Welcome to your CDP Water Security Questionnaire 2021

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

We are the sixth largest global producer of thermoplastic resins, with 41 industrial units in four countries (Brazil, United States, Mexico, and Germany), having over 21 million tons of annual production capacity, and 16 regional offices in the main global economic regions serving clients in nearly 100 countries.

Our strategic vision features six fundamental pillars aswe continue building a global company that is recognizedas a leader in increasingly innovative and sustainable chemical and plastic solutions, focused on human beings and positive results for all stakeholders. The innovation pillar is seen as across-organization enabler for the ambitions of other pillars. Sustainability was included as our sixth strategic pillar at the end of 2020 to help us monitor the implementation of projects, partnerships and investments in light of our commitment to the 2030 sustainable development goals, in response to current and future challenges for the planet and society.
Ours Strategic Pillars and Objectives: 1:Productivity and competitiveness: Braskem as a first quartile operator; 2: Sustainability: Reference in the global chemical and petrochemical sector for its sustainable development; 3: Diversification: Increased diversification in raw materials, markets and products, with new operations representing more than 50% of EBITDA; 4: People, innovation, governance and reputation: Be recognized as a company that promotes local development and human rights; 5: Capital Allocation / financial rigidity: Braskem as a financially healthy company that reates shareholder value

We maintain our commitment to sustainable growth and development and we will continue to act proactively to pursue the best opportunities for creating value for its Clients, Shareholders and Society.

Our long-term goal is to ensure that all the water used by Braskem comes from low-risk sources. In a challenging global scenario, our water risk assessment identified severe droughts as the greatest potential risk in Brazil,for example. We carry out periodic checks to ensure we have enough quality water for the operation of our plants in every region. Diagnostic analyses guide Braskem's Adaptation Plans, aiming to mitigate

availability risks and to allocate investments to safer water sources, such as reused or desalinated water.

Compared to 2019, our units in Mexico and Germany maintained the same Water Security Index - 100%. The indicator for USA operations was reduced due to the completion of the Texas River Basin risk assessment pointing to higher long-term water risk (by 2040). In contrast, Brazil operations improved by around 12% thanks to progress in shifting from surface water abstraction to safer underground water abstraction, in addition to other internal initiatives to increase water reuse and recycling. Given the proportion of Brazilian operations within Braskem's total number of plants, their weight in the indicator is 80%, which explains why overall corporate results rose from 75% in 2019 to 82.9% in 2020, with a total of 18.86% of our water consumption coming from areas where water stress is high or very high.

W-CH0.1a

(W-CH0.1a) Which activities in the chemical sector does your organization engage in?

Bulk organic chemicals

Specialty organic chemicals

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1, 2020	December 31, 2020

W0.3

(W0.3) Select the countries/areas for which you will be supplying data.

Brazil

Germany

Mexico

United States of America

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

USD

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which operational control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Vital	The primary use of freshwater in Braskem's direct operations is throughout the production process. Among its main uses, as a very water intensive industry (chemical / petrochemical) we highlight the use of freshwater for cooling systems and steam generation, consumption in processes and the disposal of effluents. Therefore, the lack of water can affect operational costs and ultimately cease operations (dependency is high in present and future scenarios), explaining why it is vital for operations. Since Braskem is a chemical / petrochemical industry, a significant part of our suppliers has a similar use of water (e.g. cooling, steam), especially considering that Braskem's main raw material is petrochemical naphtha. The lack of water can affect / interrupt their operations (indirect use), explaining why importance is vital, resulting in impacts for Braskem as well, in present and scenarios up to 2040, according to internal climate risk assessments.
Sufficient amounts of recycled, brackish and/or produced water available for use	Vital	Vital	In "water stress" areas, reuse water is an alternative to maintain operations under normal conditions (mitigate / neutralize impact) and avoid competing for freshwater. Its primary use in Braskem's direct operations is throughout the production process. It is important to emphasize that due to the essentiality of water for cooling and steam production, the availability of water for reuse becomes even more important in regions of

			water stress. Therefore, the lack of water can affect operational costs and ultimately cease operations (dependency is high in present and future scenarios), explaining why it is vital for operations. Since Braskem is a chemical / petrochemical industry, a part of our suppliers has a similar use of recycled water (e.g. cooling, steam). The lack of water can affect / interrupt their operations (indirect use), explaining why importance is vital, resulting in impacts for Braskem as well, in present and scenarios up to 2040, according to internal climate risk assessments.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	Braskem measures and monitors for 100% of sites. The total water intake volume refers to the consumption of 41 industrial facilities located in Brazil (29), U.S. (6), and Germany (2) and Mexico (4) measured monthly and recorded into the SAP system. The volume is obtained through a meter inserted directly into the pipe, which transports water, performing the measurement and sending the result through a transmitter to the centralized control system. Monitored daily and consolidated monthly on-site by HSE focal point.
Water withdrawals – volumes by source	100%	Braskem measures and monitors for 100% of sites. The total water intake volume per source is summed up once per year, because of the closing of annual results report. The volume is obtained through a meter inserted directly into the pipe, which transports water, performing the measurement and sending the result through a transmitter to the centralized control system. Monitored daily and consolidated monthly on-site by HSE focal point.
Water withdrawals quality	100%	Braskem measures and monitors for 100% of sites. Water quality refer to 41 industrial facilities located in Brazil (29), U.S. (6), and Germany (2)

		and Mexico (4). The quality is measured by Chemical analysis in laboratory to check turbidity, alkalinity, solids, among others. The results are recorded into SAP system, monitored monthly and consolidated on-site by HSE focal point.
Water discharges – total volumes	100%	Braskem measures and monitors for 100% of sites. Water discharges refers to the 41 industrial facilities located in Brazil (29), U.S. (6), and Germany (2) and Mexico (4) measured monthly and recorded into the SAP system. The volume is obtained through a meter installed in the effluent drainage channel, making the measurement and sending the result through a transmitter to the centralized control system. Monitored daily for attend environmental standards and consolidated monthly on-site by HSE focal point.
Water discharges – volumes by destination	100%	Braskem measures and monitors for 100% of sites. The total wastewater generated per source is summed up once per year, on the closing of annual results report. The volume is obtained through a meter installed in the effluent drainage channel, making the measurement and sending the result through a transmitter to the centralized control system. Monitored daily for attend environmental standards and consolidated monthly on-site by HSE focal point. Braskem uses two types of disposal for its effluents: Fresh surface water and Third-party destinations. Destination is chosen according to operational and economic viability, and by the obtaining of legal permits.
Water discharges – volumes by treatment method	100%	Braskem measures and monitors for 100% of sites. The total treated wastewater is assessed monthly by measuring four different sources of wastewater: inorganic, organic, sanitary effluent (domestic sewage), and non-contaminated rainwater. An annual wastewater disposal assessment is made according to the treatments: Separation of oil and water, physical, neutralization, biological, chlorination, etc. The volume is obtained through a meter installed in the effluent drainage channel,

		making the measurement and sending the result through a transmitter to the centralized control system. The volumes are monitored and consolidated on-site by HSE focal point
Water discharge quality – by standard effluent parameters	100%	Braskem measures and monitors for 100% of sites. The quality of the measured wastewater varies for each of the manufacturing facilities, taking into account local operating requirements and the local legislation in which the facilities are located. Quality is measured by chemical laboratory analysis to check parameters such as COD and COB, which are measured regularly, monthly. Some industrial units perform chemical analysis in their own laboratory or for an external laboratory. The volume is obtained through a meter installed in the effluent drainage channel, making the measurement and sending the result through a transmitter to the centralized control system. The results are monitored monthly and consolidated on-site by HSE focal point.
Water discharge quality – temperature	76-99	Braskem currently measures and monitors water temperatures in 87% of the sites. In Brazilian operations, our largest operations, we measure in 100%. In US, Germany and Mexico the measurement is made in compliance to legal requirements. The temperature measurement is obtained through a sensor installed in the effluent drainage channel, performing the measurement and sending the result through a transmitter to the centralized control system. Monitored monthly and consolidated on-site by HSE focal point.
Water consumption – total volume	100%	Braskem measures and monitors for 100% of sites. The total water consumption refers to the 41 industrial facilities located in Brazil (29), U.S. (6), Germany (2) and Mexico (4); The volumes varies according the production's demand. The volume is obtained through a meter inserted directly into the tube, which transports water, at the main entrance of the pipe that feeds the industrial unit, making the measurement and sending the result through a transmitter to the centralized control system. Monitored daily and consolidated monthly, recorded into the SAP

		system, on-site by HSE focal point.
Water recycled/reused	100%	Braskem monitors 100 % of its facilities that have implemented water recycled/reused technologies, 67% of the 41 facilities on annual basis; the remaining 33% currently do not make use of recycled/reused waters due to technological projects or financial viability. The volume is obtained through a meter inserted directly into the pipe, which transports water, performing the measurement and sending the result through a transmitter to the centralized control system. Monitored and consolidated monthly by HSE focal point.
The provision of fully-functioning, safely managed WASH services to all workers	100%	Braskem measures and monitors for 100% of sites. Water for personal hygiene is provided by local water utilities, in accordance with the quality standards defined by current laws in the regions. We perform semiannual analysis at the drinking fountains of all areas and water taps in restaurants, analyzing the microbiological parameters of total coliforms and some bacteria to check the quality of drinking water provided for human consumption in filters and drinking fountains.The volumes are monitored and consolidated onsite by HSE focal point.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	69,341.06	Lower	The consumption of water follows the volume of production, last year we have almost 5% of decreased of production due to pandemic year. Since 2002, Braskem invested more than R$ 280 million in projects to improve water efficiency at its plants, with an accumulated economy of more than R$ 175 million in cost reduction with treatment of liquid effluents and operating costs with water consumption. Future

			withdrawal tends to decrease due to the initiatives of alternative sources of water abstraction under study in Braskem, but are still susceptible to external events and variations in production that might affect efficiency. The equation W = D + C is respected considering that consumption of water is associated with incorporation and evaporation of water throughout the chemical process Criteria: Much lower = reduction above 10%; Lower = reduction up to 10%; Higher = increase up to 10%; Much higher = increase above 10%
Total discharges	19,672	Much lower	There was a change in the calculation methodology of effluents at plants in The United States, and thus, the total value of effluents for 2019 was corrected to 21,130.87 megaliters. Discharges decreased by 6.9% in comparison to 2019. The value decreased due to: Implemented improvements positively impacting operational efficiency, consequently decreasing the number of purges in the cooling towers, among several implemented initiatives. Positive actions continued to be implemented, such as increasing the concentration cycle in cooling towers, optimizing operational procedures with consequent reuse of water currents and reduction of losses. Reducing the consumption of water used in cooling towers has always been a challenge for Q1 BA team in Brazil. This scenario, however, has changed after the implementation of the Cooling Water Loss Reduction project. The initiative saved more than 300 million liters of water, equivalent to the consumption of around 9,000 people in six months. Installed in bathrooms, the Piipee is a device that saves up to 75% of water in toilets bowls. Future discharge tends to decrease due to the initiatives of water efficiency under implementation in Braskem, but are still susceptible to external events and variations in production that might affect efficiency.

			The equation W = D + C is respected considering that consumption of water is associated with incorporation and evaporation of water throughout the chemical process Criteria: Much lower = reduction above 10%; Lower = reduction up to 10%; Higher = increase up to 10%; Much higher = increase above 10%
Total consumption	49,668.65	Lower	There was a change in the calculation methodology of effluents at plants in The United States, and thus, the total value of effluents for 2019 was corrected to 21,130.87 megaliters. Consequently the total amount of water consumption for the year 2019 was corrected to 51,258.60 megaliters. The total consumption reduced by 3.1% in comparison to 2019. The good performance in relation to the water efficiency in the last year is due to production reduction and some planned interruptions of the operation for general maintenance of the facilities. Future consumption tends to decrease due to the initiatives of water efficiency under implementation in Braskem. The equation W = D + C is respected considering that consumption of water is associated with incorporation and evaporation of water throughout the chemical process Criteria: Much lower = reduction above 10%; Lower = reduction up to 10%; Higher = increase up to 10%; Much higher = increase above 10%

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress and provide the proportion.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Identification tool	Please explain
Row 1	Yes	11-25	Lower	WRI Aqueduct	Specific assessment developed by Trucost based on aqueduct, climate scenarios and local data

					to quantify the risk of every watershed Braskem operates, from that, the company defined the risk areas. According to Trucost's assessment based on the WRI aqueduct tool, high-risk means that the annual demand of water is over 20% of long-term average annual supply. This criterion was used to define whether the water has been withdrawn from stressed areas. Once defined the risk areas strategies started to be developed to mitigate or eliminate the risk, such as adopt reuse and/or desalination water. The percentage reduced 28% from last year (2019). Water Security Index: Compared to 2019, our units in Mexico and Germany maintained the same Water Security Index 100%. The indicator for USA operations was reduced due to the completion of the Texas River Basin risk assessment pointing to higher long-term water risk (by 2040). In contrast, Brazil operations improved by around 12% thanks to progress in shifting from surface water abstraction to safer underground water abstraction, in addition to other internal initiatives to increase water reuse and recycling Water risks from the ABC region were neutralized by the Aquapolo water reuse project.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	9,298.85	Lower	Among the options for water withdrawal, Fresh surface water, including rainwater, water from wetlands, rivers, and lakes, Braskem uses only Fresh surface water/rivers. Volume reduced from 2019 by 10.44%. The reduction is due to lower consumption of raw material, optimization of water use in the process and production reduction in some industrial units. Water source are chosen according to availability, in both quality and quantity to supply operations and according to operational and economic viability, varying from site to site depending on geography. Most of our sites are located close by rivers (US plants, Mexico, Brazil – Rio Grande do Sul, São Paulo, Rio de Janeiro and Alagoas) justifying the relevance of this source. Future withdrawal tends to decrease due to the initiatives of alternative sources of water abstraction under study in Braskem (increase of third-party source and reduction of this source).

Brackish surface water/Seawater	Not relevant			Braskem do not source water from Non-fresh surface water/seawater, other sources indicated sufficed the companies requirements (that is why 'Not relevant' was chosen). Considering future uses, the company assessed the possibility of using desalination plants in high-risk water stress areas. So far, there is no viability to implement such projects.
Groundwater – renewable	Not relevant			Braskem do not source from Groundwater – renewable, other sources indicated sufficed the companies requirements (that is why 'Not relevant' was chosen). Future tendency is to increase the use of this source. In Bahia (Brazil), there is an estimate to increase the use of groundwater as a secure alternative source along with water reuse. Considering the criteria to distinguish non-renewable from renewable, the use will fall on non-renewable.
Groundwater – non-renewable	Relevant	1,109.67	Much lower	Production reduction, consumption optimization, mainly by reducing leaks and improving the cycles of concentration in the cooling towers were the main reasons why water withdrawal from groundwater decreased this year (23.36% in relation to 2019). Water source are chosen

				according to availability, in both quality and quantity to supply operations and according to operational and economic viability, varying from site to site. It is the single source for one of our plants that is inserted in a water stressed region – Alagoas, therefore explaining why this source is relevant. Future withdrawal tends from this source tends to decrease due to the initiatives of alternative sources of water abstraction under study in Braskem (increase of third-party source and reduction of this source).
Produced/Entrained water	Not relevant			Braskem do not source from Produced/Entrained water, other sources indicated sufficed the companies requirements (that is why 'Not relevant' was chosen). There is no future expectation of consuming water from this source.
Third party sources	Relevant	58,932.54	Lower	Water consumption from third parties decreased by 2.68% in 2020 in comparison to 2019. Results area connected with reduced production and optimization implemented by reducing leaks and improving the cycles of concentration in the cooling towers. Much of the water supply to Braskem in 2020 came from the company that acquired the water treatment facilities from

				Braskem itself. It is relevant because it is our most important source of water (in volume withdrawal). Water source are chosen according to availability, in both quality and quantity to supply operations and according to operational and economic viability, varying from site to site. Future withdrawal from this source tends to increase due to the initiatives of alternative sources of water abstraction under study in Braskem (Reuse water projects such as Aquapolo, for instance, that is considered as a third-party source).

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	5,984.87	Much lower	Discharge to this destination decreased by 25.12% from last year, due to the water quality better in the entrance of the process increasing efficiency and production reduction in some industrial units. Destination is chosen according to operational and economic viability, and by the obtaining of legal permits. Now, fresh water it is the second most important destination (in volume), explaining why it is relevant.

				Future discharge tends to decrease from this source due to the initiatives of water efficiency under implementation.
Brackish surface water/seawater	Not relevant			Braskem do not discharge effluents on Brackish surface water/seawater, explaining why 'Not relevant' was chosen. Last year Braskem discharged water from this type of destination either. Braskem does not intend to discharge to this destination in the future.
Groundwater	Not relevant			Braskem do not discharge effluents on Groundwater, explaining why 'Not relevant' was chosen. Braskem does not intend to discharge to this destination in the future.
Third-party destinations	Relevant	13,687.54	Much higher	Braskem had a 16.63% increase, from 2019, in water discharge from third party destinations. These results are associated from increased temperatures requiring more water in the cooling towers, a reduction in the water quality affecting efficiency and the increased of rain water. Destination is chosen according to operational and economic viability, and by the obtaining of legal permits. It is the most important (in terms of volume) destination of discharge, explaining why it is

				relevant. Future discharge tends to decrease from this source due to the initiatives of water efficiency under implementation in Braskem.

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Relevant	7,101.32	Lower	21-30	Some treatments are carried out such as biological treatment (aerobic).
Secondary treatment	Relevant	1,768.68	Lower	61-70	Most industrial units carry out this phase before final disposal.
Primary treatment only	Relevant	1,768.68	Lower	61-70	Most industrial units carry out this phase before final disposal.
Discharge to the natural environment without treatment	Not relevant				Braskem doesnt discharge to the natural environment

					without treatment.
Discharge to a third party without treatment	Relevant	232.12	Higher	1-10	This type of treatment is carried out by the two industrial units in Europe.
Other	Not relevant				Braskem has no other type of treatment, only those presented, primary, secondary, tertiary and discharge to a third party.

W-CH1.3

(W-CH1.3) Do you calculate water intensity for your activities in the chemical sector?

Yes

W-CH1.3a

(W-CH1.3a) For your top five products by production weight/volume, provide the following water intensity information associated with your activities in the chemical sector.

Product type

Specialty organic chemicals

Product name

Polypropylene (Brazil)

Water intensity value (m3)

1.43

Numerator: water aspect

Total water consumption

Denominator

Ton

Comparison with previous reporting year

Lower

Please explain

Braskem produced in 2020 about 1.57 million tons of polypropylene in Brazil, 4.28% lower than 2019 and water intensity is about 1.01% lower than last year, due to better operational efficiency after planned maintenance of industrial units. These values help the company measure the performance in terms of water efficiency per ton in comparison to previous years and follow up the its consumption goals (public disclosed commitments).

Braskem is constantly seeking to improve process that save water, investing to reduce consumption at cooling towers for an example, and also proposing challenges to our innovation area that search an environment of start-ups for new solutions.

The metrics are monitored internally at facility level by the HSE Corporate team. Critical analysis of the deviations is made on monthly basis, comparing to Braskem's targets.

For the future, considering the period of 2021 and 2025, we expect a reduction of 4% in this water intensity indicator.

Product type

Specialty organic chemicals

Product name

Polyethylene

Water intensity value (m3)

3.08

Numerator: water aspect

Total water consumption

Denominator

Ton

Comparison with previous reporting year

Lower

Please explain

Braskem produced in 2020 about 3.35 million tons of polyethylene, 1.75% lower than 2019. Company water intensity is 2.12% lower than last year, due to the implementation of initiatives to reduce water consumption and also investments in efficiency.

Braskem is constantly seeking to improve process that save water, investing to reduce consumption at cooling towers for an example, and also proposing challenges to our innovation area that search an environment of start-ups for new solutions.

These values help the company measure the performance in terms of water efficiency per ton in comparison to previous years and follow up the its consumption goals (public disclosed commitments).

The metrics are monitored internally at facility level by the HSE Corporate team. Critical analysis of the deviations is made on monthly basis, comparing to Braskem's targets.

For the future, considering the period of 2021 and 2025, we expect a reduction of 6% in this water intensity indicator.

Product type

Bulk organic chemicals

Product name

Chemicals and specialties (Brazil)

Water intensity value (m3)

5.39

Numerator: water aspect

Total water consumption

Denominator

Ton

Comparison with previous reporting year

Higher

Please explain

Braskem produced in 2020 about 7.64 million tons of Chemicals and specialties, 6.21% lower than 2019 and water intensity is 3.32% higher than last year.
The implementation of initiatives to reduce water consumption contributed positively to this indicator and negatively, stops for planned maintenance of industrial units and reduction of production plans.

These values help the company measure the performance in terms of water efficiency per ton in comparison to previous years and follow up the its consumption goals (public disclosed commitments).

Braskem is constantly seeking to improve process that save water, investing to reduce consumption at cooling towers for an example, and also proposing challenges to our innovation area that search an environment of start-ups for new solutions.

The metrics are monitored internally at facility level by the HSE Corporate team. Critical analysis of the deviations is made on monthly basis, comparing to Braskem's targets.

For the future, considering the period of 2021 and 2025, we expect a reduction of 10% in this water intensity indicator.

Product type

Specialty organic chemicals

Product name

PVC

Water intensity value (m3)

12.23

Numerator: water aspect

Total water consumption

Denominator

Ton

Comparison with previous reporting year

Higher

Please explain

Braskem produced in 2020 about 0.45 million tons of PVC, 7.34% lower than 2019 and water intensity is 8.17% higher than last year, due to some planned maintenance of industrial units.

These values help the company measure the performance in terms of water efficiency per ton in comparison to previous years and follow up the its consumption goals (public disclosed commitments).

Braskem is constantly seeking to improve process that save water, investing to reduce consumption at cooling towers for an example, and also proposing challenges to our innovation area that search an environment of start-ups for new solutions

The metrics are monitored internally at facility level by the HSE Corporate team. Critical analysis of the deviations is made on monthly basis, comparing to Braskem's targets.

For the future, considering the period of 2021 and 2025, we expect a reduction of 25% in this water intensity indicator.

Product type

Specialty organic chemicals

Product name

Polypropylene (USA)

Water intensity value (m3)

3.22

Numerator: water aspect

Total water consumption

Denominator

Ton

Comparison with previous reporting year

Lower

Please explain

Braskem produced in 2020 about 1.55 million tons of polypropylene in USA, 6.35% higher than 2019 and water intensity is 7.48% lower than last year. The implementation of initiatives to reduce water consumption contributed positively to this indicator and negatively, stops for planned maintenance of industrial units and reduction of production plans.

These values help the company measure the performance in terms of water efficiency per ton in comparison to previous years and follow up the its consumption goals (public disclosed commitments).

Braskem is constantly seeking to improve process that save water, investing to reduce consumption at cooling towers for an example, and also proposing challenges to our innovation area that search an environment of start-ups for new solutions.

The metrics are monitored internally at facility level by the HSE Corporate team. Critical analysis of the deviations is made on monthly basis, comparing to Braskem's targets.

For the future, considering the period of 2021 and 2025, we expect a reduction of 7% in this water intensity indicator.

W1.4

(W1.4) Do you engage with your value chain on water-related issues?

Yes, our suppliers

W1.4a

(W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?

Row 1

% of suppliers by number

76-100

% of total procurement spend

76-100

Rationale for this coverage

Braskem monitors 100% of its supply chain, for key suppliers, and then use the criteria of geographic location against the risk of water stress for that particular watershed using data from a climate risk study developed internally in partnership with ERM to select those inserted in high-risk areas. Those are then requested to reply to CDP Supply Chain. 100% of Braskem's key suppliers goes through this selection process, considering they might suffer impacts that could indirectly affect Braskem as well (e.g. production disruption). The suppliers are incentivized to report through sensitization and training steps (workshops) organized by Braskem with the support of CDP. Suppliers also receive individual support and Braskem evaluated the results to identify potential opportunities for collaborative actions.

Impact of the engagement and measures of success

The information requested from suppliers are the one requested by CDP Supply Chain questionnaire. Braskem requests the reporting of the water management strategy, the established goals and identified risks and opportunities in water use, indicators and evolution.

In 2020, Braskem has invited 153 suppliers to report the CDP Supply Chain Water questionnaire and achieved a 77% rate of engagement. Braskem integrates the risks and opportunities identified by its suppliers in its analysis of risks and opportunities, using a framework developed by FGV. The result of this process is the development of a robust adaptation plan, as part of a business strategy. In addition, Braskem procurement area monitors the evolution of each supplier. The success is measured through the percentage of the Water Security Plan completion and the percentage of suppliers engaged every year.

Comment

Suppliers are invited to participate in CDP events, workshops and training, join the Action Exchange and are contacted for support in the questionnaire (e.g. help identify initiatives to reduce impacts/costs).

W1.4b

(W1.4b) Provide details of any other water-related supplier engagement activity.

Type of engagement

Incentivizing for improved water management and stewardship

Details of engagement

Demonstrable progress against water-related targets is incentivized in your supplier relationship management
Water management and stewardship action is integrated into your supplier evaluation
Water management and stewardship is featured in supplier awards scheme

% of suppliers by number

76-100

% of total procurement spend

76-100

Rationale for the coverage of your engagement

Braskem developed a series of assessments on water security risks, from this point on the company started a series of policies and actions to prevent water risks from affecting production. Being aware of the water risks, Braskem has a prevention program, called IP (Braskem Prevention Index) that considers environmental aspects, including water resources, defining activities that must be carried out by suppliers, such as weekly dialogues for awareness, planned meeting for results evaluation and deviations treatment process.
All of these topics are followed up, resulting in a score for each supplier, thus stimulating them to invest on water monitoring, assessments, and also seeking to identify actions to reduce water impact. The score is used to select the suppliers that will be recognized in the annual supplier HSE recognition program.
The ’76-100’ was chosen because every Braskem suppliers that are located in stressed water area are invited to CDP Supply Chain and IP program.

Impact of the engagement and measures of success

There are 2 types of benefits: awareness of the environmental aspects and management of water resources (suppliers can replicate these practices in their processes), and the reduction of the water impact on Braskem's operations, as several suppliers work at Braskem's facilities.
The measure of success is the percentage of suppliers engaged in the program (IP). Considering suppliers with more than 10 employees, and a long-term contract (more than 6 months), the engagement rate is 100% in regions of potential water stress.

Comment

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

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?

No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

No

W3. Procedures

W-CH3.1

(W-CH3.1) How does your organization identify and classify potential water pollutants associated with its activities in the chemical sector that could have a detrimental impact on water ecosystems or human health?

Due to the nature of Braskem's operations, the company is legally obliged to undertake a series of monitoring in its liquids discharges (parameters such as pH, temperature, OBD, sediments, oils, floating materials, benzene, among several others). Those obligations and monitoring are followed up and enforced by governmental environmental agencies through periodic reports and oversight, after being identified in a risk analysis as port of an Environmental Impact Assessment. Each of Braskem business has its own specific parameters matrix of what to monitor and thus considered as pollutants, determined in the environmental operation permit, those parameters have as a minimum requirement what is predicted in country regulations such as the CONAMA Resolution nº 430/2011 in Brazil. Non-compliance may lead to fines and prohibition to discharge effluents. Depending on the business and its risks, the company make additional monitoring (beyond legal norms) by its own initiative, as is the case for BTX concentration in effluents, following regulations and norms from the Labour Ministry, National and International Accords. All effluents receive the proper treatment before its final discharge and samples are analysed in specific laboratories (allowing identification of the potential water pollutants), results are submitted to regulatory agencies. However, in some cases, the effluent is not even discharged in water bodies, such as the case for our plants in Rio Grande do Sul where after 03 levels of treatment the effluent is discharged on soil in a specific area of 200 ha. As a petrochemical company, the plants deal with specific pollutants such as BTX, organochloride and heavy metals. Those specific pollutants can have serious effects such as intoxication, cancer potential, insomnia, among other, and therefore they are under severe control and neutralized by the company's best practices and procedures. Braskem have internal documented procedures on exposition control, including biological, and control / preventive measures.

The impacts caused by our direct operation are water quality degradation impacting freshwater treatment and distribution to the population; increased treatment costs for use to both society and business; damage to property value in the margins of the rivers; lower oxygen in the water leading to biodiversity losses. Other includes eutrophication leading to an excessive amount of algae, killing biodiversity by the removal of oxygen and preventing the light penetration. Some elements can cause intoxication and bioaccumulation such as heavy metals, other such as oil can cause cancer and harm biodiversity in several ways (suffocation, prevent photosynthesis, intoxicate, etc.). PH can cause corrosion and damage to plants and agriculture; BTX may cause cancer and less severe effects such as sickness, vomit, sleepiness. Other such as BTX can have a diffuse impact due to its volatility characteristic.

Our main suppliers are Oil and Gas companies that present the same conditions of effluent generation and potential impacts and are subjected to the same regulations and permits. The most impactful substances are not carried through our clients and do not represent risk to consumers.

W-CH3.1a

(W-CH3.1a) Describe how your organization minimizes adverse impacts of potential water pollutants on water ecosystems or human health. Report up to ten potential pollutants associated with your activities in the chemical sector.

Potential water pollutant	Value chain stage	Description of water pollutant and potential impacts	Management procedures	Please explain
OBD, OBC, pH, BTX, Organochloride, heavy metals	Direct operations Supply chain	The impacts caused by our direct operation and supply chain (petrochemical suppliers) are water quality degradation impacting freshwater treatment and distribution to the population; increased treatment costs for use to both society and business; damage to property value in the margins of the rivers; lower oxygen in the water leading to biodiversity losses. Other includes eutrophication leading to an excessive amount of algae, killing biodiversity by the removal of oxygen and preventing the light penetration.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	How the procedures selected manage the risks of the potential impacts outlined: All the plants use a series of treatments in all 03 levels to prevent the main pollutants to reach nature in values in discordance with the legal norms and safe for the environment and human health. At first, level the process uses gravitational separators especially to deal with oil in the water. The second stage uses neutralization, coagulation, filtration and flotation technics and at level 3, the company

		Some elements can cause intoxication and bioaccumulation such as heavy metals, other such as oil can cause cancer and harm biodiversity in several ways (suffocation, prevent photosynthesis, intoxicate, etc.). PH can cause corrosion and damage to plants and agriculture; BTX may cause cancer and less severe effects such as sickness, vomit, sleepiness; Impacts in general are regional (scale), with a low to medium probability and medium to high magnitude. Some chemicals such as heavy metals can have a persistent effect and bioaccumulate. Other such as BTX can have a diffuse impact due to its volatility characteristic.		used, depending on the plant, solutions such as biological filers, oxidation towers, reverse osmosis and specific solutions to remove BTX and organochloride. Braskem required main suppliers to respond to the CDP water and monitor compliance with legal requirements and standards. In general, the company's main suppliers are engaged in Oil & Gas and Ethanol production and refining thus adopting practices from the chemical industry. They, as well as Braskem, uses a series of treatments in all 03 levels to prevent the main pollutants to reach nature in values in discordance with the legal norms and safe for the environment and human health. At first, level the process uses gravitational separators especially to deal with oil in the water. The second stage uses neutralization, coagulation, filtration and flotation technics and at level 3, the company used, depending on the plant, solutions such as biological filers, oxidation towers, and reverse osmosis. How success is measured and evaluated:

				Braskem followed the best practice from the chemical industry and the standard quality of effluent discharge determined by the environmental agencies in all regions we operate. Depending on the effluent, it never reached the water bodies being discharged at a specific site of 200 ha of soil. Therefore, success is measured when the standard quality of effluent discharge fulfils the requirements imposed by regulations. Periodic analyses and reports are issued to regulation agencies. Success is evaluated when the supplier complies with industry standards. This is guaranteed during the procurement procedure.

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Direct operations

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of an enterprise risk management framework

Frequency of assessment

Annually

How far into the future are risks considered?

More than 6 years

Type of tools and methods used

Tools on the market
Enterprise Risk Management
International methodologies
Other

Tools and methods used

WRI Aqueduct
COSO Enterprise Risk Management Framework
ISO 31000 Risk Management Standard
Life Cycle Assessment
External consultants
National-specific tools or standards
Other, please specify
FGV - UKCIP/INCAE Wizard & DEVESE

Comment

Water risks integrate the Enterprise Risk Management platform, reporting results directly to the Board of Directors. Braskem developed a Climate Change & Adaptation Study in 2016, mapping and prioritizing risks (including Drought and flooding) and opportunities for the company's operational sites until 2040 (Horizon). The study originated action plans measured through a PMO. In 2017, a new indicator called 'Water Safety Index' was defined and approved.
The study is reviewed approximately every 5 years. This water security indicator is part of the company's Sustainable Development macro objectives and is evaluated annually

Supply chain

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of other company-wide risk assessment system

Frequency of assessment

Annually

How far into the future are risks considered?

More than 6 years

Type of tools and methods used

Tools on the market
Other

Tools and methods used

WRI Aqueduct
External consultants
National-specific tools or standards

Comment

Braskem integrates the risks (including drought and flooding) and opportunities identified by its suppliers (via CDP Supply Chain) and by the Climate Change & Adaptation Study in its risk analysis, with a framework developed by FGV. Company's proposal is to evaluate every five years the status of water risks in water stress regions where it operates in a 2040 horizon. The result of this process is the development of a company-wide adaptation plan, part of the business strategy.

Other stages of the value chain

Coverage

None

Comment

At the end of each annual engagement cycle through the CDP Supply Chain, Braskem holds individual meetings with suppliers who reported a high water risk, with the aim of supporting them in identifying risk mitigation actions. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact.

W3.3b

(W3.3b) Which of the following contextual issues are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	This parameter is relevant because the chemical industry is intensive in the direct use of water or steam, so the lack of water interrupts the operation / process. Braskem performed the risk evaluation of the current water supply at local level in terms of the quantity, quality and frequency required for operations in all of its operational plants. Because water risk is associated with climate, water management (actions to mitigate these risks, including water availability at the local level) is being managed using the FGV FRAMEWORK (WIZARD FROM UKCIP AND INCAE - AUSTRALIAN GOVERNMENT GUIDELINES FOR RISK ASSESSMENT), Along with all actions of the adaptation plan. The WRI AQUEDUCT was also used to evaluate the short and long (2040) term risks associated with water availability in water basins where Braskem identified a high risk of water stress. In 2016, this assessment was performed for 4 basins where Braskem

		has operations (Alto Tietê basin, Recôncavo Norte e Inhambupe basin, Guandu river basin and Caí river basin). Among the four basins studied, 3 presented high long-term risks: Alto Tietê basin, Reconcavo Norte e Inhambupe basin and Guandu river basin. Given these results in 2017 and 2018, the company is studying the alternatives such as reuse water and desalinated water to mitigate availability risks. Regarding water quality, this parameter is also considered because it has a direct impact on Braskem's operations. With the implementation of a reuse project in São Paulo called Aquapolo, besides solving the problem of water availability, also solved the problem of water quality due to the reduction of equipment intervention and reduction of quantity of chemical products used for treatment. Braskem reassessed the water risk of its plants in the Texas basins, USA, in 2020. The result was a high water risk. At this moment, the industrial team is evaluating the report, and the next step is to define actions to mitigate these risks.
Water quality at a basin/catchment level	Relevant, always included	Braskem performed the risk evaluation of the current water supply and discharge at local level in terms of the quantity, quality and frequency required for operations in all its operational plants. Regarding water quality, this parameter is critical considered it has a direct impact on Braskem's operations (production, equipment maintenance, etc.). With the implementation of reuse projects such as the Aquapolo in São Paulo, besides solving the problem of water availability, the company also solved the problem of water quality due to the reduction of equipment intervention and reduction of quantity of chemical products used for treatment. In order to evaluate the risk related to quality of water withdrawal and discharge, the main tool used in the assessment are the laboratory analysis of water. The results from these analyses are compared to the limits imposed by legal requirements and regulatory agencies. In Brazil to be able to discharge its effluents, the company needs a specific permit, based on an environmental impact evaluation. This permit is issued with a series of conditions on the limits of every pollutant and require periodical reports for its maintenance. Tool referred in W3.3a – National Specific Tools or Standards.

Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	This aspect is relevant for Braskem because the company operates in regions of potential water stress and as we are major consumers of water, in severe drought scenarios, the likelihood of conflicts among stakeholders increases. Braskem developed an adaptation study to identify the impacts of climate change in its global operations. One of the goals of the study was the mapping and prioritization of risks and opportunities. Based on the result of this study, the current areas of conflict with stakeholders were identified. Actions were also defined to deepen the study of water availability and risk. This was done in order to re-ratify effective actions already taken such as the Aquapolo water reuse project, which started to supply all the plants in conflict regions (Santo André, Mauá, Sao Bernardo do Campo, São Caetano do Sul, Diadema, Ribeirão Pires and Rio Grande da Serra) with 100% of reuse water. These actions are managed through the adaptation framework (WIZARD FROM UKCIP AND INCAE - AUSTRALIAN GOVERNMENT GUIDELINES FOR RISK ASSESSMENT). Projects such as the Aquapolo are now being studied to be replicated for other high stressed areas, to increase the company's water security and reduce conflicts of use.
Implications of water on your key commodities/raw materials	Relevant, always included	Current implications of water on Braskem's key commodities/raw materials are evaluated because they indirectly represent impact in terms of costs and competitiveness. The LIFE CYCLE ASSESSMENTS carried out by the Sustainable Development team allows Braskem to evaluate the water consumption throughout the life cycle of many products created (or that can potentially be produced) using Braskem's resins. Braskem incorporates the results of these studies in its decision-making process. Between 2006 and 2019, 115 (59 complete, 16 reviews and 40 simplified) Life Cycle Assessments (LCA) were completed, identifying the advantages and priority areas for product improvement. A practical example of a completed study is the comparative LCA study between traditional promotional bags and I'm green ™ Green Polyethylene for the transport of 14-liter volumes that hold up to 10 kg. Both were classified in the same price range and printing area. The result showed that I'm green ™ Polyethylene option has better environmental performance in most categories of impact evaluated, and specifically in water consumption the performance of the plastic alternative is 11% superior, including steps at the beginning of the life cycle, such as extraction and treatment of raw material.

Water-related regulatory frameworks	Relevant, always included	This aspect is relevant for Braskem because in some regions that we operate, due to water scarcity scenarios, laws are being studied that may impact on cost increase or concession restrictions. Braskem developed a study considering regulatory changes at local and regional level, to identify regulatory opportunities and risks that affect the company's operations regarding present and future scenarios, including legislations on water-related risks, legislations on safety standards, among other risks and opportunities. Likewise, as was done for physical risks, after the identification of regulatory risks, an assessment of each of the scenarios and their respective impacts to the company at local and regional level was carried out. It was done according to the scope of legislation (using WIZARD FROM UKCIP AND INCAE - AUSTRALIAN GOVERNMENT GUIDELINES FOR RISK ASSESSMENT), thus generating actions for monitoring and influencing scenarios of greater risk. Two examples identified by Braskem can be mentioned: (1): In Bahia (which includes the plants PE 1, PE 2, PE 3, UNIB 1, CS 2, PVC 1) there was a reduction in the water grant to all consumers in the region in 2016, among them Braskem. (2): In Rio de Janeiro (which encompasses UNIB 4, PE 9, PP 5), there was already a bill in 2016 (142/15) that imposed the obligation of industries located in the State of Rio de Janeiro to install water treatment and reuse equipment, which resulted in the approval of Law 7599/17 in 2017.
Status of ecosystems and habitats	Relevant, always included	After assessing the results of the potential impacts of climate risks on Braskem's operations, the severe drought scenario for the Duque de Caxias unit in Rio de Janeiro was identified. Within the adaptation plan, the study of the Guandu basin was carried out, confirming this scenario and the high risk of water scarcity. Based on this diagnosis, Braskem started to participate in a pilot project using the methodology of the FGV (DEVESE) - methodology for valuation of ecosystem services - considering some scenarios (e.g. grant scenario) in the quantification and economic valuation of aquatic ecosystems at local level, to diagnose the Current situation and to design different future scenarios. In this way, Braskem expects to obtain results that enable solutions to reduce water and climate risks. The WRI AQUEDUCT Framework was also used throughout this process. Trucost used this specific tool to analyse how different users (domestic, agriculture and business) use water and what drivers will change the demand of water for

		those users between now and 2040 in water basins where Braskem identified a high risk of water stress.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	This aspect is relevant for Braskem because the operations in the industrial areas take place continuously, without interruption, with team rotation, so water for both consumption and hygiene is relevant to maintain the health and safety of these groups that take turns. From the raw water that Braskem collects, after treatment the following waters are obtained: potable water for use in the unit (for fully functioning WASH services), clarified water and demineralized water for use in the process and boilers for steam generation. Therefore, the water risk assessment that Braskem performed (considering the quantities of water abstracted and discharged) includes the analysis of water for fully functioning WASH services as well. Because water risk is associated with climate risk, water risks management (including risks associated with WASH services) is being supervised using the FGV framework (WIZARD FROM UKCIP AND INCAE - AUSTRALIAN GOVERNMENT GUIDELINES FOR RISK ASSESSMENT), along with all actions of the adaptation plan.
Other contextual issues, please specify	Not considered	Not considered.

W3.3c

(W3.3c) Which of the following stakeholders are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Customers	Relevant, always included	Risk considered – lose competitiveness due to high footprint of the products impacting in water / image / sales risks for the client. Solution / Engagement: Braskem incorporates the water risks associated with its customers in the development of plastic solutions for access to drinking water and in the development of plastic products with always-smaller footprints. Customers are consulted in the development of new products and new solutions. Braskem uses LIFE CYCLE ASSESSMENT studies to develop and analyse products with customers. It is important to highlight that, within an LCA study, the impacts related to water use are also described. A practical example that may be cited is the

		development of the LCA study related to the mulching solution. It was a study developed with the involvement of the requesting customer and is a product that allows the reduction of the consumption of pesticides and water in agriculture, increasing agricultural productivity.
Employees	Relevant, always included	Risk considered – water drought affecting production for both operations and employee. Lack of water leading o WASH problems for employees in their residences. Solution / Engagement: During the preparation of Braskem's climate risk study (using WIZARD FROM UKCIP AND INCAE - AUSTRALIAN GOVERNMENT GUIDELINES FOR RISK ASSESSMENT), focal points of all industrial company's plants were involved (e.g. PE1, PE2, PE3, UNIB 1 plants). Their involvement was essential from the initial stages of the project, such as the mapping of historical climate events, impact validation, risk validation and definition of the adaptation plans and actions. The constant interaction between the sustainable development team and the operational site members throughout the process was essential to the elaboration of the study. Moreover, the adaptation plans helped defining actions that involve different business areas and stakeholders in the future as well. With the severe drought scenario, there is a risk of water shortage, which may interrupt industrial operations for short or medium periods. The climate risks assessment also help the company understand the most vulnerable river basin not only for their operations but also for their employees. Scarcity might affect availability and WASH leading to loss of production, financial impacts for both Braskem and its employees.
Investors	Relevant, always included	Risk considered – lose investment potential and dividends due to not identify, manage, improve and report on water risks (influence on INDEXES SUCH AS DJSI AND CDP INVESTOR, i.e. investor confidence and perception). Other risks includes image / reputation damages. Solution / Engagement: Based on the understanding that the responses provided by Braskem in the CDP Investor questionnaire are public, the company seeks the best practices in water risk management as

		a way of meeting Investors' expectations through constant interaction, while evolving at the same time in its practices. Through events sponsored by the entities that Braskem participates in (such as the CDP workshops), the company also seeks to capacitate and influence other stakeholders. A practical example is the participation of Braskem in the annual event to publicize the results of CDP Investor. In addition to being present at the event, Braskem remains until the end of it to answer questions from investors. Another example to be cited is the annual event held by B3 (São Paulo Stocking Exchange). Braskem has been participating for two years in the event, presenting to investors all its Sustainable Development strategy and answering investor questions.
Local communities	Relevant, always included	Risk considered – water scarcity and the impact on local communities leading to potential conflicts of interest. Solution / Engagement: Braskem participates in forums for the evaluation and discussion of water risks management at local, regional and national level (some of them including local communities), such as associations of chemical industries, industry federations and watershed committees. In case of water scarcity, the priority is the use of the community. A practical example is the EAB (Estação Ambiental Braskem) initiative, an annual environmental education program with surrounding schools (i.e. local communities). This program has as one of the objectives to educate about climate change and consequently the risks of water scarcity arising from this context.
NGOs	Relevant, always included	Risk considered – managing water risks in a regional scale (river basin). Reputational risks and external pressure from NGOs. Solution / Engagement: Braskem engages NGOs through participation in basin committees and through associations and institutions it participates (e.g. ABIQUIM). We incorporate the issues raised in these institutions (including risk analysis) for internal management. In addition, Braskem promotes debate, as well as provides internal presentations to disseminate management practices. For example, within the FGVCes group focused on water resources, Braskem supported the development of a survey of good practices among participating companies. Subsequently meetings were scheduled to discuss these practices and the result was presented at ABIQUIM. In addition,

		within ABIQUIM, Braskem has launched a document entitled 'Efficient management of water resources', which is already in circulation. Company also signed CEBDS the Brazilian Business Commitment to Water Security and in 2019 endorsed the Global Compact CEO Water Mandate.
Other water users at a basin/catchment level	Relevant, always included	Risk considered – water security issues regarding climate change and the loss of freshwater in distribution systems. Solution / Engagement: Braskem participates in forums for the evaluation and discussion of water risks management at local, regional and national level (including different water users), such as associations of chemical industries, industry federations and watershed committees. For example, Braskem presented the study of climate risks and water risks with the support of the federations of the states of Sergipe, Ceará and at the request of the National Confederation of Industry, seeking to engage different regional water users, despite not having operations in these regions. Braskem is also leading the UN Global Compact initiative called 'Menos Perda, Mais Água', which seeks the engagement of governments at municipal level and which has already been approved by seven municipalities. The aim of this project is to promote a broad debate on water losses in distribution systems, with a practical agenda focused on the development of a program against losses.
Regulators	Relevant, always included	Risk considered – lack of regulations impacting on the development of alternatives sources of water for industrial use. Solution / Engagement: Through associations (e.g. industry confederation) Braskem participates and encourages discussion and debates related to new legislation (involving regulators), taking into account the water risk assessment carried out by the company to promote industry evolution in the theme. An example to be mentioned is the contribution made by Braskem in relation to the bill that aims to provide tax incentives to reduce the cost and consequently promote an increase in water reuse. These contributions were given during discussions in the technical chamber of the CNI (National Confederation of Industry), in the technical water chamber of CEBDS and in the environmental technical commission of ABIQUIM.

River basin management authorities	Relevant, always included	Risk considered – management decisions on the future of water use in a River Basin being taken without the participation and view of the business sector. Solution / Engagement: We participate in basin committees at the regional level, presenting the water risk studies that we have carried out, seeking to develop new partnerships with the authorities and influencing the development of new solutions to mitigate the identified water risks. In each operational region of Braskem, representatives of the local business units participate in the region's river basin management committees continuously as members seeking to influence and share information related to the company, seeking to improve management effectiveness and engagement.
Statutory special interest groups at a local level	Relevant, always included	Risk considered – water security at a regional level. Solution / Engagement: Braskem participates in forums for the evaluation and discussion of water risks management at local, regional and national level (some of them including statutory special interest groups), such as associations of chemical industries, industry federations and watershed committees. In these forums, Braskem presents the studies that the company has carried out, seeks new partnerships and influences the development of new projects and initiatives to mitigate the identified water risks. Braskem is leading the UN Global Compact initiative called 'Menos Perda, Mais Água', which seeks the engagement of governments at municipal level and which has already been approved by seven municipalities. The aim of this project is to promote a broad debate on water losses in distribution systems, with a practical agenda focused on the development of a program against losses. In this company-specific example, the governments at municipal level were considered as statutory special interest groups.
Suppliers	Relevant, always included	Risk considered – loss of production due to water scarcity issues in our suppliers. Solution / Engagement: Braskem invites 100% of the suppliers that are in scenarios of high water stress to participate in the CDP Supply Chain.

		Braskem uses the CDP Supply Chain as a key element to manage its suppliers on water management. The information of risks and opportunities of suppliers feed the water risk management of Braskem. The company became a member company of the CDP Supply Chain with a strategic posture that seeks to encourage its suppliers to participate in the program, answering the questionnaire in full. Braskem also uses these responses from these suppliers and the feedback provided to assess the evolution of its suppliers regarding water management and identify opportunities to increase water efficiency that involve one or both companies (supplier and customer). Using this information, the company aims to enhance its relationship with its suppliers and increase the network of companies engaged in sustainability. Braskem also encourages its suppliers to participate in the CDP Supply Chain Workshops and in the Action Exchange in order to capacitate them in the theme.Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Management.
Water utilities at a local level	Relevant, always included	Risk considered – lack of efficiency impacting on water availability for the business sector. Solution / Engagement: In all regions, Braskem maintains its relationship with these direct stakeholders to ensure compliance with all commitments in the operating licenses, as well as action plans in periods of water scarcity.
Other stakeholder, please specify	Not considered	Not considered.

W3.3d

(W3.3d) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

Water risks are fully integrated into the business risk management through the Entrepreneur Risk Management (ERM) platform, being reported directly to the Board of Directors, and based on COSO, ISO 31000 and IBGC standards.

In order to identify, assess and respond to water-related risks within our direct and value chain stages, Braskem is using the FGV framework based on Wizard from UKCIP and INCAE. First, in order to identify risks and opportunities, Braskem' s sustainable development team worked with focal points of all the company's industrial plants and strategic areas to obtain accurate and qualified information about the extreme water related climate events. Events that caused

(or might cause) positive and/or negative impacts in all operations. Parallel to this survey, it was prepared an analysis of future climate-related projections considering the INPE, IPCC and WRI Aqueduct scenarios until 2040 (Timescale). The approach adopted defined risk as a product between the probability of an extreme event and magnitude of the impact. The magnitude of the impact was rated, considering the following aspects: health and safety, social context, environmental impact, financial impact, infrastructure and image. From the historical survey and future projections, all water risks and opportunities were prioritized.

As a result, cross-referencing impacts with frequencies leads to quantified risk and opportunity results, which according to the quantitative result, can be in one of the 03 regions in the matrix: (1) green = should be followed-up /monitored; (2) yellow = should have an action plan and implement all of the actions identified; (3) red = should have a strategy and implementation should be immediate.
The main water-risks, classified as high, were ‘Drought’ and ‘Floods’, located specially in the north-eastern and south-eastern regions of Brazil, considering present (2015) and future (2040) scenarios. For every risk classified as high, action plans were defined.

Once the action to mitigate a potential high water risk is defined, this action is inserted in the water security plan of the industrial unit and its implementation is monitored by the unit's director. In addition to this monitoring, there is also corporate monitoring, where all actions for mitigating high risk are monitored by the CEO within the corporate risk management process which also considers water risks.

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, both in direct operations and the rest of our value chain

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

Braskem developed an adaptation study to identify the impacts of climate change in its global operations. One of the goals of the study was the mapping and prioritization of risks and opportunities.
Through this methodology, it was defined that a substantive strategic impact is noticed when the following threshold are reached for any of the categories listed below (e.g. Financial, Environmental, Social).

Impact Measurement (with respective Thresholds):

a) Financial: Above 'Losses above US $ 100,000.00' (Threshold)

b) Environmental: Above ‘Impact of considerable magnitude, but reversible with mitigation actions restricted to the company's area; and/or absence of impact on sensitive species/habitats.’ (Threshold)
c) Health and Safety: Above ‘Injury/disorder with medical leave, or injury/disorder without medical leave with restriction.’ (Threshold)
d) Social: Above ‘Complaints submitted to user/consumer/society service.’ (Threshold)
e) Image / Reputation: Above ‘Report on media at local (municipal or state) level; concern/complaints of specific groups/organizations (for ex.: NGOs).’ (Threshold)
f) Infrastructure: Above ‘Frequent partial reduction of production process.’ (Threshold)

Metrics and indicator used:

a) Metrics: The metric used was the cross between probability of occurrence (frequency) and impact measurement of each climate event for every category listed above. With these results, it was possible to classify the risks in low, medium and high by the crossing of the frequency with the impact measurement.
b) Indicators: The indicator used was the risk classification (low, medium and high). The risks classified as high are the ones that represent substantive change in our business and were the ones prioritized in the definition of adaptation actions.

The analysis is valid for Braskem’ s direct operation. For suppliers, the methodology follows the CDP Supply Chain standard where suppliers themselves report the risks with their magnitude of impact and likelihood according to their own methodology.

As an example, our Climate Risk and Adaptation Assessment considered 03 areas (Bahia, Rio de Janeiro and Alagoas) where Braskem has operations of high risk for water scarcity. This risk was classified as ‘High’ for these three regions because the Financial impact measurement surpass the US$ 100,000.00 threshold. Once identified those areas the company developed a study with FGV to better understand the risks and analyses scenarios with solutions such as reuse. Now the company is working on action plans with the operations from those areas to mitigate/eliminate water scarcity risks by adopting alternatives such as reuse, desalination and safe source of groundwater.

The risk of water scarcity is crucial for Braskem’ s operation because the importance rating of direct and indirect use of water is vital. Freshwater and reuse water is used throughout the entire production process, in processes such as cooling, steam generation, effluent treatment. Therefore, the lack of water can affect operational costs and ultimately cease operations. Because Braskem is a chemical industry, a significant part of our suppliers has the use of water similar to our processes, especially considering that Braskem’ s main raw material is petrochemical naphtha.

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	10	1-25	Despite representing about 24% of the total facilities these operations, represents 17.1% of the water withdraw, so we can assume that this is the percentage under risk.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?

Country/Area & River basin

Brazil

Other, please specify

Guandu (Rio de Janeiro)

Number of facilities exposed to water risk

3

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

1-10

Comment

According to Trucost, using the tool from WRI Aqueduct, the Guandu Basin presents a medium risk by 2040. Braskem is already studying an action plan to implement alternatives such as water reuse and desalination for its plants in the area (Chemicals 4; PE 9 and PP 5). Company is also engaging with other companies and stakeholders to invest in the potential alternatives.

To calculate the revenue that could be affected Braskem considered a series of potential scenarios (9 in total). For this questionnaire we adopted one of the scenarios that involves a 30% reduction in the water withdraw permit leading to a calculated reduction in production for the duration of the withdraw restriction (12 months).

Country/Area & River basin

United States of America

Other, please specify

Seadrift River, Victoria, Texas, United State

Number of facilities exposed to water risk

3

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

1-10

Comment

Trucost analyzed the full value of water for three of Braskem's locations and calculated potential revenue at risk due to water risks. The analysis conveyed that Braskem has significant water risk across these facilities. This study was recently completed, Braskem is evaluating the results in order to define the necessary mitigation actions.

To calculate the revenue that could be affected Braskem considered a series of potential scenarios (9 in total). For this questionnaire we adopted one of the scenarios that involves a 30% reduction in the water withdraw permit leading to a calculated reduction in production for the duration of the withdraw restriction (12 months).

Country/Area & River basin

Brazil

Other, please specify

Baixada Santista (São Paulo / Cubatão)

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

Less than 1%

Comment

According to Trucost, using the tool from WRI Aqueduct, the Baixada Santista Basin in 2040 presents a low to medium scarcity risk. Braskem is already studying an action plan to implement alternatives such as water reuse in the area (in PE 8 plant). Company is also engaging with other companies and stakeholders to invest in water alternatives and security in the same area.

To calculate the revenue that could be affected Braskem considered a series of potential scenarios (9 in total). For this questionnaire we adopted one of the scenarios that involves a 30% reduction in the water withdraw permit leading to a calculated reduction in production for the duration of the withdraw restriction (12 months).

Country/Area & River basin

Brazil

Other, please specify

Piracicaba, Capivari, Jundiaí (SP)

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

1-10

Comment

According to Trucost, using the tool from WRI Aqueduct, Rios Piracicaba, Capivari e Jundiaí Basin in 2040 presents a low to medium scarcity risk. Braskem is already studying an action plan to implement alternatives such as water reuse in the area (PP 3 plant). Company is also engaging with other companies and stakeholders to invest in water alternatives and security in the same area.

To calculate the revenue that could be affected Braskem considered a series of potential scenarios (9 in total). For this questionnaire we adopted one of the scenarios that involves a 30% reduction in the water withdraw permit leading to a calculated reduction in production for the duration of the withdraw restriction (12 months).

Country/Area & River basin

Brazil

Other, please specify

Remédios (Alagoas)

Number of facilities exposed to water risk

2

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

1-10

Comment

According to Trucost, using the tool from WRI Aqueduct, the CELMM Basin in 2040 presents a medium to high scarcity risk. Braskem is already studying an action plan to implement alternatives such as water reuse and desalination in the area (plants CS 1 and PVC 2). Company is also engaging with other companies and stakeholders to

invest in water alternatives and security in the same area.

To calculate the revenue that could be affected Braskem considered a series of potential scenarios (9 in total). For this questionnaire we adopted one of the scenarios that involves a 30% reduction in the water withdraw permit leading to a calculated reduction in production for the duration of the withdraw restriction (12 months).

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Brazil

Other, please specify

Guandu (Rio de Janeiro)

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity.

The plants located in Duque de Caxias (Chemicals 4, PE 9 and PP 5) are part of the Atlantic Forest biome of the State of Rio de Janeiro. Although the increase in temperature and reduction of precipitation are less impacting than in the other South-eastern biomes, the next years still tend to be hotter and drier with reduced rainfall periods. The water availability of plants may be reduced in the short and long term, resulting from an increase in temperature and consequent evaporation of water bodies. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages impacting industrial processes and electricity generation, especially considering Brazilian energy matrix characteristics (major contribution of hydro-electric energy). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

32,707,774

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Based on a series of 9 potential climate scenarios, using DEVESE methodology, with 2040 as the timescale, the value represents the potential impact of one of the scenarios. In this case it was considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Secure alternative water supply

Description of response

The Climate Change and Adaptation Plan developed by Braskem indicated water scarcity as the primary potential risk for the company's operations. The same plan complemented by specific high-risk basins studies (developed using DEVESE methodology), including Guandu, indicated the need to find new / alternative water sources to mitigate / neutralize the impacts of water scarcity as the main primary response to risk. Using DEVESE, the company estimated an internal price on water and the costs to invest in alternatives such as water reuse, desalination, among other, considering future water scarcity scenarios leading to restrictions on the water withdraw permit. Braskem is currently developing action plans (2017 / 2030) to find these new / alternative sources of water.

For the Guandu plants (Chemicals 4, PE 9 and PP 5) the company is already in contact with the regional sanitation company (CEDAE) to locate sewage treatment plants that can supply Braskem with reuse water in the scale that it needs. In 2018, the company started a conversation with PETROBRAS to potentially establish a partnership for a great reuse project including two industrial districts.

Cost of response

3,488,807

Explanation of cost of response

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

Country/Area & River basin

United States of America

Other, please specify

Seadrift River, Victoria, Texas, USA

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity.

The water availability of plants may be reduced in the short and long term, resulting from an increase in temperature and consequent evaporation of water bodies. The potential impacts: (1) Operational / structural impacts: Reducing water availability (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5,930,175

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Trucost analyzed the full value of water for three of Braskem's locations and calculated potential revenue at risk due to water risks. The analysis conveyed that Braskem has significant water risk across these facilities. The full value of water ranges from 4.0x the current market price to 11.3x the current market price. Braskem's total risk adjusted water bill is $5,930,175 or 8.35x higher than its current water bill.

Primary response to risk

Secure alternative water supply

Description of response

The Climate Change and Adaptation Plan developed by Braskem indicated water scarcity as the primary potential risk for the company's operations. The same plan complemented by specific high-risk basins studies (developed using DEVESE methodology), indicated the need to find new / alternative water sources to mitigate / neutralize the impacts of water scarcity as the main primary response to risk. Using DEVESE, the company estimated an internal price on water and the costs to invest in alternatives such as water reuse, desalination, among other, considering future water scarcity scenarios leading to restrictions on the water withdraw permit. Braskem is currently developing action plans (2017 / 2030) to find these new / alternative sources of water.

For the industrial units in USA, as water risk assessement was recently completed, Braskem is evaluating the results in order to define the necessary mitigation actions.

Cost of response

100,000

Explanation of cost of response

As the water risk assessment was recently completed, Braskem is evaluating the results to define the necessary mitigation actions. We have considered the costs related to the studies concluded. After actions defined we will update the total costs.

Country/Area & River basin

Brazil

Other, please specify

Baixada Santista (São Paulo/Cubatão)

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity.

The water availability of the plant (PE 8), located in the Atlantic Forest biome, may be reduced in the short and long term, resulting from a reduction in the amount of rainfall combined with an increase in temperature and consequent evaporation of water bodies. The PE 8 industrial plant produces polyethylene that supplies the Brazilian market, and represents around 5% of the global production of this product at Braskem The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages impacting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydro-electric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

Low

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5,545,576

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Based on a series of 9 potential climate scenarios, using DEVESE methodology, with 2040 as the timescale, the value represents the potential impact of one of the scenarios. In this case it was considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Secure alternative water supply

Description of response

The Climate Change and Adaptation Plan developed by Braskem indicated water scarcity as the primary potential risk for the company's operations. The same plan complemented by specific high-risk basins studies (developed using DEVESE methodology), including Baixada Santista basin, indicated the need to find new / alternative water sources to mitigate / neutralize the impacts of water scarcity as the main primary response to risk. Using DEVESE, the company estimated an internal price on water and the costs to invest in alternatives such as water reuse, desalination, among other, considering future water scarcity scenarios leading to restrictions on the water withdraw permit. Braskem is currently developing action plans (2017 / 2030) to find these new / alternative sources of water.

Baixada Santista Basin is close by ABC where part of our plants are covered by the Latin America largest industrial reuse plant – Aquapolo, which Braskem help establish. This plant is the main water withdraw source for the company's local operations and Braskem is analysing the possibility to link it to the Aquapolo system. Other alternatives such as the use of rainwater are under development in some of our plants.

Cost of response

662,797

Explanation of cost of response

The cost represents the difference between purchasing freshwater and purchasing reuse water at a price similar to Aquapolo (ABC reuse project - around 6.74 BRL/m3), to supply 100% of the region operations. The cost is recurring annually (long-term contract to make alternative viable to the local sanitation company). For the plants in Baixada Santista basin, Braskem is currently evaluating long-term contracts in a partnership with local companies.

Country/Area & River basin

Brazil

Other, please specify

Piracicaba, Capivari, Jundiaí (SP)

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity.

The water availability of the plant (PP 3), located in the Atlantic Forest biome, may be reduced in the short and long term, resulting from a reduction in the amount of rainfall combined with an increase in temperature and consequent evaporation of water bodies. The PP 3 industrial plant produces polypropylene that supplies the Brazilian market, and represents around 9% of the global production of this product at Braskem. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages impacting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydro-electric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

Medium

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5,015,817

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Based on a series of 9 potential climate scenarios, using DEVESE methodology, with 2040 as the timescale, the value represents the potential impact of one of the scenarios.

In this case it was considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Secure alternative water supply

Description of response

The Climate Change and Adaptation Plan developed by Braskem indicated water scarcity as the primary potential risk for the company's operations. The same plan complemented by specific high-risk basins studies (developed using DEVESE methodology), including Piracicaba, Capivari and Jundiaí River Basin, indicated the need to find new / alternative water sources to mitigate / neutralize the impacts of water scarcity as the main primary response to risk. Using DEVESE, the company estimated an internal price on water and the costs to invest in alternatives such as water reuse, desalination, among other, considering future water scarcity scenarios leading to restrictions on the water withdraw permit. Braskem is currently developing action plans (2017 / 2030) to find these new / alternative sources of water.

The company is already in contact with the local sanitation company responsible for the Piracicaba, Capivari and Jundiaí River Basin (São Paulo/Paulínia) area to locate sewage treatment plants with reuse potential and groundwater alternatives for the industrial district where Braskem operates. Other alternatives such as the use of rainwater are under development in some of our plants.

Cost of response

609,433

Explanation of cost of response

The cost represents the difference between purchasing freshwater and purchasing reuse water at a price similar to Aquapolo (ABC reuse project - around 6.74 BRL/m3), to supply 100% of the region operations. The cost is recurring annually (long-term contract to make alternative viable to the local sanitation company). For the plants in Piracicaba, Capivari and Jundiaí River Basin, Braskem is currently evaluating long-term contracts in a partnership with local companies.

Country/Area & River basin

Brazil

Other, please specify

Remédios (Alagoas)

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity.

The plants located in Alagoas (CS 1 and PVC 2) are part of the Atlantic Forest biome of the State of Alagoas. The increase in temperature and reduction of precipitation are less impacting than in the Caatinga biome, but the next years still tend to be hotter and drier with reduced rainfall periods. Although located near the Mundaú-Manguaba estuary, the water availability of the plant may be reduced in the short and long term, resulting from an increase in temperature and consequent evaporation of water bodies. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages impacting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydro-electric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Virtually certain

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

47,989,276

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Based on a series of 9 potential climate scenarios, using DEVESE methodology, with 2040 as the timescale, the value represents the potential impact of one of the scenarios. In this case it was considered a 30% reduction in the water permit withdraw for 12

months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Secure alternative water supply

Description of response

The Climate Change and Adaptation Plan developed by Braskem indicated water scarcity as the primary potential risk for the company's operations. The same plan complemented by specific high-risk basins studies (developed using DEVESE methodology), including Remédios River Basin, indicated the need to find new / alternative water sources to mitigate / neutralize the impacts of water scarcity as the main primary response to risk. Using DEVESE, the company estimated an internal price on water and the costs to invest in alternatives such as water reuse, desalination, among other, considering future water scarcity scenarios leading to restrictions on the water withdraw permit. Braskem is currently developing action plans (2017 / 2030) to find these new / alternative sources of water.

The company is already in contact with the sanitation company responsible for the Remédios Basin (Alagoas) and already located a sewage treatment plant with reuse potential near where Braskem operates. Now the company is finalizing a series of cost benefit analysis to check the viability of projects.

Cost of response

5,980,618

Explanation of cost of response

The cost represents the difference between purchasing freshwater and purchasing reuse water at a price similar to Aquapolo (ABC reuse project - around 6.74 BRL/m3), to supply 100% of the region operations. The cost is recurring annually (long-term contract to make alternative viable to the local sanitation company). For the plants Remédios River Basin, Braskem is currently evaluating long-term contracts in a partnership with local companies.

W4.2a

(W4.2a) Provide details of risks identified within your value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Brazil

Other, please specify

Alto Tietê (São Paulo)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity. Based on the assessment, all those who supply to Braskem's operations and are located in this same region of high risk were considered at risk of product disruption as well, because they do not have access to alternative sources of water (36 suppliers total in Alto Tietê), Suppliers fed by this water basin can be affected in the short term, due to a combination of factors such as the reduction of rainfall, increase in temperature and consequent evaporation of water bodies and increased demand by a growing population and economy. In terms of financial impacts, it should be noted that water scarcity might increase the price of water, generating financial impact for Braskem and for the supplier. It could also lead to disruption of supply of raw material to our company. However, those connected to the Aquapolo reuse plant might not be affected by the crisis, as it was the case in the drought of 2014 and 2015.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

81,508,042

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Supply issues have the same impact as reduction in direct operations thus same value also based on a series of 9 potential scenarios with 2040 as the timescale. In this case the scenario considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Supplier engagement
Increase supplier reporting on water

Description of response

Braskem encourages its suppliers to report by inviting and encouraging them to participate in CDP events, workshops and training, as well as direct contact for support in the questionnaire response process. Braskem reinforces the invitation from CDP Supply chain so that all suppliers participate in the Action Exchange, obtaining a free consultation to identify initiatives to reduce impacts and costs. In addition, in the supplier evaluation process, Braskem inserted a bonus in the score of those who join the CDP Supply Chain. In addition, Braskem develops Workshops every year to train its suppliers in reporting to CDP SC. In 2017 and 2018, Braskem in São Paulo and Triunfo arranged Workshops with more than 15 suppliers participating. Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Monetizer tool.
In 2019, the Procurement area, supported by Braskem's Sustainable Development area, held the first event to recognize suppliers with best performance in management of water resources and climate change issues. The event had 96 participants, including suppliers, speakers and Team Members. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact. Thus, we select only the most critical suppliers that can be impacted by the potential scenarios of severe droughts or extreme climate change events. The criterion for recognizing suppliers was the performance at the 2018.

Cost of response

50,000

Explanation of cost of response

Costs to engage in the CDP Supply chain program, including benefits such as inviting suppliers; individual support with gap analysis; consultancy with identification of improvement opportunities and participation in Latin American discussions. Costs also include CDP workshops. The cost is recurring annually.

Country/Area & River basin

Brazil
Other, please specify
Guandu (Rio de Janeiro)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity. Based on the assessment, all those who supply to Braskem's operations and are located in this same region of high risk were considered at risk of product disruption as well, because they do not have access to alternative sources of water (3 suppliers total in Guandu).

Although the increase in temperature and reduction of precipitation are less impacting than in the other South-eastern biomes, the next years still tend to be hotter and drier with reduced rainfall periods that combined with population increase can affect suppliers. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages affecting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydroelectric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

32,702,774

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Supply issues have the same impact as reduction in direct operations thus same value also based on a series of 9 potential scenarios with 2040 as the timescale. In this case the scenario considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Supplier engagement

Increase supplier reporting on water

Description of response

Braskem encourages its suppliers to report by inviting and encouraging them to participate in CDP events, workshops and training, as well as direct contact for support in the questionnaire response process. Braskem reinforces the invitation from CDP Supply chain so that all suppliers participate in the Action Exchange, obtaining a free consultation to identify initiatives to reduce impacts and costs. In addition, in the supplier evaluation process, Braskem inserted a bonus in the score of those who join the CDP Supply Chain. In addition, Braskem develops Workshops every year to train its suppliers in reporting to CDP SC. In 2017 and 2018, Workshops were arranged by Braskem in São Paulo and Triunfo, with more than 15 suppliers participating. Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Monetizer tool.
In 2019, the Procurement area, supported by Braskem's Sustainable Development area, held the first event to recognize suppliers with best performance in management of water resources and climate change issues. The event had 96 participants, including suppliers, speakers and Team Members. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact. Thus, we select only the most critical suppliers that can be impacted by the potential scenarios of severe droughts or extreme climate change events. The criterion for recognizing suppliers was the performance at the 2018.

Cost of response

50,000

Explanation of cost of response

Costs to engage in the CDP Supply chain program, including benefits such as inviting suppliers; individual support with gap analysis; consultancy with identification of improvement opportunities and participation in Latin American discussions. Costs also include CDP workshops. The cost is recurring annually.

Country/Area & River basin

Brazil

Other, please specify

Recôncavo & Inhambupe (Bahia)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity. Based on the assessment, all those who supply to Braskem's operations and are located in this same region of high risk were considered at risk of product disruption as well, because they do not have access to alternative sources of water (7 suppliers total in Recôncavo & Inhambupe).

Despite being located between two large reservoirs, the water availability of the suppliers may be reduced in the short term, resulting from reduced rainfall periods, increase in temperature, evaporation and demand by a growing population and economy. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages affecting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydroelectric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

182,868,632

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Supply issues have the same impact as reduction in direct operations thus same value also based on a series of 9 potential scenarios with 2040 as the timescale. In this case the scenario considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Supplier engagement

Increase supplier reporting on water

Description of response

Braskem encourages its suppliers to report by inviting and encouraging them to participate in CDP events, workshops and training, as well as direct contact for support in the questionnaire response process. Braskem reinforces the invitation from CDP Supply chain so that all suppliers participate in the Action Exchange, obtaining a free consultation to identify initiatives to reduce impacts and costs. In addition, in the supplier evaluation process, Braskem inserted a bonus in the score of those who join the CDP Supply Chain. Also, Braskem develops Workshops every year to train its suppliers in reporting to CDP SC. In 2017 and 2018, Workshops were arranged by Braskem in São Paulo and Triunfo, with more than 15 suppliers participating. Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Monetizer tool.

In 2019, the Procurement area, supported by Braskem's Sustainable Development area, held the first event to recognize suppliers with best performance in management of water resources and climate change issues. The event had 96 participants, including suppliers, speakers and Team Members. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact. Thus, we select only the most critical suppliers that can be impacted by the potential scenarios of severe droughts or extreme climate change events. The criterion for recognizing suppliers was the performance at the 2018.

Cost of response

50,000

Explanation of cost of response

Costs to engage in the CDP Supply chain program, including benefits such as inviting suppliers; individual support with gap analysis; consultancy with identification of improvement opportunities and participation in Latin American discussions. Costs also include CDP workshops. The cost is recurring annually.

Country/Area & River basin

Brazil

Other, please specify

Baixada Santista (São Paulo/Cubatão)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity. Based on the assessment, all those who supply to Braskem's operations and are located in this same region of high risk were considered at risk of product disruption as well, because they do not have access to alternative sources of water (36 suppliers total in Baixada Santista).

Suppliers fed by this water basin can be affected in the short term, due to a combination of factors such as the reduction of rainfall, increase in temperature and consequent evaporation of water bodies and increased demand by a growing population and economy. In terms of financial impacts, it should be noted that water scarcity might increase the price of water, generating financial impact for Braskem and for the supplier. It could also lead to disruption of supply of raw material to our company. However, those connected to the Aquapolo reuse plant might not be affected by the crisis, as it was the case in the drought of 2014 and 2015.

Timeframe

More than 6 years

Magnitude of potential impact

Low

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5,545,576

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Supply issues have the same impact as reduction in direct operations thus same value also based on a series of 9 potential scenarios with 2040 as the timescale. In this case the scenario considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Supplier engagement

Increase supplier reporting on water

Description of response

Braskem encourages its suppliers to report by inviting and encouraging them to participate in CDP events, workshops and training, as well as direct contact for support in the questionnaire response process. Braskem reinforces the invitation from CDP Supply chain so that all suppliers participate in the Action Exchange, obtaining a free consultation to identify initiatives to reduce impacts and costs. In addition, in the supplier evaluation process, Braskem inserted a bonus in the score of those who join the CDP Supply Chain. Also, Braskem develops Workshops every year to train its suppliers in reporting to CDP SC. In 2017 and 2018, Workshops were arranged by Braskem in São Paulo and Triunfo, with more than 15 suppliers participating. Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Monetizer tool.

In 2019, the Procurement area, supported by Braskem's Sustainable Development area, held the first event to recognize suppliers with best performance in management of water resources and climate change issues. The event had 96 participants, including suppliers, speakers and Team Members. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact. Thus, we select only the most critical suppliers that can be impacted by the potential scenarios of severe droughts or extreme climate change events. The criterion for recognizing suppliers was the performance at the 2018.

Cost of response

50,000

Explanation of cost of response

Costs to engage in the CDP Supply chain program, including benefits such as inviting suppliers; individual support with gap analysis; consultancy with identification of improvement opportunities and participation in Latin American discussions. Costs also include CDP workshops. The cost is recurring annually.

Country/Area & River basin

Brazil

Other, please specify

Piracicaba, Capivari, Jundiaí (SP)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity. Based on the assessment, all those who supply to Braskem's operations and are located in this same region of high risk were considered at risk of product disruption as well, because they do not have access to alternative sources of water (36 suppliers total in Piracicaba, Capivari, Jundiaí).

Suppliers fed by this basin can be affected in the short term since years tend to be hotter and drier with reduced rainfall periods. This region is one of the most industrialized in the country and consumption might exceed the demand by 22% if investments are not done. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages affecting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydroelectric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

Medium

Likelihood

Likely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5,015,817

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Supply issues have the same impact as reduction in direct operations thus same value also based on a series of 9 potential scenarios with 2040 as the timescale. In this case the scenario considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Supplier engagement
Increase supplier reporting on water

Description of response

Braskem encourages its suppliers to report by inviting and encouraging them to participate in CDP events, workshops and training, as well as direct contact for support in the questionnaire response process. Braskem reinforces the invitation from CDP Supply chain so that all suppliers participate in the Action Exchange, obtaining a free consultation to identify initiatives to reduce impacts and costs. In addition, in the supplier evaluation process, Braskem inserted a bonus in the score of those who join the CDP Supply Chain. Also, Braskem develops Workshops every year to train its suppliers in reporting to CDP SC. In 2017 and 2018, Workshops were arranged by Braskem in São Paulo and Triunfo, with more than 15 suppliers participating. Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Monetizer tool.
In 2019, the Procurement area, supported by Braskem's Sustainable Development area, held the first event to recognize suppliers with best performance in management of water resources and climate change issues. The event had 96 participants, including suppliers, speakers and Team Members. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact. Thus, we select only the most critical suppliers that can be impacted by the potential scenarios of severe droughts or extreme climate change events. The criterion for recognizing suppliers was the performance at the 2018.

Cost of response

50,000

Explanation of cost of response

Costs to engage in the CDP Supply chain program, including benefits such as inviting suppliers; individual support with gap analysis; consultancy with identification of improvement opportunities and participation in Latin American discussions. Costs also include CDP workshops. The cost is recurring annually.

Country/Area & River basin

Brazil

Other, please specify

Remédios (Alagoas)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Physical

Increased water stress

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Primary risk driver was identified through Braskem Climate Change and Adaptation study in partnership with ERM and Trucost, followed by the analysis of specific river basin scenarios, considering 2040 as timeframe and factors such as one drought event every five years lasting for 12 months among other variables. Such drought would lead the company to its primary potential impact – reduction or disruption in production capacity. Based on the assessment, all those who supply to Braskem's operations and are located in this same region of high risk were considered at risk of product disruption as well, because they do not have access to alternative sources of water (2 suppliers total in Remédios).

Suppliers fed by this water basin can be affected in the short term, due to increase in demand temperature and reduction of precipitation and consequent evaporation. The potential impacts: (1) Operational / structural impacts: Reducing water availability causing unscheduled outages affecting industrial processes and electricity generation (Brazilian energy matrix are predominantly hydroelectric). (2) Financial impacts: water scarcity increasing the price of water will generate financial impact for the plant. There may be changes in legislation regarding the water withdraw leading to an increase in the price of water, and consequently in the costs of operation.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Virtually certain

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

47,989,276

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Supply issues have the same impact as reduction in direct operations thus same value also based on a series of 9 potential scenarios with 2040 as the timescale. In this case the scenario considered a 30% reduction in the water permit withdraw for 12 months in a 05-year period that could lead to a calculated reduction in production affecting directly the regional plant's load (reflecting on the plant's EBITDA). This potential financial impact was calculated based on historical data.

Primary response to risk

Supplier engagement

Increase supplier reporting on water

Description of response

Braskem encourages its suppliers to report by inviting and encouraging them to participate in CDP events, workshops and training, as well as direct contact for support in the questionnaire response process. Braskem reinforces the invitation from CDP Supply chain so that all suppliers participate in the Action Exchange, obtaining a free consultation to identify initiatives to reduce impacts and costs. In addition, in the supplier evaluation process, Braskem inserted a bonus in the score of those who join the CDP Supply Chain. In addition, Braskem develops Workshops every year to train its suppliers in reporting to CDP SC. In 2017 and 2018, Workshops were arranged by Braskem in São Paulo and Triunfo, with more than 15 suppliers participating. Braskem has organized workshops on water risk and valuation where, in partnership with stakeholders, building capacity for its suppliers on the Water Risk Monetizer tool.
In 2019, the Procurement area, supported by Braskem's Sustainable Development area, held the first event to recognize suppliers with best performance in management of water resources and climate change issues. The event had 96 participants, including suppliers, speakers and Team Members. The initiative is relevant because, within our risk matrix, water and climate have a high potential for impact. Thus, we select only the most critical suppliers that can be impacted by the potential scenarios of severe droughts or extreme climate change events. The criterion for recognizing suppliers was the performance at the 2018.

Cost of response

50,000

Explanation of cost of response

Costs to engage in the CDP Supply chain program, including benefits such as inviting suppliers; individual support with gap analysis; consultancy with identification of

improvement opportunities and participation in Latin American discussions. Costs also include CDP workshops. The cost is recurring annually.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity

Efficiency

Primary water-related opportunity

Cost savings

Company-specific description & strategy to realize opportunity

Save costs by reducing the amount of water used in the Companies Toilets.

Braskem plants have been using new technology that allows us to reduce the consumption of water by thousands of liters per month. Installed in bathrooms, the Piipee is a device that saves up to 75% of water in toilets bowls. The device uses a biodegradable additive, removing odour and colour from urine, avoiding the need to flush the toilet. Piipee – the company responsible for developing the solution – estimates that the technology has the potential to save over 60 million liters of water per year in all Braskem's plants in Brazil. The initiative was already implemented in Bahia (installation of the Piipee device in every toilet), covering 6 industrial sites (Q1, PE1, PE2, PE3, PVC1, CS2), and the idea is that the implementation is expanded to every other Braskem facility in the next couple of years (strategy to realize the opportunity).

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

Low-medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

193,565

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

It is estimated that, on average, 7 to 20 liters of drinking water are wasted down the drain when toilet is flushed. The innovation significantly reduces water consumption, saving up to 75% of water in toilets bowls. When this saving (using Braskem data) is multiplied by the cost of water, we reach the potential financial impact. This potential financial impact was calculated based on historical data.

Type of opportunity

Efficiency

Primary water-related opportunity

Cost savings

Company-specific description & strategy to realize opportunity

Cost savings by investing in efficiency such as the optimization of the cooling towers, scheduled shutdowns for maintenance and cleaning, reuse in closed loops, among others. This opportunity is directly related with Braskem's operational characteristic (petrochemical company). For example, our plant in Santo Andre (PE 7) closed the loop on water reuse. It discharges its effluent directly to a sewage treatment station linked to our water reuse supplier (Aquapolo), from that, the water is treated and reinserted into the PE 7 process reducing the amount of "new" water.

Braskem uses specific indicators to measure its water efficiency, such as water consumption (m3 / t of product) and generation of effluents (m3 / t of product). For effluents generation, the 2020 result was 6.9% lower than 2019. Some factors directly contribute to the better performance in our numbers, such as temperature control and better water quality from third parties decreased consumption of water in cooling towers; The strategy to implement the water efficiency actions revolves around the constant monitoring of the water consumption index made by each industrial sites, identifying opportunities to reduce the index.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

3,127,687

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

Value was calculated based on the year's consumption being above baseline year (2002) but discharge being lower than baseline, but both being above the target goal for 2019. The value represents how much was saved in relation to the projected costs if the company have stayed at the baseline level and not below. Water efficiency lost 4,597,463 but effluent generation saved 7,725,150.

Water quality impacts the number of times it may be recirculated in cooling processes. The worse the quality, the lower the number of recycles and, consequently, the greater the water consumption. Water recirculation in cooling processes concentrates substances during this cycle. The purer the water used, the more cycles can be performed and the less water replacement will be required. In addition, several factors contributed to improving the Company's performance in water consumption, such as adjustments and improvements in cooling tower cycles (using additives, improving water quality), implementation of measures to reduce consumption due to the water crisis, minimization of losses, and elimination of leaks. This potential financial impact was calculated based on historical data.

Type of opportunity

Resilience

Primary water-related opportunity

Increased resilience to impacts of climate change

Company-specific description & strategy to realize opportunity

Identification and neutralization of potential impacts of water scarcity in the operations.

Through its climate change and adaptation study the company invested in calculate the cost of alternative uses of water to implement them (reuse, desalination, groundwater, etc.) in order to secure water for the operations, especially those in high-risk areas such as the Rio de Janeiro, Bahia, São Paulo and Alagoas plants.

The company is now developing action plans to invest on water source alternatives.

As an example of strategy in action, it is important to highlight the assessment of alternative sources of water made by Braskem with Aquapro in Rio de Janeiro in 2017/2018, which allowed Braskem to identify alternatives such as desalinization and reuse water. In 2018, the assessment evolved into a cost benefit analysis and led to opening a dialogue with PETROBRAS to understand the potential to implement a collective reuse project to support 2 industrial districts in the region instead of individual

companies.

Estimated timeframe for realization

1 to 3 years

Magnitude of potential financial impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

16,085,790

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

Calculation was a result of the impact caused by a disruption in production due to water scarcity scenarios leading to restrictions in the permits to withdraw water around 30% (what was legally inputted on companies in Brazil last crisis) in a specific period. The number reflects the projected losses in production.
Scenarios considered factors such as a severe 12 months crisis in a 05 years period, 12 months crisis in a 10 years period, and others. Scenario and costs were calculated by the DEVESE methodology. Based on these scenarios the company is designing action plans for its plants in Rio de Janeiro, Bahia and Alagoas in Brazil. This potential financial impact was calculated based on historical data.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.

Facility reference number

Facility 1

Facility name (optional)

Chemicals 4

Country/Area & River basin

Brazil

Other, please specify

Guandu (Rio de Janeiro)

Latitude

-22.713099

Longitude

-43.242728

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

3,826.07

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

3,826.07

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

547.19

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

547.19

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

3,278.88

Comparison of total consumption with previous reporting year

Lower

Please explain

Water withdraws decreased (6.95%) due to lower production, who also decreased effluent discharges (10.83%).

Facility reference number

Facility 2

Facility name (optional)

PE 9

Country/Area & River basin

Brazil

Other, please specify

Guandu (Rio de Janeiro)

Latitude

-22.713099

Longitude

-43.242728

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

863.14

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

863.14

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

26.17

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

26.17

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

836.97

Comparison of total consumption with previous reporting year

Lower

Please explain

Water withdraws decreased 9.5% due to a lower in production (4.64%) who also decreased effluent discharges 8.84% and consumption had increased.

Facility reference number

Facility 3

Facility name (optional)

PP 5

Country/Area & River basin

Brazil

Other, please specify

Guandu (Rio de Janeiro)

Latitude

-22.713099

Longitude

-43.242728

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

317.16

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

317.16

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

22.01

Comparison of total discharges with previous reporting year

Higher

Discharges to fresh surface water

22.01

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

295.15

Comparison of total consumption with previous reporting year

Higher

Please explain

Water withdraws decreased 2.94% due to a lower production 3.13% and effluent discharges incresead 22.74% Due to operational inefficiency, in some periods, in some processes.

Facility reference number

Facility 4

Facility name (optional)

PP8

Country/Area & River basin

United States of America

Other, please specify

River San Jacinto

Latitude

29.89

Longitude

-95.1

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

1,071.93

Comparison of total withdrawals with previous reporting year

Higher

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

1,071.93

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

563.36

Comparison of total discharges with previous reporting year

Higher

Discharges to fresh surface water

563.36

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

508.57

Comparison of total consumption with previous reporting year

Higher

Please explain

Water withdraw incresead 12% due to a higer production 20.24% and consequently, effluent discharges increased by only 1.25% due to better operational efficiency.

Facility reference number

Facility 5

Facility name (optional)

PP10

Country/Area & River basin

United States of America

Other, please specify

River Seadrift

Latitude

30.95

Longitude

-96.76

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

903.3

Comparison of total withdrawals with previous reporting year

Higher

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

903.3

Total water discharges at this facility (megaliters/year)

303.32

Comparison of total discharges with previous reporting year

About the same

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

303.32

Total water consumption at this facility (megaliters/year)

599.98

Comparison of total consumption with previous reporting year

Higher

Please explain

Despite the reduction in production by around 10%, water withdrawal increased by 1.16% and the effluents discharge remained at the same value as last year due to the worst operational efficiency in some periods.

Facility reference number

Facility 6

Facility name (optional)

PP13

Country/Area & River basin

United States of America

Other, please specify

River Seadrift

Latitude

30.95

Longitude

-96.76

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

836.06

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

836.06

Total water discharges at this facility (megaliters/year)

175.6

Comparison of total discharges with previous reporting year

Higher

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

175.6

Total water consumption at this facility (megaliters/year)

660.46

Comparison of total consumption with previous reporting year

Lower

Please explain

Water withdraw decresead 11.06 due to lower production 11.75% however the discharge of effluents increased 101% due to worse operational efficiency.

Facility reference number

Facility 7

Facility name (optional)

PE 8

Country/Area & River basin

Brazil

Other, please specify

Baixada Santista (São Paulo - Cubatão)

Latitude

-23.856066

Longitude

-46.413245

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

443.28

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

438.85

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

4.43

Total water discharges at this facility (megaliters/year)

266.92

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

266.92

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

176.36

Comparison of total consumption with previous reporting year

Lower

Please explain

Water withdrawal decreased (10.73%) with a production decrease (13.35%). Effluent decreased (1.09%) leading to a reduction in consumption due to better operational efficiency.

Facility reference number

Facility 8

Facility name (optional)

PP 3

Country/Area & River basin

Brazil

Other, please specify

Piracicaba, Capivari, Jundiaí (SP)

Latitude

-22.7181

Longitude

-47.1343

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

473.61

Comparison of total withdrawals with previous reporting year

Higher

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

473.61

Total water discharges at this facility (megaliters/year)

70.89

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

70.89

Total water consumption at this facility (megaliters/year)

402.72

Comparison of total consumption with previous reporting year

Higher

Please explain

Water withdraws increased (4.88%) following an increase in production (9.92%). Effluent discharges also increased (6.64%) leading to a higher consumption.

Facility reference number

Facility 9

Facility name (optional)

CS1

Country/Area & River basin

Brazil

Other, please specify

Remédios (Alagoas)

Latitude

-9.672095

Longitude

-35.746608

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

587.39

Comparison of total withdrawals with previous reporting year

Much lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

587.39

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

463.95

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

463.95

Total water consumption at this facility (megaliters/year)

123.44

Comparison of total consumption with previous reporting year

Much lower

Please explain

Water withdraws significantly decreased (59.43%) following a great production reduction (99%), due to interruption of the operation to implement project changes in the industrial unit . Effluent discharges also reduced (11.6%) leading to a lower consumption.

Facility reference number

Facility 10

Facility name (optional)

PVC 2

Country/Area & River basin

Brazil

Other, please specify

Remédios (Alagoas)

Latitude

-9.669779

Longitude

-35.824888

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

3,755.33

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

3,304.61

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

450.72

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

1,595.73

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

1,595.73

Total water consumption at this facility (megaliters/year)

2,159.6

Comparison of total consumption with previous reporting year

Lower

Please explain

Water withdraws decreased (4.24%) following a production reduction (8.45%). Effluent discharges reduced (4.43%) and also consumption decreased.

W5.1a

(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?

Water withdrawals – total volumes

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water withdrawals – volume by source

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water withdrawals – quality

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water discharges – total volumes

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water discharges – volume by destination

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water discharges – volume by treatment method

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water discharge quality – quality by standard effluent parameters

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water discharge quality – temperature

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water consumption – total volume

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

Water recycled/reused

% verified

76-100

What standard and methodology was used?

Braskem plants are ISO 14.000 certified and thus pass through an auditing process where water and effluent parameters integrate the evaluation to maintain the certification. If any non-conformities in these parameters are found, they generate a report and a deadline to solve the issue. KPMG also verified data using ISAE 3000 standard yearly.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Description of business dependency on water Description of business impact on water Description of water-related performance standards for direct operations Description of water-related standards for procurement Reference to international standards and widely-recognized water initiatives Company water targets and goals Commitment to align with public policy initiatives, such as the SDGs Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to stakeholder awareness and education Commitment to water stewardship and/or collective action	Braskem is a petrochemical industry, intensive in water use thus very dependable / impacting on water and susceptible to its issues (e.g. scarcity causing production disruption and millions in losses). For so, water is present in public company-wide policies (Sustainability and HSE), macro objectives (Operational Eco-efficiency- monitored by the Board), in our ERM oversighted by the CEO. Braskem established goals (reduce production intensity m3/ton; increase reuse percentage and reduce effluent generation m3/ton) and indicators (e.g. “Water Safety Index”). All our goals are voluntary, beyond legal requirements, aligned with the SDG6 and WASH targets. Company respond to CDP Water and incentive (procurement bonus) supply chain to do so. Braskem also leads important water groups in forums such as CEBDS (e.g. water security commitment), UNGC CEO Water Mandate and UNGC Brazil, participating on collective and awareness actions and investing in innovation (Braskem Labs). HSE also issues water guidelines and standards.

		Acknowledgement of the human right to water and sanitation Recognition of environmental linkages, for example, due to climate change	

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Chief Operating Officer (COO)	Water has an important position in Braskem's materiality matrix and is thus on of the strategic items that integrates our Macro goals that are systematically followed up by the Committees, where leaders and experts participate. The Brazil Manufacturing & Global Industrial Operations Vice President (COO) is the operational eco-efficiency Macro Objective sponsor and the person responsible for enforcing the implementation of all the actions to achieve the macro objectives, including water efficiency (for which the goal is to reduce water consumption index (m3/t), among others). COO was chosen because he leads an area with a relevant impact on the company's eco-efficiency results. An example of the action taken was the approval of the water security plan in Bahia, where through new sources of water withdrawal and other strategic actions, it reduced the risk of these operations.
Board-level committee	Board committee regularly monitors and manages the company's main business risks, including water risks associated with climate risks. The Board of Directors is responsible for water-related issues, since one of its roles is to oversight the matters related to Sustainability. Water efficiency is a material aspect to Braskem, being one of the highlighted items in Braskem's Sustainable Development Policy. An example of the action taken was the approval / recognition of the potential high water risk in the DCX region, within the corporate risk strategy, thus authorizing the industrial director to start the project to identify alternative sources of water withdrawal.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - all meetings	Monitoring implementation and performance Overseeing acquisitions and divestiture Overseeing major capital expenditures Providing employee incentives Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Reviewing innovation/R&D priorities Setting performance objectives	From the Macro Goal Operational Eco- Efficiency, water risk was inserted into the Enterprise Risk Management (ERM) as one of the critical criteria for action plans, company's strategies and investments. A water efficiency indicator supports the evaluation of plants exposed to high water risks leading to implementation and optimization of water use in the plants; and to analyse investments in reuse / desalination technologies to mitigate risks. All enforced by Braskem HSE and Sustainable Development policies that lead to Corporate Responsibility and Innovation projects (Braskem Labs). Performance targets directs investments in water efficiency and are public disclosed in the company's annual report. All the information are presented to the board trough a specific achievement indicator of the Macro Objectives, and the actions undertaken by the company to achieve this result. The Brazil Manufacturing & Global Industrial Operations Vice President (COO), Sponsor of Operational ECO-Efficiency MO, reports periodically the status of the progress of water stewardship to the board of directors, being this the main governance mechanism that allows the constant oversight of water issues.

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)

Chief Operating Officer (COO)

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

Half-yearly

Please explain

Braskem's COO who is responsible for achieving the goals approved by the company's board. In the case of water, the sponsor is the Brazil Manufacturing & Global Industrial Operations Vice President (COO), the COO reports directly to the President of the company (CEO). His duty is therefore to enforce and guarantee the implementation of all the actions to achieve the water macro objectives.
Management is carried out through a technical and strategic committee, in which leaders from all the technical areas involved (Directors and Vice Presidents) participate, who assess and define the main short and long-term challenges. The Corporate Environment area reports water issues to the COO. The COO reports water issues to the board, annually, that are the short- and long-term plans and goals, as well as compliance and evolution.
The industrial directors responsible for water security action plans, periodically report the progress for COO.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	Incentives for the management of water issues are considered in the achievement of goals to reduce water consumption in operations and to reduce water risk.

W6.4a

(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Role(s) entitled to incentive	Performance indicator	Please explain
Monetary reward	Chief Operating Officer (COO) Other, please specify	Reduction in consumption volumes	Each employee has a set of goals to achieve each year and the achievement is what defines the value of their profit sharing. The goals are evaluated through the water efficiency indicator. The chosen indicator is the specific annual water

	Sustainability VP and Director		consumption, that is, total annual water consumption (in m3) divided by the total annual production. In terms of reduction in consumption, Braskem has set an annual target of reducing the water consumption intensity in its operations. The indicator was chosen because Braskem is water-intensive industry and can improve this indicator by implementing water efficiency initiatives. The assessment of compliance following the results: 0% -not achieved, 50% -partial achievement, 100% -total achievement. It is recommended that each target value be at least 5% of the variable remuneration. Thus, it reached the goal, 5% is obtained; partially reached 2.5%; did not reach, 0. The operational directors have in their PA (Action Plan), associated water efficiency index results with economic incentives. The water efficiency index results are reported to Vice Presidents. Each director/manager/employee has variable remuneration (profit sharing) associated with the result of his agreed goals. The Director of an industrial unit, located in a region of water stress, has as a goal, associated with an economic incentive, to identify an alternative source of water, thus reducing the water risk.
Non-monetary reward	Director on board Other, please specify Sustainability Director, VP and Manager	Other, please specify Efficiency project or target – direct operations	Each Braskem employee has a set of goals to achieve each year, and the achievement or not is what defines the value of their profit sharing, making achieving the goals attractive and incentivized to each collaborator. Complementarily, the company also give an internal award to those who work stood out, incentivizing professionals to improve performance on the subjects including water. This ‘prize’ (internal recognition) is awarded by a Braskem VP every three months, considering the people responsible for initiatives that stood out (water included). The threshold is defined by the HR team, through a methodology developed which included the scope and magnitude of the initiative.

			This indicator was chosen to incentivize people to present new and innovative solution regarding water stewardship.

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

Yes, direct engagement with policy makers
Yes, funding research organizations
Yes, other

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

Braskem is a very active member of several organizations that advocacy for water. It joined the efforts of CNI and CEBDS to influence a bill to incentive water reuse in Brazil. Braskem leads the environmental group of ABIQUIM that frequently advocate in water issues.

To ensure that our representatives are aligned with our policies and represents the best interests of Braskem, only leaders / specialists on water (previously briefed) are allowed to represent the company in forums / advocacy actions. This process guarantees that all Braskem's activities are consistent with our policies. Results from the participation in external forums / initiatives must be presented to the sustainability and water leaders / sponsors. If the results / interests are inconsistent with Braskem's water policy, the company evaluates whether to maintain its participation or not.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)
Braskem_RI2020_EN (1).pdf

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	> 30	Braskem developed a climate risk and adaptation plan considering 2040 AS THE HORIZON. Based on these scenarios, critical areas for WATER SCARCITY AND FLOODS (ISSUES) that impact business objectives were established with Trucost & DEVESE. Company then started developing action plans to mitigate and/or finding alternatives to avoid production losses due to water security issues. These plans are considering alternatives such as water reuse and desalination. TO DEFINE THE BETTER ALTERNATIVE TO AVOID SCARCITY ISSUES BRASKEM CALCULATED AN INTERNAL PRICE ON WATER CONSIDERING CLIMATE MODELS UP TO 2040 (WHY). Company already have a successful reuse model that is the Aquapolo (project allowed the company to pass through the São Paulo water crisis without production losses, on the contrary, production increased). The possibility to replicate this model is currently associated to the long-term business strategies to avoid production and financial losses. The company has established a goal of becoming a reference for the chemical sector in water efficiency use and increase water reuse to reach 30% in 2025 and 50% in 2030. The goal is aligned with the general long-term business objective to be a reference company in sustainability for the chemical sector and a company that provide sustainable products and solutions through thermoplastic resins.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	> 30	Braskem is developing, since 2017, ACTION PLANS FOR ALL THE PLANTS LOCATED IN HIGH-RISK WATER BASINS (HOW), according to our climate impact and adaptation study to MITIGATE AND/OR FINDING ALTERNATIVES TO AVOID PRODUCTION LOSSES (WHY) DUE TO WATER SCARCITY ISSUES (WHICH). These plans are considering alternatives such as water reuse and desalination, comprehending assessments in partnership with local sanitation companies and depending on location, a partnership with other businesses. A reuse model for the company is the Aquapolo, a project that allowed the company to pass through the São Paulo water crisis without production losses; on the contrary, production was able

			to increase. The period for reuse contracts is 40 years, and the CLIMATE SCENARIOS CONSIDERED REACH UP TO 2040 (HORIZON). The action plans are also aligned with the goal to increase water reuse to reach 30% in 2025 and 50% in 2030. The studies and action plans are strategies aligned with the general long-term business objective to be a reference company in sustainability for the chemical sector and be a company that provide sustainable products and solutions through thermoplastic resins.
Financial planning	Yes, water-related issues are integrated	> 30	ALL INVESTMENTS ARE MADE BASED ON THE SCENARIOS (SCARCITY) PRESENTED BY THE 2040 CLIMATE RISK AND ADAPTATION STUDY (HORIZON). In order with this scenario, since 2002, Braskem INVESTED MORE THAN 78 MILLION IN WATER RELATED PROJECTS (HOW), being 18 in the last 02 years, in this last 02 years period the company avoided 10 million in costs due to water efficiency improvements. ACTIONS PLANS FOR THE HIGH-RISK WATER SECURITY / SCARCITY AREAS (WHICH) are now being developed based on an internal price on water, defined by DEVESE methodology, and are driving our financial planning to invest in water reuse and/or desalination that will help define water contracts for the next 40 years. COSTS PRESENTED MAKE IT VIABLE THE STUDIES AND ACTION PLANS THAT FORM BRASKEM STRATEGIES (WHY) aligned with the general long-term objective to be a reference company in sustainability for the chemical sector and be a company that provide sustainable products and solutions through thermoplastic resins.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

-10

Anticipated forward trend for CAPEX (+/- % change)

100

Water-related OPEX (+/- % change)

-6

Anticipated forward trend for OPEX (+/- % change)

-2

Please explain

The capital expenditure and operational expenditure comes up due to demands or initiatives. OPEX is calculated based on cost to withdraw and treat water and cost do treat and dispose effluents For OPEX, there was a reduction of 6% in relation to 2019 due to the reduction of production plans and it is expected to reduce 2% for 2021. CAPEX considered all investments in water and effluent treatment infrastructure, water efficiency equipment, alternative sources such as reuse and rainwater. For CAPEX, there was a reduction of 10% in relation to 2019 due to the stage that some relevant projects were in,that is, they are not in the implementation phase, but in the development of a conceptual project, which requires more actions in research and engineering; expectation for 2021 is increase 100%.

W7.3

(W7.3) Does your organization use climate-related scenario analysis to inform its business strategy?

	Use of climate-related scenario analysis	Comment
Row 1	Yes	Braskem with the support of ERM launched in 2016 a climate risk and adaptation study, based on scenarios until 2040. This study is helping the company with its strategies and action plans.

W7.3a

(W7.3a) Has your organization identified any water-related outcomes from your climate-related scenario analysis?

Yes

W7.3b

(W7.3b) What water-related outcomes were identified from the use of climate-related scenario analysis, and what was your organization's response?

	Climate-related scenarios and models applied	Description of possible water-related outcomes	Company response to possible water-related outcomes

Row 1	RCP 2.6 Other, please specify IPCC AR4, BESM, DWD, ESRL	Main outcomes from the scenarios analysed by the ERM and Braskem study considering 2040 as the final date are: - Brazilian plants: potential risks identified area associated with severe droughts, especially in the plants located in Rio de Janeiro, Alagoas and Bahia and electric discharges in the northeastern operations; - United States Operations: increased intensity in hurricanes are the potential risk for the Texas operations. Some plants also have drought risks; - Germany: risk identified is the change in raining patterns leading to flooding.	The potential risks identified were than inserted in a risk matrix that identified the Brazilian areas of Rio de Janeiro, Alagoas and Bahia as presenting the highest risks. From that point on Braskem worked with Trucost to deepen the risk scenarios for the river basins of these specific regions, adding Texas in 2019 which is nearing completion in 2020 and depends on the result, an action plan will be defined for this region. Currently work plans are being developed to implement alternatives to mitigate/eliminate the water security risk, such as the use of alternatives like water reuse and desalination. The identification and validation phase of the solutions started in 2018, with completion scheduled for 2021. The final phase of implementation of the defined solution is expected to start in 2021 and complete in 2026.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

Yes

Please explain

Once Braskem developed a water risk analysis for the river basin, where it operates and identified the ones with high risk (Rio de Janeiro, Alagoas and Bahia) it developed an internal price on water based on the Getulio Vargas Foundation methodology – DEVESE. The price considered potential losses in production and revenue considering a disruption (reduction of water grant) caused by a drought scenario such as on serious drought event in a five years period and a 12 months duration, plus 03 other different scenarios. With that price calculated the company can compare with prices from reuse (using Aquapolo as the referral case) and desalination that would be alternatives that would annul the disruption and loss of production risks/impacts, supporting the decision to implement projects to access safe alternative sources of water.

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals Business level specific targets and/or goals Activity level specific targets and/or goals Brand/product specific targets and/or goals Basin specific targets and/or goals	Targets are monitored at the corporate level Goals are monitored at the corporate level	Braskem set the goal to be a global benchmark in the use of water for the chemical industry, not only in terms of consumption but also in terms of reuse. Not only that but based on the climate scenarios and analysis of the company's operation water risks it included water in one of the 7 priorities of the materiality matrix thus becoming a macro goal to be oversighted by the Board of Directors. Braskem created a specific water risk indicator that evaluates how much of our water withdraw are under risk, and subsequently the production. The main company and business target are associated with reducing the amount of water per amount of product and amount of effluent. Theese goals related to water consumption, effluent generation and water reuse are validated and monitored annually at the industrial committee, composed of the industrial directors of all the company's industrial units. Plants inserted in high-risk basins has as targets and action plans to implement water alternatives (e.g. reuse and desalination) not to be vulnerable to water droughts. Company also uses Life Cycle Assessments to support clients to develop more efficient products, including water efficiency. Braskem also joined forums with the goal to contribute to collective actions / projects at a basin level.

W8.1a

(W8.1a) Provide details of your water targets that are monitored at the corporate level, and the progress made.

Target reference number

Target 1

Category of target

Product water intensity

Level

Company-wide

Primary motivation

Climate change adaptation and mitigation strategiess

Description of target

In 2020, water consumption (4.31 m³/ton of product) achieved 92.5% of the goal set for the 2025 year (4.01 m³/ton of product) . The results was due to initiatives implemented in the period to reduce this environmental impact.

The lack of water can impact operational costs and ultimately cease operations, explaining why this resource is extremely important for Braskem's cost and competitiveness. Consequently, to ensure reliable operation, Braskem needs to ensure sufficient water (either reuse or freshwater) for abstraction and consumption in the production process. Therefore, setting targets and implementing improvements related to water consumption intensity is directly aligned with this understanding.

Quantitative metric

% reduction per product

Baseline year

2010

Start year

2010

Target year

2025

% of target achieved

92.5

Please explain

There are two goals, water consumption intensity and water reuse percentage. For the water efficiency pillar the company goal is to keep water consumption below the average of the chemical companies (26.64 m3/ton). On a yearly basis, the company defines its intensity goals always looking to improve from previous year. The target is relevant to the goal of achieving water security because petrochemical companies in general are water-intensive industries in terms of consumption, being able to influence regional water availability for other users. The current results was due to initiatives implemented in the period to reduce this environmental impact.

Target reference number

Target 2

Category of target

Water recycling/reuse

Level

Company-wide

Primary motivation

Risk mitigation

Description of target

Braskem has a goal to improve water reuse by 25% until 2020, 30% until 2025 and 50% until 2030. In 2020, a total of 25.8% of all water consumed in our operations came from reuse processes, 19.69% of which resulted from process improvement (investment) and 6.11% from original plant operation (born with the plant design). The percentage of water reused grew from 18.5 to 25.8 between 2011 and 2020, representing an aggregate improvement of about 39%. The lack of water can impact operational costs and ultimately cease operations, explaning why this resource is extremely important for Braskem. The identification of potential risk scenarios for water scarcity and the evolution of conflicts over access to water make the water reuse option more than a cost issue, but also a strategic topic for the company because it can affect the perpetuation of the business. Therefore, setting targets and implementing improvements related to water reuse (25%) is directly aligned with this understanding.

Quantitative metric

% increase in water use met through recycling/reuse

Baseline year

2010

Start year

2010

Target year

2030

% of target achieved

51.6

Please explain

In 2010 Braskem presented its 07 macro goals for sustainability development that became 10 in 2013, among them water efficiency. The water macro goal has two pillars, water consumption intensity and water reuse percentage. For the second pillar, Braskem has a goal to improve water reuse by 25% until 2020, 30% until 2025 and 50% until 2030. In 2020, a total of 25.8% of all water consumed in our operations came from reuse processes, 19.69% of which resulted from process improvement (investment) and 6.11% from original plant operation (born with the plant design).The target is relevant to the goal of achieving water security because Braskem does not influence the regional freshwater availability for other consumers. The current results was due to initiatives implemented in the period to reduce this environmental impact.

Target reference number

Target 3

Category of target

Water pollution reduction

Level

Company-wide

Primary motivation

Reduced environmental impact

Description of target

Braskem has a goal to improve water efficiency and become one of the benchmarks of the chemical industries. Aligned with these goals the company's eco-efficiency in generating liquid effluents (1.22 m^3/t) achieved 93.9% of the goal set for the 2025 year (1.15 m^3/t). The results was due to initiatives implemented in the period to reduce this environmental impact.

Quantitative metric

% reduction in water discharge volumes

Baseline year

2010

Start year

2013

Target year

2025

% of target achieved

93.9

Please explain

For water efficiency, the company goal is to keep water consumption and effluent generation below the average of chemical companies.
The target is relevant to achieve the water security goal since directly influences the quality of the water available to other regional users and the ecosystem, reducing pollution. The current results was due to initiatives implemented in the period to reduce this environmental impact

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

Goal

Other, please specify

Be a global chemical industry reference

Level

Company-wide

Motivation

Risk mitigation

Description of goal

Braskem's materiality matrix reflects the company’s concern with minimizing its negative impacts and maximizing its positive influence. Materiality matrix was developed through a survey with its main stakeholders, who helped define the material aspects. One of the material aspects was water. This resource is extremely important for Braskem because it is directly associated with the company’s cost and competitiveness, therefore considering the global chemical industry in terms of water resources, water consumption and water reuse are strategically important, explaining why this particular goal was adopted. This resource is also important in terms of reputation and risk mitigation since water is vital for Braskem's direct operations. The measure of success of the goal is the comparison between Braskem's water consumption index and the average index for the global chemical industry (ICCA-2013). The timescale for completion is 2020. The company is implementing the goal through internal communication, assessments, developing specific actions plans based on the Climate Change and Adaptation Study and incentivizing the development of water efficiency initiatives in every industrial site. The target is monitored by the Brazil Manufacturing & Global Industrial Operations Vice President and is reported periodically to the Board of Directors, involving actions from different areas of Braskem (e.g. HSE, Production, and Process). This process ensures that the level is company-wide.

Baseline year

2013

Start year

2013

End year

2020

Progress

The indicator used to assess progress is the quantity of water consumption per ton of product (m3/t). 100% (the goal has been achieved early). Although Braskem has anticipated reaching the goal set for 2020, it has the challenge of continuing to meet the goal set by 2020, keep consumption / ton lower than the mean of the chemical industry. According to ICCA-2013 data, Braskem operates approximately six times more efficiently, 4.31 m3/ton, than the average index for the global chemical industry of 25.64 m³/t (threshold of success)

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?

Yes

Braskem_RI2020_EN (1).pdf

W9.1a

(W9.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W8 Targets	All data provided in the annual report, based on the GRI framework, and including company's policies, governance, targets and macro goals. It was also verified water, energy and climate targets and data.	AA1000AS	Braskem has water as a material aspect of its operation and thus answers to specific GRI disclosures in its annual report alongside the basic GRI information on governance, goals, targets, operations, stakeholders, among others. The company annual report is assured yearly by KPMG (using the referral standards – AA1000AS and ISAE3000), as well as, complementary water and effluent indicators.

W10. Sign off

W-FI

(W-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.

W10.1

(W10.1) Provide details for the person that has signed off (approved) your CDP water response.

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

W10.2

(W10.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

Yes

SW. Supply chain module

SW0.1

(SW0.1) What is your organization's annual revenue for the reporting period?

	Annual revenue
Row 1	11,381,000,000

SW0.2

(SW0.2) Do you have an ISIN for your organization that you are willing to share with CDP?

Yes

SW0.2a

(SW0.2a) Please share your ISIN in the table below.

	ISIN country code	ISIN numeric identifier (including single check digit)
Row 1	BR	BRKMACNOR1

SW1.1

(SW1.1) Could any of your facilities reported in W5.1 have an impact on a requesting CDP supply chain member?

Yes, CDP supply chain members buy goods or services from facilities listed in W5.1

SW1.1a

(SW1.1a) Indicate which of the facilities referenced in W5.1 could impact a requesting CDP supply chain member.

Facility reference number

Facility 9

Facility name

CS 1

Requesting member

The LEGO Group

Description of potential impact on member

Although located between two large reservoirs, the water availability of the plant may be reduced in the short term, resulting from an increase in temperature and consequent evaporation of water bodies. The potential identified NEGATIVE impacts are listed below: - Operational / structural impacts: Reducing water availability could cause unscheduled outages due to lack of water, both for human consumption, and for processes and lack of electricity from the national grid. - Financial impacts: water scarcity may increase the price of water, which will generate financial impact for the plant. In addition to the increase in the price of water, there may be changes in the legislation regarding the abstraction of water in wells and loss of concessions, which may lead to an increase in the cost of the liter of water abstracted.

Comment

Braskem has in place and it is expanding, in partnership with the local utilities company - CETREL, the use of groundwater from new sources and has also in place a reuse initiative called Agua Viva. The latest is also epxanding. This initiatives are part of the company adaptation plan to improve water security.

Facility reference number

Facility 8

Facility name

PP 3

Requesting member

Electrolux

Description of potential impact on member

The water availability of the plant may be reduced in the short term, resulting from a reduction in the amount of rainfall combined with the increase in temperature and consequent evaporation of water bodies. The potential identified NEGATIVE impacts are listed below: - Operational / structural impacts: reducing water availability could cause unscheduled outages due to lack of water for both human consumption and lack of electricity from the national grid, disrupting the supply of product. - Financial impacts: water scarcity may increase the price of water, which will generate financial impact for the plant, affecting the price of product as well

Comment

PP 3 are implementing, as part of its climate change adaptation plan, 2 actions to increase its water security - a rainwater harvesting and an internal reuse process

SW1.2

(SW1.2) Are you able to provide geolocation data for your facilities?

	Are you able to provide geolocation data for your facilities?	Comment
Row 1	Yes, for all facilities	

SW1.2a

(SW1.2a) Please provide all available geolocation data for your facilities.

Identifier	Latitude	Longitude	Comment
Q 4 DCX	-22.713099	-43.242728	This Asset is located in Brazil.
PE 9 DCX	-22.713099	-43.242728	This Asset is located in Brazil.
PP 5 DCX	-22.714783	-43.240188	This Asset is located in Brazil.
Q 1 BA	-12.663054	-38.328438	This Asset is located in Brazil.
PE 1 BA	-12.662917	-38.324718	This Asset is located in Brazil.
PE 2 BA	-12.649768	-38.316281	This Asset is located in Brazil.
PE 3 BA	-12.65387	-38.319307	This Asset is located in Brazil.
CS 2 BA	-12.655718	-38.307192	This Asset is located in Brazil.
PVC 1 BA	-12.653599	-38.316587	This Asset is located in Brazil.
PE 8 CUB	-23.856066	-46.413245	This Asset is located in Brazil.
Q 3 ABC	-23.639331	-46.486444	This Asset is located in Brazil.
PE 7 ABC	-23.646045	-46.487657	This Asset is located in Brazil.
PP 4 ABC	-23.640301	-46.465745	This Asset is located in Brazil.
CS 1 AL	-9.672095	-35.746608	This Asset is located in Brazil.
PVC 2 AL	-9.669779	-35.824888	This Asset is located in Brazil.
PP 3 PLN	-22.7181	-47.1343	This Asset is located in Brazil.
Q 2 RS	-29.8774	-51.382	This Asset is located in Brazil.
PP 1 RS	-29.8858	-51.3937	This Asset is located in Brazil.
PP 2 RS	-29.873	-51.3989	This Asset is located in Brazil.
PE 5 RS	-29.873	-51.3989	This Asset is located in Brazil.
PE 4 RS	-29.872	-51.3992	This Asset is located in Brazil.
PE 6 RS	-29.872	-51.3992	This Asset is located in Brazil.
PP LA Porte USA	29.7024	-95.0803	This Asset is located in USA.
PP Marcus Hook USA	39.8149	-75.4267	This Asset is located in USA.
PP Neal USA	38.3298	-82.5837	This Asset is located in USA.
PP Seadrift USA	28.615	-96.6261	This Asset is located in USA.
PP Oyster Creek USA	28.9338	-95.3361	This Asset is located in USA.

PP 11 GER	50.8423	6.9455	This Asset is located in Germany.
PP 12 GER	51.3945	11.974	This Asset is located in Germany.

SW2.1

(SW2.1) Please propose any mutually beneficial water-related projects you could collaborate on with specific CDP supply chain members.

Requesting member

Colgate Palmolive Company

Category of project

Promote river basin collective action

Type of project

Invite customer to collaborate with other users in their river basins to reduce impact

Motivation

Improve watershed management, seeking to reduce water risk through our participation in watershed management committees.

Estimated timeframe for achieving project

4 to 5 years

Details of project

Identify the hydrographic basins in which both companies are common users and develop an action plan to improve participation in the management committees of these basins.

Projected outcome

The main outcome will be an action plan for engagement in watershed.

Requesting member

Electrolux

Category of project

Promote river basin collective action

Type of project

Invite customer to collaborate with other users in their river basins to reduce impact

Motivation

Improve watershed management, seeking to reduce water risk through our participation in watershed management committees.

Estimated timeframe for achieving project

4 to 5 years

Details of project

Identify the hydrographic basins in which both companies are common users and develop an action plan to improve participation in the management committees of these basins.

Projected outcome

The main outcome will be an action plan for engagement in watershed.

Requesting member

Givaudan SA

Category of project

Promote river basin collective action

Type of project

Invite customer to collaborate with other users in their river basins to reduce impact

Motivation

Improve watershed management, seeking to reduce water risk through our participation in watershed management committees.

Estimated timeframe for achieving project

4 to 5 years

Details of project

Identify the hydrographic basins in which both companies are common users and develop an action plan to improve participation in the management committees of these basins.

Projected outcome

The main outcome will be an action plan for engagement in watershed.

Requesting member

Koninklijke Philips NV

Category of project

Promote river basin collective action

Type of project

Invite customer to collaborate with other users in their river basins to reduce impact

Motivation

Improve watershed management, seeking to reduce water risk through our participation in watershed management committees.

Estimated timeframe for achieving project

4 to 5 years

Details of project

Identify the hydrographic basins in which both companies are common users and develop an action plan to improve participation in the management committees of these basins.

Projected outcome

The main outcome will be an action plan for engagement in watershed.

Requesting member

L'Oréal

Category of project

Promote river basin collective action

Type of project

Invite customer to collaborate with other users in their river basins to reduce impact

Motivation

Improve watershed management, seeking to reduce water risk through our participation in watershed management committees.

Estimated timeframe for achieving project

4 to 5 years

Details of project

Identify the hydrographic basins in which both companies are common users and develop an action plan to improve participation in the management committees of these basins.

Projected outcome

The main outcome will be an action plan for engagement in watershed.

Requesting member

The LEGO Group

Category of project

Promote river basin collective action

Type of project

Invite customer to collaborate with other users in their river basins to reduce impact

Motivation

Improve watershed management, seeking to reduce water risk through our participation in watershed management committees.

Estimated timeframe for achieving project

4 to 5 years

Details of project

Identify the hydrographic basins in which both companies are common users and develop an action plan to improve participation in the management committees of these basins.

Projected outcome

The main outcome will be an action plan for engagement in watershed.

SW2.2

(SW2.2) Have any water projects been implemented due to CDP supply chain member engagement?

No

SW3.1

(SW3.1) Provide any available water intensity values for your organization's products or services.

Product name

Polyethylene

Water intensity value

2.44

Numerator: Water aspect

Water consumed

Denominator

Tons

Comment

The value presented refers to the m3/ton used by Braskem to measure its performance. Numbers are constantly update, 2.44 refers to 2020.

Product name

Polypropylene

Water intensity value

2.1

Numerator: Water aspect

Water consumed

Denominator

Tons

Comment

The value presented refers to the m3/ton used by Braskem to measure its performance. Numbers are constantly update, 2.10 refers to 2020.

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms