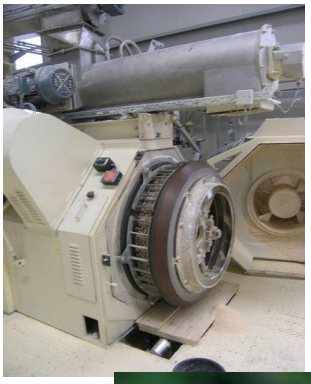

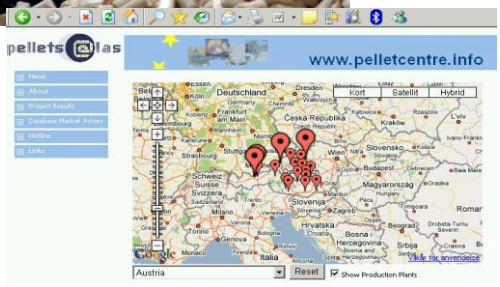

Development and promotion of a transparent European Pellets Market

Creation of a European real-time Pellets Atlas

Pellet market country report

ROMANIA

Intelligent Energy Europe

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October 2009

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This report is available at the pellets@las website at www.pelletsatlas.info

The pellets@las project is supported by the European Commission under the EIE programme (EIE/06/020/SI2.448557). The sole responsibility for the content of this report lies with the authors. It does not necessarily reflect the opinion of the European Communities. The European Commission is not responsible for any use that may be made of the information contained therein.

TABLE OF CONTENTS

1. Introduction

Romania is characterized by extremely high primary energy intensity, compared to the EU-27 average. According to the national strategies for Energy Efficiency and for the Use of Renewable Energy Sources, Romania's target is to reduce the primary energy intensity and to increase the weight of the renewable energy in the national gross energetic consumption.[1]

Romania has 6.3 million hectares of forestland, which accounts for 28 % of the total land area and the demand for energy from renewable raw materials is growing in Romania due to high dependency on fossil fuel imports and especially in view of the EU Renewable Energy Directive. Therefore bio energy is considered one of the most promising growth markets (the energy potential of biomass is approximately three times higher than the potential of wind energy). However, although this sector shows great potential, it has barely been utilized.

Within the country, the biomass energy sector is divided. Wood production is concentrated in the Carpathians and the lower Carpathians, while agricultural by-products are produced in the south of the country and the region of Moldavia.

Presently biomass, such as wood and wood chips, is used to heat private households and provide them with warm water. In addition, a small amount is used in modern and low-emission power plants.

Although the number of newly built pellet plants had increased rapidly within the last few years, the use of wood pellets in Romania especially for private heating is still very limited. At least 80 % of the production is exported. The most relevant export countries are Italy followed by Austria, Hungary and Germany.

The large-scale consumption of pellets for the production of electricity (as it is already common in northern Europe) is of no importance in Romania. Still there already exists a small market for industrial pellet heating systems and for district heating.

To promote the development of a national pellet market a Romanian pellet association was founded in 2008.

To convince the Romanian government of longterm incentives for the installation of pellet heating devices and to implement the European standard to guarantee pellet quality will be the main challenges for the Romanian pellet industry for the next few years.

[1] Roadmap for the implementation of the Environmental Technologies Action Plan – ETAP in Romania (2007).

2. History of market development

Biomass was predominantly used in rural areas and at the town outskirts for heating and food preparation by means of traditional technologies.

Over 14 million stoves and ovens burning wood and/or agricultural waste used for heating or food preparation in individual residences have low energy efficiency and generate high noxious emissions (CO, CO2, NOx). Only 11 % of the energy from biomass is generated in relatively modern installations. Some industrial units, especially in the wood processing industry, have acquired industrial boilers for steam and hot water preparation from biomass (including sawdust). In 2006 there were more than 550 industrial hot water and steam boilers running on fuel wood and about 10 hot water boilers between 0.7 MW and 7 MW for heating (totalling 45 MW). Seven settlements have 38.9 MWt urban heating installations running on wood biomass.[2]

In Romania the renewable energy sources represent a new market with much less market actors than in the developed countries but with promising perspectives for the future. Only about 4 years back there was no RES industry in Romania but only small-scale projects or prototypes developed by few research institutes or small companies. Although a few projects on using waste wood were carried out within the last 10 years, the production of pellets started quite late; 2004 probably only two production plants existed with a production capacity of approximately 30,000 tonnes per year. 4 years later the number of producers and production capacity has nearly multiplied tenfold (Table 1).

Table 1: Development of the pellet market over the past years (source: HFA).

Year	Total production capacity [tonnes/year]	Total production [tonnes/year]	Consumption [tonnes/year]
2008	~ 260.000	~ 114.000	~25.000
2004	~ 30.000[3]		

Recently the Romanian government has begun to change its mind in regard to energy production, leading to plans for expanding the use of biomass and the construction of wood burning power plants; in the course of this opportunities for biomass utilization have been developed as Romania has adopted the primary legislative framework for promoting renewable sources. The “Romanian Strategy for Renewable Energy Sources Utilisation” provides the necessary framework and general principles for developing action programmes for renewable energy sources and sets targets for increasing reuse of waste, including wood and agricultural residues.

The national “Energy efficiency programm for 2009-2010” assures financial support for specific types of investment focusing on use of renewable energy sources (including biomass) and among others on modernization of systems for the supply of

[2] ACCESS Biomass and Solar (2007): Report on the perspectives to the development of the biomass potential (D14).

[3] ACCESS Biomass and Solar (2007): Maps and databases on the biomass potential (D13).

thermal energy. The main promoter is the Romanian Energy Conservation Agency (ARCE), which defined clearly the biomass as the viable alternative to the fossil fuels in small district heating systems.[4]

A promotion of pellets in particular is still outstanding though.

3. Pellet production

Romania has 6.3 million hectares of forestland, which accounts for 28 % of the total land area. The main tree species is beech (32 %), followed by spruce (24 %) and oak (18 %).[5] Forestry became important only after the privatization of the national forests and there exists a substantial wood working industry. The bigger part of by-products generated from sawmills is further processed in wood panel manufacturing and cellulose industry. However, only ten years ago a considerable amount of residues from the wood working industry was lying around as waste.

Efforts were made then to heat this “waste” in district heating facilities. The idea to produce wood pellets only was adopted about five years ago. The production plants are predominantly small-sized companies with only one medium-sized plant (Table 2).

The rapidly growing interest in pellets as an alternative to oil and natural gas has led to extensive investments in pellets production within the past years (often through foreign investors). Currently pellets are produced at about 20 sites in 10 Romanian counties.

In 2008 the production capacity of about 260,000 tonnes per year was ten times higher than the domestic demand. The real production can only be estimated with about 114,000 tonnes. It has to be noted, that the total production capacity per year is difficult to evaluate because the capacity is usually given in tonnes/hour and depends on the number of shifts and operating days of the year, which especially for small companies often depends on the raw material supply.

[4] Government of Romania: Energy efficiency programme for 2009-2010

[5] Borlea G. F., Radu N.: Wood Energy in Romania; http://www.zgs.gov.si/fileadmin/zgs/main/img/CE/biomasa/BIOMASA_ANG_PROJEKTI/PDF_sredstavotve_II_del/Romania.pdf; 02.12.2008

Table 2: Production of wood pellets 2008 based on the size of the pellets plants (source: HFA, evaluated with the pellets@las methodology).

Size of pellets plants	Production capacity 2008 [tonnes/year]	Total production 2008 [tonnes/year]	Number of pellets plants 2008	Utilisation rate 2008 [%]
small-scale (< 30000 tonnes/year)	~ 180.000	~ 71.000	19	40
medium-scale (30000 – 70000 tonnes/year)	~ 80.000	~ 43.000	2	54
large-scale (> 70000 tonnes/year)	--	--	--	--

Standards

At present there exist no national standards or regulations regarding pellets in Romania. Most producers state that their pellets meet the requirements of the German standard “DIN 51731: Testing of solid fuels – Compressed untreated wood – Requirements and testing” but without owning a certificate.

There is one company certified according the Austrian standard “ÖNORM M 7135: Compressed wood or compressed bark in natural state – Pellets and briquettes – Requirements and test specifications” and the German certification programme DIN *plus* and another company according DIN *plus*.

The European prestandard “CEN 14961: Solid biofuels – Fuel specifications and classes” is not yet commonly known.

Raw material

Firewood and agricultural wastes make up about 80 % of the total biomass while wood wastes from industrial processes about 6.5 %. About 66 % of firewood and 66 % of wood wastes are located in the Carpathians and Sub-Carpathians (Figure 1, Table 3).[6] There is a large amount of wood waste available throughout the country, which is still waiting to be utilized.

[6] ACCESS Biomass and Solar (2007): Report on the perspectives to the development of the biomass potential (D14).

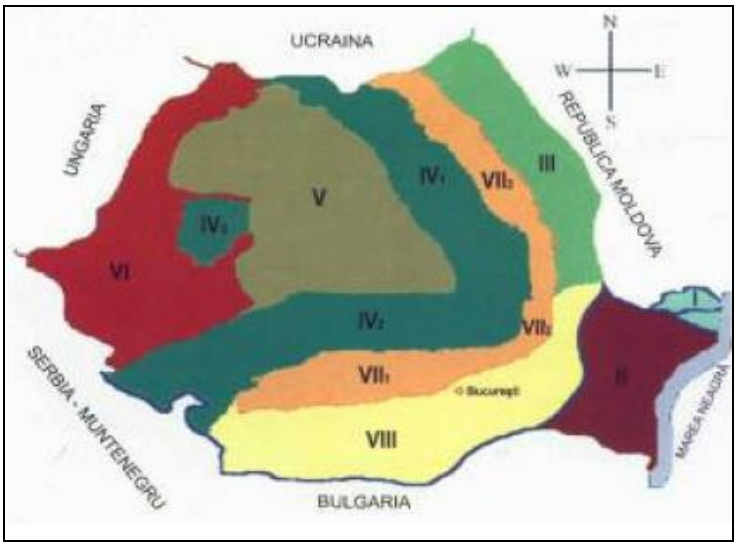

Figure 1: Regions in Romania.[7] I. Danube Delta; II. Dobrudgea; III. Moldavia; IV. Carpathians; V. Transylvania Plato; VI. West Plain; VII. Sub Carpathians; VIII. South Plain

Table 3: Biomass potential (TJ) in Romania.[8]

Region	Biomass wood - forestry	Wood wastes	Biomass agriculture	Biogas	Urban wastes	Total
Dobroudja	451	269	13,422	1,477	910	16,529
Moldavia	1,728	802	37,071	2,462	2,370	44,433
Carpathians	19,552	8,049	17,506	1,231	1,640	47,978
Transylvanian Plateau	8,721	3,482	12,956	2,954	2,740	30,853
West Plain	3,622	1,603	24,761	4,432	1,825	36,243
Subcarpathians	13,034	5,366	40,849	3,693	6,570	69,512
South Plain	2,133	861	54,370	8,371	6,750	72,485
TOTAL	49,241	20,432	200,935	24,620	22,805	318,033

Pellets are made from wood chips or from by-products out of the industrial wood processing. The latter possibility is the currently most used in Romania.

The sawdust produced by uncountable small and middle size wood companies can be ideally used for the pellet production. Although the final product has been continuously developed over the last two years, the major problem for pellet plants without an ajacent sawmill still is the difficulty to obtain a homogeneous feedstock to guarantee a constant pellet quality. Those companies, which process residues out of their own production don´t face this problem and this way are able to offer high quality pellets (with DIN *plus* and/or ÖNORM M 7135 certificate).

[7] Ionel I. (2006): The potential of biomass in Romania; NETBIOCOF workshop; http://www.netbiocof.net/data/upload/uploads/The%20potential%20of%20biomass%20in%20Romania-3%20.pdf; 02.12.2008

[8] ICEMENERG in ACCESS Biomass and Solar (2007): Maps and databases on the biomass potential (D13).

An interesting development is a production plant built in mobile units. The components of the plant are designed to fit entirely in special containers, with all the machineries that are useful for all the phases of the pellet production, from the collection of raw materials to the storage of the finished product packaged in 15 kg bags. This plant can be dimensioned, with the following production capacity: 1,000 kg/hr, 1,500 kg/hr and 2,000 kg/hr.[9]

Associations

Although the number of newly built pellet plants increased rapidly within the last years, the use of wood pellets especially for private heating is still very limited. For the majority of plants with a small-sized company structure the transport costs for exporting pellets are quite considerable. Therefore a group of 12 stakeholders, which in 2008 founded the Romanian pellets association; aim at the establishment of a relevant home market for pellets.

Association members are companies operating in the field of pellet economy including mainly pellet producers, manufacturers/traders of pellet boilers/stoves and pelletising equipment producers.

Priority objective of the association is to convince the Romanian government of the necessity of subsidies for the installation of pellet heating systems in private homes.

4. Pellet trade and logistics

Storage and Logistics

The storage capacity at the production plants amounts to about 22,000 tonnes but the data quality of this figure is rather low due to a low response rate of the production companies.

There is no private endconsumer market for loose pellets at the moment. Pellets are sold in bags (15 kg) either directly at the pellet plants or they are offered by various retailers (e.g. Metro, baumax, Praktiker); the enduser is responsible for the transport.

Pellets in stores are said to be nearly twice as expensive as bought directly at the pellet plant. This shows that the infrastructure for the sales of pellets is still at a low stage of developement.

Import and Export

With a current production capacity of about 260,000 tonnes meeting a national consumption of around 25,000 tonnes only Romania is a typical pellet exporter country. The biggest part of the pellets goes to Italy, followed by Austria, Germany,

[9] Vivarelli F. (ETA) (2008): 4th Newsletter of the Pellets@las project.

Hungary and other countries (Figure 2). There is no import of pellets. The transport is done by trucks.

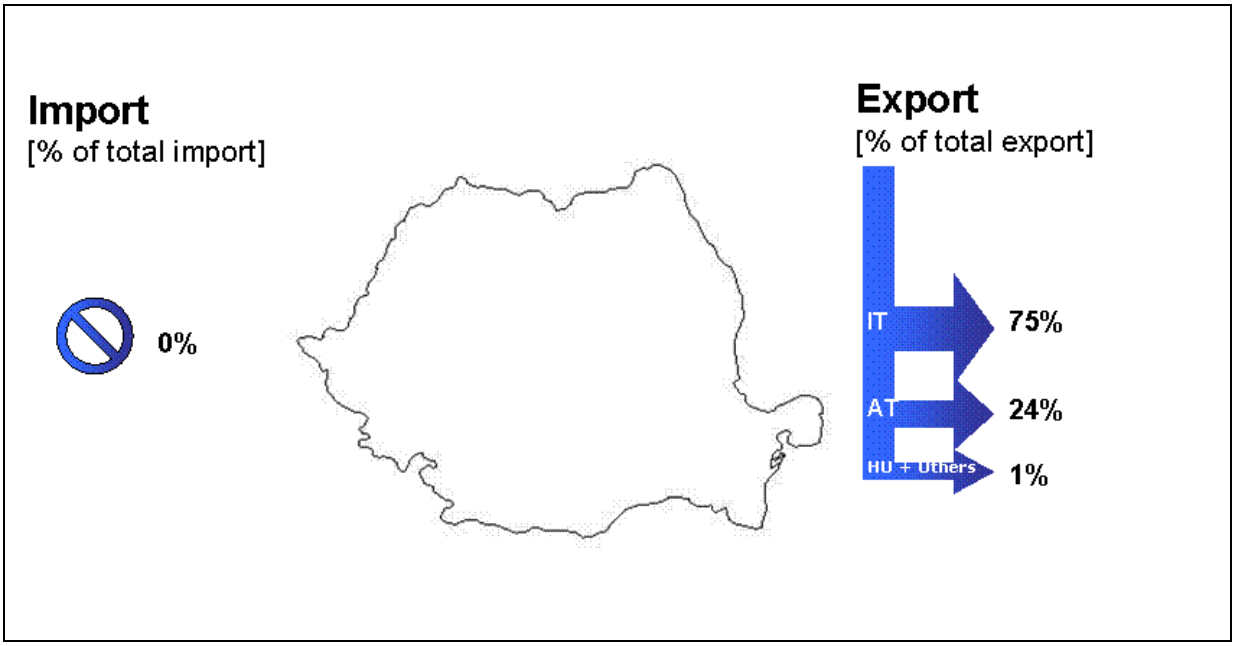

Figure 2: Pellet trade 2008 (source: HFA).

5. Pellet consumption

The Romanian endconsumer market for woodpellets is rather small still but is expected to grow quickly in the next years.

Small-scale consumption

During the last few years Romanian companies started to produce and distribute heating appliances for residential use with modern design and very high efficiency (80-85 %) meeting all major international standards and environmental and legal requirements. The Romanian producers work in cooperation with well-known EU companies. These companies have distributors in Romania and their production is available at the Romanian market.

For the private heating market pellet boilers (< 50 kW), pellet stoves and central-heating stoves are used. The number of installed boilers is still below 1000 with an estimated pellet consumption of 6,000 – 10,000 tonnes in 2008.

The total annual consumption in 2008 for Romania is estimated with 25,000 tonnes. There was a slight increase of the pellet price during winter months (Figure 3) but due to existing stocks discounts were given by some plants from the beginning of 2009 on.

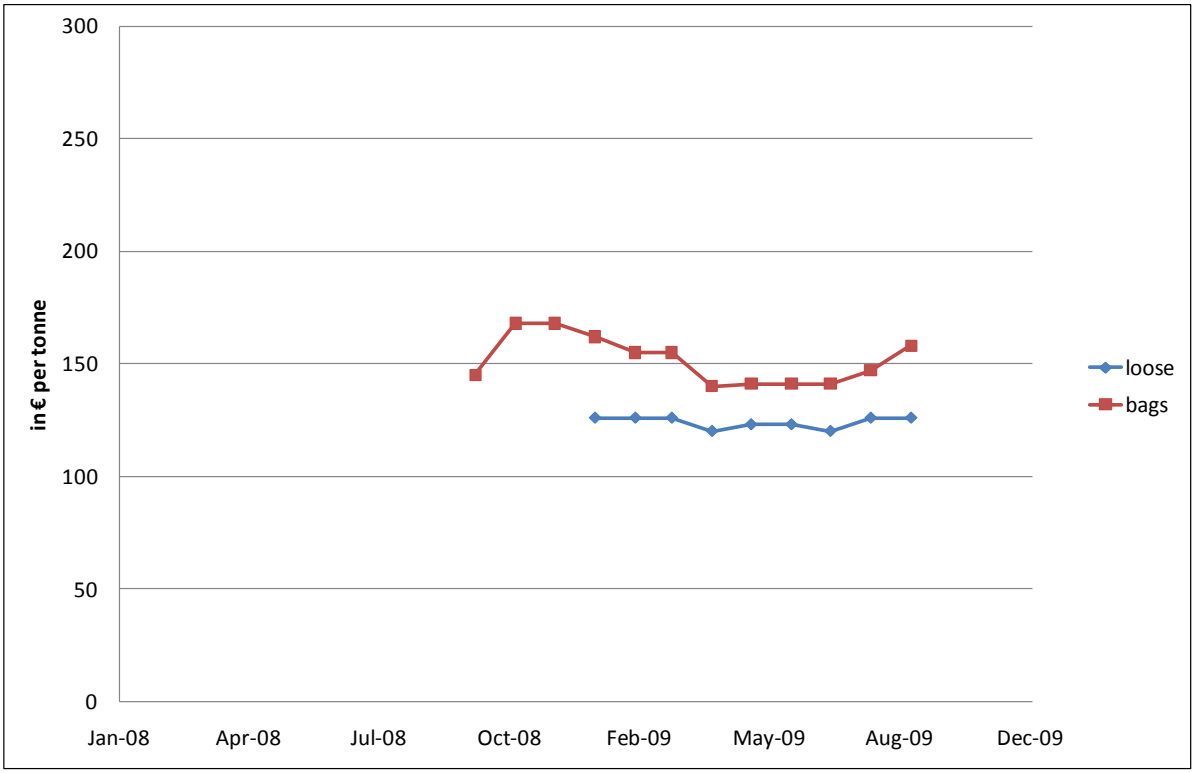

Figure 3: Price development over the past months. Weighted average price per tonne wood pellets in bags < 25 kg on pallets; sold directly at the pellet plant; excl. transport; incl. VAT (19 %); Price represents approx. 5 % of the private consumption in the country (source: HFA).

Large-scale consumption

The large-scale consumption of pellets for the production of electricity (as it is already common in northern Europe) is of no importance in Romania. A future increase of biomass for co-firing of power plants (CHP) is rather going to be realized through direct firing of wood chips or agricultural biomass.

Still there already exists a small market for industrial pellet heating systems (estimated consumption 2008: up to ~ 10,000 tonnes) and for district heating (estimated consumption 2008: up to ~ 10,000 tonnes).

6. Mixed biomass pellets

There is hardly any information about the Romanian MBP market; it is assumed that there doesn´t exist a considerable MBP market in Romania at the moment.

Nevertheless extracting energy from renewable raw materials is an important alternative to the limited fossil fuels such as coal and natural gas and an opportunity for agriculture at the same time. With 14.8 million hectares Romania is the second largest producer of agricultural products in Central and Eastern Europe behind Poland and currently holds one of the best positions in Europe in terms of biomass. About 58 % of agricultural wastes are found in the South Plain, West Plain and Moldavia (Figure 1).[10]

[10] Press release: RENEXPO®-South-East Europe 2008

The large potential for biomass in Romania is far from being depleted. In order to guarantee an independent energy supply for the rural population, concepts were developed to produce energy and heat out of agricultural by-products.

Still, at the moment it seems that the production of MBPs competes strongly with the direct firing of biomass, due to higher investment costs for the pellet production. For the future it will matter which kind of biomass is mainly promoted under the programme of the Romanian Energy Conservation Agency (ARCE).

7. Legal framework & Policy

The institutional framework for the promotion of measures to encourage the efficient use of energy was created in 1990 with the founding of the Romanian Agency for Energy Conservation (ARCE), a public body under the authority of the Ministry of Economy and Trade. The powers of this agency were strengthened in 2000 with the adoption of Law 199/2000 regarding the efficient use of energy, this law being amended and supplemented by Law 56/2006. The legislative framework is constantly beeing completed with the primary and secondary legislation needed in order to reach the settled tasks for the use of renewable energy.[11]

There was no legislation found concerning emission tresholds of residential heating devices.

In the field of biomass-burning technologies all relevant CEN standards have been adopted in the national standardisation (e.g. SR EN 14785: “Residential space heating appliances fired by wood pellets – Requirements and test methods.” And SR EN 303-5:”Heating boilers for solid fuels hand and automatically fired, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking.”).[12]

Subsidy schemes

Since 2003 (unlimited) the Romanian Energy Efficiency Fund grants subsidies for corporate bodies for projects in the field of Energy Efficiency and Renewable Energy up to 80 % of the total investment costs if at least 50 % of investment´s benefits come from energy savings.[13]

Since 2005 (unlimited) the Romanian Environmental State Fund (AFM) grants subsidies for corporate bodies in the field of “Use of Clean Energy” and “Enhancing the Rate of Renewable Energy in Energyproduction”.Companies are supported with

[11] Constantin C. et al.: „The Romanian legislation regarding the energy efficiency and renewable sources“; http://www.mec.utt.ro/; 07.04.2009.

[12] ACCESS Biomass and Solar (2007): Standards for biomass products and small scale RET (D17).

[13] Romanian Energy Efficiency Fund (2006): „Capacity Building for Romanian Banks in Energy Efficiency Loan Provision“-USAID Romanian Energy Program.

up to 50 %, communes up to 60 %, NGOs and schools up to 90 % of the total investment costs.[14]

At the moment there are no subsidies given for private persons concerning the use of pellets. The Programme “Green House” was planned for the year 2009 by the Ministry of Environment to grant subsidies for solar heat and heat pumps only but the new government had suspended this programme for an indefinite period of time. A new programme including pellet heating is in discussion.

Information campaigns

There is no information about specific campaigns on the part of the government or the Romanian pellet association promoting pellets.

But the implementation of the RENEXPO® concept (an international trade fair with accompanying conferences for renewable energy) into south-east Europe in the last year reflects the growing interest in bio energy topics.

In November 2008, the RENEXPO® South-East Europe, international trade fair and conference for renewable energy and energy-efficient construction and renovation, took place for the first time in Bucharest. Biomass was one of 5 RES-topics. The next trade fair for 2009 is already in preparation.

In March 2009 the “1st International Wood Energy Conference in Romania – Modern Wood Energy Systems: A New Opportunity for Romania & South-East Europe” took place in Arad at ENREG ENERGIA REGENERABILA®. It offered the attendees overview upon ways of the utilization of wood energy in Romania, brought practical examples from other European countries and gave the chance to get informed about the latest results of research and development.

8. Projections on future developments

Due to gas crisis and increasing fossil fuel prices the Romanian pellet heating market is expected to grow quickly. In Romania there is more opportunity to cut emissions compared to Western Europe, but the biggest impact on the use of biomass will be the growth of energy demand in this region and the attempt to meet this demand in a sustainable way. Nevertheless, to meet the aims set in the new EU Renewable Energy Directive, it will be necessary that the government promotes the use of pellets by granting subsidies for the installation of pellet heating systems.

With the continuous growing of the market an implementation of the European standard CEN 14961, which is going to be issued soon, is going to be unavoidable,

[14] Danuletiu D. C., Teiusan S. C. (2008): „The role of the romanian environmental fund in Financing environmental programmes“.

especially if the production companies want to be competitive on the European market in the long run.

The worldwide economic crises can be felt primarily in the export, although owing to the cold winter wood pellets were not affected so long. Due to the massive infrastructure projects (e.g. highway construction, renovation of the railway network, expansion of the Danube) and high level of EU subsidies no collapse of the Romanian economy is to fear. [15]

9. Summary and conclusions

There is a large amount of wood waste available throughout the country. But utilisation of this wood for energy purposes is insufficient due to difficulties related to gathering, processing and transportation. A number of studies conducted in the last years showed that these wood wastes are economically viable resources which only recently are used for the production of pellets.

In Romania the pellet market is under development, in particular for heat generation. The main barriers and drivers for the growth of the market are listed below.

Major barriers for further market growth

For pellet production:

- Heterogenous raw material still makes it difficult to guarantee a constant high quality of the pellets.
- Insufficient infrastructure regarding especially the road network
- Small pellet plants still face difficulties to find buyers for their pellets without relevant home market and the export being no cost-efficient alternative due to high transport costs.

For pellet consumption:

- High investment costs for pellet heating devices

With the growing of the consumptionmarket further barriers are likely to surface:

- Problems with the pellet quality
- Deficiencies in the installation of the pellet heating systems
- The supply security of pellets as a fuel

[15] Hotspot Rumänien; Wirtschaftsnews: http://portal.wko.at/wk/format_detail.wk?AngID=1&StID=471288&DstID=0#; 01.04.2009

Major drivers for further market growth

For pellet production:

- The development of a home market for pellets (depending on incentives)
- In view of the EU directive for renewable energies 2020 a considerable growth in pellet demand can be expected.
- Expansion and rehabilitation of the road networks

For pellet consumption:

- Subsidies for the installation of pellet heating systems would boost the market very efficiently.
- Implementation of quality control for pellets
- Special trainings for installers (in the long run)
- Nation-wide storage concepts have to be developed to ensure supply security (in the long run).