <i>Market barriers for waste water treatment biogas projects</i>	<i>8</i>
1.3. <i>Market barriers for landfill biogas projects</i>	<i>9</i>
2. Financial barriers for biogas implementation	10
3. Other related barriers for biogas implementation.....	11
3.1. <i>Economical barriers.....</i>	<i>11</i>
3.2. <i>Social barriers</i>	<i>11</i>
3.3. <i>Legal & Administrative barriers.....</i>	<i>11</i>
4. Conclusions	13

Introduction

As mentioned in the template of this chapter the main aim of this material is to identify, describe and were possible understand the non-technological barriers to the introduction and use of biogas plants in Romania.

From the list of barriers common to many countries we have selected some of the basic barriers encountered during design, development or implementation phase of biogas plants. Some of the barriers are specific to Romania and they are treated separately.

One such barrier (specific to Romania) is the former (prior to 1990) development of the biogas (5169 small and medium installations and 32 industrial installation developed at the animal farms) using rather low investment schemes, accentuating only the energy component of the national program, developed by the state and also owned, lack of considerations for the economic and ecological consequences, lack of proper dissemination and support from the local population. As a consequence a certain degree of reticence is encountered in this moment to the development of the new biogas plants.

1. Market barriers for biogas implementation

1) Awareness about the use of biogas potential

The introduction of new incentives and tax exceptions for the renewable energy is a constant focus of some departments in the Romanian government. The EU accession process and the necessity to harmonize the national legislation to the EU have posed increased challenges to the Government and the Parliament during the recent years. The adoption of the Strategy for Renewable Energy has pushed forward the production of renewable energy. As a target Romania has a very ambitious one to reach up to 33 % of the electric energy consumption in 2010 by RE that means 11% of the total energy consumption. For wastes, there is an amendment stipulating that 50 % for the wastes should be used for energy production.

2) Awareness about available biogas technologies

Two distinct categories of investment (and related need of technologies) are common in Romania. The first one is the state promoted biogas technologies for waste management included usually in the strategy for waste management at local and regional scale. These are technologies used to recover biogas from waste dump sites (waste land fields). The second one is based on a more organic development due to local investors (farmers and farming association) that want to have low price energy on long term, using if possible the subsidies from the state in the development of the plants. The information and awareness about available biogas technologies is more needed for the second type of investors.

3) Waste management & supply (“fuel availability”)

The objectives of the waste management are those established also at the European level and include- prevention, reduction of quantities, **material and energy recovery and disposal** (incineration, land filling).

In order to ensure compliance with the provisions of art 5(2) from the Directive 1999/31/EC, Romania has elaborated the strategies for waste reduction, which also contain the strategy for the reduction of biodegradable waste going to landfill. The biodegradable waste is a problem for landfills as they represent about 61% of municipal waste generated in Romania. As a strategy for waste reduction two technologies are proposed a) composting (aerobic digestion); b) mechanic-biological treatment/anaerobic digestion with production and collection of biogas.

b) Mechanic-biological treatment

A series of criteria have been established for mechanic-biological treatment /anaerobic digestion with production of biogas (dense urban areas, high percentage of biodegradable matter, and quantities of over 100,000 t per year). In the strategy the intention of the government is to propose only a few mechanic-biological treatment stations will be constructed.

The existing criteria are more like a barrier in the development of new biogas facilities, especially based on the new experiences of different technologies for biogas generation from biodegradable waste.

4) Electricity Market Liberalization, transparency, dominant players

Romania started the process of energy market liberalization in the late 1990. The process is not yet finished but important steps towards market liberalization have been made (figure 1).

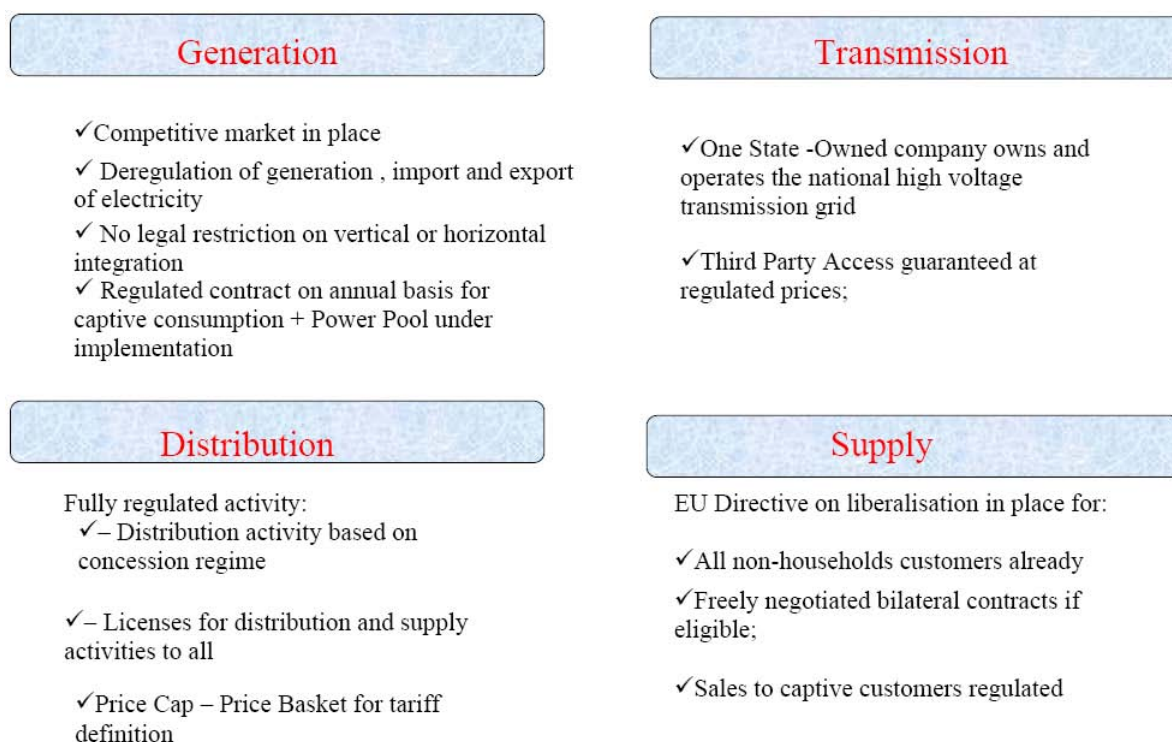


Figure 1. Steps in the electricity market liberalization – Romania

Like in other east European countries the privatization process started in 1999 – 2000 with small steps towards today free energy market and included all sectors of power production:

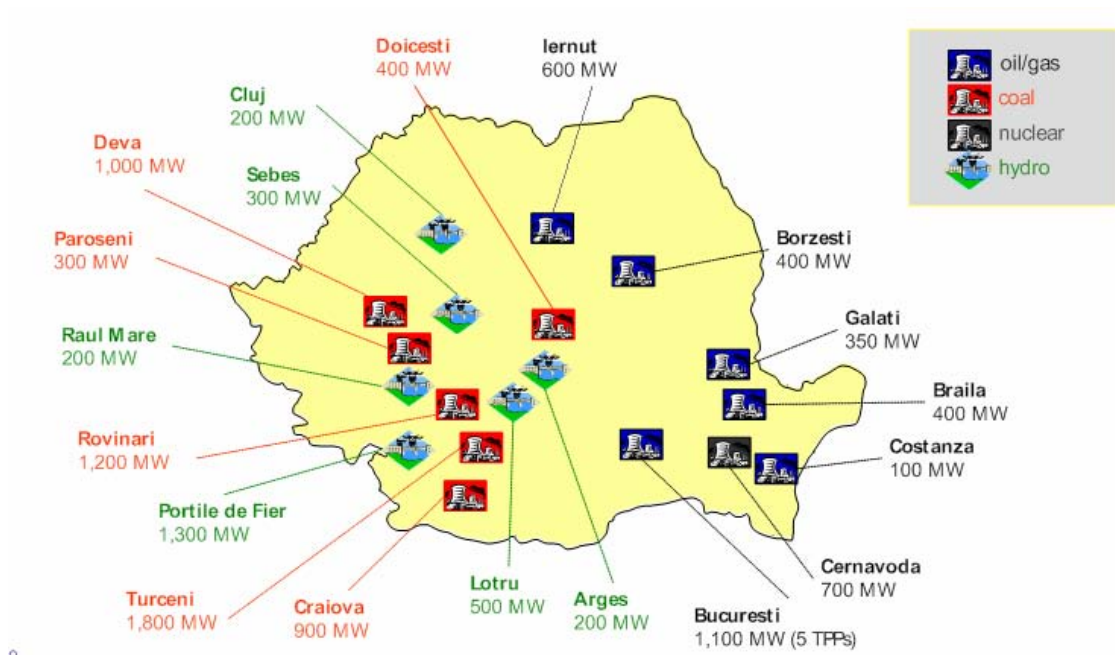


Figure 2. Main electricity production facilities

The total installed capacity is 19,972 MW of which 13,009 MW – Termoelectrica, 5,803 MW – Hidroelectrica, 700 MW – Nuclearelectrica;

The total electricity generation is 53,860 GWh of which: 31,461 GWh – Termoelectrica, 14,480 GWh – Hidroelectrica and 5,446 GWh – Nuclearelectrica.

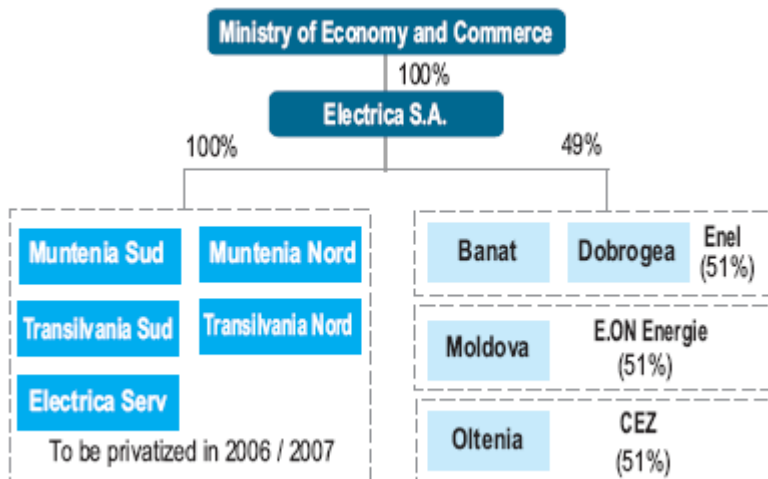


Figure 3. Main electricity distribution companies

Still, in terms of grid connexion, some investors could feel that the process is very complicated in Romania. The few projects that connected alternative energy production facilities to national grid had no a clear procedure to follow in order to have their permits granted. Hence, long times for permitting could be a barrier in development of biogas projects too, case the produced energy is to be sold into the grid.

5) End user related barriers:

- Electricity and combined heat and power (CHP) production (description of situation with feed-in tariffs, green certificates, possibilities of connection to electricity grid)

Romania has adopted the Green Certificate support scheme. It has some advantages (sustained only by the market) as well as drawbacks (limited support from the state). Each supplier is obliged to annually buy a number of Green Certificates representing the value of mandatory quota multiplied by the quantity of electricity supplied by it in the current year to the end-consumers. The Regulatory Authority annually certifies the producers of electricity using renewable energy sources in order to obtain Green Certificates.

Eligible Renewable Sources to participate in the Green Certificate Trading System are: Wind, Sun, Biomass, Geothermal, Waves, Hydrogen produced from renewable energy sources (RES). Mandatory quota produced from renewable energy sources (E- RES) are established according to the target committed by Romanian Government in negotiation process of EU accession to, namely 33% E- RES in national electricity gross consumption, by 2010-2012.

Although some years ago, the grid connection was problematic, due especially, to the bureaucratic problems and the degree of awareness and experience of the main Romanian companies involved in the transport system, the situation has changed and only technical problems could led to problems accessing the network.

- Heat production (finding the heat user, heat transfer network)

Romania has no support schemes in place for the RES heat production. Nevertheless the Romanian Energy Efficiency Fund included the use of RES for heating. In the same time there is support for electricity generated using renewable energy. Support for the development of new biogas facilities could be secured also by the use of structural fund money.

- Biomethane production (purification, possible connection to natural gas grid)

Only one biomethane capacity is in use at this moment (using the new technologies) and this installation is producing heat and electricity so no injection into the gas grid at this moment. There aren't any mentions about the injection of biomethane in the natural gas grid. This is a possibility that has to be discussed at national level with the Ministry of Economy. There are issues linked with the quality of biomethane produced in the biogas facilities and the need to fully comply with the existing natural gas quality standards.

- Production of transport fuel (logistics, existing transport infrastructure)

Due to the increasing price for the oil and derivates and also due to the difference between the gas price and oil, for many years a market of gas as a transport (GNCV) fuel has been developed in Romania. The experience that Romania has in this utilization is expanding over 20 years. There are stations for gas near oil stations and is also well developed a mar-

ket for needed changes to the car (gas tank, pipes). The gas is in fact an alternative to the oil use as the capacity to drive using both combustible is still in place.

A “technical code of compressed natural gases for the vehicle use“was developed by the national authority for regulation in the natural gas and is in place. <http://www.anrgn.ro/anrgn/DocPdf/CodTehnicGNCV.pdf> . It stresses out the main characteristics of the GNCV as being: p 200-250 bar; Wobble index 37,8-56,6 MJ/mc; P max in the vehicle recipient 200 bar; relative density 0,55-0,7 kg/m³ and the auto ignition temperature of 540 C. This is in fact a good opportunity for biogas development and use as by 2020 from the total car number 10 % should use this type of fuel. The gas quality is again a limiting factor. The standard for gas quality is expressed in the ISO 15403.

1.1. Market barriers for agricultural biogas projects

As mentioned in the introduction there is one specific barrier different from other countries, and this is linked with the former plan for the use of renewable energy sources that started in Romania in the late 1970. There are multiple barriers to the development of agricultural biogas projects: the decline of the agriculture in general following the privatization and fragmentation of large agricultural units, the decline of specific sectors (pig & cow complexes), the fragmentation of the properties and the old technologies used in agriculture – those are questioning the size of the biogas installations. The lack of information about the biogas in general and the economic benefits of using it is another barrier for the development of biogas installation in large number.

The direct use of energy crop in specific energy crop farms is an idea that should be based on economic values and that has to overpass a strong tradition in the utilization of land for food production. We are advocating for a stepwise process in which the development of biogas facilities should be based on economic, environmental and social acceptance and we should be aware that past mistakes are still a burden to the future development.

1.2. Market barriers for waste water treatment biogas projects

Huge investments in the waste water treatment were and still are made in Romania with the support of EU. The present situation reveals that 644 localities (265 cities and towns and 378 rural localities) have public collecting waste water treatment systems. In 2002, only 77% of the total discharged waste water flow is treated in the urban collecting networks; in 47 urban localities, with more than 150,000 inhabitants, the waste water is discharged without a preliminary treatment.

In Romania (in 2002), the sludge from wastewater treatment plant is landfilled in urban waste landfills. The sludge quantity produced in 2001 was 171,086 tones.

A total of 31 agro-food units that discharge directly into surface water had been identified with an equivalent organic loading of more than 4,000 population equivalent. From this total 26 agro-food units have mechanical or mechanical – biological treatment plants. It has

to be said that in many location a biogas station could be developed and the remaining agro-food units could be possible biogas stations.

Romania has developed prior to the accession into EU an “Implementation plan for Council Directive 91/271/EEC concerning urban waste water treatment as amended by Directive 98/15/EC. Based on this implementation plan many projects will be developed and implemented for the urban waste water treatment. As in many cases the implementation plan has no cross sectoral or any other linkages to other policies (including energy policy). The lack of vision in developing and integrating policies is a huge barrier in the development of any projects including biogas.

1.3. Market barriers for landfill biogas projects

The use of separate collection system for solid waste is just at the beginning in Romania. Just in very few areas the systems is used and it has to be noted that this is just seen as experimental.

Like in the case for the waste water management, Romania has developed an “Implementation plan for Directive 1999/31/EC on the land fill of waste”. As a consequence Romania developed also a strategy for the reduction of biodegradable waste going to landfill. Biodegradable waste represents about 61% of municipal waste generated in Romania. In order to reach the overall recovery/recycling objectives and the objectives for the reduction of biodegradable waste going to landfill, all possible measures for the recovery of biodegradable waste must be taken. Two methods will be used in order to reduce biodegradable waste in Romania: a) composting (aerobic digestion); b) mechanic-biological treatment/anaerobic digestion with production and collection of biogas.

One project has been developed (as design and basic discussions) on the implementation of biogas recovery from landfill in the city of Focsani. The project, with a value of 556000 euro has the support of Danish government (50 % of the total funds). The rest of the financial support will be provided by the local company of public utilities and the Focsani Town hall. The first economic analysis showed that the project is self sustained the financial effort being totally recovered after 5 years. The total life time of the project is 7 years. The project is supposed to provide only thermo energy and electricity to the Focsani city. No bi-methane injection into the grid is foreseen. Until this moment the project did not encountered any major difficulties.

Nevertheless the biogas production is only seen as a mean to reduce the organic waste and not necessary as a production of electricity and thermo energy.

2. Financial barriers for biogas implementation

One major problem to all RES projects is the upfront spending are relatively high and the return period is usually is long. As a result there are also high risks associated with the projects developments (at least in the financial adviser's views) that make this kind of projects difficult to be financed by different banks. In many cases the preferred solution is the government involvement or the support from the EU.

Several possibilities could be used as financial support for biogas implementation: 1) Third Party Financing (TPF) and/or Public-Private Partnership; 2) Possibility to use specific financial products from commercial banks; 3) Possibility to use EC support (Structural and Cohesion Funding) – is there some Operational Programs related to biogas projects

- 1) Possibility to use Third Party Financing (TPF) and/or Public-Private Partnership (PPP) for biogas projects

The Danish support to the development of Focsani city biogas recovery facility is a good example for this category. The involvement of both local utility company and the mayor of the city with the financial support of the Danish government is a good example that could generate more similar projects.

- 2) Possibility to use specific financial products from commercial banks

Many projects will need the support of commercial banks in order to develop and implement their projects in renewable energy. Several banks have special programs in order to support projects aimed at using structural funds for this kind of activities. The bank will analyse both the company documents (for the solidity and the capacity to return the loan) and also the business plan and feasibility study of the facility.

- 3) Possibility to use EC support (Structural and Cohesion Funding) – is there some Operational Programs related to biogas projects

The options 2 & 3 are linked, because, in general, the investors, will rather use other financial sources than the own one. A special measure (Measure 123, financial support scheme XS 13 for agricultural projects) is dealing with the support for bio combustibles. The financial support is 50 % of the total eligible cost. The support is 80 % coming from the EU and 20 % is the support from the Romanian government. The only problem in accessing the structural funds is the relatively difficult procedure needed to be followed, that is extremely time consuming.

3. Other related barriers for biogas implementation

3.1. Economical barriers

1) Price of energy/Green certificates scheme

Energy price in Romania is relatively high especially for industrial application and the tendency is to rise in the next years at a step even more accentuated than the prices in the Western Europe. This is despite the fact that internal production energy capacity is, depending on the year and the sources used for production, between 70 % and 100%. In several years (with high precipitation) Romania is even an energy exporter in the Balkan region. No evaluation about the profits of biogas installation is available on the Romanian market.

A special issue is the support offered through the Green Certificates. This is a special market that is providing support only for the electricity production. That means that no support will be given to the biomethane injection to the national gas grid.

3.2. Social barriers

Social barriers

- a. Communication is not seen as a key element for the development of biogas facilities in Romania. The only point when an investor needs to communicate with the local communities or with interested stakeholders is when issuing the environment permit. If the procedure established (based on the data communicated about the relative impact of the project) is a hard one then several round tables (consultations) must be carried on. Development of a project with many different actors is a novelty in Romania (but is starting to be used more and more) and for complex projects (including for the financial part) it seems to be the logical framework. For this kind of project negotiations and harmonization is a must.
- b. Past projects have also significantly affected the way in which these projects are seen. So, there is a new barrier that has to be overcome.

3.3. Legal & Administrative barriers

Legal & Administration barriers

1. As already mentioned, obtaining the permission to build and operate any sort of RE facility is a difficult endeavour. Despite the new evolution (as a consequence of the implementation of different European policies) there is a trend toward renewable energy from wind to solar and biomass. Nevertheless there are also some inconsistencies in the implementing framework. We have to say that this is not only characteristic for Romania but for

other countries as well. The lack of a Strategic Biogas Plan or even mentioning biogas in different strategies as well as the lack of coordination between several strategies (environment, energy, transportation) is proving the lack of vision in dealing with complex problems at the policy development level. This sectoral approach is a huge barrier that needs to be overcome.

2. The number of authorities and permits involved is difficult to be managed in a reasonable amount of time.

4. Conclusions

The ways to eliminate the main barriers for biogas development, acceptance and penetration Romania are:

- An integrated view on different policies including transport, renewable energy production and use as well as environmental issues (a need in many EU countries). Conflicting situation between different “sectoral strategies” are still affecting the regional development. So harmonization of the policies as an entire and with EU regulation should be a priority.
- Learning from other countries experiences could prove a good opportunity for East European zone.
- Creation of special incentives schemes for biogas.