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Sector in Advanced Technology!

*Development does not exist without research.
The pulp and paper industry has perceived over the years the importance of this activity through professionals who seek evolution in day-to-day processes, as well as in big technological leaps that dictate the rhythm of the sector and ensure competitiveness in the global market*

By Rodrigo Moraes
Photos: ABTCP Image Bank/ Sergio Santorio

On one hand, businesses; on the other, universities and research institutes. The separation barriers between scientists and researchers in the pulp and paper area, as well as between who buys and who sells technology are continuously abridged each year during the international pulp and paper congress and exhibition promoted by ABTCP for the past 40 years in Brazil.

In a recent interview to O Estado de São Paulo newspaper, Carlos Henrique Brito Cruz, Fapesp's (State of São Paulo Research Foundation) Scientific Director stated that "Brazil worked with the wrong idea, for many years, that research conducted at universities could substitute the research carried out by companies". So much so that, today, added Mr. Cruz, one of the main restrictions towards innovation and technological development resides in the fact that companies possess a much reduced staff of scientists.

Proof of this is in the results of a survey conducted by Brito Cruz regarding the percentage of Brazilian scientists working at companies, "Only 16% of this professional category work for privately held companies, while in other countries this ratio can reach up to 80%." As such, the ABTCP event represents a technology integration initiative for the sector, where

creators and developers, salespeople and professionals interested in pulp and paper matters gather to discuss technological updates, innovations and to reflect on everything that relates to development, research and processes of an industry that invests and bets on the competitiveness and quality of the country's pulp!

This year, ABTCP-ZELLCHEMING – 40th International Pulp and Paper Congress and Exhibition –, promoted by ABTCP in partnership with its German sister entity, ZELLCHEMING, counted on the participation of roughly 800 congress participants and received more than 18 thousand visits during the four-day event. "An event like this is an opportunity to assess the future of technology and introduce trends and demands of the pulp and paper consumer market. And this is strategic to the sector's evolution", commented Clayton Campanhola, Director of the Brazilian Agency for Industrial Development (ABDI).

With regards to the technological evolution of Brazil's pulp & paper industry, supported and fostered by ABTCP, many important milestones have been achieved throughout the century. It is a continuous process in which the sector consolidates its position in the market and improves its competitiveness. "This is a century-old industry, capable of continuously renewing itself. So



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Brazil: Industrial companies expenditures in Research and Development (R&D), according to activity - 2005 in thousands of reais (R\$)

Select industry and services activities	Internal Research and Development activities	External acquisition of Research and Development services	TOTAL	%
Total	10.387.490	1.201.293	11.588.783	100
Mining industries	77.575	11.867	89.442	0,8
Processing industries	7.035.353	944.069	7.979.423	68,9
Production and assembly of automotive vehicles, trailers and truck bodies	1.692.553	207.498	1.900.051	16,4
Production of coke, refining of petroleum, preparation of nuclear fuels and production of ethanol	949.922	134.313	1.084.235	9,4
Production of chemical products	864.375	171.359	1.035.734	8,9
Production of other transportation equipments	774.171	60.038	834.209	7,2
Production of electronic material and communication devices and equipments	411.352	185.963	597.316	5,2
Production of electric machines, devices and materials	394.838	17.331	412.168	3,6
production of machinery and equipments	371.052	23.055	394.107	3,4
Production of food and beverage products	293.551	19.618	313.169	2,7
Production of rubber and plastic goods	194.573	19.834	214.407	1,9
Basic metallurgy	177.406	19.524	196.931	1,7
Production of office equipments and computer equipments	153.381	35.063	188.444	1,6
Production of hospital-medical instrumentation equipments, precision and optical instruments, equipments for industrial automation, chronometers and watches	170.331	5.986	176.318	1,5
Production of non-metallic mineral products	112.414	8.651	121.065	1
Production of furniture and various types of industries	86.903	9.127	96.030	0,8
Production of metal products	87.184	5.238	92.421	0,8
Production of pulp, paper and paper products	85.365	6.633	91.998	0,8
Preparation of leather and leather products, travel items and footwears	66.597	6.672	73.270	0,6
Production of textile products	55.601	3.077	58.678	0,5
Production of clothing items and accessories	34.436	1.269	35.705	0,3
Production of tobacco products	20.792	2.012	22.804	0,2
Production of wood products	19.785	644	20.429	0,2
Editing, printing and reproduction of recordings	18.769	1.164	19.934	0,2
Services	3.274.562	245.356	3.519.918	30,4
Research and development	2.207.068	29.628	2.236.696	19,3
IT activities and related services	620.056	37.057	657.113	5,7
Telecommunications	447.438	178.672	626.109	5,4

Source(s): Industrial Technological Innovation Research (Pintec) 2000 of the Brazilian Geography and Statistics Institute (IBGE).

Prepared by: General-Coordination of Indicators - ASCAV/SEXEC - Ministry of Science and Technology.

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much so that 10 years ago, a pulp mill would not have a capacity for more than 750 thousand tons/year. Today, people already talk about 1.4 million tons/year as a natural thing. In other words, this industry practically doubled its size", says Otávio Pontes, Vice-president of Stora Enso for Latin America.

For Augusto Milanez, a Research Specialist at Suzano Papel e Celulose, the market currently possesses a continuous need for technological advancements. "When competitiveness requires this from companies, technological leaps have to happen", believes the Suzano executive. Who shares this market vision is Érico Ebeling, Coordinator of ABTCP's Technical Paper Committee. "For example, if research perspectives point to a future of paper production without water, paradigms need to be broken regarding



Event "New Projects on Pulp: The Impact on Worldwide Market" – from left to right: Carlos Alberto Farinha e Silva (Pöyry Tecnologia); Horacio Lafer Piva (Bracelpa); Elizabeth de Carvalhaes (Bracelpa); Antonio Maciel Neto (Suzano Papel e Celulose); Nestor de Castro (Voith Paper); Alberto Mori (ABTCP); José Luciano Duarte Penido (Votorantim Celulose e Papel); Carlos Alberto Lira Aguiar (Aracruz); and Ming Chung Liu (Nine Dragons Paper (Holdings) Ltd.)

production concepts. And this truly refers to a major technological leap that has to be given."

From a strategic point of view, VCP's Technical Research Consul-

tant, Shinji Sato, comments that the main areas that were the focus of researchers can be broken down into three key areas: Forestry, Industrial/Pulp and Industrial/Paper.

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“Considering investments and results achieved, Brazil is one of the leaders in the area of technological and industrial development when the subject matter is eucalyptus and pulp from eucalyptus, respectively”, he said.

In terms of paper, the story is a bit different. “We are not on a par with other competing nations and, therefore, I believe we should focus our efforts to leverage this technological development, in order to seek innovations in the paper area”, believes Sato. But for such, Sato points out that the sector must do its homework, “since it would be no use to pursue innovation if you don’t first

prepare for this endeavor”.

In 2005, data provided by the Ministry of Science and Technology (MCT) about R&D, investments in the pulp, paper and paper product sector as a whole amounted to R\$ 92 million. Of this total, R\$ 85 million was earmarked for internal R&D activities, and the remaining R\$ 6.6 million to purchase external R&D. An insignificant amount when compared to investments made by other industry and service fields. The amount invested, for example, by the automotive industry totals roughly R\$ 1.7 billion (16.4% of the total invested in R&D), while the oil industry invested R\$ 949 million (9.4%).

However, from a broader perspective of results, the R&D process in the sector shall evolve at the same pace that the sector grows as a whole. “Every time a new process improvement is developed in terms of new control methods and new requirements, it represents another chance for automation to develop and create new growth opportunities for the market in terms of introducing new products and services”, added Ronaldo Ribeiro, Coordinator of ABTCP’s Technical Automation Committee.

Among other factors, the important thing is to acknowledge the structure under which research and

Research and Development (R&D) expenditures for selected countries, in relation to Gross Domestic Product (GDP), per capita and per researcher

Country	Year	Research & Development (P&D) Expenditures	Research and Development expenditures in relation to Gross Domestic Product (GDP)	Research and Development (R&D) expenditures per capita	Research and Development (R&D) expenditures per full-time researcher
		(millions of US\$ in current PPP)	percent	(US\$ in current PPP per inhabitant)	(US\$ in current PPP per researcher)
Germany	2003	57.065,30	2,55	691,5	215.567,70
Argentina	2003	1.825,70	0,41	49,6	66.711,00
Australia	2002	9.165,10	1,62	463,9	127.980,00
Brazil	2004	13.494,00	0,83	74,3	158.792,40
Canada	2003	18.709,20	1,94	591,5	166.120,0 ⁽⁴⁾
China	2003	84.618,30	1,31	65,6	98.152,00
Singapore	2003	2.239,00	2,13	520,6	11.815,00
Korea	2003	24.379,10	2,64	508,7	161.179,00
Spain	2003	11.031,60	1,1	270,3	119.230,00
USA	2003	284.584,30	2,6	977,7	225.640,0 ⁽²⁾
France	2003	37.514,10	2,19	609,6	201.234,0 ⁽⁴⁾
Israel	2003	6.611,20	4,93	986,7	...
Italy	2003	17.698,60	1,16	305,2	248.429,00
Japan	2003	114.009,10	3,15	893,4	168.819,00
Mexico	2001	3.623,70	0,39	36,2	165.624,0 ⁽²⁾
Portugal	2002	1.827,10	0,94	176,2	103.080,0 ⁽³⁾
United Kingdom	2003	33.579,10	1,89	563,8	212.981,0 ⁽¹⁾
Russia	2003	16.926,40	1,29	118	34.722,00

Source(s): Organisation for Economic Cooperation and Development, Main Science and Technology Indicators, 2005/1 and Brasil: Federal Government Integrated Financial Administration System (Siafi). Special study carried out by the Federal Data Processing Service (Serpro) and Industrial Technological Innovation Research (Pintec) of the Brazilian Geography and Statistics Institute (IBGE) – 2000 and 2003.

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Note(s): 1) refers to the 1998; 2) refers to 1999; 3) refers to 2001 and 4) refers to 2002.

PPP – Purchasing Power Parity.

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development is supported in the pulp and paper industry, so that it becomes increasingly possible to work in an integrated network of mutual collaboration. This is how innovation can be achieved with less risk to be incurred in terms of innovation cost. "Risks need to be calculated. If nobody takes on risk in an attempt to create something new, advancements could take a much longer time to take place", said Carlos Renato Trecenti, Director at Lwarcel Celulose e Papel.

SCIENTIFIC PRODUCTION

And how is scientific production doing in Brazil? This question was very timely, as an element of reflection among participants of this year's ABTCP congress. Despite deficiencies and flaws being pointed out in Brazil's "development" system, it is curious to imagine that this same country, incapable of bringing technological innovation in a satisfactory manner into its own industry, stands out for one aspect in Latin America: Scientific Production!

In 2006, for example, 16,872 technical articles by Brazilians were published in international scientific publications indexed by the Institute for Scientific Information (ISI). Such figure accounts for 48.83% of the 34,552 articles published in all of Latin America! When comparing with the rest of the world our evolution in terms of publications of this sort, Brazil has published since 1981 almost nine times more in the period, while the average growth worldwide of publications, under the same circumstances, only doubled. (See table with data).

Hence the importance of the work carried out by O Papel Magazine in the pulp and paper industry towards stimulating the country's scientific production. Even though it is not yet indexed by the Institute

Number of articles from Brazil, Latin America and the World published in international scientific publications indexed by the Institute for Scientific Information (ISI), 1981-2006

Year	Brazil	Latin America	World	% of Brazil in relation to Latin America	% of Brazil in relation to the World
1981	1.884	5.641	432.059	33,4	0,44
1982	2.179	6.197	443.150	35,16	0,49
1983	2.196	6.456	452.097	34,01	0,49
1984	2.274	6.500	452.692	34,98	0,5
1985	2.300	6.905	484.997	33,31	0,47
1986	2.489	7.446	503.118	33,43	0,49
1987	2.528	7.801	502.215	32,41	0,5
1988	2.759	8.042	521.949	34,31	0,53
1989	3.083	8.824	542.965	34,94	0,57
1990	3.539	9.604	558.087	36,85	0,63
1991	3.874	10.073	569.835	38,46	0,68
1992	4.555	11.356	607.311	40,11	0,75
1993	4.403	11.560	600.725	38,09	0,73
1994	4.791	12.657	635.836	37,85	0,75
1995	5.410	14.240	665.924	37,99	0,81
1996	5.957	15.662	676.324	38,03	0,88
1997	6.640	17.426	681.175	38,1	0,97
1998	7.974	19.401	707.299	41,1	1,13
1999	9.015	21.634	721.370	41,67	1,25
2000	9.563	22.706	718.466	42,12	1,33
2001	10.606	24.604	737.350	43,11	1,44
2002	11.347	25.883	733.817	43,84	1,55
2003	12.672	28.659	797.933	44,22	1,59
2004	13.316	28.574	767.648	46,6	1,73
2005	15.796	33.831	883.508	46,69	1,79
2006	16.872	34.552	879.011	48,83	1,92

Source(s): Institute for Scientific Information (ISI). National Science Indicators (NSI).

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for Scientific Information (ISI), this ABTCP publication has pursued an approximation with such entities and complied with the requirements set forth for becoming indexed, so that in the near future, it can also become a relevant scientific publication worldwide, valuing the authors of technical articles pertaining to the pulp and paper sector.

One of the most successful partnerships at encouraging this process has occurred among technicians from companies and scientists at universities. The result is the best of

scientific research applied in companies. "The university develops a given process or product, and the company truly interested in breaking these barriers and pursue new technologies will certainly find innovation at the right address. We, from universities, do not wish to market a product, but rather, develop technologies for the industry. Which makes us very proud", said, Rubens Chaves de Oliveira, Head Professor of the Pulp and Paper Course at the Federal University of Viçosa (UFV), who also attended the event.