BRAZILIAN INDUSTRY ADVANCES TOWARDS SUSTAINABLE DEVELOPMENT

SUMMARY OF THE SECTORAL FASCICLES

INDUSTRY MEETING FOR SUSTAINABILITY

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SUMMARY

CNI PRESENTATION

The sustainable development agenda bears great challenges and many opportunities for Brazil. The country has a diversified and sophisticated industry and accounts with a combination of natural resources that puts it in a privileged position to deal with the tasks and seize opportunities arising from the need to be more sustainable. The challenges to society are also challenges for the industrial sector, which is totally engaged in joint efforts to find solutions.

The Rio+20 provides a broad reflection about the Brazilian strategy to deal with the themes of this agenda. The topics "Green Economy in the context of sustainable development and poverty eradication" and "Institutional framework for sustainable development" are at the center of the discussions in Rio de Janeiro. The Brazilian National Confederation of Industry (CNI), which is the major representative of the Brazilian industrial sector, presents a set of ideas about how to develop Brazil respecting the environment.

The creation of conditions for increasing the competitiveness of industry, by increasing the efficient use of resources and skills in relation to all stakeholders in the business, is our primary goal. The continuous compatibility of this goal with the requirements of sustainability is our challenge today and tomorrow.

The efforts should be focused on keeping alive the spirit of negotiation and cooperation. The CNI hopes that we reach the definition of concepts and clear mechanisms that promote the balance of the three classic dimensions of sustainable development – economic growth, poverty eradication and environmental conservation – considering the cultural dimension. It is important to seek balance among them, without sacrificing any one over the others.

The changes required by a standard of sustainable development depend on public and private investments, especially in innovation and cleaner production technologies, and innovative methods in business management. The Brazilian industry is already doing its part by investing in new technologies and improving its production

processes, seeking to combine productivity gains with employment generation and the efficient use of resources. The second part of this document is broad in concrete examples of such advances.

To deepen its contribution to sustainable development, the industry must rely on regulatory and institutional environments favorable to productive changes and to investments required. This document presents a set of domestic and international requirements for the transition to more sustainable patterns of production and consumption. The Brazilian industry demonstrates its commitment to participate in the concretion of such conditions, because it understands that sustainability is only possible if based on a close dialogue among governments, business and society.

The paper T**he Brazilian Industry on the Way to Sustainability** is the result of a comprehensive process of articulation and reflection of the CNI along with state federations of industry and industry associations to submit to the Brazilian society, government and international players its updated view on the sustainable development agenda. In addition to the actions of communication, the documents prepared in partnership with the 16 industrial sectors and the debates that will take place in Rio de Janeiro are the national industry recognition that sustainability is at the center of the competitiveness strategy of the country.

The CNI presents in this document, a set of positions and commitments of the Industry System in the field of sustainability. CNI will promote the theme of sustainability in its representation networks and the engagement in partnership with governments and civil society organizations, in building a political-institutional environment that creates the conditions for the incorporation of sustainability requirements in the Brazilian economy.

Thus, it contributes to the consolidation of a productive and competitive economy which fosters the development respecting the environment.

Robson Braga de Andrade
President of the National Confederation of Industry – Brazil

1 INTRODUCTION

For the Brazilian industry, there is no incompatibility between the transition to a sustainable economy, in environmental and social terms, and the economic growth and improvement of competitiveness objectives.

Over the past 20 years, the Brazilian industry has taken important steps incorporating sustainable development objectives and social responsibility into their business strategies, despite the international situation obstacles and the domestic environment not always favorable.

The advancement of Brazilian industry on the agenda issues of Rio+20 is a recognition of the different industrial sectors that sustainability will become a predominant factor for business success. It is not a question of dealing with sustainability as a speech and expressions of good intentions, but to have it present in the development of business plans and as a key variable to the companies competitiveness strategies.

To combine economic development with social inclusion and sustainable use of the abundant natural resources in the country is a reality for many sectors of the Brazilian industry, which developed under the aegis of a rigorous social and environmental legislation and that, often, have taken initiatives that go beyond regulatory rules in these areas.

The second part of the National Document of CNI: the Brazilian industry facing the Rio+20, brings the synthesis of the advances of the industrial sector in the sustainability field. This broad and rich set of information goes towards the practice of presentation of industrial sector success stories, bringing data and information aggregated by sector.

2 RECENT ADVANCES OF BRAZILIAN INDUSTRY

From an unprecedented mobilization of 16 industrial associations, bringing together some of the most representative sectors of the Brazilian industry, documents were prepared on obstacles, challenges, opportunities and advances related to sustainability agenda of each sector. The sectoral diagnostics and the advances recorded in different industrial segments are not homogeneous – and couldn´t be, given the intersectoral and interregional diversity of Brazilian industry– but in all documents there are cases and experiences that can serve as a reference to the industry as a whole.

The industrial sector's advances towards sustainability mobilize technological and management innovations built into the production process, in addition to self-regulation and certification initiatives. In the context of corporate governance, such advances rely on actions for the continuous improvement of quality of life levels, professional qualification, workers ' health and safety.

BRAZILIAN INDUSTRY INITIATIVES ON THE PATH OF SUSTAINABILITY: HIGHLIGHTS

- Diversification of renewable energy sources – about 40% split between biomass and hydropower – and innovation in the use of new energy sources-such as biofuels and wind energy;
- Investments in energy efficiency and economic use of water;
- Rationalization of fossil energy and use of alternative energy sources, through the energy recovery of waste and production processes by products;
- Drastic reduction in solid waste generation and waste, as well as increasing the rate of recycling of materials and products;
- Support to the sustainable extraction of raw materials to the industry through a variety of qualification mechanisms and suppliers' commitment;
- Replacement of inputs with impacts on the environment by new materials;
- Expressive reduction of emissions of GHG associated with products and processes;
- Use of raw materials from planted forests as input in the production chains of various industries.

Energy

The best use of the Brazilian energy matrix advantages, increasing the use of renewable sources and with lower intensity of greenhouse gas emissions, and the investments in energy efficiency have been goals pursued by the national industry.

The rationalization of energy, from sectors that use fossil fuels, has been a constant concern in the Brazilian industry and the results are encouraging. Chemical industries represented by the Brazilian Chemical Industry Association – Abiquim, for example, in the period of 2001-2010, despite the absolute consumption of thermal energy have remained stable, there was a major change in the mix of inputs used, with a 65% reduction in fuel oil consumption over the period. These have been replaced by natural gas and renewable fuels, keeping the total energy consumption virtually constant. The stable consumption in absolute terms meant a huge energy saving effort, since, in the period from 2001 to 2010, there was an increase of 62% in the industrial sector production.

Alternative energies

The Brazilian industry has developed relevant initiatives in the use of alternative energy sources, tailored to its needs and compatible with sustainability objectives.

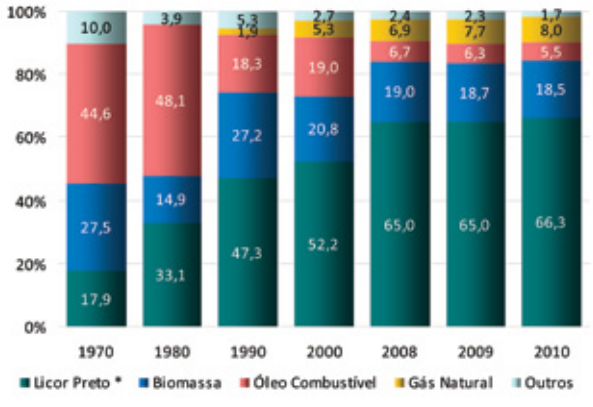
SUGAR CANE BAGASSE: IMPORTANT SOURCE FOR THE FOOD INDUSTRY

The bagasse of sugar cane is a source of energy that grows in importance for the Brazilian industry. According to the Brazilian Association of Industry – ABIA – the National Energy Balance (BEN, 2011) relating to 2010 shows, for example, that the food industry has high levels of use (75.2% of total) of the energy generated from the sugar cane bagasse. The firewood accounts for 9.6% of industry's energy matrix and electricity accounts for 9.3% of consumption. Other sources, such as natural gas, fuel oil and diesel account for the remaining 5.6%. Therefore, approximately 90% of the food industry's energy matrix is renewable. The location of many food industries, near to agroforestry bases, facilitates this integration of alternatives biomass to industry's energy matrix.

COGENERATION: ADVANCES IN PULP AND PAPER SECTOR

In the paper and pulp sector, according to the Brazilian Pulp and Paper Association – Bracelpa –, the use of processes byproducts in boilers of the plants, added to cogeneration, is one of the main actions to reduce carbon emissions. In this sector, the use of black liquor stands out, a wood waste resulting from the extraction of cellulose, which is an alternative and clean fuel.

CHART 1. ENERGY MIX OF PULP AND PAPER INDUSTRY – 1970-2010



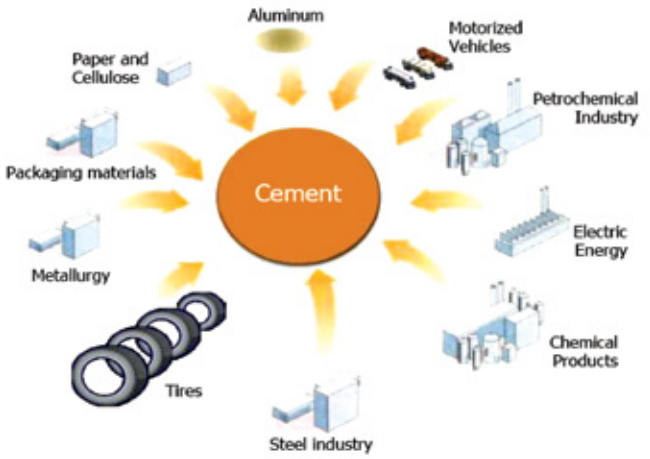
*Subproduto (Biomassa).

Source: Balanço Energético Nacional.

CO-PROCESSING: ALTERNATIVE FUELS IN THE CEMENT INDUSTRY

A relevant example in this area is provided by the cement industry, as shown in the fascicle prepared by the Brazilian Association of Cement Portland – ABCP. Wastes are used through co-processing – tires, biomass and industrial waste – as alternative fuels in cement kilns, which besides having the CO_2 emission factor lower than traditional fuels, present themselves as an environmentally sound solution to energy recovery of waste.

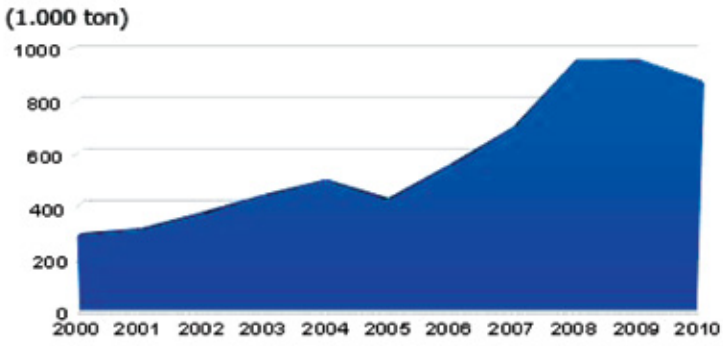
CHART 2. COPROCESSING



Source: ABCP Sectoral Fascicles.

Currently, there are in Brazil 37 licensed plants to perform coprocessing. In 2010, there were 870 thousand tons of coprocessing waste from various industrial sectors, with 198 thousand as a substitute for raw materials and 672 thousand tons as energy supplies.

CHART 3. COPROCESSING EVOLUTION (1.000 TON)

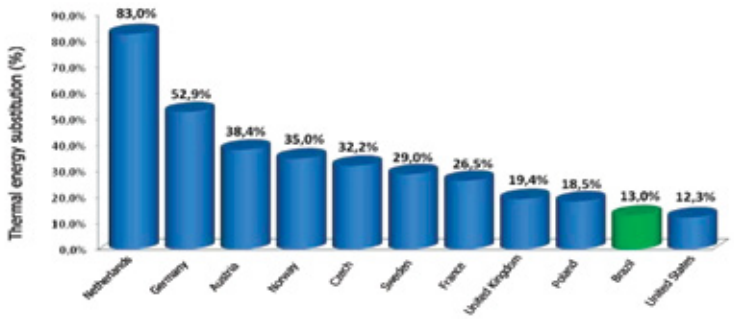


Source: ABCP–2011.

In 2010, it went through coprocessing in cement kilns 183,500 tons of tires, equivalent to approximately 36 million units of tires for passengers cars. In addition to being a solution for the management of this waste, the coprocessing replaces conventional fuels.

The use of waste in cement kilns grew considerably from year 2000. However, comparing the current level of waste use in Brazil with the observed in other countries, it still exists in the country, great potential for an increase in energy use of waste. As seen in the chart below, the energy replacement index was 83% in Netherlands and 53% in Germany, in 2007, while in Brazil was only around 13% in 2010.

CHART 4. THERMAL ENERGY SUBSTITUTION RATES: INTERNATIONAL COMPARISON



Source: Sustainability Report – Cement Association of Canada – 2010 – Data from 2007.

Water resources

The concern with efficiency in water use by industry is occupying a prominent place in the competitive strategies of domestic companies, especially those that use more intensively the resource. –There are already cases where the concern with water use is widespread in supply chains, especially in sectors with greater participation in external markets or in those who have operations in areas of water scarcity. From these chains, and also depending on the growth of water shortages, the same concern starts to radiate to the Brazilian industry as a whole.

Recycling and recirculation: steel and mining initiatives

Currently, the Brazilian steel industry has high levels of water recirculation, over 96%, according to the Brazil Steel Institute – IABR. This increased efficiency resulted in significant reduction of capitation in water bodies and sewage discharge. The companies have effluent and water treatment stations permitting its reusing in the original production unit or its allocation in another unit.

The ventures in mining sector use abundantly surface and underground water resources in its production processes, and are often located in areas of springs and water recharge. The relationship between the quantity of new water in the process and recycling/recirculation varies according to the type of extraction and productive processes, being the ideal situation the one in which the discharge is zero, i.e. the recycling process optimization allows the reuse of all water already used in a closed circuit.

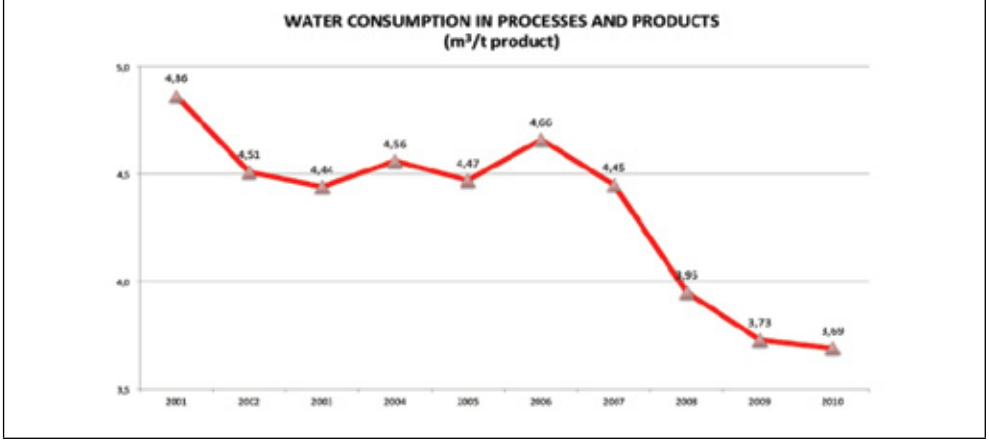
According to the Brazilian Mining Institute – Ibram, water recycling or recirculation in the mining plants of several segments is never less than 50%, with cases reaching 90% – iron mining, gold and coal, for example. In the case of industrial quartz sand, dolomite and limestone, this percentage reaches 95%. The data comes from Inthemine 2011, and refer to the activity of the mining sector in Brazil.

There is a growing concern in mining with the quantity and quality of water, because the resource impacts the production cost and the efficiency of production processes. Thus, the recycled water in concentration plants, originating from the tailings ponds, thickeners and filtering operations, among other steps in ore processing, contributes to reduce consumption of new water in the process. The importance of water for mining can be evidenced by the fact the Ibram has structured a specific program aimed at water resources management.

Water savings in chemical, food and automotive industries

The case of the chemical industry, presented by the Brazilian Chemical Industry Association – Abiquim, also deserves attention. As in the case of energy, maintaining a stable absolute consumption in a period characterized by increased production demonstrates the great effort to save water that chemical industry companies have made in the last ten years. As shown in the following figure, the stability in the absolute value of consumption meant that the intensity of consumption in processes and products, measured in m^3/ton of product, has fallen 34% between 2001 and 2010. The main origins of this water resources economy in the industry can be found in the recycling of liquid effluents from some water-intensive production units in waste reduction and steam economy.

CHART 5. WATER CONSUMPTION IN THE CHEMICAL INDUSTRY IN PROCESSES AND PRODUCTS

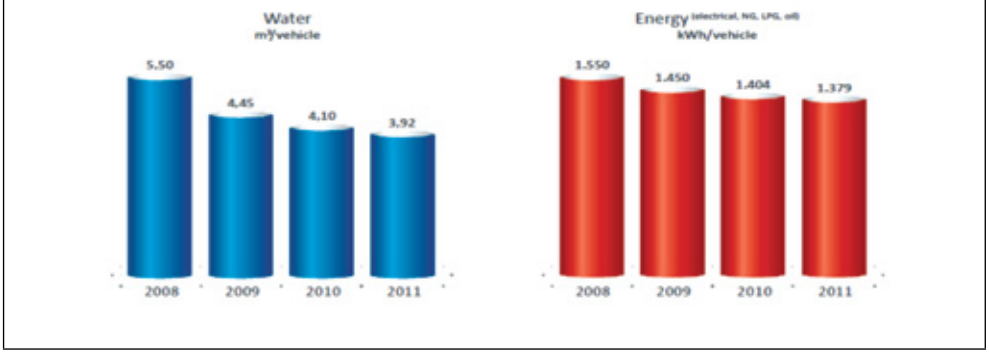


Source: Abiquim 2011.

There are other important examples, in terms of increased efficiency in the use of water resources, such as the reduction in water use achieved by the country's biggest drinks brand within their production process. According to ABIA, the relation between liter of water used and liter of beer produced in 2004 fell from 4.37 in 2004 to 3.9 in 2009, being 3.5 to 2012 the goal of the largest producer in the country. The country´s largest soft drinks brand announced in 2010 the target of reaching neutrality in water until 2020, i.e. achieve the relation of one liter of water to one liter of soft drink.

As shown in the following chart, the National Association of Motor Vehicles Manufacturers – Anfavea also reports significant reduction of water consumption in its industrial processes: while in 2008 were used 5.5 m^3 to produce a vehicle in 2011, this number dropped to 3.92 m^3, registering in the short period of three years, a reduction of approximately 30%.

CHART 6. BRAZILIAN AUTOMOTIVE INDUSTRY | USE OF INPUT



Source: Anfavea.

Another interesting example is the debate on the rational use of water promoted under the Brazilian Program of Quality and Productivity – PBQP. The sectoral plans of ceramics and metals quality, for example, taking into account the individual potential of water savings, made that manufacturers develop equipment that allow reducing consumption by up to 60% per flush, as in the case of some toilets models with bounding box.

Industry network of water resources

In addition to adopt, within their firms, practices and programs for the sustainable use of water, the industrial sector – through the Industry Network of Water Resources, established in 2009, formed by 27 states' federations of industry and sectoral associations coordinated by CNI – defines its positions in public policies and disseminates good practices of efficient use of water. The industry also participates actively in the implementation of the National Water Resources Policy –PNRH, with representation in all their boards – National and States Council of Water Resources and River Basin Committees. On the other hand, incentive mechanisms for the efficient use of water in the industry are being developed, through a partnership signed in March 2012 between CNI, as coordinator of the Industry Network of Water Resources, and the National Agency of Water. Among the initiatives, stands out the creation of a strand of Cleaner Production Program[1] focused specifically on the promotion of the water use efficiency.

Biodiversity

Some success cases, especially in the segments of pharmaceuticals, perfumery, cosmetics and food, among others, have given visibility to the growth potential of Brazilian biodiversity use in business. With the aim of promoting an increasing engagement of the industry in the theme of biodiversity, CNI has created, in 2011, the Biodiversity Network, composed of regional industry federations representatives, industrial sectors and several enterprises.

Through the network, the sector actively participates in the discussion of public policies related to the biodiversity theme and also monitors the implementation of the Convention on Biological Diversity in Brazil. In addition, the network seeks to identify opportunities related to business and biodiversity, as well as promote training actions to the industrial sector.

In 2012, CNI became the first Executive Secretary of the Brazilian Business and Biodiversity Initiative. This initiative aims at the engagement of the productive sector in the implementation of the CBD objectives, in accordance with decision XVII of COP 8, held in 2006, and the promotion of best practices in biodiversity.

1 The Cleaner Production Program of Domestic Industry will be presented in detail in this document.

Carnauba wax industry (Caatinga)

An effective example comes from *carnaubeira*, a palm tree that inhabits the banks of rivers in the northeastern region of Brazil and that produces a wax of high social and economic value. The *carnaubeira* forests, located along watercourses, protect it from the erosion process.

The wax production activity from *carnauba* represents sustainable extractive activity. This wax is used in the manufacture of various products in the industry of polishing, chemical, waterproofing products, automotive components, pharmaceutical, information technology, among others. In Ceará, the activity generates more than 100 thousand jobs and extracting, refining and marketing of *carnauba* wax are the main economic activities of this state, according to local Industry System representation.

The various examples in the food sector

The food industry, gathered together in ABIA, presents the case of fish, being sardines and tuna the most common species in the table, which may originate from Brazilian waters. In both cases, the national brands possess the Dolphin Safe certification, which ensures the selective fishing of tuna without reaching the dolphins, and the Friends of the Sea certification, which follows the criteria of the Food and Agriculture Organization of the United Nations (FAO) for the preservation of marine biodiversity.

Formal industries of food and beverage sector that use raw materials – whether in the extractive model or the crops model – usually develop social and environmental projects with local communities, so as to ensure the preservation of biodiversity and the livelihood of families. It is the case of the community of Maués, a municipality about 250 kilometers from Manaus (Amazonas), from whence comes most of the Brazilian *guaraná* crop. Companies already have distributed more than half a million seedlings of the plant, free of charge, to stimulate the renewal and enhancement of productive area. Technical assistance for a quality production is also provided.

Professional training for the sustainable extraction of raw materials, stimulus to the organization and certification of local producers, in addition to financing to investments in technology, according to ABIA, also are practices of the food and beverage industries which use the Brazilian biodiversity in their products.

The pharmaceutical industry, for example, is a major user of genetic resources, along with biotechnology, seed producers, cosmetics and food and beverage industries. Each sector is an important part of a single market, with differentiated research and development processes and different demands for access to genetic resources.

There is no consistent data on the use and value of genetic resources for most sectors, but it is suggested that between 25% and 50% of the global sales value of the pharmaceutical industry are related to the use of genetic resources. Based on market value of the pharmaceutical sector – according to the IMS (2009), about $ 825 billion – these rates show that the value of genetic resources used in medicine should be between $ 206 and 412 billion.

Certification initiatives and identifying opportunities

Biodiversity has several implications on the business environment, risks and opportunities, depending on the natural factors and the nature of these businesses. In Brazil, as an illustration that trend of biodiversity begins to be incorporated by companies, was created the LIFE Certification (Lasting Initiative for Earth), which is voluntary and establish corporate commitments towards biodiversity conservation. Some economic sectors already perceive opportunities and recognize the importance of going beyond the statutory restrictions.

One of the key initiatives at a global level to quantify economically sustainable factors is "The economics of ecosystems and biodiversity" (TEEB), a global study initiated in 2007 by the G8 along with the five major developing economies.

The TEEB report aims to show that conserve biodiversity is cheaper than devastating it. The key point is that nature does not charge for services rendered (erosion control or purification of air, for example) and, therefore, companies and people give as certain the continuity and abundance of these resources. This is the economic invisibility of nature. When one puts a price on a product that has no price, the market helps to control the conservation. As a result, opportunities arise such as, for example, in the cosmetics industry, which derives from the nature the raw material, but preserves it to continue relying on the resource.

Currently, Brazil is making a specific study of the same nature. The goal of TEEB Brazil is "to identify and emphasize the economic benefits from biodiversity and ecosystem services in Brazil, evaluating the rising costs of their loss, as well as the opportunities generated by its conservation and sustainable use". It is planned the preparation of a series of Brazilian documents, one geared toward the business sector, which has the support of CNI. This report will provide an assessment of the risks and costs of biodiversity loss and of the ecosystems degradation to selected Brazilian business sectors, as well as the opportunities associated with their conservation and sustainable use. The entities that are spearheading the TEEB Brazil are the Ministry of Environment, the International Conservation Brazil, the IPEA and UNEP.

Climate and emissions

The initiatives for the reduction of GHG emissions and mitigation of climate change are already part of the Brazilian industry agenda, although the integration of this dimension to business strategies vary greatly depending on the sector, company size and regions of the country.

In the institutional perspective, the United Nations Framework Convention on Climate Change has impacts on Brazilian national policies and performance of the industry. The National Policy on Climate Change (PNMC), determined by the law n° 12.187, from December 29, 2009, established the voluntary national commitment on reducing GHG emission between 36.1% and 38.9% of projected emissions up to 2020, in line with the reductions reported by Brazil in its submission to the Copenhagen Agreement, to be met through the development of national mitigation actions (NAMAs: Nationally Appropriate Mitigation Actions).

As a result of this voluntary international commitment, Brazil established by means of Decree nº 7390/2010, Plans of Sectoral Actions in the following areas: deforestation in the Amazon and the *Cerrado*, agriculture, energy and the replacement of coal originating from deforest by forests planted by the steel industry. Other sectors (transport, industries of processing, durable consumer goods, fine chemical, pulp and paper, mining, civil construction and health services) must be regulated in 2012, as mentioned in the above regulation amended by Decree nº 7643/2011.

However, according to information from the Ministry of Development, Industry and Foreign Trade, coordinator of the Industry Plan– which involves all sectors mentioned above, except mining and health services –, will be regulated in 2012 the sectors of: cement, aluminium, paper and pulp, fine and base chemical. In 2013, the sectors of metallurgy, lime and glass will be regulated.

The industrial sector through sectoral associations and regional federations coordinated through the Climate Network of Brazilian Industry from CNI, participates in the elaboration of such plans, contributing to the consolidation and implementation of PNMC.

Brazil, as a signatory of the United Nations Framework Convention should take reduction targets on emission of greenhouse gases, as decided in Durban, during COP-17. According to this decision, the countries pledged to sign until 2015 an agreement, to apply from 2020, based on legally binding reduction targets for large emitters. The definition of major emitters has not yet been presented, but should be part of that block the countries in Annex I of Kyoto Protocol, plus Brazil South Africa, China and India, which form the BASIC, in addition to the United States.

Emission inventory: efforts of the mining sector

The Brazilian Mining Institute – Ibram – has produced the "Inventory of GHG emissions from the mining sector", from existing inventories to the ten most representative mineral products, in terms of value of production in the country. For each of these goods, there were selected the companies jointly responsible for at least 80% of the goods production. In the end, a projection of total GHG emissions related to each of the minerals was made, having as base year 2008.

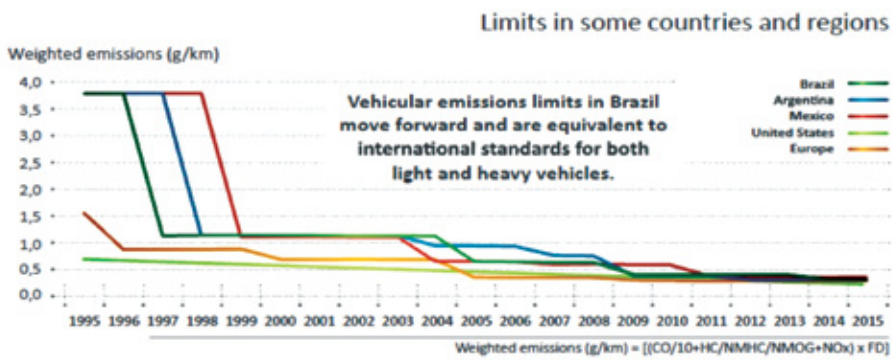
Emissions of greenhouse gases, for the ten minerals studied, expressed in metric tons of carbon dioxide equivalent (tCO_2e), that represents the sum of CO_2, methane and nitrous oxide emissions, to the year 2008 totalized 8,855,655 tCO_2e. Of this total, 7,473,800 tCO_2e are related to the mineral iron, which includes its mining activities, inland transport and pelletizing. Therefore, iron accounts for 84% of total emissions. However, only the pellet accounts for 67% of sector emissions (5,957,420 tCO_2e). Without this processing step, total emissions would be 2,898,235 tCO_2e. In this case, the relative contribution of iron would be 52% (1,516,380 tCO_2e).

Considering the most recent official data from Brazil (2005), the total emissions, considering only CO_2 (GHG most emitted), were 1,637,950,000 tCO_2. Thus, it can be stated that the contribution of mining has little significance to the limit of the production process used in extraction, processing and transportation. However, within that limit, the use of equipment and vehicles with high consumption of fossil fuels appears as a significant source of GHG emissions.

Vehicular emissions

Created in 1986, the Control of Air Pollution by Motor Vehicles Program – Proconve has established new paradigms for vehicular emissions in Brazil. As a representative result of the initiative, according to Anfavea, today's car emit 28 times less than a vehicle produced in the 1980s. In other words, it would take 28 current vehicles to generate the same emissions level of only one vehicle in the mid-1980s. With this, the vehicular emission limits in Brazil are progressing and equates to international standards for light vehicles.

CHART 7. EMISSIONS LIMITS | LIGHT VEHICLES



Source: Anfavea.

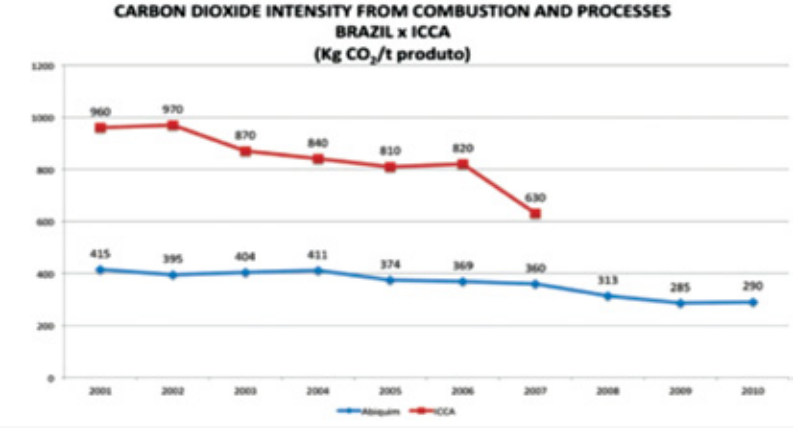
Reducing emissions in the chemical industry

An emission reduction effort is also observed in the chemical industry. Brazilian companies in the sector of products for industrial use, encouraged by the Responsible Care Program, have sought to voluntarily reduce greenhouse gas emissions – GHG. As a result, the CO_2, N_2O and CH_4 emissions dropped significantly between 2001 and 2010.

The total emissions of the chemical production reduced by 47% in this period, as a result of fuel energy economy, increasing participation from biomass and, mainly, of investments made for reduction of N_2O e CH_4 emissions.

The GHG emission intensity required to produce substances in the Brazilian chemical industry is much smaller than the international average, standing in 2007, last year with consolidated information, 43% below the global average of the International Council of Chemical Associations – ICCA.

CHART 8. COMPARISON BETWEEN THE BRAZILIAN CHEMICAL INDUSTRY AND THE WORLD AVERAGE FOR THE SEGMENT

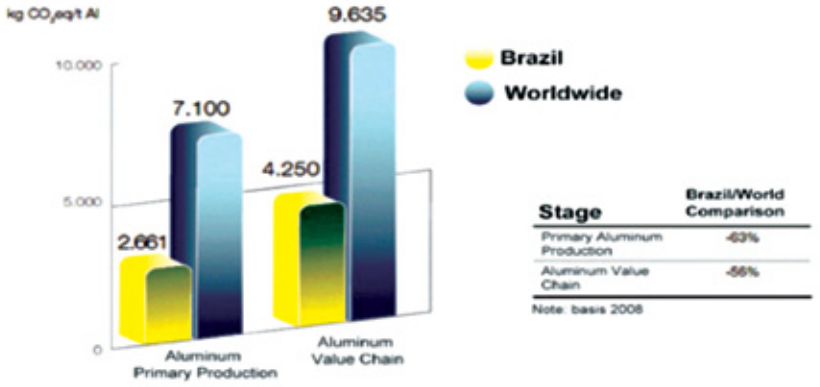


Source: ABIQUIM, 2011.

Aluminum production using hydroelectricity: low level of emissions

Another example of progress in confronting the climate challenge by Brazilian industry comes from the Brazilian Aluminum Association – ABAL. The Brazilian aluminium has the advantage of being produced from hydroelectricity, a clean renewable energy source, which contributes for the total emissions from the production chain of metal – from recycling to mining – to be 4.2 tCO_2e per tonne of aluminium, to be below of the world average of 9.7 tCO_2e per tonne of aluminium, disclosed by the International Aluminium Institute – IAI.

CHART 9. CO_2 EMISSIONS – THE BRAZILIAN ALUMINUM ADVANTAGE



Source: Study – Evaluation of emissions of greenhouse gases in the value chain of aluminum – Espaço ECO Foundation

Energy efficiency

As important as increasing the supply of renewable energies is to increase the consumption efficiency of generated energy, whether through renewable sources or not. The initiatives under way in Brazil, according FMASE, will avoid the expansion of 8.3% up to 2030, equivalent to 109 TWh. The table below presents the projections concerning the consumption of electricity, including self-production and the parcel of conserved energy.

TABLE 1. ELECTRIC ENERGY CONSUMPTION AND ELECTRIC EFFICIENCY (GWH)			
Consumption[1]	**2011**	**2015**	**2020**
Potential consumption without conservation	480.759	595.768	754.965
Energy conservation	2.709	15.208	33.611
Energy conservation (%)	0,6	2,5	4,5
Final consumption considering conservation	478.050	580.560	721.354
Conserved energy by sector			
Industrial sector[2]	0,6	7.347	16.211
Transport sector	1,0	124	335
Commercial sector	0,7	2.975	6.665
Residential sector [3]	0,4	2.895	6.790
Other sectors[4]	1,1	1.688	3.610

[1]Includes self production. [2]Includes electric sector. [3]Includes urban and rural households. [4]Agricultural and public. Source: EPE.

The cost of additional energy obtained through energy efficiency — conserved energy — has to be competitive and lower than the marginal cost of expansion (which represents only 20% of the final value paid by the consumer). The main inhibitor that makes private agents postpone investments in energy conservation is the fact that these initiatives provide lower rates of return in comparison to other initiatives that compete for the same resource internally – expansion of production, introduction of new technologies that increase the product competitiveness etc. This makes new policies and clear strategies aimed at promoting energy efficiency essential. It is especially necessary to optimize the benefits and minimize the costs, avoid misalignment and use more efficient engines.

Solid waste management

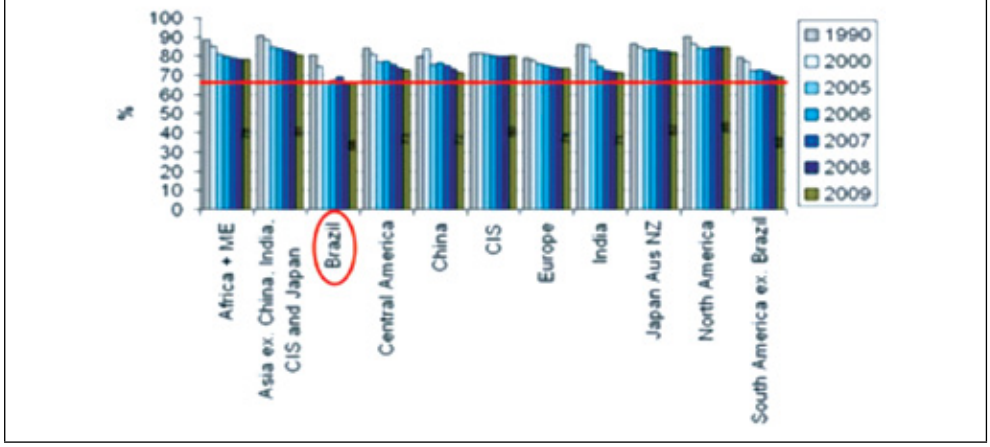
The minimization of waste generation, increasing the reuse of products after consumption and the reduction of social and environmental impacts generated by emergency events are on the Brazilian industry agenda. In some cases, partnerships between industrial sectors point to the potential role of industry in the responsible management and production of waste.

Production of cement with materials addition: synergy between sectors

The production of cement with materials addition such as furnace slag, fly ash, limestone fillers and artificial pozzolana is an example highlighted by the Brazilian Association of Portland Cement – ABCP, which demonstrates the benefits of synergy between different industrial sectors in this area. In addition to diversifying applications and specific characteristics of cement, this act provides the reduction of limestone use, CO_2 emissions, the burning of fuels and emission by calcination/decarbonation.

A survey of the Cement Sustainability Initiative – CSI – considering the ratio clinker/cement and, as a result, the percentage of additions used in coprocessing, places Brazil in a prominent international position in cement production with minor emission.

CHART 10. CLINKER/CEMENT RATIO



Source: CSI – Getting the Numbers Right.

The cement industry's action shows that the Brazilian steel industry initiatives are on track to add value to what, a few decades ago, was considered non-salvageable waste.

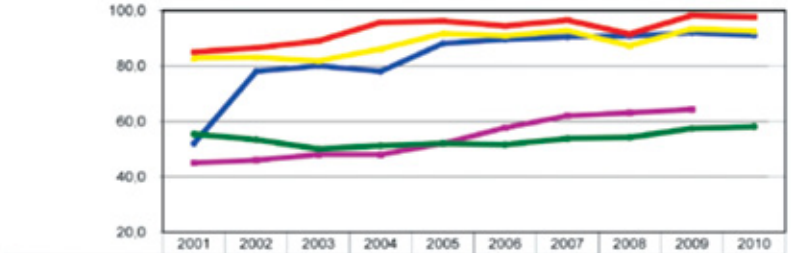
According to the Brazil Steel Institute – IABR –, sector companies generate annually more than 20 million tonnes of waste and co-products. About 88% of the total of such materials are reused in the procedure itself or by a third party and only 5% are going to landfills. The IABR instituted in 2011 the Brazil Steel Co-products Centre – CCABrasil with the goal of creating a center of reference on these materials.

Recycling of aluminum cans: Brazilian leadership

Aluminum industry also contributes to reducing the impact of waste, mainly on landfills. Brazil has one of the highest rates of metal recycling in the world.

The country is champion in recycling beverage cans and the proportion of aluminum scrap recovered, which integrates the metal supply for processing, is more than 38% against 27% of the world average, according to 2009 data released by ABAL. In 2010, the index of aluminum cans recycled reached 97.6%. This is a real "energy bank" to future generations, since it is estimated that over 75% of the aluminum ever produced is still in use, recycled numerous times.

CHART 11. RECYCLING INDEX OF ALUMINIUM CANS FOR BEVERAGES (%)



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Argentina	52.0	78.0	80.0	78.0	88.1	89.6	90.5	90.8	92.0	91.1
Brazil	85.0	86.5	89.0	95.7	96.2	94.4	96.5	91.5	98.2	97.6
Europe Average	45.0	46.0	48.0	48.0	52.0	57.7	62.0	63.1	64.3	
USA	55.4	53.4	50.0	51.2	52.0	51.6	53.8	54.2	57.4	58.1
Japan	82.8	83.1	81.8	86.1	91.7	90.9	92.7	87.3	93.4	92.6

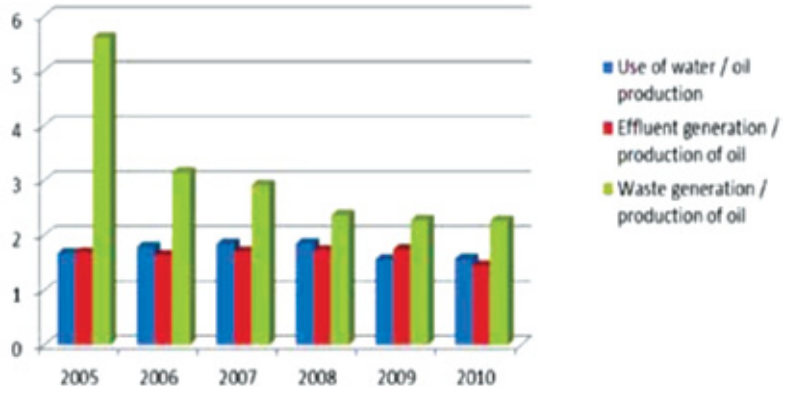
Sources: ABAL; Brazilian Association of Manufacturers of Highly Recyclable Cans; The Japan Aluminum Can Recycling Association; Cámara Argentina de la Industria del Aluminio y Metales Afines; The Aluminum Association; European Aluminium Association – EAA.

Waste reduction in oil industry

The chart below shows the changes in the performance of the oil and gas industry in Brazil, with regard to water abstraction, waste and effluent generation, in relation to oil production in each period.

The national production of oil grew approximately 26% from 2005 to 2010. With regard to water, after a slight increase, the ratio abstraction of water/oil production has been decreasing over the last two years of the period. The same trend can be observed in the generation of effluents, emphasizing the significantly decrease in 2010. The generation of waste, in turn, decreased considerably in the period, either in absolute or relative terms.

CHART 12. ENVIRONMENTAL PERFORMANCE INDICATORS OF THE OIL AND GAS SECTOR (WATER AND EFFLUENTS – $M^3/10^3 M^3$; WASTE – $T/10^3 M^3$)



Source: Sectoral Fascicle IBP.

The environmental quality in the automotive industry

The automobile industry, as reports the Anfavea, reflects in major chains such as electronics, information technology, steel, fuels and agribusiness, in addition to a multitude of services. By its extensive capillary action, the automobile industry is a strong economic chain with multiple effects on the social and economic environment. Its products, the vehicles, continue for years to generate new revenues, taxes, business, jobs and investment.

The environmental issue is one of the sustainability pillars of the automotive industrial matrix, along with the product ecology. Systems, processes and management for improved environmental quality, with clean production processes, resource economy, reduction of waste, treatment and reduction of effluents, as well as competence and productivity gains in enterprises are a key factor to sustainability in companies.

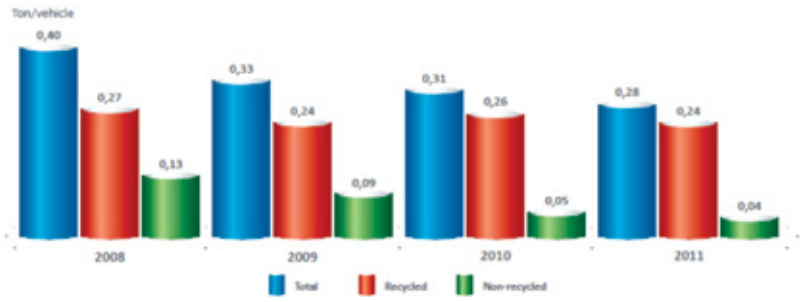
The policies and principles of environmental and social sustainability adopted in the automaker industry are permeable to all industry supply chains earlier and later on assembly lines, aligning raw material suppliers and intermediaries, as well as logistics and dealers, to operate based on the principles of green economics, with clear goals and objectives.

On environmental issues, the main indicators concern to the decrease of inputs consumption per vehicle produced; the reduction of greenhouse gases is also relevant. The tripod is complete with the recycled waste and waste indicators. The Brazilian automobile industry's efforts in this direction can be seen in the following table and chart.

TABLE 2. MANAGEMENT OF MAJOR WASTE IN AUTOMOTIVE INDUSTRY	
Material	**General process**
Metal scrap	Separation, recovery, recycling
Oils and paints	Storage, recycling, coprocessing
Hazardous waste	Storage, coprocessing, incineration
Inert waste	Recycling, industrial landfill

Source: Anfavea.

CHART 13. WASTE IN THE VEHICLES MANUFACTURING



Source: Anfavea.

The CNI in the National Policy on Solid Waste

CNI participated actively in the discussion of the law of National Policy on Solid Waste – PNRS and is the most representative of the industry in the review and creation of important standards for waste management in the National Council for the Environment – Conama and in the governmental committees for the implementation of PNRS.

The industry participation in the forums for the implementation of the PNRS is absolutely essential because it is one of the main protagonists of the production chain. The main innovation of the PNRS law is on reverse logistics, which is in an accelerated process of implementation in the country. CNI participates in the various thematic work groups of the Guiding Committee of Reverse Logistics – CORI, where sectoral agreements are proposed for the reverse logistics of general packaging, packaging of lubricating oils, electronics products, mercury containing lamps and disposal of medicinal products.

The Inter-ministerial Committee regulates the other instruments of the PNRS with emphasis on management plans and waste management, energy recovery, economic instruments and the management of hazardous waste. Having CNI as its voice, the industry participates in the various working groups responsible for the treatment of these themes.

If properly implemented, frameworks as the reverse logistics, the selective collection and the shared responsibility could lead Brazil to be a world reference in the recovery of post-consumer materials through recycling. To create economic instruments which make it possible to advance in solid waste management a new legal framework is necessary, always considering that any rule created under PNRS must ensure as its basic premise the protection of Brazilian industry competitiveness.

Fashion Patchwork: social inclusion and environmental preservation through the textile waste recycling

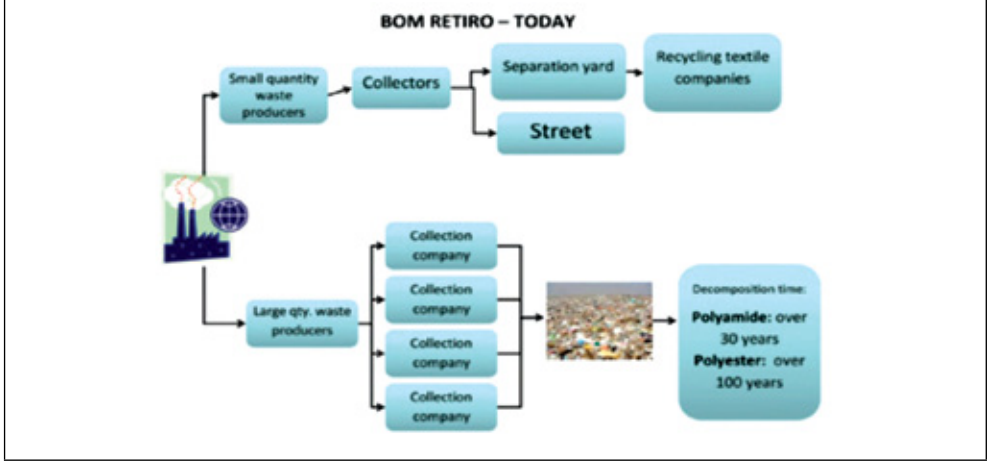
The Sinditêxtil-SP, with the support of the Brazilian Textile and Apparel Industry Association – ABIT, imposed on the entity a committee to coordinate projects related to social responsibility in the textile industry of São Paulo, such as the Fashion Patchwork. The committee is coordinated by members of the union and partner institutions, such as the Clothing Industries Union of São Paulo (Sindivest), the Municipal Government of São Paulo, the Chamber of Shopkeepers of Bom Retiro (CDL) and institutions of education and development, such as SENAI- Textile of São Paulo and Mackenzie Presbyterian University.

The project is based on four pillars: environmental responsibility; social responsibility; adding value to the textile and apparel industry; and the National Policy of Solid Waste (law N° 12305 of 8/2/2010). Currently, the textile waste collection in Bom Retiro, São Paulo, is still poorly structured. The region has 1,200 confections installed, and estimates indicate the generation of approximately 12 tons per day of waste textiles, according to the CDL.

As established in Law n° 13.478/02 the major generators of waste, estimated at 60% of the region's companies, must hire a company specialized in garbage collection to dispose the waste. However, it was found that the collecting companies in this region are directing the textile waste to landfills.

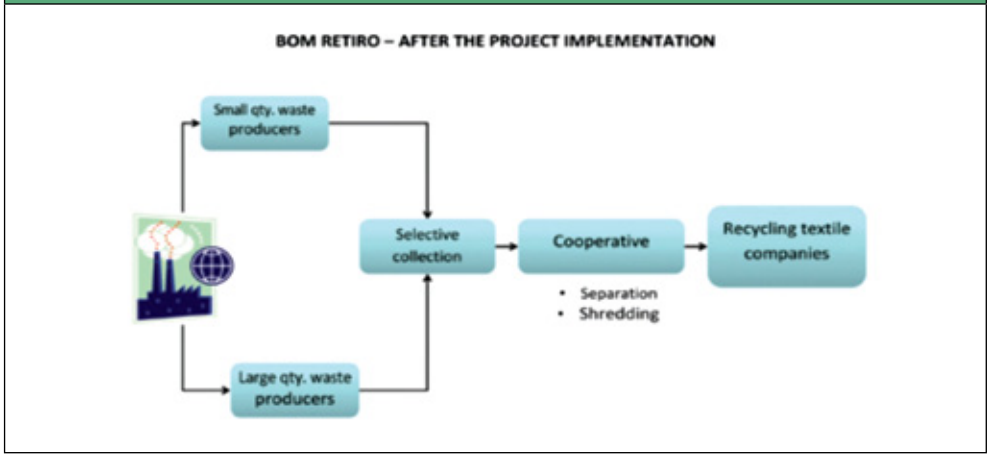
It is intended to be formalized, with the implementation of this project, the work of waste pickers and forward the waste collected, both by them and by companies responsible for waste collecting and disposal from large generators, for a cooperative that will be responsible for managing the trash recyclers, separate waste and preparing the raw material to be sold to recycling businesses, preventing tons of textile wastes to be disposed in landfills or on the streets, as well as the social and environmental impacts arising from irregular disposition.

FIGURE 1. SELECTIVE WASTE COLLECTION SCHEME IN THE NEIGHBORHOOD OF BOM RETIRO – SÃO PAULO



Source: Sinditêxtil – São Paulo P, 2011.

FIGURE 2. SELECTIVE WASTE COLLECTION SCHEME IN THE NEIGHBORHOOD OF BOM RETIRO – SÃO PAULO



Source: Sinditêxtil–São Paulo, 2011.

The committee in charge of the Fashion Patchwork project intends to finalize and operationalize all stages until the end of 2013. This is another initiative of the textile and apparel sector that can be reproduced in other centers of production in the country. The initiative aims at environmental preservation and income generation with qualified occupation, creating socially fair conditions of employment to citizens who depend on this means of livelihood. The re-establishment of socio-environmental regions involved and the creation of management and marketing infrastructure of these wastes are reflections of these actions, so as to contribute to textile companies that use it as a raw material.

Industry System waste stocks: an initiative of SENAI

In addition to acting in the construction of public policies, the industrial sector has developed a tool to optimize the process of industrial waste management. Several stocks of waste and recyclables were created by federations of industry and regional SENAIs in various regions of the country helping to bring together the waste generators and the reuse and recycling companies.

It was also created, in 2009, the Integrated Industry System of Waste Stocks. It is a CNI's initiative with the goal of uniting the various stocks of residues in Brazil in a single virtual system. With a single registration this system allows the companies to use the entire database available, including negotiation of waste at national level.

The Integrated System seeks to strengthen regional stocks, grant the standardization in the operating form of these and incorporate the best existing experiences in an interface of easy navigation, modern and safe. The national database is intended to also give greater visibility to the operations of stock exchanges, adding value in the negotiations relating to the scale and increased publicity of the ads registered.

Another important initiative is the process known as industrial symbiosis, also sponsored by Industry System, in which companies gather and verify potential synergies for recovery of waste, energy, water and wastewater.

Technology and innovation

Innovation and technological development are essential vectors for sustained growth of Brazilian industry. This is the combination that will allow the country to take the comparative advantage that the abundance of natural resources offers, inserting itself into international value chains, which ensure the combination of diversification and industrial sophistication with sustainable development of the Brazilian economy.

CNI has made of innovation one of its major flags. To lead the Enterprise Mobilization for Innovation (MEI), the organization seeks to stimulate the private sector to invest in technological development and engaging in the discussion of public and private mechanisms and regulatory aspects to facilitate – or do not represent impediments – initiatives of the Brazilian companies investing in innovation.

Innovation and development of new technologies require the incorporation of researchers to the effort of technological innovation, besides workers able to cope with the new technologies and to contribute with sustainable production processes.

The improvement of the legal framework to supporting innovation, the improvement of infrastructure and industrial property culture, the implementation of effective sectoral programs of innovation and the support for structuring projects of research and development (R&D) should guide the public-private cooperation in this area. To reduce the productivity gap still existent in the industrial sector, it is essential to support the diffusion of technology to small and medium-sized enterprises.

The CNI recognizes that the entrepreneurship should be protagonist in innovation efforts and it develops strategic actions for the advancement of the country in that direction. Among them, the formation of a greater number of people in vocational and technical courses in engineering.

The Cleaner Production Program (P+L), offered by SENAI, deserves to be highlighted by introducing in the industrial sector, especially in medium-sized and small businesses, best practices and techniques for a production with less environmental impact. The program also contributes to the transfer of clean technologies, facilitating the adaptation of companies to the environmental laws so as to make them compatible with the current reality and expanding the industry's competitiveness. The program is based on the work done by the United Nations Industrial Development Organization – Unido in conjunction with the United Nations Environment Programme – UNEP, creating initiatives for pollution prevention activities and efficiency in the use of natural resources as input, featuring several centers for cleaner production in developing countries, which form a network of information on the subject.

In Brazil, SENAI Rio Grande do Sul has the cleaner production center, called National Center for Clean Technology – CNTL. This center operates since 1995 disseminating information, implementing cleaner production programs in productive sectors, training professionals and constructing environmental policies.

ABIT and Sinditêxtil-SP, supported by Environmental Sanitation Technology Company (Cetesb) and by specialized staff, created the Environmental Chamber of Textile Industry of São Paulo, producing the "Textile Industry's Environmental Technical Guide – P+L Series. This a publication that combines the cleaner production measures targeted at the textile industrial processes, with the aim of guiding industry entrepreneurs to adopt practices and measures that improve the productivity and the rationalization of consumption of raw materials and natural resources, resulting in a decrease in load generation of organic, inorganic and toxic metals in effluents, thereby reducing the risks to human health and the environment.

University-enterprise integration in the search for innovation

To promote the development of young people to the labor market, the IEL, along with SENAI, Sebrae and CNPq, launched in 1995, the Scientific and Technological Initiation for Micro and Small Enterprises – Bitec – aiming to stimulate the transfer of knowledge from university to industry and its direct application in the productive sector. Geared primarily for micro and small industries, BITEC fosters the involvement of students with good academic performance in the technological improvement of industry; the engagement of teachers and researchers interested in technological updating; the formulation and development of industry interest projects whose goal is the improvement of quality and productivity.

Over nine editions, were distributed 4,029 scholarships in the areas of agribusiness, information technology, environmental management, biotechnology, food and health. The industrial sector was covered with 43% of approved projects.

Treatment of waste generated by manufacture of plaster in Espírito Santo: a success case

This project sought the reuse of the plaster waste generated in the manufacture of blocks and decoration pieces, during the same productive process and thus, decrease the amount of raw materials extracted from the environment as well as the waste disposed improperly, damaging the ecosystem.

The project, developed by a student of chemical engineering at the Aracruz University (FAACZ), proved the feasibility of the idea. With the tests, it was proved the possibility of applying the waste generated in the manufacture of plaster pieces in its own production process. It was also found that 10% of the raw material can be replaced by this waste and yet their properties remain within the required by NBR 13207, ABNT rule, which specifies the requirements for the plaster used in civil construction. Whereas the generation of waste is circa 7% on average, the implementation of the project will make the company ecologically correct, because all your waste is re-used in the company itself.

With the modification in the manufacturing process, the company may direct resources before applied to the allocation of the waste in the process itself, making the production self-sustaining.

Capital goods for renewable energy: another example of university-industry cooperation

Another example of checking for greater synergy with the academic realm comes from the Brazilian Association of Machinery and Equipment – Abimaq and the Brazilian Association to Industrial Development – ABDI. The entities created in 2010, the project "Prospects for Sectoral Technological Development: Capital Goods Industry for Renewable Energy".

Under the coordination of the Group of Industry and Competitiveness –GIC-IE/UFRJ and with collaboration of UFRJ Polytechnic School and Nucleus of Industrial Economics and Technology – NEIT from Unicamp, the goal of the project is to assess the prospects for technological development for the Capital Goods Industry for Renewable Energy (IBKER), expected for the next 15 years.

The project is targeted for equipment related to electric power generation originated from the following renewable sources: wind, solar, photovoltaic, in addition to the traditional, such as biomass and small hydropower units – PCH. Its conclusions should identify further initiatives to the construction of a sectoral technological agenda with suggestions for actions on industrial policy to the capital goods sector.

Innovation for increased energy efficiency: the initiatives of the electric-electronic sector

The technological, innovative and management incorporated into the production process transformations have direct impact on the rational use of inputs, particularly of natural resources. According to the Brazilian Association of Electrical and Electronics Industry – Abinee, the sector continually seeks to produce equipment that make the production of electricity more efficient by reducing transmission losses and by promoting a more rational distribution, through the use of new technological tools, such as smart networks to distribute energy.

The current hydro generation turbines, for example, are about 15% more efficient than ten years ago, due to technological innovations in design and materials used in its manufacture. Products and services of the sector are now used in the so-called intelligent buildings, which demand less energy and water consumption in the building automation systems, in the more economic refrigerators, which consume less energy, and in the computers and information technology systems used in virtually all sectors of the economy concerned with sustainability.

National Interconnected System: Brazil advances in energy efficiency

The National Interconnected System (SIN) is a key differentiator for Brazil. With size and characteristics that allow it to be considered unique in the world, the SIN is a large size hydrothermal system, with strong predominance of hydroelectric plants and with multiple owners. Practically the whole country is part of the system – only 3.4% of the electricity production capacity is out of SIN.

The SIN puts Brazil at the forefront of sustainable energy. Through the National Electric System Operator (ONS), the country can offer large blocks of hydroelectric power from one region to another, focusing on those areas where the rainfall is unfavorable at the moment.

The electro-electronics industry offers the country technical support and equipment needed to make a reality of the SIN. The industrial park in this segment is one of the most advanced in the world with laboratories for the production of local technology. The world's leading companies in this segment are operating in the country.

The hybrid shower: Brazilian solution to save water and energy

A genuinely Brazilian solution, the hybrid shower is more economic at everything compared to other solutions. In the hybrid, the electric power plays a complementary role and is only triggered when there isn´t enough sun to heat water at the desired temperature. In a very sunny country in most regions, the hybrid is the most effective alternative in terms of energy consumption. Therefore, it is already part of housing programs such as "My house, my life," of the federal government, and programs of the government of the state of São Paulo.

The bath in the hybrid shower requires an average of three liters of water, compared to eight liters in solar heating systems and nine liters in gas heating. The Data is from a survey of the Polytechnic University of Sao Paulo – USP. In Energy consumption, the hybrid is also more effective. It is an improvement over the ordinary electric shower, whose energy efficiency is already superior to 95%.

Pulp and paper: innovate to preserve species and mitigate environmental impact

The pulp and paper companies, gathered in Bracelpa – Brazilian Association of Pulp and Paper – have been intensifying the use of technology for the preservation and control of environmental damage. Through the cultivation in mosaic system, which combines forest plantations with native forests, the planted forest becomes part of a complex of ecosystems, many of them rich in species of flora and fauna, creating ecological corridors – a phenomenon that is not possible when the patch of native vegetation is interrupted by degradation. Making possible the movement of characteristic species of the permanent preservation areas (APPs) and of the legal reserve areas (ARLs).

Another important example of technological development that has major impact on reducing the environmental damage was the replacement of chlorine by less harmful compounds in the pulp bleaching process to adapt it to the production of some types of paper. Currently, the whitening is done by processes without elemental chlorine, known as ECF (Elemental Chlorine Free), in which are used chlorine dioxide and oxygen based oxidants (peroxides, ozone, etc..). Processes completely free of chlorine compounds are also used for some types of cellulose pulp (TCF – *"Total Chlorine Free"*). Studies show that the effluent coming out of both processes, when treated, has no significant difference in the toxic content. Thus, the two procedures are extremely low on environmental impact.

The actions related to innovation and increased use of technologies to improve standards of environmental conservation are seen by the pulp and paper sector as a necessity in the pursuit of development and of a competitive position in the world, and generate better jobs in a transition context to sustainability. The segment also seeks to deepen the dialogue with society and the government and increase its relations with universities to improve their practices and improve public policies for sustainable development.

The plastic from sugar cane: biodegradable packaging

Brazil is globally leading experiments of substitution of technologies based on petrochemical-based products for those based on alcohol chemistry products, opening up great possibilities for biodegradable packaging. The plastic from sugar cane is being applied in many packages of foods and beverages in Brazil. Besides being more easily degradable this plastic emits approximately 25% less carbon dioxide in its production process.

Social inclusion and education

By adopting sustainable agendas in terms of relations with stakeholders, radiating their potential of wealth generation for communities around its operations and involving its supply chain, for example, companies have examples of success. The Brazilian industry has been playing a leading role in the improvement of the education indicators, and in the strengthening of vocational education in partnership with public agencies, business organizations and NGOs.

Local productive arrangements generating inclusion and development: incentive to entrepreneurship

The IEL, along with the Ministry of Integration, implemented in 2004, the Development Program of the Middle Region of the Valleys of Jequitinhonha and Mucuri – considered one of the poorest of the country – aiming to promote sustainable local development through the promotion of business activities that generate employment and income and increase the social capital of the region.

The program is a milestone in the development of projects to stimulate entrepreneurship with strong social content. Initiatives were carried out in six sectors and local productive arrangements – APLs – beekeeping, aquaculture and fish farming, fruit growing, artisanal *cachaça* (sugar cane rum), wood and furniture making, gems and stone handicrafts. The program involved in total more than one hundred municipalities in the states of Bahia, Minas Gerais and Espírito Santo, who developed projects for the revitalization of the six segments mentioned.

FIGURE 3. MAP OF THE APLS SUPPORTED BY THE IEL – MINISTRY OF INTEGRATION IN THE MIDDLE REGION OF THE VALLEYS OF JEQUITINHONHA AND MUCURI PARTNERSHIP

Source: Relatório Anual IEL 2006.

The results of the program were critical to the development of the municipalities that comprise the middle region. The project of gems and jewelry artifacts sales, for example, benefited 100 members of the Association Art in Stone, in Araçuaí, Minas Gerais. They received subsidies to take the course of polishing gems in the unity of SENAI in 2008 and started producing crafts of decorative mineral, as utility or as ornaments, and to lapidate gems, with the aid of tools, personal protective equipment, computer and electronics. The gems that were once sold in a raw state, began to be cut and applied to ceramic parts. With the support of the program, the association launched a sales unit of stone artifacts in the city's airport in August 2007.

Another benefited was the traditional sector of the manufacture of cachaça. In 2007, was inaugurated the unit homogenization, storage, bottling and marketing of the *cachaça de alambique* (distillery sugar cane rum) in the regions of Itanhém, Araçuaí and Jequitinhonha in Minas Gerais. The project gave new impetus to the association of producers of Araçuaí (MG) – Cachaçaboa – which was transformed into a cooperative, contributing to increased production in the region.

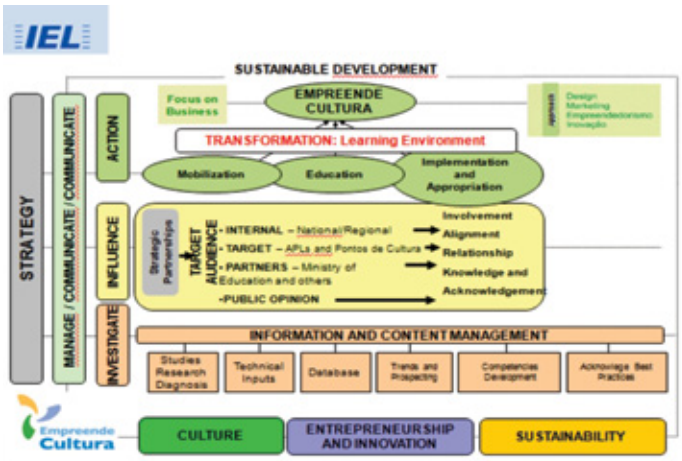
Through the program was inaugurated in 2008 in the municipality of Bahia Mucuri, a unit of storage of honey in partnership with the Association of Beekeepers of Mucuri Valley. For this sector, were acquired specialized technical equipment, computers, laboratories and furniture collection, adjusting the processing of honey and other derived products to the health standards required by regulatory agencies. About 300 families of beekeepers have benefited from the project.

In five years, the project strengthened the business activity, contributed to the generation of employment and income, stimulated the social capital, encouraged sustainable development, with an appreciation of regional diversity and added value to products produced in these regions, in addition to fighting social inequality.

Another action focusing on regional development and increased competitiveness of micro and small businesses, the project Empreende Cultura, developed in 2006 by IEL in partnership with SESI and the Ministry of Culture, encouraged the approach of the industry with cultural agents of different regions and its training to generate competitive advantages in local industrial and handicraft production. This innovative strategy to regional development approached the actions developed in Culture Points[2] of the companies members of APLs, using as an inducer the image strengthening and the cultural identity of the region to generate industrial competitiveness and sustainable development.

The project contributed to improving the quality of life, employment and income generation and transformation of a Brazilian region, making it pass from a certain level of economic, social and technological development, to higher one, by stimulating and strengthening the identity and the local cultural image.

FIGURE 4. EMPREENDE CULTURA



Source: Relatório de prestação de contas do Programa Empreende Cultura. Parceria IEL/SESI e Ministério da Cultura.

Based on concepts of innovation, entrepreneurship and management, the project has benefited over 60 companies in APLs of states of São Paulo, Bahia, Minas Gerais, Rio Grande do Norte, Acre and Paraná. The program included the analysis of trademarks, patents and iconography in the region; the training workshops in design and marketing, and the advice for creating products to give prominence to the local culture.

In the lower Acre region, the production chains of wood and furniture, meat, leather, milk and fish were seen. Among the results is the creation of the Center of Furniture Design and the Center of Research and Development for fish farming. In the metropolitan region of Salvador, the actions have focused on tourism and the chains of the metalworking and petrochemical industry, with emphasis to the implementation of the Multisectoral Technology Park.

2 Entities recognized and financially and institutionally supported by the Ministry of Culture that develop actions of socio-cultural impact in their communities. The Culture Point is the priority action and the articulation point of the other activities of the Living Culture Program. (www.cultura.gov.br).

Finally, the IEL has also promoted the economic development of the state of Alagoas through the Alagoas Project. Conducted in partnership with Sebrae, the project aimed to contribute to the economic development of the state of Alagoas through initiatives to stimulate production, local and regional technological development, training of entrepreneurs and promotion of the entrepreneurial culture.

Women in construction sites: the initiative of the construction industry

The Brazilian industry has been making an important contribution to the promotion of productive social inclusion through job creation, stimulating entrepreneurship and the creation of purchasing power. An innovative example comes from the Brazilian Chamber of Construction Industry – CBIC, with the program Insertion of Women in the Construction Site. The program has served to increase the presence of women in the work of construction, in order to meet the demand for skilled labor and make the environment in the construction sites more humane. The workers are trained in the project "Next Step".

Data from the Ministry of Labor and Employment shows that between 2007 and 2009, the number of women employed in construction companies grew by 44.5%. In 2009, the construction sector recorded an increase of 32.65% in hiring, reaching more than 2.22 million workers. Of this total, 172,734 were women (7.78%). If, on the one hand, the program helps to offset the increasing demand for workers in the sector, on the other hand it inserts in the labor market through training, a population that often was separated from the market due to lack opportunity and even by some prejudice against the female presence in a segment hitherto exclusively male.

Education and training: the role of CNI

Education is the priority and structural axis of sustainable development, vector to liberate the potentials of creativity, innovation and production, as an enabler of the transition to a new pattern of social inclusion and interaction with the environment. For this access to quality education universalized and the democratization of knowledge must be ensured.

Encourage training and professional qualification for the new pattern of production and consumption, and the transfer of technology, is one of the priority strategic actions of the Brazilian industry. Workers with technical skills and quality of life contribute to the competitiveness of enterprises. In addition to the initiatives of companies and industry associations, this work is also done by the System Industry, through the SENAI, SESI and IEL. These institutions work in line with regional needs, providing training, consulting and strategic information suitable for companies of all sizes.

One of the largest professional education complexes in the world and the largest in Latin America, SENAI qualifies more than 2 million workers a year. To ensure harmony with the needs of industry, it constantly monitors the labor market, and it prepares prospective studies in technological, organizational, educational and occupational fields.

SESI, in turn, integrates entrepreneurs and their employees, innovating and creating programs and projects in the areas of education, health, sports, culture, leisure and social responsibility. This provides a leap in quality of life for industrial workers and their families.

IEL works in the business education and professional training, which together offer the Brazilian industry the leading tools for its full and sustainable development: encouraging innovation, efficiency in management and leadership training in tune with the challenges of the new world economic order.

The performance of SESI aligns with the social pillar of sustainable development with a clear and undeniable influence of most of the initiatives in the quest to eradicate poverty in Brazil. The strong institutional commitment to strengthening the industries human capital, through actions in areas such as education, health and leisure, has also been an important factor to boost the economic development of the sector and of the country.

The Strategic Map of Industry for 2007-2015, designed by the CNI, integrates sustainable development into its strategic vision and considers education a fundamental element for the global growth of the economy and the country. It specifies among its objectives, the quality assurance of basic education, the strengthening of vocational and technological education and the promotion of digital inclusion.

To express its involvement with the process of sustainable development, SESI elucidated in its institutional strategic positioning for the period 2007-2015, four major challenges for the industry in promoting quality of life of its workers, including increasing the educational level of workers.

The low educational level of workers in Brazil has been diagnosed as a fundamental cause for both the loss of national competitiveness and for poverty and inequality. One of the main tools used by SESI to face this harsh reality was the Worker Education Program, launched in early 1998 with the express purpose of raising the education of youth and adults, having benefited about five million students by 2006. A total of seven million enrollments in basic and professional education was achieved during 2007-2010, meaning the organization contributed actively to the gradual change of the profile of industrial labor.

In industry, the diagnosis made based on data from 2005 showed a picture of acute training needs for 42% of the mass of employees, equivalent to 3.3 million people. A comparison of the instructional level of industrial workers throughout the country, considering the years 2005 and 2010 reveals a significant improvement. Workers with incomplete primary education, for example, decreased from 31.2% to 17.6%, whereas the group with high school education rose from 27.3% to 37.9%. The percentage of illiterates fell from 1.1 to 0.8 (Ministry of Labor and Employment – RAIS, 2005 and 2010).

The actions of increasing schooling regularly adopted by SESI prioritizes the industrial sectors with the greatest need, planning the provision of care for youth and adults with curriculum proposals by productive sector and establishing care practices in scale, including through distance education. The program, which includes across content areas such as health and work safety and citizenship, attains to mobilize every year more

than three thousand partners among businesses, state and municipal departments of education, NGOs, trade unions and universities using a contingent higher than 25 thousand teachers and one thousand educational supervisors.

The program for the sugar and alcohol sector

Besides the systematized, continuous and structural work from the institutions of the Industry – SENAI, SESI and IEL – some sectors have been developing measures that combine efficiency in the use of mechanisms for greater productivity in the retraining of workers. The Program for Rehabilitation of Sugar Cane Workers (RenovAção), according to the National Forum of Sugar and Energy, the largest program of rehabilitation of the agriculture industry in Brazil, began to be discussed at the time the Environmental Protocol of the State of São Paulo, was signed in 2007.

The commitment of the sector of anticipating to the legal framework and reducing the deadlines for the purpose of controlled burns, with the mechanization of the harvest, brought huge environmental benefits such as reduced emissions and the impact on biodiversity, in addition to improving the conditions of work in the field. On the other hand, as an inevitable consequence it has been bringing a reduction in the number of workers who work in manual cutting of cane.

Each machine replaces the work of 80 men, which generates impacts on current jobs offered in the field and will also impact the communities surrounding the plantations, which often have in sugar production its main source of employment and income. On the other hand, each machine needs 18 more skilled workers in front of work, as well as available jobs in other sectors of the economy, improving income.

Thus, the retraining of these workers emerges as the only alternative to their reintegration into other jobs. Launched in 2010, the program has an ambitious goal: to train and retrain every year, three thousand manual cane cutter workers or former workers, so that they begin to operate the machines that will replace them in the field, working in other operations in own power plants or even that can be absorbed by other sectors of the economy.

Best management practices and corporate governance

The domestic industry has been assimilating management models in which governance is dealt with from transparency and involvement with various social groups, from suppliers to customers, from employees to the neighborhood, passing by governments and opinion makers. The result is the spread of best social and environmental management practices among companies, which serves as an example for other industry segments of the economy, and helps to attract investments to the country.

The CNI has been establishing partnerships, including with international organizations, in order to absorb and disseminate technologies for improved performance of the do-

mestic industry in corporate practices related to sustainable production. One example was the partnership with the British Embassy in Brazil for the development of the document "Low Carbon Corporate Strategies: Managing Risks and Opportunities", incorporating the variable climate in business planning.

The adoption of modern corporate governance practices by companies, especially those publicly traded, is already a reality. Below are presented initiatives of sectors of Brazilian industrial activity that runs through success stories and are organized as structured and coordinated actions by industry associations with reflections in the medium and long term and along supply chains. Without ignoring the entrepreneurial initiatives, it is emphasized that the initiatives structured sectorally become importantly relevant in view of the breadth of its impact in promoting sustainability.

Responsible Care Program: Chemical industry initiative

Another example of the mobilization of businesses and business organizations for the sustainability agenda comes from the Brazilian Association of Chemical Industry – Abiquim. In 2012 it is celebrated in Brazil the 20th anniversary of the introduction of the Responsible Care Program®, the national version of the Responsible Care Program®, created in Canada in 1985 and now coordinated and led by the International Council of Chemical Associations – ICCA. Launched in April 1992, in the eve of the Rio 92, the Responsible Care is the initiative of Abiquim intended to support the chemical industry in the management of their health, safety and environment, aimed at sustainability.

The program's launch marked the beginning of the sector's commitment to proactivity, transparency and dialogue with stakeholders in industry, in a continuous and responsible way, regardless of legislation. This continued effort represents the "commitment to sustainability" of the Brazilian chemical sector.

It is possible to attribute to the Responsible Care Program part of the chemical industry performance improvements that allowed to significantly reduce environmental and health impacts, arising from processes and products. Moreover, its results help reduce costs for companies and society, contributing to the improvement of social conditions and quality of life of industrial workers, communities neighboring the factories and the general public.

BOX 1 – COORDINATION BETWEEN DIFFERENT PLAYERS: THE CASE OF THE FOOD SECTOR IN BRAZIL

The dissemination of best practices can be made through coordination among different sectors of a production chain, as shown in the document of the Brazilian Association of Food Industry (ABIA). An environmental pact with non-governmental organizations (NGOs) ensures the monitoring of the commitment of companies linked to the Brazilian Association of Vegetable Oil Industries (Abiove) and the National Association of Grain Exporters (ANEC) of not buying soya from deforested areas in the Amazonic biome, since July 2006. This is the Soy Moratorium, renewed until 2013 by the entities and partners Ministry of Environment – MMA, Brazil´s Bank – BB, Conservation International, Institute of Amazonian Environmental Research (IPAM), The Nature Conservancy (TNC) and World Wildlife Fund (WWF-Brazil). This agreement is particularly important since the food industry is the target of 57% of the country's agricultural production.

Through the satellite tracking, associated with a work incentive for producers in the Amazon region for joining the Rural Environmental Registry (CAR), the Soy Moratorium has shown strong results, especially in states such as Mato Grosso, Pará and Rondônia. In addition to directly discourage deforestation, the action of the sector´s large companies creates a domino effect on the entire chain. By blocking the suppliers of newly deforested areas, they devalue the production and hinder the flow. The control of deforestation is the effort of the industries in raising awareness and put pressure on their suppliers, turning the food industry into an important agent for the success of the National Policy on Climate Change and the biodiversity conservation.

There is also an agreement among slaughterhouses, ranchers and the state government of Pará to prevent the marketing of cattle originating from areas of recent deforestation, under monitoring of the Public Prosecution – MP. The ranchers need to adhere to the agreement and the effect is identical to that of the Soy Moratorium: whoever disobeys it is excluded from the list of accepted suppliers.

In addition to the industry's own initiatives, individual or collective, the food sector relies on lists and existing public policies to control deforestation. Thus, most companies that directly buy agricultural and livestock products adopt as official policy the blocking of producers included in lists of disapproval and embargoed areas of the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA). Thousands of vendors were blocked because of that – 1,873 only in 2009 and 2010. Special attention is also given to the origin of raw materials in the municipalities included in the list of the deforestation of the MMA, which indicates the regions in which the opening of forest areas is still critical.

Sustainability protocol of charcoal: the newest initiative of steelmaking

An act of governance with repercussion on the supply chain, customers and also on the reputation of the sector comes from the Brazil Steel Institute – IABR – with the "Protocol for Sustainability of Charcoal." One of the important points of the steel industry's commitment is to achieve, within four years, 100% of planted forests to meet their demand for charcoal.

With the release of the protocol, the steel industry reaffirms its commitment to sustainability. The use of biomass in the production of steel is a comparative advantage of Brazil in relation to other countries, because it is a renewable natural resource and, moreover, contributes to reducing emissions of greenhouse gases.

3 FINAL CONSIDERATIONS

The information presented and the Sectoral Fascicles produced in the process of articulation of the Brazilian industrial sector shows that the sector has advanced considerably in the last 20 years. The domestic industry is more efficient in the use of natural resources and energy, and more responsible in their social and environmental practices. Under the coordination of the National Confederation of Industry, the state federations and sectoral associations, the domestic industry is actively involved in the construction of public policies that shape the institutional environment promoting sustainable development.

Modern and always attentive to global trends, the Brazilian industry, through the efforts undertaken for the Rio+20, demonstrates that it recognizes its leading role in building more sustainable patterns of production and its important contribution to the construction of more sustainable consumption models. The challenges that are posed to society are also challenges of the industrial sector, which will not refrain from engaging the joint efforts to find solutions. The joint work between governments, productive and financial sectors, and civil society organizations is the way to ensure economic and social development and conservation of natural and cultural assets in Brazil.

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