Welcome to your CDP Climate Change Questionnaire 2021

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

We are the sixth largest global producer of thermoplastic resins, with 41 industrial units in four countries (Brazil, United States, Mexico, and Germany), that have over 21 million tons of annual production capacity, and 16 regional offices in the main global economic centres that serve clients in nearly 100 countries.
Our strategic vision features six fundamental pillars aswe continue building a global company that is recognizedas a leader in increasingly innovative and sustainable
chemical and plastic solutions, focused on human beings and positive results for all stakeholders. The innovation pillar is seen as across-organization enabler for the ambitions of other pillars. Sustainability was included as our sixth strategic pillar at the end of 2020 to help us monitor the implementation of projects, partnerships and investments in light of our commitment to the 2030 sustainable development goals, in response to current and future challenges for the planet and society.
Ours Strategic Pillars and Objectives: 1:Productivity and competitiveness: Braskem as a first quartile operator; 2: Sustainability: Reference in the global chemical and petrochemical sector for its sustainable development; 3: Diversification: Increased diversification in raw materials, markets and products, with new operations representing more than 50% of EBITDA; 4: People, innovation, governance and reputation: Be recognized as a company that promotes local development and human rights; 5: Capital Allocation / financial rigidity: Braskem as a financially healthy company that reates shareholder value
Braskem maintains its commitment to sustainable growth and development and will continue to act proactively to pursue the best opportunities for creating value for its Clients, Shareholders and Society. The Company conducts its business in accordance with best corporate governance practices. The Public Commitment made in August 2002, at the time of establishing the company, defines the business practices of transparency, accountability and respect for shareholders, team members, clients and society in general. Additionally, on May 2018, the company launched its Sustainable Development Global Policy, focusing on three main pillars: (i) Braskem aspires to be recognized as one of the world's leading chemical companies for its contribution to Sustainable Development; (ii) to be seen as an engaged company, as a citizen company by the communities where it has operations; (iii) to be

recognized as a leading company in the management and offering solutions for mitigation of and adaptation to climate change, for efficient use of water resources and for the solution post-consumption of plastics residues.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Reporting year	January 1, 2020	December 31, 2020	No

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

Brazil
Germany
Mexico
United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

BRL

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C-CH0.7

(C-CH0.7) Which part of the chemicals value chain does your organization operate in?

Row 1

Bulk organic chemicals

Lower olefins (cracking)
Aromatics
Polymers

Bulk inorganic chemicals

Chlorine and Sodium hydroxide

Other chemicals

Specialty chemicals

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board-level committee	The Board of Directors is responsible for climate-related issues, since one of its roles is to oversight the matters related to Sustainability. Climate Change is a material aspect to Braskem, being one of the highlighted items in Braskem's Sustainable Development Policy, a corporate risk monitored by the Board and the Executive Committee. As an example of what is monitored, the most relevant climatic risks, high risk, are monitored periodically, as well as the evolution of the action plan to mitigate these risks. One of the decisions already taken was the decision to implement internal carbon pricing in the company, as well as the approval of the long-term emission reduction target.
President	Braskem's Business Leader (CEO) is a member of Braskem's Board and also is the head of the Global Sustainable Development Committee. The committee is composed by ten working groups, seven for each of the Macro Objectives and three structuring ones. Each of these working groups is led by a company vice president, who has the direct support of a director.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain

Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	The Executive Committee holds its meetings at least 4 times a year and in two of them discusses Sustainability maters, including climate-related issues. After each meeting, the Coordinator of the Committee reports to the Board of Directors the Committee discussions and contributions made regarding all climate-related issues brought into discussion and how it affects the business of Braskem. This way, the Board of Directors is permanently updated on the subject. All the information provided is presented to the board trough a specific achievement indicator of the Macro Objectives (the status of the goals is disclosed at the company's website), and the actions undertaken by the company to achieve this result. The Brazil Manufacturing & Global Industrial Operations Vice President (COO) with the support from the ERM Director does the presentation to the board, including information of actions underway and CAPEX involved. All combined indicators shown through the presentation give a clear view of the plants under risks, their efficiency and where to improve. The Brazil Manufacturing & Global Industrial Operations Vice President – Climate sponsor - reports periodically the status of the progress of climate stewardship to the board of directors, being this the main governance mechanism that allows the constant oversight of climate issues.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Braskem's Vice President of Global Industrial Manufacturing and Operations (COO), sponsor of the macro climate change objective, reports directly to Braskem's CEO. Mitigation and adaptation measures are monitored by the COO every three months. Operational risks related to climate issues are also discussed, such as RE21, which represents challenges to adapt to climate change and mitigate GHG emissions in production, including aspects such as: challenges in the search for renewable sources of raw material for production of basic chemicals and resins; decrease the intensity of emissions and the use of renewable energy sources. These responsibilities lie with this COO, as he is responsible for Braskem's most emitting industrial units (GHG).

Braskem has 10 macro objectives for sustainable development, each macro objective has a vice president as responsible, who is chosen for his potential contribution. Climate change is a macro objective, whose sponsor is the COO, as mentioned.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Incentives for the management of climate issues are considered in the achievement of goals to reduce GHG emissions in operations, climate risk management and engagement of suppliers, for the main stakeholders.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity inventivized	Comment
Chief Operating Officer (COO)	Monetary reward	Energy reduction project	Initiatives for energy consumption reduction, increase of energy efficiency and energy reduction targets.
Other, please specify Plants' leaders	Monetary reward	Energy reduction target	Leaders (at director level, managers and coordinators) of the plants with the highest GHG emissions. This includes targets to reduce energy consumption, generation of waste, etc.

Environment/Sustainability manager	Monetary reward	Emissions reduction target	Emissions reduction targets and evolution in the CDP investors and supply chain.
All employees	Monetary reward	Efficiency target	All employees are eligible for variable compensation according to performance on the eco-indicator targets, including reduction of energy intensity and generation of waste.
Other, please specify Vice President	Monetary reward	Other (please specify) Score and targets evolution	Vice President of Investor Relations and Sustainable Development. Activities include evolution on the CDP score and evolution of targets in the ISE and DJSI that contain Climate Change dimensions.
Other, please specify Director of sustainable development	Monetary reward	Other (please specify) Evolution of targets	Evolution of targets in the ISE and DJSI that contain Climate Change dimensions.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	5	Braskem considers the present as a short-term time horizon.
Medium-term	5	25	Braskem considers the timeframe used in most studies required by the company to generate data projections, following the timeframe used by environmental bodies like INPE, for example.
Long-term	25	55	Braskem considers the timeframe used in most studies required by the company to generate data projections, following the timeframe used by environmental bodies like INPE, for example.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Analysis at company level: Braskem initially hired specialized consultants to identify the physical and regulatory risks and opportunities (with support from internal teams) with a potential impact on 100% of its industrial operations, with a vision of the present and the future (2040). Analysis was conducted in a cooperative way, considering the INPE climate models and the IPCC scenarios until 2040, identifying the impacts and vulnerabilities of our operations. Every 5 years, these studies will be updated for reassessment of scenarios and residual risks and maximized opportunities. For risks and opportunities associated with the value chain, Braskem uses the CDP Supply Chain to identify these risks and opportunities. Braskem also analyzed reputational risks at the company level.

Analysis at asset level: The identification of risks and opportunities at the asset level focuses on the present, since the future risk analysis is carried out at corporate level. Focal points of all industrial sites and strategic areas work together with Braskem's Sustainable Development team to monitor and identify current or potential new climate risks and opportunities. These risks are assessed every six months by the Board.

Prioritization is done using a tool supplied by the FGV-SP, with some adaptations from Braskem. Prioritization is performed considering both present and future (2040) scenarios, making it possible to verify the behavior and evolution of risks and opportunities over time. To evaluate the magnitude of the impact, both positive and negative, the following criteria are considered depending on if it is an opportunity or risk:impact on people, considering the seriousness of the injury; in the environment, considering if the impact is internal or external, reversible or not and how extensive it is; in operations, if there is a partial or total interruption, frequent or not, including that which ends up stopping an operation; financial impact; and reputation, if the repercussions is in the internal, local, regional or international media. For opportunities, positive impacts are verified such as development of a new product, development of a new market, increase in market share and impacts that improve the company's profits. To identify future frequency, the results of IPCC and INPE studies are considered, and for current frequency, plant histories are considered.

To identify impacts, there is a procedure that assesses the following items: people's health and safety, social context, environmental impact, impact on infrastructure, reputation and financial impact. For each of them, there is a 4-level scale that varies from low, moderate, critical and higher. As a final result cross-referencing impacts with frequencies leads to quantified risk and opportunity results. The risks and opportunities, according to the quantitative result, can be located in one of the four regions in the risk matrix:
-green = should be followed-up /monitored (risk classified as low).
-yellow = should have an action plan and implement all of the actions identified (risk classified as moderate)
-red = should have a strategy and implementation should be immediate (risk classified as high).

In this analysis, financial losses above BRL 39,500,000 are considered as a substantial financial impact. However, not only this value is used during prioritization. Considering the combination of the magnitude of this financial impact with the probability of the event occurring, scenarios with low financial impact, but high probability, might also be classified as high risk scenarios.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Analysis at company level:
Braskem initially hired specialized consultants to identify the physical and regulatory risks and opportunities (with support from internal teams) with a potential impact on 100% of its industrial operations, with a vision of the present and the future (2040). Analysis was conducted in a cooperative way, considering the INPE climate models and the IPCC scenarios until 2040, identifying the impacts and vulnerabilities of our operations.
Every 5 years, these studies will be updated for reassessment of scenarios and residual risks and maximized opportunities. For risks and opportunities associated with the value chain, Braskem uses the CDP Supply Chain to identify these risks and opportunities. .
Analysis at asset level:
The identification of risks and opportunities at the asset level focuses on the present, since the future risk analysis is carried out at corporate level. Focal points of all industrial sites and strategic areas work together with Braskem's Sustainable Development team to monitor and identify current or potential new climate risks and opportunities. These risks are assessed every six months by the Board. Prioritization is done using a tool supplied by the FGV-SP.
To evaluate the magnitude of the impact, both positive and negative, the following

criteria are considered depending on if it is an opportunity or risk:impact on people, considering the seriousness of the injury; in the environment, considering if the impact is internal or external, reversible or not and how extensive it is; in operations, if there is a partial or total interruption, frequent or not, including that which ends up stopping an operation; financial impact; and reputation, if the repercussions is in the internal, local, regional or international media. For opportunities, positive impacts are verified such as development of a new product, development of a new market, increase in market share and impacts that improve the company's profits.
To identify future frequency, the results of IPCC and INPE studies are considered, and for current frequency, plant histories are considered.
As a final result cross-referencing impacts with frequencies leads to quantified risk and opportunity results.
The risks and opportunities, according to the quantitative result, can be located in one of the four regions in the risk matrix:
-green = should be followed-up /monitored (risk classified as low).
-yellow = should have an action plan and implement all of the actions identified (risk classified as moderate)
-red = should have a strategy and implementation should be immediate (risk classified as high).
In this analysis, financial losses above BRL 37,200,000 are considered as a substantial financial impact. However, not only this value is used during prioritization. Considering the combination of the magnitude of this financial impact with the probability of the event occurring, scenarios with low financial impact, but high probability, might also be classified as high risk scenarios.
Results are reported to the Executive Committee comprised of the CEO and all business leaders and externally to investors and all interested parties. Geographic areas considered include Brazil, USA, Germany and Mexico (100% of our industrial plants).
Physical risks are considered as the INPE scenarios for Brazil, as the National Oceanic and Atmospheric Administration (NOAA) for USA, German Meteorological National Agency for Germany and as the Instituto Nacional de Ecología y Cambio Climático (INECC) for Mexico. In addition to the physical risks, regulatory, reputational and other risks are considered.
During the monitoring, information about adaptation measures implemented in Braskem, such as percentage of data collected and percentage of achievement of these measures, are discussed and verified, besides all mapped business risks regarding climate-change.
Considering all climate risks and opportunities were identified and classified as low, moderate or high, for every high risk or opportunity, it is mandatory the identification of an action to mitigate or eliminate the risk or an action to keep the opportunity in the ‘high’ position. Before approving these actions, the Sustainable Development area makes a comparative analysis for the cost of the impact without any actions implemented and for this same cost after implementation. An efficiency analysis is also made to ensure the risk is decreased after implementing the action. All actions validated in these two steps are approved and its implementation is monitored considering its approved schedule.
Management of these actions is made by monitoring the accomplishment percentage of

the action plan and by the reduction of high risk scenarios. The achievement of these measures is now evaluated according to an achievement projection, considering plants achieve measures' goals in a linear tendency throughout the years.
Braskem monitors these achievement according to the focal point's report and comparing these results to the projection.
Regarding physical risks, a case study : Situation: There is the risk of hurricanes and extratropical cyclones in the South of Brazil Task: Identifying adaptation actions to reduce the impact of these extreme events, increasing the resilience of industrial units and mitigating climate risk Action: Adaptation measures were defined, such as review of contingency and emergency plans, reassessment of permanent and temporary physical facilities and engagement of critical suppliers. Result: Industrial units are better prepared to monitor preventively and more resilient to these extreme weather events. Time horizon covered: 2040 Year. Stage of the covered value chain: Own operations and logistics for receiving products and raw materials and delivering products
For transitional risks, there is case study: Situation: the risk of a mandatory carbon-pricing instrument being implemented in regions where Braskem operates; Task: Consider emission impact assessment in decision criteria to prioritize projects that reduce emissions; Action: In order to prepare for this scenario, Braskem implemented the internal carbon-pricing strategy in 100% of its operations in Brazil and already defined the strategy to replicate it in international operations; Result: Projects and initiatives, which reduce emissions, approved and implemented in industrial units. Time horizon covered: 2030 Year. Stage of the covered value chain: Own operations and the entire value chain (scope 1, 2 and 3).

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Current regulatory risks are considered when it comes to local policies on climate-related issues, such as the National Policy on Climate Change in Brazil, the Fossil Fuel Use Tax in Mexico and the European Trading System (EU ETS) for our operations in Germany. These risks are assessed in meetings with Board members, who discuss changes to the current regulatory system and provide input on the subject. Risk example: an example would be the implementation of an economic instrument for carbon pricing in the regions where the company operates. The creation of an additional tax for the company. The risk is important because the company is a large contributor to industrial emissions (especially in Brazil), in the scenario of creating a carbon tax, might reduce our profit margin over time.
Emerging regulation	Relevant, always included	Braskem considers the possibility of the implementation of economic instruments for carbon-pricing, in countries where the company operates (Brazil, USA, Germany and Mexico), in in the future. Braskem

		assesses this risk by taking part in national and international forums and events on the matter, gathering information on this possible regulation and by evaluating measures taken by other companies.
Technology	Relevant, always included	The areas of innovation, technology and energy in Braskem has specialists who monitor technological risks and identify actions or projects for mitigation. In order to guarantee its competitiveness in the market during extreme scenarios, Braskem includes power supply generation, renewable sources and suchlike subjects in its risk assessment. An example of technological risk is associated with the company's capacity to adapt to the consumption of renewable energy (wind and solar), once they are more modern, continuous and clean technology. It is considered a risk because the company consumes part of its energy from sources that can be discontinued, such as hydraulics, which in periods of severe drought reduce the supply. With the migration to other safe energy sources, the company will be guaranteed the continuity of energy use. This risk is important, because in some industrial units energy consumption is high, and if the company does not adapt to be supplied by these renewable sources, it may impact operating costs and might reduce our profit margin over time. One example of technological improvement related to energy generation is VESTA´s project, an initiative to optimize steam generation in our Q 3 plant approved in 2018, in partnership with Siemens. This type of risk was first integrated in the assessment with studies from a hired consultancy agency and is often updated by meetings with the Board Members.
Legal	Relevant, always included	Braskem has ongoing consultancy support to assess compliance with current and future legislation. In the monitoring of draft laws, potential regulatory risks are assessed, including those that may impact the licenses of its operations. On the Rio de Janeiro, Brazil's site, for the renewal of the operating license, a target for reducing emissions in the state was included. Legal risks are considered since it is expected that environmental agencies include emissions management requirements in the licensing processes of the regions that we have operations. In Rio de Janeiro this is already a legal requirement implemented by INEA, the local environmental agency. Its assessment is also made by meetings considering its discussion and contributions
Market	Relevant, always included	This type of risk is integrated in the assessment with studies from a hired consultancy agency and is often updated. Market risks are considered when we evaluate the possible change in market logic, that is, considering oil products as an input, consumers can reduce the consumption of oil products, consequently impacting the market reduction for our products. In response, Braskem has already been working with a strategy of diversifying the product

		portfolio, as an example the production of green PE, with renewable raw material, the company is the largest producer in the world.
Reputation	Relevant, always included	This type of risk is integrated in the assessment with studies from a hired consultancy agency and is often updated. Reputational risks in Braskem are considered within other risks, like the possibility of articles and news registered by the media and complaints from groups like NGO's, created by the risk of a severe water scarcity, especially in the Southeast (Rio de Janeiro) and Northeast (Bahia) of Brazil.
Acute physical	Relevant, always included	This type of risk is integrated in the assessment with studies from a hired consultancy agency and is often updated. The process safety team, after evaluating the consultancy study, assess the impacts on all Braskem operations, considering the acute physical risk. A serious example is the occurrence of fires in regions of potential water stress, where the lack of water due to severe droughts or the fire fighting system potentiates this impact. To mitigate this risk, Braskem has an action to review the emergency procedure in all regions where these risks were identified.
Chronic physical	Relevant, always included	This type of risk is integrated in the assessment with studies from a hired consultancy agency and is often updated. It is important to emphasize that for this type of risk, the health and safety team, after evaluating the consultancy study, assess the impacts on all Braskem operations, considering the chronic risk. An example is in Braskem's risk assessment by the evaluation of heat waves and increased days of severe droughts risks, especially in the Mexican and the Brazilian industrial site, where the impact of chronic risk refers to the need to assess the adequacy of some facilities, including those that may impact the ergonomics / health of employees.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Carbon pricing mechanisms

Primary potential financial impact

Increased indirect (operating) costs

Company-specific description

Under the Paris Agreement, Brazil (where Braskem has 29 industrial sites, out of 41, operating) is committed to a 37% reduction in emissions by 2025 and a 43% reduction by 2030 from 2005 levels.

Although the largest reduction is related to deforestation activities, it is possible for the Government to introduce a pricing mechanism to ensure reductions in industry and other energy intensive sectors. Among the options are the cap and trade mechanics or taxation on carbon. In the second case, there is a significant risk for Braskem of increasing operating costs, since we are an intensive carbon industry. As Braskem is a great emitter of GHG emissions in Brazil, having its greatest emitter units in Bahia (Q1-BA), Rio Grande do Sul (Q2-RS) and São Paulo (Q3-ABC), which are the plants responsible for the production of basic petrochemicals, establishing a target that might be difficult to meet given the nature of the business might directly affect Braskem, even resulting in fines.

Also, but not less important, in the state of Rio de Janeiro in Brazil, there is already a legal requirement that imposes the presentation of the GHG emissions and mitigation plan to obtain or renew the operating licence. Therefore, emission reductions can be a decisive factor for a renewal or not of an operating license.

According to a study in 2017 by Federação das Indústrias do Estado de São Paulo (FIESP) about Climate Change, for each sector of the economy, there is a different cost of carbon pricing, considered in two cases: taxation and cap-and-trade, from 3 dollars to 60 dollars per ton of carbon up to 2030 according to the sector. It is highlighted, among the conclusions of the survey, that with attributes or cost of mitigation is high. The point of view of cost effectiveness, a wide market of allowances of use (cap-and-trade), is the best

To strengthen the understanding of this issue, Braskem has been participating since 2013 in an initiative to simulate an emissions trading system with the participation of 30 companies from different sectors, totaling 60 MtonCO2 equivalents, negotiations were made on an online platform, from BVRio.

Lessons were learned on the structuring and operation of an emissions trading system. Based on the FIESP case study and the lessons learned from the above mentioned emissions trading simulation exercise, the transition risk was evident, supporting Braskem's decision to implement internal carbon pricing as a measure to mitigate this risk.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

45,000,000

Potential financial impact figure – maximum (currency)

70,000,000

Explanation of financial impact figure

The great challenge related to climate change in the regulatory environment is that risks are generally associated with mandatory emission reduction associated with a carbon tax. Such regulation might insert new costs into Braskem's operations, limiting GHG emissions and possibly demanding costs for emissions compensation activities. Assuming a scenario where: the reduction for the chemical sector can range from 5% to 8% in Scope 1 emissions; carbon tax in Brazil will be around R$100 per tCO2e (value based on information from many Climate Change forums that we participate); and that Braskem takes no action to reduce its emissions. Within this scenario, the fine, which is the financial impact, could corresponds to the targets applied to Braskem’s 2018 Scope 1 emissions in Brazil (8,936,750 tCO2e) multiplied by the carbon price estimative.

Impact formula: potential impact cost = result of the GHG emissions inventory * quantity of emissions from the reduction target (minimum 5%, maximum 8%) * individual cost of emissions

*Considering the case of not achieving the target

Cost of response to risk

300,000

Description of response and explanation of cost calculation

The costs are related to the activities for preparing and assurance the GHG emissions inventory, as well as identifying new initiatives.
Braskem considers itself to be prepared to perform the necessary adjustments to face a future sector target established by the Brazilian government since it has implemented energy efficiency and emissions reductions projects with such targets under

consideration. A case study:
Situation: Some regions in Brazil already have legislation with the obligation to disclosure and verify the emissions inventory. Some environmental agencies are demanding the disclosure of the inventory for renewal of operating licenses.
Task: Disclosure and verify GHG emission inventory and monitor the evolution of legislation in all regions to adapt in advance.
Action: The company already performs a GHG emissions inventory in 100% of its installations, covering 100% of the categories of all scopes of emissions, performs the report and verification, as well as the identification and monitoring process of the initiatives for GHG emissions reduction. Braskem keeps up to date about the development of environmental legislation and associated risks through monthly reports of the Ius Natura consultants (Bills of law and legislation).
Result: In regions where there are mandatory legal actions, the company is compliance to the requirements of current legislation and environmental agencies, as well as being prepared for all other regions.

In conclusion, the cost is related to 3 initiatives: 150,000 to ensure the inventory of GHG emissions, for the realization of the inventory the cost is zero, as it is done by the company itself; 150,000 for monitoring legal requirements, as well as identifying actions applicable to Braskem and auditing to ensure compliance with these actions; the third initiative, internal carbon pricing process that is implemented, with zero cost additional for the company.

Comment

Costs associated with the actions needed to face possible emissions reduction targets set by the government or other forms of emissions control refer to the investment made in emissions reduction projects. Every year, the company performs the planning cycle, where all risks and opportunities, including those related to climate change are evaluated.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Chronic physical

Changes in precipitation patterns and extreme variability in weather patterns

Primary potential financial impact

Increased indirect (operating) costs

Company-specific description

The increase in average global temperature disturbs the balance of climatic systems, intensifying phenomena that directly impacts Braskem's activities, such as water

availability. According to INPE, for Brazilian regions where Braskem operates, indicates that by 2040, the average precipitation in the summer could be reduced to 2.3 mm/day in the RCP 4.5 scenario and 3.7 mm/day in the RCP 8.5 scenario. For the USA (5 industrial plants), according to the NOAA, droughts will become more frequent, will last longer and will be more intense. In Germany (2 industrial plants), the models and scenarios consulted indicate that summers will tend to be hotter and have less rain, which could have consequences for water availability in the country.
Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Truecost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity.
The plants located in Duque de Caxias (Chemicals 4, PE 9 and PP 5) are part of the Atlantic Forest biome of the State of Rio de Janeiro. Although the increase in temperature and reduction of precipitation are less impacting than in the other South-eastern biomes, the next years still tend to be hotter and drier with reduced rainfall periods. The water availability of plants may be reduced in the short and long term, resulting from an increase in temperature and consequent evaporation of water bodies. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages impacting industrial processes and electricity generation, especially considering Brazilian energy matrix characteristics (major contribution of hydro-electric energy). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation. New technologies that consume less water per ton of product or in technologies that reuse this resource. Several units have already initiated projects aimed at reusing and/or reducing the water footprint, in light of the current risk.

Time horizon

Medium-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

125,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Based on a series of 9 potential climate scenarios, and using business guidelines for economic valuation of ecosystem services at FGV-São Paulo, Brazil (DEVESE methodology), considering 2040 as the timescale, the value represents the potential impact of one of the scenarios. In this case the scenario we considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Potential impact cost = quantity of product produced during 12 months * 30% * loss of profit

*Production at the industrial unit Q 4, Rio de Janeiro, Brazil
**30% because we consider 30% reduction in the water permit withdraw

Cost of response to risk

13,300,000

Description of response and explanation of cost calculation

Braskem has already undertaken projects to reuse and reduce the water footprint to give continuity to its business even in the case of resource shortage. At the Camaçari Complex (Brazil), twenty artesian wells for water collection were constructed. Braskem also consumes water from two reuse projects, the Aquapolo (ABC Industrial Complex) and Agua Viva (Camaçari Complex). The first collect wastewater, which is treated and reused in the process and the second collect rainwater. Between 2015 and 2018, the Aquapolo project was responsible for saving more than 25 million cubic meters of water. In addition to these engineering projects, Braskem developed an adaptation study to identify the impacts of climate change in its global operations. One of the high risks identified for Braskem's northeastern/southeastern plants was the drought risk. Subsequently, for all industrial units where potential water stress scenarios were identified, a hydric risk study was carried out (projections up to 2040) in order to evaluate the water availability as a function of the evolution of population density in the period and evolution of demand for all users of the water basins that feed these units. With these results, mitigation actions are being defined for regions that are at high risk.In this case, for the region of Duque de Caxias, other forms for capitating water are already being evaluated, such as water reuse and desalinization.

The cost represents the difference between purchasing freshwater and purchasing reuse water at a price similar to Aquapolo (ABC reuse project - around 6.74 BRL/m3), to supply 100% of the region operations. The cost is recurring annually (long-term contract to make alternative viable to the local sanitation company).

Formula: A = Annual amount of water consumed by 3 units of ABC, São Paulo, Brazil, surface water withdrawal (m3)
B = Annual amount of water consumed by 3 units in ABC, São Paulo, Brazil, withdrawal from third-party reuse water (m3)
C = Cost of fresh water (BRL/m3)
D = Cost of reuse water (BRL/m3)
Cost of Response to Risk = B*D - A*C

Comment

For Guandu plants, Braskem is currently evaluating long-term contracts in a partnership with the State Industry Federation (FIRJAN) and companies of the Duque de Caxias Complex.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical
Increased severity and frequency of extreme weather events such as cyclones and floods

Primary potential financial impact

Increased capital expenditures

Company-specific description

The occurrence of hurricanes and extratropical cyclones might cause damages to Braskem, impacting on the input and output of feedstocks and products logistics, on power supply systems, communication systems and also on facilities' structure. In the South region of Brazil, where this future vulnerability scenario is present, Braskem has operations in 6 industrial plants (Q2-RS, PE4-RS, PE5-RS, PE6-RS, PP1-RS and PP2-RS). In the United States, where Braskem has 5 industrial plants, RCP 4.5 scenario from IPCC indicates that the number of hurricane occurrences will remain mostly the same, but that the magnitude of the events will increase, which means that hurricanes will become stronger. One example was observed with Hurricane Harvey that hit Texas on August 2017 and caused around $125 billion on damage for the country.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

135,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The greatest threat of hurricanes and extratropical cyclones present to Braskem's are concentrated, in our facilities in the USA and South region of Brazil. The potential financial losses are related to, financial losses caused by infrastructure damages, interruption in the transportation and distribution of feedstock and products , power outage supply and disaster relief. Three units in Texas were hit by Hurricane Harvey in 2017 and the financial impact calculated were around US$ 10,000,000, which is around R$ 40,000,000 in total and around R$ 13,500,000 per plant. This last figure was used to estimate the potential financial impact in our global operations - six plants in the South of Brazil and 4 in the USA are also vulnerable to the same magnitude.

Cost of response to risk

850,000

Description of response and explanation of cost calculation

An adaptation plan to mitigate this risk was defined for the plants in the South region of Brazil and the USA. This plan is being implemented and monitored by the Vice-President Sponsor of Climate Change in Braskem, and includes 20 actions to mitigate the vulnerability for hurricanes and extratropical cyclones in our operations. For example, as an adaptation measure, the Q2-RS plant plans to seal a contract with weather forecasting companies (such as Climatempo, in Brazil) to monitor this type of event in order to obtain more reliable information regarding the occurrence of hurricanes, extratropical cyclones and storms, with the goal of improving the emergency plan, in case an evasion is needed. Also, in the USA, key critical suppliers were identified and requested for contingency plans for future hurricanes events.
The management cost was estimated considering the investments of all 20 actions defined for hurricanes and extratropical cyclones.

There are 3 blocks of actions: first, it refers to the review of procedures and contingency plans, with an approximate cost of R$ 80,000; the second refers to the strengthening of the structure, such as evaluation of the criteria for the design of installations (fixed and temporary), revaluation of the structure of the industrial unit, etc., with an approximate cost of R$ 650,000; third block refers to chain engagement actions, collective actions and others, with an approximate cost of R$ 120,000.

It's important to mention that this does not represent the total cost of all actions, as a significant part of the costs is being considered within the maintenance and routine costs of the industrial units.

Comment

For the management of this risk in the operations in southern Brazil, a partnership was made with companies that monitor the climate, where the industrial units in that region started to monitor in order to previously identify the occurrence of cyclones and extratropical hurricanes. The costs associated with this initiative were not considered in the management costs informed

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient production and distribution processes

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

Braskem believes that it can benefit from the reduction of production costs through the implementation of improvements in processes and necessary technologies needed to comply with new productive standards and mandatory regulations on GHG emissions in the medium to long term. This new technology and/or processes might have a direct impact on reducing GHG emissions and utilities consumption, such as energy and water. Examples of initiatives already implemented include emissions reduction by equipment replacement, energy efficiency projects and optimization initiatives to reduce water consumption. Regarding the last example, Braskem’s water specific consumption

index currently represents 1/6 from the international chemical industries mean value. Braskem has reduced its water withdrawal intensity at the greatest pace over the last five years, cutting intensity relative to revenue by 16%.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

650,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

This potential financial impact is related to Braskem's GHG emission reduction projects, which would promote a decrease in operational costs through the implementation of improvements in processes and technologies that must comply with new productive standards and mandatory regulations. Also, in a possible future regulatory scenario, this reduction on GHG emissions might be used as CO2 permits, in the case of an Emissions Trade System, in which Braskem can trade and negotiate these permits. This potential financial impact was calculated based on historical data.

Braskem has an indicator that determines the emissions avoided annually, that is, the difference in emissions in absolute numbers from one year to another, in the case of reduction, it is considered as avoided emissions. In order to determine the economic value associated with this benefit, the value is multiplied by the unit cost of US $ 40, which is the social cost of carbon according to some technical references. The result represents the positive impact associated with this reduction in emissions / emissions avoided.
Formula: total number of emission reductions in a period * $ 40

This result for the year 2019 was approximately 65,000,000. In this case, we are considering this gain for 10 years, that is, 10 * 65,000,000 = 650,000,000.

Cost to realize opportunity

15,100,000

Strategy to realize opportunity and explanation of cost calculation

A case study:
Situation: Braskem is committed to reducing its absolute emissions by 30% by 2030.
Task: Identify initiatives to reduce emissions, through processes that encourage operational areas to Action: In order to develop initiatives in emissions reductions, Braskem uses its 2030 Sustainable Development Strategy to encourage energy efficiency programs by the establishment of voluntary targets.
Result: The industrial units have identified and implemented energy efficiency initiatives, among others, that are contributing to the reduction of emissions. One of the guiding pillars of the strategy in sustainable development is focused on the search for more sustainable operations. Also within this strategy, the second pillar is supported by the search for a more sustainable product portfolio, like Green PE, implying in the use of tools that allow the decisions to be guided by more sustainable paths. Therefore, the company's internal methodology of investments contains sustainability requirements that support the decision for new projects. It is important to mention the Quality and Productivity Area's initiative, named "Braskem +", that seeks to capacitate teams in their processes, aiming the continuous improvement through the identification and solution of losses. In addition, the teams using the certified Six Sigma methodology are conducting several other initiatives; these initiatives generate a series of energy consumption reduction projects, many of them implemented during the programmed maintenance stops.

In 2019, Braskem disbursed R$ 15,100,000 (or US$3,823,000) in investments in the environmental area and emissions management, 7.8 million in mitigation and reduction of emissions, and 7.3 million in other environmental areas.

Comment

Braskem is seeking new solutions that could allow significant gain in efficiency through the adoption of new technologies in combustion equipment, which can also reduce absolute emission, water consumption and generation of residues.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development of new products or services through R&D and innovation

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

According to the BCCP – Brazilian Climate Change Panel, considering the IPCC AR4 B2-BR scenario for 2011 to 2040, the water flow in the hydrographic region of the southeast Atlantic will shrink by up to 20%; the hydrographic region of Paraná by up to 15%; the Eastern Atlantic hydrographic region by up to 74% and the Northeastern Atlantic hydrographic region by up to 83%, all in comparison to the ANA history between 1961 and 1990. For the Brazilian regions where Braskem operates, such as Northeast, Southeast and South, the INPE models indicate that by 2040, the average precipitation in the summer could be reduced to 2.3 mm/day in the RCP 4.5 scenario and 3.7 mm/day in the RCP 8.5 scenario, in relation to the historical data (1960 to 2005). Some Brazilian states are already experiencing water shortages. In Brazil approximately 65% of the electricity is generated from hydraulic sources, therefore, the reduced of water availability has a direct impact on electric generation, possibly causing a lack and/or rationing of electricity. The occasional reduction in electric energy availability in Brazil will encourage the development and search for new products that will reduce this consumption. Today, Braskem has a line of resins called Maxio®, a seal that identifies PE, PP or EVA resins with lower energy consumption in their applications. Energy consumption is reduced through a lower processing temperature and shorter cooling time. Studies indicate a minimum energy reduction of 9%. In this case, the environmental impact is indirect, resulting from the energy saved by Braskem clients that acquire products with this profile.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

590,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Financial impact refers to an increase in Braskem’s revenue due to higher sales of products and services that cause lower GHG emissions.
The potential financial impact was calculated based on the historical revenue growth rate of the new products. This potential financial impact was calculated based on historical data.

According to Braskem's annual report from 2013 and 2014, in 2013 sales of Maxio resin grew by 30%, and in 2014, accumulated by 27% compared to 2012.

The potential financial impact was calculated considering: the growth in demand for low carbon products, the increase in the production capacity of Maxio resin and the strengthening of the product's marketing strategy; and thus, the company might increase its revenue for these products.
Potential impact formula = current annual revenue from low-carbon products (Maxio resins)
B = Estimated % of annual demand growth
C = Number of years considered = 10 years
Potential impact formula = A * B * C

Cost to realize opportunity

50,400,000

Strategy to realize opportunity and explanation of cost calculation

Braskem invests in the research and development of products that reduce electric energy consumption while in use. The action plan for this opportunity consists of expanding the research in this area. The Maxio® resins are an example of this investments. Studies indicate a minimum energy reduction of 9% with the use of Maxio® resins. In 2018, we incorporated into the Maxio family the HDPE HD4601U, a resin that enables the rotomolding process to occur faster than with similar resins, with a reduction of 7% to 10% in the production cycle time of each, resulting in lower power consumption and higher productivity (the annual savings with natural gas of approximately R$ 130 thousand and electric energy of 1,600 kWh, in addition to reducing CO2 emissions by more than 130 tons).

The cost of this opportunity refers to: 22% of investments in laboratories and technology and innovation centers and 78% in progress in research in renewables and others.

Comment

The green ethylene plant located in Triunfo, Rio Grande do Sul, demanded investments R$ 500 million from 2008-2010. This plant have capacity to produce 200,000 tons / year of ethylene. In 2019, Braskem invested more than R$50 million at Innovation and Technology, part of this quantity is directed to the development of resins from renewable feedstock.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Other, please specify

Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

Company-specific description

The demand for products with better efficiency standards and from renewable sourcesopens space to the development of products and markets. Braskem seeks to understand the change in consumer behavior in this regard in order to adapt and develop new solutions. Examples of outcomes of this process are the Green PE and Maxio resins, produced by industrial units in Brazil. . The Green PE is produced from sugarcane ethanol, at the PE5 industrial unit in southern Brazil, which is a renewable feedstock, therefore promoting the capture and storage of CO2 that is emitted through its production. For the Maxio resins, on the other hand, when a client use these resins instead of other equivalents, they typically reduce their energy consumption, and associated emissions, by 10-50%.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

192,780,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The potential financial impact was calculated based on the historical revenue growth rate of the Green PE applied to the revenue obtained with the sales of this resin in 2018. The financial implications associated with the opportunities indicate that the introduction of green products in the market adds value and increases profitability in a sustainable way. As the world's largest producer of biopolymers, in 2018 we started to

supply our I'm greenTM Green Polyethylene for the production of the botanical elements such as trees, shrubs and leaves of the Lego Group. A partnership that reinforces our successful strategy of investing in sustainable and innovative products.

The potential financial impact was calculated considering the growth in demand for Green PE and thus, the company increasing its revenue for this product.
Potential impact formula: annual revenue from Green PE * sales prospecting (based on historical data)

Cost to realize opportunity

50,400,000

Strategy to realize opportunity and explanation of cost calculation

The use of renewable feedstock characterizes a unique opportunity for the reduction of Braskem's products' Carbon Footprint, resulting in greater acceptance in national markets and greater access to international regulated markets. Braskem's focus on the development of green products such as ETBE and green polyethylene, is to take advantage of the opportunities identified and of the growing demand for these products in the market. The first Green PE plant started its operations during the second semester of 2010. Among its sustainable products portfolio, Braskem has improved the placement of the Green Polyethylene, closing deals with important clients such Embalixo, Faber-Castell, Johnson & Johnson, Kimberly-Clark, Natura, Tetra Pak, Tigre, Walmart, Adimax, Panvel, Luvex and LEGO. Additionally, the company increased to 98% the portion of renewable raw material from suppliers committed with the socioenvironmental code of conduct, offering higher standards for our customers.

The cost of this opportunity refers to: 22% of investments in laboratories and technology and innovation centers and 78% in progress in research in renewables and others.

Comment

The green ethylene plant located in Triunfo, Rio Grande do Sul, demanded investments R$ 500 million from 2008-2010. This plant have capacity to produce 200,000 tons / year of ethylene. In 2019, Braskem invested more than R$50 million at Innovation and Technology, part of this quantity is directed to the development of resins from renewable feedstock.

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Is your organization's low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	Yes	The company's carbon neutral plan is discussed in several forums, including the Annual General Meeting.

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details
RCP 8.5	For this scenario, all operations sites were included in the analysis, all historic climate-related events that have occurred in Braskem units were collected and then, the potential climate-related events until 2040 were mapped utilizing projection data from INPE in Brazil, NOAA, ESRL and Climate Central in the USA, DWD data in Germany and from the Instituto Nacional de Ecología y Cambio Climático (INECC) in Mexico. As the models used by Braskem offer the years of 2040, 2070 and 2100 as timeframe options, the year of 2040 was chosen, as it showed to be the closest option to Braskem's current reality. Results showed that, in Brazil, the greatest risk lies in severe droughts, although risks that will most likely cause impacts on Braskem's operations in Brazil are water scarcity and atmospheric electric discharges. Energy generation might also have a great impact on the Northeast of Brazil. For the USA, hurricanes of greater intensity are the biggest threat, especially to units located in Texas (PP8 La Porte, PP10 Seadrift and PP13 Oyster Creek), as these events might cause damage to constructions and installations and paralyze operations due to floods (as have already happened in 2017 to the PP 13 unit after the Harvey hurricane), besides the impacts on utilities and feedstock supply. For Germany, changes in the precipitation pattern showed to be the greatest risk, which might cause floods and damage construction and supply chain in the area. At last, for Mexico, changes in precipitation patterns, electrical discharges and heat waves showed to be the greatest risks for the future, causing not only damages to construction and supply chain, but possibly also to employee's health (in the case of heat

	waves). Using these results, actions and adaptation measures were defined to each unit considering the main risks identified for its respective area and, therefore, the Adaptation to Climate Changes Plan of Braskem was defined, totalizing 86 actions for Brazil, 8 for USA, 5 for Germany and 9 for Mexico, besides 8 actions for the Corporative areas of Logistics, Energy and HES. As an example, there is the Q 3 ABC unit (São Paulo, Brazil). For this unit, considering scenarios until 2040, the potential risk scenarios totalized a potential financial impact of 57,305,000 BRL, whilst the cost of approved actions, to eliminate or mitigate these risks, totalized 5,465,500 BRL. Approved actions for Q3-ABC include: studies of slopes in the area in order to redirect water flow from floods; revaluation of the unit's rain drainage system; developing a systematic critical analysis for the Aquapolo (water reuse project located in the ABC Industrial Complex, where the Q3-ABC unit is located); elaboration of a master plan to identify and evaluate the viability of projects for water consume reduction, rain water usage and streams reuse (Efluente Zero project); a water risk study for the basin supplying the unit and evaluating the need of implementing an operational and business contingency plan in case of potential pandemics. The results of our Adaptation Plan are made public in our website and in our Annual Sustainable Report. After the identification of possible climatic risks, the scenarios were constructed considering the impact of these potential risks on business, such as production interruption time, reduction of inputs / raw materials availability. An impact assessment is carried out considering the variation of these items and the corresponding economic impact, interruption of production for 3 months, 6 months or 1 year, impact on the availability of raw material of 30, 50 or 100%. The areas considered for the analysis of this scenario are those exposed to severe droughts, which is the most relevant climatic risk for Braskem.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	The demand for better processes, products and services with lower environmental impacts gave the chance to Braskem to expand its product portfolio, by creating new products that follow this demand. Based on this, Braskem seeks to diversify its product portfolio with products based on renewable raw materials, implementing these measures by the year 2030.

		Among other products, there is an example that is Green PE. The I'm green™ polyethylene, known as green plastic, is produced from ethylene obtained from sugarcane ethanol. Its main differential is its contribution towards reducing greenhouse gas (GHG) emissions in the atmosphere. Green polyethylene is a type of biopolymer, a category which includes renewable-source and/ or biodegradable materials. More specifically, green polyethylene is made using a renewable source raw material, sugarcane, and at the end of its lifecycle, it can be recycled using the same chain that exists for traditional polyethylene, without causing contamination. Braskem's biopolymer captures 3.09 tonnes of carbon dioxide, according to its Life Cycle Assessment (LCA), a study conducted by the Company with the support of specialized consultants, which followed the ABNT ISO 14040 guideline and was validated by global specialists. Over its 10 years of existence, I'm green ™ has avoided the emission of at least 5.54 million tons of CO2, which is equivalent to more than a year of automotive emissions in the city of São Paulo. In 2020 we have invested US$ 61 million in expanding biopolymer production to meet the fast-growing demand from society and our partners for sustainable products in recent years. We will expand our production capacity for green ethylene 200,000 to 260,000 tons per year. The project aiming to keep Braskem at the forefront of the biopolymers market will start in 2021, with completion planned for the fourth quarter of 2022.
Supply chain and/or value chain	Yes	Braskem's strategy and commitments related to climate change have direct impact in our entire value chain, both upstream (suppliers) and downstream (clients). Climate change has been pressing our customers for demanding products with a lower environmental footprint and / or from renewable sources. This was seen by Braskem as a business opportunity to create shared value in the long term, by offering more sustainable products that can help our clients to decrease their negative impact in climate change. Hence, our carbon neutral ambition is closely related to the expansion of the sale of products made with raw materials of renewable origin. In 2020, Braskem reached a historical sales record of 170,000 tons of the Green PE. Other

		products such as Maxio resins also play a role: when compared to equivalents, Maxio products typically reduce energy consumption and associated emissions by 10-50%. From a supply chain perspective, our bet on renewable raw materials intensifies our partnership with sugar cane suppliers for our I'm green products, which represents a major change in our supply chain strategy. Also, our emissions reduction goals is pushing us to find new energy suppliers focused on renewable energy.
Investment in R&D	Yes	Braskem sees Innovation and R&D as tools to build a more sustainable future. In 2020, 36% of our Opex investments in R&D are focused on sustainability. More specifically, Braskem's focus on climate change has been steering much of the company's R&D investments. For instance, we currently have one Renewable Chemicals Research Center in Campinas (Brazil), focused on the development of renewable technologies. The innovation area, in 2020 began to use sustainable development criteria for project approval. These criteria consider the topic of climate change (risks, opportunities and mitigation) with a relevant weight. The projects are being defined with a horizon until 2030 and also until 2050 (carbon neutral target) In 2020, the company also developed and implemented the Sustainability Index for the entire portfolio of Innovation and Technology (I&T) projects, and this is now part of the standard planning process and approval pipeline for I&T projects. The Index aims to ensure overall alignment with sustainability, and all projects (both new products or processes) are assessed in terms of sustainability from the early planning phase. A new project may have a positive, neutral or negative impact on each dimension, being greenhouse gas emissions one of them (along with water, energy, chemical safety, process/product and circularity). In 2020, 80% of the I&T projects had a positive impact on the Sustainability Index. Based on our commitment to sustainable innovation, we entered a partnership with the University of Illinois, USA, to research alternatives for the development of ethylene from the capture and use of carbon dioxide (CO2) emitted in industrial processes, especially from the burning of fuels. The project is still in the early phase of development, and we

		will contribute with our know-how in the commercialization of raw materials and production of polymers. The final objective is to evaluate the possibility of capturing CO2 emitted in our operation and converting it into a raw material for the production of polymers.
Operations	Yes	Reducing energy consumption and using renewable energy are key to reducing our carbon emissions. Hence, in order to achieve our climate related commitments, we invest in energy efficiency projects in our plants, and we seek long-term partnerships in our purchase of clean energy. In 2020, we signed two contracts for the purchase of renewable energy in 2020: one for solar energy with Canadian Solar, and the other for wind power, in partnership with Casa dos Ventos. Since 2018, we have negotiated and signed four renewable energy purchase agreements that will avoid an estimated 1.5 million tons of CO2 e. These agreements involve the construction of renewable energy generation farms, contributing not only to our own sustainable development strategy, but also improving Brazil's energy matrix, in addition to bringing economic development to the regions where the solar farms are installed. Currently, at least 74% of all electricity we purchase globally comes from renewable sources. Our Energy Efficiency Program was created in 2019 to accelerate energy initiatives and boost our competitiveness while reducing our CO2 e emissions. The initiatives aim to make Braskem one of the best chemical industries in energy consumption worldwide, and even during the pandemic we moved forward implementing them in several plants.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Indirect costs Capital expenditures	From the beginning of our operations in 2002, we have been committed to aligning our business strategy with the goal to improve people's lives based on sustainable solutions from chemicals and plastics. To this end, we follow our Global Sustainable Development Policy, which assesses and meets the needs and demands of all stakeholders, in order to

	Capital allocation Acquisitions and divestments Access to capital Assets	promote economic growth aligned with environmental preservation, work and process safety and social justice in all our business activities, services, investments, relationships and products. To align our growth plan with the development of products, processes and solutions that improve environmental and social impacts, following our Global Sustainable Development Policy, we set goals and aspirations also considering our Materiality Matrix, which guides the relevance of the topics of sustainability within our 2030 business strategy. Revenue: With the inclusion of more sustainable products, such as the Maxio resins, in Braskem's product portfolio, there was consequently an impact on the company's revenue, leading to an increase of it. For example, in 2018, there was a revenue just for the Maxio resin, which was more than 100% (double) the revenue brought by this same resin in 2017. In 2019, we reviewed the I'm green brand, which now offers renewable, recycled and renewable-recycled products. A total of 1,651 tons of post-consumer resin were produced and sold, representing 8.2% of the target for 2020. The Chemical Recycling Squad carried out some trials with product from the chemical recycling of post-consumer plastics produced by technology companies partners. Indirect costs (operating): In the last 3 years in the region of São Paulo, Brazil, due to the scenario of drought, many plants from other companies had to interrupt their operations due to water scarcity. However, Braskem's units in this area kept 100% operational during the whole time, as an adaptation measure was already implemented: a project of water reuse, which reuses 100% of the water consumed in this reuse unit. Therefore, one can say that Braskem has actually been impacted in a positive way regarding its operations, since a risk management measure was implemented before any losses had occurred. In order to guarantee that these plants keep operational under other drought scenarios, Braskem has an annual cost of R$3,927,602. Also, another impact was observed with Hurricane Harvey that hit three units in Texas in 2017 and the financial impact calculated were around US$ 10,000,000, which is around R$ 40,000,000 in total and around R$ 13,500,000 per plant. Capital: In 2015, when Braskem built the Mexican Complex in Coatzacoalcos (Veracruz, Mexico), the company acquired system equipment already designed according to the benchmark technology during that year in order to lead to lower environmental impacts, such as GHG emissions. Due to these investments, the Mexican unit is, in normal operations´condition, the one with the best emissions intensity indicator

		among all other cracker plants in Braskem, which is 30% lower when compared to the mean value of other plants with similar technology in the company. Acquisitions and divestments: As a chemical company and also supplier of feedstock to many chains, Braskem has specific permanent subjects of focus (material themes) associated with the impacts of its business, through its investments, operations, products, processes, services, etc. Notably, eco-efficiency of operations regarding GHG emission is one these material themes , which is explicit in the Sustainable Development Policy approved in 2018 by the Board, applied to all investments, operations, products, services, acquisitions, joint ventures and divestments, in all countries where Braskem operates. Between 2008 to 2010 due to the divestment of the Caprolactama unit, there was a reduction of 496,440 tCO2e, considering the carbon price, US$40, used in the pilot phase of internal carbon pricing, corresponds to US$ 19,857,600 or R$ 78,437,520 Access to capital: Regarding access to capital, Braskem has been positively impacted. Currently, the company deals with two types of investors: the ones that invest in Braskem's actions and the ones providing capital to Braskem's debts. Currently, there are already differentiated criteria to receive a loan. In the application of questionnaires regarding social-environmental information of the company, it might be clearly seen that investors want to know more about the company's actions and risk management. For example, Braskem has already utilized funding lines (Financiadora de Estudos e Projetos, FINEP) for innovation and technology projects with appealing taxes that are lower than the ones in use in the Market, which are around 6.17% per year. Assets: Regarding assets, one example of how Braskem has been impacted in this matter is the Aquapolo Project, in São Paulo, Brazil, which reuses water consumed by the plants in the ABC Petrochemical Complex. An investment of R$ 364 million was made for this project. Also, as another example, there is the investment made in the green polyethylene plant in the South of Brazil (Rio Grande do Sul), of R$ 1,078,800,000.

C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

Regarding to the financial plan, once a high climate risk with potential impact on the business is confirmed, the strategic planning areas, responsible for long-term plan and ensuring business operational continuity, together with the corporate risk management area, support the area exposed to this risk in the identification and implementation of the solution, thus integrating with financial and business planning.

The process of collecting information to amend and ratify the strategy was driven by consultation with the Braskem senior leadership by means of interviews and consultation with internal stakeholders. Consolidation of these results of consultations determined the degree of importance of each aspect addressed. The extent of the impacts and the level of Braskem's control over every aspect were also evaluated. Based on these data, the company's sustainable development strategy for the 2013-2020 period was amended and approved together with the Leaders of the Business Units and Support Units.
Braskem recognizes that, individually and also within its value chain, it is an important GHG emitter, however it has been acting systematically and consistently to minimize the negative impact its productive activities could have regarding climate change and encouraging its suppliers and clients to do the same. In addition to the search for efficiency in operational processes, it also invests resources in the research and innovation of products. Moreover, life cycle studies have shown that the use of chemical products can avoid GHG emissions along the value chain. Braskem’s strategy is widely influenced by reputational aspects and those related to changes in consumption habits, keeping in mind the growing demand of clients for products that are less carbon-intensive and use renewable feedstock. That is why Braskem has as a strategic measure the investment in the production of polymers produced from sugar cane. The objective is to position Braskem as a worldwide reference in the use and responsible production of chemicals.
Braskem’s short term strategy (2020 - next two years) was influenced mostly regarding targets of improvement of production processes, with the objective of reducing the intensity of greenhouse gas emissions and energy consumption. The plant´s management aligned with the sustainable development team acts to minimize the socioenvironmental impacts caused by the company’s operations.
The corporate strategy takes into account reputational, regulatory and physical risks related to climate change, as well as opportunities presented by it, such as the development of new products that use renewable feedstock. Actions and initiatives derived from the 2020 Strategy on Sustainable Development have this focus. It is worth pointing out that Braskem does not include only the climate issues, but also all environmental issues in the process of evaluation of new products and technologies through the Life Cycle Analysis (LCA) for all new opportunities.
The strategy is directly related to the company’s responsibility for its supply chain. Braskem seriously seeks to stimulate and develop suppliers to offer products that reduce environmental impact.
The development of Green Products, produced from renewable feedstock, is aligned with the company´s strategy to become one of the main investors in biotechnology for the chemicals production from biomass. Braskem understands that this positioning brings important strategic advantages against competitors, since it developed innovative products, some of them with no competitors in the global market. Our constant efforts were recognized by the magazine Fast Company, which selected Braskem as one of the 50 most innovative companies of 2014. This recognition was the result of our research into products made from renewable resources,

especially our Green Plastic. Fast Company also highlighted our innovative process of transforming sugarcane ethanol into ethylene, the feedstock used to make the bio-based polyethylene. To support our research activities, we maintain two Innovation & Technology Centers, one in Brazil (Triunfo, RS) and the other in the United States (Pittsburgh, PA). From 2011 to 2019, Braskem's disbursements I&T totaled over R$ 1.8 billion.
One important business decision influenced by climate change was the development of Braskem’s Sustainable Development Policy, approved in 2018. This Policy reafirms and strengthens Braskem’s commitment to the simultaneous promotion of economic growth, environmental preservation and social justice, aimed at ensuring stakeholder satisfaction today and in the future. The ultimate goal of this Policy is to ensure the attainment of Braskem’s purpose of “improving people’s lives by creating sustainable solutions through chemicals and plastics”. Another objective of this Policy is to guide strategic, tactical and operational planning, as well as the respective budgeting processes, conducted company-wide. Also, this Policy integrates and clarifies the corporate standards and guidelines related to Sustainable Development, as well as voluntary commitments and international initiatives undertaken by Braskem, inducing definitions of goals and targets regarding sustainable development, whose definition and implementation must be performed during the Planning Cycle, considering qualitative and quantitative aspects in the various areas of Braskem.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Both absolute and intensity targets

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Year target was set

2020

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (location-based)

Base year

2020

Covered emissions in base year (metric tons CO2e)

10,771,240

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2030

Targeted reduction from base year (%)

15

Covered emissions in target year (metric tons CO2e) [auto-calculated]

9,155,554

Covered emissions in reporting year (metric tons CO2e)

10,771,240

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this a science-based target?

No, but we are reporting another target that is science-based

Target ambition

Please explain (including target coverage)

In 2020, we continued reducing our absolute emissions (scopes 1 and 2), with a slight decline of 0.62% compared to the previous year, showing our sustained performance even in the face of the Covid-19 pandemic. We defined our new long-term goals in 2020, and we also updated the emissions of our base year (2019). Another highlight is that we continue to lead CDP Climate, and we made their A-list. Scope 1 emissions totaled 10,035,761 tCO2 e, about the same level as the previous year(+0.04%). Scope 2 emissions totaled 735,479 tCO2e, 8.79% lower than the previous year, as a result of the reduction in the emission factors of the electricity grid.
Braskem's climate-related targets are divided in two main steps: i. By 2030, reduce greenhouse gas emissions in scopes 1 and 2 by 15% and ii. achieve carbon neutrality by 2050.

Target reference number

Abs 2

Year target was set

2020

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (location-based)

Base year

2020

Covered emissions in base year (metric tons CO2e)

10,771,240

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2050

Targeted reduction from base year (%)

100

Covered emissions in target year (metric tons CO2e) [auto-calculated]

0

Covered emissions in reporting year (metric tons CO2e)

10,771,240

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition

1.5°C aligned

Please explain (including target coverage)

In 2020, Braskem comitted to achieve carbon neutrality (scopes 1 and 2) by 2050.In order to do so, the company's strategy is divided in three main pillars: i. reduce emissions with a focus on energy efficiency, as well as increasing the use of renewable energy in current operations, establishing partnerships
aimed at innovation and technology; ii. compensation of emissions with potential investments in the production of chemicals and polymers from renewable sources and iii. capture of carbon emissions through research and development to use carbon

emissions as a raw material. as an intermediate objective, the company also committed to a 15% reduction in its emissions (scopes 1 and 2) by 2030.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Year target was set

2013

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (location-based)

Intensity metric

Metric tons CO2e per metric ton of product

Base year

2008

Intensity figure in base year (metric tons CO2e per unit of activity)

0.772

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

100

Target year

2020

Targeted reduction from base year (%)

22.28

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

0.5999984

% change anticipated in absolute Scope 1+2 emissions

59.88

% change anticipated in absolute Scope 3 emissions

40.12

Intensity figure in reporting year (metric tons CO2e per unit of activity)

0.669

% of target achieved [auto-calculated]

59.8831638775

Target status in reporting year

Underway

Is this a science-based target?

No, but we are reporting another target that is science-based

Target ambition

Please explain (including target coverage)

Our performance of the carbon intensity indicator (tCO2e/t produced) considers the impact of accumulated Scopes 1 and 2 emissions (Market-based; tCO2e) compared to the company's total production (tons produced). Despite our progress in absolute terms, Braskem's carbon intensity increased by 4.6% compared to 2019, reaching a value of 0.669 tCO2e / t. This
increased intensity can be attributed mostly to the 5% smaller production volume, leading to lower energy performance in the units, while the events of the pandemic of Covid-19 made it impossible to schedule maintenance stops in some industrial units.

Target reference number

Int 2

Year target was set

2020

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (location-based)

Intensity metric

Metric tons CO2e per metric ton of product

Base year

2020

Intensity figure in base year (metric tons CO2e per unit of activity)

0.669

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

100

Target year

2030

Targeted reduction from base year (%)

37

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

0.42147

% change anticipated in absolute Scope 1+2 emissions

15

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

0.669

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this a science-based target?

No, but we are reporting another target that is science-based

Target ambition

Please explain (including target coverage)

Braskem aims to reduce its intensity in GHG emissions in 37% until 2030.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production
Net-zero target(s)
Other climate-related target(s)

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Intensity

Target type: energy carrier

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

Other, please specify

renewable electricity energy purchased

Base year

2020

Figure or percentage in base year

74

Target year

2030

Figure or percentage in target year

85

Figure or percentage in reporting year

74

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this target part of an emissions target?

Yes, it is associated to Scope 1+2 absolute consumption target (C4.1a)

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

Braskem has bilateral contracts with a series of eletric power generators that have a renewable portfolio. In addition, Braskem acquires electricity from the national grid, which in turn has a large part of its composition from renewable sources.

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number

Oth 1

Year target was set

2017

Target coverage

Company-wide

Target type: absolute or intensity

Intensity

Target type: category & Metric (target numerator if reporting an intensity target)

Other, please specify

Other, please specify

Number of completed actions

Target denominator (intensity targets only)

Other, please specify

Number of total actions

Base year

2017

Figure or percentage in base year

0

Target year

2023

Figure or percentage in target year

100

Figure or percentage in reporting year

71

% of target achieved [auto-calculated]

71

Target status in reporting year

Underway

Is this target part of an emissions target?

No.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

The Adaptation Plan, which aims to reduce to zero the climate risks classified as "high" by 2023 and maximize business opportunities, has evolved positively and the projects implemented up to 2020 have reduced potential physical impacts quantified at approximately US$ 55 million. Some examples of projects that have already been implemented and have contributed to reducing our vulnerability to climate change are: evaluation and improvements in lightning protection systems (SPDA); slope recovery to direct water flow and protect against flooding; contracting of alternative renewable sources of electricity in order to reduce the dependence on hydroelectric sources in scenarios of water scarcity.

Target reference number

Oth 2

Year target was set

2017

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Other, please specify

Other, please specify

Number of high climate risk

Target denominator (intensity targets only)

Base year

2017

Figure or percentage in base year

63

Target year

2030

Figure or percentage in target year

0

Figure or percentage in reporting year

27

% of target achieved [auto-calculated]

57.1428571429

Target status in reporting year

Underway

Is this target part of an emissions target?

No.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

As for the field of adaptation, Climate Change and proper management of our impacts are matters of business continuity. In 2016, we completed a study to identify risks and opportunities in 100% of our operations. This study allowed us to develop an Adaptation Plan with actions to mitigate or reduce the most significant climate risks, classified as “high” in our matrix. Based on the climate risk scenarios and models used, we identified 63 potential high-risk threats to the business by 2040 with a potential financial impact of approximately US$ 175 million, 36 in Brazil, 16 in Mexico and 6 in the United States (numbers revised in 2019), for which 110 specific adaptation actions were outlined, both in management and engineering.

The Adaptation Plan, which aims to reduce to zero the climate risks classified as "high" by 2030 and maximize business opportunities, has evolved positively and the projects implemented up to 2020 have reduced potential physical impacts quantified at approximately US$ 55 million. Some examples of projects that have already been implemented and have contributed to reducing our vulnerability to climate change are: evaluation and improvements in lightning protection systems (SPDA); slope recovery to direct water flow and protect against flooding; contracting of alternative renewable sources of electricity in order to reduce the dependence on hydroelectric sources in scenarios of water scarcity.

C4.2c

(C4.2c) Provide details of your net-zero target(s).

Target reference number

NZ1

Target coverage

Company-wide

Absolute/intensity emission target(s) linked to this net-zero target

Abs1

Target year for achieving net zero

2050

Is this a science-based target?

Yes, and we have committed to seek validation of this target by the Science Based Targets initiative in the next 2 years

Please explain (including target coverage)

Braskem considers this target equivalent to SBT since the percentage of annual emission reduction to reach the target is higher than the 2.1% required. Over the years, Braskem has implemented several actions to foster energy efficiency and expand the use of renewable energy sources in order to achieve our goal of carbon neutrality by 2050. Our strategy to face climate change is divided into three fronts. In terms of reducing emissions, we are working on expanding the use of renewable energy in our operations while constantly improving our energy efficiency. As a result, in the past 13 years, we have reduced the intensity of our GHG emissions by around 17%. This effort will help us achieve our intermediate target of reducing direct emissions (scopes 1 and 2) by 15% by 2030. The second front is compensation, and it will go hand in hand with the expansion of our activities in the renewable products market. We will increase our output of Green Polyethylene with an additional 60,000 tons and plan to diversify our portfolio with new solutions based on renewable raw materials. On the third front, our innovation teams are workingtirelessly to develop creative technologies to embed carbon capture and use in our processes.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	26	6,225,754
To be implemented*	9	1,357,589
Implementation commenced*	0	0
Implemented*	18	486,352
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Low-carbon energy consumption

Solar heating and cooling

Estimated annual CO2e savings (metric tonnes CO2e)

39,300

Scope(s)

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

9,832,500

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

16-20 years

Comment

As part of its transition towards a renewable energy grid, Braskem is building several partnerships to use solar energy in its operations. As an example, in 2020 Braskem announced a long-term contract for the purchase of renewable energy with Canadian Solar Inc., one of the largest companies in the solar sector in the world. The agreement enables the construction of a plant in the North of Minas Gerais, and guarantees the

supply for 20 years. The plant will have an installed capacity of 152 MWp, enough to supply a city of 430,000 inhabitants. Construction works are scheduled to begin in 2021 and the energy generated will be used at Braskem's industrial units in Brazil. Through the contract, the company estimates to avoid the emission of 500 thousand tons of CO2 into the atmosphere over two decades.

Initiative category & Initiative type

Low-carbon energy consumption
Wind

Estimated annual CO2e savings (metric tonnes CO2e)

49,416

Scope(s)

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

12,354,000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

16-20 years

Comment

As part of our transition towards a renewable energy grid, Braskem is building partnerships for wind power generation. As an example, it signed a contract worth more than R$1 billion for the acquisition of wind energy from Casa dos Ventos, one of the pioneers and largest investors in the development of projects in the segment in Brazil. The contract is linked to the construction of a new wind farm and provides for the supply of renewable energy for 20 years.

Initiative category & Initiative type

Energy efficiency in production processes
Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

212,606

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

53,151,500

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

Our Energy Efficiency Program was created in 2019 to accelerate energy initiatives and boost our competitiveness while reducing our CO2 e emissions. One example is the Vesta project, launched in 2020, that is a partnership between Braskem and Siemens to improve energy efficiency in the ABC Paulista - São Paulo. The project was valued at R$ 600 million and will modernize the electrical system and update of the system that serves the cracker, the main industrial unit of the Petrochemical Complex, responsible for the production of raw materials for the chemical and plastic sector. The estimative is for a reduction of 11.4% in water consumption and 6.3% in the unit's CO2 emissions.

Initiative category & Initiative type

Other, please specify

Other, please specify

Renewable raw-material expansion

Estimated annual CO2e savings (metric tonnes CO2e)

185,000

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

46,250,000

Investment required (unit currency – as specified in C0.4)

60,000,000

Payback period

4-10 years

Estimated lifetime of the initiative

1-2 years

Comment

We have invested US$ 61 million in expanding biopolymer production to meet the fast-growing demand from society and our partners for sustainable products in recent years. We will expand our production capacity for green ethylene in the Triunfo industrial unit in Rio Grande do Sul from 200,000 to 260,000 tons per year. The project aiming to keep Braskem at the forefront of the biopolymers market will start in 2021, with completion planned for the fourth quarter of 2022.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Braskem follows climate related regulatory developments closely and in a recurrent manner.
Dedicated budget for low-carbon product R&D	Braskem allocates budget in its research and technology area for the development of low carbon products. Examples of the success of the decision is the introduction of products such as Green PE, Green Isoprene, Green Butadiene and ETBE.
Dedicated budget for energy efficiency	Energy efficiency improvements are part of Braskem targets related to GHG emissions set in the 2020 sustainable development macro goals. therefore a specific budget is dedicated to the development of such projects and initiatives. Internal incentives and GHG intensity targets programs are considered to be among other indicators to define the variable annual remuneration for each employee.
Other Qualitative criteria for sustainability in Investments	Braskem developed its Sustainability Index to improve the prioritization of investments. The index aligned the prioritization process with the macro objectives of the company, and one of these macro objectives encompasses climate change issues.
Internal price on carbon	Aiming to benefit projects that present a reduction in GHG emissions, Braskem developed a tool to calculate the virtual cost of carbon in its investments. The tool calculates the virtual cost of carbon as an anticipatory way for future impact regulation, identifying the positive and negative contributions to projects. In this way, the economic values, positive or negative, corresponding to the environmental impact caused by the emissions are calculated for those projects that reduce or generate emissions.This process now enters the monitoring phase to evaluate the effectiveness of the defined price in relation to changing the eligibility of projects in the decision-making process.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Group of products

Description of product/Group of products

“Maxio” resin

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Addressing the Avoided Emissions Challenge- Chemicals sector

% revenue from low carbon product(s) in the reporting year

1

Comment

Braskem has a line of resins called Maxio®, a seal that identifies PE, PP or EVA resins with lower energy consumption in their applications in the client. For example, the Grade RP141 provided reduction of energy consumption by 9% in the manufacturing process of the Customer, where consumption felt from 770.7 kWh/t to 702.0 kWh/t. The gain was achieved mainly due to the reduction of process temperature, which decreased from 240°C to 200°C.

Level of aggregation

Group of products

Description of product/Group of products

I’m green™ Polyethylene produced from sugarcane ethanol

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Addressing the Avoided Emissions Challenge- Chemicals sector

% revenue from low carbon product(s) in the reporting year

2

Comment

Today, Braskem is the largest global producer of biopolymers, with annual production capacity of 200,000 tons of I'm green™ Polyethylene produced from sugarcane ethanol, a source that is 100% renewable, therefore promoting the capture and storage of CO2. Considering its lifecycle, Braskem´s Green PE has a potential to store 3.09 tCO2e per tonnes of product

Level of aggregation

Product

Description of product/Group of products

ETBE additive

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Addressing the Avoided Emissions Challenge- Chemicals sector

% revenue from low carbon product(s) in the reporting year

0.84

Comment

ETBE: a bio additive to gasoline partially produced with sugarcane ethanol and each ton produced avoids the emissions of 783 kg of CO2 when compared to MTBE, when considering a cradle to gate life cycle approach (source: ecoeffiency analysis commissioned by Braskem). When considering the use by our clients, MTBE emits 0,695 tCO2e/t and ETBE emits 0,690 tCO2e/t (Source: Ecoinvent 3.1).

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

10,035,761.21

Comment

The base year changed from 2008 to 2020 due to the end of the 2008-2020 cycle.

Scope 2 (location-based)

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

762,569.33

Comment

The base year changed from 2008 to 2020 due to the end of the 2008-2020 cycle.

Scope 2 (market-based)

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

732,760.82

Comment

Although we have purchased electricity from the free market, it was only in 2019 that we decided to officially report market-based emissions in our Annual Report.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009
Brazil GHG Protocol Programme
Defra Environmental Reporting Guidelines: Including streamlined energy and carbon reporting guidance, 2019
IPCC Guidelines for National Greenhouse Gas Inventories, 2006

IPIECA's Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011
ISO 14064-1
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
The Greenhouse Gas Protocol: Scope 2 Guidance
Other, please specify
Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard; IPCC Guidelines for National Greenhouse Gas Inventories, 2019

C5.2a

(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

- IPCC Guidelines for National Greenhouse Gas Inventories, 2019
- Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

10,035,761.21

Comment

Scope 1 emissions totaled 10,035,761.21 tCO2e, same level as that observed in the previous year (0.04%).

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

Although we have purchased electricity from the free market, it was only in 2019 that we decided to officially report market-based emissions in our Annual Report.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

762,569.33

Scope 2, market-based (if applicable)

732,760.82

Comment

Scope 2 emissions lower than the previous year, as a result of the reduction in the emission factors of the electricity grid.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

8,177,449.13

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and life cycle emissions factor from Ecoinvent 3.1. database.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

This category represents 38%, due to its relevance, there are ongoing initiatives in the supply area.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

494,479.89

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and life cycle emissions factor from Ecoinvent 3.1. database

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category represents 2.3%, there are ongoing initiatives in the supply area.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

496,686.57

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and life cycle emissions factor from Ecoinvent 3.1. database

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category represents 2.31%, there are ongoing initiatives in the energy area

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

647,167.16

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and UK DEFRA emissions factor

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

This category represents 3.01%, there are initiatives underway in the logistics area

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO2e

41,593.31

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and IPCC 2019 emissions factor

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category represents 0.19%, there are ongoing initiatives in the area of circular economy.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

1,599.88

Emissions calculation methodology

This category represents 0.1%, there are ongoing initiatives in the area of circular economy.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

This category represents 0.01%, there are ongoing initiatives in the service area.

Employee commuting

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

6,764.48

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and UK DEFRA emissions factor

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

This category represents 0.03%, there are ongoing initiatives in the service area.

Upstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

613.68

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and Programa Brasileiro GHG Protocol emission factors

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

There are ongoing initiatives in the area of circular economy.

Downstream transportation and distribution

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

220,376.67

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and UK DEFRA emissions factor

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

This category represents 1.02%, there are ongoing initiatives in the logistics area.

Processing of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

7,657,467.28

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and life cycle emissions factor from Ecoinvent 3.1. database

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category represents 35.64%, due to its relevance, there are ongoing initiatives in the circular economy area.

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,863,712.24

Emissions calculation methodology

Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and life cycle emissions factor from Ecoinvent 3.1. database

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category represents 8.67%, due to its relevance there are ongoing initiatives in the circular economy area

End of life treatment of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,780,722.37

Emissions calculation methodology

Greenhouse Gas Protocol’s Corporate Value Chain (Scope 3) Accounting and Reporting Standard and life cycle emissions factor from Ecoinvent 3.1. database

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category represents 8.28%, due to its relevance, there are ongoing initiatives in the circular economy area

Downstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

Greenhouse Gas Protocol’s Corporate Value Chain (Scope 3) Accounting and Reporting Standard

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Calculated emission is equal to zero because Braskem doesn't have any downstream leased assets

Franchises

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

Greenhouse Gas Protocol’s Corporate Value Chain (Scope 3) Accounting and Reporting Standard

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Calculated emission is equal to zero because Braskem doesn't have any franchises

Investments

Evaluation status

Relevant, calculated

Metric tonnes CO2e

98,420.38

Emissions calculation methodology

Greenhouse Gas Protocol’s Corporate Value Chain (Scope 3) Accounting and Reporting Standard

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

This category representes 0.46%. The Scope 3 emissions in 2020 totaled 21,487,103 tCO2e, an decrease of 18% when compared to the previous year. Since 2018, Braskem has been advancing in management of this Scope, improving discipline in reporting, increasing the accuracy of information.

Other (upstream)

Evaluation status

Please explain

Other (downstream)

Evaluation status

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.000175

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

10,236,620.38

Metric denominator

unit total revenue

Metric denominator: Unit total

58,500,000,000

Scope 2 figure used

Location-based

% change from previous year

1.13

Direction of change

Decreased

Reason for change

The indicator improved due to the implementation of the initiatives of Low-carbon energy consumption, Energy efficiency in production processes.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	9,706,006.64	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	64,636.57	IPCC Third Assessment Report (TAR - 100 year)
N2O	18,505.15	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	246,156.85	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	456	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Brazil	8,642,280.22
United States of America	129,106.83
Germany	59,956.03
Mexico	1,204,418.12

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By business division
By facility

C7.3a

(C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Basic Petrochemicals	9,163,232.72
Polypropylene	229,632.93
Polyethylene	96,573.54
Vinyls and Chloride	545,194.41
Corporate	1,127.6

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Q 1 BA	2,974,203.17	-12.663	-38.3284
Q 2 RS	2,767,093.99	-29.8774	-51.382
Q 3 ABC	1,754,503.55	-23.6393	-46.4864
Q 4 DCX / PE 9 DCX	507,715.88	-22.713	-43.2427
PVC 1 BA	97,690.44	-12.6535	-38.3165
PVC 2 AL	404,588.09	-9.6697	-35.8248
CS 2 BA	33.78	-12.6557	-38.3071
CS 1 AL	42,882.11	-9.672	-35.7466
PE 1 BA	3,283.53	-12.6629	-38.3247
PE 2 BA	1,080.13	-12.6497	-38.3162
PE 3 BA	24,562.67	-12.6538	-38.3193
PP 5 DCX	5,175.22	-22.713	-43.2427
PE 8 CUB	948.74	-23.856	-46.4132
PP 3 PLN	4,518.05	-22.7181	-47.1343
PE 7 ABC	6,872.73	-23.6458	-46.4885
PP 4 ABC	22,439.54	-23.6392	-46.467
PP 1 RS	6,652.77	-29.8858	-51.3937
PP 2 RS	1,784.5	-29.873	-51.3989
PE 4 RS	1,141	-29.872	-51.3992
PP 7 USA	29,385.68	38.3298	-82.5837
PP 8 USA	63,398.44	29.7024	-95.0803
PP 9 USA	12,911.73	39.8149	-75.4267
PP 10 USA	8,339.78	28.615	-96.6261
PP 11 GER	44,541.85	50.8423	6.9455
PP 12 GER	15,414.19	51.3945	11.974
PP 13 USA	15,071.21	28.9338	-95.3361
IDESA MX	1,204,418.12	18.1348	-94.3698
Corporate	0	-23.5711	-46.7032
PE 5 RS	13,202.3	-29.873	-51.3989
PE 6 RS	780.45	-29.872	-51.3992

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Comment
Chemicals production activities	10,035,701.21	All of our Scope 1 emissions are from direct and indirect chemicals production activities.

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Germany	96,350.29	96,350.29	216,290.76	0
United States of America	532,712.94	532,712.94	1,103,357.46	0
Brazil	227,949.7	198,141.2	3,839,356.03	2,127,991.7
Mexico	18,161.64	18,161.64	37,000	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division
By facility

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Basic Petrochemicals	65,427.87	61,854.51
Polypropylene	531,030.36	528,480.02
Polyethylene	144,789.82	121,105.02

Vinyls and Chloride	20,248.89	20,248.89
Corporate	87.63	87.63
Terminais	984.76	984.76

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Q 1 BA	36,467.57	36,467.57
Q 2 RS	2,557.5	2,557.5
Q 3 ABC	9,505.92	9,505.92
Q 4 DCX / PE 9 DCX	15,985.56	7,404.48
PVC 1 BA	4,874.19	4,874.19
PVC 2 AL	12,783.11	12,783.11
CS 2 BA	2,591.59	2,591.59
CS 1 AL	0	0
PE 1 BA	4,893.91	4,893.91
PE 2 BA	3,270.74	3,270.74
PE 3 BA	10,890.33	10,890.33
PP 5 DCX	4,207.1	1,948.72
PE 8 CUB	53,290.82	53,290.82
PP 3 PLN	10,610.09	10,610.09
PE 7 ABC	9,380.22	9,380.22
PP 4 ABC	6,060.31	6,060.31
PP 1 RS	9,090.74	8,880.65
PP 2 RS	3,659.42	3,577.54
PE 4 RS	19,797.39	7,227.48
PP 7 USA	72,261.41	72,261.41
PP 8 USA	89,025.69	89,025.69
PP 9 USA	167,385.73	167,385.73
PP 10 USA	28,492.75	28,492.75
PP 11 GER	44,009.04	44,009.04
PP 12 GER	52,341.25	52,341.25

PP 13 USA	43,886.84	43,886.84
IDESA MX	18,161.94	18,161.94
Corporate	87.63	87.63
PE 5 RS	16,424.43	16,095.05
PE 6 RS	9,591.35	3,813.56
TERMINAIS	984.76	984.76

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Chemicals production activities	762,569.33	732,760.82	All of our Scope 2 emissions are from direct and indirect chemicals production activities.

C-CH7.8

(C-CH7.8) Disclose the percentage of your organization's Scope 3, Category 1 emissions by purchased chemical feedstock.

Purchased feedstock	Percentage of Scope 3, Category 1 tCO2e from purchased feedstock	Explain calculation methodology
Naphtha	47.73	Naphtha is one the most relevant feedstock for Braskem´s operations. Considering the amount consumed and emission factors provided by Ecoinvent, emissions from Naphtha were calculated (around 3,903 thousand tCO2e) and divided by total Category 1 emissions.
Ethane	10.45	Ethane is the sum of all ethane and ethene acquired by Braskem in the reporting year. Considering the amount consumed and emission factors provided by Ecoinvent, emissions from these feedstocks were calculated (around 854 thousand tCO2e) and divided by total Category 1 emissions

Propane gas	3.36	Propane is the sum of all propane and propene acquired by Braskem in the reporting year (liquid or gas). Considering the amount consumed and emission factors provided by Ecoinvent, emissions from these feedstocks were calculated (274 thousand tCO2e) and divided by total Category 1 emissions.
Other (please specify) Hexane, Ethanol, Solvents and other additives	38.46	Considering the amount consumed and emission factors provided by Ecoinvent, emissions from these feedstocks were calculated (3,107 thousand tCO2e) and divided by total Category 1 emissions.

C-CH7.8a

(C-CH7.8a) Disclose sales of products that are greenhouse gases.

	Sales, metric tons	Comment
Carbon dioxide (CO2)	0	Braskem does not produce any CO2 for selling purposes.
Methane (CH4)	0	Braskem does not produce any CH4 for selling purposes.
Nitrous oxide (N2O)	0	Braskem does not produce any N2O for selling purposes.
Hydrofluorocarbons (HFC)	0	Braskem does not produce any HFC for selling purposes.
Perfluorocarbons (PFC)	0	Braskem does not produce any PFC for selling purposes.
Sulphur hexafluoride (SF6)	0	Braskem does not produce any SF6 for selling purposes.
Nitrogen trifluoride (NF3)	0	Braskem does not produce any NF3 for selling purposes.

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	3,900	Decreased	0.04	Last year 3,900 tCO2e were reduced by a change on our renewable energy consumption/through emissions reduction activities, and our total Scope 1 and Scope 2 emissions in the previous year was 10,873,309 tCO2e, therefore we arrived at 0.04% through (3,900 /10,873,309) * 100 = 0.04%.
Other emissions reduction activities	70,978.25	Decreased	0.65	Last year 70,978,52tCO2e were reduced by a change emissions reduction activities through emissions reduction activities implemented in some industrial units (Q 2, PE 9, PE 6, PE 4, etc.), and our total Scope 1 and Scope 2 emissions in the previous year was 10,873,309 tCO2e, therefore we arrived at 0.65% through (70,978,52 /10,873,309) * 100 = 0.65%.
Divestment	0	No change	0	
Acquisitions	0	No change	0	There isn't any change.
Mergers	0	No change	0	There isn't any change.
Change in output	0	No change	0	There isn't any change.
Change in methodology	0	No change	0	There isn't any change.
Change in boundary	0	No change	0	There isn't any change.
Change in physical operating conditions	0	No change	0	There isn't any change.
Unidentified	0	No change	0	There isn't any change.
Other	0	No change	0	There isn't any change.

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 5% but less than or equal to 10%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh

Consumption of fuel (excluding feedstock)	LHV (lower heating value)	547.66	48,288,704	48,289,251.66
Consumption of purchased or acquired electricity		3,027,340	1,063,660	4,091,000
Consumption of purchased or acquired steam		0	1,121,004.25	1,121,004.25
Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		3,027,887.66	50,473,368.25	53,501,255.91

C-CH8.2a

(C-CH8.2a) Report your organization's energy consumption totals (excluding feedstocks) for chemical production activities in MWh.

	Heating value	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	48,289,251.66
Consumption of purchased or acquired electricity		4,091,000
Consumption of purchased or acquired steam		1,121,004.25
Consumption of self-generated non-fuel renewable energy		0
Total energy consumption		53,501,255.91

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No

Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Coal

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

2,407,743.15

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

2,407,743.15

Emission factor

0.54

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Distillate Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

161.72

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

161.72

Emission factor

0.3

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Fuel Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

30,296,938.13

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

29,130,251.62

MWh fuel consumed for self-generation of steam

1,166,687.51

Emission factor

0.18

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

275,899.85

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

275,899.85

MWh fuel consumed for self-generation of steam

0

Emission factor

0.22

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

11,965,033.5

MWh fuel consumed for self-generation of electricity

5,203,245.86

MWh fuel consumed for self-generation of heat

618,913.06

MWh fuel consumed for self-generation of steam

6,142,874.58

Emission factor

0.19

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Refinery Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

154,889.83

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

154,889.83

Emission factor

0.21

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Residual Fuel Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

3,132,569.75

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

3,132,569.75

Emission factor

0.26

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

Fuels (excluding feedstocks)

Hydrogen

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

56,015.73

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

56,015.73

Emission factor

0

Unit

metric tons CO2e per MWh

Emissions factor source

The emission factor was calculated based on Braskem consumptions and emissions figures.

Comment

Braskem is identifying and implementing improvements to reduce carbon intensity per unit of energy.

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	1,864,279	1,864,279	0	0
Heat	0	0	0	0
Steam	21,458,030.45	20,448,675.96	0	0
Cooling	0	0	0	0

C-CH8.2d

(C-CH8.2d) Provide details on electricity, heat, steam, and cooling your organization has generated and consumed for chemical production activities.

	Total gross generation (MWh) inside chemicals sector boundary	Generation that is consumed (MWh) inside chemicals sector boundary
Electricity	1,864,279	1,864,279
Heat	0	0
Steam	21,458,030.45	20,448,675.96

Cooling	0	0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method

Power purchase agreement (PPA) with a grid-connected generator without energy attribute certificates

Low-carbon technology type

Hydropower

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Brazil

MWh consumed accounted for at a zero emission factor

2,127,991.7

Comment

As part of our Sustainable Development Policy, Braskem has an internal target for renewables electricity consumption. All purchases were audit by KPMG and considered in our scope 2 market-based emissions.

C-CH8.3

(C-CH8.3) Does your organization consume fuels as feedstocks for chemical production activities?

Yes

C-CH8.3a

(C-CH8.3a) Disclose details on your organization's consumption of fuels as feedstocks for chemical production activities.

Fuels used as feedstocks

Naphtha

Total consumption

8,142,732.07

Total consumption unit

metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

0

Heating value of feedstock, MWh per consumption unit

0

Heating value

LHV

Comment

Naphtha feedstock use in our chemical process in crackers in Brazil.

Fuels used as feedstocks

Liquid biofuel

Total consumption

385,637.35

Total consumption unit

metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

0

Heating value of feedstock, MWh per consumption unit

0

Heating value

LHV

Comment

Ethanol feedstock use in our chemical process – Q 1, Q 2, industrial sites in Brazil.

Fuels used as feedstocks

Ethane

Total consumption

1,388,514.93

Total consumption unit

metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

0

Heating value of feedstock, MWh per consumption unit

0

Heating value

LHV

Comment

Ethane feedstock use in our chemical process in cracker in Mexico.

Fuels used as feedstocks

Propane liquid

Total consumption

547,664.13

Total consumption unit

metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

0

Heating value of feedstock, MWh per consumption unit

0

Heating value

LHV

Comment

Propene feedstock use in our chemical process.

C-CH8.3b

(C-CH8.3b) State the percentage, by mass, of primary resource from which your chemical feedstocks derive.

	Percentage of total chemical feedstock (%)
Oil	77
Natural Gas	21
Coal	0
Biomass	2
Waste (non-biomass)	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	0

Unknown source or unable to disaggregate	0

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Other, please specify

Waste

Metric value

35,892,667

Metric numerator

Total water consumption (m3)

Metric denominator (intensity metric only)

0

% change from previous year

2.99

Direction of change

Decreased

Please explain

A truly circular economy starts at home. That is why we have several initiatives to avoid internal waste generation. Our priorities are: 1. Avoid generation; 2.Reduce; 3. Reuse; 4. Waste treatment; 5. Final Disposal. Our efforts in the different categories aim to reduce waste treatment costs, increase eco-efficiency rates and prevent environmental liabilities.

Description

Energy usage

Metric value

53,501,255.91

Metric numerator

Total energy consumption (MWh)

Metric denominator (intensity metric only)

0

% change from previous year

1.32

Direction of change

Decreased

Please explain

Reducing energy consumption and using renewable energy are key to reducing our carbon emissions. We invest in energy efficiency projects in our plants, and we seek long-term partnerships in our purchase of clean energy. Currently, at least 74% of all electricity we purchase globally comes from renewable sources.

C-CH9.3a

(C-CH9.3a) Provide details on your organization's chemical products.

Output product

Other, please specify

Basic chemicals

Production (metric tons)

8,423,000

Capacity (metric tons)

10,518,000

Direct emissions intensity (metric tons CO2e per metric ton of product)

1.08

Electricity intensity (MWh per metric ton of product)

0.32

Steam intensity (MWh per metric ton of product)

0.026

Steam/ heat recovered (MWh per metric ton of product)

0

Comment

Basic chemicals include ethylene, propene, butadiene, aromatics and others. Direct emissions intensity include Scope 1 emissions only.

Output product

Polymers

Production (metric tons)

7,410,000

Capacity (metric tons)

9,830,000

Direct emissions intensity (metric tons CO2e per metric ton of product)

0.11

Electricity intensity (MWh per metric ton of product)

0.36

Steam intensity (MWh per metric ton of product)

0.1199

Steam/ heat recovered (MWh per metric ton of product)

0

Comment

Polymers include polyethylene, polypropylene and polyvinyl chloride. Direct emissions intensity include Scope 1 emissions only.

Output product

Other base chemicals

Production (metric tons)

15,000

Capacity (metric tons)

860,000

Direct emissions intensity (metric tons CO2e per metric ton of product)

2.86

Electricity intensity (MWh per metric ton of product)

5.73

Steam intensity (MWh per metric ton of product)

0

Steam/ heat recovered (MWh per metric ton of product)

0

Comment

Other base chemicals include caustic soda and others. Direct emissions intensity include Scope 1 emissions only.

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Our modern innovation and technology center in Pittsburgh, Pennsylvania, enables us to deliver pioneering polymers to ourcustomers. We have also announced the development of our global export center in Charleston, South Carolina, to better serve international clients.

C-CH9.6a

(C-CH9.6a) Provide details of your organization's investments in low-carbon R&D for chemical production activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Other, please specify Innovation and Technology	Applied research and development	21 - 40%	87,300,000	Innovation in products, processes and mindset are essential to achieve the objectives of our business strategy. On the innovation front, our efforts are aimed at Research and Development of new products and clean technologies, while fostering open innovation and advancing our digital transformation program to improve processes and operations through data analysis and automation.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/ section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/ section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/ section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Purchased goods and services

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Capital goods

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Upstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Waste generated in operations

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Business travel

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Employee commuting

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Upstream leased assets

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Processing of sold products

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: End-of-life treatment of sold products

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Downstream leased assets

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Franchises

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

BRASKEM_CDP-verification 2020_KPMG.pdf

Page/section reference

All pages

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	ISO 14064-3	KPMG also verified the information of Braskem's annual report. Therefore all information concerning GHG emissions were observed 1

C8. Energy	Emissions reduction activities	Programa Brasileiro GHG Protocol	KPMG verified our energy contracts, renewable energy declarations from the provider and energy bills during the certification process of our Market-based calculations. 1

[1]BRASKEM_CDP-verification 2020_KPMG.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

EU ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

EU ETS

% of Scope 1 emissions covered by the ETS

0.04

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1, 2018

Period end date

December 31, 2020

Allowances allocated

0

Allowances purchased

4,000

Verified Scope 1 emissions in metric tons CO2e

4,000

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

Installation Name/ Aircraft Operator Code: Braskem Europe Wesseling/ Polypropylen-Anlage Schkopau

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Situation: It is predicted that in the next 3 years we will be able to have an economic carbon pricing instrument in Brazil. In Mexico, it already exists in an emissions trading system pilot and the Braskem unit is participating. Task: We needed to implement a process to introduce the impact of carbon into investment decision-making. Action: Braskem implemented internal carbon pricing. Result: After a pilot phase in Brazil, the strategy is being planned for global implementation in 2021.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit origination

Project type

Fossil fuel switch

Project identification

In 2017, together with Ticket Log, we started the project to generate carbon credits from the replacement of automotive gasoline with ethanol in the fleet of corporate vehicles in the state of São Paulo. To be eligible for the credits, our ethanol consumption rate must be maintained at over 95%. In 2020, Braskem’s carbon credit certificates were obtained

for having proved the use of renewable fuel (ethanol) in at least 96.1% of our fleet of vehicles in São Paulo between July 1, 2019 and June 30, 2020

Verified to which standard

VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO2e)

33

Number of credits (metric tonnes CO2e): Risk adjusted volume

33

Credits cancelled

No

Purpose, e.g. compliance

Voluntary Offsetting

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Drive low-carbon investment

GHG Scope

Scope 1

Scope 2

Application

The price is applied to the corporate division responsible for the investment portfolio in Braskem (Projects Management Office Department), being used as a tool for the investment decision-making process.

Braskem updated its internal carbon pricing strategy in 2020, based on lessons learned, with global coverage, which is being validated by the company's Board to be implemented in 2021.

The price informed is the value that was used in the pilot phase of this initiative.

Actual price(s) used (Currency /metric ton)

200

Variance of price(s) used

Variation of the price is not used, as the set price showed to be efficient, without any need to change it (0%).

Type of internal carbon price

Shadow price

Impact & implication

Situation: It is predicted that in the next 3 years we will be able to have an economic carbon pricing instrument in Brazil. In Mexico, it already exists in an emissions trading system pilot and the Braskem unit is participating. Task: We needed to implement a process to introduce the impact of carbon into investment decision-making. Action: Braskem implemented internal carbon pricing. Result: After a pilot phase in Brazil, the strategy is being planned for global implementation in 2021.

Before implementing the methodology for the internal carbon-pricing tool, Braskem made a pilot study using the price of 137.74 BRL/tCO2e (disclosed value). Currently, different price values are used, since this number varies according to which country is being considered in the matter (Brazil, USA, Germany or Mexico). Variation of the price is not used yet, as the new set price showed to be efficient, without any need to change it.

Braskem’s tool calculates the virtual cost of carbon as an anticipatory way for future impact regulation, identifying the positive and negative contributions to projects. In this way, the economic values, positive or negative, corresponding to the environmental impact caused by the emissions are calculated for those projects that reduce or generate emissions.

Between 2016 and 2018 51 projects used the methodology, of these 37 with an impact on reducing GHG emissions. The potential impact associated with regulatory risk is between BRL 45 and 70 million, considering that great challenge related to climate change in the regulatory environment is that risks are generally associated with mandatory emission reduction associated with a carbon tax. Such regulation might insert new costs into Braskem's operations, limiting GHG emissions and possibly demanding costs for emissions compensation activities. Assuming a scenario where: the reduction for the chemical sector can range from 5% to 8% in Scope 1 emissions; carbon tax in Brazil will be around R$100 per tCO2e (value based on information from many Climate Change forums that we participate); and that Braskem takes no action to reduce its emissions. Within this scenario, the fine, which is the financial impact, could corresponds to the targets applied to Braskem’s 2018 Scope 1 emissions in Brazil (8,936,750 tCO2e) multiplied by the carbon price estimative.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Engagement & incentivization (changing supplier behavior)

Details of engagement

Climate change performance is featured in supplier awards scheme

% of suppliers by number

67

% total procurement spend (direct and indirect)

80

% of supplier-related Scope 3 emissions as reported in C6.5

42

Rationale for the coverage of your engagement

To select suppliers, Braskem uses two criteria: Suppliers that have the greatest impact on costs and / or GHG emissions. Braskem has used the CDP Supply Chain as a key element to manage their suppliers on climate change. To calculate % of suppliers, we consider key suppliers.

Impact of engagement, including measures of success

Braskem has a prevention program, called IP (Braskem Prevention Index) that considers environmental aspects, including activities that directly and indirectly impact emissions, defining activities that must be carried out by suppliers, such as weekly dialogues for awareness, planned meeting for results evaluation and deviations treatment process.

All of these topics are followed up, resulting in a score for each supplier, thus stimulating them to invest on monitoring, assessments, and also seeking to identify actions to reduce climate impact. The score is used to select the suppliers that will be recognized in the annual supplier HSE recognition program.

There are 2 types of benefits: awareness of the environmental aspects and management of emissions (suppliers can replicate these practices in their processes),

and the reduction of the climate impact on Braskem's operations, as several suppliers work at Braskem's facilities.
The measure of success is the percentage of suppliers engaged in the program (IP). Considering suppliers with more than 10 employees, and a long-term contract (more than 6 months), the engagement rate is 100%.

Comment

The IP considers activities to prevent health, safety and the environment in all operations; in the environmental dimension the climate management is considered. This program applies to all Braskem's relevant suppliers. Each program activity has a weight to compose the result of the supplier's prevention index. 5% - weekly awareness dialogue; 10% - planned performance evaluation meeting; and 15% - deviation treatment process.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

67

% total procurement spend (direct and indirect)

80

% of supplier-related Scope 3 emissions as reported in C6.5

42

Rationale for the coverage of your engagement

To select suppliers, Braskem uses two criteria: Suppliers that have the greatest impact on costs and / or GHG emissions. Braskem has used the CDP Supply Chain as a key element to manage their suppliers on climate change. To calculate % of suppliers, we consider key suppliers.

Impact of engagement, including measures of success

The information of risks and opportunities of suppliers feed the climate risk management of Braskem. By having the data on Braskem suppliers' GHG emissions and climate change strategies, it is also possible to use tools such as Life Cycle Analysis (LCA) and Carbon Footprint, to calculate the environmental impact of the its main products, offering these to customers and suppliers. As a measure of success, one can point out the percentage coverage of Scope 3 emissions from Suppliers through the CDP Supply Program.
Another measure of success is the number of critical suppliers with defined actions to mitigate the high climatic risks identified, the result for the last year is 5 suppliers.

Comment

Throughout 2020, we continue to motivate the engagement of our Key Suppliers to the issues of Climate Change. This joint effort increases the chain's power through initiatives such as reporting targets to reduce emissions and the Suppliers themselves voluntarily pass on this commitment to their partners. We encourage our Suppliers to join the Action Exchange, of the CDP Supply Chain, a free consultancy that identifies opportunities to reduce costs, emissions and energy consumption in the processes.

% of key suppliers engaged: 87%

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Collaboration & innovation

Details of engagement

Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number

82

% of customer - related Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

Using the Life Cycle Analysis (LCA) tool, Braskem selects clients that show the best opportunities for developing new products or solutions that prove to be a better option with a lower environmental impact.
We prioritize this group because there are more opportunities to reduce emissions, through redesign of packaging and products, bringing environmental benefits, including the reduction of emissions.

Impact of engagement, including measures of success

In relation to customers, Braskem use tools such as Life Cycle Analysis (LCA) and Carbon Footprint, to calculate results of its main products, offering these to all customers that asks for. In addition, the company offers carbon footprint calculation to any customer that requests. Throughout 2020, we completed 7 life cycle assessment studies. Accordingly, the company has a specific area for customer support as well as a specific program called Visio, in which it supports the customer, including with regard to sustainable development issues. Braskem also publishes its GHG inventory annually to customers. For some customers, Braskem even registers GHG emissions (from the plant where the purchased products were produced) on the customer system itself. As measures of success, one can quote the creation of the WeCycle Recycling Platform

area, which is responsible for the development of products with post-consumer recycled content, process qualification and technical reliability, strengthening partnerships not only with our customers, but also recyclers and brand owners.
The measure of success is the number of events held (Design Challenge) and the number of students trained, using LCA studies and DfE (Design for Environmental) concepts.
The number of the design challenge, accumulated until 2020 is 8. The number of trained students was greater than 174.

Our Braskem Design Challenge was also taken online in2020. The event gathered designers to solve packaging problems for our clients Grupo Boticário and BRF following the Design for Environment concept, which seeks to reduce environmental impacts over the entire product lifecycle. The eighth edition of the Challenge brought together 24 recent graduates, and the best solution received a R$ 20,000 cash prize. The winning projects are currently in the planning phase for technical and industrial validation/refinement, involving Braskem and clients in the preparation for a future market launch.

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Reducing energy consumption and using renewable energy are key to reducing our carbon emissions. We invest in energy efficiency projects in our plants, and we seek long-term partnerships in our purchase of clean energy.Currently, at least 74% of all electricity we purchase globally comes from renewable sources. We signed two contracts for the purchase of renewable energy in 2020: one for solar energy with Canadian Solar, and the other for wind power, in partnership with Casa dos Ventos. Since 2018, we have negotiated and signed four renewable energy purchase agreements that will avoid an estimated 1.5 million tons of CO2e. These agreements involve the construction of renewable energy generation farms, contributing not only to our own sustainable development strategy, but also improving Brazil's energy matrix, in addition to bringing economic development to the regions where the solar farms are installed.
On the plastic waste frot, we announced partnerships that will make it possible to sort and mechanically recycle such waste, and moved forward in a partnership for enhanced chemical recycling technology. In addition, we expanded global sales of resins with recycled content, growing 284% compared to 2019 to a total of 7.3 ktons sold.

CARBON CAPTURE:
Based on our commitment to sustainable innovation, we entered a partnership with the University of Illinois, USA, to research alternatives for the development of ethylene from the capture and use of carbon dioxide (CO2) emitted in industrial processes, especially from the burning of fuels. The project is still in the early phase of development, and we will contribute with our know-how in the commercialization of raw materials and production of polymers. The final objective is to evaluate the possibility of capturing CO2 emitted in our operation and converting it.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers
Trade associations
Funding research organizations
Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Mandatory carbon reporting	Support	The company has representatives in CTIBC, Low Carbon Industry Technical Committee, that will define the pattern for measurement, report and verification of the GHG emission corporate inventories, in Brazil, within the National Policy on Climate Change.	The company supports this because it understands that performing the inventory is the starting point for progress in reducing emissions. To achieve this, it is important to define a solid, recognized and comparable standard.
Cap and trade	Support	Braskem is among the multinational participants of Caring for Climate Business Summit, of the Global Compact, the world's largest coalition of companies dedicated to developing solutions capable of accelerating the transition to a more sustainable economic model. Continuously seeking to expand the consolidation of the carbon pricing market, Braskem joined in 2014 the "Carbon Pricing Leadership Coalition"; an initiative of the World Bank that seeks to mitigate climate change through the introduction of carbon pricing mechanisms.	This is important in order to understand the advantages and disadvantages, seeking to define the best standard for Brazil. It is also an opportunity for Braskem to prepare itself for an upcoming policy in the following years.
Adaptation or resilience	Support	The company participates of the CEBDS, Brazilian Business Council for Sustainable Development, and seeks to influence public policies and adaptation studies.	There is a need for progress on issues that require the engagement of other actors, as well as work on adaptation together with mitigation.
Adaptation or resilience	Support	The company participates of several institutions in Brazil (Abiquim, Rede	The solutions must involve actions from all, since the

		Clima, CNI), seeking to develop and support the evolution in climate issues, and also in the international scope (ICCA, etc.). Braskem participates in the Global Pact in Brazil.	issues are global and interrelated with all agents.
Carbon tax	Support with minor exceptions	In the last five years, Braskem has signed the adhesion to two initiatives focused on the low-carbon economy at the United Nations Climate Summit in New York. Called "Carbon Pricing", "Entrepreneurial Leadership for Carbon Pricing", the programs reinforce the importance of defining the values for greenhouse gas emissions, and one initiative in Brazil, “the Open Letter on Climate Change” coordinated by the Ethos Institute.	Braskem would support carbon tax just if there is no increase in taxes

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Technical Chamber on Climate Change of the National Confederation of the Industry

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association’s position

The National Industry Confederation (CNI) has participated in the coordination of some strategic themes within the National Policy on Climate Change.

How have you influenced, or are you attempting to influence their position?

Braskem has participated as a deputy for Abiquim, and taken the models used in the chemical area as a contribution to the national industrial scenario.

Trade association

Technical Chamber on Climate Change of the National Confederation of the Industry

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Braskem is a member of the Climate change technical adaptation committee at the National Industry Confederation (CNI).

How have you influenced, or are you attempting to influence their position?

Braskem has contributed in the form of undertaking analyses of the National Adaptation Plan and how it correlates with the industrial sector as well as presenting the results of its own studies on climate risks.

Trade association

Technical Chamber on Climate Change of the National Confederation of the Industry

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Abiquim has evolved with consistent actions and results in climate issues. It is the national standardizing organization.Abiquim issued a position in the chemical industry for COP 21 supporting carbon pricing in Brazil.

How have you influenced, or are you attempting to influence their position?

Braskem seeks to stimulate all companies associated with engagement in all the initiatives related to the theme of climate change.

Trade association

Technical Chamber on Climate Change of the National Confederation of the Industry

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

A committee for sustainable development was created in 2015, Braskem is the vice coordinator.

How have you influenced, or are you attempting to influence their position?

It was Braskem´s idea to form this committee whose purpose is to strengthen the chemical industry as regards sustainable development.

Trade association

ICCA International Council of Chemical Industry Associations

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Energy and Climate change are two of the priorities policy areas for ICCA (International Council of Chemical Industry Associations). ICCA is made up of multiple chemical industry associations active throughout the globe. Its global policy positions recognize that progress ultimately relies on its national associations working with their national governments. ICCA supports global and regional efforts to address climate change mitigation or adaptation. ICCA is engaged in developing both technological and political solutions and offers respective contributions. ICCA calls for a global climate framework and price signals to address the risks posed by rising GHG emissions. Controlling GHG emissions is a global challenge and needs global efforts to be effective, efficient, and real.

How have you influenced, or are you attempting to influence their position?

Supporting ICCA in setting and reviewing its Climate Change Policy, providing technical support for the discussions and offering real cases for studies and assessments such as avoided emissions and innovation.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

Yes

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

Braskem understands that part of its role is to contribute to discussions on corporate and global efforts towards sustainability. Accordingly, the company continues to strengthen its participation in many associations, such as: The National Confederation of Industry (CNI), through which, Braskem works to present the benefits of the chemical industry in the mitigation of climate change and the positive characteristics of the Brazilian industry compared to those of other countries. These initiatives do not have the direct objective of working together with the government, but do support the Ministry of Development and Ministry of Environment in the preparation of the Sectorial Plan for Industry Mitigation and Adaptation to Climate Change, as part of the government's National Policy on Climate Change. They show the government how companies have positioned themselves on the subject of climate change and cover some actions by governments. Braskem is a signatory of the Global Compact, a program of the UN to strengthen the implementation of corporate social responsibility. Participant in the program since 2007, Braskem achieved in 2013, the most status at report in the progress of the adoption of its 10 Principles. Since 2008, the Company integrates the Committee of the Brazilian Network of the Global Compact, which accounts for the presidency for the biennium 2013-2014. Since 2017, Braskem has coordinated the energy and climate technical group of the Global Compact Brazil network, seeking to support the Brazilian business network in the mitigation and adaptation agendas. Braskem participated, in September 2013, a meeting at UN headquarters in New York, with presence of more than a thousand executives from around

100 countries companies, for the launch of a Better World Architects platform that seeks corporate engagement in sustainability issues. A few weeks after the meeting at the UN, the Company promoted the launch of the platform in Brazil, a partnership between the Brazilian Network of the Global Compact, the GRI and the WBCSD/CEBDS , the Bovespa. The purpose of the meeting was the establishment of an agenda for sustainable development, as agreed in the Charter of Commitments of Rio+20 (2012), signed by 230 business leaders and organizations that are committed to the theme in Brazil.Braskem participated in the UN Conference on Climate Change (COP-22) held in Marrakesh, Morocco, contributing to discussions on carbon pricing tools, among others, as well as disseminating its practices and advances in climate risk management and adaptation to climate change. For Braskem COP-22 was once again a good opportunity to strengthen its position as a solution provider.Brazilian Chemical Manufacturers' Association (Abiquim): Braskem has led several actions to promote national and international exchange of best practices on climate change.ICCA (International Council of Chemical Associations): Braskem is part of the executive leadership team and works in workgroups of energy, climate change and chemical safety. Also serves on internal groups and Communication Energy & Climate Change. Through Abiquim and ACC (American Chemistry Council). The company also operates in various public, private and non-profit institutions, seeking to contribute to discussions on public policies based on its extensive experience in the green product sector. For this reason, Braskem believes that Rio+20 was an opportunity for the company to present its position of collaboration, in the definition of global policies and governance structure for the implementation of sustainable development, and to strengthen its image with its stakeholders.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

The consistency is achieved by ensuring that any compromise on the subject is analyzed by the sustainable development director, the vice president and the CEO. Also we reported in our annual report engagement in these commitments.In its strategy of sustainable development, Braskem has 7 macro objectives, one of them being climate change. Each macro objective has a “Sponsor”, Company leader, who personally coordinates policy to advance the objectives and goals of their respective macro objectives. The sustainable development team identifies all the initiatives, internal and external, which will contribute to the evolution of each macro objective, with follow up, controls and future projections. Braskem makes its presence known during the Conferences of the Parties, where it always seeks to promote discussions that may provide leaders with new perspectives and emphasize Brazil's vanguard position on this issue. One of its objectives is to reinforce the importance of renewable raw materials in the production process, presenting its own green plastic as an example.The company also operates in various public, private and non-profit institutions, seeking to contribute to discussions on public policies based on its extensive experience in the green product sector. For this reason, Braskem believes that Rio+20 and COP-22 were opportunities for the company to present its position of collaboration, in the definition of global policies and governance structure for the implementation of sustainable development, and to strengthen its image with its stakeholders.

C12.4

(C12.4) Have you published information about your organization’s response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

Braskem_RI2020_EN.pdf

Braskem_RI2020_EN.pdf

Page/Section reference

From page 54 to 57

Content elements

Governance
Strategy
Emissions figures
Other metrics

Comment

Within Braskem, we have adopted a comprehensive and robust strategy, and issues related to Climate Change are part of our 7 macro business goals. One of the aspirations of our Global Sustainable Development Policy is to be recognized as a leading company in matters related to the topic. Since 2008, when we structured our internal management of the topic, we have taken Mitigation and Adaptation measures to proactively detect potential risks and business opportunities related to Climate Change. Our actions demonstrate that it is possible for the business sector to be positively involved with the issue, driving towards the development of efficient public policies.

C15. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

Braskem reports its strategy and results on climate change in the annual report, in the GHG Protocol Brazil in addition to the CDP.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Vice President - Chief Financial Officer and Director of Investor Relations	Chief Financial Officer (CFO)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

Braskem has evolved in recent years in Environmental Report considering its role as supplier and customer.

As a supplier, Braskem responds, at the request of its direct customers, information on its environmental management, focusing on the allocation of emissions/water consumption and the identification of risks and opportunities regarding climate and water stewardship.

As a customer, Braskem engages its suppliers through the CDP Supply Chain program with a strategic stance, seeking to encourage its suppliers to participate in the program, involving them in the stages of awareness raising, training and decision making. Together with CDP, Braskem monitors how success was the engagement of its suppliers, and tries to improve every year the percentage of suppliers that complete all the steps of both programs.

One way that Braskem uses to measure the engagement success is calculating the % of company's scope 3 that the suppliers engaged represent and the evolution of this value each year. Braskem also uses these responses from these suppliers and the feedback provided to identify risk and opportunities regarding climate and water that involve one or both companies (supplier and customer). Through the use of this information, the company aims to develop action plans and enhance its relationships with its suppliers and increase the network of companies engaged in sustainability. The information about risks and opportunities of suppliers are used at the climate risk management and pass through the same priorization process that occurs to the risks and opportunities identified by Braskem.

By having the data on Braskem suppliers' GHG emissions, water consumption and climate change /water stewardship strategies it is also possible use tools such as Life Cycle Analysis

(LCA) and Carbon/Water Footprint, to calculate the environmental impact of the its main products, offering these to customers and suppliers.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	58,500,000,000

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

Yes

SC0.2a

(SC0.2a) Please use the table below to share your ISIN.

	ISIN country code (2 letters)	ISIN numeric identifier and single check digit (10 numbers overall)
Row 1	BR	BRKMACNOR1

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member

Ambev S.A

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

4,591.56

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

ARKEMA

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

121.54

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty

may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Clorox Company

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

88.77

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was

multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Colgate Palmolive Company

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

64.09

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Electrolux

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

352.37

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its

Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Givaudan SA

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

468.46

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and

n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Koninklijke Philips NV

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

0

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

L'Oréal

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

85.12

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Pirelli

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

554.99

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of

December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Prysmian SpA

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

64.29

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions

associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Suzano Papel & Celulose

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

1,399.98

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

The Dow Chemical Company

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

60.56

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the

acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

The LEGO Group

Scope of emissions

Scope 1

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

1.65

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 1 emissions applicable for the unit: stationary sources, mobile sources, industrial processes, fugitive emissions and wastewater treatment plant.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]

Where:
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Ambev S.A

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

346.06

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

ARKEMA

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

195.31

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published

annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Clorox Company

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

454.69

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and

n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Colgate Palmolive Company

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

241.41

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Electrolux

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

1,530.97

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published

annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Givaudan SA

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

5.74

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and

n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Koninklijke Philips NV

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

0

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

L'Oréal

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

399.12

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published

annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Pirelli

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

49.68

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and

n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Prysmian SpA

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

327.64

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Suzano Papel & Celulose

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

105.515

Uncertainty (±%)

8

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published

annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

The Dow Chemical Company

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

0.73

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and

n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

The LEGO Group

Scope of emissions

Scope 2

Allocation level

Facility

Allocation level detail

The GHG emissions were calculated taking into account the industrial site intensity of GHG emissions (tCO2e/t) and the quantity of product (t) acquired by customer through a mass allocation method.

Emissions in metric tonnes of CO2e

24.96

Uncertainty (±%)

5

Major sources of emissions

Emissions from all Scope 2 emissions applicable for the unit: electricity consumption - location based approach.

Verified

Yes

Allocation method

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Braskem monitors the quantity and the industrial site that provides product for each of its customers. Based on these data, it was possible to estimate the emissions associated with each customer through an allocation based on mass of product purchased. The emission intensity of each site that provides to customers was multiplied by the quantity of product purchased to obtain the total emissions.
E_client j=∑ (i=1 -> n) [emission intensity_industrial site i (tCO2e/t) * quantity of product purchased by client j from industrial site i (t)]
Where
E_client
j is the total emissions (tCO2e) associated with client j, and
n is equal to the number of industrial sites that supply client j.
By using the emission intensity in the calculation, it is assumed that the plant emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
Braskem adopts the oil&gas sector publication (IPIECA, OGP and API) “Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions”, of December/2003, as reference to determine a global uncertainty level in the Emissions calculation. According to the evaluation of the consultant ERM Brazil, the uncertainty may be qualified as similar to the oil-refining sector, which adopts the best practices on the emissions monitoring and energy use (oil refineries and Table 6.2 petrochemical layers). The uncertainty level is probably close to the bottom limit of 5%, in view of the acquisition of data on composition fuel and of the flows continually made for gaseous fuels and quite frequently made for liquid fuels.
All emission data is extracted from Braskem's GHG Inventory. Braskem develops its Inventory every year, audited by an independent third-party. The results are published annualy in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

Braskem uses its own (primary) data in answering question SC1.1.

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges

Diversity of product lines makes accurately accounting for each product/product line cost ineffective	Braskem is able to track emissions to customer level, and also know exactly which product was sold to each client and what was the industrial site that produced that specific product. By using the industrial site emission intensity in the calculation, it is assumed that the industrial site emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the site.
Other, please specify Scope 3 segmentation	Braskem has disclosed the Scope 3 emissions allocated to each client through CDP Supply Chain. However, it is important to notice that the Scope 3 reported comprises Upstream and Downstream emissions from the entire value chain, following the international GHG Protocol guidelines.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

By using the industrial site emission intensity in the calculation, it is assumed that the industrial site emits the same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the site.

The next challenge is to allocate the emissions to each product of each plant that Braskem operates. In order to achieve this goal, Braskem is developing the LCA Inventory of every plastic resin produced.

A second improvement point would be to report only the Scope 3 emissions desired by each Client.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

Requesting member

Ambev S.A

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

ARKEMA

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Clorox Company

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Colgate Palmolive Company

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Electrolux

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Givaudan SA

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Koninklijke Philips NV

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

L'Oréal

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Pirelli

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Prysmian SpA

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Prysmian SpA

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

Suzano Papel & Celulose

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

The Dow Chemical Company

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

Requesting member

The LEGO Group

Group type of project

Other, please specify

Risk and opportunity management

Type of project

Other, please specify

Integration of risk management in the chain

Emissions targeted

Other, please specify

Reduction of high climatic risks

Estimated timeframe for carbon reductions to be realized

3-5 years

Estimated lifetime CO2e savings

0

Estimated payback

Other, please specify

This initiative does not exist investment.

Details of proposal

Participation in meetings to share practices on managing climate risks and opportunities. Each company presents its management process, as well as its adaptation plan, including actions in the chain.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

Yes

SC2.2a

(SC2.2a) Specify the requesting member(s) that have driven organizational-level emissions reduction initiatives, and provide information on the initiatives.

Requesting member

Colgate Palmolive Company

Initiative ID

2019-ID21

Group type of project

New product or service

Type of project

New product or service that reduces customers operational emissions

Description of the reduction initiative

In partnership with Colgate-Palmolive and Kimberly-Clark, in 2019 we held the 7th edition of our Design Challenge, which instigated the creativity of Design, Architecture and Engineering students to develop solutions considering the Design concept for the Environment. Using an innovative format, there were three different days of hackathons and more than 30 hours of work with students from four universities in São Paulo who needed to rethink the sustainability of the brands' toothpaste and toilet paper packaging taking into account the product life cycle assessment. The winning group presented a refill tube design for toothpaste and a packaging based on our Green Plastic. The idea presented by the students encourages proper disposal, stimulating circular economy, in addition to using raw material from renewable sources in production, which could reduce the environmental impact of product packaging by up to 78%.

Emissions reduction for the reporting year in metric tons of CO2e

0

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

No, I am not providing data

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission	Are you ready to submit the additional Supply Chain questions?
I am submitting my response	Investors Customers	Public	Yes, I will submit the Supply Chain questions now

Please confirm below

I have read and accept the applicable Terms