

DEVELOPMENT OF THE NEW PELLET MARKET IN SLOVAKIA

Ladislav Zidek, Dagmar Bohunicka

SUMMARY:

The paper presents results and experiences with the development of the new pellet market in Slovakia. The main goals of BIOMASA Association through its ongoing project are the creation of a sustainable wood pellets market for biomass energy aiming at heat generation, GHG emissions reduction and promotion of the renewable energies in Slovakia. In this project a new plant for pellet production has been built and 44 boilers in schools and other public buildings were converted from fossil fuel to wood pellets. Such complex logistic systems have never been created and managed before in Central and Eastern Europe. Project is multinationally financed through several grants.

Keywords: wood pellets, logistics, biomass heating, green house gases, renewable energies, sustainability, regional development in Central and Eastern Europe.

1. BOTH PELLET PRODUCTION AND USE

Slovakia is considered to have ideal natural conditions for developing biomass energy, it is definitely among countries that are rich in biomass. Almost half of Slovakia is afforested with a huge amount of biomass. But environmental awareness in Slovakia is still low and many people consider biomass as a fuel used by nature enthusiasts and environmentalists. A successful project implementation, in which people can see in practice that pellets are a competitive and a cost-effective heating fuel, might be a “first step” overcoming the people’s mistrustfulness.

BIOMASA Association designed and is implementing the project that presents complex solution for the implementation of pellet heating and establishment of the market with wood pellets in Slovakia. It solves production and consumption of pellets as one integrated unit.

Project includes all aspects of building a new bio-energy market, in this case a pellet market.

- a) Adjustment activities for reducing institutional, financial and information / awareness barriers of using “the quite new energy source” biomass in Slovakia
- b) Constructing and starting the operation of a pellet plant, so called “Central Processing Unit (CPU)” with an annual production of 12,000 tons of wood pellets.
This includes: collecting of waste residuals; technical processing of sawdust into pellets; packing, storing and sales of pellets; distribution to boiler rooms.
It only works, if there is a market...
- c) Building a “first market” by installing and operating 44 biomass boilers (by replacing coal / coke fired boilers with wood-pellet boilers) as living and touchable example.
- d) Information campaign to increase the use of biomass as a widespread and well developed energy source.
- e) Building a sustainable biomass fuel market (which can be replicated in other regions and countries).
- f) Result at the end: Reducing of GHG emissions, development of new technology in Central Europe.

Such complex logistic systems have never been created and managed before in Central and Eastern Europe.

2. PELLETS PRODUCTION

The new pellet plant in Kysucky Lieskovec in Zilina region is in operation since October 2004. Its production capacity reaches 12 000 tones per year using approx. 20 000 tones of wood residues. The initial investment costs for the plant construction were about 3,5 millions Euro. The technologies used are from Slovak producers besides the pellet mill, which was delivered by CPM Europe in Netherlands. The hourly production is 2 - 3 tons.



Fig.1: Pellets production plant in Kysucky Lieskovec

Pellets production plant also serves as a (so called) Central Processing Unit and it ensures the following activities:

- Collection of wood waste residuals in the form of wet and dry sawdust
- Technological processing of sawdust to wood pellets respecting quality standards
- Packing, storing and sales of pellets
- Distribution of pellets to boiler rooms
- Central management of boiler rooms

Sawdust is collected by the own transport system (two containers sets) from local producers. The collection logistics is oriented above all to small sawmills with continuous and reliable supply. Plan for 2005 is to produce 8 000 tons of pellets of a 6 and 8 mm diameter. 4 000 tons will be used for own boiler rooms and 4 000 tons for domestic market and export. For the next years the production will reach 12 000 tons. Then, boiler rooms operated by BIOMASA will consume 5 000 tons of pellets and an amount of 7 000 tons is intended for domestic market and export.

Distribution channels for pellets are different and gather all possible distribution methods. Pellets to biomass boiler rooms operated by BIOMASA are distributed by tank truck. These boiler rooms are located in BIOMASA member municipalities, which are mostly small villages in mountains, often with difficult access for transport in winter. Distribution plan is updated according real consumption, depending on outside temperature and real boiler consumption.

Pellets for sales in domestic market and export are packed in big-bags of 1 000 or 1 200 tons and sacks of 15 kg. In some cases, they are marketed in Slovakia also in bulk and transported by own tank truck or in containers. Up to now the pellets are exported mainly to Italy, Poland and Austria.

7 other producers started also to produce pellets during the recent few years in Slovakia. But they export all their production or they are small, produce pellets as side products and their production depends on demand possibilities.

3. BOILER ROOMS RECONSTRUCTION AND HEAT PRODUCTION

A total of 44 boiler rooms with capacity ranging from 15 kW to 2 500 kW were reconstructed within the project. Old inefficient coal, coke and sludge fired boilers were replaced by wood-pellet boilers. Reconstructed boiler rooms are placed mainly in public buildings owned by BIOMASA members and they produce replicable, economically viable, and environmentally friendly source of heat for them.

First pilot biomass boilers were installed in 2000 in two villages. One in Klokocov was the first example of small biomass district heating as it heats school, school gym and canteen, 2 blocks of flats, municipal office building and village service building.

Since 2003 the biggest pellet boiler room within this project, with a capacity of 2.5 MW (two boilers) is in operation in small spa village Lubochna in Liptov region. It heats 14 buildings of health sanatorium, among them also flats, plus 3 school pavilions, kindergarten and municipal office building.

In 2004 another 9 pellets boiler rooms were reconstructed and 19 boilers in public buildings as well as 12 small boilers in private houses and NGO's were installed and put into operation in 2005.



Fig. 2: Example of an old boiler before reconstruction...

.... and after reconstruction

For boilers in public buildings, 2 different boiler suppliers were chosen; Herz boilers from Austria from 25 up to 300 kW and Justsen boilers from Denmark over 300 kW. There is another supplier for small boilers. After one year of operation it has to be evident that the operators of the plants do have advantages because of the above mentioned decision. They know what to do if they meet a problem. If more different boiler systems would be in operation it would be much more difficult to solve upcoming problems. As a result, the customers do have the feeling that the plants do not have even one problem.

In many cases replacement of the heat source was connected with realisation of equithermic adjustment of heating systems, and other energy efficiency measures (insulations, windows reconstruction, etc.). The Association is owner of the installed technology in the reconstructed boiler rooms and sells the heat to the end users.

Operation of boiler plants includes:

- Heat production and its sales to end customers (Association's members and others)
- Control and monitoring system of all boilers - all operated boiler rooms are electronically connected to the central monitoring and control system in CPU. This makes possible to have control, to monitor and to make evaluations from distance.
- Maintenance and reparation services of boiler rooms operated by BIOMASA.

4. MULTINATIONAL FINANCING AND BIOMASA ASSOCIATION

Activities, described above are realized on the basis of project „Integrated Logistic for Use of Biomass energy - Reducing Greenhouse Emission through the Use of Biomass Energy in Northwest Slovakia“. Project is multinationally financed through several grants from European Community – LIFE III Programme, Global Environmental Facility, through UNDP, Ministry of the Environment of the Slovak Republic and Austrian Environmental fund Programme through Kommunalkredit Public Consulting.

BIOMASA, Association of legal entities - project holder is a non-profit organization joining municipalities, schools and health care institutions. The aim of the association is to participate in the process regarding the use of renewable energy sources, through the information dissemination and implementation of the new environmental friendly technologies powered by biomass. Association was founded in 1999 and since that time it is leader in biomass utilization in Slovakia.

BIOMASA activities:

- pellets production and sales
- reconstruction of boiler-rooms into biomass ones
- installation and operation of pellet-fired boilers
- production and sales of heat
- sales of pellet boilers and stoves

- biomass promotion in local market
- consulting and information activities
- project development and implementation

The project has created 35 jobs up to now and it considerably contributes to the regional development. It was awarded by the European award for local climate protection activities **Climate Star 2004** and international Environmental Price **ÖGUT** in 2001.

5. CONCLUSIONS AND SLOVAKIAN PARTICULARITY

According to our experiences biomass pellets are the most comfortable fuel for family houses and small facilities. The price for pellets is fully competitive compared to the price of gas and is significantly lower than propane and electricity in Slovakia. Although biomass can be sold at a competitive price, the technology and manufacturing facilities are higher than for fossil fuels. This could be a barrier to the further spread of biomass energy in Slovakia. Initial investments costs (for using biomass energy) are higher because of the new technologies that must be imported from abroad but in the long-term the use of renewable energy sources is cheaper than fossil energy sources. But despite of that the rising interest for pellets as a fuel among small companies and public is observable.

Main barriers for pellets in the Slovak energy market are lack of information and awareness of the end users (costs, benefits, technologies, constrains of biomass heating), lack of complex and expert information and practical experiences, higher investment costs, lack of trained professionals to promote and support biomass energy activities, and to ensure reliable operation of the new installations; ambiguous and inflexible national RES policy, lack of cross-sectoral strategy and policy and absences of stable long term financing mechanism to support RES.

Building a complete wood pellet market (from collecting the raw material to the environmental friendly burning of the pellets) gives all project's stakeholders and beneficiaries the possibility to see that it works very well.

The decision to take pellets instead of wood chips would not be approved by everyone. But it was chosen because:

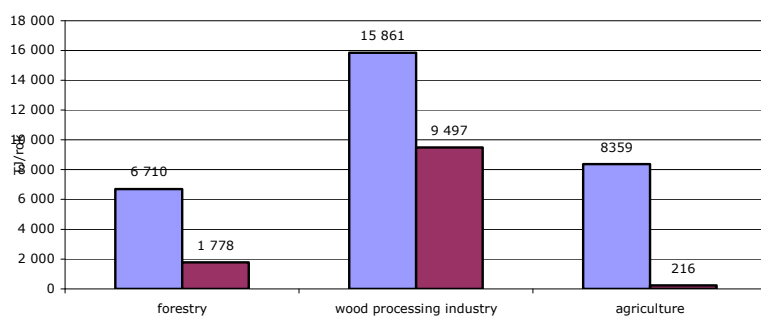
- pellets do need more technical input, BUT:
- they are easier to handle (transport and burning)
- fewer problems arise when heating with wood pellets than with wood chips.

This "well working biomass boilers" will lead to a faster and bigger acceptance of biomass for energy purposes in Slovakia. Then biomass will be in the mind of people as a well known "good working system". As a result, decision makers and consumers will start to think about

other ways of using biomass (e.g. wood chips...), which present few more operational complications but still easy to manage. Therefore they will accept small problems that might arise by heating with e.g. wood chips, because they know: "It will work because I have seen it!"

Biomass and renewable energy sources cannot fully replace the energy from primary sources. However, it could help to solve the energy and ecological situation in individual regions. Generally, Slovakia considerably lags behind in the utilization of RES in comparison to what is actually available and technically feasible. The present utilization of biomass figures less than 1,3 % of the total primary energy supply in Slovakia. Just approximately 17 % of the technically usable potential of renewable sources in Slovakia is used; still vast potential of energy remains unused. The greatest share of technically usable potential out of all renewable energy sources is covered by biomass (42 %, 30 PJ) and it is mainly for heat generation. According to the current estimates, the share of renewable will rise to 5 % in 2010.

Fig 3: Biomass in Slovakia -Technically usable potential and present utilization



Ladislav Zidek, Dagmar Bohunicka

BIOMASA, Association of legal entities
023 34 Kysucky Lieskovec, 743
Slovak Republic
biomasa@biomasa.sk
www.biomasa.sk