



# National Pact for the Chemical Industry

**ABIQUIM**

# Presentation

In order to sustain Brazil's economic growth over the coming years, harness the biomass potential, and make the most of opportunities arising from the future pre-salt oil exploration significant investments in the chemical industry are necessary. This is due to its role as a supplier of a wide range of inputs and products for all production chains as well as to the end consumer.

The urgency and relevance of strategic investments in a country that seeks to figure among the five largest economies in the world are reflected in the substantial increase in imports and consequently in the deficit in the trade balance of chemical products.

The National Pact for the Chemical Industry makes a quantification of the investments needed in order to serve as outlines for the commitment of the chemical industry to the social and economic development of Brazil. It also identifies the greatest stumbling blocks to national and foreign investors' decision-making vis-à-vis expanding business in the Brazilian chemical sector. Removing these obstacles is an essential factor in the path that leads to the strengthening and the sustainability of the Brazilian economy.

São Paulo, June 2010

Abiquim's Board of Directors

# Contents

<b>Executive Summary</b> .....	4
<b>1. Introduction</b> .....	6
<b>2. The size of the challenge</b> .....	9
<b>3. Bases for the proposal</b> .....	18
<b>4. The chemical industry's commitment to the development of Brazil</b> .....	19
<b>5. The chemical industry's needs</b> .....	28
<b>Board of Directors</b> .....	35

## Executive Summary

The chemical industry is one of the most important and dynamic sectors of the Brazilian economy. It is estimated that the contribution of the sector in the GDP reached 3.1% in 2008. As for the industrial GDP, the chemical industry currently holds the third largest sector participation in Brazil, accounting for 10.3% of it, according to Annual Industrial Survey carried out by IBGE (Brazilian Institute of Geography and Statistics, the Brazilian Office responsible for the national statistics). The Brazilian chemical industry ranks ninth worldwide in its sector, with a turnover of US\$122 billion in 2008.

The economic growth projected for the next ten years, a possible correction of the deficit in the trade balance of chemical products, the expansion of the renewable-based segment of the chemical industry, and the utilization of the opportunities arising from the pre-salt oil exploration give rise to potential investments of US\$167 billion between 2010 and 2020. Added to this, there is the need for investments in Research, Development and Innovation of some US\$32 billion, equivalent to approximately 1.5% of the total net turnover forecast for the period.

This document presents a proposal for overcoming obstacles that may affect the potential to achieve investments and development crucial to the expansion of the chemical industry in Brazil. This proposal is underpinned by the identification of drawbacks and the quantification of the investments required, and constitutes the National Pact for the Chemical Industry.

Its strategic goal is to position the Brazilian chemical industry among the five largest in the world, and to make Brazil a country with a surplus in chemical products and a leader in green chemistry.

The Pact, a study conducted by the economist and professor João Furtado, after in-depth consultation with most leaders and executives of the chemical industry, encompasses a number of commitments made by the chemical industry to innovation, to the social and economic development of the country and the creation of propitious conditions for investments in the sector.

The chemical industry agrees to:

**Keep developing high standards of conduct and promoting sustainability.**

- **Encourage Brazil's economic growth and long-term economic sustainability through investments.**
- **Develop technologies, and innovate with advanced products and solutions.**

- **Raise standards for management, tax responsibility and productivity improvement.**
- **Continuously promote the qualification of chemical industry professionals and contribute to developing human resources in related sectors.**

These commitments reflect the strategic guidelines defined by the International *Council of Chemical Associations*, which represents the chemical industry worldwide.

In order to support these commitments and to prepare the ground for the promotion of sustainability, investments, development of technological solutions and the expansion of staff productivity and qualification, the following conditions are required:

- **Competitive prices for raw materials, mainly from the Brazilian oil company Petrobras, with long term contracts.**
- **Correction of distortions in the taxation system, tax equalization with similar products and protection against unfair competition.**
- **Correction of some logistic infrastructure bottlenecks, especially for gas distribution and ports, roads, and their connections.**
- **Decisive public support for technological development and innovation.**
- **Easy access to credit for small and medium firms, in order to strengthen the chemical chain, to promote exports and to foster technological development and innovation.**

The benefits brought to Brazilian development by the Pact are:

- **Active contribution to the achievement of Brazilian strategic goals.**
- **Creation of more than 2 million jobs directly, indirectly and through the income effect.**
- **Increased country attractiveness for foreign direct investments.**
- **Increase in Brazil's trade flows.**
- **Strengthen Brazil's trade surplus.**
- **Transforming the inputs coming from pre-salt oil into industrial products.**
- **Expansion of the potential use of biomass resources through chemistry applied to renewables.**
- **Fomenting development of the capital goods sector.**
- **Creation and development of technology and spreading a culture of innovation and research through the whole chemical industry.**
- **Strengthening of the stock market with solid chemical companies.**
- **Attainment of a world leadership position in sustainability.**

# 1. Introduction

The chemical industry is present in most consumer goods and all economic activities, providing solutions and contributing to process improvement and product quality. With abundant capital, knowledge and qualified human resources, the segment produces an extensive range and amount of inputs for all sectors. Investments in the chemical industry are massive, and capital-intensive. Therefore, the value of such investments is relatively high when compared to the sums invested in other industrial segments.

The chemical industry is deemed strategic not only because of its capacity to generate qualified jobs and income but also for its contribution to all other economic activities and to consumption. Chemical products are found in agriculture, mining, oil extraction, industry, transport, services – healthcare included – and packaging, to name but a few. That also explains why the sector presents higher expansion rates than the average GDP growth. The scientific knowledge produced and accumulated over the last 200 years has enabled the chemical industry to develop adequate, functional solutions applicable to all these activities. Furthermore, the companies in the sector and their trade associations have

continuously encouraged responsible production, conscious consumption and the dissemination of increasingly higher standards for production and technology. It is possible to affirm that all activity sectors make use of chemistry, which makes its participation strategic for developing and developed economies.

In Brazil, it is estimated that the sector's participation in the GDP reached 3.1% in 2008.

With regards the industrial GDP, the chemical industry has the third largest sector contribution in Brazil, accounting for 10.3% of it, according to IBGE's Annual Industrial Survey.

Brazil's chemical industry recorded a turnover of US\$103.3 billion in 2009. However, due to the global financial crisis that made this year very atypical, projections in this study refer to the year of 2008, in

## Net income – Global Chemical Industry

US\$ billion

Country	Earnings
United States	689
China	549
Japan	298
Germany	263
France	159
South Korea	133
United Kingdom	123
Italy	123
<b>Brazil</b>	<b>122</b>
India	98
Netherlands	82
Russia	78
Spain	75

Total estimated worldwide: US\$ 3.7 trillion

Sources: ACC, CEFIC and Abiquim – Data for 2008

which the total sector turnover was of US\$122 billion, an amount that will be surpassed this year. The Brazilian chemical industry ranks ninth worldwide.

As the graph shows, exports represent US\$12 billion of the US\$122 billion produced in the country. Thus, domestic consumption of chemical products made in Brazil attained US\$110 billion in 2008. The total domestic consumption amounts to US\$145 billion when the US\$35 billion from chemical products imports are added to this calculation, revealing a trade deficit of US\$23 billion.

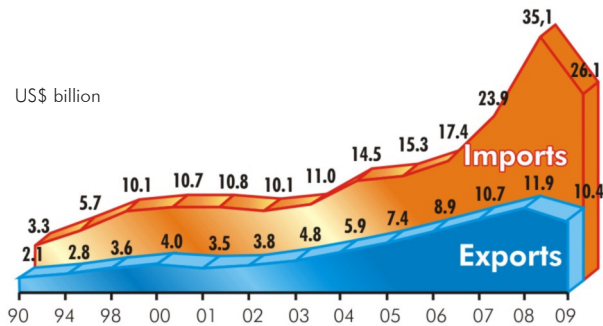
The growth rates presented by Brazil in recent years and the prospects for its continuity offer important challenges and great opportunities for the chemical industry. The chemical sector grows much faster than the overall economy. However, over the last two decades, the investments in the sector did not meet the country's demand. Investment opportunities were missed, national production was below its needs, qualified jobs were not created and possibilities for technological development were not fully taken advantage of. As a result, the trade deficit for chemical products in Brazil rose from US\$1.2 billion in 1990 to US\$6 billion in 2000, peaking at US\$23.2 billion in 2008. The deficit reduction to US\$15.7 billion is mostly attributable to the global downturn of economic activity.

Once the obstacles to these investments have been identified and overcome, the investments in the Brazilian economy can grow substantially. Additionally, an expansion in the offer of many industrial inputs may help growth to gather pace and relieve inflationary pressures. However, the success of investment opportunities depends on the creation and establishment of a number of conditions: infrastructure, energy prices, taxes, interest and



exchange rates. It is a matter of correcting distortions that thwart corporate competitiveness and preclude Brazil from international competitive practices. The effort made by the chemical industry joins forces with other sectors to reaffirm the need for solid solutions for each of these issues in order to solve problems impeding certain

### Trade Balance For Chemical Products - Brazil



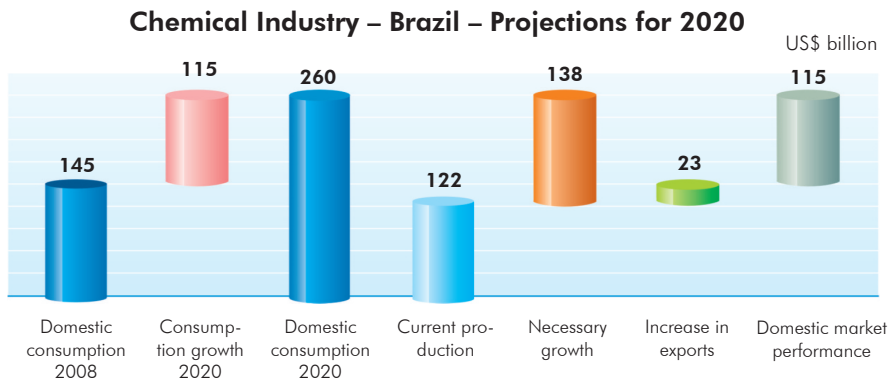
Source: Aliceweb System – MDIC/Secex

aspects in growth as a means of creating adequate conditions for competition. In the particular case of the chemical industry, the access to raw materials in competitive volumes, supply time frames and prices are imperative. This is, undoubtedly, the main limitation to investments in the sector. For investments to occur, the chemical industry must have access to raw materials under competitive conditions.

This document presents an alternative for overcoming the obstacles that may affect the achievement of the potential for investments and development related to the expansion of the chemical industry in Brazil. This proposal is underpinned by the identification of obstacles and the quantification of the investments required, and constitutes the National Pact for the Chemical Industry. The Pact encompasses a number of commitments by the chemical industry to innovation, to social and economic development of the country and the creation of propitious conditions for investments in the sector. Plans include the establishment of an agenda of commitments for companies in the sector and an active contribution to the creation of public policies aimed at the development both of the chemical industry and of Brazil.

## 2. The size of the challenge

Based on the data vis-à-vis the domestic consumption of chemical products in 2008 (production plus imports minus exports), which reached US\$145 billion, as well as GDP growth estimates (4% per year) and an elasticity of 1.25, the projections point to a domestic consumption of chemical products of US\$260 billion in 2020, which means an additional consumption totaling US\$115 billion. In 2008, the opening of domestic consumption was: US\$122 billion from local production, US\$35 billion from imports, and US\$12 billion from exports. The analysis of this information indicates great investment opportunities in the chemical sector linked to the increment in domestic consumption, as well as to the expansion of exports. The graph synthesizes these projections, and shows growth possibility for exports in the sector.



Source: Abiquim

The opportunities for investment in the chemical industry between 2010 and 2020 were projected based on data from 2008 and divided into five segments:

- Economic growth and its impacts on the demand for chemical products.
- Improvement in the trade deficit for chemical products.
- Development of a renewable-based chemical industry.
- Chemical use of the opportunities provided by the exploration of the pre-salt oil.
- Research, development and innovation aligned with the best practices.

The subsections hereafter present the investments estimated for each of the areas defined, followed by data consolidation and results.

## **Economic growth**

The investments arising from the economic growth forecast for the 2010-2020 period involve both industrial chemical products and all related segments (fertilizers, crop protection products, artificial and synthetic fibers, personal hygiene, cosmetics, cleaning products, pharmaceuticals and paints, enamels and varnishes).

The estimation of these investments is based on the following premises:

- The income elasticity of demand for chemical products is equivalent to 1.25, on average. That means each percentage point in GDP growth generates 1.25 points of growth in the consumption of chemical products.
- For entirely new investments, Abiquim's data point to a capital-production ratio of 1.1 for the segment of chemical products with industrial application and 0.7 for end chemical sectors. Based on the current structure of production involving chemicals for industrial application and end chemicals, the capital-production ratio can be estimated as slightly above 0.9.

The chart presents a summary of investments forecast for GDP growth rates of 3.0%, 4.0% and 5.0%, elasticities of 1.00, 1.25 and 1.50 and capital-production ratio coefficients of 0.9, 1.0 and 1.1.

The first amount highlighted (US\$87 billion) was obtained from rather conservative hypotheses for the annual GDP growth (4.0%), the capital-production ratio (0.9), and the

average value of elasticity (1.25). These hypotheses may be replaced with others, based on less conservative scenarios: if the GDP grows at a 5% annual rate and the capital-production ratio is 1.1, with the same elasticity, the need for investments in the period would total US\$144 billion (second amount shown in the chart). The most realistic figure is probably somewhere between these amounts, either due to an increase in manufacturers' productivity or to the vital tax concessions on equipment and other components.

### Estimations – Necessary Investments

GDP growth	Capital/ production ratio	Elasticity		
		1	1.25	1.5
3.0%	0.9	47	68	85
	1	52	75	93
	1.1	57	<b>87</b>	111
4.0%	0.9	66	97	123
	1	73	107	135
	1.1	80	118	152
5.0%	0.9	87	131	169
	1	97	<b>144</b>	186
	1.1	107		

US\$ billion

Source: Abiquim

## Correction of the trade deficit

The second set of potential investments is related to the substitution of imports and the expansion of exports, in order to correct the current deficit observed in the trade balance of chemical products. It does not represent a proposal to substitute imports of all chemical products acquired by Brazil, rather the elimination of the country's trade deficit in the segment, either by substituting imports or by incrementing exports.

For several products, a reduction in the trade deficit requires investments in areas where Brazil lacks robustness. In other cases, this elimination may be impossible, or undesirable. That happens, for instance, in the case of imports associated with raw materials whose availability is limited or non-existent in Brazil, or in circumstances in which owners of protected technologies choose to be based in their countries of origin or in other regions. In such situations, exports of goods manufactured locally for which Brazil has competitive edges may counterbalance the deficit. Furthermore, in cases in which scale requirements surpass the dimensions of the Brazilian market, investments are only viable if the production also focuses on the foreign market. Thus both the substitution of imports and the expansion of exports would evolve.

### Projected Trade Deficit - 2010-2020

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Deficit - 4% annual growth</b>	25.0	26.0	27.0	28.1	29.2	30.4	31.6	32.9	34.2	35.6	37.0
<b>Deficit - 4% annual growth and elasticity of 1.25</b>	25.6	26.9	28.2	29.6	31.1	32.6	34.2	35.9	37.7	39.6	41.6
<b>Variation (deficit projected with base on natural growth)</b>	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.8	1.9	2.0
<b>Investment needed (capital/production ratio=1.1)</b>	1.3	1.4	1.4	1.5	1.7	1.7	1.8	1.9	2.0	2.1	2.2

Source: Abiquim

US\$ billion

The projection is based on the hypothesis of an increase in biomass production of 2 million hectares in ten years, or 200,000 hectares annually. That represents 30 percent of the 7 million hectares of the current planted area and is just 2 percent of the available area today occupied by cattle raising activity. While the conversion of sugar cane bagasse into ethanol is not economically feasible, the use of this biomass is twofold: saccharose for chemical processing and electric energy. For the US\$20 billion projected in investments in plants and in chemical production (related to the plant stage and its chemical developments), there must be additional investments in the agricultural (30 percent) and energy production (30%) stages. The evolution of renewable chemistry takes place, *pari passu*, due to the increase in opportunities throughout the process, stimulating the production of equipment and the offer of energy thanks to the additional demand.

Thus, it is expected that this area of the chemical sector alone may generate investments of US\$20 billion.

### Investments Needed For Trade Deficit Correction 2010-2020

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
<b>Steady elimination of current deficit (US\$ 25.6 multiplied by capital/production ratio of 1.1 in 11 periods)</b>	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
<b>Progressive elimination of deficit (according to scenario above)</b>	(nota)	1.4	1.4	1.5	1.7	1.7	1.8	1.9	2.0	2.1	2.2	
<b>Annual investments needed</b>	2.5	3.9	3.9	4.0	4.2	4.2	4.3	4.4	4.5	4.6	4.7	45.2

Source: Abiquim

US\$ billion

Nota: calculations for the progressive deficit begin in 2011, as its amount for 2010 has already been included in the US\$25.6 billion projection.

## Renewable-Based Chemistry Investments

Type of investment	Description	Measurement unit	Quantity	Investment
Investment – Agricultural sector	Additional sugarcane fields	MM hectares	2.0	6.0
	Additional saccharose production (sugarcane)	MM tons/year	24.0	
Investment – Electric sector	Dry fiber: bagasse + straw and bits (traditional sugarcane)	MM tons/year	41	6.1
	Electric energy generation (approx. 1.2 MWh/tbd)	MM MWh/year	49	
	Associated power (approx. 8,000 hours/year)	MW	6,120	
Investment in chemical centrals	Saccharose extraction	MM tons/year	24.0	3.3
	Green naphtha production	MM tons/year	7.2	7.2
	Additional production of “green” basic chemicals	MM tons/year	5.5	3.3
Downstream investment	Additional production of second-generation chemicals	MM tons/year	7.2	6.5
Total (central + downstream investments)	Total (central + downstream investments)			20.3

US\$ billion

## Utilization of the petrochemical potential of the pre-salt oil

The fourth component of the expected investments is associated with the possible utilization of opportunities offered by the exploration of the ‘pre-salt’ oil through the industrial processing of the raw materials extracted from this new oil source. The investments made in the pre-salt area will result in crude oil and associated gas, demanding further investments in the subsequent steps so as to ensure a more effective use, while contributing to Brazil’s economic growth and development.

There are many variables regarding the oil and gas from the pre-salt layer, so there should be caution when making any projections about the subject. For that reason, some projection parameters have been built based on knowledge acquired in other fields. Supposing that this additional production of oil reaches 2 million barrels a day, the

utilization of the petrochemical chains associated with it will demand US\$15 billion in investments, distributed between the centrals (1/3) and the second generation (2/3). The availability of competitive raw materials for third generation (e.g. plastic transformers) may naturally allow for additional investments that may transcend chemistry but have great relevance for Brazilian industry and its development. Nonetheless, those investments have not been considered in this projection.

For the chemical sector, the utilization of the opportunities offered by the pre-salt oil should stimulate investments of up to US\$15 billion.

### Petrochemical Investments Associated To The Pre-Salt

Type of investment	Description	Measurement unit	Quantity	Investment
Investment - Petrobras	Additional production of oil (approx. 0.137 ton/bbl)	MM barrels/day	2.0	
		MM tons/year	100.0	
	Associated natural gas production (approx. 8.0% of total mass)	MM tons/year	8.0	
	Petrochemical naphtha production (approx. 10.0 % of total mass)	MM tons/year	10.0	
	Ethane production extracted from associated gas (approx. 10% of total mass)	MM tons/year	0.80	
Investment in petrochemical centrals	Additional production of basic petrochemicals	MM tons/year	8.3	5.3
Downstream investment	Additional production of second-generation petrochemicals	MM tons/year	10.8	9.8
<b>Total (central + downstream investments)</b>	<b>Total (central + downstream investments)</b>			<b>15.1</b>

US\$ billion

## Research, Development and Innovation

The production leap suggested by the previous topics will demand a solid agenda for innovation. The development opportunities of a renewable-based chemical industry that makes the best use of the opportunities offered by the pre-salt oil can be expressed as a need for research and development, both for new products and advanced processes.

Furthermore, the correction of the trade deficit requires a vigorous strategy to address weaknesses associated with the development of markets with which the Brazilian industry is not yet well acquainted. It is no coincidence that policies for development and support of exports become innovation strongholds in many countries.

The best international practices suggest that the equivalent to at least 1.5% of a company's turnover is invested in Research and Development (R&D). Some companies in the sector already present that level of investment and regard it as a decisive factor in their success. Applying this data to the national production projected in this study, it is reasonable to expect an additional volume of investments of US\$31.9 billion, which will be necessary over the next 10 years.

Based on the experience accumulated by the industry, part of this investment should be expected to come from the cooperation with education and science and technology institutions, resulting in a body of knowledge and structures potentially useful in projects that go beyond the ones present in this document.

Due to its very nature, the chemical industry is capable of offering solutions for several different economic and social areas, from family consumption to housing investments, from new fields for renewable raw materials to new energy sources.

## Consolidation

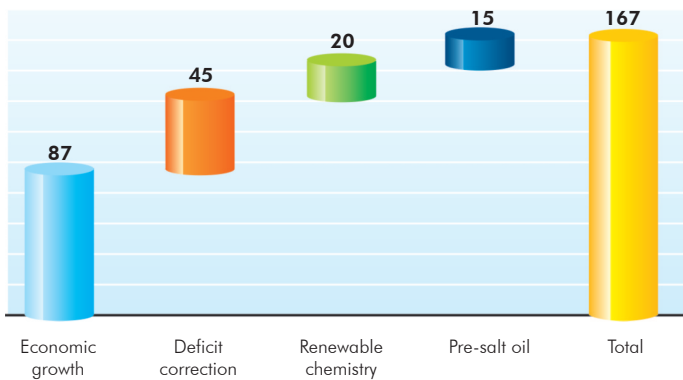
For the consolidation of the investments projected for the 2010-2020 decade, it is assumed that:

- Investments arising from the economic growth forecast for the period should total US\$87 billion.
- Amounts related to trade deficit correction should be of US\$45 billion.

- The amount necessary for the development of a renewable-based chemical industry should reach US\$20 billion.
- The investments required for the utilization of opportunities offered by the pre-salt oil should be equivalent to US\$15 billion.
- The agenda for research, development and innovation demands investments amounting to US\$32 billion. Because part of these investments can be computed as expenses, it is appropriate to keep it separately from other items in the consolidation.

Therefore, investments in capacity are estimated to mount up to US\$167 billion, with another US\$32 billion allocated to R&D.

### Opportunities for investment in the chemical industry until 2020



Source: Abiquim

US\$ billion

## 3. Bases for the proposal

The bases identified for the National Pact for the Chemical Industry are comprised of support elements for the body of proposals and commitments presented and therefore constitute vital requisites for the success of the project and for the creation of favorable conditions for investments and for Brazil's economic and social growth. These requirements were divided into four major topics.

### 1. Basic inputs and infrastructure

- Competitive contracts for oil and natural gas products
- Investments in infrastructure and logistics
- Competitive contracts for electric energy

### 2. Foreign trade

- Prompt defense of the domestic market against subsidies, dumping and unfair competition
- Policies for trade surplus, stimulating local production and incentives to exports
- Management of exchange rates to avoid overvaluation of Brazilian currency
- Alignment of foreign trade policies with innovation policies

### 3. Innovation and technology

- Support for the development of advanced technologies as a leverage to our strengths
- Support for applied research and pre-competitive R&D
- Focus on the development of green chemistry
- Strengthening of engineering and promoting advances in science and technology

### 4. Strengthening of the value chain

- Support from BNDES (Brazilian Development Bank) for the modernization of Brazil's production base, credit for working capital and the strengthening of the value chain
- Elimination of fiscal arbitration for imports and between states
- Tax concessions and equality within the value chain and between different value chains

## 4. The chemical industry's commitment to the development of Brazil

This document not only projects the potential for sector investments but also presents a number of commitments undertaken by the chemical industry with a view to Brazil's economic growth and development. The chemical industry is aware of its relevance in all production and consumption activities and acknowledges that its role should transcend that of following the evolutionary path and the development and growth standards of this country. Because of how its companies and production are organized, the technology in its products, its ability to provide advanced solutions for a variety of challenges and the commitment of its leaders, the chemical industry can and must play a leading role in a number of processes linked to Brazil's progress, and this position is best represented by the commitments which follow:

- Develop and disseminate increasingly higher standards of responsibility and conduct in the industrial, environmental and corporate fields, promoting sustainability in the segments encompassed by the chemical industry.
- Encourage Brazil's economic growth, making substantial investments in the utilization of the pre-salt oil resources, in the use of biomass in renewable chemistry solutions and in the increase of our national production capacity for exporting.
- Develop technologies, product innovation and advanced solutions to meet demands from other sectors and activities.
- Raise standards of management, fiscal responsibility and productivity.
- Promote the continuous qualification of chemical industry professionals and contribute to the training of professionals in related industries.

The commitments proposed reflect the strategic guidelines established by the International Council of Chemical Associations (ICCA), which are: i) Demonstrate outstanding performance through Responsible Care; ii) Safe management of chemicals across the value chain through the Global Product Strategy; iii) Effective global advocacy and influence; iv) Develop and promote a comprehensive chemical industry energy and climate change strategy that keeps the industry's competitiveness and growth; v) Promotion of fair and free trade; vi) Clear and effective communication; and vii) Develop international capacity to improve chemicals management.

**Develop and disseminate increasingly higher standards of responsibility and conduct in the industrial, environmental and corporate fields, promoting sustainability in the chemical industry segments**

The chemical industry adopts extremely strict and high standards in the fields of industry and technology, society and environment, as well as in the corporate field.

The industry's technology requires qualified information and knowledge for each plant and every operation of transportation and final use of products. For that reason, the chemical industry has, over the decades, adopted a conduct dictated by a strict, voluntary action code embraced by all companies affiliated to Abiquim – the Responsible Care Program.

The sector understands that sustainability is a progressive process, built gradually, effectively and consistently. The chemical industry is engaged in the adoption of concrete actions so that in the future its standards reach even higher levels than the present ones, so as to make a decisive move towards sustainability.

**Encourage Brazil's economic growth by making substantial investments in the use of the pre-salt oil resources and of biomass in renewable chemistry solutions as well as in the increase of our national productive capacity for exporting**

Brazilian growth depends on the chemical industry and the chemical industry depends on Brazilian growth. By providing products and solutions, the chemical industry takes part in all activity sectors, including agriculture, mining, oil extraction, industry and services. This supply is conceived and elaborated in order to meet its users' needs, contributing to the expansion of economy as a whole. The chemical sector produces special goods and solutions adapted for a wide range of specific uses.

The use and consumption of chemical products has been growing faster than the GDP, turning the chemical sector into a major player in the country's economic dynamics. Its capacity to create better and adapted products make the chemical sector responsible for the development of solutions that advantageously substitute other materials and products, broadening horizons and creating new development perspectives. All the sector investments are robust, and capital-intensive.

The chemical industry must seek growth rates that exceed demand in order to make the most of opportunities. However, converting these opportunities into investments that may foster Brazil's growth with incentives of additional demand and production depends on the creation and establishment of a whole set of suitable conditions: infrastructure, energy prices, taxation, interest rates, and exchange rates. The chemical industry emphasizes the need for solid solutions for each of these subjects, so as to eliminate some barriers and malfunctions that hinder growth and create more adequate conditions for healthy competition.

Nevertheless, there is one unique trait that differentiates the chemical industry from all other industrial activity: it presents the largest dependence on raw materials in terms of volumes, supply time frames and competitive prices. For investments to effectively occur and for the chemical industry to contribute even more actively to Brazil's development, it is essential that it has access to raw materials at competitive prices. This is, undoubtedly, the greatest obstacle to sector investments.

These investments may substantially raise the gross fixed capital in the Brazilian economy. Additionally, an expansion in the offer of many industrial inputs may help growth to gather momentum and contribute to macroeconomic policy by relieving inflationary pressures, but this requires the correction of distortions that thwart corporate competitiveness and preclude Brazil from international competitive practices.

**Develop technologies, product innovation and advanced solutions to meet demands of other sectors and activities**

The third commitment undertaken by the chemical industry refers to technology and innovation. The chemical industry plays a significant role in promoting advanced solutions that serve the industrial system, the primary production, agro-industries and services, as well as family consumption.

Not only has the chemical industry been present but it has played an influential role in Brazil's production and consumption standards. The ascension of millions of families to new income brackets has revealed an enormous new potential for consumption and therefore for economic growth. The chemical industry has helped to meet the demands of this whole new contingent of consumers by offering affordable products adapted to their needs.

The same can be said about Brazil's production system. The needs presented by the agro-pecuary sector, for instance, are unique and specific. The technological set imported long ago gave way to original solutions defined by the actual demands of the sector in Brazil. The contribution given by Brazilian research to the development of a national agro-pecuary relied on the decisive support from the chemical industry. The revolution that transformed Brazil into an important agricultural power and supplied the nation with abundance was based on technologies that found in chemistry a vital mainstay.

The chemical industry also participates in advanced solutions in the energy and environmental areas. More efficient home appliances, less polluting cars and more sustainable homes depend on solutions that can be provided by the chemical industry, using increasingly higher standards.

The ongoing change in society and consumption patterns, the continuity of the agricultural revolution, the evolution of environmental solutions and sustainability are intrinsic commitments due to the very nature of the chemical industry. Thanks to this, the chemical industry is made up of highly respected teams of technicians, engineers and scientists, and takes part in national and international networks of scientific and technological cooperation. This allows for the continuous development of better solutions that best meet the requirements demanded by individuals, economic systems and environmental sustainability.

The main companies in the chemical sector possess robust and efficient technological competences. Nonetheless, hundreds of other enterprises still have to develop such attributes, which are crucial for meeting the demand from a variety of segments that clearly rely on chemistry for innovative solutions, such as shoes, furniture, plastics and clothing.

The development of these segments and of Brazil itself, as well as the creation of jobs and their very quality, would benefit significantly from an easier access to credit for these companies, and above all, from the access to instruments and resources to support innovation which have been created by the federal and many state governments. Those initiatives are so important and yet not very accessible to a large number of businesses, especially small and medium enterprises, which need them the most.

## **Raise standards for management , fiscal responsibility and productivity**

The development of a country is always a collective work that involves individuals, companies, business sectors, unions, non-governmental organizations and government institutions. The collaboration of the chemical industry and its efforts to contribute to Brazil's development go beyond its endeavor to generate a large amount and variety of wealth in the shape of competitive, high quality products that suit people's and markets' needs.

It is also a permanent commitment undertaken by the chemical industry to promote the progressive and consistent raising of performance and sustainability standards in companies, mostly those which still face weak capabilities in this field. That commitment can be fulfilled in two different ways: the creation of a simplified Responsible Care Program to facilitate the adhesion of new enterprises (mainly small and medium), and a continuous training process for businesses of all sizes. Through this attitude, the chemical industry reaffirms its concern and commitment to higher and broader standards.

The problems presented by Brazil's tax structure have been long known and discussed. The chemical industry has two different visions of the questions relating to the tax systems. The first, a systemic look, takes into account the negative impacts observed by the productive segments and by society as a whole, whereas the second focuses its concern on the specificities of the chemical sector in Brazil.

Is the Brazilian tax burden high? The answer to that question is undoubtedly yes. It is certainly high when the standards for comparable average income countries are taken into consideration. That burden to society, production and consumption could offer counterparts such as public services and investments that would ensure welfare and competitiveness. However, this offer is evidently somewhat below the needs faced by the population and the productive segments and the chances of this taking place are very slim.

This matter gains specific contours in the chemical industry. The tax burden in the segment is not only high but also badly distributed. While some companies fulfill their duty through regular payment, others do it partially or do not honor their obligations whatsoever. This brings an element of competition distortion into the economic system, which contaminates this environment and affects trade negatively. For the higher the tax rates

are, the more this encourages opportunistic behavior by some enterprises, and the larger the distortions that affect competition. A company that dodges taxes has higher profits than those which choose committed work, investments, quality enhancement, and development of new products and processes. That weakens wholesome attitudes and stimulates opportunistic actions.

The distortions in the tax system strongly affect both investments and competitiveness. Investment decisions are – or should be - based on the availability of raw materials, labor, infrastructure and on the distance between markets. Some tax incentives distort investment decisions, thus creating a production structure that depends on government concessions, a mistake that brings heavy consequences upon industrial competitiveness and Brazil.

Chemistry also suffers from unequal competition with products from other chains, which manufacture similar goods under a lighter tax burden. That contrast is observed when comparing PET against aluminum and glass, for packaging; PET against wood, for transformed goods; PS against fiber glass; and PVC against leather. Harmful fiscal regimes motivate the promotion of imports and hamper the expansion of production and investments in the national chemical industry.

Informal practices that still prevail in the periphery of the economic system are also damaging to production for they cause distortions that spoil a healthy competitive environment with undesirable elements.

The chemical industry embraces the commitment to contribute to the evolution of the tax and fiscal agenda through broadening the tax base. This expansion creates conditions for a fairer burden distribution, tax rates cuts and the elimination of current distortions.

**Promote the continuous qualification of chemical industry professionals and contribute to the training of professionals in related industries**

The chemical industry is known for its high productivity levels. Because industrial chemical processes are developed through the intensive use of knowledge, science, technology and engineering, its workers are naturally highly qualified, as well as the manufacturers of equipment that ensure productivity and safety in the plants, and those who manipulate the goods manufactured by the chemical sector.

As a consequence, the development of the chemical industry depends on the availability of well-trained and qualified labor, both in companies of the sector and suppliers and users of those goods. Brazil presents a significant shortage in this field, which is clearly associated with its educational system and professional training courses, which are improving, but not as fast as required.

The chemical industry is engaged in contributing actively to solving this problem, thus ensuring a fast, sustainable advancement towards better education and professional training conditions.

## 5. The chemical industry's needs

The commitments expressed by the chemical sector require a supporting base that ensures the adequate conditions for the developmental leap that is intended. The chemical industry's most relevant needs have been identified and grouped in five segments presented as follows.

### **Competitive prices, volume availability and deadlines defined by contracts for raw materials**

The chemical industry depends on some basic raw materials, mostly oil (from which the petrochemical naphtha is obtained) and natural gas. Furthermore, at least two of its segments (chlorine/soda and industrial gas) are electro-intensive, with electric energy as its major raw material.

Once the industry investments are organized as large indivisible plants associated with economies of scale, there is a trend towards seeking even larger plants. Their lifespan is also long, thus any investment depends on supply contracts for raw materials with characteristics that suit the project, taking into account suitable conditions of cost, volume and time frame.

The problem in allying supply conditions with investment safety requirements must be immediately tackled, so as to align both the planning and the execution of projects by the companies that belong to the chemical and petrochemical production chain. The investments in each of the steps and industrial segments are conditioned to the availability created by the previous step, operative from the beginning of the chain (naphtha and gas).

Besides this urgent matter, there is another to be addressed as soon as possible, even though it is unlikely to arise within the next two or three years: the need to bring forward investments associated with Brazil's economic transition from deficit to surplus in oil production. New investments are imperative to avoid trade surplus overvaluing the real and establishing an increasing dependence on oil. As an appreciated currency reduces the competitiveness of exports and encourages imports, it makes the foreign trade of oil an increasingly necessary tool to support the trade balances. That scenario would create a cycle of dependence on the exports of primary goods, thus characterizing Dutch disease. Investing in the chemical industry is the alternative to prevent such problems.

The utilization of oil resources (and associated gas) requires the proper alignment of oil extraction, production and its transformation into oil and petrochemical products. As the time-to-value for petrochemical investments is typically between 4 and 5 years, and corporate assemblies involve long previous negotiations, the architecture of the possible uses for oil and gas from the pre-salt area deserves to be thought out in advance.

**Taxes: correction of distortions in the taxation system, tax concessions for the chain, tax equality with similar products and protection against unfair competition**

There are three large tax agendas. The first covers the need to significantly reduce the fiscal burden. The second is related to the irrational elements of the tax system: its complexity and the challenges in maintaining costly fiscal apparatus with the sole intent of meeting tax requirements. The chemical industry joins forces with the productive sector in the quest for a solution for these serious matters. However, because such problems demand complex and probably lengthy solutions, the need to address a third issue arises, as it dramatically affects all companies in the sector: the multiple distortions presented by the tax system on different levels, which hamper the creation of healthy competitive standards based on efficiency, good management practices, technology development and innovative solutions.

### **Logistic infrastructure: gas distribution, ports, roads and other solutions**

The lack of infrastructure hampers economic activities that process large volumes and require integration between different steps and processes. Throughout its history, the chemical industry had been based on sites that are distant from its main markets. As a factor for local development, these hubs demand a high level of logistic integration and efficient transport conditions in order to function competitively. However, this dimension of systemic competition currently presents significant deficiencies and elevated costs. It is imperative that this serious matter, which affects chemical companies and Brazil's economy as a whole, is urgently addressed, in order to relieve competitiveness of such a burden.

Elevated costs of energy are also an important issue, even though this is minimized by the uncertainties regarding conditions for productive offer. Finding a consistent solution to this matter is a vital requisite for the chemical sector to spark a more intensive program of investments.

## **Innovation and Technology: decisive government support to technological development**

The chemical industry is characterized by its tight bonds with technological development and innovation, as its companies make massive investments in technology and science. Oil companies and petrochemicals invest heavily in research and development (R&D) and direct their efforts to promote innovation in its broadest sense. Through its solid R&D structures and innovation management processes, large businesses have been able to optimize their processes and product lines. In many cases, they are supported by public policies, both from federal and state governments. The “Lei de Inovação” (‘Innovation Act’), the “Lei do Bem” (‘The Goodness Act’), mechanisms for economic subsidies, financing programs from institutions (such as Finep (Research and Projects Financing) and BNDES (Brazil’s Development Bank), as well as the instruments and resources utilized by Fundações de Amparo à Pesquisa dos Estados (‘State Research Foundations’) – all of them representing important sources of financial support to research and development of innovative technological solutions.

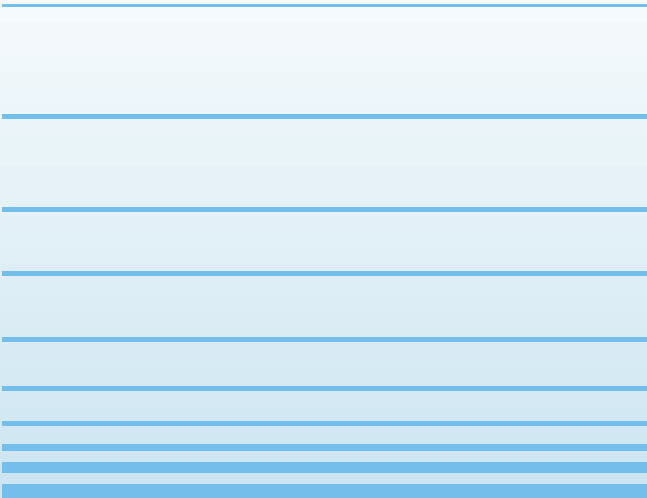
For the chemical industry to thoroughly fulfill its innovation potential, it is essential that some conditions are improved. The first concerns the increment of the current Brazilian legal framework, improvement of analysis processes and promptness in credit release. The second is related to a vigorous expansion for the innovation agenda, including actions that target small and medium enterprises. Studies from a number of sources (including the National Association of Research, Development and Engineering of Innovative Companies – ANPEI) show that a significant part of the best instruments had their scope reduced for they remain inaccessible to smaller businesses. Another focal point is the development of resources for activities for pre-competitive R&D, such as the construction of pilot sites and scaling up projects. This kind of activity involves considerable risks and industries need specific support in order to share that risk. Finally, it is necessary to analyze the professional training profile in Brazil, which is presently inadequate for an innovation-oriented culture. In Brazil, only 11 percent of graduates obtain their degrees in engineering or sciences. An emergency program of actions is vital to strengthen our national engineering and the training in applied sciences.

### **Credit: credit access for chain strengthening, exports and technological development and innovation**

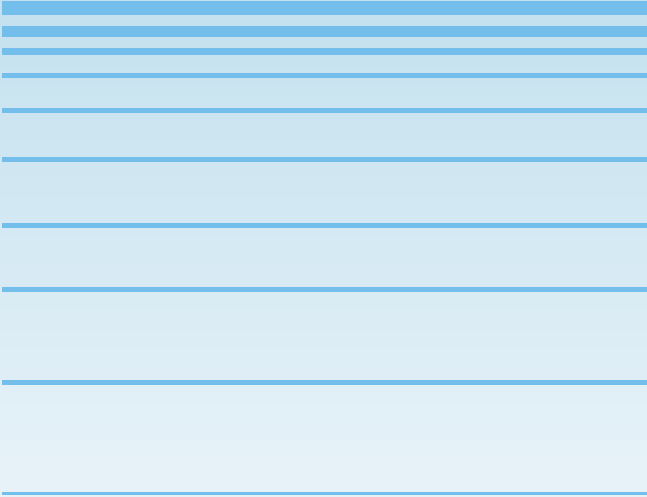
Over recent years, the access to credit has been expanded through different means. The reduction in the interest rates plays a crucial role in this process, as well as the expansion of resources by BNDES and the redefinition of its scope, the development of the capital market and the access to foreign credit flows.

Notwithstanding the advancements observed so far, some issues still await a solution. For example, a more intensive reduction in interest rates and the reduction of costs on resources for banking and for credit markets. Furthermore, the access of small and medium enterprises to credit on suitable terms and conditions also needs addressing. The integrated development of the chemical chain involves an improvement in credit conditions for smaller businesses, for their relevance in the creation of new business opportunities, their capillarity and variety and the entrepreneurial spirit that propels them.

Many chemical companies compete with international counterparts that have global presence, access to cheap, abundant raw materials and are not impacted by systemic deficiencies in their competitiveness or taxation on imports. Granting credit on good terms of cost and volume may encourage many chemical companies to seek additional export flows more incisively. Financing conditions may also help these companies to meet current competitions standards by accomplishing compatible scales.



The strategic intent of the National Pact for the Chemical Industry is to position the Brazilian chemical industry among the five largest in the world, thus becoming a country with a surplus in chemical products and a leader in green chemistry.



## Board of Directors

<b>President:</b>	Bernardo Gradin	Braskem
<b>Vice-Presidents:</b>	1 <sup>st</sup> Vice: Pedro Wongtschowski 2 <sup>nd</sup> Vice: Henri Armand Slezynger 3 <sup>rd</sup> Vice: Pedro Emilio Suarez 4 <sup>th</sup> Vice: Marcos De Marchi 5 <sup>th</sup> Vice: Marcelo Lacerda Soares Neto 6 <sup>th</sup> Vice: Paulo Francisco Schirch 7 <sup>th</sup> Vice: Alfred Hackenberger	Oxiteno Unigel Dow Rhodia Lanxess Solvay Basf
<b>Counselors:</b>	Arthur Whitaker de Carvalho Carlos Schmid Ciro Mattos Marino Domingos Henrique Guimarães Bulus Flávio Augusto Lucena Barbosa Michael Pronin Horstfried Laepple Irandi Sampaio Edelweiss Isaac Plachta João Benjamim Parolin José Veiga Veiga Julio Muñoz Kampff Luiz Antonio Veiga Mesquita Luiz de Mendonça Luiz Fernando Marinho Nunes Mario Antonio Carneiro Cilento Paulo Cezar Amaro Aquino Reinaldo Rubbi Ricardo Vellutini Ricardo Werner Marek Wanderlei Passarella Weber Porto Wolfgang Heinz Guderle	Unipar Huntsman Millennium White Martins Innova Clariant Bayer Deten IQT Oxiteno M&G Polímeros Henkel Fosfertil Quattor Petrocoque Carbocloro Petroquisa Elekeiroz DuPont Akzo Nobel GPC Química Evonik DyStar

## Fiscal Council 2009/2011

<b>Effective Members:</b>	Aldo Gandolfi Junior Ricardo Neves de Oliveira Rodrigo Lopes Almeida	Montana Fosbrasil Monsanto
<b>Substitute Members:</b>	Mário Montini Nobuo Kimura Ronaldo Silva Duarte	Air Liquide Ajinomoto Columbian
<b>Consultive Council</b>	Carlos Mariani Bittencourt Eduardo Eugênio Gouvêa Vieira Otto Vicente Perrone Paulo Guilherme A. Cunha	

---

**Executive-President** Eduardo José Bernini



**Responsible Care<sup>®</sup>**  
Our commitment to sustainability

**ABIQUIM**

Brazilian Chemical Industry Association

Av. Chedid Jafet, 222 - Bloco C - 4º andar  
CEP 04551-065 - São Paulo - SP - Brasil  
Tel.: (11) 2148 4700 - Fax: (11) 2148 4760

[www.abiquim.org.br](http://www.abiquim.org.br)