

On the sustainability footprint path

In the International Year of Forests, natural resources and the pursuit of more equalitarian environmental legislation head the list of topics being discussed about the sector's sustainability. Within this context, the big question is: How are environmental issues shaping the rhythm of the pulp and paper's productive chain in the country?

This is what we look to answer in this month's *Cover Story*...

Guaranteeing life on the planet... Something so elementary and at the same time of a complexity without limits... How produce without destroying the soil, contaminating the water or polluting the air? How can prevent man from becoming the fatal victim of his own evolution? We are faced with one of the greatest paradoxes of our times. It took us a long time to see the wrong way we were promoting development among so many prior generations, but it's being a lot quicker to understand with each passing day that rebuilding is much more difficult and costly than maintaining things – had we only prevented the destruction...

What should we do now in view of this scenario? This is the question we ask every time a new tragedy receives huge coverage in the media. The answer is quickly being discovered by researchers and scientists, however the velocity at which nature has responded to our errors has been astounding consider-

ring our possibilities of changing attitudes and habits inherited by our ancestors on Earth.

The importance of change led the United Nations (UN) to declare 2011 as the International Year of Forests. Such declaration could not have been timelier, since major environmental discussions are loading the nation's agenda with the promise of new directions in the country's environmental policy. The objective? To achieve the sustainability we've been yearning so much for! We have progressed considerably in the direction of this need to maintain our industries over the next years.

This is not a dream. The alarming scenario of climate change and the key role forests play in reducing, controlling and mitigating Greenhouse Gases (GHG) – which issues in the past were restricted to research institutes – have been the center of speeches, web discussion forums, meetings, conferences and manifestations that are taking place every day in various regions throughout Brazil. We are being forced to face an inconvenient tru-



th that we didn't want to learn about so soon – much less in the way it was revealed.

On one hand, many forests are being devastated by illegal activities; on the other, the pulp and paper sector is a reference in environmental protection. It just so occurs that given the intense interaction with natural resources in our production lines, we ended up being blamed for those who are irresponsible in Brazil and beyond. We sought to reduce energy consumption and identify renewable energy alternatives; we defined water consumption reduction goals in our companies and engage in sustainable forestry management. Nonetheless, it has been insufficient.

In the energy area, the pursuit of new clean development mechanisms is a constant, as are the sector's petitions to officially recognize forest credits in the carbon market and the potential use of biomass as renewable energy in the future. With regards

to water usage, we strive for conscious consumption in society, while we reduce the inflow of this essential resource in each stage of production.

The spotlight goes to land, now the center of discussions regarding the text that substitutes the 1965 Forestry Code. The reason? The urgent need to update the documents and update legislation to the new reality, which constituted itself around the country's vegetation coverage and importance of regulating Areas of Permanent Protection (APPs) and Legal Reserves (LRs). According to the bill's reader, House Representative Aldo Rebelo (PC do B political party), at present more than 90% of rural properties are illegal because their real conditions contradict the law itself!

Among positive and negative points, the New Forestry Code text presents some fundamental changes (*Read the "Brazil's Forestry Code undergoing approval..." box*). Changes include a reduction in environ-

BRAZIL'S FORESTRY CODE UNDERGOING APPROVAL...

- 1934: The first Code is instituted under the concept of protective forests.
- 1965: The second version of the "New Forestry Code" is approved with the limitation of use and exploration of soil and forests.
- 1986: Federal Law #7,511 amends the concept of forest reserve and begins prohibiting deforestation in these areas.
- 1989: Federal Law #7,803 creates the Legal Reserve and alters the size of Permanent Protection Areas (APPs).
- 1996: Provisional Measure #1,511/96 expands the restriction in forest areas.
- 1998: Law of Environmental Crimes produces changes to the 1965 Code and begins applying more severe fines by environmental supervision bodies.
- 2001: Provisional Measure #2,166/2001 once again amends the concepts and limits of Legal Reserves (RLs) and Areas of Permanent Protection (APPs).
- 2008: Decree #6,514/2008 and creation of a work group to discuss the Code. The decree stipulates the June 2011 deadline for registering RLs. With these new determinations for RLs and APPs, in the event the text of the New Code is approved, this decree will no longer be valid.
- 2009: Aldo Rebelo begins preparing the text of Brazil's New Forestry Code and proposes the following changes:
 - ▶ Reduction from 30 down to 15 meters for APP river margins, when the area is already occupied; for new properties or when the area is free, the 30-meter minimum margin is maintained;
 - ▶ Utilization of hillsides for some types of plantations;
 - ▶ Possibility of APPs being joined to RL areas;
 - ▶ Waiver of the recomposition or compensation by properties with vegetation percentage in accordance with the law in effect at the time when the vegetation suppression occurred;
 - ▶ Rural Environmental Registration;
 - ▶ Suspension of fines applied through July 2008 to producers who adhere to the Environmental Regularization Plan.

mental liabilities with the suspension of fines levied through July 2008 for producers who adhere to the Environmental Regularization Plan. "This measure would favor the country's agribusiness producers, as it would encourage a lot of them to regularize their situation, as they are not in conformity with the law. Considering that companies in the forestry sector are in compliance with their legal environmental obligations, it is important keep the small producers in mind", says Pöyry's attorney and environmental consultant Pedro de Toledo Piza.

According to him, many times these producers – who plant eucalyptus as a source of income and play an important role in the sector's production chain, representing roughly 50% of the total land explored by pulp and paper companies, are burdened by heavy legal obligations that are impossible to be satisfied. In view of this and other divergences, the forest base sector and some of the main socio-environmental organizations presented, through Diálogo Florestal (www.dialogoflorestal.org.br), a consensus proposal to the bill in March 2011.

The open document, called '*For a Modern and Necessary New Forestry Code for the Country's Development*', took eight months to be prepared and was signed by more than 60 organizations, which included companies from the sector, socio-environmental organizations, Instituto Ethos and its member-companies. Once signatures were collected, the text was submitted to Executive Branch representatives, congressmen and people who discussed the subject matter in the House of Representatives.

The consensus proposal defends 16 specific points of the Code that seek to promote the development of productive activities and environmental protection, as well as recognize the protection work already carried out through the use of financial incentives. "It is important to combine policies and promote sustainability, in order for sectors to continue investing. Within this context, we believe that the Code should offer incentives for owners to protect, expand and recuperate their areas, rather than fine them", says Bracelpa's Executive President Elizabeth de Carvalhaes.

One of the main points proposed by Diálogo Florestal refers to a viable way to help reduce greenhouse gas emissions: the carbon market as an option for transforming APPs and LRs into income. "This is where there exists a huge opportunity for agribusiness. Be it planting sugarcane or eucalyptus, what we need to assess is the carbon cycle, because we're talking about renewable resources", said Piza. According to Bracelpa, it is still a



SÉRGIO BRITO/LWARCEL

study, particularly in relation to regulating this internal market of commercializing carbon credits, which needs to be done through specific legislation.

Regardless, however, of government decisions, it is worthy to mention an example to prove that it isn't necessary to break the law in order to work in favor of the environment. Such is the case with Celulose Irani. The company recently won the Ecology Expression Award from the Ministry of the Environment for its project of recovering the Ribeirão de Anta APP (Area of Permanent Protection) in Vargem Bonita (SC). The objective is to rebuild vegetation coverage in order to stop fragmentation of the remaining native vegetation. Of the 15.2 hectare-area, 50% is already being recuperated with the planting of 8 thousand baby plants of 16 native species.

Water: a separate case

One of the sensitive points in the New Forestry Code, i.e., vegetation along the main hydrographic basins, brings water into the spotlight. According to the United Nations, it is estimated that water consumption is expected to grow 25% by 2030 due to the increase in population and number of companies. This topic is no game. Today, compared to 1945 (66 years ago) water consumption has more than doubled. Another alarming fact: of all the sweet water currently available among all Brazilian states, only 20% circulates in territories where mainly the population and companies are geographically situated.

The remainder, that is, 80% of the water that's "good to drink" is in the Amazon, according to Atlas Brazil. Therefore, according to a study by the National Agency of Waters (ANA), to continue offering water to the population and companies until 2025, roughly R\$ 70 billion would have to be invested in new engineering projects – an urgent actions, especially when considering that the agriculture sector consumes 70% of all water resources in the country, compared to 20% consumed by all other industry sectors.

In order to improve current efficiency and productivity rates in the industry-environment ratio of developing nations like Brazil, the United Nations Conference of Parties (COP 16) created the Green Climate Fund. The meeting between global leaders from various nations took place in Cancun, Mexico, and defined the guidelines for an action plan in favor of the planet's sustainability. It was decided that US\$ 30 billion will be earmarked by 2012 for issues aimed at mitigating environment-related problems.



“To lose steam in the atmosphere, lose fiber in effluents, is to lose money. That why sustainability went from being just a matter pertaining to the environmental area to becoming part of the CEO's agenda”

However, due to undefined matters between the UN and World Bank, this capital has not yet been made available, which situation is expected to continue until the upcoming COP 17 to take place in Durban, South Africa in December. While the year-end meeting does occur, the pulp and paper sector shows that it has been doing its homework for a long time when talking about reducing water consumption in production.

Today, it takes roughly 25 thousand liters of water to produce a ton of paper. In the case of pulp, to produce the same amount of this commodity, it takes roughly 30 thousand liters. Even though in these processes the sector has reduced water consumption by more than 50% since 1970, there is still a lot that needs to be improved. Such is the importance of the theme that, among the various discussed in Bracelpa's Sustainability report, the item "water consumption, disposal and recycling" was pointed out as very relevant by those interviewed in preparing the report.

Of the various practices mentioned for saving water, industries have invested in the implementation of circuits that are more closed in mills, with water capturing, treatment and reutilization in their production process. Such is the case with Fibria's Jacaré (SP) unit, a benchmark-company in terms of reuse water utilization. In addition to utilizing 82% of this water in its entire process, the company registers a consumption rate of 20 m³/ton.

LWARCEL: AN EXAMPLE TO BE FOLLOWED

Lwarcel stands as an international model when it comes to water consumption. Located in Lençóis Paulista (SP) and distant from water basins, the company gets its water from the soil through semi-artesian wells, drawing only what is necessary to produce its pulp.

With one of the lowest consumptions among companies in the sector, Lwarcel went from 44 m³/ton in 2004 to its current 23 m³/ton of water per ton of pulp produced. For such, small changes were made in various stages of the process.

The main changes include:

1. Substitution of rotary drums for DDwashers to wash pulp – medium consistency fiber line technology.
2. Reuse of the black liquor evaporation cooling towers purge and then utilized on the fiber dewatering machine and on the effluent plant filtering thickener (ETE).
3. Reuse of cooling water of condensate samples and sealing system of water pumps that feed the recovery boiler.
4. Reuse of reverse osmosis rejected material as part of the supply of industrial water for the mill.
5. Reuse of water and thermal energy produced in the drying machine digester.
6. Reuse of sealing water from vacuum pumps from the brown stock washing process.
7. Reduction in the consumption of potable water.

From the capturing of water and treatment of effluents, Lwarcel obtained annual savings of R\$ 450 thousand, of which R\$ 320 thousand just in capturing costs. With this project, the volume saved annually amounts to roughly 1,500,000 m³ (6 m³/tsa).



Lwarcel's waste treatment station. The adoption of practices aimed at using and reusing water sector by sector in a rational manner was the solution found to reduce the amount of water captured and effluent generated

The leap was significant: in 2002, said figure was at 48 m³/ton. Such reduction was only made possible by closing circuits, which has led to a progressive reduction in water consumption since 1997. Today, the unit is considered a global benchmark in this aspect by Integrated Pollution Prevention and Control (IPPC). The methodologies adopted to obtain this result mainly comprise the measures also adopted by Lwarcel. (*Read about the company's experience in the "Lwarcel: an example to be followed" box*) "The main answer to environmental issues by a sector as competitive as the pulp and paper consists in the ever perfect closing of production cycles in each unit or operation", says ecoefficiency specialist Prof. Dr. Celso Foelkel. This new perception of using water efficiently calls for measures that minimize water waste during the process and ensure end product quality. With this done, Foelkel believes that what needs to be done is to value economically, environmentally and socially industrial activities that represent a major consumption of natural resources in companies, one being water.

In addition to reducing water consumption by closing the circuit of mills, an attractive alternative to today's market is reuse water for industrial purposes – something that Santher adopted in its processes and approved the results obtained through this choice. (*Read about the company's experience in the "Santher: a vote of confidence for reuse water" box*)

However, only a few companies in the sector have adopted the option offered by Cetesb (*Read this month's Interview*). According to ABTCP's Technical Manager Afonso Moura, this option needs to be divulged. "As water becomes more and more expensive, companies will seek alternatives, and reuse water will be used more by companies in the sector. This is the trend", he said.

Charge for the use of water?

It's a fact that companies are already working to reduce their consumption, but in view of the success cases such as those mentioned in this *Cover Story*, it is clear that, while legislation does not become more rigorous, efforts towards more conscientious water consumption in production call for more commitment – and charging for the use of water, for example, would boost this commitment. In view of this reality, the Water Resources Master Plan, which already applied charging for the use of water and also pollutants disposed in rivers, it is possible to visualize a more promising future in the history of consumption reduction.

At present, we have 19 basins delimited in the country (all of the ones in the state of Rio de Janeiro, three in the state of São Paulo and another three in Minas Gerais). The first basin to begin charging was Paraíba do Sul, in 2003. Organized by ANA to start charging in the region of the water basin, a committee of basins will be formed (comprising government, civil society and private companies involved). In this case the agency will only be able to be responsible for the Union's rivers, that is, those that encompass more than one state. Otherwise, the state itself will be able to do so.

The measure will only be applied in basins that really present low water quality or quantity. As such, the idea is for companies to use the resource rationally and, at the same time, help make improvements. Since this is not a tax, but rather a law, all proceeds received by the ANA will be invested to maintain and protect the basin.

All this discussion about the conscious consumption of water resources is part of something much bigger: the fact that water is also energy. When combined with other measures – the so-called Clean Development Mechanisms (CDMs) –, the conscious consumption of water not only reduces a company's production costs, but also makes it efficient energy-wise, that is, with an environmentally sustainable system. Today, pulp and paper industries have made huge progress in their GHG emission inventories. Some companies have gone even further, having developed plans for recuperating their energy grids and apply CDMs according to their needs. Nonetheless, there is still a lot that can be done.

ABTCP currently develops an exclusive study about



energy efficiency with the National Council of Natural Resources, through the National Confederation of Industry (CNI). Based on this project, the *Energy Efficiency Guide* will be officially launched this month (May). Innovations and technologies for reducing water consumption are part of this program. "Soon, we will be able to orient companies as to their water footprint, how much they consume and where they can improve their management. There are a lot of companies that don't know what to do and others that are benchmarks in terms of good practices, but are not divulged. Therefore, we will do this exchange", said Moura. Designed by ABTCP, the measures are some of the opportunities for mitigating GHG coveted by the

Foelkel believes that in addition to "closing water faucets" in industries, it is necessary to place more value on ecoefficient management

OPPORTUNITIES FOR MITIGATING GREENHOUSE GASES

- Alter the energy grid to use less carbon intensive fuels.
- Optimize the burning of black liquor in the recovery boiler by improving the evaporation of black liquor (increase solid content) and production of steam with a higher pressure for generating more electricity.
- Reduce thermal losses in the process.
- Manage solid waste, by including reuse and composting.
- Burn methane in industrial landfill for non inert waste.
- Capture methane from the effluent treatment systems that utilize anaerobic system technology.
- Restructure the transport mode for raw materials and finished goods, by including the use of waterways.
- Greater use of biofuels by the forestry fleet.
- Adopt technologies that elevate the productivity of plantations.
- Generate energy from biomass to boiler.

Source: ABTCP – Where the pulp and paper sector stands in the context of implementing global efforts to stabilize the climate (May/2009).

“Considering that companies in the forestry sector are in compliance with their legal environmental obligations, it is important keep the small producers in mind”, says Toledo Piza

sector. (Read about the measures in the “Opportunities for mitigating Greenhouse Gases” box”)

More than environmental, this is a socio-economic matter. Who shares this point of view by ABTCP’s Technical Manager is Celso Foelkel. “We need to value ecoefficient management. Each stage in the process offers opportunities for gains, contrary to waster, which only produces losses and costs for mills. Employees today who don’t add value, because they simply treat waste and pollution, could become specialized personnel focused on development”, says the specialist. He even proposes a series of strategies to reduce water consumption and minimize waste, as presented in the box “Eleven strategies to reduce water consumption”.

SANTHER: A VOTE OF CONFIDENCE FOR REUSE WATER

In 2005, an agreement between Sabesp and Santher in the city of São Paulo gave rise to two key objectives: treat industrial effluents at Sabesp’s Waste Treatment Station (ETE) in Parque Novo Mundo, in view of its idle installed capacity and possibility of contributing to the state’s pollution cleanup program of the Tietê River. In turn, Santher would have the possibility of being supplied with reuse water at a more affordable cost than potable water.

“Even though at the time Santher had its own and adequate system for treating effluents, it agreed to take part in this project and contribute to the city of São Paulo”, said Santher’s Quality Manager João E. Souza. The result? Cost reduction and continuity of the plant in the region. “Due to the Penha unit’s location and current requirements, we would have to procure potable water at a much higher cost, which make the operation’s maintenance unfeasible”, he said.

The company participated in the initial investments of the project to build the first reuse water distribution line, which start-up occurred in 2008, offering said water for the entire production process, except boiler. According to the Quality Manager, over the last ten years Santher has been continuously investing to reduce water consumption in its industrial units, applying internal techniques for recovering this resource through the use of appropriate chemical agents, as well as employee awareness.



Perspectives of the triad

Water, earth and energy. A triad of resources fundamental to productive sectors that work closely with nature, such as pulp and paper, among others. These players of a key play about the footprint of sustainability currently remain in the backstage of the impasse in congress and amendments to the New Forestry Code until final voting of the document.

Until the closing of this edition of *O Papel magazine* (May 17, 2011), the New Forestry Code had not yet been voted, but the sector believes that some of the measures proposed, particularly those relating to small forestry producers and financial incentives necessary for the development of the activity, will be contemplated in the new text. However, according to the Pöyry consultant, unfortunately “the possible suspension of fines is not being extended to the other small producers – and not only who call themselves family farmers, as it does not benefit the small efficient farmer who many times is one developed by the forest base”.

Another point raised is about the Environmental regularization Plan. For Toledo Piza, it is first necessary to remember that small rural owners are weary about signing commitments – this being the reason why the benefit should be extended to larger areas, without limiting itself to rural land family ownership. “If the New Code encourages owners to use their land in a democratic manner, with planning and assessment of environmental impacts, it would be possible to arrive at the sustainability we preach so much. Land that can’t be touched leads to invasion and degradation. Rural property that’s conserved is that which the owner can use!” he said.

Lastly, he mentioned a slogan he learned from his father: “nature hates emptiness! Let’s cultivate our land”.

However, it’s a fact that the Office of the General Counsel to the Federal Government (AGU) will impact the sector of forestry investments regarding land acquisitions by foreigners.

Issues involving water and energy efficiency are headed to a more prosperous future. This year alone, according to ANA data, two more basins are expected to start charging for the use o water: Rio São Francisco and Rio Doce. Entities of the sector are eyeing this process.

Water footprint is already a fundamental item for measuring energy potential in companies and is part of an even broader footprint: sustainability. We can't say how long it will take to balance the development-

environmental protection ratio, but we can already say that the sector has done everything possible for day to come when we achieve a balance between industrial evolution and human development. ■

ELEVEN STRATEGIES TO REDUCE WATER CONSUMPTION

1. Reduce water consumption at the origin or source, exactly where each effluent is generated.
2. Reuse water as much as possible in all processes.
3. Identify water and effluent quality in each sector of the mill, in order to ensure a least contaminated effluent at the end of the process via controls per sector.
4. Segregate different types of waters and effluents.
5. Keep operations balanced and do not exceed the installed capacity of the mill and of each sector that generates effluents.
6. Remove or modify contaminants using "kidney"-type treatments, eliminating only the hazardous substances, so as to maintain a chance for reusing water in the process. Ex.: removal of chlorides and potassium from recovery boiler ashes and heat exchangers, among others.
7. Treat different effluents segregated in the process by different methods, preferably in the own generating areas using innovative methods. Ex.: wood yard waters – treat in emerging plants beds; pulp machine effluents – separate fibers for reuse and contaminants for disposal and return the water to the process; water purge from boilers – direct utilization; clean condensates and hot water – direct utilization; hydrocyclones discharges – removal of solids and reuse of water; wet gases from cooling towers – condensation and reuse of water, among others.
8. Close effluent lines of certain specific areas that do not need to generate effluents: digestion of wood; pulp washing and screening; chemical plant, recovery boiler, among others.
9. Recycle a fraction of the final treated effluent to be used in some process area or even have it sent to be mixed with the water collected from the river and sent to be purified for the mill.
10. Use other sources of water, like rain water, more moistened wood chip, etc.
11. Deal with environmental control agencies to restrict losses of pollutant in load (kg/adt) and not just in concentration (ppm).



Source: Celso Foelkel - *Critical Overview of Water Consumption in the Pulp and Paper Industry*