Welcome to your CDP Climate Change Questionnaire 2022

C0. Introduction

C0.1

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

Braskem S.A. is a global petrochemical company, committed to a circular economy and carbon neutrality, that believes and invests in innovation as an enabler pillar of its business plan, whose purpose is to improve people's lives by creating sustainable solutions in chemicals and plastics.
Founded in 2002 in Brazil, it is currently the sixth-largest petrochemical company in the world in the production of thermoplastic resins, and leader in Americas, with clients in more than 71 countries, and a market leader and pioneer in the industrial-scale production of bio-polymers (plastic made from renewable raw materials).
We are the largest producer of polypropylene in the Americas, based on the annual production capacity of our plants in Brazil and the United States of America. We are the only integrated petrochemical company that produces basic chemicals and polymers in Brazil, and the largest producer of PE in Mexico and PP in the United States. We produce a diverse portfolio of petrochemicals and thermoplastics, including polyethylene, green polyethylene (biopolymer), polypropylene and PVC. Our products are typically used in high-volume applications and we benefit from our world-scale plants to increase our competitiveness.
Our clients use our plastics and chemical products to produce a wide variety of products that people employ in their daily lives to meet their essential needs in food packaging, home furnishings, industrial and automotive components, paints and coatings. We believe that the transformation of plastics and chemical production from raw fossil materials to sustainable renewable sources represents one of the key growth and sustainability opportunities in the global chemical industry. We are a global leader in the production of green polyethylene (green PE) and benefit from our proximity to one of the world's largest renewable energy producers, Brazil.

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, 2021	December 31, 2021	No

C0.3

(C0.3) Select the countries/areas in which you operate.

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

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier

Yes, a Ticker symbol	BRKM5

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 is responsible for climate-related issues in two ways: (i) by monitoring and discussing Braskem initiatives related to Environmental, Social and Governance (“ESG”) factors; (ii) by monitoring and discussing corporate risks both mapped and approved, which include those linked to climate change threats. Both attributions are incorporated in the Board of Directors internal rules. The Communication, Strategy and ESG Committee (CECESG) provides support to the Board of Directors regarding discussions over ESG initiatives and risks mapped. It is composed of a limited number of directors from the board and has the role of overseeing the implementation of Sustainable Development Global Policy, including actions to address the fixed material topic of climate change. After a discussion of ESG initiatives and risks, it brings to the Board of Directors the relevant topics to be monitored and discussed at a Board of Directors level. Here follow some examples of discussions held by the Board of Directors regarding the two topics mentioned in the first paragraph: (i): one of the decisions taken in the last two years was the decision to implement internal carbon pricing in the company, as well as the approval of the long-term GHG emission reduction target; and (ii) the most relevant climatic risks monitored by the board is Water Scarcity, considered as a high risk, in which the evolution of action plans to mitigate that risk are periodically assessed.
Other, please specify Vice Presidents	Vice presidents are part of the Global Sustainable Development Committee, which is an executive level of discussion and monitoring over sustainable development strategy and is led by the CEO. The Committee convenes quarterly and was created in an executive level to ensure that Braskem is discussing and monitoring the sustainable development strategy deployment in a high level of management and taking the appropriate alignments and approvals to evolve with business plans that support it. To support the Committee’s discussion, Braskem created workstream groups for each of the goals established in the sustainable development strategy and for structural functions that support the evolvement of the strategy. Each of the

	workstreams are led by one specific Vice-president, who is responsible to ensure that their Braskem team is working on solutions and in the evolvement of the established action plans to achieve the target. As Braskem sustainable development strategy has long-term goals for combating climate change, there is a specific workstream group for this topic and a specific Vice-President that leads it. Braskem's Europe/Asia Vice President is the head of the Global Climate Change workstream. The sustainable development director supports the vice president in the technical commission of the workstream. Other members of the workstream: the directors of Global Energy Efficiency, director of Health, Safety and Environment, director of Industrial Efficiency, director of Innovation, director of Logistics, director of Renewables, and other directors of areas considered in the climate change mitigation and adaptation strategies. In past years, initiatives have been defined as, for example: global mitigation plan management, decarbonization program, biochemicals and biopolymers portfolio and global adaptation to Climate Change Plan. Their goals, defined until 2030, had focal points with directors of the most strongly related areas of each theme. The evolution of these initiatives is monitored in this workstream.
Chief Executive Officer (CEO)	As per Braskem Sustainable Development Global Policy, some of the roles of the Business Leader, that is, the Chief Executive Officer, include leading the proper deployment of the Policy's directives on business plans and the strategic partnerships with stakeholders, focusing on the achievement of established, long-term goals. In addition to that, the CEO is responsible to annually evaluate and report on the evolution of such Policy and linked strategies to the Board of Directors, including climate change strategy. To monitor and discuss the evolution of the Policy and the strategy linked to it, Braskem has established a Global Sustainable Committee composed of the senior executive management and led by the CEO. The Committee convenes monthly and was created on an executive level to ensure that Braskem is discussing and monitoring the sustainable development strategy deployment at a high level of management and taking the appropriate alignments and approvals to evolve with business plans that support it. As an example of CEO oversight on climate change strategy, he has approved with the Board of Directors the renovation of Braskem global sustainable development strategy, which includes ambition, goals and action plans to combat climate change. The second example of CEO oversight on this topic is a consequence of the approved strategy: the definition of individual targets linked to variable remuneration. In 2021, the CEO envisioned mapping industrial projects that would bring a reduction of 250 kilotons of CO2 starting in 2022. By the end of the year, the initiatives mapped totaled 285 kilotons of CO2 reduction, achieving more than 100% of the established target.

C1.1b

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

Frequency with which climate-	Governance mechanisms into	Please explain

related issues are a scheduled agenda item	which climate-related issues are integrated	
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding business plans Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	The Board is responsible for climate-related issues in two ways: (i) by monitoring and discussing Braskem initiatives related to Environmental, Social and Governance (“ESG”) factors; (ii) by monitoring and discussing corporate risks both mapped and approved, which include those linked to climate change threats. Both attributions are incorporated in the Board of Directors internal rules. The Communication, Strategy and ESG Committee (CECESG) provides support to the Board of Directors regarding discussions over ESG initiatives and risks mapped. It is composed of a limited number of directors from the board and has the role of overseeing the implementation of Sustainable Development Global Policy, including actions to address the fixed material topic of climate change. After a discussion of ESG initiatives and risks, it brings to the Board of Directors the relevant topics to be monitored and discussed at a Board of Directors level. Here follow some examples of discussions held by the Board of Directors regarding the two topics mentioned in the first paragraph: (i): one of the decisions taken in the last two years was the decision to implement internal carbon pricing in the company, as well as the approval of the long-term GHG emission reduction target; and (ii) the most relevant climatic risks monitored by the board is Water Scarcity, considered as a high risk, in which the evolution of action plans to mitigate that risk are periodically assessed.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues
Row 1	Yes	The criteria to assess the competence was based in whether the Board member have participated in regional/municipal concils or secretaries related to climate change; participated in academic initiatives related to environmental topics and/or climate change; or participated in the board

		of directors of companies coordinating or being a member of ESG committees.

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
Other, please specify Europe/Asia Vice President	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 has a Sustainable Development Global Policy, which establishes directives and fixed material topics in which it must have a long-term strategy to mitigate negative impacts and wide positive impacts. Such Policy and the strategy linked to that is overseen by the Board of Directors annually. In 2021, Braskem renewed and approved such strategy, defining 7 dimensions of goals for 2025, 2030 and 2050. One of these dimensions is Combating Climate Change, which established the goals of: (i) reduce GHG emissions by 15% by 2030; (ii) increase production capacity of Green PE to 1 million tons by 2030; and (iii) achieve carbon neutrality by 2050.

To support and ensure the achievement of such strategy, Braskem established an executive Sustainable Development Global Committee, led by the CEO and composed by the senior executive management, the Vice Presidents. The committee is supported by workstream groups for each of the strategy's dimensions, in which all of the Vice Presidents are leaders. Their role is to ensure that teams are evolving with action plans and the achievement of targets.

CEO reports directly to the Board of Directors. Braskem's Europe/Asia Vice President reports directly to Braskem's CEO. Both are members of the Global Sustainable Development Committee, in which the CEO leads. The Europe/Asia Vice President leads the Climate Change workstream, which supports the Global Committee. Mitigation and adaptation initiatives are monitored by the Climate Change workstream meetings every two months. Operational risks related to climate issues are also discussed, such as the risk and 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, decreases in the intensity of emissions and the use of renewable energy sources.

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.

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 incentivized	Comment
Chief Executive Officer (CEO)	Monetary reward	Emissions reduction target Other (please specify) Target related to increase in production capacity of biopolymers made from renewable feedstock (sugarcane ethanol) which removes CO2 from the atmosphere in its life cycle.	Reward linked to emission reduction targets and increase in production capacity of products made from renewable feedstock (sugarcane ethanol) which removes CO2 from the atmosphere in its life cycle.
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 Europe/Asia Vice President	Monetary reward	Other (please specify) Target related to increase in production capacity of biopolymers made from renewable feedstock (sugarcane ethanol) which removes CO2 from the atmosphere in its life cycle.	Rewards linked to initiatives taken towards the net-zero 2050 target.
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.
Other, please specify Vice President of Industrial Operations	Monetary reward	Emissions reduction target	Mapping and implementation of initiatives that will contribute to a 15% reduction in CO2 emissions by 2030
Other, please specify Director of Energy and Decarbonization	Monetary reward	Emissions reduction target	Responsible for mapping decarbonization initiatives with a focus on energy efficiency and renewable electrical energy purchasing.

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% on 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 (Intergovernmental Panel on Climate Change) 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 has 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 the 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 (Fundação Getulio Vargas, São Paulo), 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 are 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 a 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
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

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, in Brazil, Mexico, Germany and USA, 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 the 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 are 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 a 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 the percentage of achievement of these measures, are discussed and verified, including all mapped business risks regarding climate change.
Considering that all climate risks and opportunities were identified and classified as low, moderate or high, for every high risk or opportunity, it is mandatory to identify 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 according to 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 that plants achieve measures' goals in a linear tendency throughout the years.
Braskem monitors these achievements 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 Q2 industrial unit, located 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 unit Q2 and others located in the region (PE4, PE5, PE6, PP1 and PP2) are better prepared to monitor preventively and are more resilient to these extreme weather events. Time horizon covered: Year 2040. 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, mainly Brazil and Mexico. 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, Mexico, Germany and USA. Result: Projects and initiatives, which reduce emissions, approved and implemented in industrial units, such as Q3, Q1, Q2 and others. Time horizon covered: Year 2030. 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 of a current regulation risk would be the increase in cost or scope of emission permission in EU ETS, as it related to Braskem's operations in Germany. The risk is considered as a risk for the company because it can impact negatively the result of the industrial unit in Germany as it 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 and Mexico), 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. Risk example: an example of an emerging regulation risk would be the implementation of an economic instrument for carbon pricing in the regions where the company operates, such as the creation of an additional tax for the company. The risk is considered as such for the company because Braskem is a large contributor to industrial emissions (especially in Brazil). In the scenario of creating a carbon tax, it can potentially create a negative impact as it might reduce our profit margin over time.
Technology	Relevant, always included	The areas of innovation, technology and energy in Braskem have 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 similar 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 use 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 the energy consumption is high, and if the company does not adapt to being 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 Q3 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 periodically 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. At Brazil's Rio de Janeiro 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 periodically 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 periodically 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 NGOs, 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 periodically updated. The process safety team, after evaluating the consultancy study, assesses 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. The risk of fires can negatively affect the operation of the plants and pose a risk to the employers. 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 periodically updated. It is important to emphasize that for this type of risk, the health and safety team, after evaluating the consultancy study, assesses 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 drought risks, especially at the Mexican and the Brazilian industrial sites, 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), 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 no less important, in the state of Rio de Janeiro in Brazil, there is already a legal requirement that imposes the presentation of GHG emissions and mitigation plan to obtain or renew the operating license. Therefore, emission reductions can be a decisive factor for a renewal or denial of an operating license.

According to a study in 2017 by Federação das Indústrias do Estado de São Paulo (FIESP) on 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 these attributes the 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 reductions 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 BRL 100 per tCO2e (value based on information from many climate change forums in which we have participated); and that Braskem takes no action to reduce its emissions. Within this scenario, the fine, which is the financial impact, could correspond to the targets applied to Braskem's 2018 Scope 1 emissions in Brazil (8,936,750 tCO2e) multiplied by share of reduction of the chemical sector (5% to 8%) multiplied by the carbon price estimate.

Impact formula: potential impact cost = result of the GHG emissions inventory * share of emissions above 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 assuring 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 reduction projects with such targets under consideration. A case study:
Situation: Some regions in Brazil already have legislation with the obligation to disclose and verify the emissions inventory. Some environmental agencies are demanding inventory disclosure for the renewal of operating licenses.
Task: Disclose and verify the 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 in compliance with the requirements of current legislation and environmental agencies, and must be 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 additional cost 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 referring 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. The costs related to decarbonization and the carbon-pricing processes are not mentioned here because they were already considered in the operational costs of the company.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Chronic physical

Changing precipitation patterns and types (rain, hail, snow/ice)

Primary potential financial impact

Increased indirect (operating) costs

Company-specific description

The increase in average global temperatures disturbs the balance of climatic systems, intensifying phenomena that directly impact Braskem's activities, such as water availability. INPE indicates that by 2040, for Brazilian regions where Braskem operates, 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.

A 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 a 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 of 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 will 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 bodies of water. 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 withdrawal, 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 evaluation 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 scenario, we considered a 30% reduction in the water permit withdrawal for 12 months in a 5-year period that could lead to a calculated reduction in production directly affecting 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 Q4, Rio de Janeiro, Brazil
**30% because we consider 30% reduction in the water permit withdrawal

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 collects wastewater, which is treated and reused in the process, and the second collects 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 cavitating 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's 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
Cyclone, hurricane, typhoon

Primary potential financial impact

Increased capital expenditures

Company-specific description

The occurrence of hurricanes and extratropical cyclones might cause damages to Braskem, impacting the input and output of feedstocks and product logistics, on power supply systems, communication systems and also on facilities' structures. In the United States, where Braskem has 5 industrial plants, the 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 USD 125 billion of 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)

72,000,000

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 is concentrated in our facilities in the USA and the southern 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 was around USD 10,000,000, which is around BRL 54,000,000 in total and about BRL 18,000,000 per plant. This last figure was used to estimate the potential financial impact on our global operations: 4 plants in the USA are 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 USA. This plan is being implemented and includes actions to mitigate the vulnerability to hurricanes and extratropical cyclones in our operations. For example, as an adaptation measure, key critical suppliers in the USA were identified and requested for contingency plans for future hurricanes events.
The management cost was estimated considering the investments of all 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 BRL 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 BRL 650,000; the third block refers to chain engagement actions, collective actions and others, with an approximate cost of BRL 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 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 identify the previous occurrence of cyclones and extratropical hurricanes. The costs associated with this initiative were not considered in the informed management costs.

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 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 of the international chemical industries mean value. Braskem has reduced its water withdrawal intensity at the greatest pace over the last three years, cutting intensity relative to revenue by 43%.

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)

487,500,000

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. This 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 USD 30, which is the social cost of carbon according to current prices practiced in Europe. The result represents the positive impact associated with this reduction in emissions/emissions avoided.
Formula: total number of emission reductions in a period * USD 30

This result for the year 2019 was approximately 48,750,000. In this case, we are considering this gain for 10 years, that is, 10 * 48,750,000 = 487,500,000.

Cost to realize opportunity

685,800,000

Strategy to realize opportunity and explanation of cost calculation

A case study:
Situation: Braskem is committed to reducing its absolute emissions by 15% by 2030.
Task: Identify initiatives to reduce emissions, to support the elaboration of a MACC curve containing all the iniatiatives with potential emission reduction. 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. To that end, a decarbonization program was created, including all industrial units in Brazil, Mexico, USA and Germany and led by the Energy team, who annually identifies initiatives to reduce GHG emissions, especially in the Q1, Q2, Q3 and Q4 cracker units, that after consolidation are transformed in the annual GHG reduction target.
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 empower 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 programed maintenance stops.

Braskem has projected an investment of BRL 685,800,000 (USD 127,000,000) for 2022 towards CAPEX projects directed to climate change mitigation and adaptation. This investment number was based on the type of projects, which includes machine replacement to achieve energy reduction; process alterations that allow the replacement of current fuels to less carbon-intensive ones, among others.

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 emissions, 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 reduction 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 of and search for new products that will reduce this consumption. Today, Braskem has a line of resins called Maxio®, which is 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 research in this area. The Maxio® resins are an example of these 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 BRL 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, state of Rio Grande do Sul, demanded BRL 500 million in investments from 2008-2010. This plant has the capacity to produce 200,000 tons of ethylene per year. In 2019, Braskem invested more than BRL 50 million in 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 sources, opening space for 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 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 green™ Green Polyethylene for the production of botanical elements such as the

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 goal in 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 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 to the socio-environmental 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, state of Rio Grande do Sul, demanded BRL 500 million in investments from 2008-2010. This plant has the capacity to produce 200,000 tons of ethylene per year. In 2019, Braskem invested more than BRL 50 million in Innovation and Technology. Part of this quantity is directed to the development of resins from renewable feedstock.

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan

Yes, we have a transition plan which aligns with a 1.5°C world

Publicly available transition plan

Yes

Mechanism by which feedback is collected from shareholders on your transition plan

We have a different feedback mechanism in place

Description of feedback mechanism

All medium and long-term strategies are approved in the Board of Directors, composed by representatives of the main shareholders.

Frequency of feedback collection

Annually

Attach any relevant documents which detail your transition plan (optional)

Braskem's 2021 Integrated Report

Braskem-Relatorio-Integrado-2021-ENG-02-06.pdf

C3.2

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

	Use of climate-related scenario analysis to inform strategy
Row 1	Yes, qualitative and quantitative

C3.2a

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

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Physical climate scenarios Customized publicly available physical scenario	Company-wide	1.6ºC – 2ºC	IPCC AR6 SSP1-2.6 (temperature target 2100); quantitative analysis
Physical climate scenarios Customized publicly available	Company-wide	2.1ºC - 3ºC	IPCC AR6 SSP2-4.5 (temperature target 2100); quantitative analysis

physical scenario			
Physical climate scenarios Customized publicly available physical scenario	Company-wide	3.1ºC - 4ºC	IPCC AR6 SSP3-7.0 (temperature target 2100); quantitative analysis
Transition scenarios IEA NZE 2050	Company-wide		NGFS NET ZERO 2050 (SSP1-1.9) This scenario imposes the goal of limiting the temperature increase to 1.5°C by the end of the 21st century, projecting the efforts that would be necessary for the transition to a low carbon economy. It assumes that the most ambitious climate policies are introduced early and gradually become more stringent, in an orderly fashion and across different countries and sectors. In this scenario, net carbon emissions are neutralized around 2050.
Transition scenarios IEA APS	Company-wide		NGFS BELOW 2°C (SSP1-2.6) This scenario imposes the goal of limiting the temperature increase to 2°C during the 21st century, projecting the efforts that would be necessary for the transition to a low carbon economy. It assumes that the most ambitious climate policies are introduced early and gradually become more stringent, in an orderly fashion and across different countries and sectors. In this scenario, net carbon emissions are neutralized around 2075.
Transition scenarios IEA STEPS (previously IEA NPS)	Company-wide		NGFS NDCs (SSP2-4.5) This scenario predicts that the unconditional NDCs promised by 2020 will be fully implemented and the respective energy and emissions targets in 2025 and 2030 will be achieved in all countries. The extrapolation of policy ambition levels over the 2030-2100 period is, however, subject to great uncertainties. In this scenario, it is also considered that there is no "transition" to the low carbon economy, as efforts are insufficient and, consequently, physical risks will be more severe.

Transition scenarios IEA CPS	Company-wide		NGFS CURRENT POLICIES Existing climate policies until 2020 remain in place, but there is no strengthening of the ambition level of these policies. Thus, it is considered that there is no "transition" to the low carbon economy, as efforts are insufficient to limit the increase in the global average temperature and, consequently, the physical risks will be more severe.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

By using climate-related scenarios, Braskem seeks to identify with better accuracy the risks and opportunities that are more relevant and adherent to the business, by using an analysis with more pessimistic scenarios and more optimistic ones.

Results of the climate-related scenario analysis with respect to the focal questions

The analyses of physical climate scenarios helped identify the priority regions where Braskem is investing more resources to mitigate the risks, as they were shown to be more significant. As an example,Braskem has invested in actions to search for alternative sources of water withdrawal in the Northeast and Southeast regions of Brazil due to the threat of severe droughts. Similarly, for the transition risks, the analyses of climate-related scenarios provided a better support for prioritization of opportunities and risks with their respective action plans. As an example: the implementation of the internal carbon pricing process.

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 Braskem the chance 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 toward 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 tons 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 guidelines 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 USD 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 to between 200,000 and 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 on 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 on 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. 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. In 2020, the innovation area 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, with greenhouse gas emissions being 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 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. 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 CO2e emissions. The initiatives aim to make Braskem one of the best chemical industries in energy consumption worldwide. Even during the pandemic, we moved forward by 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 Capital allocation Acquisitions and divestments Access to capital Assets	From the beginning of our operations in 2002, we have been committed to aligning our business strategy with the goal of improving 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 promote economic growth aligned with environmental preservation, work and process, and safety and social justice in all of 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 (Maxio resins, e.g.) 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 resins 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 2014/2015, 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 BRL 76,918,180. Another impact was observed with Hurricane Harvey, which hit three units in Texas in 2017, with the financial impact calculated at around USD 10,000,000 (around BRL 54,000,000) in total. 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 25% 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. Due to the divestment of the Caprolactama unit between 2008 and 2010, there was a reduction of 496,440 tCO2e, considering the hypothetical carbon price, USD 40, used in the pilot phase of internal carbon pricing process, corresponding to USD 19,857,600 or BRL 107,231,040. 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 BRL 364 million was made for this project until 2011. As another example, there is the investment made in the green polyethylene plant in the South of Brazil (state of Rio Grande do Sul), of BRL 1,078,800,000, until 2009.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's transition to a 1.5°C world?

Yes

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's transition to a 1.5°C world.

Financial Metric

Revenue

Percentage share of selected financial metric aligned with a 1.5°C world in the reporting year (%)

0.07

Percentage share of selected financial metric planned to align with a 1.5°C world in 2025 (%)

0.22

Percentage share of selected financial metric planned to align with a 1.5°C world in 2030 (%)

0.41

Describe the methodology used to identify spending/revenue that is aligned with a 1.5°C world

This indicator refers only to polyethylene products, specifically the increase of Green PE in relation to Braskem's total PE production. The revenue indicator was estimated based on the evolution of the production indicator of Green PE from 2020 to 2030. A market growth of fossil PE was not considered in the estimation, only the substitution of fossil PE by Green PE. The share estimated for 2025 was calculated based on the premise of a linear production growth to achieve Braskem's 2030 production goal.

C4. Targets and performance

C4.1

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

Absolute target
Intensity target

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)

Scope 1
Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

Base year

2020

Base year Scope 1 emissions covered by target (metric tons CO2e)

9,988,101.89

Base year Scope 2 emissions covered by target (metric tons CO2e)

756,378.84

Base year Scope 3 emissions covered by target (metric tons CO2e)

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)

10,744,480.74

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1

100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2

100

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes

100

Target year

2030

Targeted reduction from base year (%)

15

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]

9,132,808.629

Scope 1 emissions in reporting year covered by target (metric tons CO2e)

9,987,076.4

Scope 2 emissions in reporting year covered by target (metric tons CO2e)

881,088.78

Scope 3 emissions in reporting year covered by target (metric tons CO2e)

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)

10,868,165.19

% of target achieved relative to base year [auto-calculated]

-7.6742936206

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 target coverage and identify any exclusions

Braskem currently uses an average of Scope 1+2 emissions from 2018 to 2020 as a base for its emission reduction goals. In 2021, Braskem updated the inventory calculation to correspond to IPCC AR5, as requested by the GHG Protocol. To allow the comparison with previous years, the inventories for 2018, 2019 and 2020 were also updated to AR5 by Braskem. The emissions are as follows: 2018 (10,192,252.76 tCO2e), 2019 (9,750,861.94 tCO2e) and 2020 (10.021.190,98 tCO2e).

In 2021, despite the growth in production, Scope 1 emissions had a subtle reduction in relation to the previous year (-0.3%), mainly to maintenance stoppages in the Q3 unit and energy efficiency projects. Scope 2 had a 15% increase in emissions due to several factors, among them the 105% increase in the emission factor of the Brazilian grid in 2021, compared to 2020, coupled with a 20% growth in electricity consumption due to the return to operation of the CS-AL unit, which led to a 154% increase in emissions from plants in Brazil.

Braskem’s climate-related targets are divided into two main steps: i. By 2030, reduce greenhouse gas emissions in scopes 1 and 2 by 15% and ii. achieve carbon neutrality by 2050.

Plan for achieving target, and progress made to the end of the reporting year

To achieve the 2030 mitigation target, a decarbonization area was created within the Energy corporate area, which is responsible for managing initiatives to reduce GHG emissions. Each year, a corporate goal of reducing GHG emissions is defined for all leaders involved, with an impact on their variable remuneration. Thus, a budget is set aside for investments in these initiatives. As an example, in 2022 BRL 127,000,000 was allocated to climate change mitigation.

We believe we are on the right track, and because we are at the beginning of the cycle from 2020 to 2030, we have defined and implemented relevant actions in terms of

governance. The result of 2021, compared to 2020, showed an absolute reduction of Scope 1, which was not followed by Scope 2, due to the increase of the emission factor of the Brazilian grid, as the energy efficiency indicators were better than the previous year. The main projects that contributed to Scope 1 reduction were related to energy optimization and increased reliability of materials in the industrial units Q1, PE9, PP5 and others.

List the emissions reduction initiatives which contributed most to achieving this target

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Target reference number

Abs 2

Year target was set

2020

Target coverage

Company-wide

Scope(s)

Scope 1
Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

Base year

2020

Base year Scope 1 emissions covered by target (metric tons CO2e)

9,988,101.89

Base year Scope 2 emissions covered by target (metric tons CO2e)

756,378.84

Base year Scope 3 emissions covered by target (metric tons CO2e)

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)

10,744,480.74

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1

100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2

100

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes

100

Target year

2050

Targeted reduction from base year (%)

100

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]

0

Scope 1 emissions in reporting year covered by target (metric tons CO2e)

9,987,076.4

Scope 2 emissions in reporting year covered by target (metric tons CO2e)

881,088.78

Scope 3 emissions in reporting year covered by target (metric tons CO2e)

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)

10,868,165.19

% of target achieved relative to base year [auto-calculated]

-1.1511440431

Target status in reporting year

Underway

Is this a science-based target?

Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition

1.5°C aligned

Please explain target coverage and identify any exclusions

In 2020, Braskem committed to achieve carbon neutrality (scopes 1 and 2) by 2050 and the target comprehends all industrial units in Brazil, Mexico, USA and Germany.

Plan for achieving target, and progress made to the end of the reporting year

In order to achieve the target, 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. removal of emissions with potential investments in the production of chemicals and polymers from renewable sources and iii. capture of carbon emissions, and 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.

List the emissions reduction initiatives which contributed most to achieving this target

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

2020

Target coverage

Company-wide

Scope(s)

Scope 1
Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

Intensity metric

Metric tons CO2e per unit of production

Base year

2020

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)

0.6227370986

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)

0.0475564781

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)

0.6702935767

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure

100

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure

100

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure

% of total base year emissions in all selected Scopes covered by this intensity figure

100

Target year

2030

Targeted reduction from base year (%)

37

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

0.4222849533

% change anticipated in absolute Scope 1+2 emissions

15

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)

0.5854185096

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)

0.0516473152

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)

0.6370658249

% of target achieved relative to base year [auto-calculated]

13.3978211513

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 target coverage and identify any exclusions

Braskem aims to reduce its intensity in GHG emissions by 37% until 2030, including all industrial units in Brazil, Mexico, USA and Germany.

Plan for achieving target, and progress made to the end of the reporting year

In 2021, there was an improvement in the intensity indicators for Scope 1 (-6.0%) and Scope 1+2 (-5.0%) as a result of the energy efficiency projects. Scope 2 had an increase in intensity mainly due to the 105% increase in the emission factor of the Brazilian grid in 2021, compared to 2020, coupled with a 20% growth in electricity consumption due to the return to operation of the CS-AL unit, which led to a 154% increase in emissions from plants in Brazil.

To ensure we achieve the 2030 mitigation target, a decarbonization area was created within the corporate Energy area, which is responsible for managing initiatives to reduce GHG emissions. Each year, a corporate goal of reducing absolute GHG emissions is defined for all leaders involved, with an impact on their variable remuneration. Thus, a budget is set aside for investments in these initiatives. As an example, in 2022 BRL 127,000,000 was allocated to climate change mitigation.

List the emissions reduction initiatives which contributed most to achieving this target

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
2021

Target coverage
Company-wide

Target type: energy carrier
Electricity

Target type: activity
Consumption

Target type: energy source
Renewable energy source(s) only

Base year
2020

Consumption or production of selected energy carrier in base year (MWh)
3,374,729.7

% share of low-carbon or renewable energy in base year
73

Target year
2030

% share of low-carbon or renewable energy in target year
85

% share of low-carbon or renewable energy in reporting year
72

% of target achieved relative to base year [auto-calculated]
-8.3333333333

Target status in reporting year
Underway

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 target coverage and identify any exclusions

Braskem has bilateral contracts with a series of electric 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.

Plan for achieving target, and progress made to the end of the reporting year

To achieve the renewable electricity target once set, the purchase of renewable energy attribute certifications; the search for new solutions; and to map new opportunities for RPPAs (Renewable Power Purchase Agreements). The year 2021 was marked by: the start of the operation of the wind energy RPPA (EDF).

List the actions which contributed most to achieving this target

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)

R&D investments

Other, please specify

Number of total 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
2030

Figure or percentage in target year
100

Figure or percentage in reporting year
77

% of target achieved relative to base year [auto-calculated]
77

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 target coverage and identify any exclusions
The Adaptation Plan, updated due to the climate risk study that is being carried out between the years 2020 and 2021 and the inclusion of new actions in the plans, aims to reduce to zero the climate risks classified as "high" by 2030 and maximize business opportunities. The plan has evolved positively and the projects implemented up to 2020 have reduced potential physical impacts quantified at approximately BRL 297 million (USD 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 dependence on hydroelectric sources in scenarios of water scarcity.

Plan for achieving target, and progress made to the end of the reporting year
To ensure the achievement of the target, Braskem has assigned a focal point to each industrial unit, and a quarterly meeting is held with all focal points to ensure the implementation of planned actions.

List the actions which contributed most to achieving this target

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)

R&D investments

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

22

% of target achieved relative to base year [auto-calculated]

65.0793650794

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 target coverage and identify any exclusions

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 USD 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 USD 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 dependence on hydroelectric sources in scenarios of water scarcity.

Plan for achieving target, and progress made to the end of the reporting year

The evolution of the action plan to reduce high climate risks is monitored annually by the Board of Directors. Each risk has an action plan, with a timeline, and any deviation must be justified and re-planned.

List the actions which contributed most to achieving this target

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

Int1

Target year for achieving net zero

2050

Is this a science-based target?

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

Please explain target coverage and identify any exclusions

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 working tirelessly to develop creative technologies to embed carbon capture and use in our processes.

Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?

Yes

Planned milestones and/or near-term investments for neutralization at target year

In order to achieve the target, the company's strategy is divided in three main pillars: i. investing to 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. removal 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 milestone, the company also committed to a 15% reduction in its emissions (scopes 1 and 2) by 2030.

Planned actions to mitigate emissions beyond your value chain (optional)

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	83	279,961.21
To be implemented*	51	263,813.27
Implementation commenced*	0	0
Implemented*	44	145,096
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

Energy efficiency in production processes
Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

145,096

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

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

81,894,898

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

275,000,000

Payback period

4-10 years

Estimated lifetime of the initiative

Ongoing

Comment

Our Energy Efficiency Program was created in 2019 to accelerate energy initiatives and boost our competitiveness while reducing our CO2e emissions. In 2021, 38 were emissions reduction activities focused on process optimization, and they were implemented in 10 industrial units (Q1, Q4, PE9, PP5, etc.). For the projects that did not calculate specific monetary savings, the avoided emissions were multiplied by BRL 270 (USD 50) to arrive at the savings. The main example of reduction projects 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 BRL 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 estimate is for a reduction of 11.4% in water consumption and 6.3% in the unit's CO2 emissions.

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	In 2021, Braskem created a specific investment group entitled “Decarbonization” with funds allocated to energy efficiency and emissions-reduction initiatives. In this case, initiatives are considered that become more attractive when evaluated regarding economic aspects and the reduction of CO2e emissions.
Other Qualitative criteria for ESG investments	Braskem created a new nature of investments called ESG to consider and prioritize projects related to aspects related to Environment, Social and Governance.
Internal price on carbon	Aiming to benefit from projects that present a reduction in GHG emissions, Braskem has 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?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation

Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon

Low-Carbon Investment (LCI) Registry Taxonomy

Type of product(s) or service(s)

Chemicals and plastics

Other, please specify

CO2 removal during sugarcane growth, which is used as feedstock for green PE.

Description of product(s) or service(s)

Today, Braskem is the largest global producer of biopolymers, with an 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. The industrial unit where Green PE is produced is currently being expanded and the production capacity will be up to 260,000 tons.

Considering its lifecycle, Braskem's Green PE has a potential to store 3.09 tCO2e per tons of product. Braskem does not release the revenue of individual products, therefore, the % of revenue generated reported in this form corresponds to the sum of revenue from green PE and ETBE additive, another low-carbon product produced by Braskem.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)

Yes

Methodology used to calculate avoided emissions

Other, please specify

Addressing the Avoided Emissions Challenge - ICCA (https://icca-chem.org/wp-content/uploads/2020/05/Addressing-the-Avoided-Emissions-Challenge.pdf)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)

Cradle-to-gate

Functional unit used

ton of green PE produced

Reference product/service or baseline scenario used

PE produced from fossil feedstock

Life cycle stage(s) covered for the reference product/service or baseline scenario

Cradle-to-gate

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario

3.09

Explain your calculation of avoided emissions, including any assumptions

I'm green™ PE life cycle includes all stages, from harvesting to PE production. The sugarcane bagasse is used to generate heat and power and supply the mill's energy demands. The surplus electricity is sold to the Brazilian integrated electrical system to supply the operational margin of this system. The ethanol is then transported by rail (a small amount can also be delivered by truck) to the Braskem facilities in Triunfo, Brazil

where it will be dehydrated to produce ethylene. This ethylene is then polymerized to produce the I'm green™ PE.
As for the Fossil PE, the life cycle begins with oil extraction and refining. Naphtha, which is one of the derivatives produced in the refineries, is transported by ducts to the petrochemical complexes where it will be cracked to produce ethylene and many co-products. The ethylene is then polymerized to produce PE. Since there is no surplus electricity generated in this system, it is assumed that surplus electricity will be supplied by a thermoelectric power plant, making both product systems comparable.

More information regarding emission factors and other methodology can be found at: https://www.braskem.com.br/portal/imgreen/arquivos/LCA%20PE%20I%27m%20green%20bio-based_FINAL%20EN.pdf

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year

2

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?

No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?

No

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in methodology	The 2021 inventory was calculated using IPCC AR5 global warming potentials, instead of AR4 like previous years, according to GHG Protocol guidelines. There was an update on emission

		factors that was not representative for direct emissions, only Scope 3.

C5.1c

(C5.1c) Have your organization's base year emissions been recalculated as result of the changes or errors reported in C5.1a and C5.1b?

	Base year recalculation	Base year emissions recalculation policy, including significance threshold
Row 1	Yes	Braskem's GHG inventory for the base year was recalculated using IPCC AR5 global warming potential values.

C5.2

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

Scope 1

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

9,988,101.89

Comment

Braskem currently uses an average of Scope 1 emissions from 2018 to 2020 as a base for its emission reduction goals. In 2021, Braskem updated the inventory calculation to correspond to IPCC AR5, as requested by the GHG Protocol. To allow the comparison with previous years, the inventories for 2018, 2019 and 2020 were also updated to AR5 by Braskem. The emissions are as follows: 2018 (10,192,252.76 tCO2e), 2019 (9,750,861.94 tCO2e) and 2020 (10.021.190,98 tCO2e).

Scope 2 (location-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 2 (market-based)

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
756,378.84

Comment
Braskem currently uses an average of Scope 2 emissions from 2018 to 2020, recalculated to correspond to IPCC AR5, as a base for its emission reduction goals. The emissions are as follows: 2018 (732.024,80 tCO2e) , 2019 (801.632,93 tCO2e) and 2020 (735.478,80 tCO2e).

Scope 3 category 1: Purchased goods and services

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
8,177,449.13

Comment
Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 2: Capital goods

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
494,479.89

Comment
Braskem uses Scope 3 emissions from 2020 as a base.

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

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)

496,686.57

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 4: Upstream transportation and distribution

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

647,167.16

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 5: Waste generated in operations

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

41,593.31

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 6: Business travel

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

1,599.88

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 7: Employee commuting

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

6,764.48

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 8: Upstream leased assets

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

613.68

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 9: Downstream transportation and distribution

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

220,376.67

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 10: Processing of sold products

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

7,657,467.28

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 11: Use of sold products

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
1,863,712.24

Comment
Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 12: End of life treatment of sold products

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
1,780,772.37

Comment
Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3 category 13: Downstream leased assets

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
0

Comment
Braskem uses Scope 3 emissions from 2020 as a base. Even though we currently don't have emissions related to Downstream leased assets, emissions from this category are treated, monitored, quantified, and included in the inventory annually.

Scope 3 category 14: Franchises

Base year start
January 1, 2020

Base year end
December 31, 2020

Base year emissions (metric tons CO2e)
0

Comment

Braskem uses Scope 3 emissions from 2020 as a base. Even though we currently don't have emissions related to Franchises, emissions from this category are treated, monitored, quantified, and included in the inventory annually.

Scope 3 category 15: Investments

Base year start

January 1, 2020

Base year end

December 31, 2020

Base year emissions (metric tons CO2e)

98,420.38

Comment

Braskem uses Scope 3 emissions from 2020 as a base.

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

(C5.3) 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

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)

9,987,076.4

Comment

Scope 1 emissions totaled 9,987,076.40 tCO2e, same level as that observed in the previous year (-0.34%).

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

964,142.027

Scope 2, market-based (if applicable)

881,088.785

Comment

Scope 2 emissions higher than the previous year, as a result of the 105% increase in the emission factor of the Brazilian 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

Emissions in reporting year (metric tons CO2e)

13,079,946.57

Emissions calculation methodology

Average data method

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

100

Please explain

This category represents 43.4%. Due to its relevance, there are ongoing initiatives in the supply area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Capital goods

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

499,612.58

Emissions calculation methodology

Average data method

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

0

Please explain

This category represents 1.7%, there are ongoing initiatives in the supply area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

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

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

787,530.64

Emissions calculation methodology

Average data method

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

0

Please explain

This category represents 2.6%, there are ongoing initiatives in the energy area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

1,056,346.5

Emissions calculation methodology

Distance-based method

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

100

Please explain

This category represents 3.5%, there are initiatives underway in the logistics area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Waste generated in operations

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

38,188.88

Emissions calculation methodology

Average data method

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

0

Please explain

This category represents 0.13%, there are ongoing initiatives in the area of circular economy.

Business travel

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO2e)

1,773.99

Emissions calculation methodology

Distance-based method

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. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Employee commuting

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO2e)

9,620.05

Emissions calculation methodology

Fuel-based method

Distance-based method

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. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Upstream leased assets

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO2e)

0.61

Emissions calculation methodology

Lessor-specific method

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

Emissions in reporting year (metric tons CO2e)

273,426.71

Emissions calculation methodology

Distance-based method

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

100

Please explain

This category represents 0.9%, there are ongoing initiatives in the logistics area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Processing of sold products

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

8,438,264.43

Emissions calculation methodology

Average data method

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

0

Please explain

This category represents 28.0%, due to its relevance, there are ongoing initiatives in the circular economy area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Use of sold products

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

3,759,706.87

Emissions calculation methodology

Methodology for direct use phase emissions, please specify

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 12.5%, due to its relevance there are ongoing initiatives in the circular economy area. There was a methodology change compared to 2020, focusing

on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

End of life treatment of sold products

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

1,910,766.84

Emissions calculation methodology

Average data method

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

0

Please explain

This category represents 6.3%, due to its relevance, there are ongoing initiatives in the circular economy area. There was a methodology change compared to 2020, focusing on improving the system boundaries for this category and a better selection of emission factors. The increasi in emissions are due to this change and not due to performance.

Downstream leased assets

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO2e)

0

Emissions calculation methodology

Asset-specific method

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. Even though we currently don't have emissions related to this category, these emissions are treated, monitored, quantified, and included in the inventory annually.

Franchises

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO2e)

0

Emissions calculation methodology

Average data method

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. Even though we currently don't have emissions related to this category, these emissions are treated, monitored, quantified, and included in the inventory annually.

Investments

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

265,517.13

Emissions calculation methodology

Investment-specific method

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

100

Please explain

This category representes 0.9%. The Scope 3 emissions in 2021 totaled 30,120,701.80 tCO2e, an increase of 40% when compared to the previous year due to several improvements in data reporting and calculation. 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

0.0001037047

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

10,951,218.43

Metric denominator

unit total revenue

Metric denominator: Unit total

105,600,000,000

Scope 2 figure used

Location-based

% change from previous year

42

Direction of change

Decreased

Reason for change

The indicator improved from last year's (0.00018, using 2020's AR5 emissions) due to the implementation of the initiatives of low-carbon energy consumption, and 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	9,609,299.27	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	68,038.87	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	21,436.52	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	286,304.24	IPCC Fifth Assessment Report (AR5 – 100 year)
SF6	1,997.5	IPCC Fifth Assessment Report (AR5 – 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	8,744,764.43
United States of America	135,211.66
Germany	11,682.24
Mexico	1,095,418.05

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	8,967,965.12
Polypropylene	190,743.14
Polyethylene	113,168.11
Vinyls and Chloride	713,941.44

Corporate	1,258.58

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	3,130,811.927	-12.663	-38.3284
Q2 RS	2,824,646.121	-29.8774	-51.382
Q3 ABC	1,375,995.05	-23.6393	-46.4864
Q4 DCX/PE 9 DCX	581,838.943	-22.713	-43.2427
PVC 1 BA	103,578.349	-12.6535	-38.3165
PVC 2 AL	478,772.531	-9.6697	-35.8248
CS 2 BA	314.006	-12.6557	-38.3071
CS 1 AL	131,276.554	-9.672	-35.7466
PE 1 BA	3,302.918	-12.6629	-38.3247
PE 2 BA	9,552.48	-12.6497	-38.3162
PE 3 BA	27,469.754	-12.6538	-38.3193
PP 5 DCX	4,272.333	-22.713	-43.2427
PE 8 CUB	4,825.55	-23.856	-46.4132
PP 3 PLN	3,204.867	-22.7181	-47.1343
PE 7 ABC	2,136.433	-23.6458	-46.4885
PP 4 ABC	24,098.102	-23.6392	-46.467
PP 1 RS	11,388.481	-29.8858	-51.3937
PP 2 RS	885.444	-29.873	-51.3989
PE 4 RS	8,772.892	-29.872	-51.3992
PP 7 USA	29,040.084	38.3298	-82.5837
PP 8 USA	72,933.288	29.7024	-95.0803
PP 9 USA	12,418.904	39.8149	-75.4267
PP 10 USA	8,187.548	28.615	-96.6261
PP 11 GER	4,432.344	50.8423	6.9455
PP 12 GER	7,249.902	51.3945	11.974
PP 13 USA	12,631.844	28.9338	-95.3361
IDESA MX	1,095,418.05	18.1348	-94.3698
Corporate	1,258.585	-23.5711	-46.7032
PE 5 RS	15,746.04	-29.873	-51.3989
PE 6 RS	617.082	-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	9,987,076	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)
Germany	87,662.83	87,662.83
United States of America	367,403.04	367,403.04
Brazil	458,351.12	375,297.88
Mexico	50,725.03	50,725.03

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	76,617.787	67,530.406
Polypropylene	526,561.548	516,010.288
Polyethylene	245,691.346	202,531.929
Vinyls and Chloride	113,424.376	93,169.192
Corporate	1,846.97	1,846.97

Terminals	1,846.97	1,846.97

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)
Q1 BA	0	0
Q2 RS	15,307.946	12,108.591
Q3 ABC	22,509.164	19,808.064
Q4 DCX/PE9 DCX	32,087.886	24,965.851
PVC 1 BA	10,033.925	7,722.478
PVC 2 AL	24,847.075	21,865.426
CS 2 BA	129.563	114.016
CS 1 AL	78,413.813	63,467.272
PE 1 BA	9,908.856	8,166.105
PE 2 BA	6,576.17	5,233.341
PE 3 BA	24,001.779	20,014.189
PP 5 DCX	8,534.723	6,107.533
PE 8 CUB	50,176.103	49,499.609
PP 3 PLN	24,200.272	22,684.418
PE 7 ABC	16,025.311	14,102.274
PP 4 ABC	11,783.222	10,369.235
PP 1 RS	19,801.533	15,928.928
PP 2 RS	7,175.927	5,854.302
PE 4 RS	42,140.973	25,569.946
PP 7 USA	41,654.272	41,654.272
PP 8 USA	111,358.517	111,358.517
PP 9 USA	148,208.022	148,208.022
PP 10 USA	24,273.747	24,273.747
PP 11 GER	37,982.671	37,982.671
PP 12 GER	49,680.16	49,680.16
PP 13 USA	41,908.482	41,908.482
IDESA MX	50,725.034	50,725.034
Corporate	0	0

PE 5 RS	33,386.907	28,446.366
PE 6 RS	19,463.004	11,422.966
TERMINALS	1,846.97	1,846.97

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	964,142	881,088	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	49	Naphtha is one the most relevant feedstocks for Braskem´s operations. Considering the amount consumed and emission factors provided by Ecoinvent, emissions from Naphtha were calculated (around 6,413 thousand tCO2e) and divided by total Category 1 emissions.
Ethane	8.1	Ethane is the sum of all ethane and ethylene acquired by Braskem in the reporting year. Considering the amount consumed and emission factors provided by Ecoinvent, emissions from these feedstocks were calculated (around 1,059 thousand tCO2e) and divided by total Category 1 emissions
Propane gas	29.5	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 (3,853 thousand tCO2e) and divided by total Category 1 emissions.
Other (please specify) Hexane, Ethanol, Solvents and other additives	13.4	Considering the amount consumed and emission factors provided by Ecoinvent, emissions from these feedstocks were calculated (1,753 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 HFCs for selling purposes.
Perfluorocarbons (PFC)	0	Braskem does not produce any PFCs 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?

Increased

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	85,771.22	Decreased	0.79	There was a 85,771.22 tCO2e reduction compared to 2020 due to the consumption of an additional 173,880 MWh of renewable energy. The total Scope 1+2 emissions of 2021 are 10,868,165 tCO2e, therefore we arrived at 0.79% through (85,771.22 /10,868,165) * 100 = 0.79%.
Other emissions reduction activities	34,114.58	Decreased	0.31	Last year 34,114.58 tCO2e were reduced by a change in emissions reduction activities through emissions reduction activities, such as loss reduction and optimization, implemented in some industrial units (Q1, Q4, PE9, PP5, etc.). The total Scope 1+2 emissions of 2021 were 10,868,165 tCO2e, therefore we arrived at 0.31% through (34,114.58 /10,868,165) * 100 = 0.31%.
Divestment	0	No change	0	There isn't any change.
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	201,573.093	Increased	1.85	The main reason for this 201,573 tCO2e increase in Scope 2 was a 105% increase in the emission factor of the Brazilian electricity grid, which had a historically high value in 2021, a result of the water crisis scenario,

				compared to an atypically low value in 2020 due to the pandemic scenario. The total Scope 1+2 emissions of 2021 were 10,868,165 tCO2e, therefore we arrived at 1.85% through (201,573 /10,868,165) * 100 = 1.85%.

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?

Market-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)	0	48,489,139.8	48,489,139.8
Consumption of purchased or acquired electricity		3,374,729.7	1,311,624.3	4,686,354
Consumption of purchased or acquired steam		0	984,804.2	984,804.2
Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		3,374,729.7	50,785,568.3	54,160,298

C-CH8.2a

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

Consumption of fuel (excluding feedstocks)

Heating value

LHV (lower heating value)

MWh consumed from renewable sources inside chemical sector boundary

0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

48,489,139.8

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

0

Consumption of purchased or acquired electricity

MWh consumed from renewable sources inside chemical sector boundary

3,374,729.7

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

1,311,624.3

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

0

Consumption of purchased or acquired steam

MWh consumed from renewable sources inside chemical sector boundary

0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

984,804.2

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

0

Consumption of self-generated non-fuel renewable energy

MWh consumed from renewable sources inside chemical sector boundary

0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

0

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

0

Total energy consumption

MWh consumed from renewable sources inside chemical sector boundary

3,374,729.7

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

50,785,568.3

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

54,160,298

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	No
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.

Sustainable biomass

Heating value

Unable to confirm heating value

Total fuel MWh consumed by the organization

0

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

0

Comment

Braskem currently does not consume biomass in its operations.

Other biomass

Heating value

Unable to confirm heating value

Total fuel MWh consumed by the organization

0

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

0

Comment

Braskem currently does not consume biomass in its operations.

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Unable to confirm heating value

Total fuel MWh consumed by the organization

0

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

0

Comment

Braskem currently does not consume renewable fuels in its operations.

Coal

Heating value

LHV

Total fuel MWh consumed by the organization

2,313,470.8

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

2,313,470.8

Comment

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

Oil

Heating value

LHV

Total fuel MWh consumed by the organization

3,298,633.8

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

3,298,633.8

Comment

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

Gas

Heating value

LHV

Total fuel MWh consumed by the organization

11,877,325.7

MWh fuel consumed for self-generation of electricity

6,023,359.07

MWh fuel consumed for self-generation of heat

235,000.75

MWh fuel consumed for self-generation of steam

5,618,965.88

Comment

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

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

LHV

Total fuel MWh consumed by the organization

30,999,709.7

MWh fuel consumed for self-generation of electricity

2,993,774.98

MWh fuel consumed for self-generation of heat

24,562,732.82

MWh fuel consumed for self-generation of steam

3,443,201.9

Comment

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

Total fuel

Heating value

LHV

Total fuel MWh consumed by the organization

48,489,140

MWh fuel consumed for self-generation of electricity

9,017,134.05

MWh fuel consumed for self-generation of heat

24,797,733.57

MWh fuel consumed for self-generation of steam

14,674,272.38

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	1,741,933.8	1,741,933.8	0	0
Heat	0	0	0	0
Steam	24,851,461.1	23,979,536.2	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.

Electricity

Total gross generation inside chemicals sector boundary (MWh)

1,741,933.8

Generation that is consumed inside chemicals sector boundary (MWh)

1,741,933.8

Generation from renewable sources inside chemical sector boundary (MWh)

0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)

0

Heat

Total gross generation inside chemicals sector boundary (MWh)

0

Generation that is consumed inside chemicals sector boundary (MWh)

0

Generation from renewable sources inside chemical sector boundary (MWh)

0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)

0

Steam

Total gross generation inside chemicals sector boundary (MWh)

24,851,461.1

Generation that is consumed inside chemicals sector boundary (MWh)

23,979,536.2

Generation from renewable sources inside chemical sector boundary (MWh)

0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)

0

Cooling

Total gross generation inside chemicals sector boundary (MWh)

0

Generation that is consumed inside chemicals sector boundary (MWh)

0

Generation from renewable sources inside chemical sector boundary (MWh)

0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)

0

C8.2e

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

Sourcing method

Unbundled energy attribute certificates (EACs) purchase

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify

Wind and hidropower

Country/area of low-carbon energy consumption

Brazil

Tracking instrument used

I-REC

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

657,000

Country/area of origin (generation) of the low-carbon energy or energy attribute

Brazil

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2,021

Comment

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

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area

Brazil

Consumption of electricity (MWh)

3,768,122.31

Consumption of heat, steam, and cooling (MWh)

429,176.02

Total non-fuel energy consumption (MWh) [Auto-calculated]

4,197,298.33

Country/area

Mexico

Consumption of electricity (MWh)

102,682.26

Consumption of heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

102,682.26

Country/area
United States of America

Consumption of electricity (MWh)
668,349.75

Consumption of heat, steam, and cooling (MWh)
475,209.98

Total non-fuel energy consumption (MWh) [Auto-calculated]

1,143,559.73

Country/area
Germany

Consumption of electricity (MWh)
147,199.72

Consumption of heat, steam, and cooling (MWh)
80,418.22

Total non-fuel energy consumption (MWh) [Auto-calculated]

227,617.94

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
8,207,941

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

488,340

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 – Q1, Q2, industrial sites in Brazil.

Fuels used as feedstocks

Ethane

Total consumption

1,273,170

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
3,246,652

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
Sum of propane and propylene 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	62.1
Natural Gas	34.2
Coal	0
Biomass	3.7
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

41,027,838

Metric numerator

Total waste generation (t)

Metric denominator (intensity metric only)

0

% change from previous year

14.31

Direction of change

Increased

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

54,160,298

Metric numerator

Total energy consumption (MWh)

Metric denominator (intensity metric only)

0

% change from previous year

1.2

Direction of change

Increased

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 72% 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)

8,767,923

Capacity (metric tons)

10,718,000

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

1.023

Electricity intensity (MWh per metric ton of product)

0.052

Steam intensity (MWh per metric ton of product)

0

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)

6,940,833

Capacity (metric tons)

8,601,000

Direct emissions intensity (metric tons CO2e per metric ton of product)
0.044

Electricity intensity (MWh per metric ton of product)
0.393

Steam intensity (MWh per metric ton of product)
0.105

Steam/ heat recovered (MWh per metric ton of product)
0

Comment
Polymers include polyethylene and polypropylene. Direct emissions intensity include Scope 1 emissions only.

Output product
Other base chemicals

Production (metric tons)
1,040,116

Capacity (metric tons)
2,090,000

Direct emissions intensity (metric tons CO2e per metric ton of product)
0.688

Electricity intensity (MWh per metric ton of product)
0.877

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	The road we have to travel is through investment in technology and innovation. For this reason, in 2021 we will be associated with other companies in the search sustainable solutions. We partnered with the North American Lummus technology for potential licensing of Braskem's green ethylene technology in two projects, one under development in North America and another under review in Thailand. In 2021, I&T reshaped its strategy and optimized the platforms to directly meet Braskem strategic objectives, leveraging R&D resources in this subjects. There are 5 innovation platforms: Biomass into chemicals: technologies for converting plant-based raw materials into chemicals, materials, and other value-added products; Material replacement: technology and product solutions to replace existing materials; Recycling: technologies for converting plastic waste into value-added products. It includes chemical and mechanical recycling technologies and processes; Next-Generation process: new processes and technologies for existing and future assets that improve carbon and energy yields and create performance differentiation; CO2 in chemicals: technologies to directly convert CO2 into chemicals, materials, and other value- added products. Includes catalytic and biotechnological solutions.

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%	109,008,000	In 2020, the value invested in R&D was BRL 87 million (page 42 of the 2020 Integrated Report), considering 36% of the OPEX sustainability. In 2021, using the same assumptions as the 2020 result, the value was BRL 109 million, based on the results presented in page 71 of the 2021 Integrated Report.

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
CDP-verification-BRASKEM-2021_v2.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

CDP-verification-BRASKEM-2021_v2.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

CDP-verification-BRASKEM-2021_v2.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
Scope 3: Capital goods
Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
Scope 3: Upstream transportation and distribution
Scope 3: Waste generated in operations
Scope 3: Business travel
Scope 3: Employee commuting
Scope 3: Upstream leased assets
Scope 3: Investments
Scope 3: Downstream transportation and distribution
Scope 3: Processing of sold products
Scope 3: Use of sold products
Scope 3: End-of-life treatment of sold products
Scope 3: Downstream leased assets
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

CDP-verification-BRASKEM-2021_v2.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 was observed
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.

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

0.03

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1, 2021

Period end date

December 31, 2021

Allowances allocated

0

Allowances purchased

3,162

Verified Scope 1 emissions in metric tons CO2e

3,162

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 2021, Braskem's carbon credit certificates were obtained for having proved the use of renewable fuel (ethanol) in over 95% of our fleet of vehicles in the state of São Paulo in the 2021 cycle. In this form, we used the numbers for the 2020 cycle since, due to the pandemic, the credits for 2021 will be tallied and generated together with the credits for the 2022 cycle.

Verified to which standard

VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO2e)

27

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

27

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 was validated by the company's Board and 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

Implicit 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 was implemented in a global approach in 2021.

Before implementing the methodology for the internal carbon-pricing tool, Braskem made a pilot study using the price of BRL 137.74/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 the great challenge related to climate change in the regulatory environment is that risks are generally associated with mandatory emission reductions 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 BRL 100 per tCO2e (value based on information from

many climate change forums in which we have participated); and that Braskem takes no action to reduce its emissions. Within this scenario, the fine, which is the financial impact, could correspond to the targets applied to Braskem's 2018 Scope 1 emissions in Brazil (8,936,750 tCO2e) multiplied by the carbon price estimate.

C12. Engagement

C12.1

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

Yes, our suppliers
Yes, our customers/clients
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

Run an engagement campaign to educate suppliers about climate change

% of suppliers by number

87

% total procurement spend (direct and indirect)

60.27

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

48.76

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.

Since Braskem works with LCA, any reduction in water or carbon impact in the supply chain/suppliers will reduce the environmental footprint of the company's products, bringing more competitiveness to the business. Regarding the measures of success, mapping Scope 3 emissions allows the company to have precise indicators and consequently establish effective goals for reducing this impact with this set of mapped suppliers.
From the moment suppliers define actions to mitigate the climate or water risk, Braskem's resilience increases since it reduces potential impacts on costs or the continuity of operations.

Comment

Throughout 2021, 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 & Details of engagement

Collaboration & innovation
Other, please specify

% of customers by number

0.2

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

48.76

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 ask for them. In addition, the company offers carbon footprint calculation to any customer that requests it. Throughout 2021, we completed several 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 2021 is 10. The number of trained students and recently graduated professionals was close to 200.
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.

Throughout 2021 an investment decision of BRL 20,000.000 (over 3 years) was conceived, discussed and made to build Cazoolo, an innovation hub dedicated to packaging redesign from the concepts of LCA and DfE. Cazoolo is scheduled to open in August 2022.

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 at our factories, and seek long-term partnerships in our purchasing of clean energy. Currently, at least 72% of all the electricity we purchase globally comes from renewable sources. We have signed another contract for renewable energy purchases in 2021: Braskem and Veolia have partnered on a project to use eucalyptus biomass as a renewable energy source. In addition, the wind power complex in Bahia went into operation in 2021, the result of the partnership with EDF Renewables.
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 the Brazilian energy matrix, as well as bringing economic development to the regions where the solar farms are installed.

On plastic waste, we announced partnerships that will allow us to mechanically separate and recycle such waste, and we advanced in a partnership for the improvement of chemical recycling technology. In addition, we expanded global sales of resins with recycled content, growing 145% compared to 2020, to a total of 22 kilotons 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 final objective is to evaluate the possibility of capturing CO2 emitted in our operation and converting it. In 2021, there was a significant advance in discoveries, from which important results were verified, equal to or superior to similar works, related to selectivity and productivity in the capture and conversion of CO2 into chemicals such as ethylene. At the same time, throughout 2021, a series of studies and projects was created dedicated to the subject of capturing and using CO2 within the Innovation and Technology area. The objective is to expand knowledge and accelerate the development of alternative technologies to address CO2 emitted from industrial sources

CARBON TRADE DESK:
This new Braskem initiative seeks to offset Greenhouse Gas (GHG) emissions from transportation between Braskem and its clients, through the acquisition of carbon credits from high-quality projects. In this way, Braskem will be working to offset the carbon footprint of operations that are difficult to decarbonize in the short term, encouraging environmental projects around the world. This initiative is an effort to promote a more sustainable value chain together with our clients.
How will it work?
1- Braskem’s commercial teams will be able to offer their clients the option of offsetting the carbon footprint of transporting
Braskem’s products.
2- This process will be supported by the Carbon Trading Desk, a Braskem team that will be responsible for conducting the process together with the commercial teams and that will carry out the offsetting of emissions through the purchase of carbon credits.
3- The commercial and technical conditions of this offsetting operation will be discussed along with the product trade.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization’s purchasing process?

Yes, suppliers have to meet climate-related requirements, but they are not included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization’s purchasing process and the compliance mechanisms in place.

Climate-related requirement

Climate-related disclosure through a non-public platform

Description of this climate related requirement

Since 2016, we have invited our critical suppliers for the assessment of the CDP Supply Chain and, in 2021, we had 87% engagement for Climate and 79% for Water questionnaires, which made us one of the leading companies in the CDP Supplier Engagement Rating.

The requirement is: 100% of suppliers that have carbon-intensive activities and are considered as "critical", as defined by Braskem's Key Supplier Matrix, are invited to disclose their environmental impacts via CDP. All those suppliers are expected to respond. The % that are "in compliance" is defined by the number of suppliers that have responded to CDP compared to the number of suppliers invited.

The company acquired in 2021 the license to use Ecovadis' platform to manage its suppliers since the selection process.

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

87.3

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

Response to supplier non-compliance with this climate-related requirement

Retain and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate

Yes, we engage indirectly through trade associations

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

Brazilian chemical industry positioning on carbon pricing

Braskem - Posicionamento Carbono -SC 4.4.pdf

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy

Braskem has participated in a multidisciplinary committee in the association that evaluates new legislation, new public policies, among others. This way, we've had the opportunity to evaluate, together with the other companies and the association in alignment with our strategy and policy of sustainable development. One of the results was the Brazilian chemical industry positioning on carbon pricing that we built together.

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association

Other, please specify

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

Is your organization's position on climate change consistent with theirs?

Consistent

Has your organization influenced, or is your organization attempting to influence their position?

We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)

The position of the trade association is favorable to the creation of an emissions trading system, following certain criteria to maintain the competitiveness of the industry. We agree with this position.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

Describe the aim of your organization's funding

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

Other, please specify

Brazilian Chemical Industry Association

Is your organization's position on climate change consistent with theirs?

Consistent

Has your organization influenced, or is your organization attempting to influence their position?

We have already influenced them to change their position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)

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.

Braskem supported Abiquim, along with other associated companies, to build a position on carbon pricing for the chemical industry in Brazil.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

Describe the aim of your organization's funding

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

Other, please specify

ICCA International Council of Chemical Industry Associations

Is your organization's position on climate change consistent with theirs?

Consistent

Has your organization influenced, or is your organization attempting to influence their position?

We are attempting to influence them to change their position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)

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 that are 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.

We are attempting to influence their position by 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.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

Describe the aim of your organization's funding

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

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-Relatorio-Integrado-2021-ENG-02-06.pdf

Page/Section reference

52-59

Content elements

Governance
Strategy
Emissions figures
Emission targets
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 toward the development of efficient public policies.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues
Row 1	

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity
Row 1	

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?
Row 1	

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?
Row 1	

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1		

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located

C16. 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.

C16.1

(C16.1) 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 the Environmental Report, considering its role as supplier and customer.

As a supplier, Braskem provides, 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 successful is the engagement of its suppliers, and tries every year to improve the percentage of suppliers that complete all steps of both programs.

One way that Braskem uses to measure the engagement success is by calculating the % of company's Scope 3 that the engaged suppliers represent, as well as the evolution of this value each year. Braskem also uses the 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 relationships with its suppliers and increase the network of companies engaged in sustainability. The information about risks and opportunities of suppliers are used for climate risk management and pass through the same prioritization process that occurs with 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 to use tools such as Life Cycle Analysis (LCA) and Carbon/Water Footprint to calculate the environmental impact of 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	105,840,000,000

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
570.67

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

Market value or quantity of goods/services supplied to the requesting member
3,042

Unit for market value or quantity of goods/services supplied
Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

5,065.7

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

Market value or quantity of goods/services supplied to the requesting member

6,000

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

19.9

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

Market value or quantity of goods/services supplied to the requesting member

3,687.75

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry

Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

64.13

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

Market value or quantity of goods/services supplied to the requesting member

3,031

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

573.41

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 the volume of products purchased

Market value or quantity of goods/services supplied to the requesting member

600

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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

annually 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

88.56

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

Market value or quantity of goods/services supplied to the requesting member

2,579

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

OMV AG

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

1,236.83

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

Market value or quantity of goods/services supplied to the requesting member

36,664

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Petróleo Brasileiro SA - Petrobras

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

4,051,348

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

Market value or quantity of goods/services supplied to the requesting member

3,847.311

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

4.68

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

Market value or quantity of goods/services supplied to the requesting member

504

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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)]
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E_client
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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 annually 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

76.59

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

Market value or quantity of goods/services supplied to the requesting member

4,332.38

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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.
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Braskem adopts the oil & gas sector's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

3,932.04

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

Market value or quantity of goods/services supplied to the requesting member

20,960

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

18.86

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

Market value or quantity of goods/services supplied to the requesting member

594

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

Vale 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

1,440.94

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

Market value or quantity of goods/services supplied to the requesting member

7,681

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

340.87

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

Market value or quantity of goods/services supplied to the requesting member

3,042

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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.
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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 annually 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

92.88

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

Market value or quantity of goods/services supplied to the requesting member

594

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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

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Requesting member

Vale 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

860.7

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

Market value or quantity of goods/services supplied to the requesting member

7,681

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies customers was multiplied by the quantity of product purchased to obtain the total emissions.
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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

2,348.68

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

Market value or quantity of goods/services supplied to the requesting member

20,960

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies customers was multiplied by the quantity of product purchased to obtain the total emissions.
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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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

116.89

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

Market value or quantity of goods/services supplied to the requesting member

6,000

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

321.83

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

Market value or quantity of goods/services supplied to the requesting member

3,031

Unit for market value or quantity of goods/services supplied

Metric tons

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

Requesting member

Petróleo Brasileiro SA - Petrobras

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

94.03

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

Market value or quantity of goods/services supplied to the requesting member

3,847.311

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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.
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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

55.38

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

Market value or quantity of goods/services supplied to the requesting member

504

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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.
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same amount per ton of product sold, although this indicator varies (in theory) for each type of product produced by the plant.
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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 annually 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

656.04

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

Market value or quantity of goods/services supplied to the requesting member

4,332.38

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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.
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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 annually 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

497.34

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

Market value or quantity of goods/services supplied to the requesting member

22,407

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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
2,085.24

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

Market value or quantity of goods/services supplied to the requesting member
22,407

Unit for market value or quantity of goods/services supplied
Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

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

Market value or quantity of goods/services supplied to the requesting member

600

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies customers was multiplied by the quantity of product purchased to obtain the total emissions.
vE_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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

531.21

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

Market value or quantity of goods/services supplied to the requesting member

3,687.75

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually in external reports, such as Annual Report (GRI Standard), CDP Climate Change, Dow Jones Sustainability Index and Bovespa/ICO2.

Requesting member

CIA ULTRAGAZ 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

43,782.16

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

Market value or quantity of goods/services supplied to the requesting member

44,030

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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.

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Requesting member

CIA ULTRAGAZ 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

141.11

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

Market value or quantity of goods/services supplied to the requesting member

44,030

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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)]
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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

416.33

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

Market value or quantity of goods/services supplied to the requesting member

2,579

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies customers was multiplied by the quantity of product purchased to obtain the total emissions.
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Requesting member

OMV AG

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

4,601.61

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

Market value or quantity of goods/services supplied to the requesting member

36,664

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

59,455.15

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

Market value or quantity of goods/services supplied to the requesting member

68,796

Unit for market value or quantity of goods/services supplied

Metric tons

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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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

1,451.82

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

Market value or quantity of goods/services supplied to the requesting member

68,796

Unit for market value or quantity of goods/services supplied

Metric tons

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

BBraskem 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 supplies 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's publication (IPIECA, OGP and API) "Oil Industry Guidelines for the communication of Greenhouse Effect Gases Emissions", from December/2003, as a reference to determine the 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 annually 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 the customer level, and also know exactly which product was sold to each client and which 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.

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 include investments.

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 include investments.

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

CIA ULTRAGAZ 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 include investments.

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 include investments.

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 include investments.

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 include investments.

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 include investments.

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 include investments.

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

OMV AG

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 include investments.

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

Petróleo Brasileiro SA - Petrobras

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 include investments.

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 include investments.

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 include investments.

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 include investments.

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 include investments.

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 include investments.

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

Vale 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 include investments.

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

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 understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below