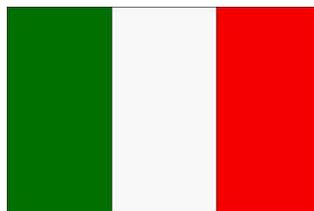


Development and promotion of a transparent European Pellets Market
Creation of a European real-time Pellets Atlas

Pellet market country report ITALY



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1. Summary

The Italian wood pellet market shows very strong features. It developed almost exclusively for domestic heating with pellets typically packaged in small bags (15 kg), a comfortable option to feed little stoves. In Italy there are no CHP plants fuelled by wood pellets and district heating is very rare: however there might be few and very small scale examples in this sense, in Alto Adige-South Tirol, close to the Austrian border.

The pellet market in Italy has experienced a fast growth since the beginning of the millennium and not even the speculative events of Winter 2005, that led abnormal price rises, significantly slowed down this development. According to our research, the annual pellet consumption in Italy has grown from 150,000 in 2001, to approximately 850,000 tons in 2008; nevertheless this kind of estimate is very difficult and other sources provide figures near to 1 million tonnes/year.

Also the production has seen a constant growth from 160,000 tons in 2001 to approx. 650,000 tons in 2008. In Italy there is a large number of small to medium size producers, currently we can count 75 companies; among these, only twenty exceed an annual production of 5,000 tons. Most of them started their activity using own sawmill waste (sawdust, shavings etc.) as raw material and selling the pellets in their region. Now they are experiencing a shortage of raw material and they are forced to import wood from foreign countries, especially the Balkans, Romania and Bulgaria or pellets from Austria and Slovenia.

Usually the pellet price in Italy is very volatile depending on the season: we touched the peak cost in middle to late winter and the lowest level during late Spring and Summer. Due to the small size of the manufacturer plants and to a weak inter-regional commerce we record also a great variability among different areas of the country. The shortage of pellets supply in Winter 2005 caused speculative phenomena which brought pellet prices up to over 300 euro/ton for small bags. Similar events did not occur again in the following years and we can state that prices in 2007-2008 have been steady or slightly decreasing and they arrived at approx. 240 euro/ton during the winter.



Figure 1: Average price development for small bags (Source: www.pelletsatlas.info)

2. Introduction

We can state that the pellet market in Italy has gone beyond its initial stage, but on the other hand we can't consider that it is fully developed. The causes of this lack of maturity are the imbalance between demand and supply, especially in some periods of the year, shortage of raw material, lack of real quality standards and lack of an important national association so far.

The convenience of wood pellets as fuel for domestic heating compared to natural gas (the most common in Italy) or, with a bigger extent, to GPL, has pushed in first in 2000, when a lot of house owners purchased a little stove able to provide heat for the rooms and for hot water supply. Italy has become the biggest little stoves market in Europe, with an estimate of 700,000 units sold until 2009, even if the stoves that run regularly are the 60% of this number. The 40% of stoves is used in second houses in rural area and these stoves run only for few hours per year. Wood pellet production was not able to satisfy this fast growing demand and when in 2005 the Winter was much colder than usual, the situation became critic. Very few suppliers, still able to deliver pellets, raised the price to very high levels, even up to 6 euro for a small bag of 15 kg. This has generated mistrust at the consumers' side, leading to an atmosphere of uncertainty for the future. People started to ask more information also about the quality of pellets, warranty for the stoves and so on.

As previously mentioned, most of the producers began to manufacture pellets using waste material of another industry, that is wood working, as raw material. This permitted to reduce the initial investment, increasing the profit, but this fact brought other consequences that are robust features of Italian wood pellet framework: a large number of small size producers and a long term raw material shortage.

Now the increase of the number of new producer companies is getting lower and lower, because many new potential market actors experience difficulties in ensuring raw material supply and prefer to become wood pellets traders. The main countries from which Italian producers import pure wood for pellet manufacturing are Slovenia, Austria, Germany, Romania, Russia and Bulgaria.

Due to the small size and local dimension of the producer companies, the concentration of plants varies a lot from region to region and the Italian pellet market is very heterogeneous regarding some fundamental parameters, such as prices, that are very changeable depending on the considered area. Another consequence of the small size and the large number of producers is the lack of a national organization gathering the biggest part of them. Last Spring there was a meeting among some of the most important producers, whose purpose was just to create a group that can speak and act as a single actor inside the pellet market. By now (Spring 2009) this organization, named Propellet Italia does not look well developed and very active, as its web site is still "under construction" after almost one year.

Some (but not all) of the main producers joined the so-called Pellet Gold standard, which is a standard based on the other international certifications, DINplus, OENORM and CENT TS, but it is not a real certificate. In fact AIEL is the association that declares which companies produce pellets in accordance with the Pellet Gold standard, but AIEL is not an independent certification agency. (Source: www.aiel.cia.it)

By now the lack of a real certification for the wood pellets manufactured in Italy could generate distrust among users and so hamper the development of the market.

3. History of market development

The Italian pellets market has seen a slow but continuous development, beginning at the end of the 1990's. Even if its dimensions are still not at the level of Swedish or German ones, it is surely in the European top five. A general productive development has characterized all the national territory.

The number of pellet producers has grown a lot during the last few years. Today in Italy around 75 producers of pellets are present. Studying the distribution of pellet producers on the Italian territory, some interesting phenomena were recorded.

If, until the year 2005, the number of producing companies on the territory was distributed in a more uniform way between North, Centre and South Italy, today the Northern part of Italy occupies the position of head as far as “number of activities per region” and still more as far as “productive capability” are regarded. The presence of a mature wood supply chain helps the operators in many important phases of the production (phases like supplying of raw materials and distribution of the final product on the territory). This stage is already over, by now: the Italian supply chain can't provide more wood to a further development of the market; therefore producers are forced to get the raw material from other countries.

As we can see from Table 1 the production capacity and the real production showed a strong increase from 2006 to 2007, numbers almost doubled. In previous years the growth was quite constant with rates in a range of 20-25%. Production capacity has had a similar trend even if with a steady stage between 2004 and 2005 and a jump of 50% from 2005 to 2006, while in the following year the production capacity has more than doubled, from 300,000 to 700,000 tons. The strong increase both in production capacity and production in 2007 probably is another consequence of the 2005 winter, where the demand was much more than the supply: companies increased their production capacity to satisfy the demand and completed this development just after approx. 2 years, in 2007. Besides, other actors, seeing the great potential of the pellet market, started to produce this solid biofuel adding themselves to the already numerous (even if often small) companies.

Since there are so many producers, real estimates of the total annual production and consumption are very difficult. Other sources provide figures a little higher than ours, for example AIEL (Associazione Italiana Energie Agroforestali) states an estimation of 650,000 tons for the production in 2007 and 850,000 tons for consumption, with a consequent import amount of 200,000 tons.

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

Year	Total production capacity [tons/year]	Total production [tons/year]	Consumption [tons/year]
2008	750,000	650,000	850,000
2007	388,000	420,000	630,000
2006	300,000	300,000	390,000
2005	200,000	240,000	290,000
2004	200,000	198,000	230,000
2003	160,000	160,000	210,000
2002			160,000
2001			150,000

Certainly Italy has always been an importer country, as its production capacity has always been lower than the consumption except in 2007. It is possible that the consumption we calculated in 2007 (630,000 tons) might be a little underestimated. However, we have to take in account that some smaller amounts are imported, especially from Austria, since the prices are significantly lower and for traders and retailers it is more convenient to stock up from there than from local producers. This fact doesn't change the typical Italian feature as importer country of pellets.

Note that after an initial steady stage, in 2001-2002, the market has experienced a boom with a growth rate of 300% in only four year (from 2003 to 2007). Encouraged by its convenience demonstration compared to natural gas and oil, more and more people adopted this new kind of fuel to warm their own houses.

4. Pellet production

As mentioned in previous chapters, given the extremely high number of producers, it's difficult to get an exact estimate about production capacity installed and real production for Italy. We calculated a production of approx. 650,000 tons in 2008 with a production capacity installed of 750,000 tons.

AIEL recently presented higher figures, but one consideration can be surely made:

- "Italy can be considered a big European producer and user of wooden pellets (in addition to their leading position as pellets stoves producers)". In the table below you can note the most evident feature of the Italian market: the extremely high number of small size production plants, approx. 85; on the opposite site the little number of medium size plants, not more than eight, with an estimated production capacity of just 30,000 tons/year. No production plant has a capacity above 70,000 tons/year, so there aren't plants of big size in Italy.

Between the 85 producers, only 63 are produce pellets for the market, the others are mainly autoproducers (their product will never arrive to the market as it is used for their own thermal needs). The following Table 2 will consider only the 63 producers that contribute to the market.

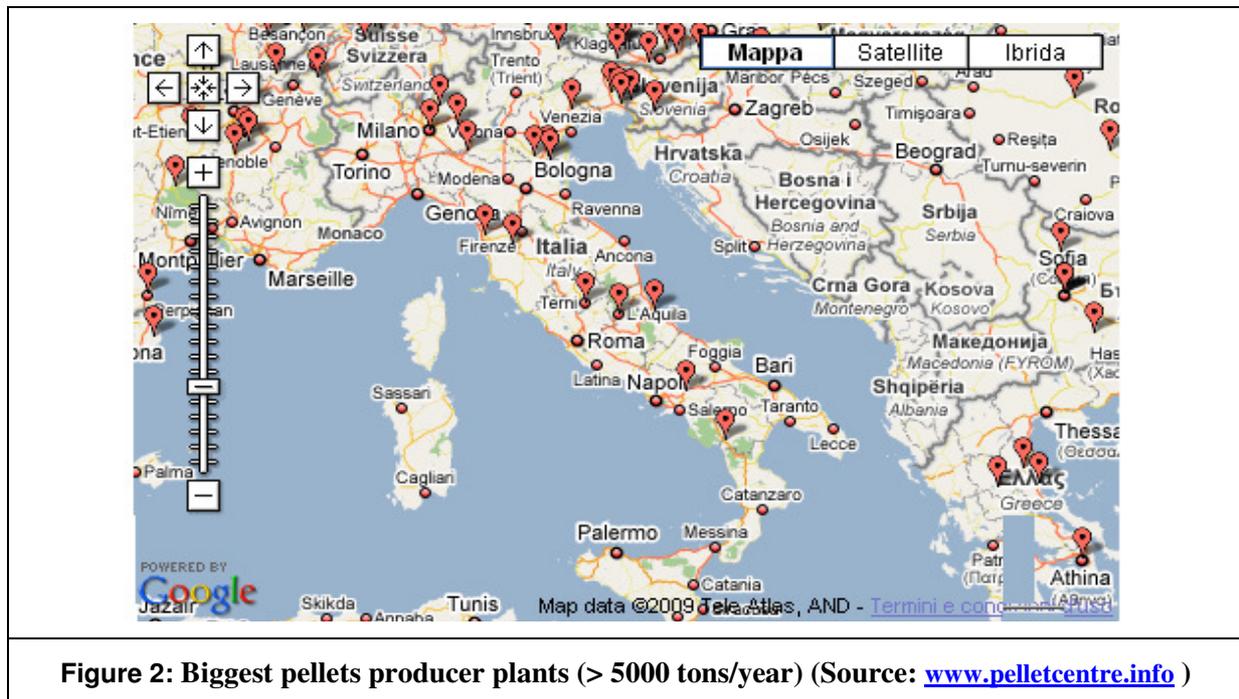
Table 2: Production of wood pellets 2008 based on the size of the pellets plants.

Size of pellets plants	Production capacity 2008 [tons/year]	Total production 2008 [tons/year]	Number of pellets plants 2008	Utilisation rate 2008 [%]
small-scale (<30,000 tons/year)	450,000	400,000	55	88%
medium-scale (30,000–70,000 tons/year)	300,000	250,000	20	83%
large-scale (>70,000 tons/year)	0	0	0	0

While, until the year 2005, the number of producing companies on the territory was distributed in a more uniform way between North, Centre and South Italy, today the Northern part of Italy occupies the head position as far as "number of activities per region" and still more as far as "productive capability" are regarded. The presence of a mature wood supply chain helps the operators in many important phases of the production (phases like supplying of raw materials and distribution of the final product on the territory).

Most of the production (offer) is concentrated in Northern areas (73.3% of the national production comes from this area). The request (demand) of the product is distributed in a more heterogeneous way between the other regions of Italy. The birth of several manufacturing companies in the Centre and in the Southern part of Italy, has been tied exactly to a constant request by users of pellet products. Also the high

number of pellet stoves sold during these years all over the nation, helped the biofuels market to find its mature way.



At the same time, on the bases of collected data and experiences through the questionnaire and the telephone interviews, several similar behaviors were recorded and a torsion of the market was noticed. In fact:

- Some companies that until the year 2005 were classified as pellet producer, stopped their production and started retailing activity. Following this plan, the companies developed contracts with big National/International producers, decreasing the number of pellet producers in several regions as Friuli, Piemonte, Abruzzo and Campania;
- At the same time some regions increased the number of pellet producers in their territory. Among those Veneto, Emilia Romagna, Umbria, Molise, Basilicata and Sicilia can be underlined.

According to this data, it is possible to foresee that new actors in the Italian market will use all the experiences acquired by other producers. In fact new actors will create their company in a place where the benefits deriving from a concrete and well developed supply chain are relevant. The supply chain of wooden raw materials is the most risky process between the all the production phases, because the supply chain is directly related to the capability/possibility of the wooden industries and of the forestry operators.

Also the situation regarding certifications is very distinctive in Italy. AIEL (Associazione Italiana Energie Agriforestali) is working for the diffusion of quality standards among the market actors. Since the year 2006 AIEL has created a "label" for the production of high quality pellets, named "Pellet Gold". It is based on the Normative *CEN/TS 14961*, *DINplus*, *ÖNORM M 7135* and on limits introduced by the

Pellet Fuel Institute (PFI). The main obstacle for the diffusion of this label is given by the extremely high number of pellet producers in Italy (around 90 producers). The biggest ones are located in the northern part of Italy, where 70% of pellets is produced. In this area the number of "Pellet Gold" producers is increasing and surely positive effects will be evident for the market actors.

Pellet Gold is a standard based on the other international certifications, DINplus, ONORM and CENT TS, but it's not a real certificate.

In fact AIEL is the association that declares which companies produces pellets in accordance with the Pellet Gold standard, but AIEL is not an independent certification agency. (Source: www.aiel.cia.it)

By now the lack of a real certification for wood pellets manufactured in Italy could generate distrust among users and so hamper the development of the market.

Raw material used in pelletizing is determined most by residues of the wood industry with 65% of sawdust, 19 % of shavings, 5% of rough discards, chips and other residues, 11% (data source ETA, 2007), while referring to the typology of wood used, 55% derived from a mix of conifers and hardwoods, 20% from beech, 12.5% from pine, 12.5 from red fir. Consumers are not usually aware regarding the kind of wood that make pellets up, they are interested only in a pure wood composition that can assure a good combustion in their little domestic stoves.

As previously mentioned, producers are organized in a kind of association called Propellets Italia, shaped on the Austrian example (Propellets Austria), and assisted by AIEL. By now Propellets Italia has not started any concrete action, although it gathers the main north Italian producers. Due to the extremely large number of producers it's difficult to imagine that national associations will be able to gather the biggest part of them in the future.

5. Pellet trade and logistics

The biggest part of the small scale producers sells their product inside the region where the plants are located. Only some medium size producers in northern Italy, especially in Veneto and Piemonte export some pellets to other Italian regions (respectively 1,500 and 1,100 tons data source ETA, 2005). Only one region in central Italy, Abruzzo, exports pellets , with 1800 tons. The interregional selling stream doesn't exceed 1.2 % of the total national production amount, a very low percentage.

This data confirm that Italy has to develop a mature market with an interregional trade network that can cope with local imbalances between demand and offer.

House owners represent the majority of final consumers. They prefer to purchase pellets in small bags of 15 kg from retailers or from large distribution agents. Following this information, companies pack 85-90% of their product in small bags. Only 10% are sold in big bags or loose.

From our research, by interviews and surveys we found out that companies of Northeast Italy follow this selling strategy:

- 50 % of companies sell directly pellets to retailers
- 29.2% of companies sell directly their product as retailer
- 20.8% didn't release any information

We assume that these results are still valid and to some extent they represent the situation of all Italy. In general we note that small size companies prefer selling pellets mostly or totally to single purchasers as retailer, whereas medium size companies prefer selling their product to retailers.

Regarding transportation costs, we have to note that it doesn't much affect the final price of pellets, as the markets developed within the production region. The average transportation cost calculated is approximately 15-18 euro/ton for a 0-200 km distance and 18-22 euro for distances over 200 km. Obviously these values are strongly affected by the quantity of pellets to be transported and from oil prices, that have been very changeable in the last months.

The import of pellets from bordering countries is a reality in Italy. In fact the amount of imported pellets in Italy is reaching a considerable level. In reference to the import of pellets, some considerations must be done.

The necessary data to calculate this value, can be summarized in the following groups of data:

- pellets imported by traders/retailer of pellets;
- pellets imported by stoves producers;
- pellets imported by pellet producers.

The sum of this three data represents the total amount of imported pellets for the period 2006/2007 and its value is calculated in 110,000 tons (data source ETA, 2007).

Before making any conclusion, another general consideration is needed. In fact during the past year, through the participation at professionals meetings and specific

events on solid biofuels, very high amounts of imported pellets on the Italian market were declared by several actors.

In complex, the amount of imported pellets from abroad countries was calculated about 500,000 tons. The pellet product arrived from Eastern countries, Germany, Austria but also from China and Brazil. For example in this last six/eight months the arrival of several cargo ships in Italian harbors with a huge quantity of pellets (about 100,000 tons each cargo) were registered. Two types of considerations must be done about this kind of pellets.

1. The first consideration concerns the mentioned quantity. In fact the Italian market couldn't have absorbed this huge quantity of products without suffering of the serious repercussions among the interested actors. In fact on the base of all interviews collected from producers and retailers, the Italian market for pellets is very competitive and full of actors. So, this mentioned scenario doesn't seem very realistic, as the inclusion of huge quantities of pellets would have created concrete effects on the Italian market (strong decrease of the final price, difficulties in stocking phases, surplus of products). Ulterior analysis about this matter should be made, in order to provide clear and exact data about the presence of these products on the Italian Market. This mentioned pellet, nowadays, will be stocked somewhere and it will go into the market with a lot of difficulties. Anyway it must be considered that the arrival of big quantity of finished products will become much more relevant, year by year.
2. The second consideration concerns the quality of this imported product. As previously said, the Italian demand is represented by small users and little domestic stoves. This type of heating systems requires a pellet of "high quality", as the technical parameters for an efficient utilization in little stoves require high standards of fuels. So it seems not realistic that pellets without any quality standards, bigger diameters than 6mm, with uncertain type of raw materials could have been accepted by market actors and reached the final users. Very interesting applications for bigger power plants could be foreseen for this type of fuels made with low quality raw material.

AIEL estimates for 2007 an import amount of 200,000 tons, which is much more near to our calculations. However, again these different values attest serious difficulties in obtaining exact figures regarding a so heterogeneous market as the Italian one.

6. Pellet consumption

As mentioned in previous chapters we calculated a national consumption of 850,000 tons for 2008. AIEL estimate figures a little higher, since according to their numbers, 850,000 tons were consumed in the previous year, already.

The typical Italian consumers, house owners that purchase pellets for domestic small stoves, are aware about quality, which is very important for a low maintenance cost of the stoves. The parameter in which they are more interest is probably the ash content. And then all the others, as moisture content, of course. In some cases the stoves retailers supply also good quality pellets for their customers.

Having a look at small bags prices over the last years we can observe a slight decreasing trend, from a very high level in late 2005 winter, (about 300 euro/ton, but with local peaks of 500-600), to an average of approx. 240 euro/ton in the last Winter (2008). However it's important to stress the fact that the price is very dependent on the season of purchase. During the summer, prices could drop down to under 200 euro/ton, like last year, in 2008 with an average of approx 196 euro/tons. Please note all prices above are including VAT and 50 km transportation.

In Italy there are not large scale generation (CHP) plants fuelled by pellets. We can find some examples of medium scale heat generation for agro-forestal companies, or for greenhouse users, but the largest part of consumers are householders. This is attested also by the number of little stoves installed, an estimate of 2008 states 800,000 units, linked to over 1,000 boilers. Italy is the most developed stoves market in Europe. Numbers of consumers can be easily inferred by the number of sold stoves with a good approximation.

The price of boilers varies depending on the size. We record approx. a price of 650 euro/Kw installed for small sizes (about 20 Kw) and 450 euro/Kw installed for power outputs over 40 Kw. All these figures are comprehensive of VAT (20%). The current Italian legislation promotes the purchase of boilers with a 55% deduction from income-taxes in five years.

The following graphic shows the pellet price trend in Italy from 2002 to 2009.

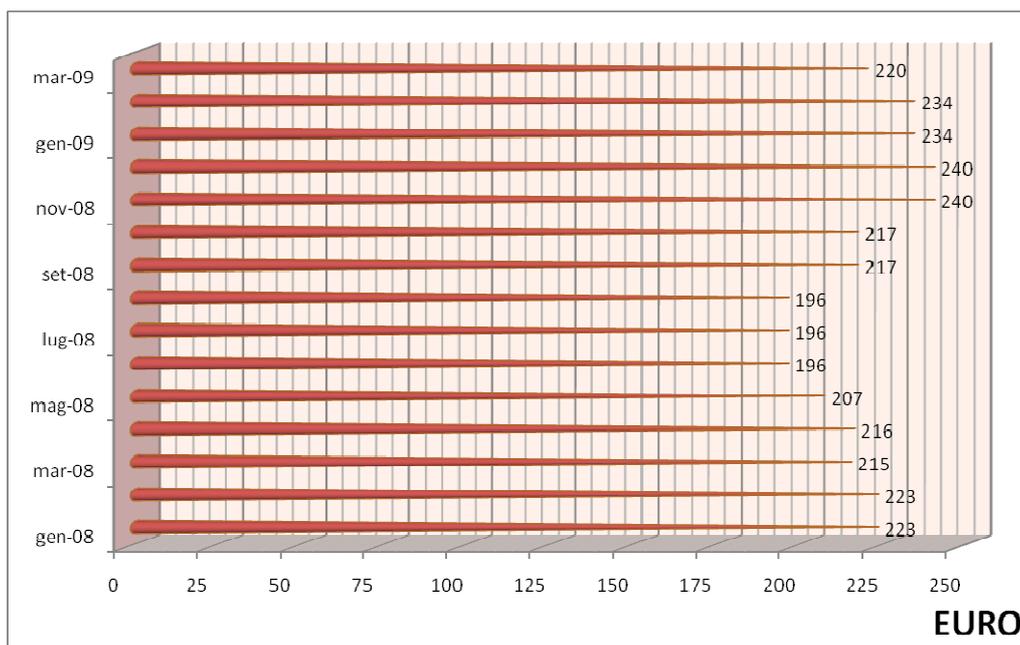


Figure 3: Pellets price trend in Italy from 2002 to 2009 –15kg bag

7. Mixed biomass pellets

The market for mixed biomass pellets has been virtually inexistent for a long time. Italian scenario of MBP did not change very much in the last months, as traditional wood pellets increased its share in the market, and also costs of fossil fuels decreased concretely due to the international events and crisis. Many trials on these products were made in the last year and some of them are still under development. In fact the diffusion of energy crops and the possible utilisation of new raw materials offer good opportunities to MBP actors. Today, only two MBP producers are working in Italy, and both of them have a limited production. Their real production capacity is much higher than their production, but the market is so limited today that higher production levels are useless. At the same time, if in the last months MBP were considered an interesting product, now the interest of people and producers seems to be inferior to previous months.

Surely, the biggest utilisation of MBP will be made in co-firing plants. The concrete production of MBP is not guaranteed, at least for the next two years. When the technical sustainability of the co-firing processes will be evident to the appropriate institutions, maybe MBP will become a concrete alternative to the utilisation of wood raw materials like chips.

The main factors hampering market development are listed below:

- To identify suitable technology for the efficient utilisation of MBP (many heating system producers declare that their products can burn every sort of material, but often the results after the combustion are not positive).
- To identify providers of MBP in Italy and compare their product with the standards of other solid biofuels, stimulating the market of boilers in Italy as the utilisation of little stove (most of the users use stoves) is not relevant for this fuel.

The two MBP producers indentified in Italy are located in Tuscany and Veneto. Only the one in Veneto has a relevant annual production, declared in approx. 1500 tonnes. We can assume this figure is partial, but MBP can be used also fort animal feeding but this investigation isn't related to the project.

The position of the Italian legislation concerning the utilisation of agricultural residues for heat and power production is not very well identified. Basically it declares that agri-products must derive from:

- dedicated cultivations;
- forest work (management of forest residues, pruning)
- industry sector (wood residues which were treated only in a mechanical way, without adding any other products, chemical element, etc)

Following to the trials that were done in the existing power plant fuelled with coal, it was confirmed that bio-residues can be used in a portion of 5-15% of the total load of coal, without modifying any part of the plant. Moreover it seems that co-firing plants have an efficiency of 36%, against the 20% of the plants fuelled with pure biomass¹.

The financial support for the utilisation of MBP is limited today.

¹<http://www.latermotecnica.net/articolo.asp?id=20060915003>

8. Legal framework & Policy

The normative related to the production of biofuels in Italy is very late, compared to other European countries. This statement is valid for both type of biofuels, solid and liquid.

Even if standards are defined, there is no strict monitoring of quality and prices.

The Normative has a lack of clear inputs, in fact several laws made from various Governments were defined in the last six years, but none of them was able to stimulate concretely the market.

In reference to the co-firing normative, the most important laws of the Italian legislation are listed below:

- D.lgs 16 marzo 1999, n 79 (decreto Bersani) for the liberalization of electricity market;
- D.M. 2002 for the rapid development of new power plants (decreto Marzano);
- DPCM 2002; Characteristics of bio fuels to be used in power plants.

This last law mentioned is very important, as it defines the kind of biofuels that can be used for co-firing in Italy.

The biggest part of the financial resources foreseen for biomass heating systems in Italy is absorbed by the purchase of stoves (not boilers).

For what concerns the economical benefits deriving from the utilisation of this biofuels, it must be noticed that there is a lack of information for both wooden and mixed biomass pellet. The biggest input for people and for the market development are mainly the environmental and economical benefits related to their utilisation.

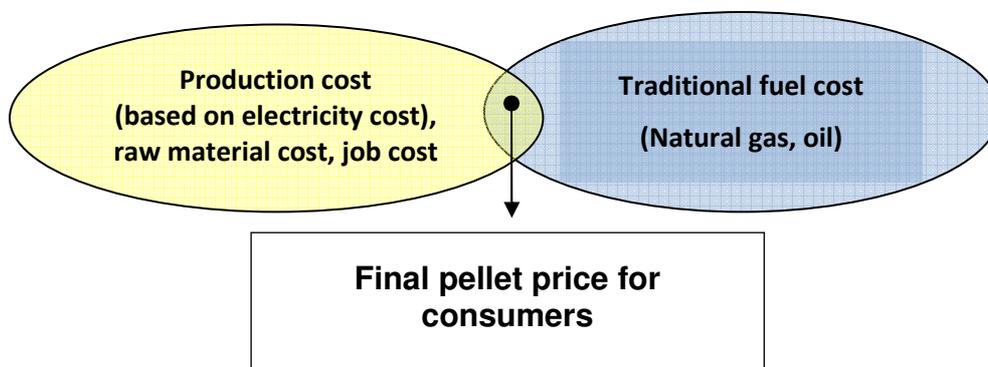
9. Projections on future developments

In Italy the pellets production has always been based on sawmills residues. This kind of supply of raw material for pellet production is already completely exploited.

Italy is a country highly populated and urbanized, it hasn't wide extensions of woods and hasn't any experience in forestry sustainability administration like, for example, northern European countries. In addition, due to a rough topography, large parts of the forests are not available for this purpose. Considering that, it's difficult to imagine new amounts of raw material in wide scale coming from residues or logs from Italian forests. Nevertheless some small size and local initiatives in this sense are possible, as for example a project for biomass utilisation we are developing with a province of Sicily, where most parts of the forests show high risks of fires every Summer.

Due to this lack of raw material it is very unlikely that the Italian market could develop to a direction different than the current one: a cheap fuel to feed little domestic stoves. In our opinion there is no way for a diffusion of big plants (CHP) fuelled by pellets. Governmental subsidies to satisfy European policy about emission and renewable energies thresholds favour other high technology solutions, as solar and wind.

As we previously observed, average prices have experienced a slight decrease from 2005 to current months. It's difficult to foresee future developments, since it depends also on imponderable factors as, for example, Winter average temperatures, production prices and so on. In general we can state that final prices are based on the following scheme.



However it seems that the market has reached an own balance and new strong shocks as the one in 2005 are very unlikely.

10. Summary and conclusions

So, as a first barrier, it must be noticed the Italian legislation should be simplified from the administrative point of view and intensified from the point of view of monitoring the quality of the bio-fuels.

At the same time all phases of the supply chain of agri and forest residues should be studied in detail, permitting to raw material producers to gather between them, facilitating the management of this activity. Probably the lack of a positive experience in Italy slows the development of this business.

Concerning the MBP, no concrete news are running in the Italian market, even if some producers are starting to be present among the regions. Therefore, for the rapid development of the market, when the “offer” of agri-residues will be constant, also the “demand” of the big co-firing plants will become a reality.

For the rapid realization of these goals, the Government has to increase their interest for energy matters, considering that:

- the ownerships of decision' s power concerning the construction of new power plants, is claimed both from the administrative Regions (20 in Italy), but also from the Minister of production activities, the central institution in Italy. This unclear classification of powers slows very much the decision processes;
- agri-raw materials are undervalued, as they are still an important resource for energetic scopes;
- the utilisation of raw material of any kind is directly related to the maturity of its supply chain;
- clear inputs must be given to entrepreneurs and citizens concerning feed for green certificates, interest, loans, for the development of power plants of little medium size (1-20 MW);
- the Governments should monitor if the “big-actors in the energy sector in Italy” are pushing for the liberalization of the energy market or if they are slowing this important event in energy market.

An important role could be played by big producers, gathered in an active association, like the new born Propellets Italia and also by other organizations like AIEL, operative since long time. They could, and probably should, push policy makers to develop a long term policy strategy for biomass.