

Market development for medium-scale pellet installations - Promoting European Pellet Heating Systems in the Market (PROPELLETS)

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Purpose of the work

The study on *Market development for medium-scale pellet installations* is part of the European Commission supported project "Promoting European Pellet Heating Systems in the Market (PROPELLETS)" (EIE-04-040), which aim is to promote the use of medium-size automatic pellet heating systems in the building and industrial sector. Starting in five European regional scenarios (Spain, Finland, Italy, United Kingdom and Austria) the results will be later on disseminated at regional, national and international level.

The specific objectives that will be covered in the period of the project (2005-2007) are:

- Market stimulation by means of assessing and disseminating best practices to targeted groups
- Involving and increasing the actors' experience through the demonstration of pilot heating unit's feasibility
- Stimulating European technology transfer to other markets

Approach

In order to give an European dimension to the project, PROPELLETS is divided in well-coordinated work packages:

- Common Methodology agreement for achieving territorial initiatives (*finished*)
- Market Structure analysis and promotional actions performance to overcome barriers (*finished*)
- Pilot actions development, demonstrating the technical-economical feasibility of pellet heating units (*on-going*)
- Targeted awareness and educational activities based on "best practices" and pilot actions results (*starting in 2006*)
- Results Consolidation and Quality Control of the pilot actions using performance indicators (*starting in 2007*)
- Dissemination Activities as international conferences, internet conference, business mission, website(www.escansa.com/propelletts.htm) , etc. (*on-going*)

Scientific innovation and relevance

In the project it will be analysed, demonstrated and promoted the use of medium size pellet boilers for heating purposes in buildings and small to medium industries. Demonstrative pilot heating systems will be developed to involve the market's actors and to favor the demand. Furthermore, the experiences and knowledge gained in the several European scenarios will be integrated and disseminated, leading to the promotion of the EU pellet market at regional level, and to the transfer of European pellets technologies to other markets inside and outside Europe.

Market development for medium-scale pellet installations

By the end of year 2005 the *Market Analysis* of medium-scale pellet heating systems was completed in all partners' countries, and there were defined the promotional activities for each selected scenario to overcome the barriers found. The summary of the main findings and market issues related to market development have been:

A- Spain (North region)

Pellets cost for consumers are competitive when compared with other fuels, 140-180 €/t, lower than UE25 average, and much lower than UE15. Furthermore, heat produced by pellets will cost in 2006 half than oil or gas, and five times lower than electricity for heating purposes.

National production in year 2005 was close to 25.000 t/year, that could (e.g.) supply fuel to 600-800 boilers installed in Spain with 200 kW-installed power each. Moreover, national consumption was lower than 5% of production, leading to exports mainly to Portugal, Ireland, United Kingdom, Italy, Central European countries...

There are national boilers available up to 350 kW, but need to improve efficiency and sometimes auxiliary systems. It is expected the development of boilers market and distribution in the following years. Pellets boilers from Austria are available, but limited to up to 150 kW power.

The main actions that will be undertaken in the project for pellets market improvement will be:

- To favour new companies to become boilers installers and distributors, with supervision to assure quality. Energy Services Companies ESCOs will be promoted, as they provide the complete system, including operation and maintenance, and finance it.
- To favour business contacts to obtain other boilers with main European manufacturers (now contacts with Austria, Finland,...)

- In order to advise end users, the project will favour contacts with pellets producers to have updated information about pellets availability and expected prizes.
- To favour technology and training transfer from other countries (e.g. by boilers manufacturers)
- To favour contacts among key actors, in order to increase pellets production in Northern Spain.
- A new pellet plant is under study (first steps) by Spanish pellets Cluster. Sustainability for the region must be analysed in order to integrate this new business.
- Incentives by Regional Government are necessary for the first units to be installed (pellets heating systems). These units should be showed to other potential end-users to increase their confidence and market introduction
- Project dissemination is critical for pellet heating systems promotion, due to the low knowledge existing on this sector

Austria (Upper Austria region)

In Upper Austria, the wood pellets market development experienced a rapid growth within the last years. Basis of this successful market development is the implementation of a comprehensive mix of measures, ranging from information & awareness raising activities and training & education measures to subsidies and R&D and quality control. Right from the beginning, the Upper Austrian market development was driven by consumer interest, supported by the regional government and the R&D efforts of the boiler producers to improve the technical performance of installations. The ambitious goal of doubling the share of modern biomass heating systems until 2010 was defined by the Upper Austrian government through an energy action plan for future market development.

Additionally the Upper Austrian network of green energy companies "Ökoenergie-Cluster" (OEC), managed by the O.Ö. Energiesparverband, supports the market development by well targeted promotion measures to improve the quality of supply.

Although pellets heating systems are very well established in the small-scale sector (for example, more than a third of new one family homes are equipped with a pellets heating system), there is low demand due to the lack of awareness and trust in the possibility of using pellet installations in the mid- to large-scale from the majority of potential users.

Wood chips are used for larger biomass installations as the optimum option, and also the competition with gas and district heating systems (especially in the cities) is a major barrier. Moreover, there is little experience in the planning and operation of larger pellet heating systems.

The main efforts undertaken at present for the introduction of mid-size pellets systems have been directed to:

- Finding "pioneers"
- Providing information to potential end-users and key actors (brochures, seminars, site-visits etc.)

Finland (Central region)

Pellet market is developing well at the moment. It is special feature for Finland that pellet production has developed well. Pellet production exceeds local consumption by 4 – 5 times. Major part of pellets manufactured in Finland are exported to other countries like Sweden, Denmark, Holland and UK.

Pellets have found its niche in certain market segments. It is common to use pellets in building heating and in small heating networks where the boiler capacity is in the range of 50 – 500 kW. In bigger units the wood chips become more common. Pellets are more common if heat is supplied by outside heat supplier/entrepreneur. Pellet fired plants require little maintenance and supervision work, can be easily automated and is reliable stand alone plant.

Pellets have not become very popular among private household owners although now the number of pellet heating units is increasing rapidly. One reason for slow development has been relatively low prices of competing fuels like fuel oil or electricity and there has been no public support for pellet heating for private households. Commercial heating companies or industries may get some investment grants when installing pellet heating unit. The increasing oil price recently has increased the demand of pellet heating units.

Pellet logistics is already organised, pellets are available delivered to your home in all parts of the country, minimum delivery by truck (pneumatic unloading) is 3 tons. Smaller quantities are available at higher price in hardware stores.

Pellet combustion equipment are manufactured in Finland. There are mainly separate burners and boilers, the integrated burner/boiler combinations have not gained much popularity yet.

The main considerations related to mid-size market situation can be summarized as follows:

- Well developed pellet production, 80 % exported
- 200 – 500 kW range developing well
- Heat entrepreneurs, larger heating service providers, municipalities investing
- Great interest for pellet use for improving low quality fuel and replacing oil as peak boiler fuel
- Private house sector needs more developing work
- High oil price helping

United Kingdom (South West region)

The market analysis for the South West of England comes at an important time in growth of the wood pellet industry. The first pellet boilers and pellet stoves have now been installed with some buildings having 2-3 years of experience with the heating systems. In addition, there are two pellet mills in the region, which are likely to come on stream early in 2006. The existence of local pellet production is likely to have a major impact on wood pellet industry in

the region as it gives more consumer confidence to security of supply and price stability as well as achieving political goals of bringing local production to the region with the economics benefits and jobs that this brings.

This emergence of the wood pellet industry in the South West also coincides with substantial and sustained increases in fossil fuel prices. Whilst this is a European wide increase, it could be argued that this price increase has been more significant in the UK where there have been traditionally low fossil fuel prices due to North sea reserves of oil and gas. The fossil fuel price increases have recently taken fossil fuel prices to levels where they are now generally higher than wood pellet fuel.

Therefore, we are now in a situation where all the various elements required for a wood pellet market to grow exist. The question is how that growth is facilitated and the pitfalls of a new industry are avoided such as poor quality pellets or poor quality installations due to lack of experience

The following considerations summarize the situation in the United Kingdom:

- Automatic wood heating is now a major industry in most Northern European Countries. However, historically it has been very slow to take off in the UK. For the following reasons:
 - o The existence of North sea oil and gas meaning low fossil fuel prices
 - o A lost tradition of heating with wood
 - o High urban density meaning an extensive gas network
 - o No historic Government support for wood heating technology
 - o Climate change not high on the agenda

- The main barriers to the Wood Pellet Market in UK have been
 1. Low fossil fuel prices
 2. No capital grant support for pellet heating technologies
 3. Lack of awareness of the technology
 4. Few demonstration installations to see working
 5. No local pellet production
 6. Few trained heating engineers experienced in pellet appliances

Factors 1 and 2 above have been removed by the fossil fuel market and the UK Government respectively. This project aims to tackle barriers 3-6 within the South West of England.

- Drivers for Wood Fuel in the UK
 - o Meeting Governments Kyoto targets on CO2 reduction
 - 12.5% reduction by 2010 (obligation)
 - 20% reduction by 2010 (policy)
 - 60% reduction by 2050 (policy)
 - o Security of supply
 - UK will be a net importer of oil and gas in the very near future. Gas contracts are being offered as interruptible and non-interruptible
 - o Government grants have been available since 2004
 - o Dramatic rises in fossil fuel costs

- Conclusions:

- o The is now a rapidly emerging wood pellet industry in the South West of England
- o Installation of two pellet mills with a combined possible capacity of 10,000 tonnes/year
- o Expansion maintained by high fossil fuel prices and greater environmental awareness and awareness of the technology
- o Lack of UK wide training for design and installation engineers could be a limiting factor in the expansion of the industry
- o In conclusion, it is likely that the expansion will continue for the UK to become a major wood heating industry in Europe

Italy

From the first analysis of the pellets heating system market in Italy it emerges that there are many problems, which conditions its development. It can generally be stated that the pellet market is still not very transparent and characterised by non-uniform development. One of the main factors which conditions the expansion of the Italian pellet market is linked to the absence of a specific set of rules to classify the product, accompanied by a system that guarantees quality. During the growth the pellet market will in fact have to be segmented in relation to the characteristics of the fuel and type of use. In this context we can grasp the importance of the spread of product standardisation and certification systems which make quality/price relations transparent, to the advantage of the more professional pellet manufacturers, heating plant manufacturers and end-consumers.

The conditions of Italian market can be showed by answering to the following questions:

Why pellets are convenient?

The pellet price in Italy is expected to become low and stable, but you have to look for the right supplier. In Italy, many new suppliers and producers come into the market, increasing competence. Also fossil fuels prices are rising and anyway vary wildly. Furthermore technology is improving, and supply enlarges, with broader supply of heating technology (stoves, boilers, burners), and new applications of pellet heating arising. Of particular interest can be application of (agri-)pellets in larger applications, due to new low cost, compact and efficient pelletisation technologies.

Why pellets can cause problems?

Pellet technology is different from other heating technology, and there is still lacking of trust in technology, supply, etc. Adaptations are necessary for switch from fossil to pellets, and regulations are different. As pellets can be made from many materials, quality must be guaranteed and labelling becomes necessary ("know what you buy")

What good circumstances are there for pellets?

Transnational aspects as industrial pellets for Kyoto may help to develop the market, and also pellet market in Italy is growing really quickly with more infrastructure and services, technology and suppliers (national production/import). Financial and political support could be obtained in various forms: negotiations with the Banks for Third Party Financing (TPF), state fiscal support, help from Local Authorities. Also in our pilot region, there is much interest for the social benefits, and the Social Cooperative (Propellets partner) has excellent contacts with Local Authorities and employs (also) socially problematical persons

What difficult conditions are there for pellets?

We have to consider that in some cases Local Authorities are unsure about how to prepare regulations (safety, environment). It will be needed to advice to prepare a guide. Local Authorities are unsure about technology, so starting with small scale technology (this year) and continue with larger scale is considered a good option. Large variations in price can frighten the market, as prices vary from 180 to 400 Euro/ton, and supermarkets ask much and have much influence on public perception!

This cold winter there is a shortage of pellets.

The Main actions to be developed to favour medium-size pellets boilers are:

- To involve local authorities in Valdinievole;
- To identify a credit institute (bank), sensible to environmental and social questions, available to support local authorities to invest in pellet systems;
- To favour the contacts between the manufacturers and a local social cooperative: the service organization that contains 30% persons with social problems;
- To show the best practices to the entities interested to pellet system: Monsummano Terme municipality is interested in visiting the hotel in Lana (Bolzano). The hotel has pellet heating of 540 kW
- To favour contacts with pellet producers to have information about pellets availability and prizes. It will also consider the hypothesis of a storage centre for the distribution to the local communities of Valdinievole, in order to allow quantity discounts;
- Promote an ESCO system in the territory. A private company could realize this service but an alternative is a public initiative through a realization of local authorities consortium.
- To favour contacts among institutional authorities in order to create a specific set of rules to classify the pellets. This action represents the first condition to realize a guarantee of quality.
- **To** point to a new low cost and small scale technology for pelletizing, for valorisation of maintenance residues of the local swamps: this makes it possible to obtain useful fuel from humid biomass without expensive thermal drying. It is possible also to pelletize mixtures of biomass resources without the use of any binding compound. Small convenient systems of 50 kg/hour will be on the market in September. If there are combustion technologies, suitable for these so called agri-pellets, and the group of 11 municipalities is interested, then they can consider this home made pellets, after having first (two years) experience with heating on commercial pellets. They can also be sold on the market for industrial heating (which does not yet exist but will benefit very much for their CO₂ emission limits).

- The Florence province guaranteed incentives (30%) for installation of pellets heating systems until 30 October 2005. Incentives by regional government are necessary to promote the installation of pellets boilers

Overall results

Summarizing, it is expected that the results of PROPELLETS will lead to a new total installed capacity of 5MW (25 pilot facilities of about 200 kW) which e.g. could substitute 34.000 t/year of coal and avoid the emission of 14.000 tCO₂/year. These results are expected to be obtained in the period of the development of the project, but the compromises, networks and agreement maintained will lead to a higher number of medium-size pellet heating systems installed in the coming years beyond the consortium.

Conclusions

Since the start of the project there is a clear demand coming from target groups in the use of pellets heating systems and boilers for the substitution of traditional coal, oil and electric heating systems.

Main barriers found are the need of information and advising for the installation of biomass heating systems, and sometimes the lack of subsidies and financial incentives. Also transfer of technology seems to be necessary among countries, and information systems for market (updated prizes) may help its development. Energy Services Companies (ESCOs) could be a good choice for several end-users in order to avoid initial investment costs.

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