

THE PELLETS@LAS PROJECT –A COMPREHENSIVE EUROPEAN PELLET MARKET OVERVIEW

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ABSTRACT: The aim of the PELLETS@LAS project is to contribute to the development of a transparent European pellets market through the creation of a European Pellet Atlas, mainly through a web-based information platform on important fuel pellet market data, such as produced and available quantities and qualities and regularly up-dated regional sales prices (www.pelletsatlas.info). In this paper, the first results are presented, including *) a geographical overview of wood pellet plants in Europe, *) wood pellet production, production capacity and the consumption in developed markets in Europe 2007, *) pellet end user prices in 17 European countries, *) prices for large volumes delivered to Rotterdam harbor, and *) a description of the developing market(s) for mixed biomass pellets (MBP) in several European countries. From the first results, it is demonstrated that pellet markets in Europe are heterogeneous (end-consumer prices can differ over a factor of two) and in general, pellet trade flows are not transparent. With the public dissemination of wood pellet production, consumption and especially price data through the PELLETS@LAS project, we expect that this situation will improve greatly.

Keywords: pellets, biomass trade, biomass resources

1 INTRODUCTION

Pellets from biomass resources have the potential for a major to several European energy policy tasks, such as security of supply and CO₂ mitigation. The markets for fuel pellets are currently largely-bilateral and highly volatile. Thus, the main barrier for market expansions is the lack of information which affects all market sectors. Also due to strongly increasing oil prices over 2007, pellet prices are expected to increase again, although but no meaningful statistics are currently available regarding pellet production trade, consumption and pellet qualities. Furthermore, pellets markets across Europe are characterized by heterogeneous development stages

2 THE PELLETS@LAS PROJECT

The general aim of PELLETS@LAS is to develop and promote transparency on the European fuel pellets market. This is done to facilitate pellets trade and to remove market barriers, mainly information gaps but also local supply bottlenecks, production surpluses and uncertainties in quality assurance management.



Figure 1: The logo of the PELLETS@LAS project

2.1 PELLETS@LAS Objectives

The project (www.pelletsatlas.info; EIE/06/020), co-ordinated by WIP Renewable Energies (Germany), is supported by the European Commission und the

Intelligent Energy – Europe programme. **The aim of the project is to contribute to the development of a transparent European pellets market through the creation of a European Pellet Atlas.** The core of the action is a data and information collection in all EU 27+2 countries (plus Norway and Switzerland) countries from wood and mixed biomass pellet (MBP) producers, traders and consumers. For the data collection a consistent methodology was elaborated. Data is collected by all project partners, who and the involvement of major stakeholder such as pellets associations as well as pellets producers, traders and consumers. The data are updated every three months, and will include different prices (bulk, big bags, small bags) for the different member countries, available qualities and quantities, the locations of stakeholders as well as a detailed description of logistics systems. Moreover the pellet imports from outside the EU are assessed. In order to support the utilization of MBP pre-feasibility studies on MBP production, logistics and consumption will be elaborated in four European countries (Poland, Slovak Republic, Greece and Germany). The obtained data is disseminated via the internet platform containing graphic interfaces and thus functioning as a pellets atlas. Further dissemination channels include regular newsletters, a final seminar and brochure, several telephone hotlines, conferences and press work.

2.2 PELLETS@LAS Work Programme and Outcomes

The PELLETS@LAS work programme is divided into four phases. In the first phase there was the development for a fitting and scientific methodology, which will be the base for the following phase the data collections on European wood and mixed biomass pellets markets and case studies on mixed biomass pellets utilisation. In the third phase there are assessments of

national and international pellet markets. In the last phase there are dissemination and communication activities.

The core of the PELLETS@LAS Project is data and information collection in all EU 27+2 (plus Switzerland and Norway) countries from wood and mixed biomass pellet producers, traders and consumers. Therefore

- A web-based information platform on important fuel pellet market data, such as produced and available quantities and qualities and regularly updated regional sales prices (www.pelletsatlas.info)
- Recording and evaluation of the acceptance and implementation of European quality standards
- A database on logistic management from which a pellets transportation chain model will be derived.
- Four case studies for mixed biomass pellet (MBP) utilisation in Poland, Slovakia, Greece and Germany
- A handbook in five European languages (English, French, Italian, Polish, Danish) on the general use of pellets
- Six workshops (in UK, France, The Netherlands, Poland, Greece and Hungary) in order to promote the energetic utilisation of pellets

2.3 The PELLETS@LAS methodology

The methodology for work package two in the pellets@las project needs to describe, how data can be collected and saved for an analysis and being depicted.

On one hand the data can be collected wherever information could be found, e.g. in the internet or at publications of universities or associations. Therefore, the data source has to be included. On the other hand the pellet market is a new market in most of the European 27+2 countries, that means that only little information can be found. There is a need to do several queries at the pellet actors in the PELLETS@LAS project. The collected figures are stored in an excel database.

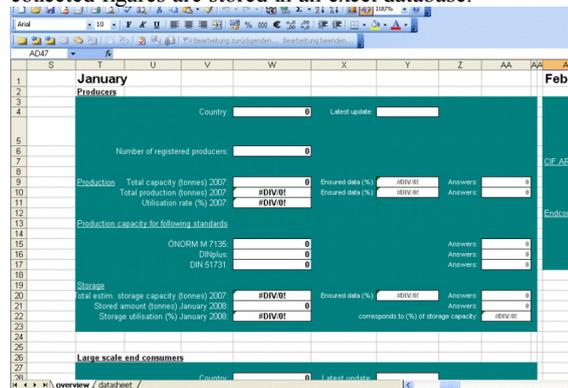


Figure 2: Overview sheet in the PELLETS@LAS data base

Collected data consists of the following items:

- The **contact data**,
- the **business operating area**, (i.e. whether the actor is a producer, trader, retailer or a large scale end consumer), data for **production** e.g. the production capacity,
- data about the **storage**,
- data for **sales**, e.g. Total sales (tonnes), loose to small consumers (< 3000 tonnes), bags (< 25kg to small scale consumers), large scale consumers, etc.,
- data for **purchases**, and

- **harbour prices for large-scale bulk deliveries**, the CIF ARA (Cost, insurance and Freight, delivered to the Amsterdam, Rotterdam and Antwerp region) price.

The methodology for the mixed biomass pellets bases on the same scheme.

3 FIRST PELLETS@LAS RESULTS

First results for 2005-2007 have been published on the projects website www.pelletsatlas.info. They mainly include production volumes, consumption volumes, and biomass prices. Currently, the first three data collections for the months July 2007 until March 2008 have been completed, although not all results are available online.

Key results include detailed analysis of pellet production, consumption and trade volumes, as detailed insights in pellet prices for most EU countries with significant pellet markets. Preliminary results are available regarding pellet imports from outside the EU, pellet logistics and a first assessment of mixed biomass production and use.

Furthermore, the preliminary project results illustrate that the development stages of wood pellets markets in Europe differ largely. In some countries, wood pellets are predominantly used for small-scale heating, while others use pellets for co-firing in large-scale electricity plants. While for some countries the development of a market structure is still required, in countries with more sophisticated markets effective international trade mechanisms is currently promoted. In both situations, the provision of detailed pellet market data, such as current prices, available quantities and qualities to all pellet actors in Europe will contribute largely to overcome market barriers. The permanent availability of such information within a pellets atlas will lower trade obstacles, support market participation and finally increase the energetic utilization of pellets. Moreover, it will contribute to the implementation of future European legislation in the heat sector which according to the Commission's Biomass Action Plan is currently hindered by lack of market confidence and transparency rather than costs. We therefore emphasise the relevance of this project for both market parties and policy makers.

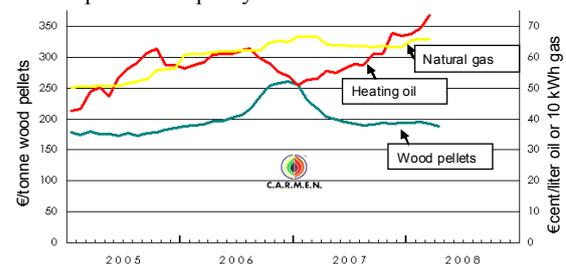


Figure 3: Pellet price (green) in comparison to the oil price (red) in Germany. (source: CARMEN eV)

In the figure 3, one can see the different heating costs shown in a comparison of wood pellets (green), heating oil (red) and natural gas (yellow) in Germany. The wood pellets are highly competitive. But due to different VAT and market prices of the pellets, this situation is different in each of the EU countries. Also, it can be seen that so far, wood pellets show little or no correlation with fossil fuel prices.



Figure 4: Geographical overview of all European pellet production plants currently included in the PELLETS@LAS database

In figure 4, a geographical overview is presented of all European pellet production plants currently included in the PELLETS@LAS database. For many plants, also the production capacity is known, though this data is not yet available for all plants included. Pellet producers also have the opportunity to add, correct or update plant data through the PELLETS@LAS website.

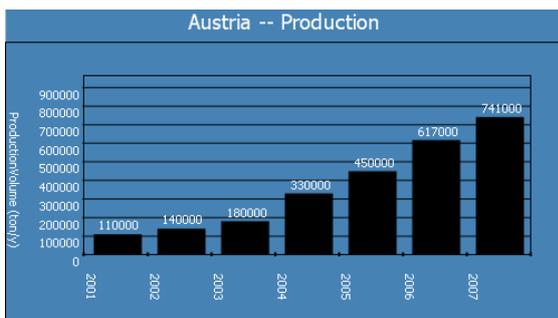


Figure 5: Annual pellet production volumes in Austria

Next to pellet production plants, the PELLETS@LAS website offers information on national production capacity and actual produced quantities and wood pellet prices to end-consumers in each EU country, and alternatively delivered to the ARA region. In figure 5, as an illustration, the annual Austrian pellet production volumes from 2001 to 2007 are shown.

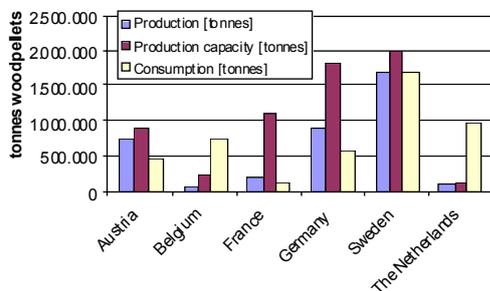


Figure 6: Comparison of the wood pellet production, production capacity and the consumption in developed markets in Europe 2007

As shown in Figure 6, there are high developed wood pellet markets in Europe (Italy and Denmark are also examples not shown here). Next to these, more and more countries take part in this market, leading to over 9 million tonnes wood pellets production capacity in the EU 27+2 (Beginning of 2008).

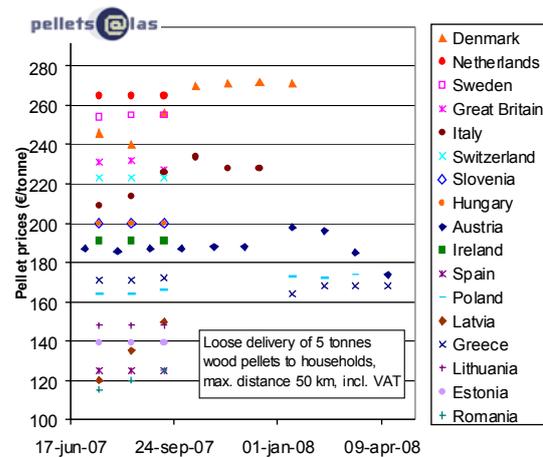


Figure 7: Overview of wood pellet prices for residential use between July 2007 and April 2008 for 17 EU countries

Figure 7 shows the wide range of pellet prices delivered to households found over Europe. At the time of writing (May 2008), for 17 European countries, price data had been collected at least for the period of July - September 2007, for some countries also data was available until March 2008. It is the expectation that over the coming months, this data will also become available. Figure 4 indicates that for some countries (Latvia, Denmark and Italy), pellet prices had increased in the fall of 2007, while basically all other countries displayed stable prices. The figure shows also that clearly prices in Sweden, Denmark and the Netherlands are the highest, followed by Great Britain and Italy (all net importing countries). On the lower end, the Baltic states and Romania are situated, which largely export pellets. It is quite stunning to see that price differences of over a factor of two are currently occurring within Europe. While these prices are including VAT (which may vary between 5-25% in the different countries and should ideally be subtracted for a direct comparison), it is clear that pellet markets so far are regional influenced by supply and demand.

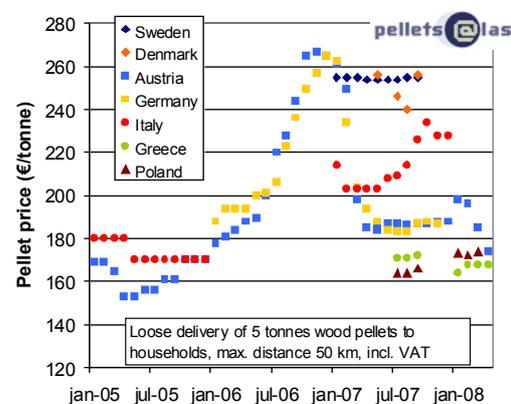


Figure 8: Price trends of wood pellets in selected European countries

The geographical dependency of prices is also illustrated by figure 8, in which the pellet prices delivered loose to households are compared for a number of EU countries

over the time frame 2005-2008. Unfortunately, only for a few countries, longer time series were available. The most remarkable time period is July 2006 until July 2007, in which pellet prices in Italy (not shown), Austria and Germany increased strongly until January 2007. This was caused by the sale of several hundred thousand pellet stoves for residential heating. The anticipated fuel demand for these stoves caused prices to soar, and pellet imports from Austria and Germany occurred. However, as the winter of 06/07 was rather mild, pellet prices strongly declined again, returning to previous levels. It is noteworthy that the prices in Germany and Austria were strongly influenced by the peak in demand in Italy during the winter of 06/07, while prices in Denmark and Sweden (at high price levels anyway) were probably not or barely influenced. In addition, it seems that prices in Italy increased again in the autumn of 2007, but this time, Austrian and German prices remained stable.

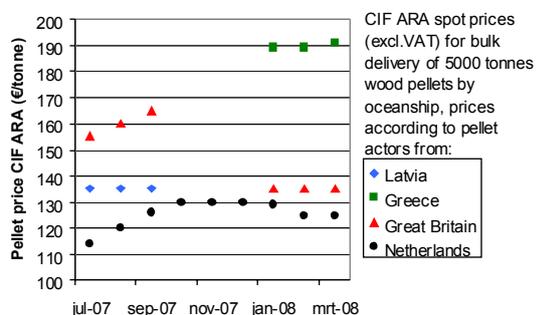


Figure 9: CIF-ARA prices as reported by different pellet actors in Europe

Finally, figure 9 shows the CIF –ARA (cost, insurance and freight for pellets delivered to the Amsterdam/Rotterdam or Antwerp region) spot price (physical delivery two months later) as estimated by pellet actors in various European countries. First of all, while the Rotterdam harbour is deemed to be one of the most important pellet hubs in Europe, it is clear that only in few countries, actors were able to indicate CIF ARA prices. Also, the numbers here are often only based on a limited number of sources. It is obvious that the estimated prices range also range quite significantly, indicating that current industrial pellet markets are not transparent., illustrating once again the necessity of a European pellet atlas.

3.1 Mixed biomass pellets data collection

As mixed biomass pellets (MBP) are a newcomer on the pellet market, as national quality standards for MBP do not exist (reference only on CEN standards) and as they will hardly be used in domestic small scale applications, trade and market structures for MBP will differ from wood pellets. For most European countries a market for MBP simply does not exist. Activities are mainly happening on bilateral agreements between producer and consumer. In order to give an outline of the small existing MBP market, and to give new markets the opportunity to create transparent market structures right from the beginning of their development, the PELLETS@LAS project will continue to monitor production volumes and prices of this emerging market.

The first phase of the project focused on the development of a model for collecting comprehensive data on the

market of wood pellets. The model was discussed, analyzed, tested and improved during the actual process of data collection with wood pellets. Based on first experiences of the wood data collection, the work on the methodology of data collection for MBP was started. MBP differ from wood pellets in many respects – they can be produced from grains, various types of grass, leguminous plants, flowers, fruit and a mixture of these materials (with some wood added). The markets of MBP producers vary to a large extent. The model of data collection developed for wood pellet was modified and adapted to suit the nature of MBP, which is more complicated due to the variety of raw materials used for their production. Below, first results of the MBP data collection are presented.

Small markets for MBP are present in Germany, Poland and the UK. In Germany, there are only about five producers of Mixed Biomass pellets. The used raw material mainly is straw. The total production capacity is about 8000 tonnes. The actual production however is only about a tenth of it. In Poland, a clear incentive to produce MBP is the available surplus of straw, which averages 15 million tonnes per year. Some wood pellet producers switch to straw pellets production from time to time, but the produced quantities do not exceed 1000 tonnes per year. Summing up, the market is developing and unstable. The interest from the manufacturer's side is increasing due to legal incentives, aiming at popularisation of RES and biomass use.

The MBP market in the UK is very small, comparable to Poland and Germany. There are two straw pellet manufacturers in production.

In Austria a MBP market does not exist. There are many discussions and projects about the use of MBP but there is no industrial producer for MBP. Nonetheless some heating system manufacturers offer special boilers for agro-pellets already but have to store them until the legal requirements are specified or sell it abroad.

Bigger markets can be found in Slovakia, the Czech Republic, the Netherlands and France. The situation on the market in Slovakia changes very quickly. It is expected that the demand for pellets will rise from 1000 t/annually to 50-100 000 tonnes in next 5-10 years, and it seems impossible to satisfy these needs without increasing the scale of agri-pellets production.

In the Czech Republic one company is the holder of the patent for the production of bio-fuel in the form of pellets made from non-wooden agricultural by-products. Due to low production costs this biofuel became very attractive and the company now awarded the production license to as much as ten other legal entities around the country. Altogether, several thousands tonnes of this biofuel are presently estimated to be produced by these manufacturers.

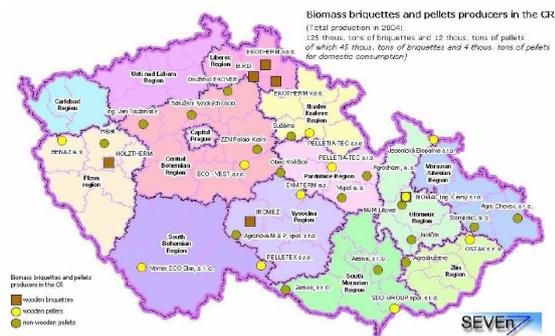


Figure 10 Biomass briquettes and pellets producers in CR

In the Netherlands about 15.000 tonnes of soy husks in pelleted form were bought from the Dutch agro industry in the years 2006 and 2007. For the year 2008 there will be the use of MBP of coffee husks, directly imported from Brazil. A power producing company expects to co-fire up to 250.000 tons of these MBP used in 2013. It partly replaces coal.

In France there are at least eight producers of MBP. The exact figures are not known so far.

4 DISCUSSION

A major part of the PELLETS@LAS project was the development of a methodology to collect pellet production and consumption volumes, pellet prices, and trade flows, and subsequently to collect these data. This has proven to be a challenge because of several reasons:

- o Pellet logistic chains and end-users vary strongly from country to country. Also, existing definitions of national pellet prices may vary in terms of quantities and distances delivered, including or excluding VAT etc. In the PELLETS@LAS project, a common definition was used to make inter-European comparisons possible.
- o Given the sensitive nature of pellet prices, pellet actors can be reluctant to provide data. As an extra incentive, actors providing data to the PELLETS@LAS project have exclusive access to the latest two months of data collected.
- o Data availability differs between countries. Countries with well-established wood pellets markets and wood pellets associations such as Sweden and Austria have extensive data series on production volumes and prices. However, in most EU countries, data availability is low, and time series on pellet prices
- o Identifying and quantifying international wood pellet trade streams is problematic. For example, the same (physical) amount of wood pellets may be traded several times by different pellet actors, which may lead to double counting. For example, the Netherlands are a large-scale industrial pellet consumer. However, several traders are also active in the Netherlands, which not only import, but also-re-export pellets. Especially if not all market transaction are known, this may lead to misleading results.

All in all, the market for MBP is small but developing. Factors that hamper the market development are still present. These factors could be a result of legal aspects or technical aspects for the heating-systems like the emissions NO_x, dust or aspects of the combustion efficiency, the corrosion, the ash melting points etc.

Beside these technical aspects a development of logistic systems for the production of agro-pellets is necessary, too. But with a development of the oil price like in the last years, the alternative markets will become stronger and stronger.

5 CONCLUSION AND OUTLOOK

As was shown in the previous sections, pellet markets differ from country to country, pellet prices for end-consumers can vary over a factor of two in different European countries, and in general, pellet trade flows are not transparent. With the public dissemination of wood pellet production, consumption and especially price data, we expect that this situation will improve greatly.

As mentioned before, the PELLETS@LAS project will continue until the end of 2009, and several additional outputs will be produced until the end of the project:

- o Four case studies for mixed biomass pellet (MBP) utilisation in Poland, Slovakia, Greece and Germany
- o Data for the Eastern European markets (Russia, Belarus and Ukraine) is currently being collected, and will be included in the PELLETS@LAS project.
- o A database on logistic management from which a pellets transportation chain model will be derived, including examples of typical wood pellet logistic chains, their cost structure and their energy balance.
- o A handbook in five European languages (English, French, Italian, Polish, Danish) on the general use of pellets
- o Six workshops (in UK, France, The Netherlands, Poland, Greece and Hungary) in order to promote the energetic utilisation of pellets. Of these workshops, the next one will be held on June 17th in Utrecht, the Netherlands. For more information, contact Martin Junginger (h.m.junginger@uu.nl).

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