

EXPANSION OF BRAZIL'S PULP AND PAPER INDUSTRY (AND ITS LIMITS)

"I like pushing boundaries"

Lady Gaga, one of the more controversial pop singers of recent times.

GLOBAL CONSUMPTION OF PAPER AND PAPERBOARD

The same factors that have guided the global pulp and paper market's evolution in recent years, continues to guide the sector's development.

Global demand for paper and paperboard shall increase from 395 million tons in 2011 to roughly 496 million tons in 2025, corresponding to an annual growth rate of 1.6%.

Tissue paper, packaging paper and paperboard will be the product types to register the highest growth rates (average annualized growth rate of 2.4% - 3.1%). On the other hand, consumption of printing paper, containing

mechanical pulp, including newsprint, shall continue dropping. The increasing consumption trend seen in developing regions shall also continue or even increase. Greatest emphasis continues being in Asia, particularly China and India.

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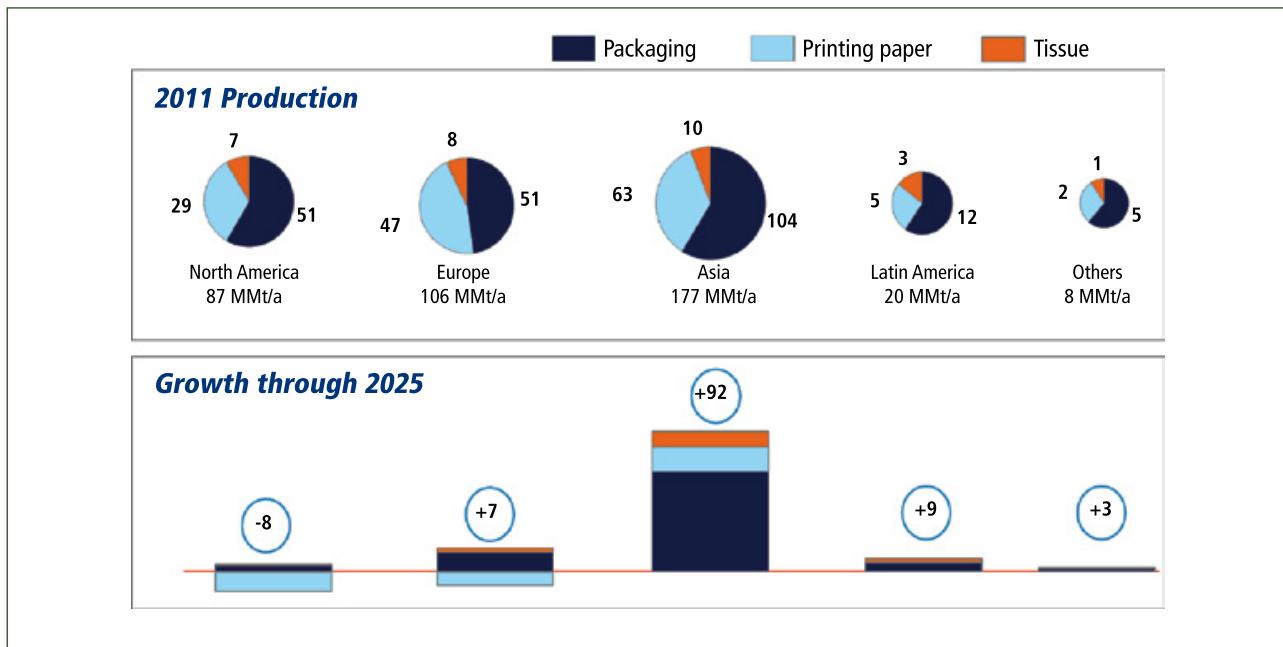


Figure 1. Paper and paperboard production through 2025 (million tons/year)

Figure 1 shows that of the roughly 100 million tons of incremental consumption in paper and paperboard, 92 million tons shall be produced in Asia.

Asia was responsible for 45% of global paper and paperboard production in 2011. What's impressive is the projection that the continent will be responsible for roughly 90% of the global production increase through 2025.

GLOBAL SUPPLY OF FIBER FOR PAPER AND PAPERBOARD PRODUCTION

Recycled paper (wastepaper) is, and will continue to be in the foreseeable near future, the main source of fibrous raw material for paper production. Global consumption of wastepaper shall grow roughly 2.3% a year in the long-term, reaching close to 230 million tons in 2025. Keeping up with the same trend for paper consumption,

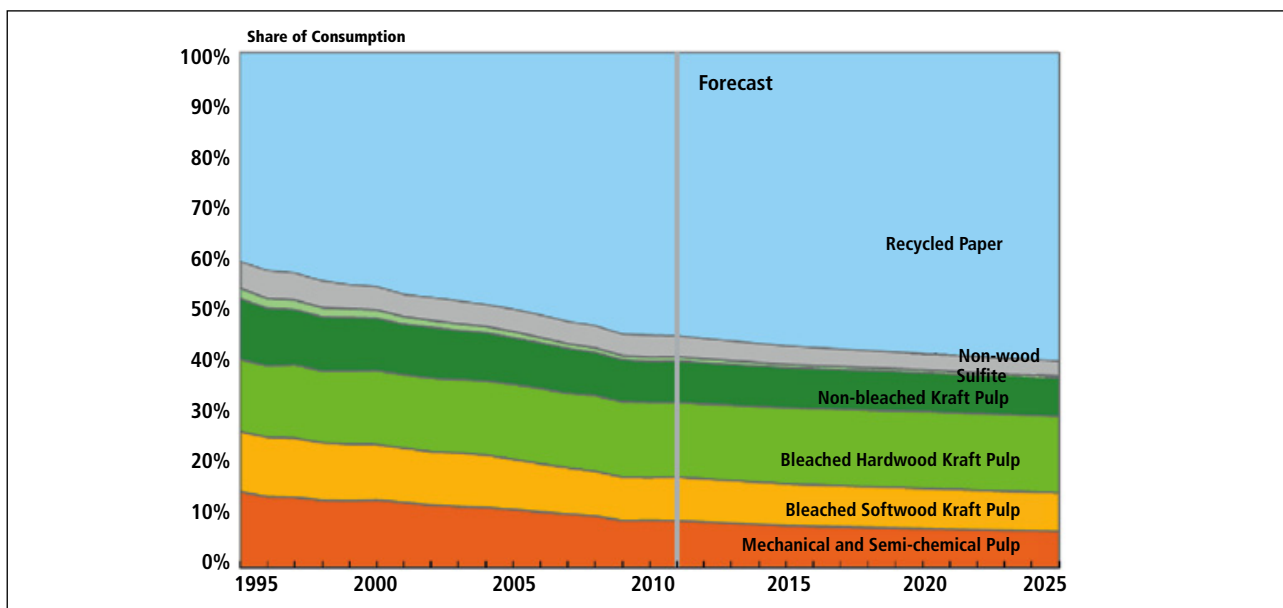


Figure 2. Fibrous raw material for paper worldwide (1990-2025)

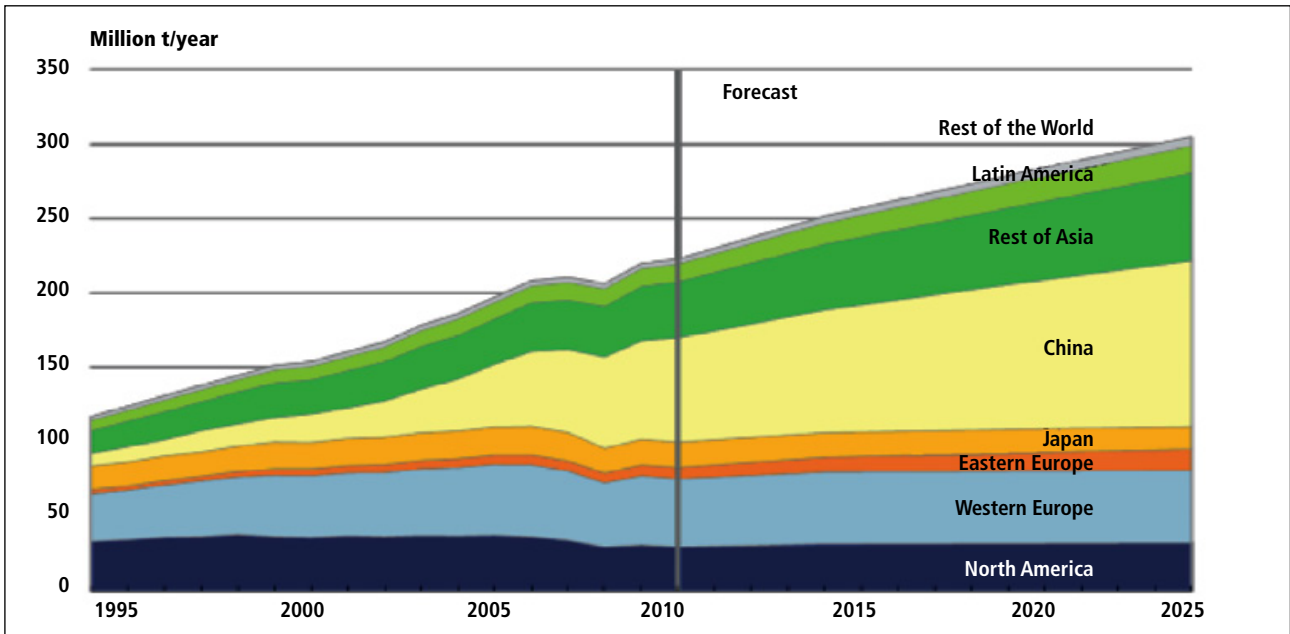


Figure 3. Recycled paper (wastepaper) consumption per region through 2025 – million tons/year

its greatest utilization shall occur in Asia. Bleached hardwood kraft pulp (BHKP), particularly of Eucalyptus, shall increase its share. **Figure 2** shows the global consumption of fibrous raw material, and **Figure 3**, wastepaper consumption per region.

The growth rate of recycled paper will be greater than the increase in paper consumption, however, it will tend to drop as the cost of collecting increases and the quality of wastepaper drops in developed nations. This trend is explained by the reduction in printing paper consumption mainly in North America and Europe,

due to the competition of electronic communication means. Reducing consumption, consequently reduces the quantity of better quality white wastepaper available used in the production of tissue and packaging paper. This phenomenon has not been offset by the increase in wastepaper collection in developing regions. See **Figure 4**.

Developing nations, particularly Asian, have relied heavily on the supply of wastepaper, a good part from developed countries, particularly from North America and Europe, which is currently becoming increasingly more scarce and of worse quality. This scarcity

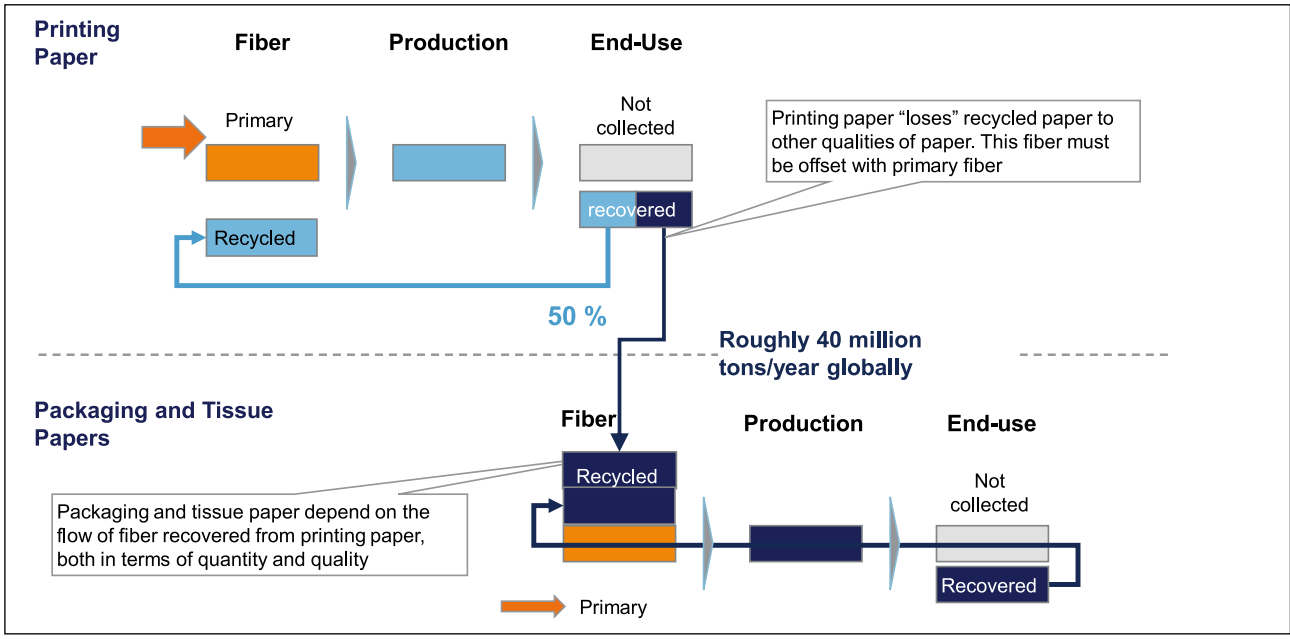


Figure 4. Printing paper scrap is an important source of fiber

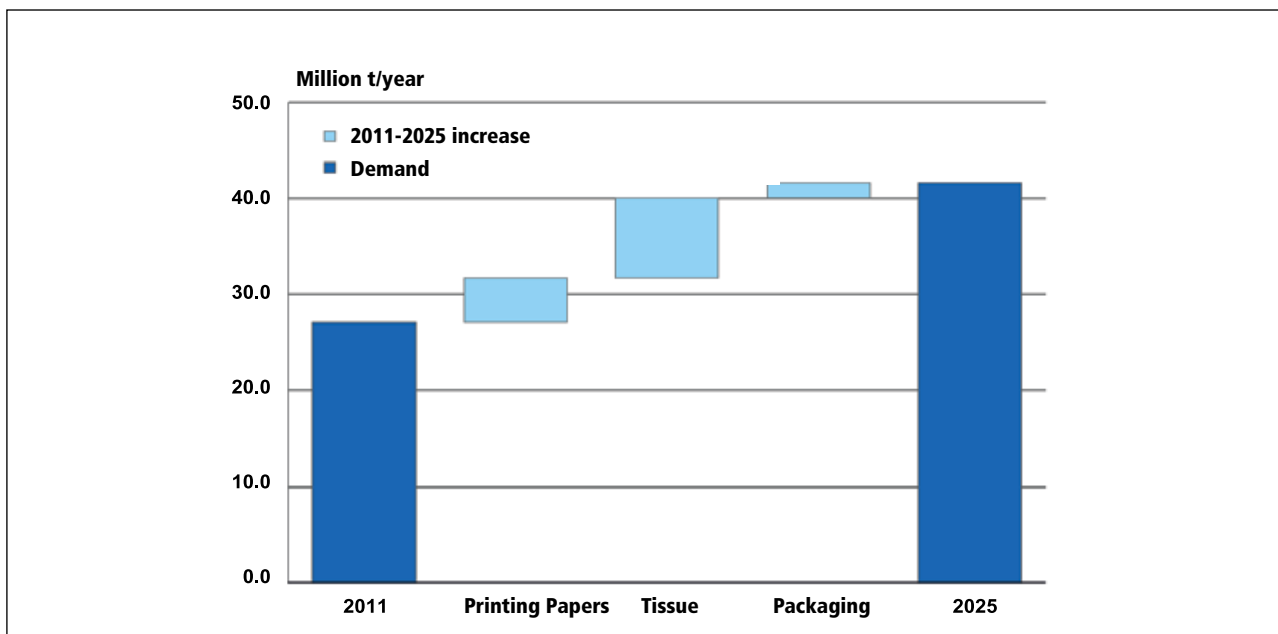


Figure 5. Main drivers of BHKP growth 2011-2025

leads to an increase in the use of primary fiber, with major relevance on the use of bleached eucalyptus kraft pulp (BEKP).

The driving forces that leverage the bleached hardwood kraft pulp market in terms of consumption and supply are linked to the following factors:

- reduction in the consumption of printing paper in developed nations, which leads to a reduction in market pulp consumption. However, this reduction is more than offset by the reduced availability of white wastepaper for consumption and export;
- closing down of non-wood-based pulp mills (examples: bamboo, straw, bagasse, bulrush, etc.);
- increase in the cost of wood stemming from planted forests (competition over the use of land for other purposes);
- start-up of new units located in competitive environments;
- favoring of hardwood market pulp for producing certain types of paper, especially tissue paper, for improving quality (See **Figure 5**);
- pulp earmarked for producing other products other than paper (fluff pulp, soluble cellulose, non-fabrics, etc.) has shown good market growth, which has led to the conversion of various pulp mills that were originally destined to produce pulp for paper.

Increase in the utilization of bleached hardwood kraft pulp (BHKP) - and more especially bleached eucalyptus kraft pulp (BEKP) - for producing tissue paper is the most important growth factor of those mentioned previously.

Until 2020, tissue consumption shall increase by roughly 6

million tons per year, however, the increase of BHKP consumption in its production will grow even more during the period, reaching roughly 7 million tons/year.

Part of this increase stems from the growth in tissue consumption, but a good part will be due to the "virginization" of fibrous raw material used, that is, substitution of recycled paper for primary fiber, a large part by market pulp.

Figure 5 shows the considerable growth in BHKP use for producing tissue paper

BRAZIL'S FOREST BASE INDUSTRY – CHALLENGES AND LIMITS

Brazil's forest base industry, fundamental for the country's economy, is facing serious challenges to maintain its competitiveness in both the short and medium term. And this is

FORESTRY SECTOR IN 2012

- Planted Area: ≈ 7 million hectares
- Gross Value of Production: R\$ 56.3 billion
- Taxes Paid: R\$ 7.6 billion (0.5% of Brazil)
- Jobs: 4.4 million (direct, indirect, income effect)
- Exports: US\$ 7.55 billion (3.1% of Brazil)
- Imports: US\$ 2.03 billion
- Trade Balance Surplus: US\$ 5.52 billion (28.4%)
- Pulp Production: 14 million tons/year
- Pulp Exports: 8.5 million tons/year

particularly true for the segments that focus on the external market.

Internally, the Brazilian economy has been on the skids these last two years, and macroeconomic fundamentals point to the return of inflation and anemic economic growth. Over the last 12 years, while average inflation in the country amounted to 6.6% a year, average weighted prices of the main production resources used to produce wood grew approximately 9.8% a year (INCAF Pöyry index - **Figure 6**). The civil construction industry, one of the biggest clients of the forest industry, practically stopped growing in 2012, and the non-integrated pig iron industry holds an idle capacity of approximately 60%, with no perspectives of reaction.

If we look at the history of cumulative capacity curves/production costs (**Figure 7**), we see that these curves have demonstrated a strong trend towards "horizontalization", that is, due to the fact that new capacities that have been implemented are located in competitive regions, especially in Latin America and Southeast Asia. In the long-term, Africa may become a relevant competitor, especially Eastern Africa due to its logistics advantage for exporting to Asia.

Although aware of this negative context and scenario, no solutions are seen in the short and medium term to leverage Brazil's economy in a sustainable manner, especially due to characteristics of its structural bottlenecks, the so-called Brazil Cost – deficient

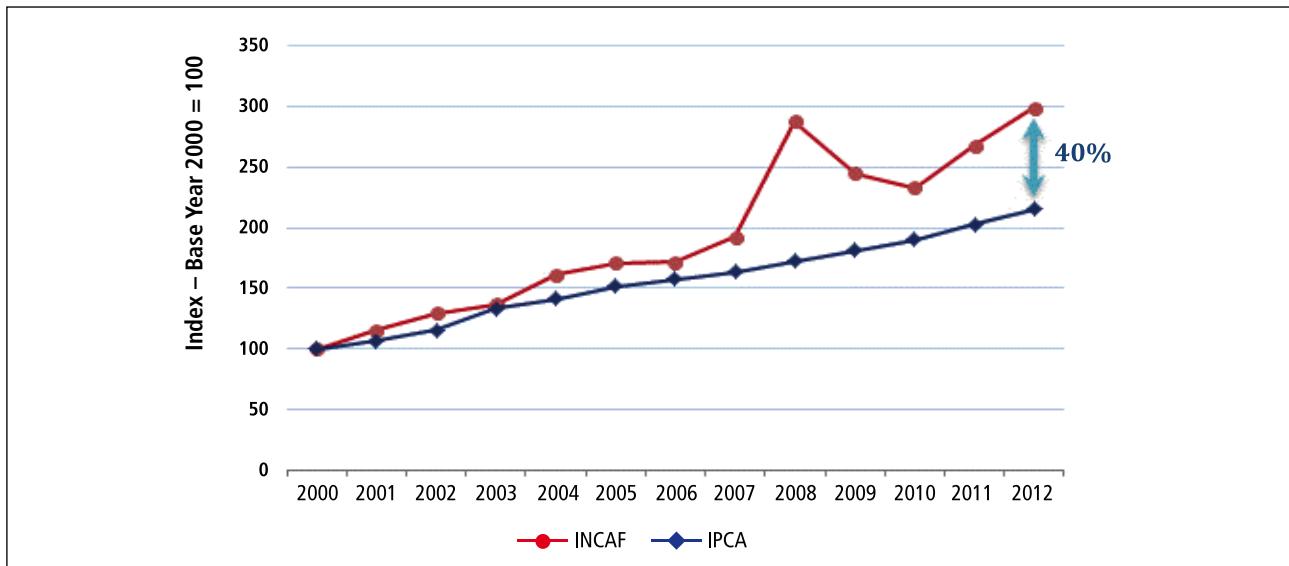


Figure 6. Increase in forestry costs in relation to IPCA (2000-2012)

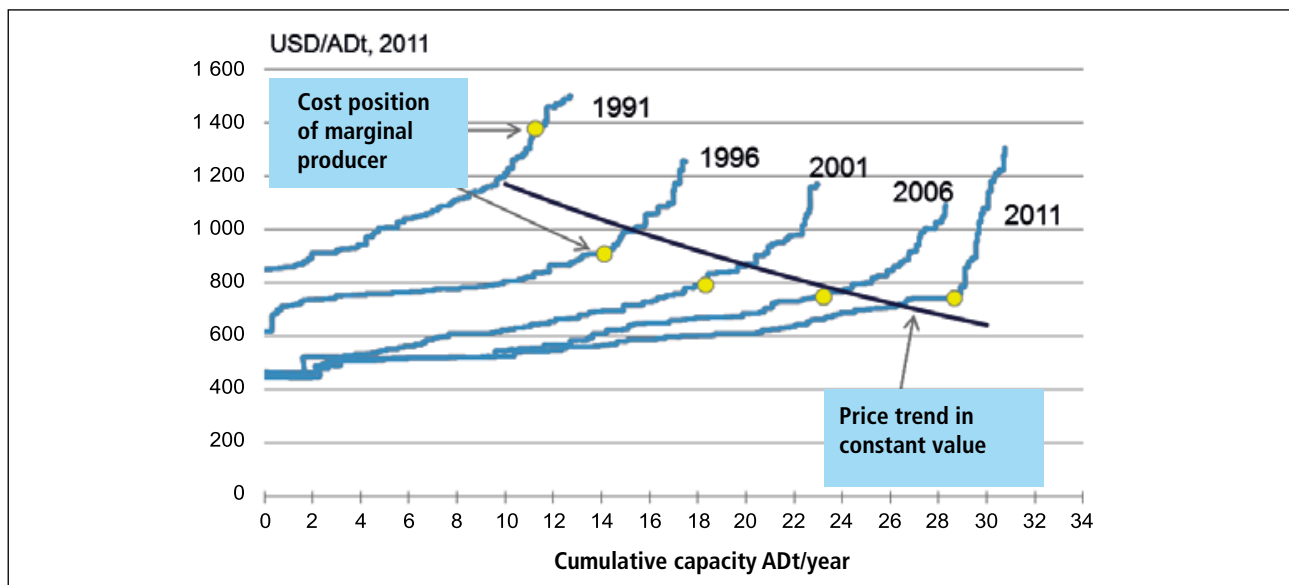


Figure 7. Development of the cost curve for BHKP market pulp since 1991

infrastructure, complex tax system, tax load that penalizes investment and production, excessive bureaucracy, limited and nonproductive workforce. Additionally, we have the so-called 'land law', which has significantly limited international investments in forestry.

The current external scenario and context are not that positive for our forest industry. Europe is facing a strong crisis, without perspectives of reacting in the short term; United States has prioritized its domestic market, in addition to focusing on exports as a strategy for coming out of the crisis; and China has been facing challenges to maintain its current growth rates.

Fortunately, for the cash cow of Brazilian exports in the sector, bleached hardwood kraft pulp (BHKP), China is striving to modify the nature of its Gross Domestic Product (GDP) growth, seeking to make it less dependent on the export and investment components, and favoring the development of its domestic market. This should favor tissue consumption, which as we saw, is the main driver of additional BHKP consumption. This fact can explain why the price of export pulp rose in the first semester of 2013, contrary to the majority of commodities.

In summary, Brazil's forest base industry, particularly which focuses on the external market, has been losing competitiveness, and new regions are beginning to surface as competitive suppliers. Therefore, in the short term, it is paramount that the industry work

hard to increase its competitiveness by reducing costs and increasing forest and industrial productivity (**Figure 8**). And in the medium-term, reduce the so-called Brazil Cost in order to provide sustainability to its short-term actions.

Within this context, the primarization of forestry operations appears as one of the opportunities for reducing production costs of wood and increase forest productivity.

Consulting projects already carried out by *Pöyry Silviconsult* in the wood and paper & pulp production sector identified the following positive impacts that may result from the primarization of forestry, to wit:

- sustainable reduction in operating costs between 5% and 15%;
- immediate gains in operational productivity;
- capturing of tax exemptions and tax gains;
- opportunity to invest in continuous improvements and technological innovations, with productivity gains in the medium-term;
- control over production process and quality; and
- definition of performance assessment metrics, reduction of legal risks and social conflicts.

Additionally, primarization also offers the opportunity to rethink the business model usually utilized by companies to supply the industry, analyzing the strategy, value proposal, resources and processes, especially in terms of management. ■

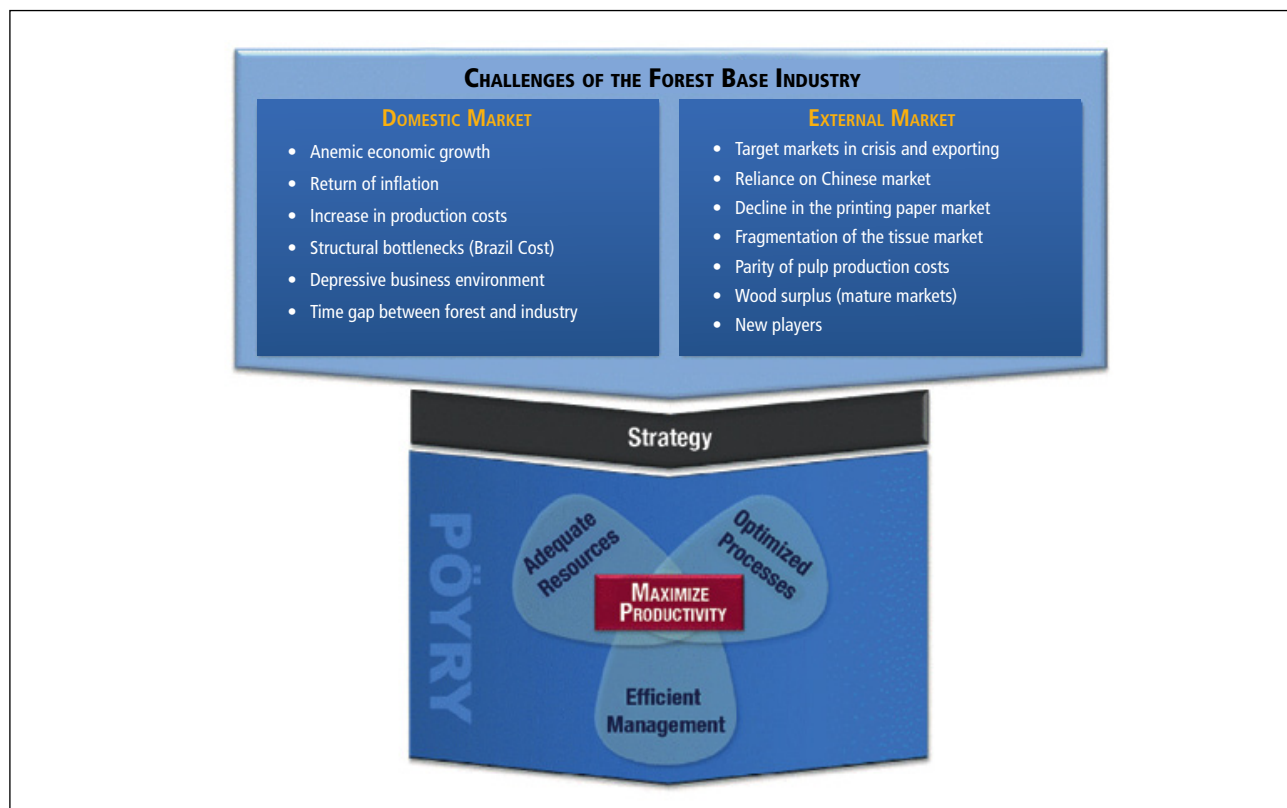


Figure 8. Forest base industry - strategy to face challenges