

Development and promotion of a transparent European Pellets Market  
Creation of a European real-time Pellets Atlas

# Pellet market country report BULGARIA



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## 1. Introduction

Bulgaria's forests cover around 4.1 million ha, about 33 % of the national territory. Broadleaved forests account for 68 % of the forest area, and conifers account for 32 % of the area. As a result of large-scale forestation activities during the second half of the 20th century the total timber stock in Bulgaria and the annual growth continue to increase. This is the basis for woodpellet production in the country. Still the woodpellet market in Bulgaria is only at the beginning of development. There exist a number of rather small pelletsmanufacturers with a total production capacity of about 62,000 tonnes/year. 80-90 % of the pellets are exported (mainly to Italy).

Pellets are still new on the Bulgarian market mainly due to the relatively high investment costs and lower purchase power compared to other EU countries. The most popular use of biomass in Bulgaria nowadays is direct combustion of fire wood, which is highly ineffective because in most cases it is carried out in facilities with low efficiency (< 50 %). Many households still use electricity for heating as well and it would be very economical to substitute it with biomass.

Industrial consumption of biomass is confined to wood shavings, bark and industrial waste from production processes; although this use of biomass is growing, their share in the country's energy balance is still insignificant. Pellets are hardly used.

Nevertheless it is expected that pellet production and use will gain speed in line with forecasted economic development and living standard increase in forthcoming years. The national policy in the area of renewable energy sources, and in particular the use of biomass as an energy source, is being carried out by the Council of Ministers through the Minister of Economy and Energy. The "National Long-Term Programme to Encourage the Use of Biomass for the Period 2008-2020" establishes the general framework of the opportunities to utilise biomass for energy purposes. After the adoption of the long-term programme short-term programmes have to be developed to promote the use of biomass in Bulgaria.

The overall situation of the Bulgarian pellet market is difficult to track. There is no pellet association. Other organisations which had worked on projects on biomass (including pellets) in Bulgaria a few years ago (Sofia Energy Centre, Black Sea Regional Energy Centre) could not give any information on how the pellet market had developed during the last years.

## 2. History of market development

Biomass historically is the largest component of the heat balance of the Bulgarian household sector. But in the second half of the 20th century a certain reorientation to electricity and liquid fuels occurred due to the tariff system distortion (subsidies). This is about to be overcome. In the period 1996-2004 households increased their biomass use 3.4 times, while at the same time the use of most other fuels has declined.<sup>1</sup> This increase is due to the low price of firewood while the recent energy policy in the country and the international energy market dynamics resulted in continuously increasing prices of oil, gas, electricity and heat. This was a strong driver towards the use of wood biomass.<sup>2</sup>

This growing biomass utilization, however, is not clearly positive, because the biomass resource used by the vast majority of households is firewood burned in simple stoves with efficiencies between 20 % and 40 %. These individual stoves are widely used all over the country, particularly in smaller towns and also in parts of bigger towns. All types of organic materials are used for heating purposes: logs, wooden chops, coal, briquettes, etc. Main advantage of this technology is that it is quite cheap and long lasting, but the use of low-efficiency and simple stoves fuelled by firewood results in both high indoor and outdoor air pollution.

Combustion units combined with a boiler, with individual capacity within the range of 4-15 kW are not very popular in Bulgaria for historical reasons. Due to the low energy (incl. electricity) tariffs, the most popular heating sources were firewood and electricity. There were no incentives for using efficient stoves due to the low prices of wood.

Table 1 shows the development of the pellets market within the last years.

**Table 1: Development of the pellet market over the past years (source: 2008-HFA, 2002-2005<sup>3</sup>).**

Year	Total production capacity [tonnes/year]	Total production [tonnes/year]
2008	~ 62.000	~ 27.000
2005	~ 4.000	n.a.
2004	~ 3.000	n.a.
2002	~ 1.000	n.a.

<sup>1</sup> REHES Renewable energy for heat supply in dwellings with individual and local heating systems (2007): „Report of the solar and biomass energy potential: Bulgaria, China, Romania, Turkey (ENERO).

<sup>2</sup> ACCESS Biomass and Solar (2007): Report on the perspectives to the development of the biomass potential.

<sup>3</sup> ACCESS Biomass and Solar (2007): Maps and databases on the biomass potential (D13).

### 3. Pellet production

The high importance of the wood processing industry is related to sufficient wood resources and long traditions of this sector. The companies active in this sector produce a wide range of materials/products for both the domestic and foreign markets. All companies in the sector are privatized and the majority of them, including pellet production plants, are SMEs.<sup>4</sup>

There are 17 small-scale production companies with a total production capacity of about 62,000 tonnes per year (Table 2). As no official statistical data is available, the numbers are estimated.

**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)	~ 62.000	~ 27.000	17	~ 44
medium-scale (30000 – 70000 tonnes/year)	--	--	--	--
large-scale (> 70000 tonnes/year)	--	--	--	--

#### Standards

There is no national standard for the quality control of pellets. Most producers stated that their pellets meet the requirements of the German standard “DIN 51731: Testing of solid fuels – Compressed untreated wood – Requirements and testing”, the Austrian standard “ÖNORM M 7135: Compressed wood or compressed bark in natural state – Pellets and briquettes – Requirements and test specifications” or the German certification programme DIN plus. No company owns a certificate for these standards.

The European prestandard “CEN 14961: Solid biofuels – Fuel specifications and classes” is known.

#### Raw material

35 % of the Bulgarian territory is covered by forests, which makes the potential for wood utilization theoretically very significant.

According to the assessments of the Energy Efficiency Agency biomass waste contributed 13 % of the total primary energy sources in 2005. The highest is the

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<sup>4</sup> ACCESS Biomass and Solar (2007): Report on the perspectives to the development of the biomass potential (D14).

potential for forestry residues and agricultural plant waste. Industrial waste amounts only to 3 % (Figure 1).<sup>5</sup>

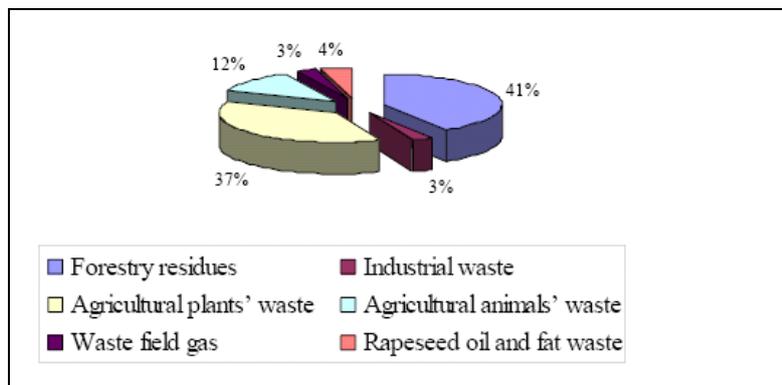


Figure 1: Share of RES types in Bulgaria.

The volume of residues from the processing of timber wood depends on the final product but the average percentage is around 31% (Table 3). The hard wastes are used for energy purposes – both in industry and by households. The soft wastes (chips, wood-dust, and wood-fibre) remain unused and represent a substantial reserve for briquette and pellet production.

Table 3: Waste and unutilised biomass in Bulgaria and its energy potential.<sup>6</sup>

	Unused quantities	Energy equivalent, toe/yr.
Branches and twigs	315 000 m <sup>3</sup> /yr.	65 100
Industrial wood waste	50 000 t dry matter/yr.	23 000
Solid agricultural waste, including:		
Straw	542 900 t/yr.	184 500
Maize stems	1 079 808 t/yr.	194 400
Sunflower stems	762 000 t/yr.	167 600
Vine prunings	136 000 t/yr.	29 900
Fruit tree prunings	47 120 t/yr.	9 400
Tobacco stems	40 000 t/yr.	8 000
Waste from live-stock breeding (only from large farms) and energy potential of biogas	325 453 t/yr.	70 000
Solid household waste and fuel equivalent when using in combustion installation	361 700 t/yr.	36 300
Landfill gas (from 10 selected landfills)	37 729 971 m <sup>3</sup> /yr.	12 600
Gas from waste water treatment plants	21 424 500 m <sup>3</sup> /yr.	9 100
<b>Total</b>		<b>809 900</b>

<sup>5</sup> REHES Renewable energy for heat supply in dwellings with individual and local heating systems (2007): „Report of the solar and biomass energy potential: Bulgaria, China, Romania, Turkey (ENERO).

<sup>6</sup> Ministry of Economy and Energy (2008): National long-term programme to encourage the use of biomass for the Period 2008-2020

## Associations

There is no pellet association in Bulgaria. There are different organisations (e.g. Sofia Energy Center, Black Sea Regional Energy Center) working in the field of renewable energy in general with pellets being only one issue amongst others.

The Association of Producers of Ecological Energy (APEE) was established in 2004 by 16 companies but is promoting mainly wind and solar energy.

## 4. Pellet trade and logistics

### Storage and Logistics

The storage capacity at the production plants amounts to about 11,000 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 through retailers; the enduser is responsible for the transport.

### Import and Export

Due to the hardly existing pellet consumption market in Bulgaria and the higher prices for pellets in other European countries Bulgaria exports a large share of the pellets currently produced. The biggest part of the pellets goes to Italy (Figure 2). There is no import of pellets. The transport is done by trucks.

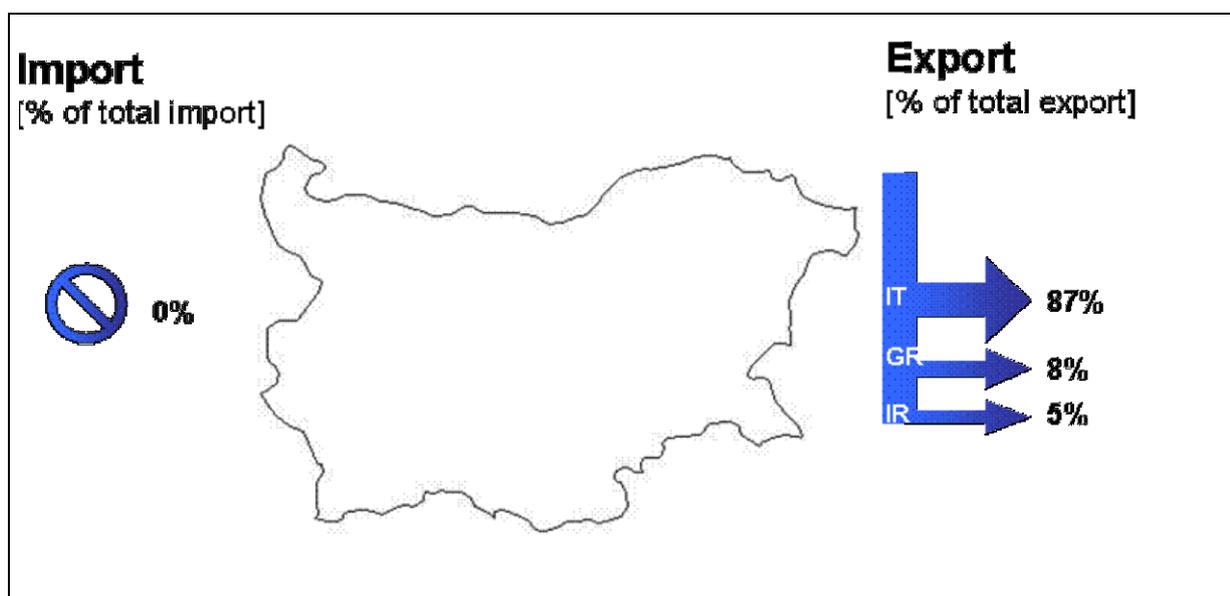


Figure 2: Pellet trade 2008 (source: HFA).

Bulgaria's road network is of great importance for trade with the European Union as well as for the integration of the country's remote regions in the European market. However, limited funds for road rehabilitation and maintenance have led to a

deterioration of a large percentage of roads in the past. Since 2007 the world bank supports Bulgaria with a “Road Infrastructure Rehabilitation Project”, which will assist the Bulgarian Government in improving the condition of roads for greater access to markets for the population and enterprises in small towns and rural areas.<sup>7</sup>

## 5. Pellet consumption

Currently 86 % of the biomass energy utilization in the country is attributed to households.<sup>8</sup>

### Small-scale consumption

During the last few years Bulgarian 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 Bulgarian producers work in cooperation with well-known EU companies. These companies have distributors in Bulgaria and their products are available at the Bulgarian market.

For the private heating market pellet boilers (< 50 kW), pellet stoves and central-heating stoves are used. The number of modern boilers used in households is still negligible due to the high share of low income population, as well as due to a lack of awareness. In the last years, this negative pattern is gradually changing, as the share of high-efficiency pellet and briquette boiler-based technologies is growing. However, such advanced technologies are mainly used by a small part of the population with high incomes and the total consumption of pellets is estimated at about 10 % of the production only.

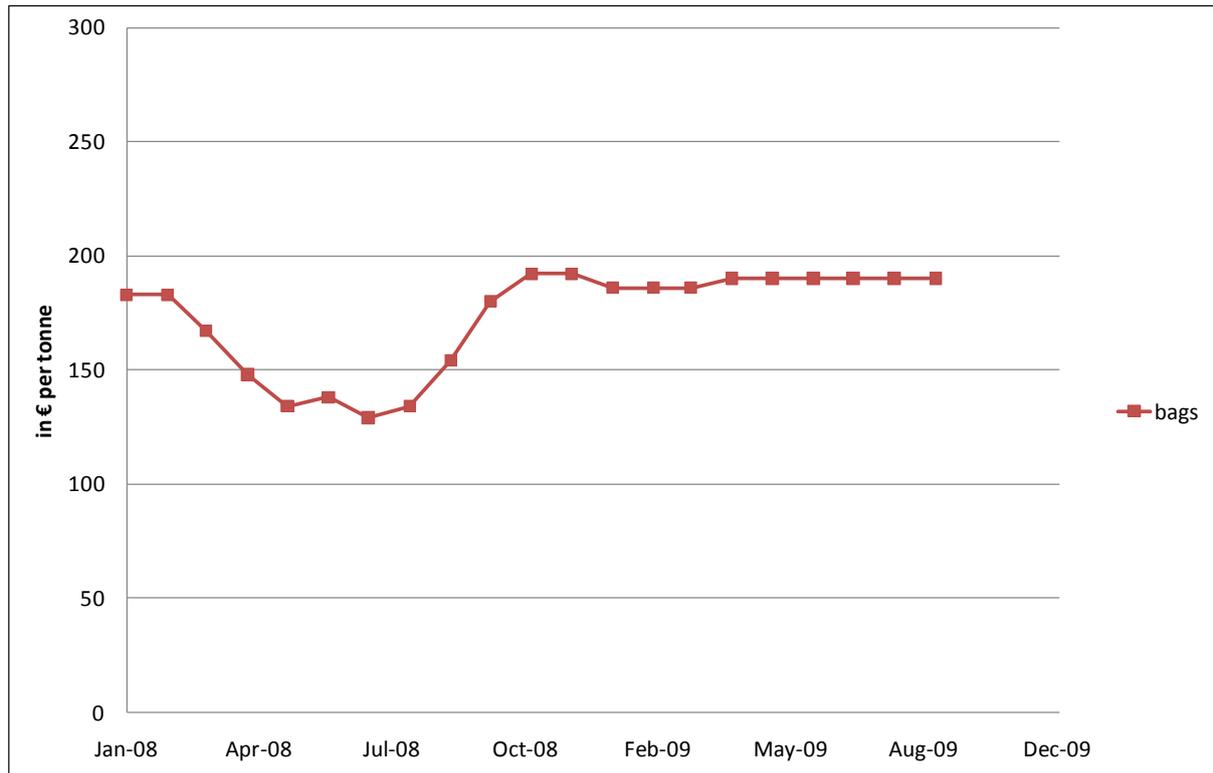
The pellet price resembles the low purchasing power in Bulgaria. It lies clearly below Western European pellet prices but otherwise follows the seasonal development (Figure 3).

The higher availability of pelletsboilers for households led to a pellets crisis in 2006/07 because pellets manufacturers were unable to provide enough pellets with constant quality for a certain price. The endconsumer market in Bulgaria which hardly existed before seemed to have stagnated for a while after this crisis.

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<sup>7</sup> <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS>; 12.05.2009

<sup>8</sup> REHES Renewable energy for heat supply in dwellings with individual and local heating systems (2007): „Report of the solar and biomass energy potential: Bulgaria, China, Romania, Turkey (ENERO).



**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 (20 %)(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 Bulgaria. 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.

The same goes for district heating and industrial boilers, where rather wood chips or wood briquettes are used. The chip production is usually cheaper, as there is no need of preliminary wood drying and energy for pelletising. On the other hand, in Bulgaria no market for wood chips is established and their price varies largely.<sup>9</sup>

## 6. Mixed biomass pellets

Agricultural residues also have substantial energy potential. The technology, necessary for the production of biomass fuels is available in the country, but its capacity is not fully used. Still the country does not have experience with the collection, pressing and transportation of e.g. maize stems and corncobs, sunflower stems and cobs, and tobacco stems.

<sup>9</sup> ACCESS Biomass and Solar (2007): Report on the perspectives to the development of the biomass potential.

Assessments show that in Bulgaria about 30 % of available straw, 65 % of the corn-stalks and about 80 % of the rest of solid agricultural wastes can be considered for energy purposes which makes about 800.000 tonnes annually.<sup>10</sup>

The generation of this type of waste is in direct dependence on the yield and harvested areas for the respective year. The utilisation of this type of biomass depends, to a large degree, on the development of technologies for prior treatment, preparing it for the subsequent transformation into energy.

There is hardly any information on the Bulgarian MBP market.

One market actor in Bulgaria selling seeds for the energy crop Rumex OK 2 “Uteush” states that in the future he is going to cultivate the crop for electricity production by means of direct firing only.

Another company gives information on the internet website concerning the production of “pellets out of wood saw-dust or other energy crops – such as straw, cornstalks, wheat, corn, sun-flower flakes, etc.”.

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 national short-term programmes.

## 7. Legal framework & Policy

The national policy in the area of renewable energy sources, and in particular the use of biomass as an energy source, is being carried out by the Council of Ministers through the Minister of Economy and Energy. The Energy Efficiency Agency (EEA) is a separate legal entity and performs the functions of an Executive Agency to the Minister of Economy and Energy. The “National Long-Term Programme to Encourage the Use of Biomass for the Period 2008-2020” establishes the general framework of the opportunities to utilise biomass for energy purposes. The programme includes an extensive review of different studies on the potential of renewables for heat and electricity generation, but there are no clearly set targets or measures.<sup>11</sup>

According to the EU Directive 2001/80/EC on Large Combustion Plants the “Regulation No. 10 of 6 October 2003 on the Emission Limit Values (Concentration in Waste gasses) of sulphur dioxide, nitrogen oxides and total dust, discharged to the atmosphere from large combustion plants” deals with large combustion plants, intended for power generation, with a nominal heat generating capacity above or equal to 50 MW. This regulation sets the emission limit values for different kinds of fuels, among others biomass (Table 4).

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<sup>10</sup> Sofia Energy Centre (2006): „Biomass – What is this and how to use it for energy.“

<sup>11</sup> REHES Renewable energy for heat supply in dwellings with individual and local heating systems (2007): „Report of the relevant national strategies, legal and administrative framework (MERKAT).“

**Table 4: Maximum emission limit values [mg/m<sup>3</sup>] of large combustion plants for biomass, based on heat generating capacity [MWth]**

	LCP plant operating before 27 <sup>th</sup> November 2003		LCP plant operating after 27 <sup>th</sup> November 2003			
	50-<100 [MWth]	100-<500 [MWth]	=>500 [MWth]	50-100 [MWth]	>100-300 [MWth]	>300 [MWth]
<b>Dust</b>		100	50	50	30	
<b>SO<sub>2</sub></b>	2000	2400		200	200	
<b>NO<sub>2</sub></b>		600	500	400	300	200

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

### Subsidy schemes

From January 2005 until December 2008 the Bulgarian Energy Efficiency and Renewable Energy Credit Line BEERECL (credit line of the European Bank for Reconstruction and Development in cooperation with national banks) subsidized the installation of woodenergy and solarthermy for private companies with 20 % of a received credit. A continuation of BEERECL was presented end of March 2009.

From May 2005 until September 2009 the Residential Energy Efficiency Credit Facility REECL (credit line of the European Bank for Reconstruction and Development in cooperation with the European Commission, the Bulgarian Energy Efficiency Agency and national banks) provides personal loans to householders for the installation of energy efficient heating devices. The subsidy amounts to 20 % of the capital costs (biomass boilers and stoves are subsidized up to 600 €) or in case of a joint project (e.g. multi-family house) to 30 %.

### Information campaigns

There is no information on specific campaigns on the part of the government promoting pellets.

Via Expo Ltd. organises the “International Congress & Exhibition for South-East Europe on Energy Efficiency and Renewable Energy Sources”. In 2009 this congress took place for the 5<sup>th</sup> time in Sofia and reflects the growing interest in bio energy topics; still pellets were hardly present in the programme.

## 8. Projections on future developments

“The national long-term programme to encourage the use of biomass for the period 2008-2020” outlines that the wider use of biomass resources would allow for a reduced dependence on the import of energy resources, contributes to the security of

energy supply and has a relatively smaller environmental impact as compared to conventional fuels (Figure 4).

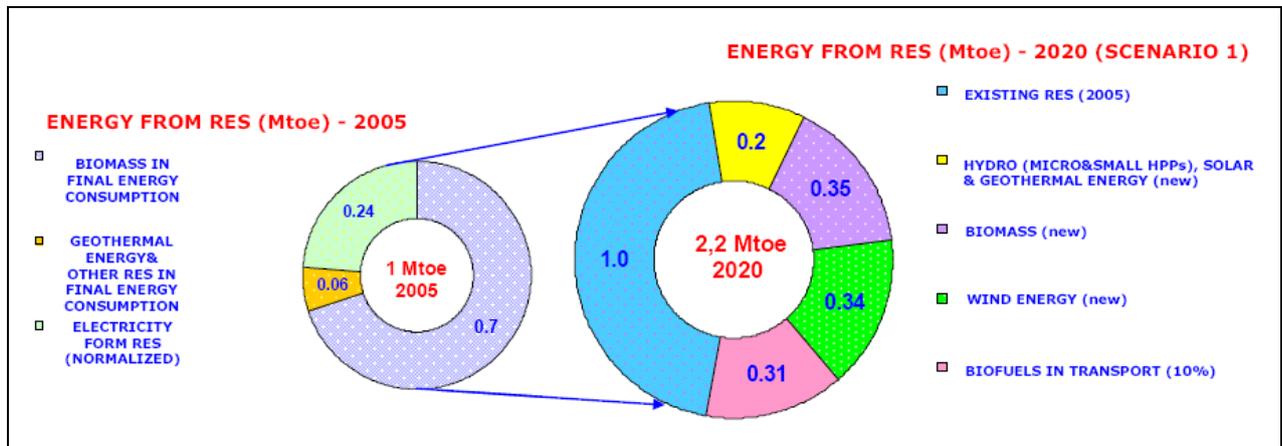


Figure 4: Energy from RES in 2005 and scenario for 2020.<sup>12</sup>

The leading role in increasing the use of the local RES potential will be played by local and regional authorities. On the one hand, they should lead, for example, by demonstrating the efficient use of local RES and on the other, by establishing a favourable environment to develop private investment and the installation of facilities and systems for use of RES electricity and energy for heating and cooling.

It is expected that with the development of the domestic market for pellets their production will quickly grow because of the existing substantial unused quantities of dry wood shavings.

But a lot will depend on the “National short-term programme to encourage the use of biomass 2009-2011, which kind of biomass is going to be mainly promoted.

<sup>12</sup> Bulgarian Energy Strategy by 2020 – draft version, November 2008

## 9. Summary and conclusions

Bulgaria gets over 70 % of its total energy consumption from imports, lignite coal being the only substantial national resource used until now. The use of RES in 2005 amounted to only 9.4 % of the gross final consumption of energy (of which 70 % were biomass). The target for Bulgaria, as proposed by the Commission, is that in 2020 16 % of the gross final energy consumption should come from RES.<sup>13</sup>

In Bulgaria the pellet consumption market is hardly existent. The produced pellets are mainly exported.

The establishment of a homemarket would further stimulate the pellet production market. The main barriers and drivers for the growth of the market are listed below.

### Major barriers for further market growth

For pellet production:

- No relevant home market
- Deteriorated road infrastructure

For pellet consumption:

- Low awareness of heating alternatives (Missing promotion of pellets compared to direct firing of biomass)
- Construction of a new gas infrastructure for domestic demand
- High investment costs for pellet heating devices.

With the growing of the consumption market 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.

### Major drivers for further market growth

For pellet production:

- The development of a home market for pellets
- Road Infrastructure Rehabilitation Project

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<sup>13</sup> Bulgarian Energy Strategy by 2020 – draft version, November 2008

For pellet consumption:

- A Pellet Association to promote the use of pellet heating systems for private homes
- Further subsidies for the installation of pellet heating systems
- Implementation of quality control for pellets
- Special trainings for heating appliance installers