

CREDIT OPINION

27 July 2023

Update



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RATINGS

Braskem S.A.

Domicile	Sao Paulo, Sao Paulo, Brazil
Long Term Rating	Ba1
Type	LT Corporate Family Ratings
Outlook	Stable

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

Contacts

Carolina A Chimenti +55.11.3043.7318
Vice President - Senior Analyst
carolina.chimenti@moodys.com

Marcos Schmidt +55.11.3043.7310
Associate Managing Director
marcos.schmidt@moodys.com

» *Contacts continued on last page*

CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
Japan	81-3-5408-4100
EMEA	44-20-7772-5454

Braskem S.A.

Update to credit analysis

Summary

[Braskem S.A.](#)'s Ba1 rating is supported by its position as the largest petrochemical company in Brazil and largest thermoplastic resin producer in the Americas, with historically above-industry-average operating margins because of high capacity utilization rates, long-term client relationships and product customization. The rating also reflects the company's dominant market position in Brazil, and its geographic diversification in the US, Mexico and Europe. Finally, the company's sizable cash position, track record of positive free cash flow (FCF) generation even during adverse market conditions and liability management initiatives support its strong liquidity.

The rating is constrained by the company's high exposure to the volatility in petrochemical spreads. The rating also takes into consideration the company's exposure to [Petroleo Brasileiro S.A. - PETROBRAS](#) (PETROBRAS, Ba1 stable), which supplies about 30% of Braskem's naphtha needs, and [Petroleos Mexicanos](#) (PEMEX, B1 negative) for the supply of about 50% of its ethane needs in Mexico. Additional credit constraints include the overhangs related to the liabilities stemming from the Alagoas geological event and Braskem's shareholders' intention to divest the business.

Credit strengths

- » Position as the largest producer of thermoplastic resins in the Americas, the largest polypropylene (PP) producer in the US and the largest polyethylene (PE) producer in Mexico
- » Good product and geographic diversification
- » Sizable cash position, track record of positive FCF and liability management initiatives, which support the company's good liquidity
- » Increased feedstock diversification through investments in natural gas-based projects and international expansion

Credit challenges

- » A commodity-based company, exposed to volatility in petrochemical spreads and supply-demand dynamics in global and regional markets
- » Exposure to PETROBRAS and PEMEX for part of feedstock needs in Brazil and Mexico, respectively
- » Recent overhangs related to liabilities stemming from the geological event in Alagoas
- » Uncertainties related to Braskem's shareholders' intention to divest the business

Rating outlook

The stable rating outlook reflects our expectation that Braskem's credit metrics and liquidity will remain adequate over the next 12-18 months, thereby mitigating risks from the cyclical nature of the petrochemical industry and potential additional liquidity calls from the overhangs in Alagoas.

Factors that could lead to an upgrade

An upgrade of Braskem's rating would require a full resolution of the current overhangs related to the geological event in Alagoas and the supply issues in Mexico, or further sustained improvements in liquidity, financial flexibility and credit metrics that would mitigate any residual risks from such overhangs under various stress scenarios. An upgrade would also require:

- » a track record of a conservative financial policy, sound liquidity and positive FCF generation
- » leverage (as measured by Moody's-adjusted debt/EBITDA, including Mexico) to be sustained below 3.0x (6.7x for the 12 months that ended March 2023)

Factors that could lead to a downgrade

We could downgrade the rating if Braskem's liquidity deteriorates because of additional significant liabilities from litigations and class actions; weaker-than-expected sales volumes or petrochemical spreads that result in higher leverage or cash burn; or more aggressive financial policies, including dividend payout remaining consistently above the minimum level established by law. Furthermore, negative rating pressure could result from weaker operating results or persistently high leverage through the cycle, with:

- » Moody's-adjusted debt/EBITDA (including Mexico) remaining at 3.5x or above on a sustained basis
- » retained cash flow/total debt remaining below 15% (2.4% for the 12 months that ended March 2023) on a sustained basis

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody.com> for the most updated credit rating action information and rating history.

Key indicators

Exhibit 1

Braskem S.A.

USD millions	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	LTM (Mar-23)	Moody's forward view Next 12-18 months
Revenue	15,976.8	13,288.7	11,473.7	19,613.5	18,726.5	17,344.4	17,000 - 18,000
Net Property Plant and Equipment	8,148.6	8,631.7	7,427.3	7,182.3	7,901.2	8,308.4	7,900 - 8,200
EBITDA Margin %	19.4%	11.9%	18.6%	29.3%	11.4%	9.1%	8.5% - 9.5%
Debt / EBITDA	3.3x	7.0x	5.3x	1.6x	4.7x	6.7x	6.5x - 7.5x
RCF / Debt	19.3%	2.2%	11.9%	28.3%	6.6%	2.4%	2.5% - 5.0%
EBITDA / Interest Expense	3.9x	1.8x	2.2x	5.3x	2.3x	1.6x	1.0x - 2.0x
EBIT / Avg. Assets	14.4%	4.0%	8.8%	30.0%	7.0%	3.5%	2.5% - 5.0%

All figures and ratios are calculated using Moody's estimates and standard adjustments. Periods are financial year-end unless indicated. LTM = Last 12 months. Moody's forecasts are Moody's opinion and do not represent the views of the issuer.

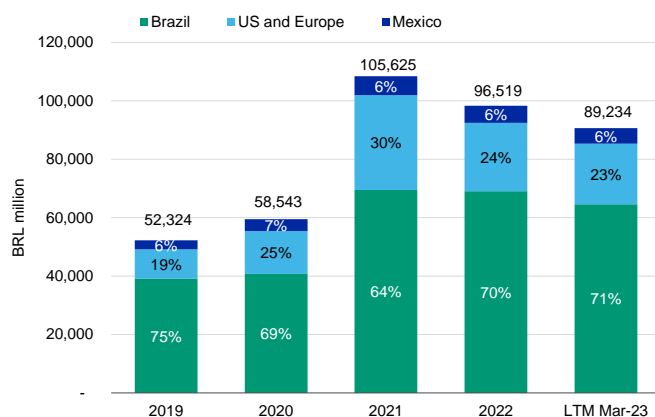
Source: Moody's Investors Service

Profile

Braskem S.A. is the largest producer of thermoplastic resins (PE, PP and polyvinyl chloride [PVC]) in the Americas, with an annual production capacity of 9.3 million tons. Braskem also has a production capacity of 10.7 million tons of basic petrochemicals, including ethylene, propylene and gasoline; and about 1.4 million tons of caustic soda, ethylene dichloride (EDC) and chlorine. For the 12 months that ended March 2023, the company reported consolidated net revenue of BRL89.2 billion (\$17.3 billion), with an EBITDA margin of 9.1%.

Exhibit 2

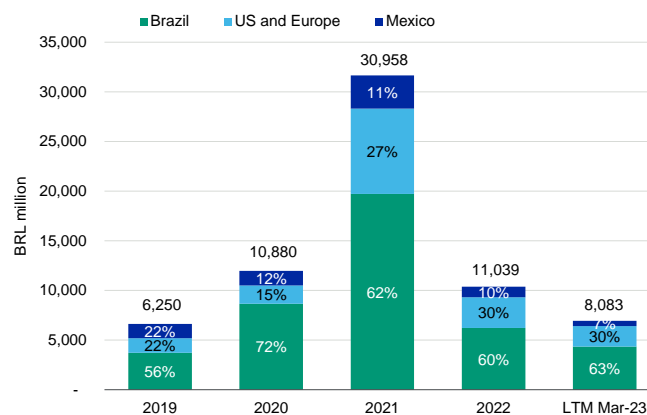
Revenue breakdown In BRL million



Sources: Braskem and Moody's Investors Service

Exhibit 3

Moody's-adjusted EBITDA In BRL million



Sources: Braskem and Moody's Investors Service

Detailed credit considerations

Strong market position in the Americas, with good business profile and diversification

Braskem is the largest producer of thermoplastic resins (PE, PP and PVC) in the Americas, the largest PP producer in North America and the largest PE producer in Mexico. Globally, Braskem is the sixth-largest thermoplastic resin producer in terms of capacity. In Brazil, Braskem is the only integrated (first- and second-generation) petrochemical company. The company's market position, combined with a sophisticated logistics and distribution system for resins in Brazil, provides it with significant advantages in the domestic market. The company is geographically well diversified, with operations in Brazil, the US, Mexico and Europe, and exports to several other countries.

Historically, 30%-40% of the company's total EBITDA has been generated from operations outside Brazil. Braskem's geographic footprint should improve as the company continues its strategy of international expansion, which will enhance its product and feedstock diversification. Braskem's latest production capacity investment was in a new PP plant in the US, which started operating in Q3 2020, adding 450,000 tons of production capacity. In June 2022, the company announced that its Mexican subsidiary, Braskem Idesa, has entered into a partnership with Advorio B.V. for the development and construction of an ethane import terminal, which is likely to be completed and reach full capacity by 2024. This new ethane import terminal should fulfill Braskem Idesa's entire ethane needs. This new investment will further unlock the potential value of the Mexican production facilities that benefit from lower-cost gas-based production.

Braskem's diversified product offering serves a wide range of end markets from food, agricultural and industrial packaging to automotive, construction and other industrial activities, which reduces the company's exposure to a specific segment and the risk of a sudden shift in demand. Such diversity helps temper the strain from potential downturns in specific industries in the domestic market. In addition, the company has the capacity to increase exports during periods of low demand in Brazil, as it is usually accompanied by lower economic growth and depreciation of the local currency, increasing the competitiveness of its locally produced resins. This resilient business model is illustrated by the average annual utilization rates of Braskem's PE and PP plants located in Brazil, which remained above 80% over the last five years even during low or negative economic growth in Brazil. PVC plants also used to have high utilization rates, which have, however, decreased to around 65% since 2019 because of supply issues related to the Alagoas incident.

Increased feedstock diversification following investments in natural gas-based projects and international expansion

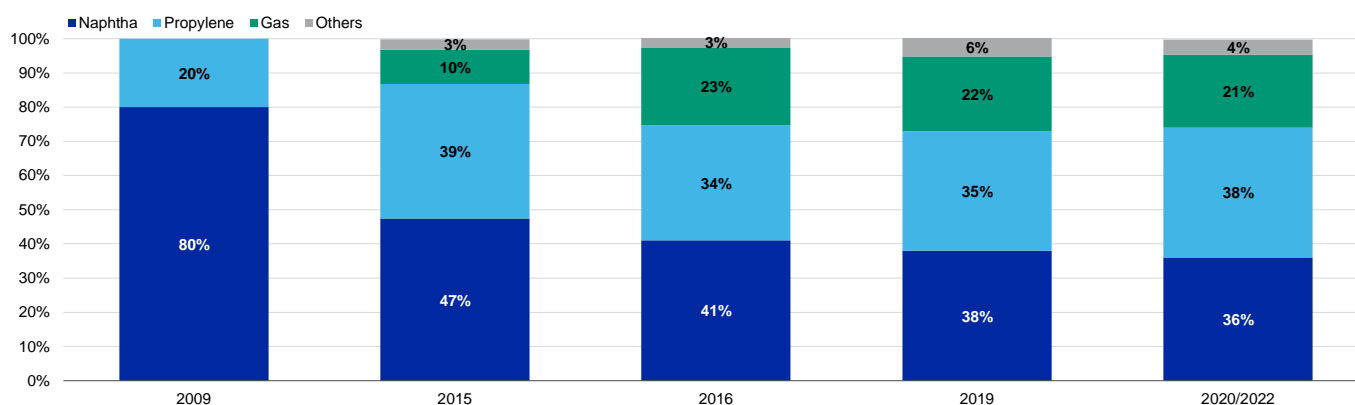
Braskem is highly susceptible to feedstock price volatility because raw materials represent 60%-70% of its total consolidated cost of sales. The location of production facilities in areas where it is possible to obtain high-quality raw materials in the right quantity and at low costs allows the company to better sustain its profitability over industry cycles.

In 2009, all of Braskem's operations were based in Brazil and its raw material needs were highly concentrated in naphtha (80% of total). As a result of the company's business internationalization, its feedstock base has become more diversified. In 2010 and 2011, Braskem expanded its operations into the US and Europe with the acquisition of [Sunoco LP](#) (Ba2 stable) and [The Dow Chemical Company's](#) (Baa1 stable) PP business. Therefore, the share of propylene feedstock increased significantly to 38% in 2011 from 20% in 2009. In 2016, the company entered the Mexican market with the start of the ethane-based Ethylene XXI complex, taking an additional step towards feedstock diversification. Later in 2017, the company converted its cracker in Bahia to a flexible cracker and signed a 10-year agreement with an affiliate of Enterprise Products for the supply of ethane feedstock, replacing up to 15% of naphtha required for the production of ethylene in Bahia's petrochemical complex. In Q3 2020, Braskem started a new PP plant in the US, for which propylene is the main feedstock.

Exhibit 4

Braskem increased its feedstock diversification significantly over the last decade

Feedstock profile by production capacity



Source: Braskem

Currently, about 36% of Braskem's feedstock by production capacity is related to naphtha, 38% to propylene, and 21% to ethane and propane. Around 30%-40% of the naphtha requirement is fulfilled by PETROBRAS and assured through long-term agreements. In June 2020, Braskem signed a new five-year naphtha supply contract with PETROBRAS, covering the local feedstock needs for the petrochemical clusters in Bahia and Rio Grande do Sul (RS). The contract establishes annual naphtha volumes ranging from 650,000 tons to 3.5 million tons, at 100% of the reference price (CIF Northwest Europe/BASIS ARA). Later in December 2020, Braskem signed new five-year agreements for the supply of up to two million tons of naphtha per year for the São Paulo cluster and up to 580,000 tons of ethylene equivalent (volume of ethylene per ton of ethane and propane) to the Rio de Janeiro cluster. The remaining naphtha needs are covered with imports from Algeria and other countries, based on annual supply agreements and spot prices. Currently, imports of naphtha represent about 70% of total consumption.

Braskem's ethane-based production (about 21% of total) relates mainly to its Mexican facilities. In Q1 2023, about 73% of its total ethane needs in Mexico were sourced under a long-term agreement with PEMEX, while the remaining came from imports from the US (fast-track solution). This compares with about 60%-65% of supply needs sourced from PEMEX in 2021-22 as Braskem Idesa has been prioritizing the ethane supplied by PEMEX over the last few quarters to maximize its margins, and PEMEX has been able to increase production to serve Braskem Idesa.

Renegotiation of the supply agreement with PEMEX and construction of a new import terminal reduce uncertainties in Mexico

The long-term ethane supply agreement with PEMEX was originally signed in June 2015 as a 20-year take-or-pay contract through which PEMEX was obliged to provide and Braskem Idesa, the company's Mexican joint venture (JV), was required to purchase 66,000 barrels per day of ethane until year-end 2035, at prices based on the highest reference between Mont Belvieu and Henry Hub plus a discount. PEMEX's ethane production was and remains insufficient to fully cover Braskem's ethane needs, with the company receiving only 50%-60% of its total ethane feedstock requirement before the contract renegotiation in September 2021, which led to lower utilization rates in the Mexican cracker. Until 2019, PEMEX was complying with the deliver-or-pay clause and compensating Braskem financially for the lower supply volumes. However, from the beginning of 2020, PEMEX ceased to pay the liquidated damage obligation, which has resulted in a total delinquency of \$119 million, and in lower-than-desired profitability and higher-than-intended leverage at the Mexican operations.

To solve the supply issue, the company built the infrastructure to enable the import of ethane from the US at a competitive price, named fast track. This solution involved importing up to 12,800 barrels per day of liquid ethane from the US, equivalent to about 20% of Braskem Idesa's feedstock needs, and transporting it 10 kilometers by truck from the Coatzacoalcos Port to the plant. While expensive, fuel transport by truck allowed the cracker to run closer to full capacity. This solution was implemented in February 2020, and the company increased its import capacity further to about 35% of the plant's requirements in 2021, and to up to 35,000 barrels per day in Q4 2022, about 50% of its total needs, further reducing its reliance on PEMEX.

In September 2021, the company renegotiated the long-term supply agreement with PEMEX, which reduced political risks and cleared the path for a definitive solution for the supply issue. In the amended agreement, PEMEX is obliged to deliver a minimum of 30,000 barrels per day, compared with 66,000 barrels per day earlier, until the start of operations of a new ethane import terminal that is likely to be completed and reach full capacity by 2024. Braskem Idesa also has a preference right on any additional ethane production that PEMEX does not direct to its own operations until 2045. With the amended agreement, Braskem Idesa finally concluded its debt refinancing plan in October 2021, replacing the remaining \$1.35 billion in restrictive project finance debt with corporate debt. The company issued \$1.2 billion of sustainability-linked notes, and the remaining proceeds were obtained from a credit line of \$150 million. With the payment of the project finance debt, the company removed non-financial covenants that led to the reporting of Braskem Idesa's debt as short-term debt and extinguished the contingent equity guarantees of \$358 million. Although the project finance debt was non-recourse to Braskem, we have always incorporated Braskem Idesa in our credit analysis of Braskem because the JV is consolidated and because of the strategic importance of the asset to Braskem in terms of both geographic and feedstock diversification as its main gas-based operation.

In June 2022, Braskem announced that its Mexican subsidiary has entered into a partnership with Advario for the development and construction of the new ethane import terminal, which will require investments of around \$400 million, with 50% of equity funding coming from Braskem Idesa. This new terminal will have the capacity to import 80,000 barrels per day, allowing Braskem to fully

meet its ethane needs for the Mexico complex and reducing its dependence on both the existing fast-track solution and on PEMEX to increase capacity utilization at its plant. On 1 March 2023, Braskem announced that its investment agreement with Advario for a 50% stake in Terminal Química Puerto México, a subsidiary responsible for the terminal construction, was signed. This resulted in a \$56 million payment to Braskem Idesa for the retroactive equity contribution. As of March 2023, physical progress of the import terminal was 34% complete.

Credit metrics will continue to deteriorate from the peak levels because of unfavorable industry dynamics

Braskem's credit metrics deteriorated significantly in 2019 because of lower petrochemical spreads. Weakening demand, coupled with oversupply, in particular for PE, led to a roughly 25% decline in petrochemical spreads for 2019 and contributed to a 45% drop in Braskem's Moody's-adjusted EBITDA. Additionally, Braskem's total gross debt increased with the depreciation of the Brazilian real, resulting in adjusted gross leverage (including Mexico) of 7.0x as of year-end 2019 compared with 3.3x as of year-end 2018. In addition to lower spreads, Braskem's operating performance was hurt by lower capacity utilization in Mexico and by the shutdown of the chlor-alkali plant in Alagoas.

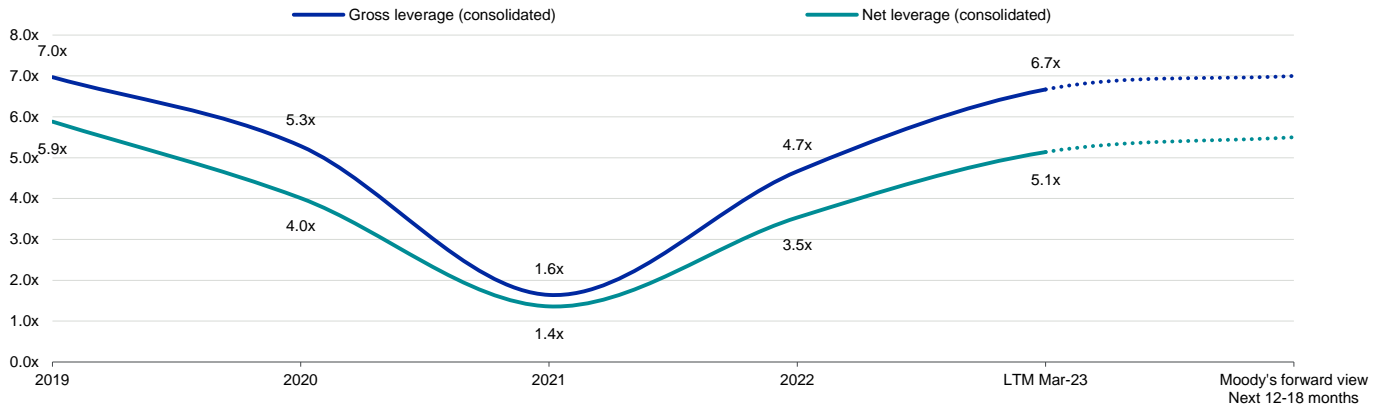
From Q3 2020, however, the faster-than-expected recovery of the Brazilian market and wide petrochemical spreads mainly from low naphtha prices and rising PE prices as a result of strong demand and global logistics disruptions supported a rapid reduction in leverage. Braskem's consolidated EBITDA increased to BRL10.9 billion in 2020 from BRL6.2 billion in 2019. In 2021, Braskem's operating performance improved following very high levels of petrochemical spreads; additional sales volumes from a new PP plant in the US; high sales volumes in Brazil, the US and Europe; and the depreciation of the Brazilian real which is positive for the company's EBITDA. About 100% of Braskem's revenue is indexed to the US dollar, while about 20% of its costs are in the local currency. For each cent of the real depreciation, Braskem's annual EBITDA increases by \$4 million-\$5 million.

In 2022, the normalization of petrochemical spreads from peak levels and supply shocks from the Russia-Ukraine conflict that pushed up oil and gas prices resulted in lower recurring margins for Braskem, with a Moody's-adjusted EBITDA margin of 11%, compared with 29% in 2021. For the 12 months that ended March 2023, the company posted BRL89.2 billion in revenue, compared with BRL105.6 billion in 2021, and its Moody's-adjusted EBITDA decreased to BRL8.1 billion from BRL31 billion in 2021 and BRL11 billion in 2022. The weaker results reflect the deterioration in petrochemical spreads because of oversupply and weaker demand globally. However, compared with Q4 2022, volumes and spreads improved slightly in Q1 2023 driven by higher demand for most of Braskem's products. This higher demand was mainly driven by the improvement in global industrial activity and the end of the zero-COVID policy in China. Moody's-adjusted gross leverage increased to 6.7x for the 12 months that ended March 2023, from 4.7x in 2022 and 1.6x in 2021, while net leverage increased to 5.1x from 1.4x in 2021.

For the next 12-18 months, we expect petrochemical spreads to remain weak, strained by new supply of PE and PP coming from China and the US. Barring additional shocks related to geopolitical events, we expect the company's Moody's-adjusted EBITDA to decrease to about BRL7.0 billion-BRL7.5 billion, while adjusted gross leverage will increase to 6.5x-7.5x, above the historical average. With a compression in petrochemical spreads, coupled with the outflow related to the provisions at Alagoas, we expect the company to post negative FCF over the coming quarters. In Mexico, the company's weak credit metrics will lead to a negotiation of the extension of a covenant waiver with creditors, as Braskem Idesa will likely not comply with the financial covenant setting the maximum net leverage at 5.9x (17x currently).

Through commodity cycles, assuming EBITDA generation of \$2 billion-\$3.5 billion, Braskem's Moody's-adjusted gross leverage (including Mexico) would hover at 3x-4x and, with a recurring \$2 billion cash position, net leverage would be 2x-3x, even with the full phaseout of the special tax regime (REIQ) in Brazil, which will reduce Braskem's annual EBITDA by \$150 million when fully extinct in 2025.

Exhibit 5
Braskem's adjusted gross leverage will remain under pressure from weak industry conditions over the next 12-18 months
 Moody's-adjusted gross and net leverage



Sources: Braskem and Moody's Investors Service

ESG considerations

Braskem S.A.'s ESG Credit Impact Score is Highly Negative CIS-4

Exhibit 6
ESG Credit Impact Score

CIS-4

Highly Negative

NEGATIVE	:	POSITIVE
IMPACT	:	IMPACT

For an issuer scored CIS-4 (Highly Negative), its ESG attributes are overall considered as having a discernible negative impact on the current rating. The negative influence of the overall ESG attributes on the rating is more pronounced compared to an issuer scored CIS-3.

Source: Moody's Investors Service

Braskem's CIS-4 indicates the rating is lower than it would have been if ESG risk exposures did not exist. The score reflects the company's exposure to environmental risks facing the chemical sector, namely related to current and evolving carbon emission regulations, and for resin producers, increasing efforts to eliminate single-use plastics and improve recycling to prevent marine pollution. Braskem's exposure to social risks is a consequence of the geological event in Alagoas and its ongoing financial impact to the company. Governance aspects are incorporated in the rating and include a track record of conservative financial management, despite the concentrated ownership and dual class of shares.

Exhibit 7
ESG Issuer Profile Scores

ENVIRONMENTAL

E-5

Very Highly Negative

SOCIAL

S-5

Very Highly Negative

GOVERNANCE

G-3

Moderately Negative

Source: Moody's Investors Service

Environmental

E 5. Braskem's exposure to environmental risks reflects mainly the risks facing the chemical sector, namely current and evolving carbon emission regulations, and for resin producers, increasing efforts to eliminate single-use plastics and improve recycling to prevent marine pollution.

Social

S 5. Braskem's exposure to social risks is a consequence of the geological event in Alagoas and its ongoing financial impact to the company.

Governance

G 3. Governance aspects are incorporated in the rating and include a track record of conservative financial management, despite the concentrated ownership and dual class of shares. Braskem is a publicly listed company with shares traded on B3, NYSE and Latibex. 50.1% of Braskem's outstanding voting shares (representing 38.3% of the outstanding total shares) are held directly and indirectly by Novonor (former Odebrecht). PETROBRAS is Braskem's second-largest shareholder, with 47.0% of voting shares and 36.1% of total shares. The relationship between Novonor and PETROBRAS is governed by a shareholders' agreement valid until 2045. Five out of the 11 board members of Braskem are independent. Seven board members are appointed by Novonor and the remaining four are appointed by PETROBRAS. Braskem's financial policies determine the maintenance of sufficient US dollar-denominated cash to cover the next six months of operations and one year of US debt maturities, and a balance of at least 70% of its net debt in US dollars. As part of its capital structure management, Braskem has a dividend payment policy and maintains minimum cash sufficient to cover its short-term debt, working capital needs, committed capital spending without funding, period taxes and derivatives mark-to-market, mitigating refinancing risks. Lastly, all of Braskem's financial policies are publicly available on the company's website. Braskem is in full compliance with the corporate governance rules established by the NYSE, including the implementation of a code of conduct and a permanent fiscal council (Novonor appoints two members out of five).

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moody's.com. In order to view the latest scores, please click [here](#) to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

Braskem's operations have allegedly caused geological damages in the northeast of Brazil

In April 2019, the Public Prosecutors Office of Alagoas filed a lawsuit against Braskem, claiming that the company caused a geological event in Maceió, Alagoas' capital. The company proactively suspended its salt extraction, chlorine and caustic soda activities in Alagoas. From May 2019 until February 2021, Braskem operated its vinyl business under a less competitive and nonintegrated business model, importing caustic soda and EDC to serve Brazil's domestic market, implying an annual EBITDA that is BRL120 million-BRL160 million lower than the integrated model. On 14 November 2019, the company announced that it submitted to the National Mining Agency (ANM) measures to permanently stop salt extraction activities in Maceió with the closure of its wells. Braskem restarted its chlor-alkali plant in February 2021 and regained part of its integration, which restored about 50% of the EBITDA lost with the nonintegrated model. While the operational impact of this environmental lawsuit is not relevant to Braskem's overall results because the company's entire vinyl business represents less than 5% of its total recurring EBITDA, the financial strain from penalties and cash freezes has reduced the company's available liquidity.

On 6 January 2020, Braskem and Brazilian authorities ratified an agreement they reached on 3 January 2020 to support the relocation and indemnification of the residents of certain areas of Maceió. Under the agreement, Braskem provisioned around BRL2.7 billion (\$507 million) to support the relocation and indemnification of the local population and to close certain salt wells. However, during 2020, the provisions related to the event increased sequentially because of new families and residents that were included in the affected areas and, by September 2020, total provisions were at BRL7.9 billion.

On 30 December 2020, Braskem announced two agreements with Brazilian authorities to settle the civil actions, which added BRL1.2 billion to the BRL7.9 billion provisioned at the end of September 2020, increasing total provisions for the event to BRL9.1 billion. The agreements settled existing lawsuits against Braskem with an initial claim of BRL34.3 billion and involved the Alagoas State Public Defender's Office, the Federal Prosecution Office in Alagoas, the Alagoas State Prosecution Office and the Federal Public Defender's Office. The provisions include proceeds to relocate residents (about 15,000 families residents of the areas at risk within the districts of Mutange, Bom Parto, Pinheiro and Bebedouro of Maceió), close 35 salt wells and stabilize the soil, and address environmental and urban effects and damage, among others.

Although the settlement is credit positive because it reduces risks related to future liabilities, and provides visibility into the potential conclusion of a definitive agreement to resolve all social and environmental aspects with authorities, Braskem remains exposed to other potential lawsuits and liabilities not covered by the agreements and to changes to the current provisions in the event of significant new developments.

The provisions related to the accident do not immediately jeopardize Braskem's liquidity given the company's strong cash generation and the distribution of payments, but reduce the company's loss absorption buffer and the excess cash that could be used for investments or debt reduction to accelerate leverage reduction. Total financial provisions related to the accident amounted to BRL13.2 billion as of the end of March 2023, of which BRL7.5 billion were already disbursed. The remaining BRL6.1 billion is due 67% in the short term and 33% in the long term.

On 21 July 2023, Braskem announced the execution of an agreement with the Municipality of Maceió for the payment of BRL1.7 billion, thus adding about BRL1 billion to total financial provisions considering that approximately BRL700 million had already been provisioned in previous years. The new agreement establishes the compensation and full refund of the Municipality of Maceió in relation to damages arising from Braskem's operations.

Uncertainties related to the judicial recovery of Odebrecht

Braskem's controlling shareholder Odebrecht (now known as Novonor) filed for judicial recovery in June 2019. Braskem's shares were neither included in the bankruptcy or in the stay period because they have been given as collateral for Odebrecht's bank loans through fiduciary lien. The banks have the right to exercise the change of control of Braskem, but have so far refrained from doing so. Odebrecht filing for bankruptcy has not had any effect on Braskem so far, but as part of its judicial recovery plan, Odebrecht is seeking potential buyers for its shares in Braskem. PETROBRAS is studying the review of the shareholders' agreement with Odebrecht to unify and divest its Braskem shares as well. A potential change of control of Braskem would only trigger an acceleration of the company's bond maturities if the change of control results in a rating downgrade of one notch or more. The banks, PETROBRAS and Odebrecht so far have not taken actions that would jeopardize the company's liquidity, such as large dividend payments.

Goals to mitigate climate change and eliminate plastic waste

Braskem faces exposure to environmental risks mainly related to the current and evolving carbon emission regulations, and particularly for resin producers, increasing efforts to eliminate single-use plastics and improve recycling to prevent marine pollution. Based on its sustainable development strategy and in line with the sustainable development goals of the United Nations for 2030 and the Paris Agreement on Climate Change, Braskem announced on November 2020 its commitment to expand its efforts to mitigate climate change and eliminate plastic waste. The company's main goals to mitigate climate change include achieving carbon neutrality by 2050 and a 15% reduction in carbon emissions (scope 1 and 2) by 2030. The goals to eliminate plastic waste include expanding the green portfolio by adding 300,000 tons of thermoplastic resins and chemicals with recycled content by 2025, and one million tons by 2030; and working to divert 1.5 million tons of plastic waste away from incineration, landfills or the environment by 2030. To achieve carbon neutrality, the company will reduce emissions by focusing on energy efficiency and increasing the use of renewable energy in current operations through partnerships focused on innovation and technology; offset emissions with potential investments in the production of chemicals and polymers from renewable sources; and capture carbon emissions through research and development for the use of carbon emissions as a raw material. Additionally, Braskem will continue to pursue its mechanical and chemical recycling projects as part of its strategy related to the circular economy. With the conclusion of the expansion investment, Braskem currently has an annual production capacity of 260 thousand tons of green polyethylene that uses ethanol from sugar cane as feedstock.

Liquidity analysis

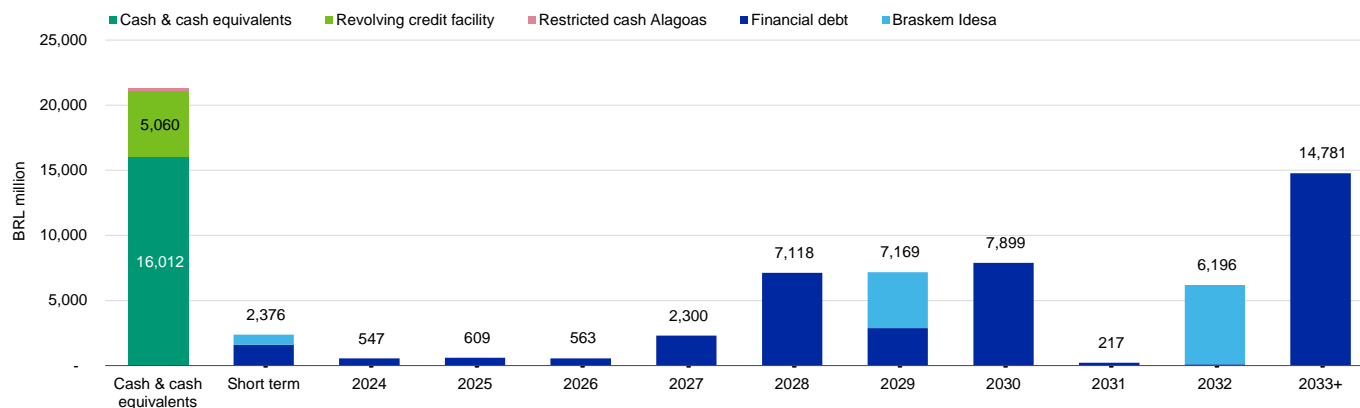
Braskem has strong liquidity based on the maintenance of a large cash balance compared with its short-term debt and a comfortable debt amortization profile with an average debt term of about 14 years. The company had around BRL16.0 billion (\$3.2 billion) of cash and cash equivalents as of the end of March 2023, in addition to a \$1 billion (about BRL5.1 billion) availability under a standby revolving credit facility due in December 2026. Taking into account the cash outflow from the Alagoas provisions of BRL4.1 billion in the short term, Braskem will be able to cover debt maturities until 2027 with cash in hand.

Besides maintaining a comfortable minimum cash balance of around \$1.5 billion over the last five years to withstand potential volatility in its operations, Braskem has demonstrated a consistent access to the local and international banks and capital markets to refinance maturing debt, and has been working actively to extend its amortization profile. In 2021, Braskem redeemed its \$500 million perpetual

notes, executed a \$235 million tender offer for its 2023 and 2041 notes, and redeemed \$255 million of its 2022 notes. The company also refinanced Braskem Idesa's project finance debt, extending the JV's debt amortization schedule. In June 2022, the company issued BRL1 billion (\$200 million) of local debentures with maturities in 2029 and 2032 while redeeming \$400 million (BRL2 billion) of debt, of which \$100 million related to outstanding 2023 notes and \$300 million to a partial prepayment of its 2024 notes. Later in August and November 2022, Braskem issued debentures for refinancing. Finally, in February 2023, Braskem issued \$1 billion in new notes due 2033, and used the proceeds for liability management and general corporate purposes.

Exhibit 8

Debt amortization schedule remains comfortable In BRL millions



Source: Braskem

Braskem paid BRL7.35 billion in dividends from December 2021 through May 2022, well above the 25% of net income required by Brazilian law and in accordance with its dividend policy that establishes a cap linked to leverage for the coming years. Although significant in absolute amounts, the extraordinary dividend payments did not jeopardize Braskem's liquidity and the company was able to generate positive FCF. We expect Braskem to generate negative FCF over the next 12-18 months because of weaker operations and cash outflows related to Alagoas. To mitigate the impact of lower petrochemical spreads, Braskem announced a few cash preservation measures, including cost and revenue optimization initiatives, and working capital and capex savings. We also expect the company to continue to pursue liability management initiatives to preserve its credit quality.

Methodology and scorecard

Braskem's scorecard-indicated outcome under our [Chemicals](#) rating methodology, published in June 2022, maps to Ba2, one notch below the current assigned rating, reflecting the company's deteriorated credit metrics under the current difficult industry environment. Our 12-18-month forward-looking view also maps to a Ba2 rating.

Exhibit 9

Rating factors

Braskem S.A.

Chemical Industry Scorecard [1][2]	Current LTM 3/31/2023		Moody's 12-18 Month Forward View As of 6/23/2023 [3]	
	Measure	Score	Measure	Score
Factor 1 : Scale (15%)				
a) Revenue (USD Billion)	\$17.3	A	\$17.0 - 18.0	A
b) PP&E (net) (USD Billion)	\$8.3	Baa	\$7.9 - 8.2	A
Factor 2 : Business Profile (25%)				
a) Business Profile	Baa	Baa	Baa	Baa
Factor 3 : Profitability (10%)				
a) EBITDA Margin	9.1%	Ba	8.5% - 9.5%	Ba
b) ROA (Return on Average Assets)	3.5%	B	2.5% - 5.0%	B
Factor 4 : Leverage & Coverage (30%)				
a) Debt / EBITDA	6.7x	Caa	6.5x - 7.5x	Caa
b) RCF / Debt	2.4%	Caa	2.5% - 5.0%	Caa
c) EBITDA / Interest Expense	1.6x	B	1.0x - 2.0x	B
Factor 5 : Financial Policy (20%)				
a) Financial Policy	Ba	Ba	Ba	Ba
Rating:				
a) Scorecard-Indicated Outcome		Ba2		Ba2
b) Actual Rating Assigned				Ba1

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

[2] As of 3/31/2023(L).

[3] This represents Moody's forward view, not the view of the issuer, and unless noted in the text, does not incorporate significant acquisitions and divestitures.

Source: Moody's Financial Metrics™

Ratings

Exhibit 10

Category	Moody's Rating
BRASKEM S.A.	
Outlook	Stable
Corporate Family Rating	Ba1
BRASKEM AMERICA FINANCE COMPANY	
Outlook	Stable
Bkd Senior Unsecured	Ba1

Source: Moody's Investors Service

Appendix

Exhibit 11

Peer comparison^{[1][2]}

(in USD millions)	Braskem S.A. Ba1 Stable			Orbia Advance Corporation, S.A.B. de C.V. Baa3 Stable			Alpek, S.A.B. de C.V. Baa3 Positive			Sociedad Química y Minera de Chile S.A. Baa1 Stable			Olin Corporation Ba1 Stable		
	FYE Dec-21	FYE Dec-22	LTM Mar-23	FYE Dec-21	FYE Dec-22	LTM Mar-23	FYE Dec-21	FYE Dec-22	LTM Mar-23	FYE Dec-21	FYE Dec-22	LTM Mar-23	FYE Dec-21	FYE Dec-22	LTM Mar-23
Revenue	\$19,614	\$18,727	\$17,344	\$8,783	\$9,648	\$9,332	\$7,705	\$10,564	\$10,341	\$2,862	\$10,711	\$10,955	\$8,911	\$9,376	\$8,759
EBITDA	\$5,749	\$2,142	\$1,571	\$2,031	\$1,931	\$1,837	\$1,135	\$1,474	\$1,250	\$1,143	\$5,869	\$5,801	\$2,479	\$2,397	\$2,128
Total Debt	\$9,121	\$9,754	\$10,632	\$4,064	\$5,168	\$5,526	\$1,774	\$2,226	\$2,420	\$2,610	\$2,911	\$2,975	\$3,624	\$3,292	\$3,441
Cash & Cash Equiv.	\$1,558	\$2,361	\$2,442	\$782	\$1,546	\$1,384	\$515	\$324	\$274	\$1,515	\$2,655	\$2,089	\$181	\$194	\$176
EBITDA Margin	29.3%	11.4%	9.1%	23.1%	20.0%	19.7%	14.7%	14.0%	12.1%	39.9%	54.8%	53.0%	27.8%	25.6%	24.3%
ROA - EBIT / Avg. Assets	30.0%	7.0%	3.5%	13.8%	12.2%	10.8%	16.3%	19.0%	15.5%	15.4%	62.6%	56.5%	22.1%	21.1%	18.0%
EBITDA / Int. Exp.	5.3x	2.3x	1.6x	8.1x	6.6x	5.7x	8.9x	14.4x	11.0x	11.7x	48.6x	45.8x	10.7x	13.5x	11.5x
Debt / EBITDA	1.6x	4.7x	6.7x	2.0x	2.7x	3.0x	1.6x	1.5x	1.8x	2.3x	0.5x	0.5x	1.5x	1.4x	1.6x
RCF / Debt	28.3%	6.6%	2.4%	28.5%	16.4%	13.3%	30.4%	28.4%	18.2%	8.3%	81.8%	77.3%	51.0%	53.2%	43.1%

[1] All figures and ratios calculated using Moody's estimates and standard adjustments.

[2] FYE = Financial year-end. LTM = Last 12 months. RUR* = Ratings under review, where UPG = for upgrade and DNG = for downgrade.

Source: Moody's Financial Metrics™

Exhibit 12

Moody's-adjusted debt breakdown

Braskem S.A.

(in USD millions)	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-21	FYE Dec-22	LTM Ending Mar-23
As Reported Debt	9,236.4	10,428.4	11,019.1	9,077.6	9,721.6	10,598.1
Pensions	47.4	40.8	49.1	43.8	32.6	34.0
Non-Standard Adjustments	373.4	360.7	0.0	0.0	0.0	0.0
Moody's-Adjusted Debt	9,657.1	10,829.9	11,068.2	9,121.4	9,754.2	10,632.1

All figures are calculated using Moody's estimates and standard adjustments.

Source: Moody's Financial Metrics™

Exhibit 13

Moody's-adjusted EBITDA breakdown

Braskem S.A.

(in USD millions)	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-21	FYE Dec-22	LTM Ending Mar-23
As Reported EBITDA	2,642.6	627.1	-168.7	5,190.6	1,974.5	1,117.3
Pensions	4.0	8.9	4.3	-3.4	-14.9	-14.9
Interest Expense – Discounting	-74.9	-86.0	0.0	0.0	-112.7	-119.7
Unusual	530.9	1,037.3	2,296.8	561.4	294.9	588.4
Moody's-Adjusted EBITDA	3,102.5	1,587.3	2,132.4	5,748.5	2,141.8	1,571.1

All figures are calculated using Moody's estimates and standard adjustments.

Source: Moody's Financial Metrics™

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Contacts

Carolina A Chimenti
Vice President - Senior
Analyst
carolina.chimenti@moodys.com

+55.11.3043.7318

Danilo Arashiro
Associate Analyst
danilo.arashiro@moodys.com

+55.11.3956.8721

CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
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