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**WP 3.3:**  
**Policy Roadmap for large-scale biogas  
implementation in Romania**

**Deliverable 3.3**



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# 1. Introduction

The main aim of this work package is describe the policy road map for Romania as regards to the introduction of large scale biogas facilities in Romania.

From the list of barriers common to different 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 high reticence is encountered in this moment to the development of the new biogas plants.

## 2. Biogas Potential in Romania – An overview

**Energy crops potential** Romania has an important potential for primary production (including energy crops). There are several area well suited for large productions, especially in the South and South-Eastern part of the country, with an average (for the entire region) of over 17 million tones. Other area could also contribute significantly to the overall production, and for some crops with even a greater potential. The Western plain around Timisoara has a great potential for energetic crops, notably the area is also suitable for oleaginous plants production, hence better placed for biodiesel production.

Eastern plains situated around Buzau to Focsani cities line is a zone suitable for corn production and hence a promising area for biogas from energetic crops.

**Agricultural waste** It is obviously that the same areas involved in the total energetic primary production are also very important agricultural waste production zones. The maximum capacity for agricultural wastes is around 6 million tones per year, over the last several years. The agricultural waste from secondary production is the highest in the Northern part of Romania. The higher potential is in the region in the North-Eastern Romania, with a total around 300000 tones per year. There are also other regions with high potential for biogas facilities.

**Municipal waste** The same region RO 21 is also the region with the highest municipal waste production in Romania with an average over the last years of about 550000 tones per year. Very close to these values are the regions RO 31 and RO32, near the Bucharest city.

### 3. National Policies

The country has a certain electricity over-capacity (Romania is currently an exporter in the Balcan region) with a significant share of hydropower (mainly large scale) in the total energy production, while the remainder is constituted by fossil fuels and nuclear power. In near future, the nuclear electricity development with two more reactors (in Cernavoda nuclear power plant) is considered to be a national priority. In terms of Renewable Energy Sources (RES), Romania has already achieved its target on share of RES in electricity consumption. The Romania target for 2010 is set at 33% that has to be achieved mainly by the current large hydropower production. The high potential of small-scale hydro power has remained almost untouched. A small number of wind, solar, biomass and geothermal projects have been implemented in the country. Provisions for public support are in place, but few renewable energy projects have so far been financed. The September 2007 energy strategy includes upgrading of hydro-power plants with total installed power of 2328 MW. Also targets for electricity from renewables were established: 35% by 2015 and 38% by 2020.

In this context, Romania has developed an institutional and legal framework in conformity with the EU *acquis* in order to promote energy efficiency and develop support instruments for RES.

Romania transposed in national legislation the provisions of the main directives for the renewable energy sources: 2001/77/CE (958/2005) and 2003/30/CE (GD1844/2005).

The national legislation is actually composed by:

- Law No 199/2000 regarding the efficient use of energy, amended and updated by Law No 56/2006, which aims to create the necessary legal framework for the development and implementation of national policies for the efficient use of energy.
- Law No 3/2001 ratifying the Kyoto Protocol to the United Nations Framework Convention on Climate Change. According to the Kyoto Protocol, Romania is obliged to cut its emissions of greenhouse gases by 8% from 1989 levels between 2008 and 2012.
- Government Decision No 163/2004 regarding the approval of the National Strategy for Energy Efficiency. The main objective of this strategy is the identification of possibilities and means to increase energy efficiency over the entire energy network through the implementation of suitable programmes.
- Government Decision No 1535/2003 regarding the “Strategy for the Promotion of Renewable Sources of Energy” and Government Decision No 443/10.04.2003 concerning the promotion of the production of electrical energy from renewable energy sources. This latter Government Decision was amended by Government Decision 958/2005 (transposing Directive 2001/77/EC) and forms a legal framework for the promotion of renewable sources of energy.
- Directive 2003/30/EC for promoting the use of bio-fuels and other renewable fuels for transport GD1844/2005

- Energy Law (no.13/ 2007) – general provisions for renewable promotion

The above mentioned legislation has been supplemented by national legislation that transposes, in its entirety, the EU acquis dealing with energy efficiency and developed the needed support instruments for RES, including timeframes for implementation. Specific national legislation include the regulation of the ANRE (Energy Regulatory Authority): i) Procedure for certification of priority production, ii) Regulation regarding the green certificate market, iii) Regulation for issuing guarantees of origin, iv) Regulation for energy labeling, v) Procedures of the market operator (For issuing green certificates and for organizing the centralized green certificate market).

There is no specific legislation on biogas generation, use or transport. All the legislation applying to the RES is applying also to the biogas.

### **Renewable Energy targets**

*According to the newly proposed RES Framework Directive from 2008* Romania has to assure a 24% share of RES on the final consumption of energy in 2020, and at least 10% share of biofuels of final consumption of energy in transport by 2020.

*The indicative target set by the RES electricity European Directive from 2001 imply that Romania has a share of 33 % of RES on gross electricity consumption by 2010 and according to the European Biofuels Directive from 2003 biofuels consumption of 5.75% of petrol and diesel use for transport in 2010.*

## **4. Barriers to large scale biogas projects**

A series of obstacles to the investment in the renewable energy sources from financial to technical up to social and environmental acceptance are still in place. First of all is the upfront cost of the investment. Even with the recent increase in the cost of oil the upfront costs of the renewable energy will be an issue to the potential investors. Despite the existence of a clear strategy at European and national level there is a need of real actions (available funds for developing new infrastructures) supporting both the upfront costs and the long term economic benefits.

On long term there are different ways to support the implementation of the renewable energy policy: one – which is the followed pattern across Europe and USA is to create huge facilities (for biodiesel, biogas, wind etc) replacing in the former oil refineries with the new era refineries (“green based”) and placing another pressure on the environment, the second one – which we consider is the most appropriate one, is the development of renewable scale application for local communities with the possibility to develop at industrial scale only in places that this is economic, environmental and social accepted and needed on long term. This paradigm change is requiring thinking of long term and restructuring of the renewable energy policy so that every single home could implement such technologies leading to a more decentralized energy production and use. The

technical obstacles are simple to grasp but we have to stress the direct link between the cost of the solution and the number of facilities on the market. The renewable energy sector is having a great social and environmental acceptance level at least at a more general view. But there are still some issues when it comes to build one in the back of the house -the response is usually NIMBY (not in my back yard). The investment in the biogas has the same drawbacks as other RES in the country.

On the other hand it seems that the green certificate quotas adopted by Romania is not the most suitable one for the actual position of the RES (other than hydro-electrical power plants) with very low funds attracted. The solution used in Romania with green certificates (despite the advantages, see next) is the not necessary the most suitable one for a not so developed production capacities in the renewable energy.

As mentioned in the introduction there is one specific barrier different from other countries, and this is link 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, the decline of specific sectors (livestock – pig & cow complexes), the fragmentation of the properties and the technologies used in agriculture – that 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 must 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 step wise 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.

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 land filled 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.

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 biomethane 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.

## **5. Public Policy Measures to Support Biogas**

### **Setting the National Biogas target**

No indicative biogas production target is specified by the National program for RES in Romania. There is only a general support for RES in Romania in form of Green Certificate allocation (one certificate per megawatt produced in such facilities). As the up-front costs are high in the case of biogas facilities this financial support is not enough to facilitate the development of biogas. One idea is to set of clear national biogas target and develop financial support mechanism for its implementation.

### **Biogas and regional planning**

Preliminary information about the spatial distribution of biogas feedstock in Romania was made available within the Big East project under the 2.4 work package. Further investigations are necessary. Biogas potential could be utilized more efficient, if RES projects would be incorporated in regional and spatial planning. Small to medium scale

biogas facilities should be encouraged so that they better use the decentralized energy potential, making available the energy to the local level communities at affordable prices and with low environmental impact support in this way the sustainable development.

### **Other uses of biomethane**

In order to inject biomethane in natural gas grid, it is necessary to amend regulations to ensure that natural gas transmission operator gives permission biomethane injection.

### **Administrative Measures**

In order to continuously update existing biogas potential studies and to find new possibilities for biogas production in Romania, improvements in collecting statistical information on biogas feedstock and biological waste is necessary. In order to overcome the administrative barriers related to permit procedure and establishment of grid connection, the development of roadmap or guide for permit procedure is necessary.

### **Incentives and state support**

The process of transformation/changes in the energy market in Romania has started several years ago with some important steps like: unbundling of the electricity market generation, transmission and distribution, establishment of a market operator and appointment of a trading system operator, road map for electricity privatization of the distribution companies as well as the production, development of green certificate market (almost 3 years ago), the development of the day-ahead market.

The regulations apply to both energy generated from renewable sources (such as wind, geothermal, hydro, biomass, waves) and energy generated from hybrid plants, using renewable and conventional sources. To benefit from the facilities provided by law, the production units using renewable sources have to obtain a certificate for the guarantee of origin attesting the provenience of the electricity.

A system of mandatory green quota, representing the proportion of electricity generated from renewable sources out of the aggregate gross domestic electricity consumption combined with the trading system for green certificates has been established. All electricity suppliers have the obligation to acquire electricity from renewable energy sources at least in the quotas indicated by law. If they do not comply with the above requirement important penalties are applied. The mandatory quotas have been established until 2010 in line with the target assumed by Romania during the negotiations for EU accession, starting from 0.7% for 2005 and ending at 8.3% for 2010-2012.