

Biomasse Italia

By Guido Castelluccio*

Biomasse Italia's main mission is to produce clean energy from the recycling of vegetal wastes and other renewable sources. The company is recognized as among the largest European companies producing energy from renewable sources (solid biomass) while fully respecting the environment.

The Company shareholdership is represented by Api Nova Energia and Bioenergie. Api Nova Energia belongs to the Api Group, one of Italy's leading oil companies. Api Nova Energia's mission is to manage and clearly improve the electricity and gas business of the Api Group. The Bioenergie Group, based in Milan, is one of the largest Italian producers of biomass energy. The Group also owns San Marco Bioenergie SpA, a 20 megawatt electrical power biomass station, located in Bando d'Argenta (FE).

Raw Materials

The Company started its activity using almost exclusively wood chips; this biomass type now represents only 60% of total consumption. During recent years the Company has invested in production processes and plant technology enabling it to use wood residuals of lower quality. These include saw mill residuals, public green and agricultural waste, biomass types that would otherwise be left in rubbish dumps.

Today, wood biomass consumption totals some 500,000 tons per year, while non-wood biomass, including olive residues and peanuts residues, account for about 50.000 tons/year.

Initially the Company imported its biomass from abroad. Early on, however, the Company encouraged and supported private forest companies in the local Calabria region with the result that local biomass availability has doubled over the last three years, dramatically reducing EU imports. Imports, however, continue at a low level as the local market cannot satisfy the whole of Biomasse Italia's demand. The Company has enjoyed a progressive decrease in the average cost of its main raw materials; that and production optimization have resulted in a cost reduction for the ash disposal.

Production

Biomasse Italia produces its energy at two sites, one located in Crotona and the other in Strongoli, with one 20 Mw power station and one 40Mw power station, respectively, for total production of about 450 GWh/year. The power plants use two different technologies which assures the acquisition of wide technical know-how, now absolutely strategic to making new technological choices for the future. Table 1 shows plant performance over the 2005 to 2007 period.

	2005	2006	2007
Operation hours (h)	7 200	7 700	7 100
Plant availability (%)	82%	88%	81%
Power capacity (MW)	58	59	58
Production efficiency (%)	96%	98%	97%
GSE (GWh) electricity	420	450	410
Biomass specific consumption (thermal efficiency) (Gcal/MWh)	3.7	3.7	3.8
Non-wood fuel incidence (%)	19%	19%	26%
Ash (%)	5%	4%	5%

Fuel Mix

Table 1 – General Indicators

The raw material mix is influenced both by the availability of local biomass and by the technological problems arising when the non-wood biomass rate increases. The development of a Biomass Knowledge Studying System has made it possible to establish a set of correlations between biomass characteristics and plant performance. For example:

- Each 1% of biomass moisture variation (around its 45% standard value for wood biomass) will result in a 0.5%-2.0% variation in profit margin, depending on the technology applied.
- Even a 1% ash variation has a 1% to 2% influence on gross profit margins, again, depending on the technology employed.
- Similarly, depending on technology, a 1% variation of specific consumption can influence the gross profit margin of 1%-4%.
- Finally, each 1% of wood and non-wood biomass mix variation can alter 0.1% of the gross profit margin; nevertheless the contribution to the profit margin may be canceled or become negative if certain percentages are exceeded (influenced by the technology chosen).

Waste Disposal

The production process residual is mostly ash from biomass combustion. Thanks to the quality of the biomass purchased and the efficiency of the combus-

*Guido Castelluccio is General Manager of Biomasse Italia. He may be reached at darainterserv@biomasseitalia.it

tion process, the ash amount is small (5% of biomass, depending also on the fuel mix) and is high quality, so that it can be recycled and not dumped in landfill sites. The Company production system uses biomass residuals, even if the quality does not comply with technological specifics. Biomasse Italia can filter and convert the small particles into “pellets” for industrial use. This method allows use of environmentally safe residuals instead of using fossil fuels only.

Air Emissions

The direct and indirect greenhouse gas emissions, NO_x and SO_x, and the quantity of special waste have always been below the limits of the law (see Table 2); and in the future the Company will install a new flue gas outlet cleaning and conditioning system.

	Line 1 KR	Line 2 KR	Line 1 STR	Line 2 STR	Legal allowance
NO _x	151	167	119	137	200
SO _x	25	10	1	6	50

Table 2 - mg/Nm3, emissions, 2007 yearly average

Biomasse Italia has never received any penalty for violation of environmental standards during its activity and has never experienced any non-compliance with regulations and voluntary codes.

Intangible Results

There have been some intangible results in the company’s short period of growth; namely:

- inputs have decreased compared to the energy quantity produced, thanks to the investment made on plants and processes.
- Ash-waste production has fallen thanks to the integration of suppliers for a better biomass quality.
- Air emissions have decreased as the process improved.
- The staff’s average age has fallen as many young people have been employed. Also local partners achieved more professional skills thanks to the cooperation with international consultants provided by the Company.
- The economic-financial relationships with the local economic system (suppliers, banks) have increased.
- A policy of territorial integration has contributed to an institutional awareness of the competitive advantage reached by Crotona Province in the field of renewable energy.

The Company Role and its Local Activities

Biomasse Italia has developed a communication plan for informing and communicating with all its stakeholders. The Sustainability Report, the Company newsletter “Energia qui” and the website are the most incisive corporate communication instruments.

The Company spends tens of millions euro for goods and services supplied by small local companies, gives support for the development of dock activities and infrastructures and encourages the investments of suppliers in the biomass supply chain.

The success of Biomasse Italia’s operations resulted in it receiving the Environmental Enterprise Award in 2007.

2009 IAEE Survey – Drawing Winner

Thank you to all who completed the 2009 IAEE Survey. It was a great success and we will be reviewing these responses and implementing changes where possible. Of all the responses that were received, the name drawn to receive a free conference registration to either the IAEE International Conference in San Francisco or the IAEE European Conference in Vienna was Marianne Sjolund of Statnett SF. Congratulations!