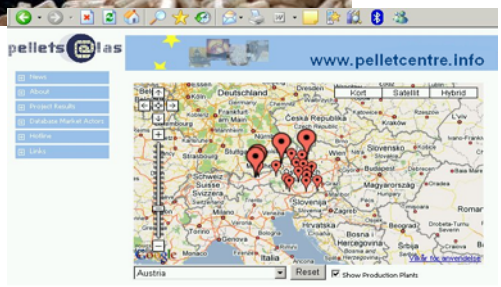

Development and promotion of a transparent European Pellets Market

Creation of a European real-time Pellets Atlas

Pellet market country report

POLAND

Intelligent Energy Europe

 Baltic Energy Conservation Agency
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This report is available at the pellets@las website at www.pelletsatlas.info

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1. Summary

Poland has 8,9 million hectares of the forestland, which accounts for 28,8% of the total land area. National forests cover the area of 7,4 mln ha, and further increase in the forestation is planned, until they cover 32% of the country in 2020.

No wonder that biomass is the most commonly used renewable energy source (its share in RES exploitation in 2007 was equal to 91,3%).

On the other hand, coal has always been the most commonly used energy fuel in Poland, due to significant own resources of it, and it will take long time to change society's mentality and existing old, coal installations – in order to popularize new fuels, like pellets.

Pellets production has started in Poland in 2003. At the very beginning they were mainly exported. Then, national consumption started to develop, due to first pellet boilers installed. These days, due to legal regulations, even large energy producers, like DH companies or CHP plans became pellets consumers. Market develops intensively and this will not change very soon, due to existing obligations concerning RES exploitation levels and rising prices of fossil fuels.

2. Introduction

Polish energy market is mainly coal based. For decades coal was the main energy carrier, exploited by power plants, DH systems and individual heating systems. Private households, without any access to DH network are equipped with either coal, gas or oil installations. These were mainly rural areas where biomass was used- in the form of log wood, fired in old, inefficient installations.

Polish pellets market is still very young – production activity has only started in 2003, but its rate of growth is very fast. Large portion of the production volume was exported every year, but this ratio changes recently, as domestic consumption grows.

Due to rising prices of fossil fuels, as well as the risk of their unstable deliveries, more and more people show their interest in pellets. Also, large consumers like CHP plants started to co-fire biomass with coal- and all of the above have resulted in major rise in pellets production, that occurred in 2008.

3. History of market development

In Poland the renewable energy sources represent a relatively new market, with much less market actors than in the developed countries, but with the promising potential of growth in the future. Although large hydropower has been exploited for decades, and wood firing has always been very popular- modern RES technologies have only started to develop.

Pellets production has begun in 2003, and the production volume has increased significantly every year. At the beginning majority of the pellets produced was exported abroad, mainly to Sweden, Denmark, Germany, Italy. However, recent legal regulations oblige energy producers to so called “green energy” production and in 2008 significant rise in domestic consumption occurred, combined with the drop of export - 230 000 tonnes of pellets.

Table 1: Development of the pellets market over the past years

Year	Total production capacity [tonnes/year]	Total production [tonnes/year]	Consumption [tonnes/year]
2008	665 000	350 000	120 000
2007	545 000	350 000	60 000
2006	415 500	280 000	35 000
2005	300 000	200 000	25 000
2004	255 000	120 000	6 000
2003	no data	20 000	0

No major changes in the number of pellets producers can be observed- it's usually around 20 companies in operation, however, some of them change the production profile or leave the market due to lack of business successes, and some new ones enter the market from time to time. Especially recently, Pellets@las hotline in Poland has registered some enquires concerning advice on starting up a pellet company in Poland. It seems that people have noticed a developing branch and see their chances in this business.

4. Pellet production

Forests cover 28,8% of the area of Poland (8,9 mln ha). National forests cover the area of 7,4 mln ha, and further increase in the forestation is planned, until they cover 32% of the country in 2020. Technical potential of the forest wood, that may be used for energy purposes, equals 6,1 mln m^3, which is sufficient to produce 42 PJ of energy. Technical potential of the wood residues from wood processing industry and other sources equals 58 PJ (8,3 mln m^3). In the future, when these reserves are not sufficient, technical potential may be increased by utilization of new energy crops and development of their plantations.

Rapidly growing interest in pellets as an alternative to oil and natural gas has led to extensive investments in pellets production within last years. Currently pellets are produced by 21 companies, however, this number changes constantly as some new companies enter the market, and some of the existing ones switch their production profile, for example to agro-pellets production.

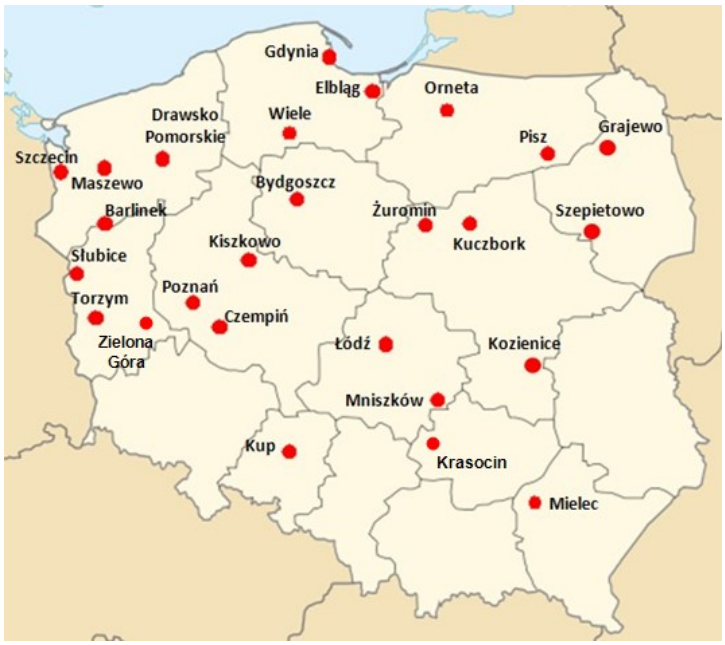


Figure 1: Location of wood pellet plants, 2008.

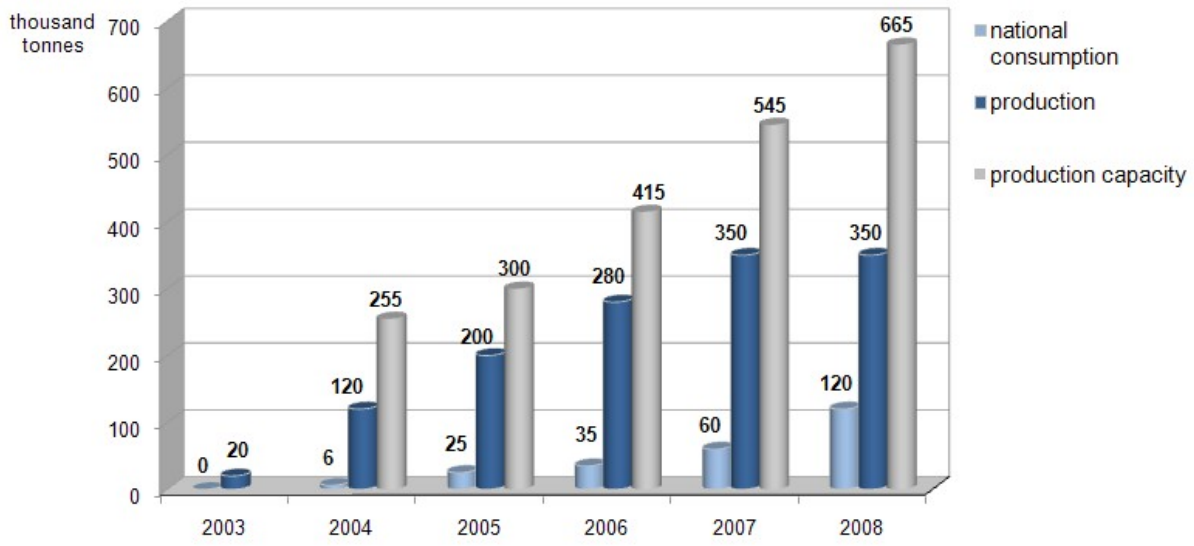


Figure 2: Installed wood pellet production capacities, wood pellet production and consumption in Poland.

Table 2: Production of wood pellets 2008 based on the size of the pellets plants.

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)	140 000	123 000	14	76
medium-scale (30000 – 70000 tonnes/year)	161 000	106 000	4	66
large-scale (> 70000 tonnes/year)	364 000	121 000	3	33

Small and medium scale production

Majority of Polish wood pellets producing company have production capacity below 30 000. However, they are characterised by the highest utilisation rate (table 2 above).

These are small or medium companies that buy their raw materials from wood processing industries in their vicinity. They operate their own regional distribution system.

Large scale production

In the large scale, only three sites are known. Two of them are operated by wood industry companies. The third one is dedicated pellet company.

Although these three companies have production capacity higher that the whole current national production, it is being utilised in only 33%. Appearance of large customers will probably change this situation soon.

Pellets of these companies do have quality certificates: two of them DINplus certificate, and the third one – DIN 51731.

Quality standards

There exists no national standard for the quality control of pellets.

Some pellets meet the requirements of the German standard DIN 51731, and their quality is certified. Producers often claim that their pellets meet the requirements of the Austrian standard ÖNORM M 7135, or the German one- DIN Plus- but they do not have the certificate to prove this fact.

There are also pellets that do not posses any certificate, but claim to fulfill criteria of all of them.

No claims on pellets quality have been registered by the Baltic Energy Conservation Agency, though.

Pellet associations

Polish pellet market is still very disorganized. There were some trials to organize national companies in an association, which will result in better clarity of the market and its development, however they did not succeed. Companies perceive each other only as rivals, trying to win better business position, and solicitously hide all production information. Unfortunately, they do not notice that in this way they plot against themselves.

Raw material utilisation

Wood shavings and saw dust are the mainly used raw material for pellet production. Quality of the raw material originating from furniture or construction industry is good. Saw dust from small sawmills may be contaminated with bark and sand, or even with larger pieces of wood , and therefore shall be sieved before the pellets production process begins. Wood chips are used in tiny amounts so far.

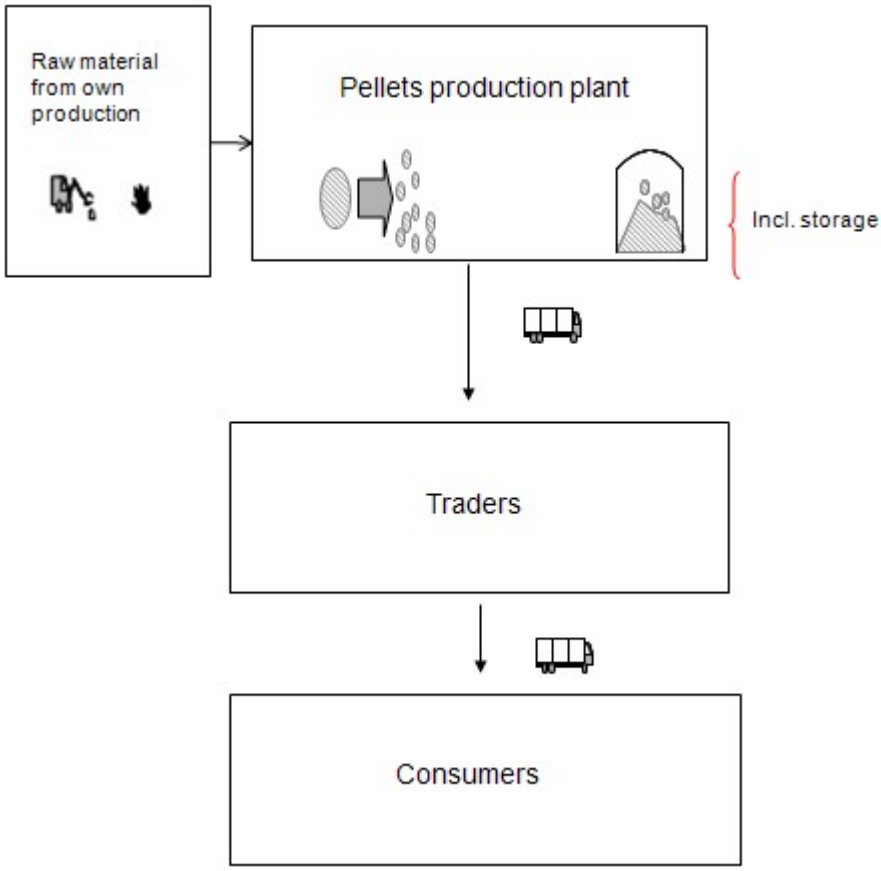
5. Pellet trade and logistics

The storage capacity at the production plants amounts to about 72.000 tonnes, but data quality is quite low as only half of the production companies decided to answer this question.

It’s even harder to say what is the percentage of the storage area utilization, as even fewer answers were collected on this question.

Typical logistic chains present on the Polish pellets market:

1)



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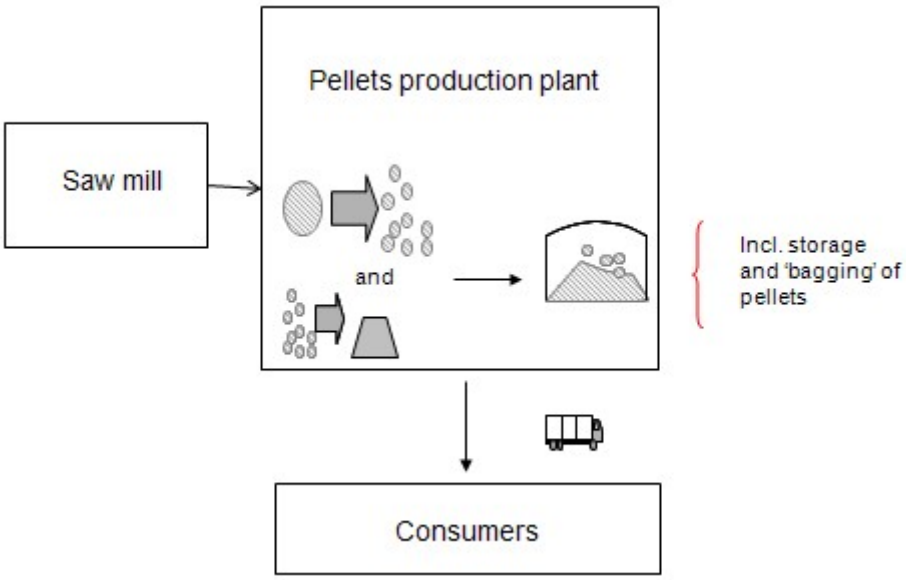

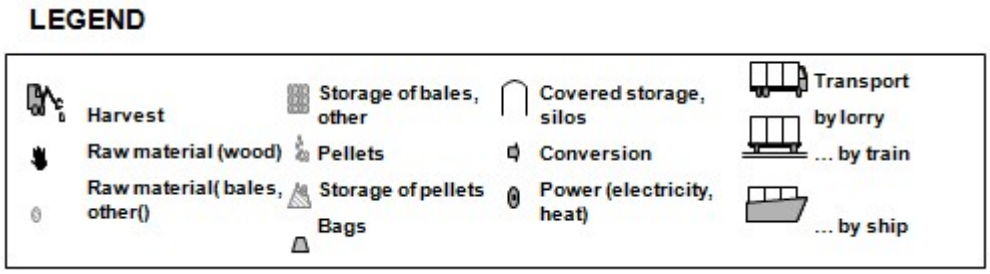

International trade:

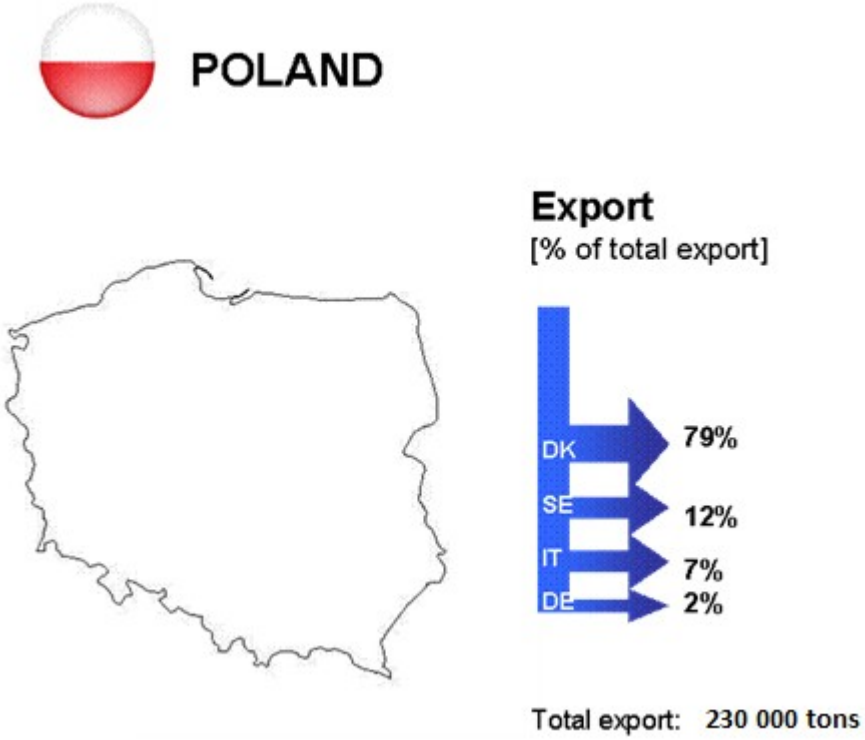

Figure 3 : Import / export flows in Poland

6. Pellet consumption

Consumption volumes

Existing legal duty concerning obligatory production of so called “green energy” (both heat and electricity) results in the increased interest of both DH companies and CHP plants in biomass utilization, in order to co-fire it with coal. As a result, significant growth in the national consumption occurred in 2008, and 120 000 tones of pellets were burned at the national market (in comparison to 60 000 tones in 2007).

Pellets Prices

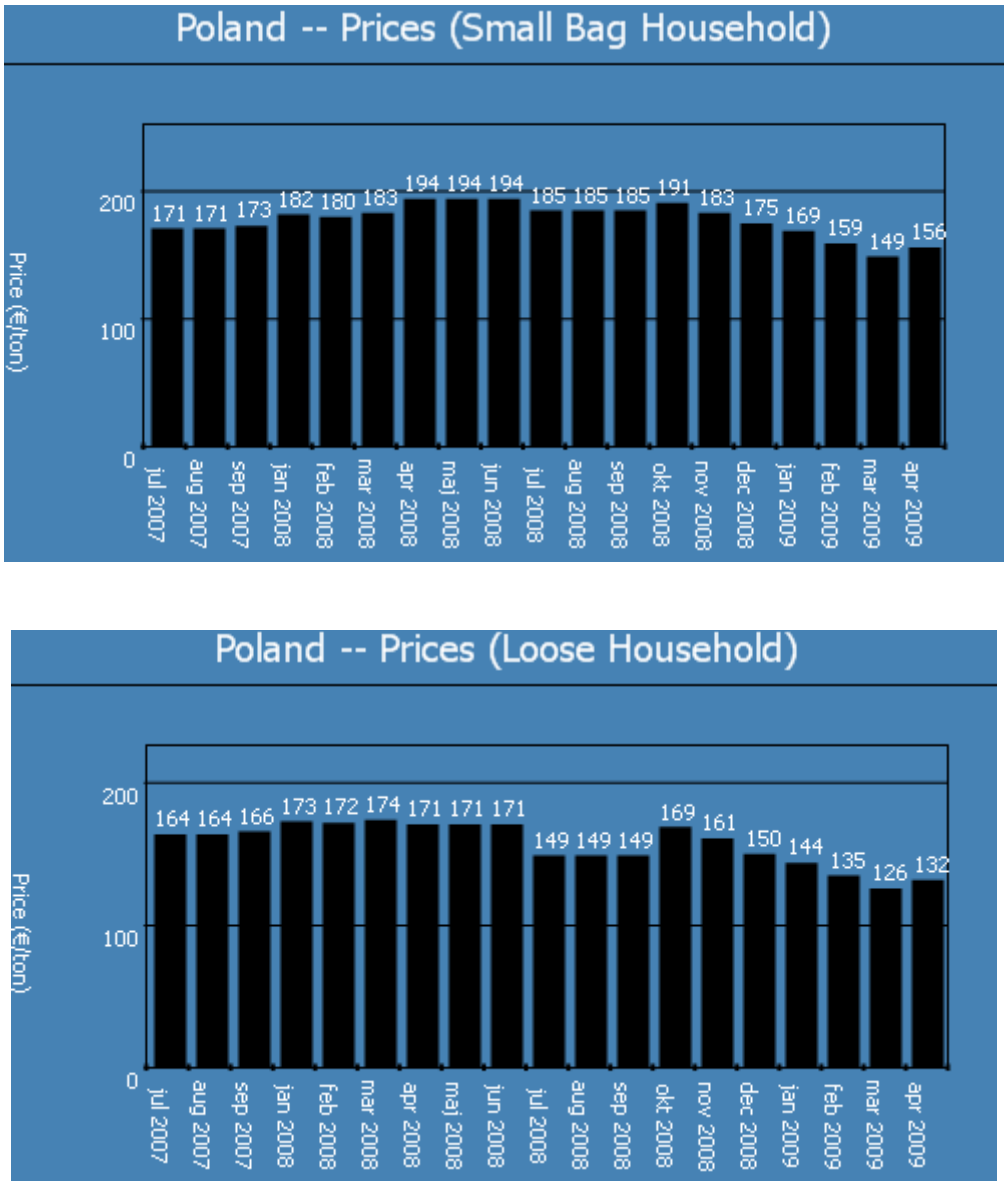

Figure 4 : Pellets prices in Poland since July 2007

Fluctuations of prices observed in 2008 are only the result of changes in the exchange rate. Significant drop of the PLN's value in relation to Euro occurred, what affected prices records. Prices on the national market remained at the stable level, minor rise was noted at the last quarter of 2008.

Pellets still remain at the very attractive price level, in comparison to other fuels.

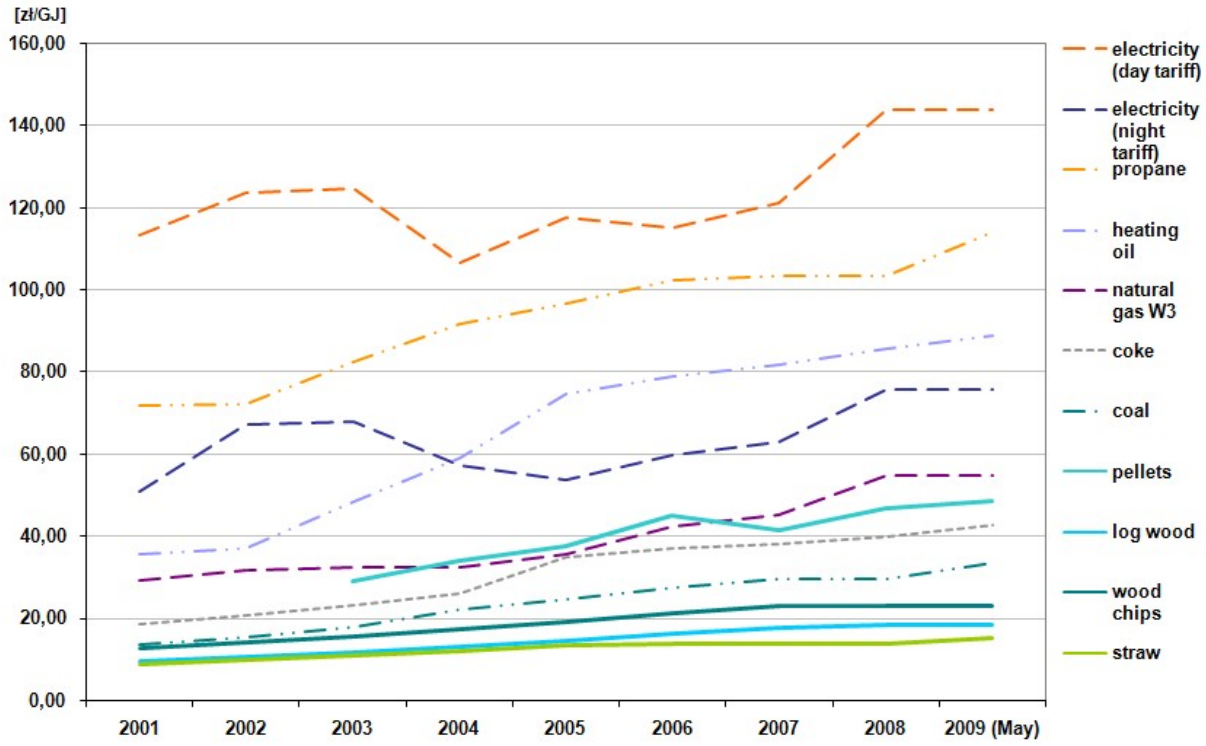

Figure 5: Comparison of heat prices (PLN/GJ)

7. Mixed biomass pellets

Production of mixed biomass pellets constantly increases in Poland. Several companies may be tracked, usually of insignificant production volumes.

Also, some companies temporary change of the production profile- from wood pellets into mixed biomass ones- resulting from the market situation, demand, raw material availability and its prices.

Sunflowers husks pellets are being imported from the Ukraine, but it is hardly possible to track numerous tiny companies performing this activity.

Figure 6: Location of mixed biomass pellet plants, 2008.

Still very little is known about MBP market. Raw material resources are difficult to estimate, however straw surpluses that can be used by energy sector are assessed at 10 million tonnes. Supply terms may change over time, as long-term contracts are not preferred by the farmers. Today, they feel confident with obtruding straw prices on potential pellets producers. As long as prediction of the production costs is difficult, high risk exists.

Despite of the aforementioned market obstacles, more and more companies see their chances in this market branch. Powerful stimulant of the MBP market growth are recent changes in legal regulations, which promote the use of agricultural biomass (energy crops, agricultural residues and residues coming from food processing industry), and no longer respect residues from forestry and their processing.

New regulation given by the Ministry of Economy (dated 14 August 2008, Dz.U. 156, Poz. 969) states, that energy producing units of power output exceeding 5MW, claiming to produce renewable electricity in cogeneration, due to biomass share among other fuels used, have to assure that agricultural biomass (energy crops, agricultural residues and residues coming from food processing industry) weight ratio is at least:

5% - in year 2008

10% - in year 2009

25% - in year 2010

Up to 100% in 2015.

The above means that power plants will strive for the increase of agricultural biomass use, and MBP constitute an interesting option for this.

8. Legal framework & Policy

Emission limits

For installations < 1 MW emission limits are given by Polish Standard PN-EN 303-5 (which corresponds to European Standard EN 303-5:1999):

Type of fuel	Power output kW	Emission limits								
		Mg/m^3 at 10% of O_2								
		CO			OGC*			dust		
		Class of device			Class of device			Class of device		
		1	2	3	1	2	3	1	2	3
Boilers loaded manually										
biofuel	< 50	25000	8000	5000	2000	300	150	200	180	150
	50-150	12500	5000	2500	1500	200	100	200	180	150
	150-300	12500	2000	1200	1500	200	100	200	180	150
Boilers loaded automatically										
biofuel	< 50	15000	5000	3000	1750	200	100	200	180	150
	50-150	12500	4500	2500	1250	150	80	200	180	150
	150-300	12500	2000	1200	1250	150	80	200	180	150

* *unburned particles of coal in the gas phase*

For installations ≥ 1 MW a regulation issued by Ministry of Environment on 4th August 2003 exists:

Power output [MW]	**Emission limits for dust in mg/m^3**					
	For installations put into operation before 29.03.1990		For installations put into operation after 29.03.1990			
	Until 31.12.2015	Since 01.01.2016	Building permit issued before 07.10.1998		Building permit issued after 07.10.1998	
			Until 31.12.2015	Since 01.01.2016	Until 31.12.2015	Since 01.01.2016

< 5	700	200	630	200	630	200
≥ 5 & < 50	400	100	400	100	400	100
≥ 50 & < 500	100	100	100	100	50	50
≥ 500	50	50	50	50	50	50

Power output [MW]	**Emission limits for SO_2 in mg/m^3**
< 100	800
≥ 100 & < 500	800-400
≥ 500	400

Power output [MW]	**Emission limits for NO_x in mg/m^3**	
	01.01.2008 – 31.12.2015	since 01.01.2016
≤ 500	400	400
> 500	400	200

There exists also a certificate issued by the Institute of Chemical Processing of Coal- "Environmental Safety Certificate". The certificate is non-obligatory, however it is often necessary when one wants to apply for European funds. It became very popular among manufacturers, who voluntarily try to get one. Certificate is issued for small solid fuel boilers, and its requirements are more strict than those of the standard PN-EN 303-5. For example, contrary to the standard, certificate sets limits for NO_x, TOCs or aromatic hydrocarbons emissions.

Boiler type	Boiler's class	Efficiency	Emission limits					
			CO [mg/m^3]	NO_2 [mg/m^3]	Dust [mg/m^3]	TOC [mg/m^3]	Aromatic hydrocarbons [mg/m^3]	Benzo-apyrene [µg/m^3]
Boilers loaded manually	B	≥ 75	≤ 5000	≤ 400	≤ 200	≤ 150	≤ 15	≤ 150
	A	≥ 80	≤ 1200	≤ 400	≤ 125	≤ 75	≤ 5	≤ 75

Boilers loaded automatically	B	≥ 78	≤ 3000	≤ 600	≤ 150	≤ 100	≤ 5	≤ 100
	A	≥ 80	≤ 1200	≤ 400	≤ 125	≤ 75	≤ 5	≤ 75

Incentives in form of “green and red certificates” contribute to the situation, where more and more companies see their chances in pellets market. Green certificates stand for electricity produced in RES – their value is approximately 250 zl/MWh, red certificates stand for CHP – reaching value of 120 zl/MWh for small plants < 1MW.

There were recent changes in legal regulations, which promote the use of agricultural biomass (energy crops, agricultural residues and residues coming from food processing industry), and no longer respect residues from forestry and their processing. This will result in the increased interest in MBP.

New regulation given by the Ministry of Economy (dated 14 August 2008, Dz.U. 156, Poz. 969) states, that electricity producing units of power output exceeding 5MW, claiming to produce renewable energy, due to biomass share among other fuels used, have to assure that agricultural biomass (energy crops, agricultural residues and residues coming from food processing industry) weight ratio is at least:

5% - in year 2008

10% - in 2009

25% - in 2010

40% - in 2011

55% - in 2012

70% - in 2013

85% - in 2014

100%- in 2015.

Energy producing units of power output exceeding 20 MW, claiming to produce renewable electricity, due to biomass share among other fuels used, have to assure that agricultural biomass (energy crops, agricultural residues and residues coming from food processing industry) weight ratio is at least:

5% - in 2008

10% - in 2009

20% - in 2010

20% - in 2011

20% - in 2012

25% - in 2013

30% - in 2014

40% - in 2015

50% - in 2016

60% - in 2017

The above means that heating plants will strive for the increase of agricultural biomass use, and MBP constitute an interesting option for this.

Subsidies

Voivodeship Funds for Environmental Protection

Offer subsidies for thermomodernization of public buildings (schools, hospitals…)

Communal Funds for Environmental Protection

- Offer subsidies if one wants to install a biomass stove (subsidy constitutes 20-30% of the whole investment cost)

European Funds

- offer subsidies (up to 50%) for the communes that want to develop renewable energy heating system on their territory

9. Projections on future developments

With an annual wood pellet consumption of 120,000 tonnes and a population of around 38 million, the per capita wood pellet consumption in 2008 amounted to around 3 kg per person. Compared to an annual per capita consumption of around 40 kg in Austria or 11 kg in Germany (2008), there seems to be a lot of potential for further market growth.

Available feedstock reserves (wood chips derived from forest residues and energy crops plantations) amount to 1 mln m^3.

There exists significant potential for the development of the following pellets markets: district and communal heating systems, co-firing at CHPs.

Torrefaction technology is already known in Poland, and developed further.

Wider application of CEN standards is advised and development of distribution network.

10. Conclusions

Nowadays, market growth is being affected by the following barriers and drivers:

Major barriers for the market growth:

- Insufficient infrastructure
- High investment costs for pellet heating devices
- The supply security of pellets as a fuel

Major drivers for the market growth:

- Fast development of the home market
- Legal obligations concerning RES utilization
- Facilitation of the access to subsidies