

# Summary



























# Message from the **Business Leader**

G4-1, G4-2, G4-SO5 Global Compact - Principle 1

2016 was one of the most challenging times in Braskem's history. Nevertheless, we have much to be proud of. Our Company has accomplished unprecedented achievements, the result of a consistent business strategy based on international presence, diversification of raw materials and constant improvement of operational efficiency, competitiveness, and Governance and Compliance standards. These pillars not only ensured us the resilience necessary to overcome the turbulence, but also proved that we are on the right track towards a promising future of sustainable arowth.

Scenario

The main adversities effecting our activities in 2016 came from the uncertainties in the political and economic scenario, both globally and in our main country of operation, Brazil. At the international level, we faced a slowdown in the pace the United Kingdom from the European Union and the fierce US presidential election. Such coupled occurrences, China's new growth pattern, led to moderate growth in international trade - below 3% for the fifth consecutive year - and to a reduction in global investment.

In Brazil, the recession scenario persisted. The GDP recorded a strong decrease of 3.6% (repeating the level of the 3.8% drop in 2015), driven by reduced credit and the prolonged political-institutional crisis, which aggravated the effects of historical bottlenecks of competitiveness.

### **Historical Operating Performance**

In 2016, Braskem achieved good operating results thanks to the gains in production efficiency and stronger integration among the industrial units in Brazil, Mexico, the United States, and Germany, and commercial offices around the world. This formula

was the basis for achieving a record EBITDA for the Company in both Brazilian reais (BRL 11.5 billion) and in dollars (US\$ 3.3 billion) at the end of 2016.

It is important to note that, despite the recession in Brazil, in 2016 our Brazilian units of basic petrochemicals and resins recorded good operating performance. We achieved a historical record of 8.5 million tons of basic petrochemicals, a volume 3% higher than in 2015, with an average cracker utilization rate of 92% (the best in the historical series), an increase of three percentage points (p.p.) compared to the previous year. Resin production reached 4.9 million tons, up 4%.

Despite the weak demand

the Brazilian market, we also achieved record sales results. Domestic sales of basic petrochemicals were 1.9 million tons, up 5%. Resin sales totaled 3.3 million, with a slight decrease of 1%. Our commercial strategy, however, made it possible to take advantage of opportunities in production sectors less affected by the Brazilian crisis, helping to expand our exports. In 2016, international shipments of resins from Brazil totaled 1.7 million tons, an expansion of 24% compared to 2015.

Diversifying raw materials and geographic presence continued to be a priority in our global strategy. We achieved a 100% average utilization rate of the polypropylene plants in the United States and Europe, which was reflected in a 2% increase in sales volume in the respective regions compared to 2015, reaching a level of two million

2016 marked the start of operation of the Petrochemical Complex in Mexico, a milestone internationalization process that required a US\$ 5.2 billion investment, the largest amount ever invested by a industrial company with Brazilian

of world economic growth from key factors such as the exit of



US\$

BILLION

in FBITDA at the end of 2016.

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5.2 BILLION

invested in the Mexican Petrochemical Complex



of CDP
Investor,
international
seal recognizes
companies
with standards
of excellence
in carbon
management.



capital in a greenfield project abroad. In the fourth quarter, the average operation rate of the three polyethylene plants in the Complex was 73%, reaching 97% in December. Polyethylene production in Mexico totaled 443,000 tons in the year.

It is also important to note the closing of the ten year contract to purchase ethane imported from the United States from an affiliate of Enterprise Products. The agreement is part of a project to modernize and make flexible the use of raw material of the petrochemical plant in Bahia, which predominantly operates using naphtha. The initiative, with an investment of BRL 380 million, will enable the production of up to 15% of ethylene using ethane as raw material. The new operation is expected to begin in the second half of 2017.

The prospects are promising after we commissioned the Ultra High Molecular Weight Polyethylene (UHMWPE) plant in La Porte, Texas, USA, in 2016, to enable better customer service in North America and Europe. The plant was built from Braskem's own technologies, enabling production of this product,

which is eight times lighter than steel and ten times more durable than high density polyethylene (HDPE), at a competitive cost.

### **Governance and Compliance**

Illegal acts committed by former members and agents of Braskem were confirmed in 2016, based on information disclosed in the context of Operation Lava-Jato.

As the main interested party clarifying the case, Braskem acknowledged its responsibility for those acts and regrets past conduct. The internal investigation process culminated in the global agreement signed with authorities in Brazil, the United States, and Switzerland, announced in December. Through the Global Agreement, Braskem agrees to pay the amount of BRL 3.1 billion as a fine and indemnity, and implement improvements in its compliance and internal control systems. This commitment will be accompanied by external monitors, appointed by the Department of Justice (DOJ), the Securities and Exchange Commission (SEC), and the Federal Public Prosecutor (MPF - Ministério Público Federal) for up to three years, to ensure compliance with the terms of the agreement.

At the end of 2016, as a result of the full provisioning of the resources established through the Global Agreement to be paid to Brazilian and international authorities in the fourth quarter of 2016, the Company posted a consolidated net loss of BRL 729 million for the year, even after retained earnings in the three previous quarters.

It is important to remember that, since the second quarter of 2016, Braskem had already implemented a wide revision project of its Corporate Governance structure, which aimed to implement a new Compliance Program in order to strengthen the responsible area with direct report to Braskem's Board of Directors and significantly reduce the possibility of any deviation of a similar nature to those identified. In addition to the initiatives already implemented in 2016, the program presents almost a hundred initiatives that will also be carried out throughout the course of 2017.

#### **Sustainable Development**

Braskem maintains a consistent course of action to promote sustainable development. We are proud to be the first industry in Brazil to join the "A" List of CDP Investor in 2016, an

international seal that recognizes companies with excellent carbon management standards. This achievement is in line with our engagement in different national and global forums linked to promoting sustainable development such as UN Global Compact, of which we have been a signatory since 2007, as well as supporting its outstanding participation in lists such as the Dow Jones Sustainability Emerging Markets Index (DJSI) and the Corporate Sustainability Index (ISE) of the Brazilian Stock Exchange (BM&FBOVESPA).

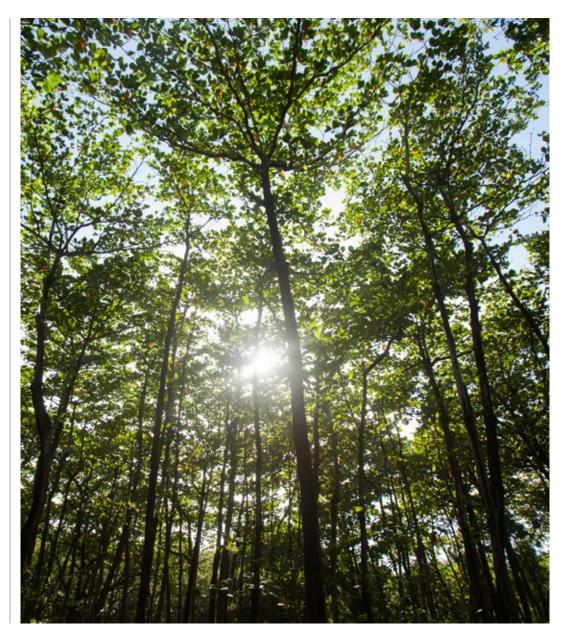
Among the most important initiatives in 2016 is the Movimento Menos Perda Mais Água (Less Loss More Water Movement), a water management project aligned with the UN Sustainable Development Goals initiated by the Brazilian Network of the Global Compact, which has Braskem and SANASA as leaders.

With a focus on generating more sustainable products, it is important to highlight the launch of 100% recycled polypropylene and polyethylene resins produced from big bags and sacks discarded. These initiatives include the Wecycle platform,

which aims to foster businesses and initiatives for appreciation of recovery, reinforcing Braskem's commitment to the plastic chain in Brazil.

### Innovation

Our Company's contribution to a sustainable world is supported by regular investments in research and development of innovative solutions capable of providing high levels of productivity and reducing impacts on the environment. Innovation initiatives are the result of the joint efforts of our Technology and Innovation Centers located at the Triunfo petrochemical complex in Rio Grande do Sul, Brazil, and in Pittsburgh, United States, as well as our laboratories in Campinas, in São Paulo, Brazil, focused on biotechnology. In addition, in 2016 we expanded innovation structure with the inauguration of the European Technical Center, located at the Wesseling plant in Germany. A highlight in product development was the launch of a polypropylene resin named under the brand Braskem Amppleo. The new resin, used to manufacture high performance foams, can withstand temperatures up to 100°C



without deformation and may be fully recycled, aligned with our sustainable commitments.

It is also worth mentioning the use of of I'm green™ Polyethylene (green plastic) to produce equipment and parts in zero gravity. The project was the result of a partnership with Made In Space, a leading North American company in the development of 3D printers for zero gravity operation and a supplier for the North American Space Agency (NASA). This is one of the essential advances for a possible mission to Mars and we are very proud to be part of this epic moment.

### **Perspectives**

Despite the adversities, 2016 was a year that once again proved the soundness of Braskem's operations. We are a strong Company, committed to the growth of the regions where we operate, and firm in our commitment to contributing to the sustainable development of the planet.

In Brazil, despite the consistent decline in inflation and rising investor confidence seen in recent months, the challenges of the macroeconomic scenario for 2016 continue in 2017. Although resumption of growth is expected, the consensus is that it will occur at a slow and gradual pace.

In the international market, according to the International Monetary Fund (IMF), the outlook for advanced economies improved for 2017 and 2018, due to stronger economic activity in the second half of 2016 and projected fiscal stimulus in the United States. For emerging markets and developing economies in general, prospects for growth have marginally worsened, with positive reviews for China and negative for countries such as Mexico, influenced by uncertainties regarding the election of Donald Trump in the United States.

Concerning the dynamics of the oil market, expectations are to maintain the agreement between OPEC members and other producers to limit global supply, which may lead to an increase in the price of oil and consequent increase of the competitiveness of the gas based producer compared to the naphtha based producer.

Concerning the petrochemical market, new polyethylene capacities in the United States may pressure the spreads of polyethylene in the international market whithin the period beginning in the end of 2017 and continuing mainly in 2018, with expected recovery beginning in 2019. Regarding the other resins (PP and PVC), expectations are to maintain the spreads at sustainable levels, especially in the North American polypropylene market, where there is no new capacity beginning operation until the end of this decade.

In this context, the Company's strategy remains focused on diversifying the raw material and geographic profile as a way to mitigate the volatility of the petrochemical cycle, taking advantage of the synergies between Braskem's industrial units and commercial offices for both marketing products and identifying new investment opportunities, reinforcing petrochemical activity in order to guarantee the operational productivity, efficiency, competitiveness of units in all regions, with emphasis on stabilizing production at the Petrochemical Complex Mexico. We are also committed continuously improving the compliance program and governance practices, maintaining financial soundness, and cost discipline. Thus, we continue on the mission of building an increasingly global Company.

Enjoy your reading Fernando Musa

# 01. Braskem

G4-6, G4-9, G4-12

1 INDUSTRIAL UNITS
29 IN BRAZIL, SIX IN THE UNITED STATES, FOUR IN MEXICO, TWO IN GERMANY

PRODUCTION OF OVER

20 million

TONS/YEAR OF THERMOPLASTIC RESINS AND OTHER CHEMICAL PRODUCTS

100
EXPORT TO CLIENTS
IN APPROXIMATELY
100 COUNTRIES

7,6k
TEAM MEMBERS
WORLDWIDE

OVER

8

SUPPLIERS
WORLDWIDE

96,4
THOUSANDS PEOPLE
IMPACTED BY THE
PRIVATE SOCIAL
INVESTMENT
PROJECTS

BRL 11.5
BILLION OF EBITDA

BRL 2.9
BILLION INVESTED

334 INNOVATION PROJECTS UNDER DEVELOPMENT WORTH US\$ 2.6 BILLION<sup>1</sup>

1 Risk-adjusted net present value of the company's project portfolio up to December 2016

GROSS
REVENUE OF
BRL
55.4
BILLION

NEW APPLICATIONS
AND 73 PATENT
EXTENSIONS.
THROUGHOUT ITS
HISTORY,
BRASKEM HAS
FILED 1,030
PATENT-RELATED
DOCUMENTS

2016 | Braskem | Annual Report

8

200

KILO TONS OF I'M GREEN™

Braskem's green plastic produced from sugar cane. With annual production of over 20 million tons, Braskem is now the largest petrochemical company in the Americas and is fifth in the world in production capacity of thermoplastic resins (polyethylene, polypropylene, and polyvinyl chloride) and basic petrochemicals (such as ethylene, propylene, butadiene, and others). Braskem is also a global manufacturer of biopolymers, with annual production capacity of 200,000 tons of I'm green™ Polyethylene (green plastic) produced from sugar cane, a 100% renewable origin.

G4-3, G4-4

Established in August 2002, as a result of the merger of six

companies from the Odebrecht Group<sup>2</sup> and the Mariani Group, Braskem<sup>3</sup> has over 7,600 Team Members and is one of the few petrochemicals in the world to maintain integrated operations for producing basic petrochemicals and thermoplastic resins, which provides competitive advantages from gains in scale and operational efficiency<sup>4</sup>.

### G4-4, G4-7, G4-9

Its global performance profile enables the Company to export to Clients in approximately 100 countries and to operate in 16 regional offices and 41 industrial units located in Brazil, the United States, Germany, and

Mexico, in the latter through a joint venture with the Mexican company Idesa.

### G4-6

Associated with diversifying its raw materials matrix and creating new sustainable chemical and plastic solutions, Braskem's growth strategy is based on strengthening its relationship with its Clients, developing the petrochemical and plastic chains, searching for operational efficiency, and on internationalization, the latter through geographic expansion focused on the Americas. All without giving up the safety and quality standards of its products.



TO LEARN MORE, VISIT

www.braskem.com



2 Copene OPP Trikem Propoet Nitrocarbono and Polialden

3 In order to identify the entities included in the consolidated financial statements and entities not covered by the report, we reference the Parent Company's financial statements prepared in accordance with accounting practices adopted in Brazil, in compliance with the provisions of Law 6,404/76 ("Lei das S/A - Corporation Law") and subsequent adjustments, and the standards issued by the CPC and in accordance with the International Financial Reporting Standards (IFRS) issued by the IASB, and are being published together with the consolidated financial statements [G4-7, G4-17]

4 In order to clarify the scope of this material, it is worth mentioning that the results of quantiQ were reported in the Financial Statements of the report, but are not considered in the social and environmental indicators. Its management was already carried out independently even before the sale of the company, quantiQ was sold on 1/10/2017 (signing), with closing of the transaction on 4/03/2017 (closing).

# Markets and New Fronts

G4-8

Petrochemical production focuses on transforming oil by-products, usually naphtha and natural gas, into materials for industrial use or into end products intended for society.

This is a fundamental sector for the growth of the economy and the development of modern society for its potential of creating new solutions and materials from chemistry and plastic, capable of providing more practicality for people's daily lives and reducing the levels of environmental impacts in different market segments, such as construction, agribusiness, automotive, among others.

Given these characteristics, the petrochemical industry is constantly evolving technologically. The market trend follows the line for diversifying raw materials and their sources, seeking to develop renewable inputs. The goal is to find innovative solutions that are capable of generating increasingly more social and environmental benefits.

The performance of the sector is associated with the fluctuation of prices of chemical and petrochemical commodities traded in the international market. The spreads are formed from the differences between the prices of oil and its byproducts, defining/ and they define the income results of the industries in the sector. It is a condition requiring companies to constantly search for operational efficiency and rigid control of production costs to guarantee the balance and safety of activities during challenging moments, resulting from lower spread cycles.

In 2015 and 2016, the chemical and petrochemical sector experienced a high spread cycle, which boosted the search for better businesses in key markets such as the United States and Europe, places that showed higher levels of economic performance. This context helped offset challenges in emerging markets, which was the case in Brazil.

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According to data from the Brazilian Chemical Industry Association (ABIQUIM<sup>5</sup>), as a result of the country's political and financial crisis, the Brazilian chemical industry - in which Braskem's petrochemical production is also

included - dropped from sixth to eighth place in the sector's worldwide ranking. Today, the industry accumulates net sales of US\$ 113 billion, after shrinking nearly 20% in 2015, having been surpassed in the international

ranking by France and India, and followed closely by the United Kingdom. The top three positions in the global ranking are occupied by China, the United States, and Japan, respectively.

<sup>5</sup> Source: ABIQUIM <a href="http://www.abiquim.org.br/comunicacao/noticia/detalhe/2433/industria-quimica-brasileira-perde-posicao-no-ranking-mundial-do-setor">http://www.abiquim.org.br/comunicacao/noticia/detalhe/2433/industria-quimica-brasileira-perde-posicao-no-ranking-mundial-do-setor</a> (portuguese only)

Cubatão (SP)

Mexico

Santo André (SP)

Coatzacoalcos (Veracruz)

**GREEN PE** 

Triunfo (RS)

**United States** 

La Porte (Texas)

Brazil

UTEC

# **Braskem Worldwide**

G4-4, G4-5, G4-6



### **ADMINISTRATIVES OFFICES**

### **Administrative Headquarters** Brazil

São Paulo (management and administrative offices)

### **Administrative Offices**

### Brazil

Salvador (BA) Porto Alegre (RS) **United States** Rotterdam **United States** Philadelphia (Pennsylvania) Germany Frankfurt

### **Commercial Offices**

Germany United States Argentina Netherland Singapore Chile Mexico Peru Colombia Venezuela

### **TECHNOLOGY AND INNOVATION**

#### **Centers for Technology and** Innovation

### Brazil Triunfo (RS) **United States**

Pittsburgh (EUA)

Partnership with companies and external laboratories for research in chemistry and polymers, petrochemical or renewable source.

Green PE Polyethylene polyethylene manufactured from sugarcane polypropylene ethanol, PVC renewable raw polyvinyl chloride material source.

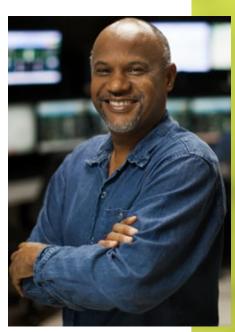
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### INDUSTRIAL UNITS BASIC **PETROCHEMICALS** Brazil Camaçari (BA) Duque de Caxias (RJ) Mauá (SP) Triunfo (RS) Mexico Coatzacoalcos (Veracruz) **PVC AND SODA** Brazil Maceió (AL) Marechal Deodoro (AL) Camaçari (BA) POLYETHYLENE (PE) Brazil

# BusinessModel

With global operations, Braskem seeks to diversify sources of raw materials, production efficiency, and innovation with sustainable returns, in terms of products and production process. All this without losing focus on the Client and market trends. These guidelines are summarized in three conceptual and strategic pillars: to survive, to grow, and to perpetuate.



## STRATEGY PILLARS

### Survive

- Focus on the Client and the market
- Competitive raw materials and energy
- Operational productivity and efficiency

### Grow

- Internationalization with expansion focused on the Americas
- Serve the global market
- Renewable chemicals

### **Perpetuate**

- Competencies and technology
- People and organization
- Sustainability and innovation
- Governance and Reputation

### Strategic Planning

Braskem's strategic planning is based on the long-term, but increasingly seeks to act efficiently, in order to adjust the paths of business development to the global market scenarios. In this respect, the Company's growth is based on:

### PRODUCTIVITY AND COMPETITIVENESS

Guarantee of operational efficiency, productivity, and competitiveness of the units in all regions, especially the stabilization of production at the Braskem Idesa Petrochemical Complex in Mexico, in 2016.

### **GEOGRAPHICAL DIVERSIFICATION**

Expansion of the global presence and synergies between industrial plants and commercial offices around the world to explore export opportunities, mitigate the volatility of the petrochemical cycle, and reduce dependence on specific markets on the Company's consolidated results.

### **DIVERSIFICATION OF THE RAW MATERIAL PROFILE**

Seek alternative sources of raw materials in order to reduce the dependence on naphtha, and adopt renewable sources with lower environmental impact.

### **COMPLIANCE AND GOVERNANCE PRACTICES**

Rigorous Compliance and Corporate Governance model, as a way of guaranteeing excellence of operations in the various global markets and protecting the business while maintaining financial soundness and cost discipline.

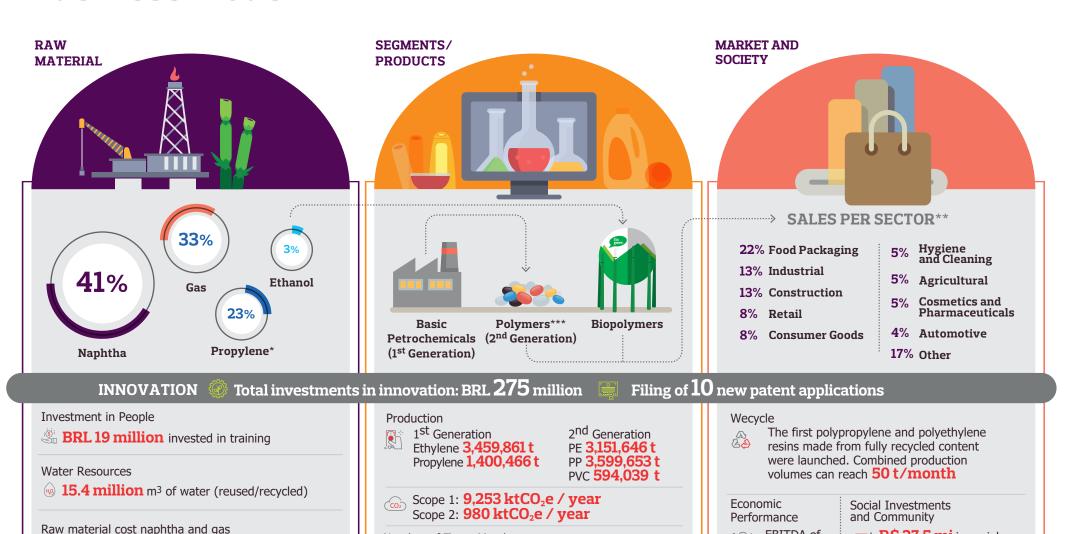
## Business Model

Naphtha BRL 13.9 billion (include condensate)

(includes ethane, propane, HLR, and propylene)

Gas BRL 6.5 billion

**PURPOSE:** To improve people's lives by creating sustainable chemical and plastic solutions.



Number of Team Members

**7,656** and creation of around 40,000 jobs in the value chain

Energy consumption: 10.25 GJ/t

° (\$) + EBITDA of

R\$11.5 bi

up 23%

compared

to 2015

**R\$ 27.5 mi** in social

and environmental, cultural

benefiting more than

and sports projects, directly

**96,400** people in 2016.

<sup>\*</sup>Considers 60% propane for US plants, 22% propane for Europe, and 18% acquired from third-parties for the plants in Brazil.

<sup>\*\*</sup>Resin sales in Brazil

# Recognition

Global Compact – Principles 6, 7, 8, 9 and 10

Braskem's operational soundness and sustainability were acknowledged by important regional and international recognition from the major press and the market throughout 2016.

In Brazil, the Company was a highlight of the sector in the award As Melhores da Dinheiro a publication of magazine IstoÉ Dinheiro, and ranked 3rd in the Chemical and Petrochemical

category of the O Estado de S. Paulo newspaper Empresas Mais award. Another highlight was receiving the award as best company in the Chemical and Petrochemical sector from Valor 1000, one of the most prestigious yearbooks in the Brazilian press.

In addition, Braskem made important achievements, some of them unprecedented among Brazilian companies:



### **INTERNATIONAL**

### **CDP INVESTOR**

In 2016, Braskem became the first representative of the Brazilian industry to join the "A List" of CDP Investor Global, for the transparency and performance of the Climate Change strategy. The list is reserved for public companies with excellence in greenhouse gas management. As for the score, Braskem reached the highest score among all companies in Latin America.

### **CDP SUPPLY CHAIN**

Braskem won two acknowledgments in 2016 regarding the engagement of its suppliers in climate change. The Company joined, for the first time, the "A List" of the CDP Supply Chain Global. It also entered the list of the 29 companies with best practices in this aspect, a new ranking created by CDP, after evaluating the practices of 3,300 companies worldwide.

### **DOW JONES SUSTAINABILITY INDEX**

For the fifth consecutive year, Braskem has been selected to be part of the select group of 95 global companies in the Dow Jones Sustainability Emerging Markets Index (DJSI). The emerging market index on the New York Stock Exchange (NYSE) identifies companies that excel by effectively incorporating sustainability into their business strategy.

### **TOP WORK PLACES 2016**

For the third consecutive year, Braskem was recognized as a top place to work in the Greater Philadelphia Region in the United States. Braskem was also recognized as a top place to work for the fourth year in Pittsburgh, United States.

#### THE SUSTAINABILITY YEARBOOK

Braskem has been included for the third time in The Sustainability Yearbook, a publication prepared by RobecoSAM, an international investment consulting agency specializing in sustainability. The



ranking lists the 457 most sustainable companies in the world, with Braskem among the leaders in the global chemical industry and classified in the Bronze category, which recognizes companies with ratings greater than 54 points and whose performance is between the 5% and 10% best evaluated in their sectors.

### **REGIONAL - BRAZIL**

### In the area of diversity, Braskem is among the ten best evaluated by women in the labor market, taking ninth place and being the only one in its sector to be on the list, according to the survey conducted by the site Love Mondays, specializing in evaluating careers. The survey, based on **DIVERSITY** 12,000 interviews, defines a ranking of 200 companies, among which Braskem is listed among the top 10. Green Plastic became the first product in the Brazilian petrochemical industry to have its carbon footprint certified by the new System of Measurement and Certification of the Carbon Footprint of Products by ABNT (Brazilian Association of Technical Standards). The measurement **GREEN POLYETHYLENE** confirmed that the product has a negative footprint (-2.78kg of CO<sub>2</sub>eg per kg of product), in other words, it helps to seguester CO<sub>2</sub>emissions from the atmosphere. FGV recognized two initiatives: The increase in the use of video-conferences to reduce travel was highlighted in the study "Sustainability in the area of Information **CENTER FOR** Technology," from Insight Case Studies magazine, from the Getúlio Vargas Foundation. A total of BRL 4.1 million was saved through **SUSTAINABILITY** 3,270 video-conferences, which avoided the emission of 1,238 tons of GHG (CO<sub>2</sub>e). STUDIES (GVces) Less Loss, More Water: An initiative by the Brazilian Network of the Global Compact, which has Braskem and SANASA as leaders, **OF FGV-EAESP** was recognized by GVces Corporate initiatives among the 10 best cases of water resource management in Brazil. In 2016, Braskem was selected for the 12th time to be a part of the Corporate Sustainability Index (ISE) of the Brazilian Stock Exchange (BM&FBOVESPA). The **ISE BM&FBOVESPA** Company has been part of this index since its inception in 2005, and its permanence reflects its commitment to best practices of Corporate Governance, social responsibility, economic and financial management, and environmental preservation. Braskem's inventory of greenhouse gas emissions (GHG) received, for the sixth consecutive year, the Gold classification of the Brazilian GHG Protocol **BRAZILIAN GHG** Program, due to coverage of emissions 1, 2, and 3 with independent external assurance. The classification was granted in 2016, based on the last **PROTOCOL PROGRAM** inventory, in 2015, calculated by the Company. The Eco Brasil Award, carried out by Amcham (American Chamber of Commerce), and the newspaper O Estado de S. Paulo, recognizes corporate

Programa Basaless GHG Protocol 2015 2015 2015

> The Braskem GHG emissions inventory received, for the sixth consecutive year, the Gold classification of the Brazilian GHG Protocol Program

**ECO 2016 AWARD** 

The Eco Brasil Award, carried out by Amcham (American Chamber of Commerce), and the newspaper O Estado de S. Paulo, recognizes corporate sustainability practices in processes and products or services. Braskem was the winner in the Processes – Large Companies category - with Braskem Labs, an incentive program for entrepreneurs. In its 34th edition, the award had 71 entries, highlighting projects that reduce energy and water consumption in the production process, reduce waste emissions, and certify a sustainable chain.

GE ECOIMAGINATION AWARD

Braskem won the Ecomagination Award, awarded by the GE Company to clients who achieved the positive balance between industrial production and sustainability challenges. The Mobile Reverse Osmosis System, implemented at PP 4 ABC in São Paulo (Brazil), was recognized for its high positive impact, exemption of Health, Safety, and Environment risks (HSE) related to handling hydrochloric acid and sodium hydroxide (caustic soda), economic gains of US\$ 950,000 per year and for optimizing the use of 128.115 m³ per year of drinking water, in addition to the guarantee of continuing to use demineralized water in the Company's production process.

# **02. SUSTAINABILITY STRATEGY**



ASSESSMENT OF IMPACTS REGARDING HUMAN RIGHTS.



280 million

SINCE 2002, INVESTMENTS OF AROUND BRL 280 MILLION IN IMPROVEMENTS IN WATER EFFICIENCY AND OVER BRL 100 MILLION TO IMPROVE OPERATIONAL AND ENERGY EFFICIENCY.

86%

THE IMPLEMENTATION LEVEL OF THE TEN MACRO OBJECTIVES REACHED 86% IN 2016.

For Braskem, to evolve is to grow sustainably. This is a principle that is materialized by the constant search for innovative solutions, created with the purpose of creating value to the business and reputation to the brand, while minimizing any possible environmental and social impacts caused by the Company's activicties.

The Company seeks to develop the sustainability strategy aligned with day-to-day business practices. Since 2002, Braskem has invested around R\$ 280 million in improvements in water efficiency and over R\$ 100 million to improve the operational and energy efficiency of all its industrial units in Brazil and abroad, adopting innovative processes and technologies.

### SUSTAINABILITY ALIGNED WITH BRASKEM'S BUSINESS

One of Braskem's ten strategic macro objectives (MOs) is to be among the business benchmarks in Brazil and worldwide for its contribution to Sustainable Development.

280
MILLION

invested in improvements in water efficiency.

With this vision and focus on growth opportunities for the coming years, Braskem defined its work foundation based on ten strategic macro objectives for sustainability. Strengthened in 2016 and with new goals to be achieved by 2020, this work guides Braskem's actions at all levels and its implementation and results are monitored by sponsors from several areas, chosen by their area of operation

and the relation to risks and opportunities associated with a given macro objective. The sponsors are responsible for establishing, maintaining, and strengthening the integration of the Business strategy and the corresponding sustainability objectives.

The sponsors' recommendation was validated by Braskem's Business Leader and Vice Presidents. The evolution of the work was systematically reported to the Company's Sustainability Committee, aiming to promote targeted decision-making, focusing on the long term. The implementation level of the ten macro objectives reached the 86% mark.

### Macro objectives and the Sustainable Development Goals (SDGs)

Defined by the United Nations (UN) in 2015, today the Sustainable Development Goals are the new benchmark for governments, civil society and other partners in designing business strategies focused on eradicating poverty, promoting prosperity and well-being protecting the environment and addressing climate change.

Active participant in the process for developing these SDGs during Rio+20<sup>6</sup> and aware of its role in creating a green and increasingly inclusive economy, Braskem has inserted all 17 UN commitments as an integral part of its 10 strategic macro objectives for sustainability.

Based on a correlation process, the Company defined 79 concrete contributions that can be put into practice through its businesses and products. Among the 17 objectives, seven were defined as more impacting and with a higher degree of contribution. They are: No poverty; Clean water

and sanitation; Decent work and economic growth; Responsible consumption and production; Industry, innovation and infrastructure; Sustainable cities and communities, and Climate change.

Some of the actions include investing in innovation and technology to create new and sustainable products; promoting recycling solutions for plastics; local development through training of people, suppliers and customers; improving management practices, especially those related to gender equality, discrimination and transparency.

# MACRO OBJECTIVES FOR SUSTAINABLE DEVELOPMENT

See the infographic on page 17 to understand how the strategic macro objectives for sustainability correlate with the UN Sustainable Development Goals

6 Held in Rio de Janeiro in 2012, Rio+20 (or United Nations Conference on Natural Development) aimed to discuss the renewal of political commitment to sustainable development.

### **Macro objectives** for Sustainable **Development**



### **INTERRELATIONS FOR SUSTAINABLE DEVELOPMENT**

G4-15

All macro objectives defined by Braskem contribute to the 17 UN Sustainable Development Goals. Braskem took part in the process for defining the SDGs between 2012 and 2015 as a Member of the Brazilian Committee of the Global Compact, actively participating in the Sustainable Development Summit.



To be one of the global benchmarks in the sector for its contribution in Sustainable Development.



To be among the benchmarks in Chemical, Occupational, and Process Safety in the Global Chemical Industry.

Safety





To be among the top three thermoplastic resin producers in the world while maintaining the

Investment Grade rating in the three major international agencies.



Energy

efficiency

Development

of solutions

Local

development















To be one of the five largest traders of polyethylene (PE) and polypropylene (PP) from recycled content in the world and become an important driver of the growth of plastic recycling in Brazil.





To be recognized as a company that

supports its Clients in the development

of environmental and social solutions

in Chemistry and Plastics, through its

products & services.















To achieve the "excellent" reputation level in the Citizenship dimension of the RepTrak® Pulse, being recognized by the Community and Society for its contribution to

improving human development.



2020



Water

efficiency

Renewable Resources

Post-consumption









To be among the leading producers of chemicals and thermoplastic resins from renewable raw materials. And remain the world's largest producer of thermoplastic resins from renewable sources.









To be among the benchmarks in the use of water resources in the global chemical industry in terms of water consumption and water reuse rates.

### **Sustainable Development Goals**

































To be among the best major chemical industries in the world in intensity of energy consumption and to be a major user of renewable energy sources.







CO2

Climate change





To be among the world's best major chemical companies in intensity of Greenhouse Gas (GHG) emissions while maintaining the use of renewable raw materials.

# Multiplier Effect of **Sustainability Strategies**

G4-18, G4-19, G4-20, G4-21, G4-24, G4-25, G4-26, G4-27

Braskem is aware that achieving the goals is only possible through clear, open, and transparent communication with all its stakeholders, including partners in the private sector, governments, and civil society.

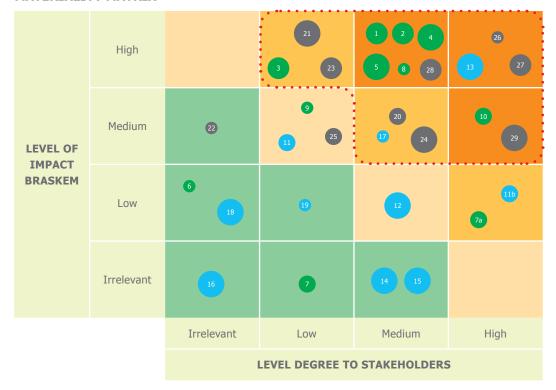
Braskem's Materiality Matrix reflects this concern in constantly reducing possible negative impacts and increasing the positive impact of its business and its presence in different locations. The results of this

Matrix show the aspects of greatest importance to Braskem's stakeholders and are aligned with the ten strategic macro objectives for sustainability, in a prospect up to 2020.



### TO LEARN MORE **ABOUT BRASKEM'S SUSTAINABILITY**

#### MATERIALITY MATRIX



#### Environmental

- (1) Non-renewable resources
- (3) Climate change and energy (4) Air
- (5) Waste
- (6) Transportation
- (7) Biodiversity
- (7) Biodiversity Mexico
- (8) Post-consumption
- (9) Suppliers environmental management
- (10) Product development environmental

#### Social

- (11) Jobs
- (11b) Jobs USA
- (12) Freedom of association
- (13) Health and Safety
- (14) Training and career
- (15) Equal opportunities
- (16) Property security
- (17) Safe use of products
- (18) Grievance mechanisms
- (19) Suppliers social management

### **Economy and governance**

- (20) Economic Performance
- (21) Social investments and community
- (22) Public assistance
- (23) Local suppliers
- (24) Free competition
- (25) Corruption
- (26) Public policies
- (27) Product development social (28) Labor from Local Communities
- (29) Transparency and integrity

### **MATERIALIDADE**

Critical

High

Moderate

Low

**BRASKEM'S LEVEL OF CONTROL OR INFLUENCE UPON THE ASPECT** 











### **MAPPING OF STAKEHOLDERS**

Category of stakeholders interacting with Braskem	Stakeholders	Means of engagement
Influenciators	Political/strategic Trade unions, regulatory agencies, professional associations, executive branch, legislative branch, public prosecutor's office, environmental agencies, public/regional opinion, NGOs, financial market analysts, auditors	Meetings, Reputation Survey*
	<b>Industry</b> Competitors, trade associations	Industry trade shows, Participation in sector meetings
	<b>Media</b> Coordinators, specialized media, general media, social networks/ virtual environment	Press Releases, Meetings, Interviews, Reputation Survey*
	Academy Research centers, schools, researchers, universities, technical schools	Meetings, Reputation Survey*, Projects in partnership
Facilitators	<b>Suppliers</b> Raw materials, Petrobras, indirect materials, services, technology	Meetings, E-Mails, Internet Channel with exclusive access, Reputation Survey*
	<b>Financial market</b> Controlling shareholder, minority shareholder, board of directors, financial institutions, debt provider, banks	Meetings, Website "Investor Relations", Reports, Video conference on results
	<b>Team Members</b> Team Members, third parties	E-Mails, Internal Campaigns, Newsletters, Safety Dialogues, Recognition Award, Intranet, Reputation Survey*, Climate Survey (every two years), Communication Survey (every two years)
Impacting	<b>Communities</b> Residents, local leadership, partners initiatives	Projects, Direct Relationships with Local Representatives from the Institutional Relations Area, Reputation Survey*
Beneficiaries	<b>Society</b> Abc 18+/ national, families of Team Members	Reputation Survey*
	Clients Clients of end consumers distributor, Unib, Unipol, Unvin, international	Meetings, Visits to Facilities, Technical and Relationship Events, Industry Trade Shows, Sponsorship, Internet channel with exclusive access, Sales support service by account managers, Technical development agenda, Reputation Survey*

<sup>\*</sup>The reputation survey has been carried out each year since 2009, with the support of the Reputation Institute.

The program relies on an Image and Reputation Management Committee, with participation of representatives of all Company areas, responsible for discussing the main risks and opportunities in the production process and the strengthening of the trust of Braskem's stakeholders.

2016 | Braskem | Annual Report

# Human Rights

G4-18

Commitment to the principles that govern Human Rights worldwide is embedded in Braskem's values, expressed in its Code of Conduct and in voluntary agreements - such as the Global Compact - aimed at promoting sustainable development.

Braskem carried out an assessment focused on the practices of protecting and promoting fundamental guarantees to all human beings, regardless of gender, ethnicity, belief, age group, or any other social status. This assessment was developed based on the UN Guidelines on Business and Human Rights (Ruggie's Framework), and included the following phases: Sector Benchmark, Corporate and Chain Impact Assessment, and GAP Analysis.

The work encompassed the Company's operations in Brazil, Mexico, the United States, and Germany, as well as the activities of external stakeholders. Several Team Members were interviewed, among them those responsible for internal areas such as People

and Organization (P&O), Health, Safety, and Environment (HSE), Procurement, Legal, Corporate Governance, Compliance, and external partners. Over 100 documents were also provided and analyzed in order to map procedures and identify key risks, opportunities, and vulnerable groups.

With this, Braskem has created a risk matrix of Human Rights violations, which is being validated by the Leaders. In 2017, Braskem will provide additional information on this aspect on its website.

The purpose of this work is to establish an integrated, strategic and continuous management of this aspect. Accordingly, based on the recommendations received, Braskem will engage its internal and external stakeholders in order to motivate them to improve the current action plans, in addition to reporting the evolution of the results. The Company's perspective is that, in 2018, the assessment of impacts on Human Rights will be strengthened and integrated into the process of reviewing the Braskem's Materiality Matrix.



2016 | Braskem | Annual Report

### **Braskem Idesa**

The Company's commitment to protecting and promoting human rights goes beyond geographical and cultural boundaries. Braskem Idesa, a joint venture between Braskem and the Mexican group Idesa, were conceived with prerogatives of sustainability and human rights. Therefore, in addition to following Braskem's global corporate policies, such as the Code of Conduct for Team Members, the unit has a policy focused on Human Rights, which includes procedures that quarantee excellent social and environmental performance:

• Health and Safety: Accident frequency rates with and without lost time during the construction phase were less than one accident per million man-hours worked, winning the DuPont Safety and Sustainability Award 2015, as a worldwide highlight in the area of Industrial Safety. In 2016, its first year of operation, this rate was 0.67, lower than the average for the Chemical Industry in Mexico determined by the National Association of the Chemical Industry in Mexico (ANIQ).



• **Diversity:** During the construction phase, women's participation was 8%, a highly representative rate when compared to the Mexican national average of 3.5%. In addition, workers came from 24 different nationalities, but with great use of local labor, which represented 85% of the workforce. The current diversity ratio in the workforce is 31% women and 69% men.

- Human Rights Training:
   Over 500 people were trained
   in different aspects, including
   sexual harassment and
   mobbing, in which there was a
   reduction of 40% of the cases
   reported.
- **Human Development:** 670,000 training hours to ensure better professional qualification.

- New Opportunities Program:
   An initiative created to support professional relocation after completion of the construction work on the Braskem Idesa Petrochemical Complex, ensuring the inclusion of 6,500 people in selective processes.
- Private Social Investment:
   After identifying regional talents, 200 people from the community (93% women) were trained to be suppliers for Braskem Idesa and other companies in the region (legal constitution of 11 cooperatives of cleaning products, uniforms, and tilapia and chicken farming, as well as recycling materials made available by the Company).
- Participatory Environmental Monitoring: Community representatives were trained to measure levels of air and water contaminants, as well as dust and noise levels. These people perform environmental monitoring, guaranteeing the transparency of the results which, so far, have not been any different than the initial environmental parameters.

- **Biodiversity:** 400 hectares of reforested area, 529 specimens of the local wildlife rescued and five-fold increase of 331 plants of the rare endangered species "Ceratozamia Miqueliana."
- Preservation of Cultural
  Heritage: The construction
  works were monitored by
  a team of specialists from
  the National Institute of
  Anthropology and History
  (INAH) to ensure that any
  archaeological remains
  were properly identified and
  recovered. Currently, over
  three thousand pieces have
  been found and are part of
  the collection of the INAHVeracruz Center.

Braskem Idesa will continue to carry out third-party audits to ensure compliance with principles governing Human Rights, and, together with Braskem's other businesses, will intensify the promotion of the Ethics Line Channel through an educational process.

85% OF LOCAL

in addition to workers of 24 different nationalities.

LABOR



## Forums and Commitments

G4-14, G4-15, G4-16

The participation in working groups and forums, with the specific purpose of multiplying positive practices and experiences, is a strong part of Braskem's sustainability strategy. In 2016, the Company supported a coalition of organizations called the IEC (*Iniciativas Empresariais em Clima* - Business Climate Initiatives) in order to adopt a series of recommendations to be submitted to the Government about the best model for Brazil regarding pricing and constituting a carbon market.

### ICCA (INTERNATIONAL COUNCIL OF CHEMICAL ASSOCIATIONS)

Braskem is part of the executive leadership group and acts in energy, climate change, and chemical safety working groups of the International Council of Chemical Industry Associations. The Company also contributes with initiatives such as the Responsible Care Program, which, since 1992, has sought to improve the environmental management of chemical companies and their production chain in Brazil, and the Global Product Strategy (GPS), a program that seeks to promote the recognition and dissemination of possible risks to workers, consumers, and the environment, arising from the production, handling, and sale of chemical products. Support for these initiatives occurs through Abiquim and the American Chemistry Council (ACC), respectively.

### **CARBON PRICING LEADERSHIP COALITION (WORLD BANK)**

In 2015 Braskem became part of this World Bank initiative that seeks to mitigate climate change by introducing carbon pricing mechanisms. In 2016, Braskem was part of this organization's Steering Committee.

### **CDP**

Launched in 2000, the program aims to collect and publish data on greenhouse gas (GHG) emissions from companies in over 60 countries. CDP is an international organization with a global reporting platform that works with investors around the globe in order to increase investment opportunities, contributing to more consistent information for decision-making and risk assessment associated with climate change. CDP operates a standard system for recording and evaluating company strategy and performance, recognizing best business practices in this aspect.

#### **GLOBAL COMPACT**

Braskem has been a member of the Global Compact's Brazilian Network Committee since 2008 and the Global Compact's LEAD group since 2013. The Company is also part of UNIDO's Green Industry Platform initiatives, Caring for Climate of the Global Compact, and Women's Empowerment Principles of UN Women.

### **BRAZILIAN BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (CEBDS)**

One of the founding companies of CEBDS and representative of the World Business Council for Sustainable Development (WBCSD) network. The initiative has nearly 60 national and regional councils in 36 countries and 22 industrial sectors.

### GETÚLIO VARGAS FOUNDATION - COMPANIES FOR THE CLIMATE

Braskem has been participating in the Companies for the Climate initiative since 2012, a business platform created by the Center for Sustainability Studies at the Getúlio Vargas Foundation (FGV).

### **BUSINESS CLIMATE FORUM (ETHOS INSTITUTE)**

In 2015, the Company extended its voluntary commitments to improving the levels of greenhouse gases reduction by signing the Open Letter to Brazil on Climate Change.

### **AKATU INSTITUTE**

Non-governmental, non-profit organization that works to promote conscious consumption. Braskem supports the Institute and sponsors the Edukatu program, an initiative aimed at sustainability education, launched in 2013.

#### TRATA BRASIL INSTITUTE

Civil Society Public Interest organization, aiming to coordinate national information and mobilization initiatives, so that Brazil may achieve universal access to basic sanitation.

### INTERNATIONAL DECLARATION ON CLEANER PRODUCTION

Part of the United Nations Environment Program (UNEP), seeks to disseminate environmentally clean production policies and more sustainable production and consumption practices.

### **BUSINESS COMMITMENT FOR RECYCLING (CEMPRE)**

A non-profit association dedicated to promoting recycling and integrated waste management.

### **PLASTIVIDA**

Entity that institutionally represents the industry production chain in order to promote the importance of plastic in modern life and promote its environmentally correct use, while prioritizing social responsibility initiatives.

### FISCAL CITIZENSHIP CENTER (CCIF)

Independent think tank whose goal is to contribute to simplifying the Brazilian tax system and improving the country's fiscal management model.



TO LEARN MORE
ABOUT THE FORUMS
AND ORGANIZATIONS
OF WHICH BRASKEM
IS A PART, THEIR
AGENDAS, AND HOW
BRASKEM IS ENGAGED,

www.braskem.com > voluntary commitments

# 03. Governance and Compliance

Global Compact - Principle 10

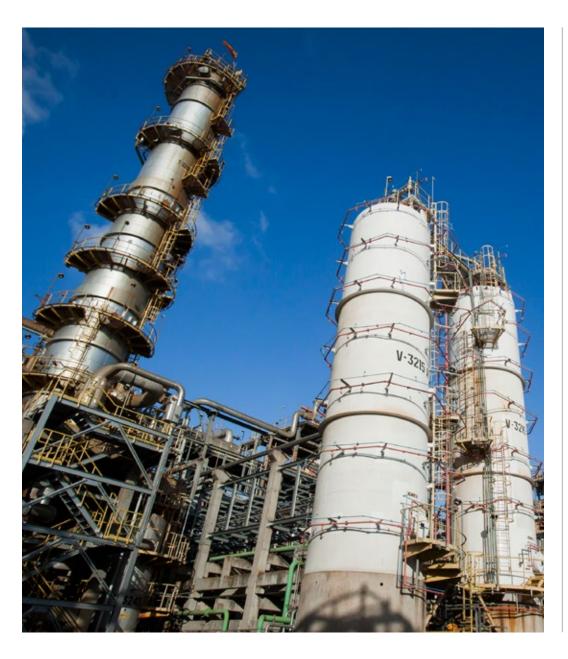


CREATION OF THE COMPLIANCE COMMITTEE, TO SUPPORT THE BOARD OF DIRECTORS. HIRING A
COMPLIANCE
OFFICER TO LEAD
THE COMPLIANCE
AREA AND REPORT
TO THE COMPLIANCE
COMMITTEE.

ACTING WITH ETHICS, INTEGRITY, AND TRANSPARENCY IN ITS BUSINESS POLICIES.







Braskem believes that action based on ethics, integrity, and transparency is essential to the Survival, Growth, and Perpetuity of its Business. This belief requires constant evaluation and updates of its Business Policies, among them those that govern Compliance. Thus, in 2016, the Company began a process of revising its structure, focusing on improving and strengthening compliance in business practices and processes.

This initiative aims to further improve the concepts and guidelines that drive the corporate actions of Braskem's Team Members and support relationships with Shareholders, Suppliers, Competitors, Governments, Communities, other stakeholders, and society in general, significantly reducing the possibility that deviations of a similar nature occur again. Search for evolution in these processes resulted in several

actions based on

market

excellence practices to ensure the implementation of a solid Compliance Program, such as the creation of a Compliance Committee composed of three Board Members, two of which are independent members who directly report to the Board of Directors. In addition, the Program also promoted: An increase in the number of independent members on the Board of Directors; an increase in the number of Compliance Members in the areas of Internal Controls, Risk Management, Compliance, and Internal Auditing; the approval of the Compliance Policy by the Board of Directors, which includes the Anti-Corruption, Antitrust, and Related Party Transactions Policies; the evaluation and improvement of Internal Controls regarding processes that have presented vulnerabilities in the past; outsourcing and improving the reporting channel, the "Ethics Line", and other initiatives.



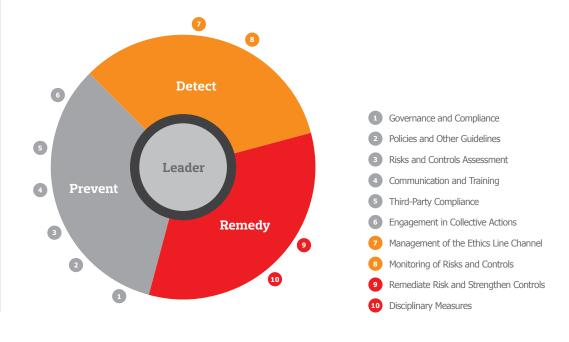
# BRASKEM COMPLIANCE PROGRAM

In 2016, Braskem reviewed its Governance and Compliance processes, focusing expanding security and protecting the Business. In this context, Braskem's Board of Directors approved the creation of the Compliance Committee directly related to it. In addition, the Company hired a new Compliance Officer and revised the scope and guidelines of the Compliance area in order to ensure greater independence and autonomy for carrying out its activities.

The new Braskem Compliance System is based on ten measures, structured in three pillars: Prevention, Detection, and Remediation. Prevention is always better and less costly than a cure. Thus, preventive measures are the most important ones to be implemented and followed, and should be made a priority for the Leaders, investments, and other uses of Braskem resources.

Practicing the Compliance System is everyone's responsibility, especially the Leaders', and must occur within the dynamics of the Action Program's planning cycle and commitment, and its monitoring, evaluation, and judgment, which permeates Braskem.

### **COMPLIANCE SYSTEM MODEL**



# COMPLIANCE MEASURES CASCADED INTO IN 151 INITIATIVES

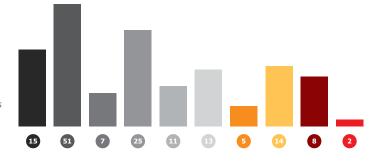
Since the beginning of the process review, ten new compliance measures have been established, already cascaded in 151 initiatives focusing on best governance practices.

- 01. Governance and Compliance
- 02. Policies and Other Guidelines
- 03. Risks and Controls Assessment
- 04. Communication and Training
- 05. Third-Party Compliance

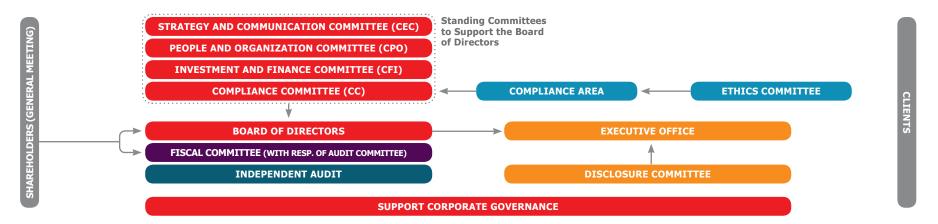
### ■ 06. Engagement in Collective Actions

- 07. Management of the Ethics Line Channel
- 08. Monitoring of Risks and Controls
- 09. Remediate Risk and Strengthen Controls
- 10. Disciplinary Measures

### **COMPLIANCE MEASURES BY SUBJECT**



### BRASKEM GOVERNANCE MODEL G4-34, G4-39



### GENERAL SHAREHOLDERS' MEETING (AG)

The General Shareholders' Meeting is the sovereign body, which has the power to decide all business related to the Company and to make the resolutions it deems appropriate for its defense and development.

#### **BOARD OF DIRECTORS (CA)**

Braskem's Board of Directors is an autonomous body of a collegiate nature, composed of eleven members and their respective alternates, six of whom are Independent Directors, elected or dismissed at any time by the General Meeting. Its Chairperson is not a Company executive. The term of office of the members of the Board of Directors is two years, and reelection is permitted.

# STANDING COMMITTEES TO SUPPORT THE BOARD OF DIRECTORS

The four Standing Support Committees are part of the Corporate Governance structure and aim to advise the Board of Directors on pre-established matters. The basic roles and responsibilities of

the Support Committees to the Board of Directors, as well as the basic guidelines for their constitution, are described in the Board of Directors' Rules of Procedure.

- Compliance Committee (CC) Created in 2016, the Committee has a Permanent Support nature to the Board of Directors regarding its continuous commitment to act with transparency and integrity, in accordance with best Governance practices and applicable laws, standards, and regulations, as well as with Company Policies, monitoring conduct based on principles and ethical values. In this way, the Committee is responsible for ensuring the monitoring of exposure to risks, internal control systems, and compliance with laws, standards, and regulations, among others.
- People and Organization Committee (CPO)

Its role is to evaluate, monitor,

and review Policies and Programs in force, regarding the aspects of People and Organization, such as Remuneration, Health, Safety, and Environment, and the Private Pension Program. In addition, the CPO reviews significant changes in macrostructure and replacement and succession of executives in strategic positions.

### • Finance and Investment Committee (IFC)

Evaluates new Policies, monitors analyzes the Policies in force regarding Financial Management, Insurance and Guarantees, Financial Risks Management, among others. It is also responsible for the investments subject to approval and investment monitoring. This committee is also responsible for contributing to the Braskem Business Leader Action Program proposal, prior to its presentation to the Board of Directors, focusing on analyzing the financial strategy, investment plan, and leverage goals.

### Strategy and Communication Committee (CEC)

Evaluates new Policies, monitors and analyzes the Corporate Policies current concerning Capital Markets, Social Responsibility, and Corporate Sustainability, as well as Institutional Image Programs. In addition, the Committee contributes to the general guidelines and assumptions used as the basis for the preparation of the Braskem Business Leader Action Program.

#### FISCAL COMMITTEE (CF)

Composed of five members and an equal number of alternates, the Fiscal Committee is an independent corporate body of Braskem's administration that supervises the acts of the administrators to ensure compliance with their legal and statutory duties, issuing opinions and providing information to the partners, and monitoring the internal audit. The committee has expanded powers,

as provided by the Sarbanes-Oxley

Act of the United States.

### **INDEPENDENT AUDIT**

Responsible for independently issuing opinions on the Financial Statements in accordance with current legislation.

### STATUTORY EXECUTIVE OFFICE

Officers are responsible for exercising the management of the Company's business and functional areas, as well as for implementing the General Policies and Guidelines established by the Board of Directors.

### **ETHICS COMMITTEE (CET)**

The Ethics Committee is an advisory and deliberative body whose purpose is to support the Compliance Committee in matters involving violations of the commitment to act ethically and with integrity and transparency. It is also responsible for evaluating and discussing the outcome of investigations of complaints in an exempt manner, treating all information and documents analyzed with absolute secrecy and confidentiality.

# Internationalization and Improvement of Compliance

The new structure of the Compliance area has also reinforced Braskem's protection in the face of the Company's more mature internationalization process, and for this, the team has already been planned with 20 Members who have global ramification. The guidelines are defined in the Brazilian matrix and passed on to representatives of other regions in the world with Braskem production units.

In 2016, the Company hired executives responsible for compliance to work in the United States and Mexico, and in 2017 will have a representative in Europe. They also have autonomy regarding their respective executive offices, since they report to the Braskem Compliance area.

# Compliance Policy and Organization

The implementation of the Compliance Policy and a new organizational structure brought improvements to the Company, but did not change its Organizational Culture. Based on the trust, delegation, and integration in relationships between Leaders and their Subordinates, in this new conceptual design, the Office's main function is to define Braskem's Compliance Guidelines and ensure its implementation by the respective areas.

It is up to the Leader to maintain their autonomy and delegation, managing the risks inherent to the Business and to the processes, executing and monitoring the controls, and fulfilling their responsibilities, accountability, and purposes.



## TRAINING IN COMPLIANCE

The teams in the Compliance area visited the Company's units to conduct training on Braskem's Compliance System, the regulatory environment, and the new guidelines. In 2016, the training focused on managers, directors, vice and advisers. who are responsible for disseminating the practices among the teams and ensuring compliance with standards and processes. In just three months, 16 workshops were held at ten different locations. reaching an audience of 416 participants.

In 2017, the center will also expand training to its Suppliers. New e-learning training related to specific issues in the Compliance Policy are being prepared and will be made available to key areas of the Company.



### **COMPLIANCE STRUCTURE**

In order to create value and contribute to Braskem's competitiveness, productivity, and reputation, the Compliance Department works to help define Guidelines and Policies, disseminate Culture and Integrity, evaluate and manage Corporate risks and improve the Controls and monitoring environment. The Braskem Compliance Department operates in four segments:

**Internal Controls:** responsible for ensuring the adequacy, strengthening, and operation of the Company's internal control system. Advises Leaders in assessing the internal control structure at the process level for management controls, SOX controls, and compliance controls, and supports them in developing processes and controls to manage transactional risks in a preventive manner, addressing possible vulnerabilities.

**Risk Management:** responsible for helping senior management identify corporate risks that may impact the possibility of attaining strategic objectives, as well as creating and protecting value for Shareholders. Supports Leaders in their responsibilities to identify risks with specialized technical and methodological risk management expertise. In addition, it assists Leaders in defining the action plans necessary to address the risks identified.

**Compliance:** responsible for supporting Leaders in disseminating the Culture of Integrity and adherence to internal laws and regulations. Provides and manages the Ethics Line Channel, enabling the reporting of conduct not in accordance with an ethical, integral, and transparent action by Team Members, Third Parties and Clients. Addresses all reports with independence and impartiality. The team is also responsible for conducting anti-corruption training for Team Members.

**Internal Audit:** responsible for the independent and objective evaluation of the processes, verifying their effectiveness and compliance, aiming to add value and improve Braskem's operations. To this end, in 2016, the team dedicated to structuring the area and developing an overall work plan, which was approved by the Compliance Committee in December 2016 and will be implemented beginning January 2017.



# Compliance Policy

The strengthening of Braskem's governance also involved the creation and approval of the Company's Compliance Policy.

Published in November 2016, the document was constructed based on guidelines determined by the Board of Directors and best practices in the market.

Braskem understands that operating with ethics, integrity, and transparency requires, on a continuous basis, the formalization and updating of its policies, including those on Governance and Compliance, as well as their effective implementation with an educational, preventive, and awareness-raising approach.

Braskem defines ten commitments assumed in this policy that must be implemented in a convincing, responsible, and unrestricted manner throughout Braskem, without exceptions or leniency.

#### THE TEN COMMITMENTS OF THE BRASKEM COMPLIANCE POLICY

- Fight and not tolerate corruption in any form, including extortion and bribery.
- Firmly and determinedly reject business opportunities that conflict with this commitment.
- Adopt ethical, integral, and transparent principles in relationships with public and private agents.
- Never cite cultural or normal market conditions as a justification for wrongdoing.
- Ensure transparency in information about Braskem, which must be accurate, comprehensive, and accessible, and disclosed on a regular basis.
- Be aware that deviations of conduct, whether by action, omission, or complacency, harm society, violate the law, and destroy the image of Braskem as a whole.
- Guarantee at Braskem, and throughout its value chain, the practice of the Compliance System, always up to date with the best benchmark references.
- Contribute individually and collectively to necessary changes in markets and in the environments where there may be incentive for deviations in conduct.
- Incorporate to the Team Members' Action Programs performance assessments to comply with the Compliance System.
- Be confident that this commitment will keep us on the path to Survival, Growth, and Perpetuity.

In 2017, all Team Members will receive a badge with the ten commitments for continuous ethical, integral, and transparent action.

# Communication: transparency in Relations with the Market and Internal Audience

G4-58

As part of its legal commitments, Braskem regularly sends a set of information to the Brazilian Securities Exchange and Commission (CVM) and the Paulo Stock Exchange (BM&FBOVESPA), and the New York Stock Exchange (NYSE), such as Standardized Financial Statements, Announcements, Material Facts, and others. In addition, members of the Board of Directors and the Fiscal Committee have an exclusive information channel, which may be accessed on the Braskem portal on the Internet, providing security, transparency, equity, and speed in the process of communicating with Shareholders.

the audience, internal Braskem's communication channel. View, (intranet), available in Portuguese, English, Spanish, disseminates and national Company regional news, corporate and business information, products, campaigns, internal processes, and acknowledgments.

### **Braskem Global Agreement**

G4-S05

In March 2015, as part of the "Operation Lava-Jato" investigation, allegations made about defendants in criminal proceedings were made public, according to which certain persons no longer linked to Braskem were involved in undue payments to obtain benefits through raw material contracts with Petrobras.

In view of these facts. Braskem immediately approved the hiring of law firms with ample and proven experience in similar cases in Brazil and the United States in order to conduct an internal and independent investigation of said allegations, which was performed under the supervision of and in collaboration with public authorities of the Department of Justice and the Securities and Exchange Commission of the United States (DoJ and SEC, respectively). By mid-July 2016, the internal investigation had not obtained evidence proving the existence of illicit facts at Braskem.

At the end of July 2016, Braskem received new information about deviations, revealed in the collaborations of former Braskem administrators in the context of Odebrecht's cooperation with the authorities.

Based on this information, the

internal investigation confirmed the existence of payments made by the Company between 2006 and 2014 to three companies located abroad, as commercial intermediation services, and it was not possible to prove the effective services provided by such companies. As Braskem's former administrators explained in their collaboration process, these companies only transferred resources to a number of other companies, which in the end made illicit payments to Braskem, involving issues such as the naphtha contract signed with Petrobras in 2009 and terminated in 2014, as well as changes in the federal and state tax legislation, to obtain tax incentives and monetization of tax credits that were already within the rights of Braskem.

After confirming the illicit acts, on October 3, 2016, Braskem began discussions with the DoJ and the SEC to formalize an agreement resolving all the illicit acts identified and to seek a simultaneous agreement with the Brazilian authorities, and later on, with the Swiss authorities.

As a result of these negotiations, on December 14, 2016, Braskem entered into a Leniency Agreement with the Federal Public Ministry (MPF). Shortly thereafter, on December 21, 2016, Braskem finalized the formal agreements with the DoJ and the SEC, as well as an agreement to terminate investigations by the Swiss Attorney General (in conjunction with the agreement with the MPF, Global Agreement). The Global Agreement includes all the facts ascertained up to the date of its execution involving Braskem under Operation Lava-Jato.

Under the terms of the Global Agreement, Braskem will pay the above-mentioned authorities, in Brazil and abroad, the approximate total value of US\$ 957 million, equivalent to nearly BRL 3.1 billion, which is approximately US\$ 95 million (nearly BRL 316 million) due to the DoJ, US\$ 65 million (nearly BRL 216 million) due to the SEC, close to CHF 95 million (approximately BRL 307 million) to the Swiss Attorney General, and approximately BRL 2.2 billion due to the MPF.

Also according to the Global Agreement, Braskem committed to undergo independent monitoring for a term of up to three years by monitors designated by the US and Brazilian authorities, who will verify Company compliance with the obligations assumed in the agreements and evaluate its Compliance Program, with the purpose of reducing the risk of deviations recurring in the Company.

# Code of Conduct: Ethics, Integrity, and Transparency

G4-56, G4-57

Acting in accordance with applicable laws, regulations, policies and best practices is a fundamental principle at Braskem. Effective Compliance represents an intangible asset for the Company to protect and strengthen the Business. Therefore, constant revision of the Compliance standards, as well as the Code of Conduct, is a best practice to

ensure that the Company adheres to the best global processes.

The content of the Code of Conduct is disseminated to all Team Members of the Company. The process included questionnaires on the subject and electronic signature of the terms of commitment with the guidelines of the Code. It is a

model that remains in force in order to ensure full assimilation of content by all Team Members.

Braskem's Code of Conduct is translated into all the languages of the countries where Braskem has operations. It may be accessed on the corporate intranet and the <u>Company's</u> website.

BRASKEM'S CODE OF CONDUCT HAS BEEN EXPANDED AND STRENGTHENED, AS PART OF THE COMMITMENT TO ETHICS, INTEGRITY, AND TRANSPARENCY, PRESENT IN THE COMPLIANCE POLICY, WITH A GLOBAL SCOPE AT BRASKEM.

IT DEFINES THE VALUES, PRINCIPLES AND PRACTICES THAT GUIDE THE COMPANY'S CORPORATE CONDUCT.

# **Pacts to Fight Corruption**

Braskem is committed to playing an important role in the fight against corruption, working to promote a more ethical and integral business market. As part of this objective, the Company is a signatory of the Business Pact for Integrity and against Corruption, an initiative of the Ethos Institute of Companies and Social

Responsibility. Braskem also actively participates in the Integrity Working Group, which assists in the implementation of policies that promote integrity and fight corruption, and mobilizes companies and business entities.

The Company is also a signatory to the UN Global Compact,

an initiative that encourages companies to adopt best governance practices. Braskem participates effectively in the Anti-Corruption Working Group, promoted by the Global Compact Brazil Network, contributing to the development of corporate actions that fight corruption in all its forms, including extortion and bribery.

Participation in collective actions through associations with other companies and entities is a way of expressing the commitment of the Braskem Leaders to sharing experiences, results, and actions, to influencing and being influenced by best practices, and to promoting improvements to the conditions of its markets and environments.



## Ethics Line Channel

G4-58

Cross-sectionally, Braskem provides the Ethics Line Channel in which all stakeholders may, in a safe and responsible manner, contribute information in order to maintain a sound, ethical, transparent, and productive corporate environment. This channel is accessible via the Internet on the Company's website, or through a tollfree number in the languages of the countries in which Braskem operates. All the information received on the investigated, Channel confidentiality respecting and independence, ensuring the anonymity of the whistle blowers and the security of the investigation.

In 2017, the Ethics Line Channel will change and evolve. The system will be outsourced and specialized, providing greater impartiality and independence. The service will be customized, will operate 24 hours a day, and will be a reference tool for managing reports.

### MAIN RESULTS OF THE ETHICS LINE CHANNEL IN 2016

G4-HR3

Of the 85 cases opened in 12 founde 2015, a total of 31 were measures: brought to 2016 under • 2 analysis and had their • 2 investigations closed during • 2 the year. • 1

106 cases opened in 2016

began the year 2017 in the

investigation process.

19 unfounded cases were closed.

Of the 85 cases opened in 12 founded cases were filed, which resulted in the following remediation 2015. a total of 31 were measures:

- 2 Team Members terminations
- 2 Team Members warnings or suspensions
- 2 notifications to Partners
- 1 Partner removal
- 3 process improvements

Of these, 62 analyses were completed and filed in 2016, of which 36 were founded and 26 were unfounded.

Based on 36 founded cases, the following remedial measures were addressed by Compliance:

- 8 Team Members terminations
- 11 feedback events/warnings/suspensions to Team Members
- 5 partner removals
- 2 cancellations of contracts with partner companies
- 2 notifications/alignments to partner companies
- 5 process/control improvements

Of these founded cases, three involved discrimination\* and the respective remediation measures were:

- 1 Team Member termination
- 1 Team Member warning/suspension
- 1 partner removal.

\*Discrimination: Includes Mobbing, Sexual Harassment, and Abuse of Power.

Of the 44 cases from 2016 that started 2017 in the investigation process, 17 were completed and presented to the Ethics Committee on March 24, 2017, 44 cases opened in 2016 and 12 will be presented to the Ethics Committee scheduled for May 2017.

Ethics Line cases are archived at the Ethics Committee's quarterly meetings.

The last meeting in 2016 took place on December 12.

### WEBSITE

www.ethicslinebraskem.com

### TOLL-FREE NUMBERS:

- Germany: 0800-183-0763
- Brazil: 0800-377-8021
- United States: 1-800-950-9280
- Holland: 0800-022-1787
- Mexico: 01-800-681-6940



# 04. Financial Performance

BRL 11.5 billion

RECORD EBITDA IN BRAZILIAN REAIS (BRL 11.5 BILLION) AND IN DOLLARS (US\$ 3.3 BILLION)

- BRAZIL: BRL 8.5 BILLION
- THE US AND EUROPE: BRL 2.5 BILLION
- MEXICO: BRL 530 MILLION

4%

IN 2016, RESIN PRODUCTION IN BRAZIL WAS 4.9 MILLION TONS, 4% HIGHER THAN 2015.

8.5 million tons

BASIC
PETROCHEMICALS:
PRODUCTION OF
8.5 MILLION TONS
IN 2016, 3%
HIGHER THAN 2015
AND A HISTORICAL
RECORD FOR THE
COMPANY.

BRL 3 billion
VINYLS: NET SALES REVENUE OF

VINYLS: NET SALES REVENUE OF BRL 3 BILLION IN 2016, AN INCREASE OF 9% OVER THE PREVIOUS YEAR.

2%

IN THE UNITED STATES AND EUROPE, BRASKEM'S PRODUCTION AND SALES VOLUME REACHED 2 MILLION TONS IN THE YEAR, A GROWTH OF 2% OVER THE PREVIOUS YEAR. Polyolefins:

HISTORICAL RECORD OF PRODUCTION OF POLYETHYLENE IN 2016, WITH 3.151 KTON. 1.7
million tons

HISTORICAL
RECORD OF
EXPORTS: 1.7
MILLION TONS,
24% EXPANSION
COMPARED TO 2015.

**42**%

ALSO IN THE RAMP-UP PROCESS, THE UTILIZATION RATE OF POLYETHYLENE (PE) PLANTS IN THE YEAR WAS 42%, WITH A PRODUCTION VOLUME OF 443 KTONS.





92%

all time record in the use of Brazilian petrochemical plants.

# BRASKEM OPERATIONS: SOUNDNESS AND RECORD RESULTS IN 2016

G4-EC1

The maturing of Braskem's global presence, coupled with greater gains in productivity from the improvement and synergy between operating and commercial units, ensured the Company's positive results in 2016.

In 2016, Braskem registered a record EBITDA in reais (BRL 11.5 billion) and in dollars (US\$ 3.3 billion), which represented growth of 23% and 18%, respectively, compared to the previous year. This improvement is mainly explained by good operating performance, a healthy level of resin spreads in the international market, a higher volume of Brazilian exports, the performance of US and European operations, and the beginning of the contribution of the Petrochemical Complex in Mexico.

In Brazil, the Company took advantage of the synergy with its commercial offices around the world and prioritized operational efficiency initiatives to increase the average utilization rate of the domestic petrochemical plants, whose index reached a record 92% in the year, 3 p.p. over the previous year. The result was achieved even after a planned shutdown of the Bahia power station for approximately 40 days during the fourth quarter of the year, as well as the poor performance of national economic activity.

Due to good operating performance, resin production in Brazil was 4.9 million tons in 2016, 4% higher than 2015. In the year, Braskem's strategy remained in service of the Brazilian market, guaranteeing exports of volume not sold in the Brazilian market due to weaker demand. In this Brazilian exports scenario, reached a historical record, totaling 1.7 million tons, a 24% expansion compared to 2015. The EBITDA of Brazilian units in 2016, including exports, was BRL 8.5 billion, representing 74% of the consolidated result of the Company's segments.

In the United States and Europe, Braskem's production and sales volume reached 2 million tons in the year, a 2% growth over the previous year, reflecting an average operating rate of 100%, which was 2 p.p. higher than 2015, both historical records for the units. The result was achieved due to the units' good operating performance, together with a stronger demand for polypropylene in the regions, especially in the American market, and also due to better spreads in these regions.

The highlight of the year was the scheduled shutdown at the Marcus Hook polypropylene plant in Pennsylvania, USA, where improvements were made to increase nominal production capacity by 64 kton per year.

## COMMISSIONING THE UTEC PLANT IN THE UNITED STATES

In 2016, Braskem commissioned its first Ultra-High Molecular Weight Polyethylene (UHMWPE) plant in the United States in La Porte, Texas. The unit will enable better customer service in North America and Europe, and starts operations supported by improvements at the Pittsburgh Innovation and Technology Center in the United States aimed toward increasing research and development capacity in UHMWPE. The resin, developed from Braskem's own technologies, is eight times lighter than steel and ten times more durable than high density polyethylene (HDPE). Its diverse applications cover sectors such as automotive and transportation, electronics, fiber and textiles, industrial and heavy machinery, material handling, oil and gas, pipelines and mining, porous plastics, and recreation.

### FLEXIBILITY OF RAW MATERIALS IN BAHIA

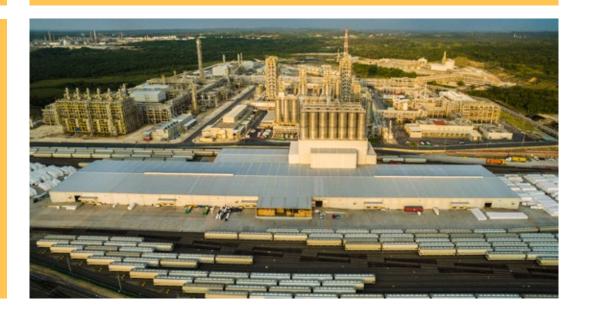
As part of the strategy to expand the diversification of raw materials for production, Braskem has made progress with the project at the Camaçari plant in Bahia (Brazil) toward making it suitable to receive ethane. With an investment of BRL 380 million and beginning operations scheduled for the second half of 2017, the project includes modernizing the industrial unit and adapting the region's port infrastructure. By the end of 2016, Braskem had already invested BRL 120 million. In addition, the Company entered into a supply agreement with an affiliated company of Enterprise Products Partners L.P. (NYSE: EPD) for ethane imported from the United States. The term of the agreement is ten years and price based on the international benchmark Mont Belvieu.

### BRASKEM IDESA REACHES AN AVERAGE UTILIZATION RATE OF 73% IN ITS FIRST YEAR OF ACTIVITY

The year 2016 was also highlighted by the contribution of the result of the first year of operations of the Braskem Idesa Petrochemical Complex in Mexico. In line with the estimates planned for the first year of activities, the unit recorded an average operating rate of 42% of the polyethylene plants and EBITDA of US\$ 163 million (BRL 530 million), representing 5% of the total consolidated EBITDA of Company segments.

In 2016, the focus was mainly on stabilizing the production of the Petrochemical Complex, consolidating the service and relationship with Mexican Clients, and exporting in synergy with Braskem's operations in other regions.

It is important to highlight the operational evolution of the Complex over the period. After the cracker's departure in March, the three polyethylene plants began operation in June, which enabled the average plant utilization rate to reach 42% in the second half of 2016, reaching 73% in the fourth guarter.



# IMPACTS OF THE GLOBAL LENIENCY AGREEMENT

Under the Global Agreement, Braskem will pay the authorities, in Brazil and abroad, the total approximate amount of US\$ 957 million, equivalent to approximately BRL 3.1 billion. Of this total, approximately US\$ 95 million will be paid in cash to the United States Department of Justice (DoJ), US\$ 65 million to the United States Securities and Exchange Commission (SEC), approximately CHF30 million to the Attorney General of Switzerland and nearly BRL 736 million to the Federal Public Prosecutor (MPF). The remaining balance will be paid by the Company as of 2018, with approximately BRL 1.5 billion to the MPF, divided into six annual payments restated according to the variation of the IPCA8 index, maturing on January 30 of each year, and approximately CHF64 million to the Attorney General of Switzerland, divided into four annual payments, due on June 30 of each year.

Due to the provision of the fine referring to the Global Agreement in the fourth quarter of 2016, the

Company recorded a consolidated net loss of BRL 2.6 billion in 4Q16, and BRL 729 million for the year. Loss attributable to shareholders for the year was BRL 411 million.

Except for the amount of the Global Agreement mentioned above, as well as other nonmonetary penalties imposed on Braskem under the terms of said agreement, the Company is not able to predict or measure at this time the extent of the financial and non-financial impacts, if any, that the confirmation of the allegations, possible actions of other authorities, parallel investigations, or the execution of the Global Agreement may cause for the Company, or the resources that may be necessary to remedy such occurrences.

The Global Agreement may have an adverse material effect on Braskem's business, reputation, financial condition, and operating results, as well as on liquidity and the price of securities issued by Braskem.

### **RISK RATING AGENCIES**

In 2016, Braskem maintained the investment grade rating by Standard & Poor's and Fitch Ratings (BBB-) and presented a credit risk above the sovereign by the three largest risk rating agencies:

Fitch Ratings: in September 2016, Fitch reaffirmed Braskem's global scale rating as BBB-and changed the outlook from negative to stable. This change was supported by the Company's strong cash generation,

diversification of the raw material matrix by beginning operation at the Braskem Idesa Petrochemical Complex (Mexico), the cash position maintained abroad, and the availability of a revolving credit line available for withdrawal.

**Standard & Poor's:** despite the downgrade of Brazil's sovereign rating by S&P in February, Braskem had its global rating reaffirmed at BBB- with a negative outlook, driven by Braskem's solid cash position

and the fact that the Company has operations outside of Brazil.

Moody's: in February, Moody's downgraded Brazil's sovereign rating and maintained the negative outlook. According to the agency's scale, the grade fell two steps to Ba2. In this sense, following the drop of the sovereign rating, Moody's lowered Braskem's risk rating by one grade to Ba1. Even with the downgrade, Braskem has a risk rating above the sovereign.



8 Broad National Consumer Price Index

# RAW MATERIALS AND SOUND PETROCHEMICAL SPREAD LEVELS

The average international spread of thermoplastic resins produced by Braskem in Brazil remained at a sound level, reaching US\$ 677 per ton in 2016, down 3% from the previous year's average spread.9

Polypropylene (PP) spreads in the United States were US\$ 702/t, which was 24% higher than the previous year, due to a combination of a larger propylene supply and greater PP demand in the US market. For the year, the average price of propylene in the American Gulf (USG) was 12% lower compared to 2015, reaching US\$ 759 per ton due to the greater availability of the input in the region.<sup>10</sup>

Also in 2016, the average oil price was US\$ 43 per barrel, 17% lower than the average price in the previous year. This drop was reflected in the average price of naphtha in the international market in 2016, of US\$ 385/t, a drop in line with the drop in oil prices when compared to the previous year.

### **NET REVENUE 2016**

Braskem's consolidated net revenue reached US\$ 13.7 billion, which was 3% lower than in the previous year. The decline was explained by the 8% drop in the prices of resins and basic petrochemicals in the international market, due to lower oil prices and the new resin capacities, especially polypropylene, that began operating in China during the year. Another factor contributing to the decline was the

decrease in sales volume in the domestic market, which dropped 1% compared to 2015.

In Brazilian reais, consolidated net revenue was BRL 47.7 billion, which was 2% higher than in the previous year due to the depreciation of the Brazilian real from one period to the next. Excluding from the analysis the resale of naphtha/condensate, revenue increased by 1% in dollars and 6% in Brazilian reais.



9 Difference between the price of petrochemicals and the price of naphtha, ethane, and propane for the raw material mix used in the Brazilian units. 10 Difference between the price of US PP and US propylene.



# Results by Operational Segment in Brazil

G4-EC1

The result of Braskem in Brazil is composed of the following segments: Basic Petrochemicals, Polyolefins, Vinyls, and Chemical Distribution.

### 1. BASIC PETROCHEMICALS

Production in 2016 was 8.5 million tons, 3% higher than 2015 and a Company historical record, while the average utilization rate in the year was 92%, an increase of 3 p.p. compared to 2015, highlighting the petrochemical plants of São Paulo, Rio Grande do Sul, and Rio de Janeiro. The Petrochemical Plant of Rio de Janeiro also stands out, due to the greater supply of ethane raw material, with a record utilization rate.

The segment's net sales revenue in the Brazilian market reached BRL 19.5 billion, a 1% growth over the previous year, driven by greater sales volume of the main basic petrochemicals to third parties, especially the redirection of sales of gasoline for the domestic market, showing a growth of 66% compared to the previous year.

The volume of export sales was impacted mainly by the replacement of the exported volume of propylene for supply to the Client in the acrylic complex in Bahia and by the higher volume of transfer to the Polyolefins segment for PP production. The result was 705 kton, 7% less than the volume recorded in 2015, which was partially compensated by the increase in benzene and butadiene exports.

Net revenue for exports was BRL 5.6 billion, up 13% from that in 2015, due to the higher average exchange rate between 2016 and 2015, in addition to better prices of some basic petrochemicals in the international market, especially butadiene.

### STRUCTURE OF THE BASIC PETROCHEMICAL SEGMENT

The Basic Petrochemicals segment owns and operates four petrochemical complexes in Brazil (Camaçari, Triunfo, São Paulo, and Rio de Janeiro), where olefins, aromatics, and utilities are produced. The total annual ethylene production capacity of these industrial units is 3,952 kton, approximately 78% of which is naphtha-based, 16% is gas based, and the rest is ethanol-based. Of the total ethylene produced by the Basic Petrochemicals units, nearly 80% is transferred for consumption in the Company's Polyolefins and Vinyls units. The segment's annual propylene production capacity totals 1,585 kton and approximately 65% is transferred for consumption in the Company's Polyolefins segment.

FINANCIAL OVERVIEW (BRL MILLION) BASIC PETROCHEMICALS	4T16 (A)	3T16 (B)	4T15 (C)	VAR. (A)/(B)	VAR. (A)/(C)	2016 (D)	2015 (E)	VAR. (D)/(E)	
Net Sales Revenue	6,548	6,409	6,297	2%	4%	25,063	24,270	3%	
Cost of Goods Sold	(5,315)	(5,194)	(5,247)	2%	1%	(20,266)	(20,053)	1%	
Gross Income	1,233	1,215	1,051	2%	17%	4,796	4,217	14%	
Gross Margin	19%	19%	<b>17</b> %	0 p.p.	2 p.p.	19%	<b>17</b> %	2 p.p.	
SG&A	(186)	(198)	(202)	(6%)	(8%)	(698)	(659)	6%	
Other Operating Income (Expenses)	(268)	(44)	(159)	507%	69%	(374)	(178)	110%	
EBITDA for the Segment	1,076	1,274	986	(16%)	9%	4,910	4,440	11%	
EBITDA Margin for the Segment	16%	20%	16%	(3 p.p.)	1 p.p.	20%	18%	2 p.p.	

5.6

**BILLION** 

is the net revenue from exports, up 13% from 2015.

### 2. POLYOLEFINS

The production of the Polyolefins segment in 2016 was 4,301 kton, a record production of polyethylene. The result was obtained due to the better utilization rate of the polyethylene (PE) and polypropylene (PP) plants, which also includes the production of Green Polyethylene made from renewable raw material.

The average utilization rate of

PE plants was 89% for the year, a growth of 2 p.p. compared to 2015, mainly influenced by the better performance of plants located in the states of São Paulo and Rio de Janeiro. In PP plants, the average utilization rate for the year was 86%, which was 10% higher than in 2015, influenced by the better performance of the plants located in the state of São Paulo and in the complex in Rio de

Janeiro (both in Brazil), as a result of the improvement in the propylene supply from the Basic Petrochemical segment.

The net sales revenue of the Polyolefins segment totaled BRL 20.3 billion, a growth of 2% compared to 2015. In the Brazilian market, the result was driven by a greater volume of exports and better prices in the international market.

### STRUCTURE OF THE POLYOLEFINS SEGMENT

The Polyolefins segment consists of 18 polyethylene (PE) and polypropylene (PP) plants in Brazil, including the production of Green Polyethylene made from renewable raw material (sugar cane). The industrial operations include PE and PP plants located in the petrochemical complexes in Triunfo, Camaçari, São Paulo, Paulínia, and Rio de Janeiro, with a total production capacity of 3,055 kton of PE, with 200 kton of Green PE, and 1,850 kton of PP.

:	FINANCIAL OVERVIEW (BRL MILLION) POLYOLEFINS	4T16 (A)	3T16 (B)	4T15 (C)	VAR. (A)/(B)	VAR. (A)/(C)	2016 (D)	2015 (E)	VAR. (D)/(E)	
	Net Sales Revenue	4,730	5,170	4,785	(8%)	(1%)	20,307	19,986	2%	
	Cost of Goods Sold	(3,731)	(4,090)	(3,659)	(9%)	2%	(16,041)	(15,461)	4%	
	Gross Income	999	1,079	1,126	(7%)	(11%)	4,266	4,525	(6%)	
	Gross Margin	21%	21%	24%	0 p.p.	(2 p.p.)	21%	23%	(2 p.p.)	
	SG&A	(348)	(327)	(348)	7%	0%	(1,304)	(1,225)	6%	
	Other Operating Income (Expenses)	(64)	(22)	(63)	193%	3%	(120)	(131)	(8%)	
	EBITDA for the Segment	694	849	829	(18%)	(16%)	3,291	3,647	(10%)	
	EBITDA Margin for the Segment	15%	16%	17%	(2 p.p.)	(3 p.p.)	16%	18%	(2 p.p.)	

### 3. VINYLS

The Vinyls segment had net sales revenue of BRL 3 billion in 2016, a 9% growth over the previous year. This increase is mainly explained by higher levels of PVC prices in the international market and by the greater export efforts adopted by the Company to compensate for the recession of the domestic market.

In 2016, exports showed a 79% increase compared to 2015. In the Brazilian market, sales totaled

528 kton, maintaining the same level recorded in 2015, since, despite the market recession, the Company increased sales to the Agribusiness sector (irrigation tubes), reaching a market share of 52%, which was 1 p.p. higher than in 2015.

In 2016, the average utilization rate of PVC plants was 84%, an increase of 7 p.p. over 2015, and production volume increased by 10% compared to the previous year.

### STRUCTURE OF THE VINYLS SEGMENT

The Vinyls segment consists of the industrial and commercial operations of the PVC, chlorine, and caustic soda units, as well as other products such as hydrogen and sodium hypochlorite. Industrial operations include three PVC plants and two chlorine-soda plants located in the petrochemical complex in Camaçari and Alagoas. The Company's annual production capacity for PVC and caustic soda is 710 kton and 539 kton, respectively.

FINANCIAL OVERVIEW (BRL MILLION) VINYLS	4T16 (A)	3T16 (B)	4T15 (C)	VAR. (A)/(B)	VAR. (A)/(C)	2016 (D)	2015 (E)	VAR. (D)/(E)
Net Sales Revenue	794	740	724	7%	10%	3,016	2,780	9%
Cost of Goods Sold	(732)	(698)	(568)	5%	29%	(2,834)	(2,416)	17%
Gross Income	62	43	156	45%	(60%)	183	364	(50%)
Gross Margin	8%	6%	22%	2 p.p.	(14 p.p.)	6%	13%	(7 p.p.)
SG&A	(68)	(62)	(64)	9%	6%	(241)	(225)	7%
Other Operating Income (Expenses)	(48)	0	(42)	-	14%	(49)	(27)	83%
EBITDA for the Segment	38	75	108	(50%)	(65%)	241	355	(32%)
EBITDA Margin for the Segment	5%	10%	15%	(5 p.p.)	(10 p.p.)	8%	13%	(5 p.p.)



# 4. CHEMICAL DISTRIBUTION (QUANTIQ)

Despite a higher sales volume, influenced mainly by the better performance of commodities such as methanol and caustic soda, the segment's net revenue ended 2016 with a result 9% lower than the previous year, totaling US\$ 239 million. In Brazilian reais, net revenue was BRL 831 million, down 5% compared to net revenue in 2015. It should be noted

that the results of quantiQ were reported in the Financial Statements of the report, but are not included in social and environmental indicators. Its management was already carried out independently even before the sale of the company. quantiQ was sold on 1/10/2017 (signing), with closing of the transaction on 4/03/2017 (closing).

### STRUCTURE OF THE CHEMICAL DISTRIBUTION SEGMENT

The Chemical Distribution segment has a portfolio of over 1,500 products. Products are classified as commodities, performance chemicals, and specialty chemicals.

FINANCIAL OVERVIEW (BRL MILLION) CHEMICAL DISTRIBUTION	4T16 (A)	3T16 (B)	4T15 (C)	VAR. (A)/(B)	VAR. (A)/(C)	2016 (D)	2015 (E)	VAR. (D)/(E)	
Net Sales Revenue	190	217	239	(12%)	(20%)	831	875	(5%)	
Cost of Goods Sold	(153)	(174)	(195)	(12%)	(21%)	(667)	(693)	(4%)	
Gross Income	37	43	44	(14%)	(16%)	164	182	(10%)	
Gross Margin	19%	20%	18%	0 p.p.	1 p.p.	20%	21%	(1 p.p.)	
SG&A	(31)	(35)	(32)	(11%)	(3%)	(133)	(123)	8%	
Other Operating Income (Expenses)	(1)	(1)	(2)	(36%)	(66%)	(1)	(5)	(87%)	
EBITDA for the Segment	6	8	11	(18%)	(44%)	36	59	(40%)	
EBITDA Margin for the Segment	3%	4%	5%	0 p.p.	(1 p.p.)	4%	7%	(3 p.p.)	

### **OPERATING RESULTS ABROAD**

Braskem's results abroad are composed of the industrial and commercial polypropylene units in the United States and Europe, and the Braskem Idesa Petrochemical Complex in Mexico.

### **UNITED STATES AND EUROPE**

Due to the increased demand European markets during 2016, the Company recorded positive results when compared to the previous year. In the period, sales volume of polypropylene (PP) increased 2% compared to 2015, due to the better operating performance of the Company's units and increased

demand, especially in Europe. for polypropylene in the US and 
The Company's net revenue reached US\$ 2.6 billion, which was 3% higher than in the previous year, due to the increase in the price of PP in the US market and the increase in sales volume. In Brazilian reais, net sales revenue grew 8% due to the exchange rate appreciation during the period.



### **BRASKEM BUSINESS STRUCTURE** IN THE US AND EUROPE

Braskem has six industrial plants in the US and two in Europe, with annual production capacity of 2,115 kton, of which 1,570 kton are in the United States and 545 kton in Europe.

FINANCIAL OVERVIEW (US\$ MILLION) UNITED STATES AND EUROPE	4T16 (A)	3T16 (B)	4T15 (C)	VAR. (A)/(B)	VAR. (A)/(C)	2016 (D)	2015 (E)	VAR. (D)/(E)
Net Sales Revenue	607	636	615	(5%)	(1%)	2,548	2,478	3%
Cost of Goods Sold	(472)	(446)	(462)	6%	2%	(1,750)	(2,093)	(16%)
Gross Income	135	190	153	(29%)	(12%)	798	384	108%
Gross Margin	22%	30%	25%	(7,7 p.p.)	(2.7 p.p.)	31%	16%	15.8 р.р.
SG&A	(48)	(46)	(37)	5%	31%	(162)	(134)	21%
Other Operating Income (Expenses)	(4)	0	(3)	-	56%	(3)	(2)	(12%)
EBITDA for the Segment	103	161	131	(36%)	(22%)	695	317	120%
EBITDA Margin for the Segment	17%	25%	21%	(8.5 p.p.)	(4.5 p.p.)	27%	13%	14.6 р.р.
Net Sales Revenue – BRL million	1.997	2.066	2.363	(3%)	(15%)	8.896	8.240	8%
EBITDA for the Segment - BRL million	336	524	492	(36%)	(32%)	2,461	1,110	123%

### **MEXICO**

In the first year of operation, the average utilization rate of the polyethylene plants at the Braskem Idesa Petrochemical Complex was 42%, registering 443 kton of PE production in 2016. In the year, 431 kton of PE were sold, including resale of resins, to meet the Mexican demand for grades that are not yet produced during the ramp-up phase of the plants.<sup>11</sup>

Of the total sold, 46% were to the Mexican market and the

rest was exported to several regions, among which are Asia, Europe, and the United States.

In Mexico, the sales price for polyethylene (PE) is referenced in the price of resins traded in the American Gulf region, whose average amount in 2016 was US\$ 1,115/t, which was 9% below 2015. In this scenario, the net revenue recorded in 2016 was BRL 1.6 billion (US\$ 474 million).



### BUSINESS STRUCTURE OF BRASKEM IDESA

This business segment consists of an ethane-based cracker, two high density polyethylene (HDPE) plants, and one low density polyethylene plant (LDPE) with annual production capacity of 1,050 kton of PE. Since May 2016, the result of Braskem Idesa is no longer registered as a project and became a reportable operating segment. The same occurred with the result of the LDPE plant, but only as of August 2016.

FINANCIAL OVERVIEW (BRL MILLION) MEXICO*	4T16 (A)	3T16 (B)	4T15 (C)	VAR. (A)/(B)	VAR. (A)/(C)	2016 (D)	2015 (E)	VAR. (D)/(E)
Net Sales Revenue	714	538	-	33%	-	1,587	-	-
Cost of Goods Sold	(428)	(325)	-	32%	-	(1,017)	-	-
Gross Income	286	214	-	34%	-	570	-	-
Gross Margin	40%	40%	-	0.4 p.p.	-	36%	-	-
SG&A	(73)	(79)	-	(8%)	-	(246)	-	-
Other Operating Income (Expenses)	(27)	(43)	-	(37%)	-	(125)	-	-
EBITDA for the Segment	336	214	-	<i>57</i> %	-	530	-	-
EBITDA Margin for the Segment	47%	40%	-	7.3 p.p.	-	33%	-	-

<sup>11</sup> Ramp-up is a term used in economics and business to define the early stage of industrial production

# 05. Innovation

Global Compact - Principles 7, 8 and 9

BRL 275 million in

ANNUAL EXPENDITURES ON INNOVATION AND TECHNOLOGY

334

PROJECTS FOR THE DEVELOPMENT OF NEW PRODUCTS AND PROCESSES

12.4%

IN THE LAST THREE YEARS, 12.4% OF THE SALES GENERATED BY THE POLYOLEFIN UNIT IN BRAZIL WERE BASED ON PRODUCTS DEVELOPED BY THE INNOVATION AREA

Development of the each of the

Development of a new Master Plan to increase the use of each country's natural talent for Research and Development

2 INNOVATION & TECHNOLOGY CENTERS: TRIUNFO (BRAZIL) AND PITTSBURGH (UNITED STATES) BRL 1.3 billion

FROM 2011 TO 2016, BRASKEM'S DISBURSEMENTS IN INNOVATION AND TECHNOLOGY TOTALED BRL 1.3 BILLION

€ 5 million

INVESTMENT IN A NEW TECHNICAL CENTER IN GERMANY, REFLECTING BRASKEM'S PROGRESS IN ITS INTERNATIONALIZATION PROCESS, FOCUSING ON LOCAL CUSTOMER SERVICE

Braskem's strategic vision is to support the development of the industry with investments in innovation and technology. The dynamics of its business activity, influenced directly by the constant oscillation of prices of commodities, requires that the Company keep below the industry average cost curve, something that can only be achieved by developing new solutions that provide greater gains in production efficiency.

In addition, as a result of the Company's global commitment to improving sustainability, innovations are also fundamental to reducing the environmental impacts inherent to large-scale industrial production and to generating new businesses resulting from disruptive creations that can guarantee the exclusivity of supply by protecting the patent right.



# Innovation Structure

In 2016, Braskem improved its innovation and technology structure, equipping units and reformulating processes and strategies for research and development (R&D).

IN DECEMBER 2016, THE PORTFOLIO FOR THE DEVELOPMENT OF NEW PRODUCTS AND PROCESSES HAD TOTALED A POTENTIAL NET PRESENT VALUE OF BRL 8.5 BILLION.

### **INNOVATION IN FIGURES**



Team Members



Pilot plants



Renewable Chemicals Research Center in Campinas (SP)



Projects for the development of new products and processes



Technical Centers: Wesseling (Germany) and Coatzacoalcos (Mexico)



Technology and Innovation Centers: Triunfo (Brazil) and Pittsburgh (United States)



Process Technology Development Center in Mauá (SP)



New patent applications and 73 patent extensions

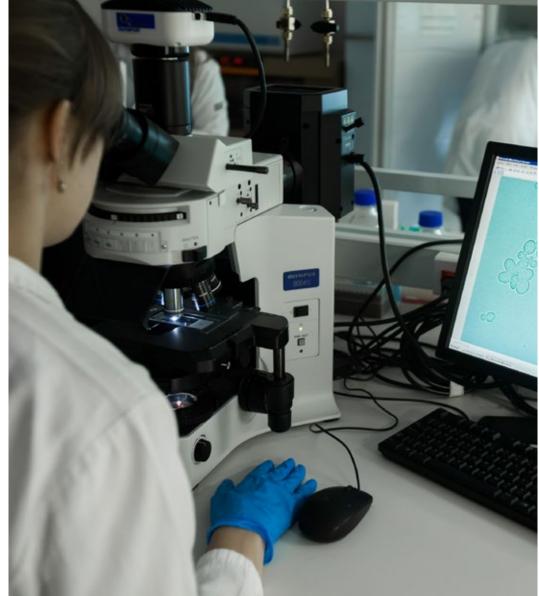
# Innovation Processes

As part of the area's efforts, Braskem has consolidated a master plan for investments in innovation activities. Based on this new global action dynamic, Braskem aims to increase the use of each country's natural talent for research and development of innovation, while stimulating integration among its different units.

The Company makes decisions on innovative projects and investment policies in science with the support of the Scientific Advisory Group, consisting of five external members, in five distinct areas of expertise: Science of matter, macromolecular chemistry, polymer catalysis, process and thermodynamics, and renewable chemicals.

In 2016, meetings were held focusing on Braskem's Innovation and Technology programs, in order to evaluate efforts undertaken in innovation based on scientific opinion and in view of global technological trends.





# Investments

From 2011 to 2016, Braskem's disbursements in innovation and technology totaled BRL 1.3 billion. This is a strategic investment, since it also serves to support innovation initiatives

carried out jointly with clients and partners. Contributions to new structures and purchases of equipment in 2016 totaled BRL 31 million.

# TECHNOLOGY AND INNOVATION CENTER, TRIUNFO (RS)

Among the most outstanding contributions during the year was the investment of BRL 2.2 million to qualify the Technology and Innovation Center in Triunfo (RS). Rotomoulding equipment was acquired, a segment characterized by the production of large, hollow pieces, such as water tanks, cisterns, children's playgrounds,

kayaks, and agricultural parts, mainly geared toward the civil construction and retail markets. The investment also includes a micronizer and auxiliary equipment that will be used to support Clients with the new developments. The inauguration event of the new laboratory will take place in 2017.

# TECHNOLOGY AND INNOVATION CENTER, PITTSBURGH (UNITED STATES)

At the Technology and Innovation Center in Pittsburgh, Braskem invested US\$ 845,400 (BRL 2.3 million) in upgrading the Nuclear Magnetic Resonance (NMR) equipment. NMR is one of the most powerful structural analysis tools available in polymer science laboratories. The investment allows Braskem to access this state-of-the-art technique and seeks to expand and intensify the understanding of modified polymer resins and catalysts.

# INAUGURATION OF THE TECHNICAL CENTER IN EUROPE - WESSELING (GERMANY)

With a €5 million investment, the new Wesseling Technical Center is a reflection of Braskem's progress in its internationalization process and reinforces its commitment to Clients and the European market in developing new products and applications, which will contribute to expanding the portfolio and the technical assistance provided.

# PROCESS TECHNOLOGIES DEVELOPMENT LABORATORY (LDTP)

Located at the Mauá petrochemical complex in São Paulo (Brazil), the LDTP received an investment of BRL 4.4 million in 2016 to modernize and acquire equipment, which will make it possible to strengthen the development of resin production process technologies, basic petrochemicals, and specialties.



# Products and Solutions Development

G4-8, G4-EN27

Braskem's growth strategy is based on developing sustainable and value-added solutions for different production chains that use plastic as an essential raw material when manufacturing its end products.

To this end, the Company makes significant investments in the research and development (R&D) of new products and services adhering to its Clients' business models in the various sectors of the processing industry. In the last three years, 12.4% of the sales generated by the Polyolefin Unit in Brazil were based on

products developed by the Innovation area.

In 2016, the Company supported 470 Clients, with the aid of 20,000 support analyses from the Technology and Innovation Center of Brazil, and another 60 Clients with approximately 16,000 analyses in the United States.

Regarding patents, the Company submitted 10 new patent applications and 73 patent extensions. Throughout its history, Braskem has contributed 1,030 patent documents.





### **NEW BRASKEM RESINS AT K FAIR**

For the fifth time, Braskem participated in the 2016 K Fair in Frankfurt (Germany), the main international event in the plastics and rubber industry. The Company exhibited a portfolio of innovative solutions developed throughout the year, among which we highlight the launch of Braskem Amppleo, a polypropylene resin with High Melt Strength properties. The resin, which was specially developed for the production of high performance foams, can withstand temperatures up to 100°C without deforming, and enables the manufacture of products with widely versatile applications within a large density range (from 35 kg to 300 kg per cubic meter), a reduced weight compared to other materials, and excellent thermal and acoustic insulation, in addition to being totally recycled. With this resin, Braskem intends to establish partnerships for the development of new applications in the automotive, industrial, packaging, civil construction, and home appliances markets.

In addition to Braskem Amppleo, Braskem presented other innovative solutions during the fair. Among them, the following stand out:

**Braskem Flexus Cling®:**Specially developed for stretch film extrusion, the polyethylene resin primarily serves the market of cargo protection during

transportation. Completing the current portfolio, Braskem Flexus Cling is recommended for composing the outer layer of the film, providing the end product with excellent handling performance and low unwinding force.

Braskem Rigeo Lumios: New polyethylene resin that provides high gloss and better finish for hard blown-moded packages. This launch is in line with the market trends and expands the supply of products to the packaging markets for cosmetics, hygiene and cleaning, and food, resulting in an even more complete portfolio with greater value added.

### **Braskem Plastic in Space**

After over a year of research, in 2016, Braskem completed the project to develop a solution in Green Polyethylene for 3D printing in zero gravity environments.

The project was conducted through a partnership between Braskem's Technology and Innovation team and Made In Space, a leading North American company in the development of 3D printers for zero gravity

operation and a NASA supplier. The technology enables the manufacture of tools and spare parts in space made of resin of renewable origin, giving space missions more autonomy.

Braskem's Green Plastic is now being used to create parts in space using the Additive Manufacturing Facility (AMF) printer. Braskem's UTEC (UHMWPE) was used in the creation of the printer. The first piece made from Green PE created off the Earth was a pipe connector for irrigating vegetables.

The equipment, which will make several types of parts with the I'm green™ Polyethylene (green plastic), is at the International Space Station (ISS) and was developed by Made In Space with the support of CASIS (Center for the Advancement of Science In Space).







### **WECYCLE**

Wecycle, Braskem's Brazilian platform for the recovery of plastic waste along the production chain, achieved important advances throughout 2016.

The first polypropylene and polyethylene resins made from fully recycled content were launched. Combined production volumes can reach 50 tons per month. Braskem works in partnership with recyclers in São Paulo, which undergo an audit process that assesses legal, environmental, and social issues, as well as product quality.

The polypropylene WCL H 1003 BBM is produced from recycling big bags used by the Company when transporting resins, which, previously, were being discarded. Approximately 120,000 big bag packages will be recycled annually, which should generate a potential volume of 30 tons per month of post-consumer recycled resin (PCR). The novelty may be applied in household utilities, garden products, and lids.

Possible applications polyethylene WCL L004 SCV include bags, laminated containers, tarpaulins, flexible packaging, and tubes, and it is produced from used and discarded bags at Braskem Distribution Centers. The total volume of recycled resin can reach 20 tons per month in 2017, which represents the monthly recycling of approximately 200,000 bags.



### **BRASKEM LABS**

In 2016, Braskem held the second edition of Braskem Labs, an incentive program for entrepreneurs that have solutions focused on sustainability and innovation, and have social impact. The program, developed in partnership with Endeavor - a global, non-profit organization fostering entrepreneurship - has broadened its thematic scope by accepting applications for chemical solutions, as well as looking at proposals for social and environmental solutions for plastic. As a special topic of the year, Braskem Labs will also select two projects to combat the Aedes aegypti mosquito.

In 2016, Braskem Labs received 190 registrations, an increase of 19.5% over last year. Of the total, 12 projects sent by young Brazilian entrepreneurs from the states of São Paulo, Santa Catarina, Rio Grande do Sul, Amazonas, and Pernambuco, were selected for development. The selected proposals were chosen considering the innovation of the proposal, the business model, social impact, market potential, and entrepreneur profile of the proponents.

Participants were individually

monitored by a Braskem Leader, selected according to the similarity between their business experiences and the challenges of each entrepreneur, having received at least four sessions of individual and collective mentoring on topics relevant to their business, as well as contents online, tailor made by Endeavor. Through the program, entrepreneurs also have access to a network of strategic players in their market - including potential Clients, partners, and investors, as well as several Braskem teams, such as Innovation, Sustainability, and Marketing.

In all, 54 mentors became involved with the program, between Braskem Leaders and mentors from the Endeavor network. The entrepreneurs participated in three classroom training events and closed the program with Demo Day, where they presented their solutions to an audience of 180 Braskem investors, mentors, partners and clients.

At the end of this edition, Braskem spoke with participating entrepreneurs seeking their evaluation of the program. In all, 48 business connections

relevant to the companies were made on behalf of Braskem Labs. Half the entrepreneurs said that the program generated business for their company, and 75% developed improvements in their solution or even made a new product. Another 67% obtained investment in 2016, and two entrepreneurs attributed the result directly to their participation in the program. The overall evaluation uses the Net Promoter Score methodology, which shows how much the participants would recommend the experience to another entrepreneur at the same level. The result, of 9.1 out of a possible 10, indicates the highest level of satisfaction and confirms that respondents will indeed act as promoters of the program.



LEARN ABOUT THE PROJECTS SELECTED ON BRASKEM LABS

WEBSITE (portuguese only)

# ODEBRECHT BRASKEM DESIGN CHALLENGE

The Odebrecht Braskem Design Challenge is an initiative that encourages university students to develop innovative applications in plastic for urban furniture. In 2016, in its fourth edition, the Company expanded the project and took it to Rio de Janeiro with the goal of using the winning pieces in public areas of Porto Maravilha, the central region of the city that has undergone a revitalization process.

With the central theme "Urban furniture for transforming spaces," Braskem offered challenges to the participating university students divided in two categories: Food and Artistic Presentations; Rest and Work. The winners were, respectively, the Fluminense Federal University (UFF) and the Federal University of Rio de Janeiro (UFRJ).

A total of 24 students participated in the Challenge (forming eight teams) from four institutions with traditional Architecture and Design courses: Pontifícia Universidade Católica do Rio de Janeiro (PUC Rio), Rio de Janeiro State University (UERJ), Federal University of Rio de Janeiro (UFRJ), and Fluminense Federal University (UFF).





# SPONSORING THE BRAZILIAN PARA-ATHLETIC TEAM

Overcoming is improving yourself every day. With this motto, Braskem, sponsor of the Brazilian Paraathletic Team since September 2015, reinforced the para athletes' ability to overcome through the sport. In Brazilian para-athletics, plastic has a practical application, since it is part of the composition of prostheses, making them lighter and better adapted to the athletes' legs, improving performance and comfort.

In 2016, Braskem renewed its partnership with the Association for Assistance to the Disabled Child (AACD) and donated 18,000 tons of polypropylene to produce approximately 24,000 products, such as prosthetics, vests, and orthopedic appliances, among others.

# Life Cycle Assessment

Leader in industry initiatives to strengthen the environmental attributes of plastic, Braskem has been developing several projects based on Life Cycle Assessment (LCA) studies, a technique used by the Company since 2005 to assess the environmental aspects and the potential impacts associated with the product (from the extraction phase of raw materials from nature to final disposal after use, going through all

stages of manufacturing, power generation, and transport.)

Between 2011 and 2016, a total of 41 Life Cycle Assessments and five Carbon Footprint studies were completed, identifying the advantages and priority areas for product improvement.

In addition, a methodology was developed to identify the alignment of the development projects of new thermoplastic resin applications with the

Sustainable Development Goals (SDG). In 2016, the alignment level of the project pipeline was 84%. This action reinforces the Company's role as a provider of social and environmental solutions for society and its purpose of improving people's lives through chemistry and plastic.

Throughout the year, Braskem completed a total of ten Life Cycle Assessment studies, among which the following stand out:



### **Recycled Plastic Resins**

In 2016, Braskem presented environmental profiles of the mechanical recycling of polyethylene and polypropylene, promoting reduced environmental impact of those who provide material for recycling and those

who use recycled materials in new packaging. The project, the result of the Wecycle platform launched in 2015, aims to stimulate consumption of recycled plastic resins, and is in line with the national solid waste policy, which

seeks to reduce the volume of disposable packaging in landfills. In LCA studies, these materials are capable of reducing environmental impacts associated with industrial production by 35%.

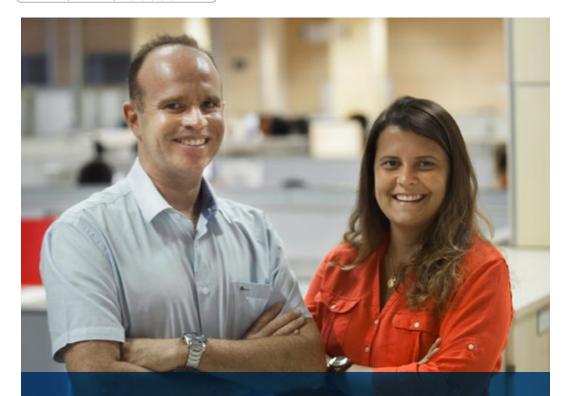
### Casa Clic

In 2016, Braskem conducted an LCA study comparing the PVC plastic solution applied to housing construction innovation with a similar traditional masonry construction. The result was improved environmental performance by about 16%. The

study, carried out in partnership with GoClic (a participant of Braskem Labs), is aligned with the Sustainable Development Goals of the United Nations (SDG 11), which aims to address the housing deficit in the world using sustainable solutions.

# 06. Stakeholders

Global Compact – Principle 1, 2, 3, 4, 5, 6 and 10



Braskem's social investment in Brazil totaled approximately BRL 26 million in social and environmental and cultural projects. In the United States and Germany, Braskem invested over BRL 550,000, and in Mexico, BRL 1.3 million.

1.2%

IN BRAZIL, THE VOLUNTARY TERMINATION RATE FOLLOWED THE DOWNWARD TREND OF RECENT YEARS: 1.2%.

% FAVORABILITY IN THE WORK ENVIRONMENT SURVEY

7,656
TEAM MEMBERS
AROUND THE WORLD





One of Braskem's fundamental principles is the practice of responsible management, based on trust and transparent dialogue with all its stakeholders, among which we highlight the Team Members, Communities close to their business activities, Clients, Suppliers, and Government, in their different spheres. Through coherent initiatives dedicated to each of these stakeholders, the Company seeks to integrate links, aiming to improve the life of society through sustainable solutions using chemistry and plastic.

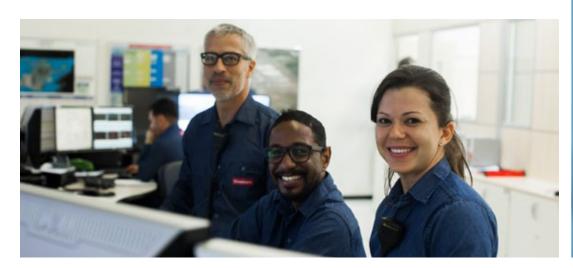
# Team Members

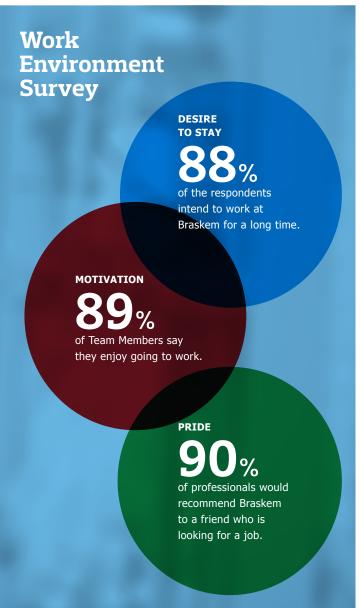
Global Compact - Principle 6)

Braskem has a Management Policy that puts people at the center of its Business strategy. The organizational culture of the Company is based on principles that guide its actions with values such as trust in people, planned delegation, proximity between Leaders and Subordinates, open communication, creation of a positive work environment,

constant concern with training new generations and qualification of people to be an integral part of Braskem's construction of the future.

Periodically, in partnership with Great Place to Work consulting, Braskem conducts a Work Environment Survey in all the countries where it is present, in order to support the continuous evolution of its management model. In 2016, the Company achieved the voluntary participation of 82% of its Team Members, and the survey grew by nine percentage points compared to the previous edition, in 2013, reaching a favorability rate of 77%. This result indicates an evolved positive perception of the work environment offered by Braskem.





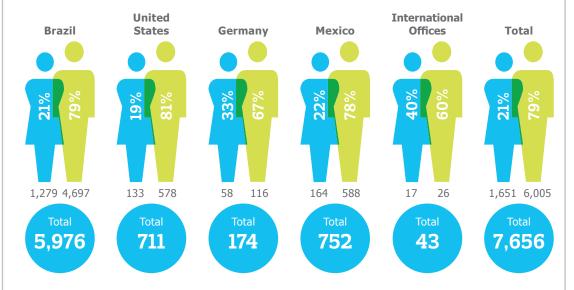
# TOTAL NUMBER OF TEAM MEMBERS BY GENDER AND REGION<sup>13</sup>

G4-10

Braskem closed the year 2016 with 7,656 Team Members, of which 6,005 were men and 1,651 were women. Of this total, 5,976 worked in industrial units and offices located in the five Brazilian states where Braskem has

operations (Alagoas, Bahia, Rio de Janeiro, São Paulo, and Rio Grande do Sul), 711 in the United States, 752 in Mexico and 174 in Germany, as well as 43 professionals in commercial offices throughout the rest of the world. It is important to

note that in the administrative areas, women represent 52% of the workforce, with 23% in Leadership positions and 52% in young professional programs (Young Apprentice, Technical Internship, University, and Associate Program).



Braskem closed the year 2016 with 7,656 Team Members.

### **DIVERSITY**

G4-10, G4-LA12

One of the key initiatives of the people strategy is centered on the Diversity Program. The program aims to stimulate an increasingly inclusive environment at Braskem and foster learning through differences, based on respect for how each one expresses him or herself in society. Braskem believes that this initiative not only enriches the work environment, but is also essential for Business Survival, Growth, and Perpetuity.

As an evolutionary process of the Diversity Program, throughout 2016, Braskem took two important steps towards equality, through its commitment to the Gender and Race Equity Program of the Federal Government, and to the Charter of Business Commitments and

LGBT<sup>14</sup> Rights, standing out as the first large Brazilian company to adopt this commitment through the Companies and LGBT Rights Forum.

In addition, several actions are already in progress and were reinforced throughout 2016. Focusing on gender equality, Braskem held two editions of the Braskem Women's Forum, promoting lectures on the role of women in the labor market, in order to engage Team Members and reinforce the importance of this aspect. The lectures were attended by Carla Tieppo, addressing the topic "Female and Male Brains," and Ana Paula Vitelli, who spoke on the "Including women in the labor market and promoting gender equality in companies."

<sup>13</sup> In order to clarify the scope of this material, it is worth mentioning that the results of quantiQ were reported in the Financial Statements of the report, but are not considered in the social and environmental indicators. Its management was already carried out independently even before the sale of the company, quantiQ was sold on 1/10/2017 (signing), with closing of the transaction on 4/03/2017 (closing).

<sup>14</sup> Acronym for Lesbian, Gay, Bisexual, Transvestite, Transsexual

These initiatives are part of an agenda that integrates the Gender Equality Program, created in 2015 by Braskem and divided into four pillars:

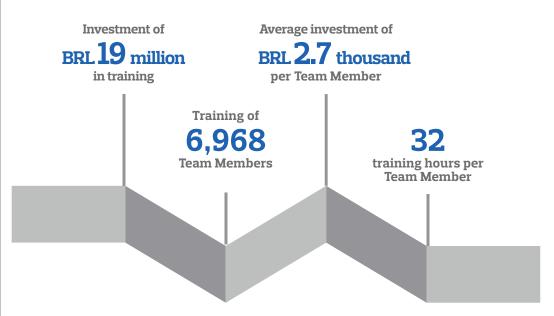
- **1. Women's careers:** aims to promote the empowerment of women in their careers, as well as foster the number of women in leadership positions at Braskem.
- **2. Maternity and paternity:** provides support so that women and men may make the most of this phase of life.
- Health and well-being: supports health and wellness actions for women and men, such as Pink October and Blue November.
- **4. Procurement and communities:** brings Braskem a greater number of women suppliers and encourages the practice of diversity programs in the Company's sector of activity, and promotes the empowerment of women through social programs in the communities.

# Respect and Equality

The presence of women in environments and occupations that were previously predominantly male has become increasingly common. Aware of this need, especially in the production units, in 2016 Braskem implemented specific breastfeeding support rooms for the withdrawal and storage of breast milk in all its units in Brazil. In addition, the Company adapted 73 bathrooms in Brazilian industrial plants, adapted work uniforms for pregnant women, defined parking spaces for pregnant women at all locations, and extended the period of maternity leave granted to female Team Members to 180 days. The results of these initiatives led Braskem to be nominated, in its first year of implementation of the Program, as a finalist in the WEPs (Women Empowerment Principles) Award of UN Women, receiving honorable mention for its work promoting gender equality.

### PEOPLE DEVELOPMENT

Attracting and developing people to support planned growth is another important part of Braskem's P&O strategy. Throughout 2016, the Company invested BRL 19 million in various training actions, trained 6,968 Team Members, with an average investment of BRL 2.7 thousand and 32 training hours per Team Member.



Throughout the year, Braskem improved the execution of several programs focused on a better work environment, integration, qualification, and training of Team Members, and on preparing Leadership to deal with the challenges of the Company's continuous and structured growth. Braskem operates based on Leadership Trails, a set of programs structured according to the stages of

development of the existing Leaders at the Company. Some of the main training conducted in 2016 was:

Culture and Integration Program (Global): 2,660 people participated in a number of actions in the units and offices where Braskem operates in Brazil, the United States, Mexico, and Germany, with the purpose of training new Team Members in the culture and values of the Company.

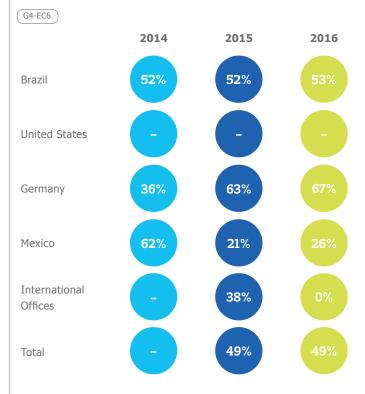
Global Leadership
Development Program:
Braskem trained 30 Leaders in
the Global Leaders Program,
which aims to develop
professionals aligned with the
Company's internationalization
strategy.

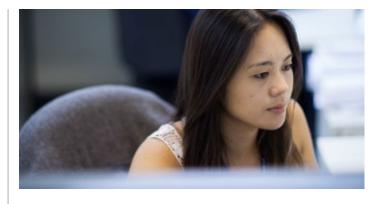
- Development Programs for Team Leaders and Area Leaders (Brazil): participation of 60 coordinators and 30 managers, respectively, with the objective of improving the performance as Educating Leaders, through reflection, education through work, and sharing experiences.
- Leadership Development
  Program (USA and Mexico): in
  the United States, 70 professionals
  from the first two stages of leadership
  were developed through the Program.
  In Mexico, 29 leaders participated in
  2016.
- Leadership Self-Development
  Platform (Brazil, Mexico, and
  United States): an online platform,
  focused on the development of
  Team Leaders, Technical Team
  Leaders, and Area Leaders in
  Braskem's Culture competencies
  through videos, e-learning, and
  actions scripts. The platform will be
  launched in Germany in 2017.

15 To calculate this ratio, Team Members of senior management, Team Members of grades 3 to 10 and who have Subordinates are considered. These grades include managers, directors, vice presidents and president. To calculate the number of Leaders from the local community, the number of Senior Management Leaders versus the place of birth is used, with the exception of the United States, which does not have this information for legal reasons.

It is important to highlight the Company's commitment to training local corporate leaders, in order to ensure the diversity of the management team and strengthen human capital with the participation of members of the local community in decision-making processes. In 2016, Braskem ended the year with 53% of senior management from local communities in Brazil, 1% higher than the previous year.

# RATIO OF SENIOR MANAGEMENT HIRED WITHIN THE LOCAL COMMUNITY<sup>15</sup>





# BRASKEM YOUNG PROFESSIONALS

The search for professional improvement at Braskem also involves young professionals looking to the Company to take the first steps in their career. Through its own programs, and others developed in partnership with entities such as SENAI (National Industrial Learning Service), technical education colleges, and universities, Braskem works toward the development and training of its future Team Members.

# Young Apprentice Program - Brazil

With a duration of one year and a half, the program enables the development of the professional skills and competencies of young adults living in socially vulnerable situations, seeking their inclusion in the labor market. In 2016, Braskem used social networks to impact this audience with the opportunities offered, disseminating content that helps young adults to direct their career and learn about the day-to-day work of the Company, based on statements from various professionals. In total, nearly five million young adults were impacted by the Company's social networks.

### Young Technician and Young Partner

Focused on training future technicians, engineers, analysts, and other professionals in Braskem's operations, the Young Technician and Young Partner programs are structured for

2016 | Braskem | Annual Repor

60

people taking Technical Education and university courses. These programs, which may last one or two years, annually offer internship opportunities in locations in Brazil where Braskem has industrial operations: Mauá (SP), Paulínia (SP), Duque de Caxias (RJ), Triunfo (RS), Maceió (AL), and Camaçari (BA), and at the other administrative offices of the Company.

In the United States, the 2014 class of Associates closed with three associates, two engineers and one business associate. In addition, four trainees participates in the Science Without Borders<sup>16</sup> program and 16 participated as summer interns.

By strengthening its relationship with educational institutions, the Company has continuously made progress identifying new professionals and strengthening its position as a Company capable of attracting young adults willing to learn and contribute to the growth of their career and the Company.

Thus, in 2016, Braskem began a partnership with the Junior Business Federations of the states of Rio Grande do Sul, Bahia, and Rio de Janeiro, supporting young professionals in their academic environment. In addition, the Company participated in a total of six events at universities in São Paulo,

Rio de Janeiro, and Rio Grande do Sul, to promote Braskem's brand and make contact with the university audience.

The technical and university internship programs had nearly 32,000 registrations in 2016. The number of university students enrolled increased 22%.

### Young Operator Program -Brazil

Aimed toward educating young adults wishing to build a career in the Industrial Operations industry, the Young Operator Program is carried out in partnership with SENAI and lasts for 18 months. In 2016, the program enrolled 4,541 young adults and qualified 219 operators.

Continuing the education and development process of Braskem's technicians and operators, over 3,900 Team Members participated in specific educational actions, such as seminars, technical forums, and e-learning. In addition, four classes of the Technical Skills

Development Program (PDCT) were formed for the Operation and Maintenance teams, involving 134 Team Members.

Also in partnership with SENAI, in the states where the Company has production units, the Petrochemicals Technical Course began to be offered, with program content aligned with the demands of the industry and with the technical training needed to prepare new chemical and petrochemical process operators.

# SALARIES AND BENEFITS

G4-EC5

Braskem has a global competitive remuneration strategy in all locations where it operates. To support this process, periodic salary surveys are carried out to assist in updating internal benchmarks and revisions of the Team Members' monthly and variable remuneration.

Monthly remuneration is based on ranges with the purpose of making team remuneration management flexible, differentiating the skill levels of the Team Members, and applying the concept of meritocracy. Monthly remuneration ranges were determined based on the following:

### **ACTION PROGRAM CYCLE**

G4-LA11

Each Team Member has the opportunity to talk with his or her Leader in order to align their thoughts on the challenges for the work year, the resources needed to carry them out, and what support will be fundamental to their success. This is recorded in the Action Program (PA), which is monitored and assessed

throughout the year, through dialogue between the Leader and his or her Subordinate. The Action Program cycle consists of four stages: Planning/Pact, Monitoring, Assessment, and Judgment. The assessment takes place at the beginning of the following year and serves as a basis for

identifying opportunities for improvement to be included in the Program for the next period, or in the Plan of Education for Work, which includes actions to support Continuing Education and recommendations for corporate programs. The process is carried out at the units and offices where Braskem

States, Mexico, and Germany. All Team Members have an Individual Action Program, which is required in order to receive variable remuneration, which is linked to the level of achievement of the goals and alignment with the Company's organizational values.

operates in Brazil, the United

<sup>&</sup>lt;sup>16</sup> The Science Without Borders Program is an initiative of the Brazilian Government, Ministry of Science, Technology and Innovation (MCTI), Ministry of Education (MEC) and of its respective partnership institutions (CNPq and Capes) and MEC's Departments of Higher Education and Technological Education of MEC to promote the consolidation and internationalization of Brazilian science and technology through international exchange and mobility.

- 85% of the market median for the initial amount (Development Range)
- Market median at the central benchmark (Target Range)
- 115% of the market median for the maximum amount (Advanced Performance Range)

Variable remuneration, carried out in the form of Profit Sharing (PLR), is aligned with Braskem's strategy and culture, making it possible to attract and retain talent. Its main objective is to stimulate achieving the best results and to recognize individual performances. The main individual challenges are included in the Action Program (PA) of each Team Member, and the calculation basis includes indicators such as operating EBITDA, working capital variation, and operational investment (CAPEX).

The variation in the ratio of the Company's lowest salary compared to the local minimum wage remained stable throughout 2016, with a slight increase of 1 and 2 points, respectively, in the state of São Paulo (Brazil), and in the United States. It is worth mentioning that the salaries at Braskem are equal for men and women within their respective positions.<sup>17</sup>

# LOWEST SALARY VERSUS LOCAL MINIMUM WAGE

		2015	2016
	SP	1.7	1.8
	RJ	2.2	2.2
Brazil	BA	1.6	1.6
	AL	1.5	1.5
	RS	1.8	1.8
United States		2.9	3.1
Germany		2.0	2.0
Mexico		3.6	3.5

G4-LA2

At Braskem, benefits are offered from the time of hiring and there is no distinction between full-time, part-time or fixed-term Team Members. 18.

- Health and Dental Plans (Brazil, Mexico, and the United States)
- Private Pension Odeprev (Brazil, United States, and Germany)<sup>19</sup>
- Life Insurance Life Insurance 16 (Brazil, Mexico, United States, and Germany)<sup>20</sup>
- Child Care Assistance (Brazil)
- Maternity and Paternity Leave (Brazil, Mexico, United States, and Germany)<sup>21</sup>
- Meal vouchers (Brazil); food stamps (Mexico); discounts at nearby restaurants with Braskem directly paying the restaurant (Germany)
- Disease Support (Brazil)
- Special Child Assistance (Brazil)

### RETIREMENT

G4-LA10

For Team Members who intend to retire from units in Brazil, Braskem offers the Horizons program, which, for a year, prepares and supports professionals and their families for the post-career transition process. The program consists of four modules, totaling 40 hours, and has two fundamental pillars:

- Reflection of life and career: process of awareness about the new stage of life that is approaching.
- 2. Knowledge management: ensure the continuity of the Company's business through a structured process of knowledge transfer acquired by each Team Member throughout his or her career that are important for Braskem's succession process.

17 The calculation used includes the lowest salary offered by Braskem, using the Hay table (table of positions and salaries established by Braskem), considering 85% of the range (least % of range varying between 85 and 115) from the lowest position at the Company versus the local minimum wage that is established by the collective bargaining agreement, in the case of Brazil, and the local minimum wage for non-union Team Members.

18 Currently, Braskem does not have Team Members in Brazil hired for a fixed term, only Apprentices (16), who are hired according to the country's own regulations. In Germany, there are three Team Members hired for a fixed-term.

19 Braskem provides private pension plans in Brazil, the United States and Germany, with the purpose of supporting the Team Members in the planning and preparation of their post-career period and their retirement. In Brazil, Braskem offers the supplementary pension plan called ODEPREV - Odebrecht Previdência, put together sustainably, without risks of actuarial imbalance, with a defined contribution format, exclusive to Team Members of the Odebrecht Organization.

20 ODEPREV – Odebrecht Previdência offers participants a social security insurance (PrevSeguro), which extends the financial protection of the Plan Participants and/or their relatives, in case of death (natural or accidental), or total and permanent disability (due to illness or accident), occurring before the age of 65.

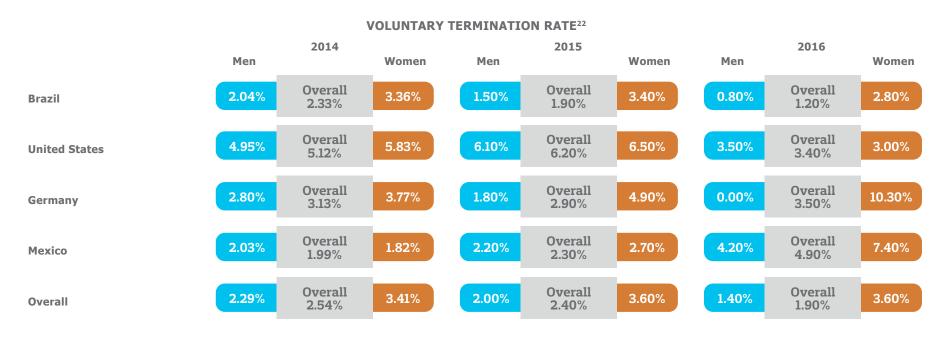
21 Braskem tracks the exit and return indicator of maternity leave only in Brazil, and does not monitor this in other countries. In 2016, a total of 33 Team Members utilized the benefit, and 29 was the number of Team Members who returned to work after the maternity leave period. (G4-LA3)



### HIRING AND TERMINATION

G4-LA1

In 2016, the Company had the lowest turnover in its history, with rates of 1.9% in global operations and 1.2% in Brazil. This is the best result in the Brazil since 2009.



In addition, Braskem maintained the hiring average when compared to the previous year. The ratio of women hired in the period was higher than that of men for the period, almost the same level as in 2015.

		2014			2015			2016	
	Men		Women	Men		Women	Men		Women
Overall hiring rate	8.60%	Overall 9.72%	13.70%	6.30%	Overall 7.00%	9.20%	6.70%	Overall 7.20%	9.10%

On the other hand, the total number of people terminated was much lower when compared to 2015. In total, 561 Team Members were terminated in 2016, which was 124 fewer people than in 2015.

<sup>22</sup> In order to clarify the scope of this material, it is worth mentioning that the results of quantiQ were reported in the Financial Statements of the report, but are not considered in the social and environmental indicators. Its management was already carried out independently even before the sale of the company, quantiQ was sold on 1/10/2017 (signing), with closing of the transaction on 4/03/2017 (closing).

# FORMAL AGREEMENTS WITH TRADE UNIONS

G4-LA8

Braskem respects trade union representation in all locations where it operates and focuses on local labor legislation as the minimum standard for the Company's obligations to its Team Members. It is part of Braskem's activity to maintain an open channel for dialogue so that formal agreements are made wherever necessary.

In Brazil, collective bargaining agreements are carried out annually, on specific dates in each region where the Company has operations, and the possibility of extending rights provided for in local legislation are discussed. There is also collective bargaining between Braskem, the Workers' Commission, and the Union, to sign an agreement regarding the Profit Sharing Program.

The representatives of Braskem maintain regular and constant dialogue with union representatives. The Labor and Trade Union Relations area is responsible, in each region, for the negotiation of base date

agreements (which includes social, economic, safety, environmental, and trade union issues), as well as agreements concerning working hours, and profit sharing. In addition, in Brazil, representatives from Labor and Trade Union Relations conduct regular training with Company Leaders in order to keep them updated on this aspect. In 2016, there were 48 meetings in which 470 Team Members were trained.

Confirming its respect for freedom of association in each region of activity, Braskem has Team Members who are part of trade union leadership. It is also important to note that the collective bargaining rules that have been signed contain clauses that affirm the policy of respect for trade union activities, which relate to the access of union leaders to factories; remuneration of union leaders for the exercise of union leadership; payment for union leaders who are absent in order to participate in external events related to union activity;



discount of monthly and union contributions. Commitments regarding the agreements are included in the Action Program (PA) of each Team Member, and are submitted to a formal assessment that is documented quarterly.

In line with its global operation, Braskem respects trade union representation in all its locations. In Mexico, Braskem Idesa operates according to the processes of SEMPRE (Integrated Health, Safety, and Environment System) and OSHA's Health and Safety Certification, and is part of the Executive Committee of the National Union of Chemical, Petrochemical, Carbochemistry,

Energy, and Gas Workers. Based on an open and transparent dialogue, the committee convenes every month to be informed about the metrics and projects under development to improve awareness toward health and safety in the work environment.

Also regarding Mexico, collective work norms contain clauses that confirm the policy of respect for union activities and freedom of association. Regarding collective bargaining agreements, every year, representatives of Braskem Idesa participate in the review of negotiations and collective bargaining agreements. Each year, a committee is also elected

to review the Profit Sharing Program.

In the United States, the labor agreement includes monthly meetings of the Health and Safety Committee. The main objectives and metrics are managed and monitored by a Safety Management Process, and the data is evaluated monthly by the Unit Leaders and by the Committee which, according to the results, may initiate investigations and make recommendations for improvement. Germany does not have in place formal agreements on health and safety, since there are several government regulations and follow-ups on these topics.

# Communities

(G4-EC7, G4-EC8, G4-SO1)

Aiming to improve people's lives through sustainable solutions in chemistry and plastic, Braskem has defined four strategic objectives for its social and environmental responsibility projects: Generate social impact; strengthen reputation; become closer to stakeholders, strengthening relationships with Communities; and increase

the visibility and familiarity of Company actions. These projects, carried out with the Communities surrounding the operations and also nationally, focus on strategic aspects such as recycling, incentive to innovation, and environmental education.

The two social causes that guide the Company's actions are:

- Boost human development by stimulating the growth of the people who make up our Communities.
- Promote social and environmental development through chemistry and plastic, strengthening the social and environmental contributions of our most important products.

### **INVESTMENTS**

In 2016, Braskem and its Team Members invested BRL 27.5 million in social and environmental, cultural, and sports projects in Brazil, divided into three areas:

- Private Social Investment Projects (ISP): BRL 4.9 million.
- Incentivized Sponsorships (public interest projects):
   BRL 12.3 million in tax incentives, plus a BRL 1.8 million consideration of direct funding.
- Odebrecht Foundation:
   BRL 7 million donated to the
   Development and Growth
   Program Integrated with
   Sustainability (PDCIS) and BRL
   1.5 million donated through
   the Program called Tributo ao
   Futuro.

In addition to direct investments, projects in Brazil raised BRL 8.7 million in 2016 with the participation of several partners, among them Ambev, City Halls, SEBRAE (Brazilian Support Service for Micro and Small Enterprises), Elektro, ABIHPEC, and Cetrel.

In the United States and Germany, Braskem invested over BRL 550,000 (approximately US\$ 125,000 in the United States and €30,000 in Germany) in philanthropic donations, benefiting over 60 organizations or programs focused on the benefits of plastic in people's lives and in the fields of science, technology, engineering and mathematics. One of the biggest contributions in the United States was made to United Way, a 125 year-old organization whose objective is to provide support to local communities. To the amounts invested in the United States, Team Members' volunteer hours in the local Communities are added.

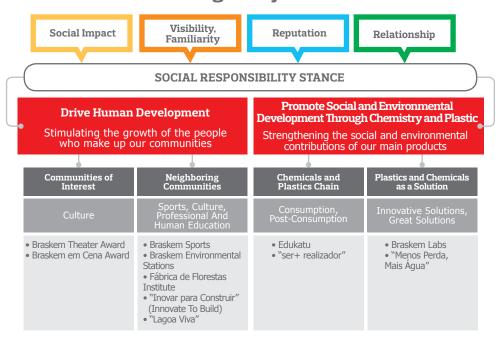
In Mexico, in 2016, there was a social investment of over BRL 1.3 million (\$2 million MXN) in production projects carried out with the Communities surrounding the industrial operation and focused on generating jobs and income, such as support for Cooperatives raising tilapias and making uniforms. External resources were also raised, of approximately BRL 1.6 million (\$2.4 million MXN).

The Odebrecht Foundation's

Development and Growth Program

Integrated with Sustainability
(PDCIS), supported by Braskem, has
the challenge of establishing a social,
economic, and environmentally

### **Strategic Objectives**



sustainable development model. In 2016, actions were carried out involving 390 Communities, directly benefiting over 20,000 people, and indirectly, another 285,000. Among them, the following stand out:

- **Education:** jointly with Rural Family Houses, that benefited over 320 students from the Agriculture, Forestry, and Agribusiness courses and the Aquaculture Qualification course in the municipalities Presidente Tancredo Neves, Nilo Peçanha, and Igrapiúna in the State of Bahia.
- Environment: through the Earth Conservation Organization, which reached the end of 2016 with 9,000 hectares of conserved area, 201,000 trees planted, 150 families served, more than 2,300 tons of carbon neutralized, and 105 springs conserved/recovered.
- Citizenship (Social): jointly with the Law and Citizenship Institute, which reached the end of 2016 with 305,000 visits to the Communities and raised about BRL 11.2 million, with the Food Acquisition Program (PAA).

### **PROJECTS**

Braskem's Private Social Investment projects directly benefited over 96,400 people in 2016. Among them, the following stand out:

### **SER+ REALIZADOR**

G4-EN28

Present in all states where Braskem operates, this initiative seeks to increase the percentage of post-consumer waste recycling in the country, promoting the social and economic inclusion of waste collectors and the efficiency of the recycling chain. By investing in equipment and infrastructure of the sorting units, training and personalized technical consulting, recyclable material collectors have been able to increase their productivity and income.

In 2016, the project benefited over 3,400 waste collectors, and among the

cooperatives supported, 47 received technical advice and guaranteed the shipment of over 30,000 tons of waste for recycling. Over 8% of this volume refers to plastics produced by Braskem: PE, PP, and PVC.

Due to the economic crisis, only the target for sorted mass was met, with increase in income prevented by the reduced value of recyclable materials. There was also an intention to expand the program, which was not confirmed in the year.

SER+ REALIZADOR'S RESULTS	2014	2015	2016	2016 Goal
Waste collectors benefited	2,132	3,538	3,444	4,000
Waste collectors trained	710	1,103	858	1,100
Waste collectors with an increase in income	402	960	787	1,300
Sorted mass (t)	8,492	25,703	30,824	30,800
Sorted plastic (t)	1,928	4,863	5,480	-
Sorted PP, PE, and PVC (t)	1,133	3,128	2,601	-

A major focus of the program since 2015 has been to support the development and implementation of strategies for managing post-consumer waste in the municipalities where Braskem operates. Deliveries to date were in Porto Alegre, Salvador, and ABC Paulista, and the latter two were given support to prepare the Consultation Letter to BNDES to obtain funds to develop their waste management plans. With

these actions, a change in scenario is expected, with a significantly larger volume of waste being sent to cooperatives, generating substantial increases in income.

The program includes the participation of several partners from the public and private sectors such as Ambev, SEBRAE, and the City Halls of Porto Alegre and Salvador, which invested over BRL 5.8 million in the year.

### **2016 HIGHLIGHTS**

### Todos Somos Porto Alegre (We are all Porto Alegre)

In 2016, the program We are All Porto Alegre came to a close. Supported by Braskem, this municipal waste management program in Porto Alegre (Rio Grande do Sul, Brazil) was created to meet the requirements of Municipal Law No. 10,531, which prohibited the circulation of human and animal traction vehicles in the city.

In order to socially include those who had their carts taken off the road, efforts were made by public authorities, civil society, and the private sector. The program was officially launched in December 2012 and included three phases:

1. Productive inclusion of those pulling carts or carts pulled by animals The waste collectors were mapped and registered through an active search carried out by the municipality, and, adhering to the program, were able to choose to migrate to the formal labor market or continue in the recycling business. In total, 2,059 people were registered in the first phase, of which 581 were allocated to other occupations with income, and 225 are in transition to new activities.

# 2. Restructuring of the sorting system The sorting units formalized adherence to the program the immediate needs and demands for investment were identified. Over the course of four years, they received the assistance of technical advisors to guide the sorting process. The leaders of the units received training aimed toward managing and

With these improvements, the capacity of the selective collection system was fully achieved, with production per person of approximately 2.4 tons per month during 2016 - an increase of 43% compared to the first quarter of 2015. The average per capita revenue recorded a 42% increase in the fourth quarter of 2016, compared to the same period in the previous year, surpassing the amount of BRL 1,000.

developing the entrepreneur.

# The last stage focused on mobilizing the population with environmental education actions. One of them was the project Caminhos da Reciclagem (Recycling Paths), in which about 400 teachers were brought to sorting units to learn about the waste sorting process, impacting over

28,000 people.

Given the success of the Rio Grande do Sul initiative, Braskem began to encourage the structured management of solid waste in other Communities of interest. In 2016, in the ABC Paulista region, the Consultation Letter for the Inter-municipal Selective Collection Plan was presented to the Inter municipal Consortium of ABC, composed of the seven municipalities in the region, which will seek funding from BNDES through the document.

Program cooperatives receive support for renovations and improvements in equipment and infrastructure and specialized technical advisory services. The advisors also help the cooperatives obtain partnerships for waste collection, which is what occurred in 2016 with Banco do Brasil in Rio de Janeiro and with the Post Office in São Paulo. In Alagoas, cooperatives were selected in a public notice for selective waste collection after receiving support from Braskem for the application.

### **EDUKATU**

Edukatu is the first online Brazilian learning network about conscious consumption and sustainability involving over 28,000 teachers and elementary and middle school students in Brazil. Created in 2013 by Braskem and the Akatu Institute, the project has already received support from partners such as HP, Cargill Foundation, Sabesp, Elektro, Unilever, KPMG, and Mais Unidos, and gained institutional support from



the Ministry of the Environment and the Ministry of Education. In 2016, it reached 28,000 participants, about 2,400 being in cities in which Braskem operates. Over 10,000 students were directly involved in intervention projects in their school communities, raising awareness with 63,000 people about conscious consumption. The targets for 2016 were not met,

for an action planned with the SESI network was transferred to 2017. In addition to the number of participants, other indicators confirm the success of the initiative. In 2016 alone, the external funding for the project from partners was approximately BRL 1.3 million. The website surpassed the two million mark of total views and has already motivated over 600 media stories.

EDUKATU'S RESULTS	2014	2015	2016	Accumulated	Goals
Accumulated number of participants	7,429	11,850	7,646	28,441	39,350
Accumulated number of teachers engaged	272	377	415	1,084	1,200
Accumulated number of students engaged	2.495	3.915	3.353	9.911	10.450

### **2016 HIGHLIGHTS**

### Turma que Recicla and Reciclaki App

Edukatu launched *Turma que Recicla* (Recycling Class) in 2016 with the goal of reflecting on the topic of waste. With the help of online games, videos, and infographics, students create actions to reduce the amount of waste generated in school and in the Community.

The game Reciclaki, an app available for computers and mobile devices, simulates the work of collectors at a sorting unit: Various types of waste pass over a conveyor belt, and the player must direct it to the correct trash bin for each type of material. Launched in July 2016, the game has already achieved over 9,500 views.

The best results in the application of the "Recycling Class" were achieved by the team of teacher Luciene Soares, from Pref. José Custódio da Silva School, in the municipality of Coite do Nóia (AL), which mobilized 230 people, reduced the school's waste generation by 20%, and created stronger ties with the region's waste collectors.

In 2016, actions were also launched about the water crisis, conscious energy consumption, and hygiene. Edukatu promotes on-site actions to mobilize teachers, training them to use the platform and carry out practical projects for engaging students and the school community. The activity took place in schools in the city of São Paulo and in nine

municipalities in the same state, as well as actions in the states of Bahia, Mato Grosso do Sul, and Pará, all in Brazil. With an expressive amount of educational content produced in recent years, in 2017 Edukatu intends to focus on gains in scale through on-site mobilization, dissemination, and teacher training for the use of the platform.

### FÁBRICA DE FLORESTAS INSTITUTE

Present in the Brazilian states of Bahia, São Paulo, and Rio de Janeiro, the Fábrica de Florestas Institute contributes to the construction of socially and environmentally responsible communities through the expansion, recovery, and maintenance of green areas, with

integrated environmental education. The organization is maintained by Braskem, Cetrel - Odebrecht Ambiental, and Comitê de Fomento Industrial of Camaçari (COFIC), in Bahia (Brazil). The work of the Fábrica de Florestas Institute is developed with the Communities,

who are trained in seed collection, native seedling production and planting, and maintaining the planted areas. The project also develops the Environmental Education Program (PEA), which offers guided visits to students from public and private networks

to the Nursery Garden Schools. In 2016, over 1,000 people were trained in planting techniques and 27,000 received sensitivity training. The result of the year was 88,000 seedlings produced and, of these, 46,000 planted and monitored. All targets for 2016 were exceeded.

### FÁBRICA DE FLORESTAS' RESULTS

Seedlings produced

Seedlings planted

People trained in planting

People received sensitivity training

2014	2015	2016	Metas
165.669	116.572	88.407	85.000
83.413	39.206	46.628	41.786
883	1.064	1.036	740
17.565	16.739	27.506	13.500



### **2016 HIGHLIGHTS**

### New Nursery Garden School and Virada Sustentável Salvador (Bahia)

In 2016, this project was marked by the inauguration of a new nursery garden school in Bom Jesus da Lapa, Bahia. A new model for the program was developed, with the creation of the Itinerant Nursery Garden School, which was displayed throughout the year in places such as malls and squares, also in Bahia, at opportune moments such as Environment Week and Forest Day, in June and September.

Also, the 1st Virada Sustentável Salvador took place, a festival that, through art, culture, and games, offered reflections on several aspects of sustainability, with cultural activities and training in parks and public spaces around the city. The Itinerant Nursery Garden School attended the event and provided sensitivity training for about 3,300 people, donated 450 seedlings of species native to the Atlantic Rainforest, and 500 children participated in seedling production workshops.

Summer Eco Parque Sauípe In 2016, another edition of the Summer Eco Parque Sauípe Project was held in the municipality of Mata de São João, which promoted adventurous activities such as a climbing wall, a zipline, and kayak tours. There were over 1,700 visitors during the two months of the project. Eco Parque Sauípe protects an area of 66 hectares in the transition region between two ecosystems in the Atlantic Rainforest: the forest and the restinga.



# BRASKEM'S REGIONAL INITIATIVES IN BRAZIL

Braskem Theater Award (Bahia) and *Braskem em Cena* Award (Rio Grande do Sul)

Salvador hosted the 24th edition of the Braskem Theater Award, which received 2,400 people at its awards ceremony. Other initiatives within the project include the Braskem Theater Award Circuit, a theater festival in the state of Bahia, and the Braskem Theater Award Show, which warms up the local scene and brings the shows closer to the audience, which was about 3,000 people at the presentations in 2016.

The Rio Grande do Sul initiative takes place during Porto Alegre em Cena, one of the largest performing arts festivals in Latin America, awarding professionals and plays in six categories. In 2016, a total of 4,500 spectators went to see the plays nominated for the award. There are also projects Sábado em Cena and Braskem "Descentralização Braskem

em Cena," focused on attracting audiences and presenting street shows in communities farthest away from Porto Alegre's cultural centers.

### Inovar para Construir (Rio de Janeiro)

Held in partnership with the FIRJAN System, the Inovar para Construir (Innovate to Build) project is an initiative that seeks to disseminate solutions for plastic for civil construction. These solutions are published on a virtual platform (www. firjan.com.br/visaotecnologica), dedicated to promoting innovative solutions for all sectors of the industry. In 2016, a total of 15 people were trained in the professional initiation course in assembly techniques for modular construction sites in plastic, and 120 people were qualified in the improvement in plastic solutions course.

# IMPACT OF THE OPERATIONS ON COMMUNITIES

### **Green Belts**

In all, 30 of Braskem's 40 units have a green belt - a green area around the industrial plants that provides another level of protection and reduces exposure to risks. The green belt also protects local flora and wildlife species and helps improve the quality of the air in the environment.

With 68 hectares of area, the Braskem Environmental Station, which surrounds the Triunfo Petrochemical Complex (Rio Grande do Sul), has been continuously monitoring the wildlife and flora carried out by the Zoobotânica Foundation since 1989. Currently, the space welcomes students for guided tours that promote environmental education through games and workshops in the middle of the native forest. In 2016, there were over 2,800 visitors.

Another Braskem green belt is a preservation area located in the district of Pontal da Barra, next to Braskem's Chlorine-Soda unit in Maceió (Alagoas). Created in 1987, it is now a space for studies, visits, and development of social

and environmental projects, and in 2016, the space received over 5,000 visitors and trained over 124 producers. The area stands out for the preservation of local wildlife and flora, and was recognized by UNESCO as an Advanced Outpost of the Atlantic Forest Biosphere.

### Safety and Communication with Communities

Braskem has communication channels open to all Communities where it operates. In some units, in addition to the toll-free number (0800) and the Ombudsman's office available on the Company's website, the Community may dialogue with the Company through periodic meetings, factory visitation programs, training, and interface with the government initiatives usually promoted by the Community Consultative Councils (CCC's) of each location. In the ABC region, in São Paulo (Brazil), the CCC returned in December 2016, with the COFIP ABC action.

### **APELL**

One of the highlights of Braskem's relationship with its surrounding community is the Community



Preparedness and Response to Local Emergencies (APELL), implemented in Brazil in the units located in the states of Alagoas and Rio de Janeiro over twenty years ago. The project conducts and coordinates emergency simulation and keeps the Community informed about the risks and measures that control and minimize possible impacts arising from industrial operations. The local coordinators of the program also plan and execute training activities and guarantee the reliability of equipment and tools such as alarm systems, substance detectors, and respiratory protection equipment that is used by public agencies.

In 2016, there were three groups of the program Formando Laços (Building Bonds). The initiative brings communities and local entities to the plants, offers a Toxicology and Medical Conduct course for health professionals, simulation, and implements actions against the Aedes aegypti mosquito. Braskem plays a leading role in the community, by engaging its neighbors and providing essential insight into the potential impacts of the products it manufactures and ways to minimize them.

### Maré Boa

Maré Boa is a communication and social responsibility program that seeks to positively impact the Communities within the area of influence of the Port of Aratu in Bahia (Brazil). The program includes actions toward strengthening and sustaining fishing activity and generating jobs and income, such as training courses. The

courses offered for the training of waterways professionals, for example, included 45 people from the local community, preparing them for the labor market.

In addition to practical actions that ease and prevent risks to the health and safety of Communities, environmental education activities are developed so that the population understands the risks and impacts of the operation of the Private Use Terminal in the region. One of the actions carried out in July 2016 was sponsoring the Civic-Social Action (ACISO) carried out by the Brazilian Navy, which provided support services to five thousand residents of these communities, among them medical care, issuing documents, and dental procedures.



# Suppliers

G4-12 Global Compact - Principle 10

With over 8,000 Suppliers spread throughout its operations worldwide, Braskem seeks to closely monitor the behavior of its partners, seeking attitudes in line with the Company's ethical, social, and safety principles. Therefore, only companies meeting tax and regulatory obligations, with technical and administrative qualification, and a healthy economic situation, are considered for hiring.

Based on the magnitude of its operations, Braskem has structured, decentralized Supplier management in areas responsible for purchasing

processes, cost analysis, quality assessment of products and services, compliance with the Supplier Code of Conduct, legal regulations, and Health, Safety, and Environment (HSE) requirements.

It is worth mentioning that all Suppliers have access to the Braskem Ethics Line Channel and are encouraged to contribute information that helps to strengthen transparency and trust. All complaints are investigated and have reparation measures to ensure the correct outcome of any problems.

## TO LEARN MORE ABOUT THE ETHICS LINE CHANNEL, VISIT

braskem.com.br > Ethics Line

The Code of Conduct for Suppliers is available for download at <u>braskem.com.br > Suppliers</u>

# PERCENTAGE OF PURCHASES BY SUPPLIERS BY COUNTRY

G4-EC9

In the period covered by this report, Braskem in Brazil reduced expenses on contracting foreign Suppliers, falling from 36% in 2015 to 24% in 2016. In its first year of operation, Mexico allocated 16% of its spending budget to hiring foreign Suppliers. This percentage was maintained in the United States and grew in Germany from 4% (2015) to 6% (2016).

### PERCENTAGE OF PURCHASES BY SUPPLIERS BY COUNTRY

	Suppliers	2015	2016
Brazil	Domestic	64%	76%
Brazii	Foreign	36%	24%
Germany	Domestic	96%	94%
Germany	Foreign	4%	6%
United States	Domestic	99%	99%
Officed States	Foreign	1%	1%
Mexico	Domestic	-	84%
PICAICO	Foreign	-	16%

# MAIN SUPPLIERS CATEGORIES

Fossil fuel raw materials: strategic to maintaining Braskem's operations, fossil fuel raw materials are among the largest portion of the Company's expenses with Suppliers. Among these products are naphtha, condensate, ethane, propane, and HLR in Brazil, ethylene and propylene in the United States and Germany, and ethane in Mexico. To ensure cost control and supply continuity, Braskem has contracts with specific suppliers in all countries where its operations are located.

**Ethanol:** Braskem's product in the highest social and environmental risk category, ethanol has a more rigorous management process than the other inputs used by the Company - and the same is true for its Suppliers. Thus,

Braskem works with a team dedicated to these partners to ensure compliance with all processes and alignment with the Company's safety standards. When signing a supply contract with Braskem, all of these partners sign the Code of Conduct for Ethanol Suppliers, developed in 2010 by Braskem with the support of Proforest. In 2016, this code went through a review that reinforced the relationship model and the procedures regarding the purchase of Ethanol. In 2016, a total of 99.1% of ethanol came from plants that signed the Code of Conduct for Ethanol Suppliers, a number above the established goal of 90%. The remainder was purchased in commodities exchanges in order to meet specific demands.

In 2016, a total of 99.1% of ethanol came from plants that signed the Code of Conduct for Ethanol Suppliers, a number above the established goal of 90%.

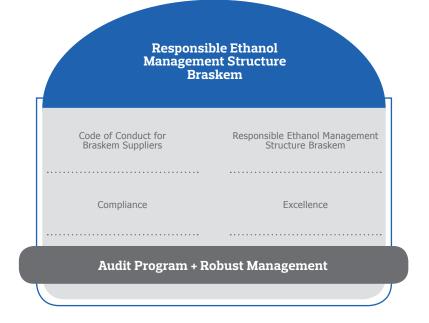
# REVISED CODE OF CONDUCT FOR ETHANOL SUPPLIERS

Following a process of continuous improvement, in 2016 Braskem promoted a review of its Code of Conduct for Ethanol Suppliers, ensuring its alignment with the code applicable to all of Company's Suppliers, according to the aspects monitored by the Company: slash and burn, biodiversity, best environmental practices, and human and labor rights. This revision also sought greater synergy with the Company's Compliance Program and the

other codes, standards, and protocols applied to the ethanol industry. The work was carried out by Proforest, an international organization that works with the management and sustainable purchase of natural resources.

In addition, Braskem reinforced its relationship model and purchase procedures with Suppliers. The Braskem Responsible Management Structure of Ethanol will be

periodically analyzed to ensure that it keeps up with market developments, incorporating the lessons learned from audits and changes in legislation, treaties, and agreements related to the sector. The new structure has an area for mandatory requirements that must be followed by the Suppliers and also a section about continuous improvement that will allow Braskem to influence its Suppliers through an agreed upon action plan.



### **PROCUREMENT BRAZIL**

In one more year of economic challenges and high inflation in the Brazilian market, the Procurement area was responsible for ensuring the Company's competitiveness and the availability of essential goods and services for the business, by optimizing existing contracts and searching for new partners. It is important to point out that Braskem Suppliers are selected by the Procurement team in conjunction with the user areas, and undergo quality analysis, with pre-established parameters in each situation, standardized Health, Safety, and Environment (HSE) assessments, as well as compliance with regulatory and legal obligations.

In Brazil, the area is responsible contracting Industrial Services (for operations maintenance), Corporate Services, purchase of inputs and packaging required for production, and purchase of equipment and materials for maintenance and operation. In addition, it also manages Braskem's indirect materials and inputs warehouses in Brazil.



### G4-EC9

# PERCENTAGE OF SUPPLIERS BY TYPE OF SERVICE

2016



Machinery, equipment, and facilities



Technical and supplementary services



Other (inputs and packaging)

### SUPPLIERS RADAR

A tool that was strengthened in 2016 was the Suppliers Radar, which identifies in advance companies with greater exposure to labor and economic risks, enabling the implementation of a work plan to minimize possible impacts on these aspects for Braskem

# SUPPLIER PERFORMANCE INDEX (IDF)

The Supplier evaluation process also underwent minor reformulations and, in 2016, the analyses began to be carried out by the user areas and respective buyers. This evaluation generates the Supplier Performance Index (IDF) and is applied to all partners considered critical in Quality, QM (deviation history), Punctuality, HSE, Financial, and Compliance dimensions. Deviations identified through this study are handled by an action plan involving the user, Supplier, and Procurement areas.

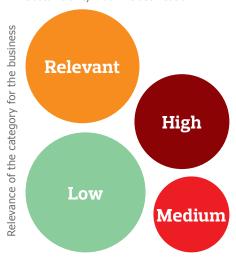
#### SUSTAINABLE PROCUREMENT

#### SUSTAINABLE PURCHASES

Based on a strategy connected to Braskem's Sustainability macro objectives, the Procurement area works to make the purchasing process increasingly more sustainable and responsible. The first action of this strategy was mapping the Supplier chain, in which the supply categories were classified by a specific criticality matrix. This matrix includes two aspects: The first

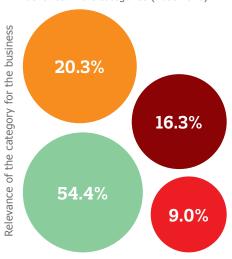
is the relevance to the business, through internal and other indicators drawn from the ISO 9000, and the second aspect evaluates the potential social and environmental impact.

Sustainability Matrix Classification id



Social and environmental impact of the category

Percentage of suppliers in the Procurement area identified in the categories (Base 2016)



Social and environmental impact of the category

Throughout the year, the actions originating from this mapping were planned. Among them is structuring self-assessment questionnaires based on the Sustainable Procurement Manual tool of

CEBDS (Brazilian Business Council for Sustainable Development). The questionnaires will be included in the new bidding processes to show the overall performance in Sustainability aspects, and to support the Suppliers selection process. In 2016, a pilot project was carried out in one of the purchasing categories, showing its effectiveness in the evaluation process.



#### **DEVELOPING SUPPLIERS WITH SEBRAE**

Another action initiated and aligned to the Sustainable Development planning of the area was the implementation of a Supplier development project in partnership with SEBRAE, in Rio

de Janeiro. Several companies were invited and participated in a business diagnosis conducted by SEBRAE-RJ, and in structured training according to the opportunities mapped.

#### **CDP SUPPLY CHAIN**



In 2016, the area continued to support the CDP Supply Chain program, which requests that Suppliers submit a report on their greenhouse gas emissions, associated risks and opportunities, and their strategy to ensure improvements in the management of the aspect. This year's focus was to identify the most significant risks and opportunities reported in the CDP program and the evaluation of possible action plans. In addition, for Suppliers located in regions of potential water stress, the water management questionnaire was requested.

#### **LOGISTICS**

Braskem Logistics (Basic Petrochemicals and Polyolefins) works with Health, Safety, and Environment (HSE) professionals to ensure compliance with all social and environmental requirements critical to the Company's operations.

Team Members of the area work with their own evaluation methods, based on Braskem's performance analysis system and Abiquim's Safety, Health, Environment, and Quality Assessment System (SASSMAQ).



#### **SAFETY PROCEDURES**

In 2016, Braskem continued to reinforce Processes Safety in Logistics through a structured program of risk studies involving seven new products with operations classified as average risk, based on the volume transported and its degree of hazard.

For the logistics operations involved in these seven products, 144 routes, 17 transportation companies, six loading and unloading areas, the configurations of road equipment, and ten ships were evaluated. Specific inspections based on international standards were also carried out at six maritime terminals contracted by Braskem with the purpose of identifying risks and defining preventive control barriers.

Braskem also holds periodic meetings with its service

providers to keep them up-todate on best practices in Health, Safety, and Environment, and, from this, adopts assessment tools and safety controls. The Company also conducts annual audits at the headquarters of the transportation companies, with evaluations and planning of corrective actions for Supplier cases that resulted below the expected in the Supplier Performance Index (IDF). To this end, tools such as the Service Level Agreement (SLA) and the Accident/ Incident Prevention (IP) Index are used. All this caution is reverted in detailed monitoring of the events and indicators of freight transportation: Transport Accident Frequency Rate (by number of trips and per kilometer driven) and Accident Severity Rate.

Maintaining partnerships with Brazil's leading risk managers

is also part of the Company's strategy, which hires most of its non-hazardous road freight (resins) with electronic For hazardous trackers. products (chlorine soda) and petrochemicals, transportation companies are required to have 100% of the freight tracked, freight must be handled exclusively by the supplier's own fleet, and must carry out the Priority Product Logistics Risk Study (e.g. Benzene and Pygas). Finally, for propylene, in addition to tracking the entire freight, telemetry is required on board the vehicles.

The Company also has a contract with Suatrans, the leader in chemical and environmental emergency road response in Brazil, and conducts audits at the service bases and simulations on the main transportation routes.

### ROAD SAFETY PROGRAMS AND PARTNERSHIPS

The areas responsible for managing Braskem's logistics activities are in line with programs relevant to promoting road safety, among which the following stand out:

- Program Olho Vivo na Estrada: established by Abiquim in partnership with Abiclor, aims to prevent unsafe behavior when transporting hazardous products through driver awareness. The "Olho Vivo na Estrada" is part of a risk management system, and its goal is to reduce the number of road accidents with chemicals to zero.
- Program Transportadora da Vida: a program of the Trade Union of Freight and Logistics Transport Companies (SETCERGS), which certifies cargo transport companies that carry out actions with a greater emphasis on safety.
- Program Na mão certa: developed by the NGO Childhood, is dedicated to eliminating the sexual exploitation of children and adolescents on Brazilian highways. In 2016, Braskem was recognized by the NGO for having trained multipliers and conducted sensitivity training with over 300 truck drivers, in addition to the partnership with the risk manager for support and communication of the cause to the majority of truck drivers who ship Braskem products.

#### **EMISSION CONTROL**

On another front, Braskem Logistics adopts different actions focused on sustainability. In this regard, the Polyolefins Logistics participated in events in four Brazilian states (São Paulo, Rio de Janeiro, Bahia, and Rio Grande do Sul) and in Mexico, to foster partner engagement in voluntary monitoring of greenhouse gas emissions (GHG), seeking

to identify opportunities to reduce emissions.

As a result, also in 2016, Braskem's Polyolefins Logistics began measuring its emissions from all modes for sales to Clients in Brazil, reaching a result of  $0.027~kgCO_2e/t.km$ , with emissions of  $67.9~million~kgCO_2e$  (3.2 million tons of resins and 108.8~million~km traveled).

In addition to initiating emissions monitoring, the area has sought creative ways to reduce this indicator, such as the use of closed circuits to transport resins, sharing of dedicated vehicles with other transportation companies, and fostering more sustainable modes of transport.





## Clients

G4-8

With Clients in diverse segments of the industry, Braskem is constantly seeking to maintain and expand a collaborative relationship with its partners. To this end, the Company integrates investments in innovation for developing solutions in partnerships with Clients, creating new solutions that can contribute to improving the life of society and ensuring the preservation of the environment.

#### **Visio Program**

Visio is a platform that integrates sharing knowledge and experiences between Braskem and Clients. The goal is to strengthen relationships to create common values capable of increasing competitiveness and business productivity.

In 2016, a total of 909 Clients were served by Braskem's Polyolefins unit in Brazil (Polyethylene, Polypropylene, and Renewable Chemicals). According to Visio records, 89 Clients were involved in 126 initiatives implemented

throughout the year, such as new formulations of grades and products, technical follow-ups, audits, and training. The tool used by Braskem as the basis for project management is CRM (Customer Relationship Management).

#### Maxio® Seal

Created to recommend the ecoefficient resins of the Company's portfolio, the Maxio® Seal serves one of Braskem's main growth pillars: Innovation. Through it, resins are identified that bring environmental gains, since they provide to Clients less energy consumption, greater productivity in the production process, and a lighter end product.

In this way, the eco-efficiency of the Maxio® line allows progressive reduction of production costs and environmental impacts, contributing to improving people's lives and preserving the environment. Among the highlights of 2016 is the experiment applying Maxio® H 202HC resin to the

production of fan blades and body. The input provided reduced emission of carbon dioxide by 4.2 tons per million pieces produced, as well as a 30% reduction in the annual energy consumption required to produce fans, an 8% drop in production time of the part, and a 9% increase in industrial productivity.

#### Wecycle

The Wecycle platform was created with the objective of developing business and initiatives for appreciation of plastic waste through partnerships, bringing reliability and quality to developing products, solutions, and processes that involve all links on the plastic recycling chain.

In this way, Wecycle can offer companies committed to sustainable development a recycled plastic raw material with quality, traceability, process regularity, and socially and environmentally responsible actions throughout the recycling cycle.

This initiative reinforces Braskem's commitment to the plastic chain in Brazil, innovation, and sustainability, providing an increasingly better life for people. Read more about the initiative.

#### **PICPlast**

The Plastic Chain Incentive Program (PICPlast) is a Braskem initiative in partnership with the Brazilian Association of the Plastic Industry (ABIPLAST). The objective is to encourage the development of the plastic production chain through three areas: promoting the export of processed polyethylene (PE) and polypropylene (PP), encouraging competitiveness and innovation in the sector, and promoting the advantages of plastic.

In 2016, the amount invested in sales fostered for exports totaled BRL 139 million, which was 3% higher than the previous year. Throughout the year, PICPlast promoted the participation of sectorial companies in fairs

and business events such as Agrishow 2016, one of the largest agricultural technology fairs in the world, held in Ribeirão Preto, in the state São Paulo.

During the year there was also an advance in the agenda to train businesses and businessmen with the launch of a Production Chain Program for eight Brazilian states, with a total of 71 companies. Held in partnership with SEBRAE, the project is part of an agenda to expand the capacity of plastic processing companies.

In promoting the advantages of plastic, the sector fund set up for financing the program received 31 new participants in 2016, which totaled 486 companies registered since December 2014. The total volume of funds collected a total of BRL 6.9 million from December 2014 to January 2017, of which over BRL 3 million were invested over the period.



### Government

G4-EC4 )

Open and transparent dialogue with all stakeholders and proposing solutions that develop not only the Company, but also other sectors of industry and the country's economy, is something that is a part of Braskem.

Always motivated to offer solutions to the sector's challenges, in 2016, the Company continued several actions to defend the competitiveness of its production chain, as well as the search for solutions to challenges in the areas of logistics, infrastructure, energy, and topics related to industrial policy still affecting Brazil's growth.

One of the topics that remained on the discussion agenda was preserving the Special Regime of the Chemical Industry (Reiq). Approved by the Federal Government of Brazil in 2013, this demand remains one of the pillars for the recovery of the sector's

competitiveness through PIS-Cofins exemption for the purchase of raw material for first and second generation petrochemicals.

Reintegra, a government program that aims to return a percentage of the taxes on the production chain to certain segments of exporters, is still working at a lower rate than expected by the sector since it underwent a revaluation in 2015.

Created in 2011 as a temporary mechanism and established as permanent in 2014, Reintegra provides mobile rates that may vary between 0.1% and 5% on the income of companies from exports. In 2015, the 1% rate was set to 0.1%, a percentage that is valid until 2016. Reintegra is expected to reach 2% in 2017, returning to 3% in 2018, according to the decree established by the Federal government.

Thousand BRL	2014	2015	2016
Total tax incentives /credit <sup>1</sup>	125.7	173.9	87.5
- PRODESIN - ICMS	60.0	71.6	78.8
- REINTEGRA	65.7	102.3	8.7
Grants for investments, research and development, and other relevant types of concessions <sup>2</sup>	1.6	-	1.6
FINEP	1.6	-	1.6
FINEP Award	-	-	-
ECAs (financial aid from export credit agencies) <sup>3</sup>	-	-	-

- 1. Tax incentives/credits: Restitution of federal taxes by the Reintegra program and tax incentives of ICMS, granted by the Government of Alagoas, through the Integrated Development Program of the State of Alagoas Prodesin.
- 2. Grants for investments, research, and development: FINEP awards and financing for innovation projects.
- 3. Financial assistance from ECAs (credit and exporting agencies): Risk insurance operation with NipponExport and Investment Insurance (NEXI Japanese agency) for investment in maintenance and in the butadiene project.

#### **OPEN DIALOGUE**

Among several other associations that discuss new paths for the Brazil's macroeconomic policies, Braskem actively participates in discussions forums in petrochemical entities, industry representatives, and other sectors of the economy:

- Brazilian Chemical Industry Association (ABIQUIM): a private law entity structured to carry out the statistical monitoring of the sector, promotes specific studies on the activities and products of the chemical industry, follows changes in legislation and advises associated companies on economic, technical and foreign trade issues.
- Brazilian Association of the Plastic Industry (Abiplast): focuses on the processing industry.
- National Industry Confederation (CNI): the highest body of the industrial trade union system, focused on defending and representing the industry by promoting an environment conducive to business, competitiveness, and sustainable development in Brazil.

- Brazilian Business Council for Sustainable Development (CEBDS)
- Federation of Industries of São Paulo (FIESP): private law entity focused on guaranteeing Brazilian competitiveness, with demands for lower production costs and containing deindustrialization, guaranteeing the country's economic and social development.
- Federation of Industries of the State of Bahia (FIEB): private law entity focused on the growth, modernization, and improvement of the competitiveness of the industry in the State of Bahia, and sustainable development of the State
- Applied Tax Studies Group (GETAP): a nonprofit entity dedicated to assisting the improvement of Brazilian tax legislation, through suggestions regarding its simplification and rationalization.

#### 78

## 07. Health, Safety, and the Environment

Global Compact - Principles 1, 2, 6, 7, 8 and 9

RECORD OF ONE ACCIDENT WITH DEATH.

#### **SEMPRE**

THREE FACILITIES
REACH THE MAXIMUM
IMPLEMENTATION
STAGE.

BRL 103.9 million

INVESTMENTS OF BRL 103.9 MILLION IN HEALTH, SAFETY, AND ENVIRONMENT PROJECTS.

#### **Environment**

BEST HISTORICAL
RESULTS IN THE
RATES OF EFFLUENT
GENERATION
AND ENERGY
CONSUMPTION.

Braskem is the first Brazilian industry to be part of CDP's "A List" – global ranking for strategies and results associated with climate change.

15 plants

PROCESS SAFETY (RISK RATING, AS PER INSURER): 15 PLANTS WITH THE INTERNATIONAL STANDARD ABOVE STANDARD.

FIRST INVENTORY
OF GHG EMISSIONS
FROM OPERATIONS
IN MEXICO.



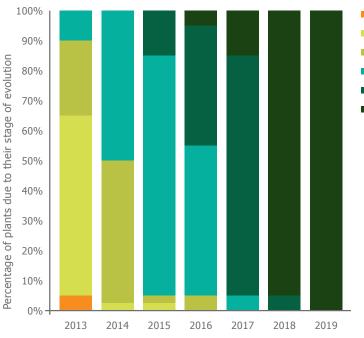
For Braskem, maintaining health and safety, and preserving the environment are key elements for the growth of the business and the search for innovative opportunities in the market. Always thinking about the future - not only of the Company, but of all its stakeholders - the Company works on its sustainability strategy objectively, focusing on developing increasingly sustainable processes. In this way, the Company is constantly

dedicated to the rigor of a set of internal controls (extended along its production chain) to ensure water and energy efficiency, constant reduction of generated waste, control and mitigation of its carbon emissions, and safety assurance in all its units.

In 2016, the Company continued on its path of evolution in Health, Safety, and Environment (HSE) management, aligned with SEMPRE (Integrated Health, Safety, and Environment System), which takes into account the unit's profile, as well as its respective risks, when setting annual progression goals. To ensure that all plants are standardized, annual audits work with the following points: Strategic Elements, SEMPRE Guidelines and Procedures in alignment with Quality and Productivity, and Verification of the Barriers for process safety risk scenarios.



#### **SEMPRE PATH OF EVOLUTION**



Diagnosis

■ Stage 1 - Construction of HSE bases

■ Stage 2 - Prevention of personal losses

■ Stage 3 - Prevention of big losses

■ Stage 4 - Performance assured in HSE

■ Stage 5 - High performance in HSE

In 2016, 100% of SEMPRE audits were carried out, certifying 90% of the units. In addition, 50% showed an improvement over 2015: today 6.7% of units are in stage 5, while 4% are in stage 4, and 46.7% are in stage 3, and 6.7% are in stages 1 and 2. It should be noted that the audits for Braskem's terminals in Brazil were carried out separately from the industrial units and focused on logistics operations.

Technology labs are included in the scope, and the Pittsburgh Innovation and Technology Center, in the United States, is certified in stage 5, and the Campinas Center for Research in Renewable Chemicals, in Brazil, is certified in Stage 1 of SEMPRE.



## Investments and Gains in Environmental Protection

G4-EN31)

Braskem applies resources to increasing the levels of environmental protection related to risks of process or product accidents. In 2016, the Company improved significantly in provisions for environmental damages (Environmental Liabilities), which increased from BRL 65.8 million in 2015 to BRL 182.6 million. This increase is not associated with a greater number of environmental liabilities, and is a result of improved management that allowed the Company to expand the forecast of expenditures from two to five years. Other expenses were divided as follows<sup>23</sup>:

#### INVESTMENTS AND GAINS IN ENVIRONMENTAL PROTECTION

Type of spending (BRL million)		2014	2015	2016
	Work safety	117.9	65.6	51.4
	Process safety	4.9	13.0	25.9
Investments in HSE	Health	15.1	4.7	2.8
	Environment	27.0	31.1	23.8
	Total	164.9	114.4	103.9
	Liquid effluents treatment		50.5	51.1
Spending on treating effluents and waste  Waste m Total	Waste management	105,1*	42.7	55.3
	Total		93.2	106.3
Emissions management		59.1	8.1	7.9
Environmental licenses		0.5	1.1	1.0
Depreciation		46.0	46.0	46.0
Provision for environmental (environmental liabilities)	damages recovery	50.4	65.8	182.6
Other environmental manage	ement costs	48.8	66.6	59.7

<sup>\*</sup>In 2014, spending on effluents and waste treatment were not evaluated separately

<sup>23</sup> The depreciation amount is an estimate based on previous years. The amount reported in provision for environmental damage recovery refers to what has been planned for use over the forecast of needs for the coming years. Other environmental management costs include groundwater management, environmental noise monitoring programs, quality of surface water resources (lakes, rivers, sea) and pipelines, environmental risk management, and energy and water management.

Health, Safety, and Environment management also include monitoring savings and avoided costs through improvement projects developed by the area. In 2016, this work resulted in gains of approximately BRL 252.4 million in operations in Brazil, the United States, Germany, and now Mexico.

## COSTS AVOIDED - HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT

DIMENSION (II	N BRL MILLIONS)	2014	2015	2016
Safety	Work safety	0.6	0.6	-3.4
Salety	Process safety	7.9	-27.0	17.1
Health	Occupational health	37.1	19.0	23.3
	Waste generation	53.7	13.5	6.7
	Water consumption	1.9	7.2	4.6
Environment	Effluents generation	1.9	6.2	2.1
	Energy consumption	307.6	116.8	134.9
	GHG emissions	4.5	0.0	67.0
UCE	Common impact	14.0	0.0	0.0
HSE	Management	4.1	0.5	0.1
TOTAL	-	431.4	136.8	252.4

## Occupational Health and Safety

In March 2016, Braskem reported the death of a Team Member at the PE 8 plant in Cubatão, Brazil. The accident occurred while finishing unloading propylene when the operator performing the maneuver was hit by the sudden movement of the hose (hook) caused by remaining pressure in the equipment. Despite all medical efforts, the Team Member died days later due to the aggravation of his state of health.

For over five years, Braskem had not recorded any accidents of this nature in its operations, and will now further reinforce its focus on discipline in its operational activities. The

frequency rate of accidents with and without lost time (CAF + SAF), considering Team Members and Third Parties per million hours worked, has shown a downward trend in the last four years, with its lowest value in 2015. In 2016, this rate increased by 17.6% compared to 2015 but is still below the historical rate.

The Lost Time Injury Frequency Rate, considering Team Members and Partners per million hours worked, was 0.24. The variation of the Severity Rate of Accidents with Lost Time went from 43.32 in 2015 to 164.17 in 2016, due to the fatality that occurred at the PE8 described above.

G4-LA6

In 2016, the frequency rate of accidents with and without lost time increased by 17.6% compared to 2015, but is still below the historical rate.



INJURY FREQUENCY RATE X 1MM/HHT	2012	2013	2014	2015	2016
Accident Frequency Rate (SAF+CAF)	1,04	1,04	0,97	0,68	0,80
Accident Frequency Rate (CAF)	0,35	0,39	0,14	0,26	0,24
SEVERITY RATE	30,79	64,70	12,53	43,32	164,17
NUMBER OF ACCIDENTS WITH FATALITIES	0	0	0	0	1

G4-LA6

## NEW CASES OR AGGRAVATED OCCUPATIONAL DISEASE

In 2016, after three years without any cases, Braskem identified a case of work-related disease (depression) in the São Paulo (Brazil) office. The investigation was completed in July and included the opinion of external and independent specialists on the case and its history. During the evolution of the analysis, the Team Member received medical assistance, including follow-up with external psychologists and psychiatrists.

2012	2013	2014	2015	2016
5	0	0	0	1

## Process Safety

To reinforce everyone's awareness of the importance of safety procedures, and ensure that processes are effective, Braskem conducts preliminary assessments in order to manage and mitigate potential risks. The process is continuously

strengthened by the leaders, who work rigorously on risk management in processes, operations, and logistics. To this end, several management methods are used, such as change management, accident and incident investigations, as

well as audits of barries and technical actions to reduce risk in scenarios of greater significance. The Process Safety pyramid is used to classify unwanted events according to their magnitude of damage.



G4-S02

One of the highlights of the year was intensifying the analysis of the smaller process safety occurrences, usually considered "near-misses," allowing for increased preventive learning in the units, as well as further revision of the corporate standards associated with

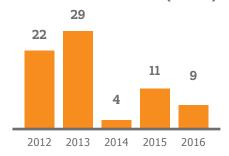
process safety. It is also worth highlighting the focus on strengthening human trustworthiness at Braskem, the continuity of the barriers audits, and the implementation of technical risk mitigation actions for the most significant scenarios.

In 2016, Braskem recorded nine Tier 1 events, down from 11 events in the previous year. The accident rate was 0.22, consistent with the best process safety benchmarks of companies in the US chemical industry (0.41 was the average benchmark for US companies in 2015).



#### TIER 1

#### **NUMBER OF ACCIDENTS (TIER 1)**

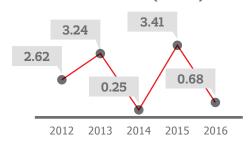


#### **ACCIDENTS RATE (TIER 1)**

no of accidents x MM/HHT



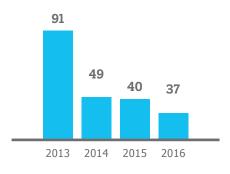
#### **SEVERITY RATE (TIER 1)**



#### TIER 2

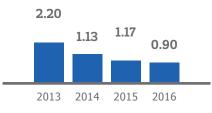
For Tier  $2^{24}$  events, the reduction trend of previous years was confirmed. In 2016, Braskem recorded 37 events, three fewer than the previous year. The accident rate was 0.90.

#### **NUMBER OF ACCIDENTS (TIER 2)**



#### **ACCIDENTS RATE (TIER 2)**

no of accidents X 1MM/HHT

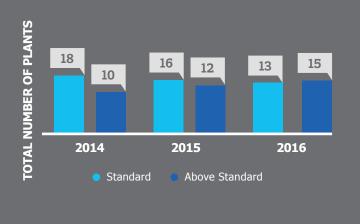


#### TIER 3

Regarding the smaller cases, 3,133 Tier 3 events, at the base of the pyramid, were recorded. This result ensures a preventive focus on the smaller events and a stronger process safety culture, and demonstrates the commitment of the Team Members to reducing the number of small events to minimize the occurrence of more severe events.

#### **RISK RATING**

Braskem has been continuously advancing in efforts to improve the Risk Rating of its plants by implementing several improvements in its facilities and searching for increasingly safe production processes. In 2016, the Company advanced in having almost all units audited by insurers and reinsurers, and now owns 13 plants with the international standard "Standard" and 15 plants "Above Standard." It should be noted that Braskem does not have a target for this indicator.



<sup>&</sup>lt;sup>24</sup> In 2012, Braskem did not evaluate the Tier2 indicator. This indicator only came to be measured in 2013, so it does not yet have a five year history.

## Product Safety

G4-PR1, G4-PR3

In 2016, Braskem updated made available all of its Emergency Sheets<sup>25</sup> in accordance with the new Brazilian legislation, improving them with the Chemical Substances Information (FISPQ) of the products produced and marketed by the Company. In addition, in partnership ABIQUIM (Brazilian Chemical Industry Association), the Company acts with the International Council of Chemical Associations (ICCA) to promote the recognition and disclosure of the risks and benefits, to people and the environment, of the use of chemicals. All FISPQs of the products manufactured and marketed may be found on Braskem's website.

Aware of the degree of hazard, toxicity, corrosivity, flammability, and environmental impact characteristics of its products, Braskem constantly carries out internal audits to ensure the safety and reliability of its processes. In 2016, audits involved units producing hazardous and non-hazardous products.

About Process Security (SEPRO), in 2016 this aspect continued to be strengthened in all of the Company's leadership committees. In addition to rigorous analysis and management of process for industrial and risks logistics operations, there was a focus on recording and analyzing near-misses, seeking preventive learning, continuous improvement of management of barriers, and the implementation of technical actions to mitigate risks for the most significant scenarios.

 $<sup>^{25}</sup>$  In the United States, the Company uses the Material Safety Data Sheet (MSDS) and in Europe, the Safety Data Sheet (SDS), required by the Occupational Safety and Health Administration (OSHA) and the EU relevant directive (REACH).



## Water Efficiency

G4-EN8, G4-EN10

The drought and reduced volume in the reservoirs responsible for water supply continue to show warning signs in Brazil. Considering this scenario, and all those with a potential impact on the Company's global operations, Braskem has been investing heavily in the assessment and management risk of water scarcity in its production units throughout the country.

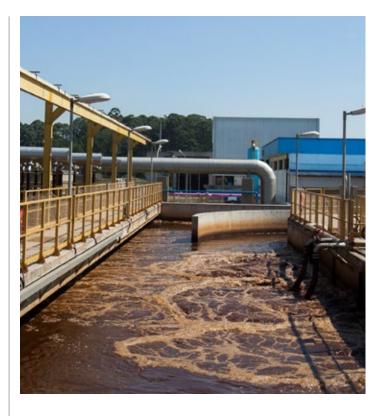
As a result of this initiative, in 2016 the Company completed the assessment of the regions where it operates crackers to help guide investments where there is a need to reduce water consumption or abstraction. For 2017, action plans will be developed focusing on reducing water risk, in addition to extending the study of water scarcity risk for the other regions in Brazil and abroad for the water stress scenario according to the climate risk study already carried out by the Company.

From 2002 to 2016, Braskem invested approximately BRL 280 million in projects toward improving water efficiency at its plants in Brazil, with accumulated savings of over BRL 175 million in cost reduction with the treatment of liquid effluents and operating costs with water consumption. The following results stand out:

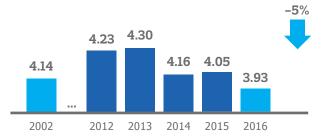
- The total volume of water consumed was 72.4 million m³/year. The consumption index reached 3.93m³/t, totaling an accumulated improvement of about 5% since 2002.
- The liquid effluent generation index reached 1.11m³/t, the best historical result since 2002, representing an accumulated improvement of about 41%, and savings of BRL 115 million with effluent treatment.
- From 2011 to 2016, the water reuse percentage (rainwater, treated industrial effluents, and

- treated domestic sewage) improved by 27%, and in 2016 alone 15.4 million m³ were reused.
- From 2014 to 2016, the reuse of 25 million m³ of water was calculated through the Aquapolo, the largest project for the production of industrial reclaimed water in Latin America, releasing a volume equivalent to 10,000 Olympic swimming pools for drinking water consumption in the ABC region, in São Paulo, Brazil.

Braskem also uses specific indicators to measure its water efficiency, such as water consumption (m<sup>3</sup>/t of product)<sup>26</sup> and generation of effluents (m<sup>3</sup>/t of product). The 2016 result was 6.0% better than the agreed upon target for the year (4.18 m<sup>3</sup>/t), and 3.0% better than the 2015 performance  $(4.05 \text{ m}^3/\text{t})$ . The achievement of the target represented a savings for the Company of nearly BRL 12 million.



#### WATER CONSUMPTION - m<sup>3</sup>/t



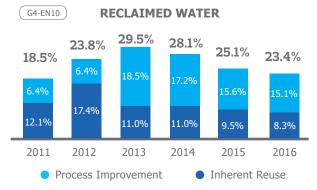
Note: Braskem Idesa's consumption in Mexico was not recorded in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning 2017, the unit's consumption will be part of this indicator.

25
MILLION m<sup>3</sup>

Volume of water reused through the Aquapolo Project. The good performance regarding the year's water efficiency is mainly due to internal initiatives by the industrial teams toward improving the cycle of the cooling towers, which represent important figures in water consumption in these industrial units, thus improving the rates for specific consumption and loss reduction.

In 2016, Braskem utilized an absolute total volume of 15,395,138 m³ of reclaimed water.

The industrial units located in ABC in São Paulo (Brazil), which used 7,957,425 m³, and where almost all of the water consumed is reclaimed water (Aquapolo), are noteworthy.



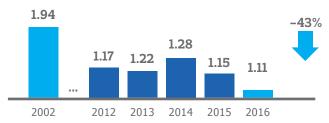
- (1) Reuse in Process Improvements is any reuse that comes from modifications in the current units, including or improving processes.
- (2) Inherent reuse is that which was always part of the industrial unit as part of the plant's original process.

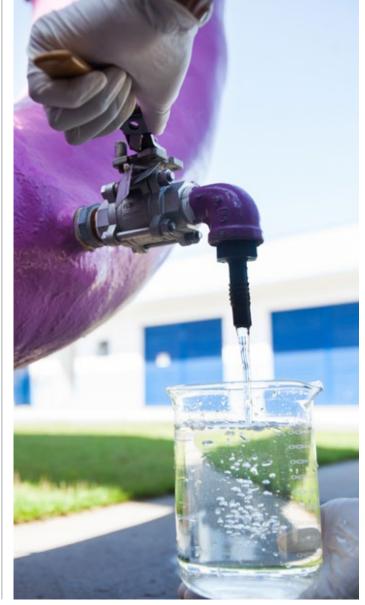
The effluent generation indicator in 2016 presented a 4.3% lower result compared to the annual target (1.16 m³/t), and 3.5% lower compared

to the previous year's performance. Despite having suffered negative impacts due to operational problems, it was Braskem's best historical

result for the indicator, and the achievement of the target represented a savings for the Company of BRL 1.7 million.

#### **GENERATION OF LIQUID EFFLUENTS – m³/t**





Note: Braskem Idesa's generation in Mexico was not recorded in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning 2017, the unit's generations will be part of this indicator.

#### **DISTRIBUTION OF EFFLUENT DISPOSAL BY LOCATION**

G4-EN22

Countries	Location	Effluent Destination	Volume of effluents discharged (m³/year)	Treatment method	COD (kg/year)
	Rio de Janeiro	Canal de Coelho	587,244	Biological	69,939
	Bahia	Odebrecht Ambiental Treatment Station	6,157,184	Pre-treatment with water-oil separator and biological treatment at Odebrecht Ambiental	3,492,411
Brazil	Alagoas	Ocean disposal	3,375,706	Neutralization/Aerobic process (activated sludge)	320
	Rio Grande do Sul	External Effluent Treatment Station (ETE)	4,155,331	Pre-treatment with water-oil separator and primary, secondary (biological) and tertiary treatments	1,261,223
	São Paulo	Ponte Funda Stream	85,153 Sent for external treatment		290,466
		Perequê River	271,386	Water-oil separator and primary treatment through decantation and filtration	NA
		Tamanduateí River	1,949,353	Conventional primary and physical, physicochemical, and biological	333,868
	La Porte	Houston navigation channel	443,044	Primary treatment and chlorination	2,658
	Marcus Hook	Delaware River via POTW	695,995	Primary, biological, and chlorination treatment	6,960
United States	Neal	Big Sandy River	241,157	Primary treatment and chlorination	1,471
	Seadrift	Victoria Barge Canal	303,324	External treatment	NA
	Oyster Creek	Oyster Creek	86,417	External treatment	NA
Germany	Schkopau	Saale River	83,382	External treatment	NA
	Wesseling	Rio Rhine	149,904	Primary and biological treatment	1,799
Mexico	Mexico	Huazuntlán River	1,271,951	Internal treatment with partial reuse and sending to the Huazuntlán River	-

Among the main impacts on effluent generation in 2016 are the quality of the abstracted water, the influence of the summer temperature in some regions, operational problems, and shutdowns for maintenance. On the other hand, positive actions were implemented, such as increasing the concentration cycle in cooling towers, optimizing operating procedures with consequent reuse of water currents and reduced losses.



## EnergyEfficiency

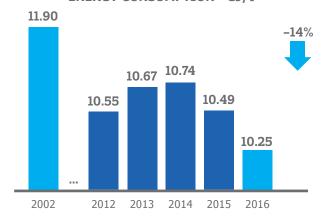
G4-EN3, G4-EN5, G4-EN6

Braskem units always seek to minimize their environmental impact. To this end, they work to find alternatives that help reduce energy consumption, improving efficiency, and searching for the best available energy matrix.

The result for the year was in line with the agreed upon target for 2016 (10.25 GJ/t), and 2.3% below the 2015 performance (10.49 GJ/t). It

was Braskem's best historical result for the indicator and a total reduction of 14% since the beginning of measurement in 2002. Among the actions that contributed to this result are the energy optimization initiatives for furnaces, boilers, turbines, pumps, and compressors, better energy utilization in the plants, greater efficiency in steam generation, and the development of control systems.

#### **ENERGY CONSUMPTION - GJ/t**

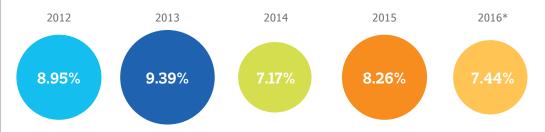


Note: Braskem Idesa's consumption in Mexico was not recorded in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning in 2017, the unit's consumption will be part of the indicator.

### PERCENTAGE OF CONSUMPTION PER TYPE OF ENERGY IN RELATION TO TOTAL CONSUMPTION

	2012	2013	2014	2015	2016
Electricity	10.3%	9.9%	10.2%	9.0%	9.0%
Natural gas	12.0%	8.9%	13.0%	16.0%	20.0%
External fuels (mainly oil and coal)	4.8%	4.8%	5.2%	5.5%	6.0%
Residual internal fuels from the petrochemical process	72.9%	76.3%	71.6%	68.8%	65.0%

### PERCENTAGE OF RENEWABLE ENERGY CONSUMPTION COMPARED TO TOTAL ENERGY CONSUMPTION



\* The 2016 data does not include Braskem Idesa unit in Mexico

Among the main initiatives in Brazil toward reducing energy consumption in the units, the following stand out:

#### **ALAGOAS - PVC2 AL**

Savings of BRL 1.7 million per year through reduced vapor consumption in the MVC T 1302 and T1502 purification column, with a reduction in CO<sub>2</sub>

emissions of 3.4 kg/t MVC/day. In addition, the plant managed to reduce consumption by 1.2 t/h of steam in the P3201A/B and P3206 heat exchangers, reducing CO<sub>2</sub> emissions (savings of BRL 657,000 per year) and steam consumption through energy optimization, with a 1.13 million m³ drop in water consumption and 1.11 million m³

drop in natural gas consumption (savings of BRL 1.2 million per year).

#### SÃO PAULO - PP3 ABC

Savings of BRL 900,000 avoiding the burning of 320,000 kg of hydrocarbons by the Flare. The result was a reduction in greenhouse gases emissions equivalent to 1,100 t of CO<sub>2</sub>.

89

In 2016, Braskem's production units recorded a gain of BRL 134.9 million through initiatives toward improvements in processes, energy sales, furnace optimization, reduced steam consumption, and improved boilers and turbines. These initiatives reduced energy consumption by 5,471,141 GJ in the year. In Brazil, the initiative

that presented the most gains was the one implemented at UNIB 2 RS (Rio Grande do Sul), which, by optimizing the furnaces, had a gain of BRL 38.4 million. By reducing the technical coefficient of steam from evaporation to 2.55, the CS 1 AL (Alagoas) unit reduced its energy consumption by 1,261,711 GJ.

G4-EN6

# INITIATIVES TOWARDS IMPROVEMENTS IN PROCESSES Improvements in production processes (except furnaces) and sale of electricity Furnace optimization 60.5 Reduced steam consumption 6.3 Boiler and turbine improvements 11.1 TOTAL 134.8



## Improvements in energy efficiency in Triunfo: the use of coal with environmental control guarantee

In recent years, the Braziliar electricity sector has beer experiencing periods of instability. Based on a predominantly hydroelectric matrix, droughts that affected a large part of the country influenced tariffs, and ever with recovered reservoir levels, the scenario is still challenging.

that guarantee a supply of clean energy with prices compatible with the needs of the business, Braskern has been working hard to analyze trends and, through internal efforts, to implement innovative strategies for energy generation in its production units. These initiatives include projects

to increase the capacity and quality of coal, optimize the use of natural gas, and increase the efficiency of cogeneration.

initiatives, Braskem in Triunfo, Rio Grande do Sul (Brazil) took advantage of the shutdown cycle (from June to September) of the two coal-fired boilers in order to promote improvements in the efficiency of the electrostatic precipitator system, responsible for retaining ash from combustion gases.

The Company invested BRL 2.7 million in a new control system that will generate daily savings of approximately 10 MW of energy. The

system, called Miecon, began operations in August 2016 and made it possible to increase and optimize the use of coal, and increase the retention of ash generated by burning -without additional costs. In this process to improve energy efficiency, the Company sought coal with higher energy value and lower emission rates, while complying with the most stringent emission control standards of particulate matter.

The changes integrate the strategic plan to obtain increased energy efficiency while guaranteeing environmental control, one of the Company's main focuses of attention.



## Waste Management

G4-EN23

For Braskem, the correct management of all generated waste in its production process is essential, and such action is part of the Safety macro objective of the Company's Sustainable Development Strategy. With this focus in mind, among the actions carried out by the Company in 2016, the following stand out: initiatives toward reductions at the source and optimizing internal procedures, creating economic value by transforming waste into by-products, reverse logistics, and actions toward reuse and composting, among others.

During the year, 37,334,108 kg of waste considered hazardous and 18,057,602 kg of non-hazardous waste were generated, both with an increase compared to 2015, mainly due to the specific characteristics of the production process and the impacts of seasonal and non-seasonal events, such as unscheduled shutdowns (which may occur due to a power outage, for example), and scheduled shutdowns for maintenance and improvements in plant efficiency.

When evaluated according to Braskem's specific eco-efficiency indicators, which considers the generation of waste per ton produced, this value has been steadily declining over the last 15 years, reaching a total reduction of 63% since 2002.

Thus, based on this data, in 2016 the index was in line with the established target (2.16 kg/t), but 7.5% higher than the previous year's performance (2.01 kg/t). Reaching the target represented savings for the Company of nearly BRL 600,000.

Regarding waste disposal, the values have remained at the same level over the years, with some changes related to the storage of this waste for later disposal, as well as seasonal generation associated with expected events and not specifically related to production.

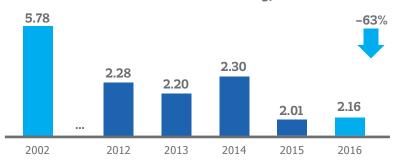
Destination of generated waste (%)	2012	2013	2014	2015	2016
Potential for reuse	55.3%	57.1%	60.6%	61.8%	56,2%
Reuse	29.6%	21.7%	26.8%	29.7%	27,3%
Discarded	15.1%	21.1%	12.6%	8.5%	16,5%

Allocated waste (thousand kg)	2012	2013	2014	2015	2016
Recycling	7,737	19,858	7,930	4,628	7,371
Recovery (including energy)	4,165	3,169	5,424	3,975	7,247
Landfill/ Industrial landfill	14,112	11,152	21,493	2,804	9,146
On-site storage	474	187	748	1,859	1,303
Incineration	11,552	17,263	20,408	1,713	8,423
Reuse	245	290	238	739	482
Composting	534	306	662	274	475
Underground waste injection	1,933	8,568	7,960	0	1,931
Other*	4,040	9,650	5,000	3,700	17,022
TOTAL	53,936	70,443	64,868	19,692	53,400

<sup>\*</sup> Other: autoclave; thermal vacuum treatment to remove mercury, co-processing of waste in rotary clinker kilns for the production of cement, soil decontamination through thermal desorption.

28 These results do not include the Braskem Idesa unit in Mexico, since the Complex was still starting operations and in the stabilization phase. Beginning in 2017, the unit's generations will be part of the indicator.

#### **WASTE GENERATION - kg/t**



Note: In 2016 Braskem Idesa's (Mexico) generations were not recorded, since the Complex was still starting operations and in the stabilization phase. Beginning in 2017, the unit's generations will be part of the indicator.

## Climate Change

G4-2, G4-EC2, G4-EN15, G4-EN16, G4-EN17, G4-EN18, G4-EN19

In 2016, Braskem took important steps in the process of evolving the climate change strategy, with emphasis on strengthening adaptation and effective actions toward reducing its greenhouse gas (GHG) emissions. Today, the Company plays an important role in international debates that define policies aligned with the industry's commitments to reducing GHG emissions. In Brazil, the Company participates in several business

forums, as well as government initiatives, seeking to support discussions on options that align the competitiveness of the Brazilian industry with a low carbon scenario.

Braskem's participation in national and international forums has been increasingly strategic, shedding light on the Company's constant efforts to reduce and mitigate social and environmental impacts. With active participation in the major

global initiatives regarding climate change, including the International Council of Chemical Associations (ICCA) and the Carbon Pricing Leadership Coalition (World Bank), Braskem has been acting as one of the leaders in developing plans and initiatives toward carbon pricing and creating the proper tools to encourage companies and governments to take action toward a low carbon economy.



CLICK HERE TO LEARN MORE ABOUT BRASKEM'S PARTICIPATION IN NATIONAL AND INTERNATIONAL WORKING GROUPS AND FORUMS.

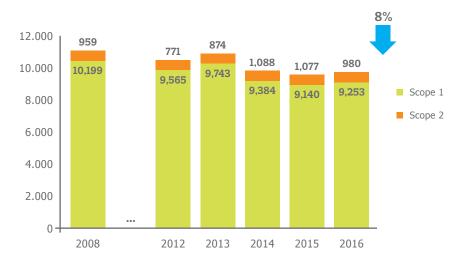
## **Important Steps**

- In 2016, Braskem's latest GHG emissions inventory was awarded, for the 6th consecutive year, the Gold category classification in the Brazilian GHG Protocol Program.
- For the fifth consecutive time, Braskem has been selected to be part of the Carbon Efficient Index (ICO2) portfolio of BM&FBOVESPA (Brazil).
- For the first time, Braskem is part of CDP's "A
   List": the maximum score of the global ranking
   of companies regarding its strategies and results
   associated with climate change. Also, Braskem is
   the first Brazilian industry to achieve this result.
- Braskem participated in the UN Conference on Climate Change (COP-22) held in Morocco, contributing to the discussions on carbon pricing instruments and disseminating its practices and progress in the management and adaptation to climate change.
- The Company conducted workshops with Suppliers on training and technical support to identify opportunities to reduce emissions and costs. Almost 44% of the emissions outside the direct control of Braskem (Scope 3) are now reported to the Company.

## GREENHOUSE GASES EMISSIONS (GHG)

Braskem's corporate GHG emissions inventory considers all categories of Scopes 1, 2, and 3 in 100% of its operations.

#### GHG EMISSIONS (SCOPE 1 E 2) - ktCO<sub>2</sub>e



Note: Braskem Idesa's emissions in Mexico were not included in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning in 2017, the Complex's emissions will be part of this chart.

Considering only Scope 1 emissions directly managed by Braskem, in 2016 the actions and initiatives implemented totaled a cumulative reduction of nearly 19% compared to base year 2008.

#### Carbon Intensity (scope 1) - tCO2e/t



Note: Braskem Idesa's emissions in Mexico were not included in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning in 2017, the Complex's emissions will be part of this indicator.

#### **CARBON INTENSITY (SCOPE 1 AND 2)**



Note: Braskem Idesa's emissions in Mexico were not included in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning in 2017, the Complex's emissions will be part of this indicator.

Among the main initiatives to reduce emissions are:

In southern Brazil, replaced part of the fossil fuel consumption with the additional purchase of electricity, implying reduced absolute emissions.

Actions to optimize operational and energy efficiency.

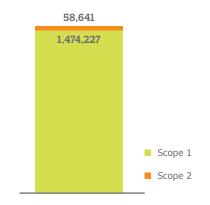
Energy reduction and/or recovery initiatives.

## FIRST INVENTORY OF GHG EMISSIONS FROM OPERATIONS IN MEXICO

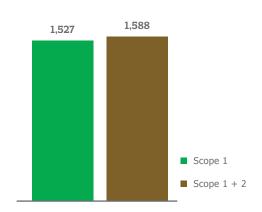
Braskem Idesa's operations carry significant weight in the Company's results, with direct emissions (Scope 1) representing 14% of Braskem's total. Given the pre-start and start of operations, results for 2016 were lower than expected, since on some occasions the unit operated without its operational efficiency at full load. Because it started operating in 2016 and to its more modern technology, the unit in Mexico is expected to improve the Company's efficiency indexes after it is stabilized.

On the other hand, it is worth mentioning that the team qualified itself, and carried out the emissions inventory including all categories of direct and indirect emissions, which will enable management and monitoring beginning at the plant's start-up phase. Due to the technology used in this new unit, the Company expects that its result in the coming years will be one of its best.





## BRASKEM IDESA CARBON INTENSITY - tCO<sub>2</sub>e/t



#### MANAGING INDIRECT EMISSIONS

Since 2011, Braskem has carried out a GHG emissions inventory of Scope 3 (indirect emissions) and has significantly evolved in actions to engage its supply chain and to identify initiatives to reduce these emissions, while also strengthening involvement in areas such as Procurement, Logistics, Services to People, Information Technology, acquisition of raw material, and others.

In 2016, the Logistics area of the Polyolefins Business Unit (UNPOL), working together with the Sustainable Development area, created a tool enabling practical and rapid measurement of Greenhouse Gas Emissions in the logistics transport of finished products in any mode of transport. With this, it was easier to visualize the emissions of cargo transport by business, by type of transport, and even by Client. To make comparisons possible, three KPIs were created (emissions by transported volume; emissions by traveled

distance; and emissions by volume per distance traveled - "Comprehensive GHGE"), which calculate the relationship between the transported volumes and traveled distances.

The chart on the next page shows the emissions by volume per traveled distance (Comprehensive GHGE) indicator, month by month. From now on, actions will be taken toward critically analyzing the results and identifying actions to reduce emissions.

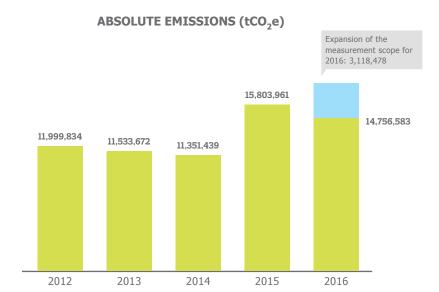


## EGHG EMISSION MANAGEMENT IN LOGISTICS (kgCO<sub>2</sub>/t.km)



In the area of Services to People, Braskem joined an initiative with the transport supplier to purchase carbon credit through the use of fuels from renewable sources in its fleet of vehicles. The initiative has been implemented and is in the process of monitoring and raising user awareness, in order to achieve maximum adherence and consequently obtaining carbon credits.





Note: Braskem Idesa's emissions in Mexico were not included in 2016, since the Complex was at the beginning of its operation and in the stabilization phase. Beginning in 2017, the Complex's emissions will be part of this chart.

The increase in Braskem Scope 3 absolute emissions was mainly due to the following factors:

Increased production in absolute figures, with the consequent increase in consumption of inputs and raw materials, among others.

Emissions from Braskem terminals, previously not yet included.

In the category referring to the use of the products sold by the Company, the beginning of reporting emissions associated with the gasoline produced and sold by the crackers, which was not previously included.

In the category referring to the end-of-life treatment of products sold, the report was expanded to approximately 80% of the products.



#### **OTHER EMISSIONS**

G4-EN20, G4-EN21

In addition to greenhouse gas emissions, Braskem manages other air emissions within its responsibility, such as ozone-depleting<sup>27</sup> substances and pollutants from fuel combustion, such as NOX, SOX, and others.

## **EVOLUTION OF EMISSION OF OZONE LAYER- DEPLETING SUBSTANCES (SDCO)**

SDCO	2012 (t)*				
Tons of CFC-11 Equivalent	-	180.5	48.6	55.3	3.0

<sup>\*</sup>Not reported in the period.

Braskem has also been replacing ozone-depleting substances with other substances outside the Montreal Protocol lists.

### EVOLUTION OF EMISSIONS OF $SO_X$ , $NO_X$ AND OTHER SIGNIFICANT SUBSTANCES

Emission <sup>(1)</sup>	2012 (t)	2013 (t)	2014 (t)	2015 (t)	2016 (t)
NO <sub>x</sub>	8,756	12,157	11,421	9,546	9,651
SO <sub>x</sub>	5,880	6,582	11,509	4,503	3,137
Volatile Organic Compounds	1,756	2,707	3,881	3,808	6,139 <sup>(2)</sup>
Particulate Matter	1,088	1,547	1,225	911	860
Toxic Air Pollutants <sup>(3)</sup>	142	549	97	652 <sup>(2)</sup>	531
Other <sup>(4)</sup>	7,121	6,108	6,190	14,495 <sup>(2)</sup>	4,145

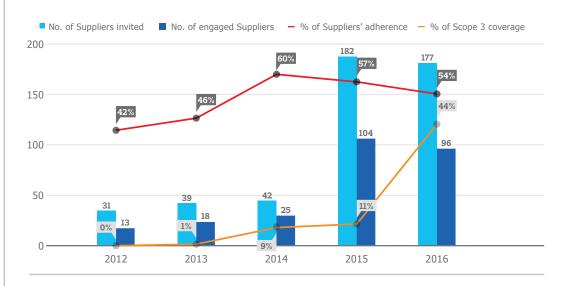
<sup>(1)</sup>The methodologies used are recommended by state environmental agencies. Where there is no measurement, estimates (emission factors) based on recognized methods, such as AP-42 from USEPA, are used.

## ENGAGEMENT OF SUPPLIERS IN EMISSIONS REDUCTION

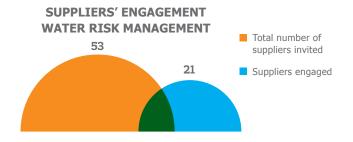
Braskem does not have mandatory requirements for its Suppliers, but has been developing voluntary engagement initiatives for the past five years as a means of more efficiently managing GHG emissions and the risks and opportunities in the chain upstream. Actions to raise awareness, encourage

the preparation and reporting of an emissions inventory, and identify risks and opportunities are carried out annually with support from CDP Supply Chain. As a result, there has been significant evolution regarding the representativeness of Scope 3 emissions.

#### **SUPPLIER ENGAGEMENT - CLIMATE CHANGE**



Braskem has expanded Supplier engagement toward Water Resources, focusing on those located in regions with potential water stress, and is training its buyers to broaden the management of the reported aspects.



<sup>(2)</sup> The plants have been expanding their assessments, which explains the increase in these parameters.

<sup>(3)</sup> Includes Toxic Air Pollutants and HAP

<sup>(4)</sup> Includes total hydrocarbons and carbon monoxide.

<sup>&</sup>lt;sup>27</sup> Ozone depletion refers to the decline in the total volume of ozone in the Earth's stratosphere (the ozone layer)

#### **CARBON PRICING**

After creating a work platform to assist in making investment decisions, Braskem concentrated its actions in 2016 on:

- Validating the carbon price with senior management.
- Adapting its standards and procedures.
- Aligning and training leaders and key stakeholders.
- Using this criteria to support decisions for the 2017 investment portfolio.

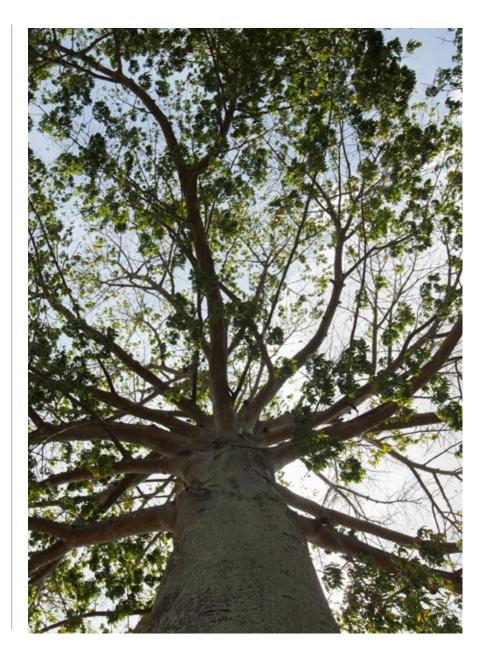
The tool calculates the virtual cost of carbon as a preliminary path for future

impact regulation, identifying positive and negative contributions to projects. Thus, the positive or negative economic values corresponding to the environmental impact caused by emissions are calculated for those projects that reduce or generate emissions.

This process is now entering the monitoring phase, in which will be evaluated the effectiveness of the price defined compared to the change in project eligibility in the decision-making process. All actions were concentrated in Brazil, and in 2017 the Company will define and implement a strategy for its international units.



It is worth mentioning that Braskem also actively participates in the Emissions Trading Simulation (SCE) and the Companies for Climate Platform, a constructive carbon market experience for debate and knowledge generation, expanding the contribution of companies to government proposals.



## RISKS AND OPPORTUNITIES - ADAPTATION TO CLIMATE CHANGE

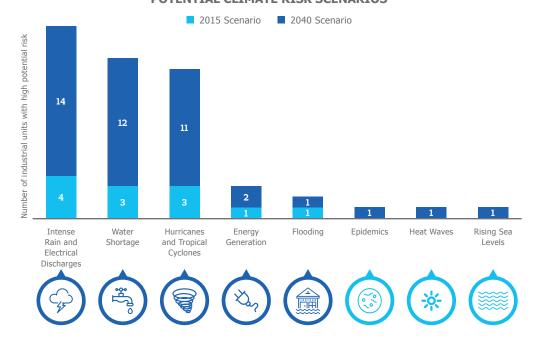
In order to ensure its competitiveness while contributing to the transition to a new development model based on the low carbon economy, Braskem has been working on a comprehensive adaptation plan that works on five fronts: internal engagement; external coordination; securing

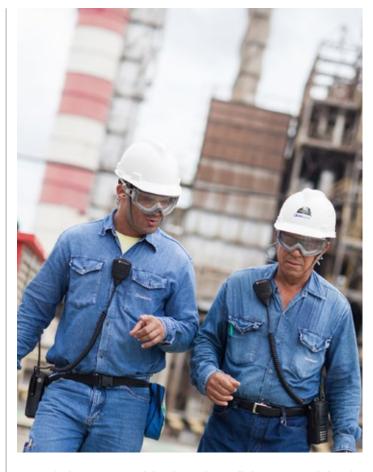
information; interpreting information; and expansion of risk management by incorporating climate variables in the Company's strategic planning.

After identifying and prioritizing potential opportunities and climate risks in all plants

in Brazil, United States, and Germany until 2040, with external support from the National Institute of Space Research (INPE) and specialized consulting, the Company complemented these studies by identifying the main potential impacts for Braskem Idesa's operations in Mexico.

#### **POTENTIAL CLIMATE RISK SCENARIOS**





In Brazil, the Company validated, with its leaders, the potential climate risks and the respective actions for the most relevant risks, which will be managed periodically through a framework based on a methodology approved with the Getúlio Vargas Foundation (FGV), in São Paulo, and with indicators

that will be monitored by the sponsor of the Company's Climate Change macro objective.

After validating the actions for potential risk scenarios, Braskem will focus on validating scenarios and actions for international operations.

#### 98

## OVERVIEW OF THE CLIMATE CHANGE ADAPTATION PLAN PLANTS OF BRAZIL

			NUMBER OF ACTIONS - "TOTAL" AND "(IN PROGRESS)"							
	Region/Location		Intense Rain and Electrical	Water	Hurricanes and Tropical	Energy Generation	Flooding	Rising Sea levels	Total	
			Discharges		Cyclones		• • • • • • • • • • • • • • • • • • • •		• • • • • • • • • • • • • • • • • • • •	
	NORTHEAST	AL	-	3(2)	-	1(0)	1(1)	1(0)	6(3)	
	NOTATION OF	BA	-	5(2)	-	2(1)	-	-	7(3)	
BRAZIL	COLITHEACT	RJ	-	4(1)	-	1(1)	-	-	5(2)	
	SOUTHEAST	SP	1(1)	3(1)	-	1(0)	3(1)	-	8(3)	
	SOUTH	RS	1(1)	-	4(1)	-	2(0)	-	7(2)	
BRASKEM	TOTAL		2(2)	15(6)	4(1)	5(2)	6(2)	1(0)	33(13)	

(-)= not applicable Example: 4(1) = total of 4 actions and 1 in progress

#### 99

## **▶** GRI G4 Content Index

INDICATOR	DISCLOSURE	PAGE
GENERAL STANDA	ARD CONTENT	
Strategy and Anal	lyses	
G4-1		<u>03</u>
G4-2		<u>03</u>
Organizational Pro	ofile	
G4-3		08
G4-4		<u>08</u> , <u>10</u>
G4-5	SP Office - Headquarters Rua Lemos Monteiro, 120, Edifício Odebrecht Butantã ZIP CODE: 05501-050 Phone: +55 11 3576-9000	10
G4-6		<u>07, 10</u>
G4-7		<u>08</u>
G4-8		<u>09</u> , <u>50</u> , <u>76</u>
G4-9		<u>07</u> , <u>08</u>
G4-10		<u>57</u>
G4-11	98.9% of Team Members in Brazil are covered by collective bargaining agreements, 42.2% in Mexico, and 8.9% in the USA.	
G4-12		<u>07, 70, 72</u>

INDICATOR	DISCLOSURE	PAGE
G4-13	Braskem Idesa Complex beginning of operation	-
G4-14	In principle, and in accordance with the Health, Safety, Environment, Quality and Productivity, Braskem does not produce, handle, use, commercializes, transports or discard any product if it does not can do it safely, with minimal impact to the environment.	<u>22</u>
G4-15		<u>17, 22</u>
G4-16		<u>22</u>
Identified Mat	erial Aspects and Boundaries	
G4-17		<u>08</u>
G4-18		<u>18, 20</u>
G4-19		<u>18</u>
G4-20		<u>18</u>
G4-21		<u>18</u>
G4-22	The following comment concerns indicators G4-22 and G4-23: it should be noted that the results of quantiQ were reported in the Financial Statements of the report, but are not included in social and environmental	
G4-23	indicators. Its management was already carried out independently even before the sale of the company. quantiQ was sold on 1/10/2017 (signing), with the closing of the transaction on 4/03/2017 (closing).	
Stakeholder E	ngagement	
G4-24		<u>18</u>
G4-25		<u>18</u>
64.06		<u>18</u>
G4-26		

INDICATOR	DISCLOSURE	PAGE
G4-28	Annual, covering the fiscal year from January 1 to December 31, 2016	
G4-29	2015	
G4-30	Annual	
G4-31		<u>120</u>
G4-32	G4 Core	
G4-33	The external assurance, performed by KPMG, occurs at the request of the Leaders and is part of the set of annual goals of those responsible for preparing the report.	
Governance		
G4-34		27
G4-39		<u>27</u>
Ethics and Inte	egrity	
G4-56		<u>32</u>
G4-57		<u>32</u>
G4-58		<u>31</u> , <u>33</u>
ETHICS AND IN	NTEGRITY	
SPECIFIC STAN	NDARD CONTENT	
Material Aspec	ts: All	
Macro Objectiv	res: All	
Material Aspec	ts: Economic Performance	



INDICATOR	DISCLOSURE	PAGE
G4-EC1		<u>35, 39</u>
G4-EC2		<u>91</u>
G4-EC4		<u>77</u>
Aspects: Market Presence		
Macro Objectives: Local Development		
G4-EC5		<u>60</u>
G4-EC6		<u>59</u>
Aspects: Indirect Economic Impacts		
Macro Objectives: Local Development		
G4-EC7		<u>64</u>
G4-EC8		<u>64</u>
Aspectos: práticas de compra		
Macro Objetivos: desenvolvimento local		
G4-EC9		<u>70</u>
Aspects: Materials		
Macro Objectives: Renewable Resources		

G4-EN1

Among the main non-renewable direct materials used by Braskem are naphtha, condensate, ethane, propane, HLR, and sodium chloride. The Company also uses ethanol manufactured from sugar cane to produce ethylene from a renewable source, thereby reducing its demand for non-renewable resources. Braskem understands materials as those present in the end product. Non-renewable materials are resources that are not renewed at the same rate at which they are consumed, such as minerals, metals, oil, coal, and gas. The values used are not disclosed because it is commercially sensitive information.

INDICATOR	DISCLOSURE	PAGE
G4-EN2	Braskem continuously invests in renewable raw materials. In industrial plants, reuse is maximized through the return of currents within the production process, which would be equivalent to internal recycling.  Investments in energy  and chemical recycling are being made for the future.	
Aspects: Ener	gy	
Macro Objecti	ives: Energy Efficiency	
G4-EN3		88
G4-EN5		88
G4-EN6		<u>88, 89</u>
Aspects: Wate	er	
Macro Objecti	ives: Water Efficiency	
G4-EN8		<u>85</u>
G4-EN10		<u>85</u> , <u>86</u>
Aspects: Biod	iversity	
Macro Objecti	ives: n/a (only material for Mexico)	
G4-EN12	The main impact of Braskem in biodiversity occurs when new units are built in areas where before there was no activity industry, such as in Mexico, where Braskem Idesa Complex finalized the construction of its petrochemical plant. These impacts are reversible in the medium term (approximately 10 years).	
G4-EN14	By 2016, only one endangered species was at risk of being affected by Braskem's operation: the Ceratozamia miqueliana(flora, critical status) in Mexico. Moving the plants found to the environmental protection area created by the Company significantly increased the number of plants.	
Aspects: Emis	sions	
Macro Objecti	ives: Climate Change	

G4-EN15 G4-EN17 G4-EN18 G4-EN19		91 91 91 91
G4-EN17 G4-EN18		<u>91</u>
G4-EN18		_
		<u>91</u>
G4-EN19		<del>_</del>
		<u>91</u>
Macro Objectives:	Climate Change	
G4-EN20		<u>95</u>
Macro Objectives:	Energy	
G4-EN21		<u>95</u>
Macro Objectives:	Safety	
G4-EN23		90
Aspects: Products	and Services	
Macro Objectives:	Application Development	
	In the agribusiness segment, the use of polypropylene to produce raffia sacks prevented the emission of $190,600$ tons of $CO_2e$ . In the automobile segment, the use of PP to replace several materials avoided the emission of $4.5$ million tons of $CO_2e$ . In the segment of real estate paints, the use of PP in buckets, replacing the tin can, avoided the equivalent of $19,500$ tons of $CO_2e$ . In total, for the PP segment, the emission of $4.7$ million $CO_2e$ . was avoided.	<u>50</u>
Macro Objectives:	Post-Consumption	
G4-EN28		<u>65</u>
Material Aspects:	Compliance	

INDICATOR	DISCLOSURE	PAGE
Macro Objecti	ve: Strengthening of Practices	
G4-EN29	Braskem was not definitively ordered to pay fines or to comply with non-monetary sanctions in the period. For the purpose of this report, the same materiality criteria used on the Reference Form established by the Brazilian Securities and Exchange Commission (CVM) was adopted, under Normative Instruction CVM 480/2009 - BRL 60 million. For environmental issues, the amount of BRL 10 million was considered.	
Aspects: Over	all	
Macro Objecti	ves: Climate Change, Energy, Water	
G4-EN31		<u>80</u>
Aspects: Empl	oyment	
Macro Objecti	ves: Economic and Financial Results	
G4-LA1		<u>62</u>
G4-LA2		<u>61</u>
G4-LA3		<u>61</u>
Material Aspe	cts: Diversity and Equal Opportunities	
Macro Objecti	ves: None, because the related aspects are not material	
G4-LA6	The health and safety data recording system does not break down data by gender or third parties. The monitoring methodology for absenteeism, which was expected to be adapted by the second half of 2016, is still being reviewed.	<u>81</u>
G4-LA8		<u>63</u>
Material aspec	cts: Training and Career	
Macro objectiv	ves: Strengthening of Practices	
G4-LA10		<u>61</u>
G4-LA11		<u>60</u>

INDICATOR	DISCLOSURE	PAGE
Material Aspe	ects: Diversity and Equal Opportunities	
Macro Object	ives: None, because the related aspects are not material	
G4-LA12		<u>57</u>
Material Aspe	ects: Local Communities	
Macro Object	ives: Local Development	
G4-S01		<u>64</u>
G4-S02		<u>82</u>
Material Aspe	ects: Anti-Corruption	
Macro Object	ives: Strengthening of Practices	
G4-S05		<u>03</u> , <u>31</u>
Material Aspe	ects: Anti-Corruption	
Macro Object	ives: Strengthening of Practices	
G4-S06	Zero. In Brazil, in 2016 Braskem made no donations to political parties.	
Material Aspe	ects: Unfair Competition	
Macro Object	ives: Strengthening of Practices	
G4-S07	Indicator is restricted to the Brazilian territory. In 2016, no actions were recorded regarding the indicator	
G4-S08	Regarding this indicator, the following should be considered: (i) The Leniency Agreement, referred to above as the "Braskem Global Agreement"; (ii) in addition, Braskem was not definitively ordered to pay fines or to comply with non-monetary sanctions in the period in question. For the purpose of this report, the same materiality criteria used on the Reference Form established by the Brazilian Securities and Exchange Commission (CVM) was adopted, pursuant to Normative Instruction CVM 480/2009 - BRL 60 million. For environmental issues, the amount of BRL 10 million was considered.	



INDICATOR	DISCLOSURE	PAGE
Material Aspe	cts: Client Health and Safety	
Macro Objecti	ves: Safety	
G4-PR1		<u>84</u>
G4-PR2	No record of complaints.	
Material Aspe	cts: Product and Service Labeling	
Macro Objecti	ves: Safety	
G4-PR3		<u>84</u>
G4-PR4	No record of complaints.	
Aspects: Mark	ceting Communications	
Macro Objecti	ves: Strengthening of Practices	
G4-PR7	There have been no instances of non-compliance with regulations and voluntary codes regarding marketing communication, including advertising, promotion, and sponsorship.	
Material Aspe	cts: Compliance	
Macro Objecti	ves: Strengthening of Practices	
G4-PR9	Braskem was not definitively ordered to pay fines or to comply with non-monetary sanctions in the period. For the purpose of this report, the same materiality criteria used on the Reference Form established by the Brazilian Securities and Exchange Commission (CVM) was adopted, under Normative Instruction CVM 480/2009 - BRL 60 million. For environmental issues, the amount of BRL 10 million was considered.	

**G4-HR3** 33

Macro Objectives: Strengthening of Practices





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## Limited assurance report issued by independent auditors

To the Directors and Officers of Braskem S/A São Paulo - SP

#### Introduction

We have been engaged by Braskem S/A ("Braskem") to apply limited assurance procedures on the sustainability information disclosed in Braskem's 2016 Annual Report, related to the year ended December 31st, 2016.

#### Responsibilities of Braskem's Management

The management of Braskem is responsible for preparing and adequately presenting the information in the 2016 Annual Report in accordance with the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines (GRI-G4) as well as the internal controls determined necessary to ensure this information is free from material misstatement, resulting from fraud or error.

#### Independent auditors' responsibility

Our responsibility is to express a conclusion about the information in the 2016 Annual Report based on the limited assurance engagement conducted in accordance with Technical Communication (TC) 07/2012 approved by the Federal Accounting Council and prepared in accordance with NBC TO 3000 (Assurance Engagements Other Than Audits and Reviews), issued by the Brazilian Federal Accounting Council - CFC, which is the equivalent to international standard ISAE 3000 issued by the International Federation of Accountants applicable to Non-Financial Historical Information. These standards require compliance with ethical requirements, including independence ones and also that the engagement is conducted to provide limited assurance that the information in the 2016 Annual Report, taken as a whole, is free from material misstatement.

A limited assurance engagement conducted in accordance with NBC TO 3000 (ISAE 3000) consists mainly of questioning the management of Braskem and other professionals of the Company involved in the preparation of the information disclosed in the 2016 Annual Report and applying analytical procedures to obtain evidence that allows us to make a limited assurance conclusion about the sustainability information taken as a whole. A limited assurance engagement also requires additional procedures when the independent auditor learns of issues which lead them to believe that the information disclosed in the 2016 Annual Report taken as a whole could present material misstatement.

The selected procedures were based on our understanding of the issues related to the compilation, materiality and presentation of the information disclosed in the 2016 Annual Report, other engagement circumstances and considerations regarding areas and procedures associated with the material sustainability information disclosed in the 2016 Annual Report where material misstatement could exist. The procedures consisted of:

- (a) planning: consideration of the materiality of aspects to Braskem's activities, relevance of the information disclosed, amount of quantitative and qualitative information and operational systems and internal controls that served as a basis for preparation of the information in the 2016 Annual Report. This analysis defined the indicators to be tested in detail;
- (b) understanding and analysis of the information disclosed related to the management of material aspects;
- (c) analysis of processes for the preparation of the 2016 Annual Report and its structure and content, based on the Principles for Defining Report Content and Quality of the Global Reporting Initiative GRI (GRI-G4);
- (d) evaluation of indicators and other non-financial information:
- understanding the calculation methodology and procedures for the compilation of indicators through interviews with managers responsible for preparing the information;
- application of analytical procedures on the quantitative information and questions about qualitative information and their correlation with indicators disclosed in the 2016 Annual Report;
- analysis of evidence supporting the information disclosed;
- visits to four of Braskem's operational units and its head office for application of these procedures, as well as of items (b) and (c);
- (e) plausibility analysis of the reasons for omissions of performance indicators associated with topics and aspects identified as material through the Company's materiality assessment; and

We believe the information, evidence and results we have obtained are sufficient and appropriate to provide a basis for our limited conclusion.

# **Scope and limitations**

The procedures applied in a limited assurance engagement are substantially less extensive than those applied in a reasonable assurance engagement. Therefore, we cannot ensure we are aware of all the issues that would have been identified in a reasonable assurance engagement, which aims to issue an opinion. If we had conducted a reasonable assurance engagement, we may have identified other issues and possible misstatements within the information presented in the 2016 Annual Report.

Nonfinancial data is subject to more inherent limitations than financial data, due to the nature and diversity of the methods used to determine, calculate or estimate this data. Qualitative interpretations of the data's materiality and accuracy are subject to individual presumptions and judgments. Additionally, we did not examine data regarding prior periods to assess the adequacy of policies, practices and sustainability performance, nor future projections data.

#### Conclusion

Based on our review, nothing has come to our attention to indicate that Braskem's 2016 Annual Report is not presented, in all material aspects, in accordance with the Global Reporting Initiative Sustainability Reporting Guidelines (GRI-G4), and with its source records and files.

#### São Paulo, July 17th, 2017

KPMG Assessores Ltda. KPMG Financial Risk & Actuarial CRC 2SP034262/O-4 F-SP Services Ltda.

Eduardo V. Cipullo Ric Accountant CRC 1SP135597/O-6

Ricardo Algis Zibas





# Safety

To be among the benchmarks in Chemical, Occupational, and Process Safety in the Global Chemical Industry.

SEMPRE: 99% of industrial plants in stage 5 implementation

Accident rate with and without lost time - 0.75 accidents/MM Mhw;

Event rate Tier 1: 0.20 events/ MM Mhw In 2016, this macro objective reached a level of progress of about 86% of the goal for 2020.

# **Occupational Safety**

- In the period from 2002 to 2016, the injury frequency rate w/o Lost Time (Saf) + w/ Lost Time (Caf), and severity rate improved respectively 92.3%, 92.2%, and 36%.
- A fatal accident occurred at the PE8 CUB-SP plant.
- Fifteen industrial plants without record of lost time accidents (considering Members and Contractors) for more than three years, ten of these for more than five years.
- The percentage of plants in SEMPRE stages 4 and 5 increased from 13% to 46.7%.
- Percentage of behavioral dialogues without deviation improved from 66% in 2015 to 80% in 2016. This
  denotes a stronger culture of prevention through compliance with procedures.

# **Process Safety**

- Risk Rating: The number of industrial plants with above standard rating based on audits by insurance companies has evolved from 12 to 15.
- Nine TIER1 process accidents were recorded, 18% less than in 2015. The total cost avoided was BRL 17.1 million.

# **Chemical Safety**

 Updated the multi-year action plans to replace asbestos, HCFC22 (Hydrochlorofluorocarbon), and CCl4 (carbon tetrachloride);

# **Occupational Health**

Recorded a new case of occupational illness due to depression.

# Liquid, Paste, and Solid Waste

• In the period from 2002 to 2016, the waste generation rate improved by 63%, representing a result 57% better than the national chemical industry average (Abiquim database, 2015).

#### **2020 GOAL**

#### **ACTIONS IN 2016**



# Economic and financial results

To be among the top three thermoplastic resin producers in the world and ensure profitability that sustains business continuity while maintaining the Investment Grade rating in the three major international agencies.

Production capacity: capacity of the 3rd largest 11,000 kt/yr. (2020) - LyondellBasell.

Investment Grade: maintain the Investment Grade rating of Moody's, Fitch Rating, and Standard & Poor's. In 2016, this macro objective reached a level of progress of 73% of the goal for 2020.

# **Production Capacity**

 The petrochemical complex in Mexico began operation in April and provided an increase in the capacity of Low Density Polyethylene (LDPE) of 1.05 million tons/year.

#### **EBITDA**

Record EBITDA of BRL 11.5 billion in 2016.

#### **Investment Grade**

Maintained the investment grade assigned by two global risk rating agencies: Fitch Rating and Standard
 Poor's. Downgraded by Moody's in February 2016.



# **Post-consumer**

To be one of the five largest traders of PE and PP from recycled content in the world, among the petrochemical companies producing Polyolefins. To become an important driver of the growth of plastic recycling in Brazil, helping achieve the goals in the Sector Agreement on Packaging.

Mechanical recycling rate: 28% in Brazil

In 2016, this macro objective reached a level of progress of 73% of the goal for 2020.

# **Wecycle Platform**

- Launched the first polypropylene and polyethylene resins made from fully recycled content. Combined production volumes may reach 50 tons per month. The resins were developed within the Wecycle platform, an initiative that seeks to recover plastic waste throughout the production chain.
- Polypropylene resin WCL H 1003 BBM is produced from recycling big bags used in resin transport that were discarded in the past. Nearly 120,000 big bags will be recycled annually, which should generate a potential volume of 30 tons/month of post-consumer recycled resin. The new product may be applied to household utilities, garden products, and lids. Tramontina is already testing and evaluating in which applications of its gardening line the resin may be used.
- Possible applications of WCL L004 SCV polyethylene resin are bags, laminated packaging, tarps, flexible
  packaging, and tubes. It is produced from used and discarded bags at Braskem's Distribution Centers.
  The total volume of recycled resin may reach 20 tons/month in 2017, representing the monthly recycling
  of approximately 200,000 bags.

#### **2020 GOAL**

#### **ACTIONS IN 2016**

S

#### Renewable resources

To be among the leading producers of thermoplastic chemicals and resins from renewable raw materials. Remain the world's largest producer of thermoplastic resins from renewable sources.

Production capacity of thermoplastic chemicals and resins from renewable raw materials: 230Kt/yr. In 2016, this macro objective reached a level of progress of 78% of the goal for 2020.

#### **Green PE**

- The production of Green PE has been modernized to further mitigate impact on the environment. With investments of BRL 7.1 million from 2013 to 2015 to reduce CO<sub>2</sub> emissions by 30%, new equipment was installed to reduce losses, reducing fuel consumption by the generator; as well as a new effluent reuse system, which will reuse effluents. After modernizing its production process, the updated Green PE Life Cycle Assessment (LCA) was launched, which identified the capture of 2.78 tons of CO<sub>2</sub>e per ton of product produced from sustainable resin, against 2.15 tCO<sub>2</sub>e/t identified in the previous study.
- Green PE is the first product from the Brazilian petrochemical industry to receive carbon footprint
  certification, an initiative that was born in the Technical Committee of the Industry Plan (CTPIn) and
  the Ministry of Industry and Commerce (MDIC), which defines and guides actions for implementing
  the National Policy on Climate Change in priority sectors. According to the measurement, made by
  Carbon Trust and the Brazilian Association of Technical Standards (ABNT), the polyethylene from
  renewable origin has a negative emissions footprint, that is, it helps to sequester polluting gas from the
  atmosphere. The company voluntarily participated in the certification in order to provide transparency to
  information to its client relations, and to promote the adoption of this practice.

In 2016, this macro-objective reached a level of progress of 96% of the goal for 2020.



# **Water Efficiency**

To be among the benchmarks in the use of water resources in the global chemical industry in terms of water consumption and water reuse rates.

Water consumption rate (m³/t): • average water consumption of the global chemical industry 26.5 m³/t (2014) •

Percentage of water reuse:

2020: 25% 2025: 30%

2030: 50%

# **Water Consumption**

- In the period from 2002 to 2016, the water consumption rate improved by 4.8%, the water reuse percentage improved by 38%, and the net effluent generation rate improved by 43%.
- Reduction in water consumption rate for the fourth consecutive year, reaching 3.93 m<sup>3</sup>/t. This is about 6.5 times better than the average for the global chemical industry (ICCA 2013 25.64m<sup>3</sup>/t).
- The net effluent generation rate reached 1.11m<sup>3</sup>/t, the best result since 2002.
- Three process improvement initiatives were implemented in the UNIB1 BA, UNIB 2 RS, and UNIB 3 ABC crackers for water recovery and reuse, totaling an annual savings of nearly BRL 2.5 million;
- Completed study of four watersheds of a total of eight that will be studied. Results presented at Abiquim's 16th Congress of the Program called Atuação Responsável (Responsible Performance).

# **2020 GOAL**

# **ACTIONS IN 2016**



# **Climate Change**

To be among the world's best major chemical companies in intensity of greenhouse gas (GHG) emissions, and to be a major sequester of GHG emissions due to the use of renewable raw materials.

CO<sub>2</sub> Emissions Intensity (tCO<sub>2</sub>e/t): remain at 600Kg/t

**Greenhouse gas inventory:** 

Considering only Scope 1 emissions, directly managed by the Company, the total aggregate reduction
was about 9% compared to baseline year 2008 (without Mexico). Scopes 1 + 2 totaled a reduction of
18% (without Mexico).

# **CDP Investor**

Braskem became the first Brazilian industry to join the A List of the CDP carbon program.

In 2016, this macro-objective reached a level of progress of 93% of the target for 2020.

# **CDP Supply Chain**

• Braskem joined the A List of the CDP Supply Chain Program.

# **Climate Risk Management**

 The climate risk studies in Mexico were completed and the Braskem's Adaptation Plan was designed in Brazil, consolidating plans for the Northeast, Southeast, and South regions.



# **Energy Efficiency**

To be among the best major chemical industries in the world in intensity of energy consumption and to be a major user of renewable energy sources.

Energy consumption rate (GJ/t): 10.82 GJ/t

% of renewable energy use: 11%

In 2016, this macro-objective reached a level of progress of 94% of the goal for 2020.

# **Energy Consumption**

- In 2016, a total of 10.25 GJ of energy was consumed per ton produced, the best result since 2002, representing an aggregate improvement of 14%.
- Five initiatives were implemented to improve the energy efficiency of the process, totaling an annual savings of BRL 4.6 million.
- Since 2002, approximately BRL 100 million has been invested to improve the efficiency of the electrical system of crackers in the UNIB1 BA and UNIB2 RS against power outages (caused, for example, by lightning striking Braskem's external and/or internal electrical system).

# **2020 GOAL**

# **ACTIONS IN 2016**



# Local development

To achieve the "excellent" reputation level in the citizenship dimension of RepTrak® Pulse, demonstrating that it is recognized by the community surrounding the facility and by society at large for its contribution to the improvement of human development.

Reputation Index (%): "excellent" level in RepTrakTM Pulse citizenship dimension (> 80%)

Leverage of private social investments: 200% based on annual budget

In 2016, this macro-objective reached a level of progress of 88% of the goal for 2020.

In 2016, a total of BRL 27.5 million were invested in social and environmental projects, with emphasis on private social investment projects:

- Ser + Realizador: 3,444 waste collectors benefited and 813 recorded an increase in income.
- Fábrica de Florestas Institute: produced 88,407 seedlings, planted 46,628, and 27,506 people received sensitivity training.
- Edukatu: the numbers have evolved significantly. The number of participants reached 28,441 people, the number of teachers engaged increased to 1,084, and the number of students engaged



# **Developing solutions**

To be recognized as a company that supports its clients in the development of environmental and social solutions using Chemistry and Plastics, reaching a "strong" reputation level through its products & services.

"Strong" reputation level with Clients in the products & services dimension of Deep Dive: 70.0%

Rate of new projects showing positive social and environmental impact: 233.2 kt/yr.

Number of LCA studies completed: 14

In 2016, this macro-objective reached a level of progress of 85% of the goal for 2020.

# LCA studies

- From 2011 to 2016, a total of 41 ACV and five Carbon Footprint studies were completed, identifying the advantages and priority areas for product improvement.
- In 2016, the level of alignment of the project pipeline was 84%. Throughout the year, Braskem completed a total of ten LCA studies, among which the Recycled Plastic Resins and Casa Clic stand out.

#### **Braskem Labs**

- In its second edition, the program received 190 applications and selected 12 innovative proposals in the areas of chemistry and plastic, and also to combat the Aedes aegypti mosquito.
- The Eco Brasil Award, sponsored by the American Chamber of Commerce (AmCham) and the newspaper
   O Estado de S.Paulo, recognized the Braskem Labs program as a winner in the Processes Large
   Companies category.

# **2020 GOAL**

#### **ACTIONS IN 2016**



# **Strengthening practices**

To be among the business benchmarks in Brazil for its contribution to Sustainable Development. To be one of the global benchmarks in the sector for its contribution in Sustainable Development.

ISE Bovespa score: remain listed with a score equivalent to the average between the portfolio benchmark and the portfolio average DJSI Emerging Markets Score.

Maintain a score equal to the average of the world Chemical Industry benchmark and the first in the global industry index.

In 2016, this macro-objective reached a level of progress of 91% of the goal for 2020.

# **Diversity**

Braskem was chosen among 200 companies in Brazil as one of the 10 best for women to work according
to a survey conducted by Love Mondays (based on 12,000 interviews). Braskem's diversity program
was reported to the People and Organization Committee (CPO), a support committee to the Board of
Directors (CA), demonstrating the strategic importance given to the topic.

# **ISE BM&FBovespa**

 For the 12th consecutive time, Braskem was included in the ISE portfolio (Corporate Sustainability Index), the sustainability index of BM&FBOVESPA of São Paulo.

# **DJSI Emerging Markets**

Braskem was listed for the fifth consecutive year in the Dow Jones Sustainability Emerging Markets Index (DJSI), the sustainability index for companies in emerging markets on the New York Stock Exchange (NYSE).

# **The Sustainability Yearbook**

 For the third time, Braskem was included in The Sustainability Yearbook, a publication prepared by RobecoSAM, an international investment consulting firm specializing in sustainability. The ranking lists the 457 most sustainable companies in the world, with Braskem listed among the 19 leading companies in the global chemical sector and among the 12 leading Brazilian companies (considering the 59 sectors covered by the study). Additionally, in 2016, Braskem received the "Bronze" classification.





# **Biopolymer**

Thermoplastic resin produced from renewable raw materials

# Cap

**Emission limit** 

# Cracker

Industrial plant where naphtha is processed into derivatives, such as ethylene, propylene, and other co-products

# Cracking (naphtha)

Breaking molecules for ethylene production

# **Eco-efficiency**

The ratio between the use of resources required to manufacture a given product and its production volume. Expresses productivity from an environmental standpoint

# **Eco-indicators**

Environmental performance indicators

# **Grid factor**

Average rate of GHG emissions resulting from generating electricity

#### **Flare**

Static mechanical safety equipment that is powered to burn chemical compounds that the industrial plant will not be able to process. Burning keeps hazardous compounds from being released into the atmosphere.

# Rotary clinker kilns

Kilns to produce cement

# Grade (Resin)

Type, Specification

#### **Investment grade**

Investment grade

# **Reverse logistics**

A set of actions, procedures, and means enabling the collection and restitution of solid waste in the business sector, for reuse in its cycle or in other production cycles, or for other destinations

# Cap&trad market

Cap & trade. A system composed of several parts in which emission quotas (permissions) are established for each participant, so that the sum of

all quotas does not exceed the maximum fixed limit for the system. The cap is set to ensure that total system emissions are reduced from one period to the next. Trade is the trading of permissions between participants - those who can reduce their emissions further can sell their surplus permissions to those for whom reducing emissions is more expensive than buying permissions from others. That is, the trade mechanism allows the reduction sought by the group to be achieved at the lowest possible cost.

# Offsets

Emission credits that may be traded in a cap&trade market. They are generated by the reduction of avoided emissions or emissions in accredited locations outside of market coverage (e.g. reforestation). These securities may be used as compensation by participants in a cap&trade market who have exceeded their emission limit

# p.p.

Percentage point

#### Raffia

Fibers used to manufacture bags for transporting fruit or small loads

#### Ramp-up

Term in economy and business defining the initial stage of industrial production

# Risk rating (of processes)

Process safety index established by insurance companies

# Second generation (in the petrochemical industry)

Second generation units, producers of intermediates and thermoplastic resins (PE, PP, and PVC)

# **Spread**

Margin (of profitability)

# **Tagalong**

Mechanism that gives minority shareholders the same rights as controlling shareholders in the event of sale or transfer of control. Under Brazilian law (Brazilian Corporate Law).

# **ACRONYMS**

ABS: acrylonitrile-butadiene

styrene

**GJ:** Gigajoules

**GPS:** Global Product Strategy

**KWh/t:** kilowatt-hour per ton

**kg/t:** kg per ton **PE:** Polyethylene **HDPE:** High Density
Polyethylene

LDPE: Low Density

LDPE: Low Density

Polyethylene

**LLDPE:** Linear Low Density

Polyethylene
PP: Polypropylene

**PVC:** Polyvinylchloride **REACH:** Registration,

Evaluation, Authorization and Restriction of Chemicals

**SAN:** Styrene acrylonitrile **UNIB:** Basic Petrochemicals

and Vinyls Unit **UNPOL:** Polyolefins,

Renewables and Europe Unit

UTEC: ultra-high molecular

weight - Braskem's brand



# Corporate Information

# **BRAZIL**

# SOUTHEAST UNIB 3 CK ABC

Avenida Presidente Costa e Silva, 1178,

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#### **UNIB 3 IN ABC**

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Mauá

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#### **UN PE 7 ABC**

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#### **UN PP 4 ABC**

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#### **UN PE 8 CUB**

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Cubatão

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#### **UNIB 4 e PE 9 DCX**

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Duque de Caxias ZIP CODE: 25221-000 Phone: +55 21 2187-8883

#### **UN PP 5 DCX**

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Duque de Caxias ZIP CODE: 25221-000 Phone: +55 21 2173-4100

#### **UN PP 3 PLN**

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# **SP Office - Headquarters**

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# SP Office - Villa Lobos

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Pinheiros

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Via de Contorno, 850

Triunfo

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# PP 1 RS

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# **Oyster Creek Plant**

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G4-31

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