



BY AGENCIA VALE

## *Pioneers in sectorial policy for energy efficiency*

*Pulp and paper producers were the first to outline a profile of their energy expenses and, together with the National Confederation of Industry Brazil (CNI), are preparing an action plan that focuses especially on this area. In addition to involving cost reductions and energy savings, such efforts also benefit the environment in a significant manner*

**By Marina Faleiros**

**T**he pulp and paper sector is the third biggest consumer of energy in Brazil's industry, as reported in the 2009 National Energy report divulged by the Brazilian government, having consumed  $8,957 \cdot 10^3$  TOE (tons of oil equivalent) in 2008. "But this scenario should change, because according to a study conducted with the National Confederation of Industry Brazil, CNI, the sector has the potential to improve its energy efficiency by at least 19%", says Afonso Moura, ABTCP's Technical Manager and Coordinator of FIESP's Climate Change Committee.



## Main barriers for streamlining energy usage

- Lack of awareness regarding more efficient technologies and their potential benefits;
- perception of risks, which occurs every time new technologies are considered;
- financial feasibility analysis is not conducted properly, where significant importance is placed on initial costs (investments) while other aspects are not considered (many times intangible);
- restriction associated to the investment capacity on the part of smaller sized businesses, but even in large companies the priority of investments (when funds are limited, which is the usual case) is rarely placed on the rational use of energy;
- difficulty in obtaining lines of financing, particularly on the part of small businesses;
- long ROI periods;
- difficulty in obtaining qualified labor, especially at small and medium sized companies.

Fonte: Energy Efficiency Opportunities for Industry/2009 Report

### FUEL CONSUMPTION IN THE PULP AND PAPER SECTOR

Unidade: 10<sup>3</sup> tep

FONTES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
NATURAL GAS	219	273	394	398	426	458	519	560	597	509
STEAM COAL	79	83	89	76	83	89	55	82	80	81
FIREWOOD	1.001	1.048	1.027	975	1.041	1.139	1.172	1.252	1.296	1.374
SUGAR CANE BAGASSE	14	24	25	24	39	30	33	34	36	37
BLACK LIQUOR	2.246	2.291	2.280	2.548	2.976	3.144	3.342	3.598	3.890	4.078
OTHER WASTES	368	406	463	491	569	505	540	660	713	756
DIESEL OIL	25	31	31	37	48	59	60	44	65	68
FUEL OIL	1.019	983	813	879	753	635	633	432	423	499
LIQUEFIED PETROLEUM GAS	19	24	27	31	26	28	56	25	29	29
PETROLEUM COKE AND KEROSENE	1	0	0	0	0	0	0	0	0	0
ELECTRICITY	1.000	1.044	1.013	1.127	1.160	1.212	1.270	1.330	1.426	1.528
OTHERS	0	0	0	0	0	0	3	0	0	0
TOTAL	5.991	6.206	6.161	6.586	7.120	7.299	7.684	8.016	8.555	8.957

Source: National Energy Report 2009 / Energy Research Company

The positive perspective is mainly fruit of the sector's advancement in studies about the bottlenecks in its consumption of energy. "The pulp and paper industry was a pioneer in accepting to participate in this project with Eletrobras, through the National Energy Conservation Program Procel", says Rodrigo Garcia, coordinator of CNI's National Energy Efficiency Program for the Industrial Sector. The main objective of the project is to discover in which areas of industry is there potential for greater energy efficiency and, if there are projects focusing on this, why they aren't being put into practice. "We want to thoroughly investigate the pulp and paper sector, learn more about it and map, together with technicians, the specific pieces of equipment that have the greatest energy saving potential, and discuss what would be the best policy to facilitate the execution of projects", says Marco Aurélio Moreira, Manager of the Eletrobras/Procel Industry and Commerce Energy Efficiency Division.

Researching and discussing the industry's energy efficiency is also essential in CNI's opinion: "Energy is a resource like others in production, but in the last few years its cost has been increasing considerably, particularly electrical energy", says Garcia. According to him, while in other countries there already existed an awareness regarding the need to increase the supply of energy and its rational consumption, in Brazil this didn't take place, since energy down here has always been abundant and cheap. "Now, the situation has changed, as we no longer have inexpensive energy and environmental pressure is much stronger. The supply is becoming more and more distant because the hydroelectric power plants possible in São Paulo and Minas Gerais have already been built and we are now going to the Amazon, which makes things more difficult", he said.

For the pulp and paper sector, one of the main advantages is being able to use

wood biomass for energy, this is why many investments focus on this area. According to consulting firm Wood Resources International LLC, the pulp and paper sector worldwide consumed 75 million tons of biomass for energy in 2009. Since 2006, the energy used that was produced from biomass grew 50%, totaling 18% of total energy consumed in 2009. "With technological advancements, such as recovery boilers that produce practically all the energy that mills consume, coupled with the reduction in specific energy consumptions that scale brought about, the model is continually being optimized", says Pedro Stefanini, Industrial Manager at Lwarcel Celulose.

However, he said that the older companies do not possess this status and, therefore, have major improvement opportunities, particularly with regards to managing the efficient use of energy. "The know-how gives the sector the experience necessary to contribute to this theme on a national level", he said.

Francisco Razzolini, Klabin's Director of Projects, Industrial Technology and Procurement, also says that it is important that companies conduct energy conservation and productivity programs as a first step, since those that do not become up-to-date will seriously compromise their competitiveness. "Plans and incentives need to be provided in order to allow for the substitution of equipment that today is financial unviable, when solely based on efficiency calculations. It is necessary to unburden investments", he said. According to him, buying the cheapest no longer works: "It needs to be the most economical and the most viable financially and environmentally."

### ENERGY INSIDE MILLS

Energy consumption in pulp and paper mills stems mainly from generating steam that's used, for example, for wood cooking and pulp bleaching, black liquor concentration, paper drying and the production of electrical energy itself.

According to the Energy Efficiency Opportunities for Industry Report – Pulp and Paper Sector, prepared last year by CNI in partnership with ABTCP, in 2006 the sector generated 7,822.1 GWh of electrical energy, of which 592.1 GWh was produced in hydroelectric power plants and 7,230.0 GWh in thermal power plants, which represented 50.6% of all energy consumed that year. The majority of cogeneration units in the pulp and paper industry burn black liquor and other biomass waste in their boilers.

For Klabin, the discussion is important because the pulp and paper sector is an intensive energy and in full expansion in the country. "This is a sector that has done its homework and invested in much more efficient equipment and processes. It produces much more today and with less raw material than ten years ago", says Razzolini. The company invests in projects that focus on energy efficiency to maintain its competitiveness and sustainability, in addition to reducing operating



**Klabin's new biomass boiler can use all the forest waste from the region where the mill is installed**

expenses and dependence on fossil fuels, which prices are high and cause a greater environmental impact. "There's no more room for waste. The times of low cost energy has ended and on account of this we now produce paperboard with 30% less energy than when we did so 10 years ago", he said.

To make this possible, Klabin had to make several investments. At its mill in Paraná, the company substituted oil boilers for high yield biomass boilers, associated to a new recovery boiler and turbogenerator, which boosted the cogeneration of electricity and reduced fuel oil consumption by 20 thousand tons/year. The average additional generation was 55 MWh/h, reducing the percentage external energy purchased from 50% down to 33%. "In addition to the financial gains from substituting oil for biomass and the reduction in CO<sub>2</sub>, we began purchasing all the biomass produced in the region, previously discarded by wood companies." What was a cost, says Razzolini, became revenue and there was even the need to implement programs for taking advantage of forest waste, which before was not used by the mill.

The company also changed the bleaching process by substituting the ozone, which reduced energy consumption and production costs, installed refiners designed for less energy consumption, utilizes higher performance electric motors and, in Santa Catarina, acquired a new biomass boiler to substitute the old one that used fuel oil.

On account of its boiler changes, Klabin will also try to obtain carbon credits. "The processes are currently underway. We believe that these substitutions from fossil fuels to renewable energies deserve obtaining carbon credits, which help improve ROI rates through the acknowledgment of environmental improvement, but the methodologies currently in effect still do not contemplate all cases", he explained. Klabin already obtained and sold credits for having substituted fuel oil in the Piracicaba (SP) unit boiler.


Ibema, in turn, which produces packaging paper in Paraná, innovated by not having to only depend on biomass in its search for clean energy. It took advantage of the geography of its property to build two small hydroelectric units, both of which are the non-flooding type. "For thermal energy we use biomass that is made from the forest residues in the region", says Nei Senter Martins, the company's president, which possesses an exclusive department for handling the energy generation system.

For the company, making an investment in hydroelectric energy is worthwhile, for it is an increasingly greater factor in the cost matrix. "Other fossil sources are getting more and more expensive and have a greater impact on global warming. As such, the competition for renewable energy is a key factor for all companies, and the pulp and paper sector will have even more importance in this process", believes Martins.

The company possesses four genera-

tion units, all with an operational capacity to use biomass. At present, Ibema produces 11 MW, 100% earmarked for domestic consumption. In the future, Martins points out that the company will analyze plans to also sell energy in the market.

São Paulo-based Lwarcel is also very concerned about energy efficiency, having invested R\$ 100 million in a thermoelectric power plant with the objective of becoming self-sufficient in energy, which project was concluded in 2009. "Self-sufficiency provides for medium to long term operational assurance, as well as competitive advantages as production costs drop", says Pedro Stefanini, Industrial Manager at Lwarcel Celulose. Add to this the environmental aspects of using biomass-based energy, as well as the substitution of less efficient equipment for another with the best technology available in terms of emissions control. The new biomass boiler uses fluidized bed boiler technology and can produce 90 tons per hour of steam at a pressure of 85 kgf/cm<sup>2</sup> and a temperature of 480°C.

At present, Lwarcel supplies energy to Lwart Group companies located in the city of Lençóis Paulista and expects to trade a surplus of roughly 8 MWh in about six months. "Before, the company generated about 90% of the energy consumed by existing equipment and purchased the balance from power utility company CPFL. Now, with this investment, we intend to obtain carbon credits, which process is currently being validated by UN technical chambers", said the executive. 

## Informação ao mercado

Nas edições de fevereiro e março de 2010 da revista O Papel, a Voith Paper publicou anúncio com informações equivocadas.

Recentemente, a Voith Paper adquiriu as fabricantes Canadense "PremiAir Technology Inc." e Alemã "Wiessner" de sistemas de Ventilação e Capotas para Máquinas de papel Gráfico, Embalagem e Tissue, e não "Visy", como incorretamente divulgado.

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