



APIMEC 2019

DECEMBER 6, 2019

Braskem 



2019 Results

Rosana Avolio



New PP plant in the US

Fernando Musa



Braskem Idesa's "*fast track*" project to import ethane

Fernando Musa



Circular Economy

Fabiana Quiroga



Alagoas

Fernando Musa



Petrochemical scenario

Celso Procknor Filho



Outlook, strategic actions and priorities for 2020

Fernando Musa



2019 RESULTS

BRASKEM'S STRATEGIC PILLARS

OBJECTIVES



Braskem as a first quartile operator



Achieve balance between liquid and gas base,
creating +/- 20% flexibility



Increase global capacity by ~25%, with
operations outside Brazil representing >50%
of EBITDA



Braskem recognized as a global,
sustainable, innovative, and people-
centered company



Maintenance of its strong liquidity position

MAIN DELIVERIES OF 2019



- Health, Safety and Environment
- Operational efficiency
- Digital transformation
- Energy modernization

FEEDSTOCK AND
SUPPLIER
DIVERSIFICATION

GEOGRAPHY
DIVERSIFICATION

PEOPLE,
GOVERNANCE, AND
REPUTATION

CAPITAL ALLOCATION
/ FINANCIAL
DISCIPLINE

HEALTH, SAFETY AND ENVIRONMENT

Safety reference in the sector

Injury rate without lost time +
with lost time¹



➤ **Zero fatalities** or any event with permanent injury

➤ Injury **rate 61% below** historical average and **54% below** the sector average

Recognition and commitment



Gold rating of the Brazilian GHG Protocol Program for the **9th consecutive year**

Joining **CEO Water Mandate** reinforcing the Company's commitment to **sustainable water use worldwide**

The CEO
Water Mandate

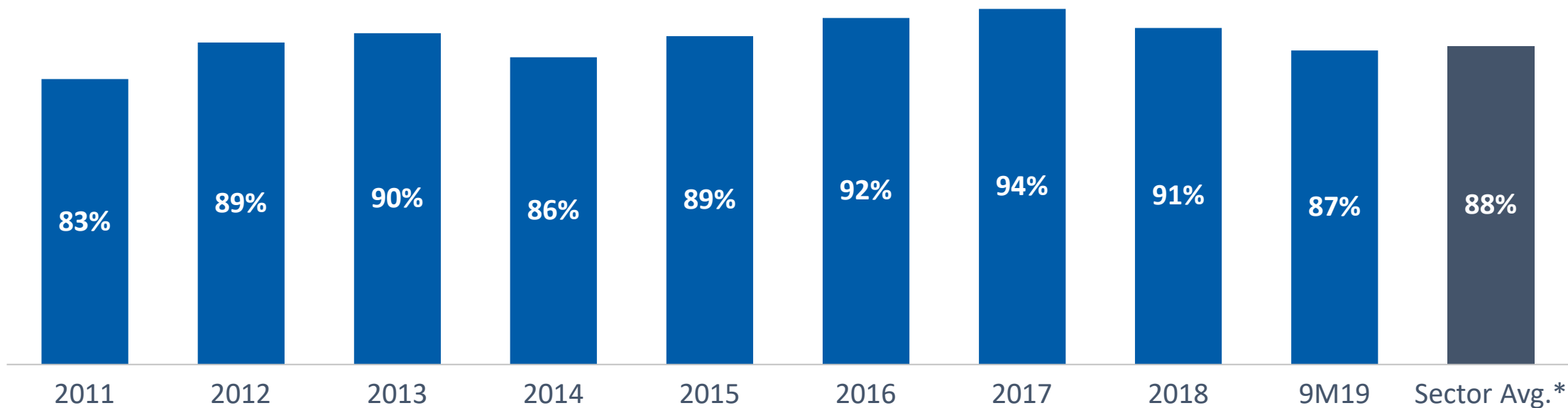


Recognition as a **Leading Company in Sustainable Development** by the UN Global Compact

OPERATIONAL EFFICIENCY



Crackers capacity utilization rate (%)



- Historical average **above sector average**
- **Increased** utilization rates in recent years reflecting **operational excellence**, supporting Braskem's **global competitiveness**
- Capacity utilization rate decreased in **9M19** due to **down cycle** of the petrochemical sector.

DIGITAL TRANSFORMATION

Adoption of **digital tools** to **optimize processes, reduce inefficiencies and increase productivity with cost reduction**, as well as making the **productive chain efficient**

Main initiatives of the Digital Center

- **Predictable maintenance**
Using advanced analytics to **predict asset failures**
- **Quality control**
Machine learning to predict and **improve product quality**
- **Integration with clients**
Customer-integrated data process leveraged by machine learning to **improve asset performance**

New digital solutions

- **Edge**
Customer portal for a **more convenient shopping experience**
- **LoadShark**
Freight platform that uses automation and algorithms, **optimizing freight cost and fleet productivity**

ENERGY MODERNIZATION PROJECTS



Petrochemical Complex of ABC

► Partnership with **SIEMENS**

Electrical system modernization project that will result in **greater production efficiency**

BEFORE ❌

AFTER ✅

Steam-based turbines ➡ **High performance** electric motors with **new cogeneration plant**

Status

- **91.8 thousand** man hours
- Physical completion of **17.6%**
- Accumulated investment of **R\$ 26.5 million¹**
- Start-up: **mar/21**



PP Plant in Neal

Electric infrastructure upgrade, mitigating safety risks and ensuring **long term operation**

BEFORE ❌

AFTER ✅

Maintenance cycle **every 2 years** ➡ Maintenance cycle reduction to **5-6 years**

Status

- **53.9 thousand** man hours
- Physical completion of **~55%**
- Accumulated investment of **US\$ 22 million**
- Start-up: **nov/20**

MAIN DELIVERIES OF 2019

PRODUCTIVITY
AND
COMPETITIVENESS



FEEDSTOCK AND
SUPPLIER
DIVERSIFICATION

- Feedstock diversification
- Supply diversification

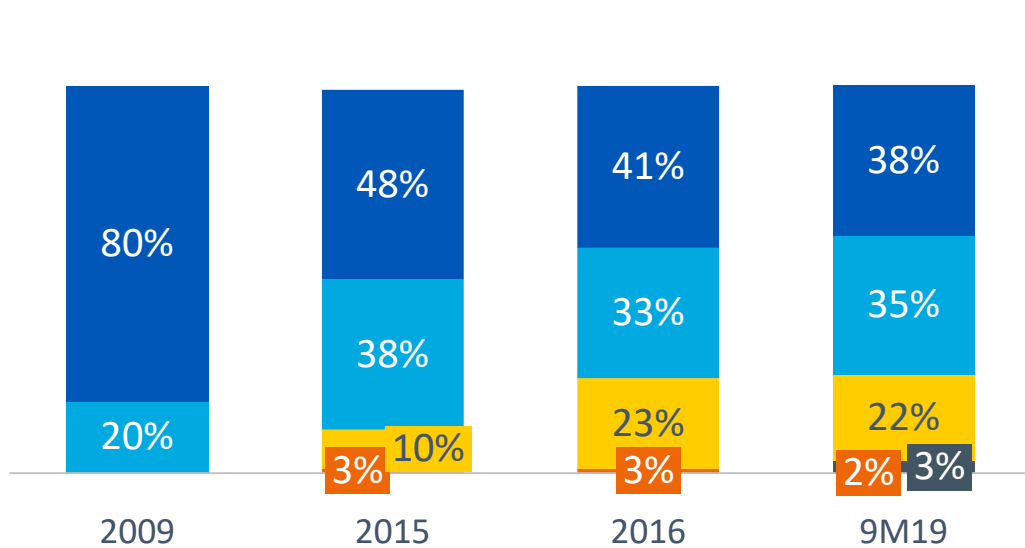
GEOGRAPHY
DIVERSIFICATION

PEOPLE,
GOVERNANCE AND
REPUTATION

CAPITAL ALLOCATION /
FINANCIAL DISCIPLINE

FEEDSTOCK DIVERSIFICATION

Feedstock base, per capacity



■ Naphtha ■ Gas ■ Ethanol
■ Propylene ■ Flex¹

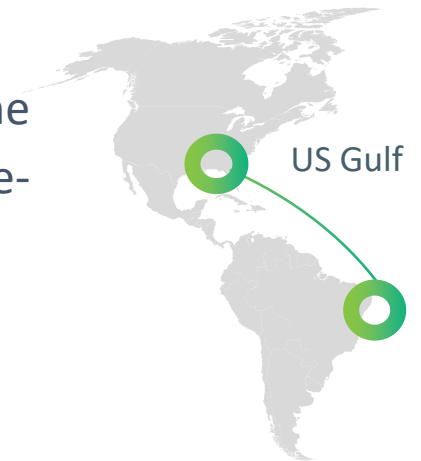
 85% naphtha; 15% ethane/propane

 Propylene

 Ethane

Balance development

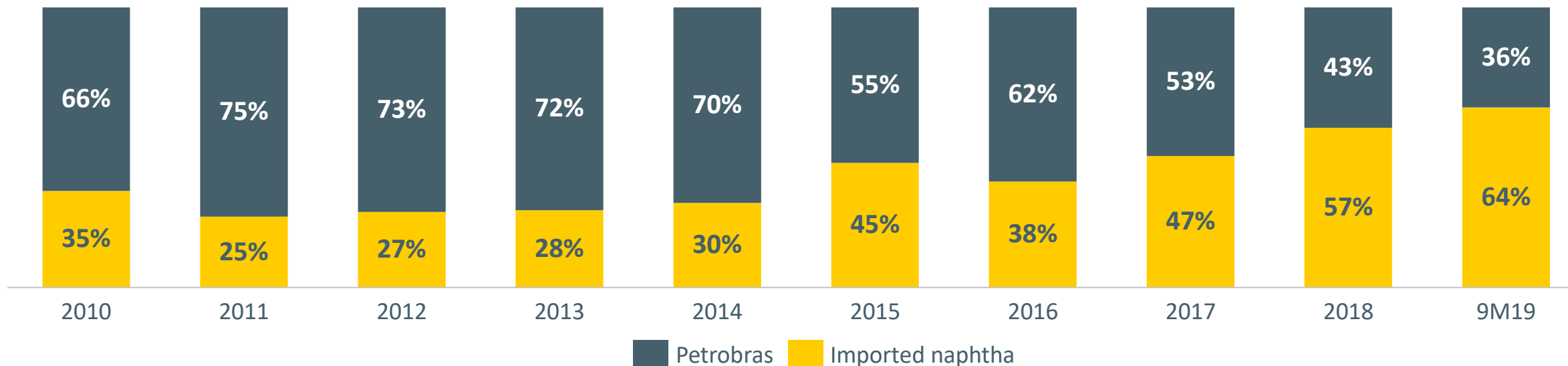
- Increased gas consumption, maintaining plant flexibility
- Bahia cracker flexibility
- Ethylene production up to **15% flexibility**
- **2%** of Bahia's ethylene production was ethane-based in the 9M19



SUPPLIER'S DIVERSIFICATION



Brazilian naphtha dependency reduction



- Increase of 27 p.p. of **imported naphtha** mix in total supply, compared to historical average of 37%.
- Increased **reliability of naphtha supply** through supplier diversification
- More than **20 suppliers of imported naphtha**

SUPPLIER'S DIVERSIFICATION



Braskem Idesa: import of ethane

- Investment: **US\$ 2.4 million** in logistical infrastructure to **import US ethane**, increasing petrochemical complex utilization rate
- **Long-term ethane supply** contract (negotiation is advanced) or spot market acquisition
- 12,800 barrels / day, up to 25,400 barrels / day, equivalent to **19% - 38% of the ethane requirement**
- Start-up: **end of 2019**



United States and Europe

- More than **15 propylene suppliers** in the US with different production alternatives:
 - ✓ PDHs
 - ✓ Refineries
 - ✓ Crackers
- More than **5 suppliers** in Germany

MAIN DELIVERIES OF 2019

PRODUCTIVITY
AND
COMPETITIVENESS

FEEDSTOCK AND
SUPPLIERS
DIVERSIFICATION



GEOGRAPHICAL
DIVERSIFICATION

PEOPLE,
GOVERNANCE, AND
REPUTATION

CAPITAL ALLOCATION /
FINANCIAL DISCIPLINE

- Industrial footprint
- Geographical diversification strategy
- Footprint expansion

INDUSTRIAL FOOTPRINT

41 industrial units around the world



BRAZIL

Bahia - 1 cracker | 4 PE | 1 PP | 1 PVC | soda chloride
Alagoas - 2 PVC | soda chloride
São Paulo - 1 cracker | 2 PE | 2 PP | 1 specialty
Rio de Janeiro - 1 cracker | 1 PE | 1 PP
Rio Grande do Sul - 2 cracker | 5 PE | 2 PP

ESTADOS UNIDOS

Pensilvânia - 1PP
West Virginia - 1 PP
Texas - 3 PP | 1 UTEC™

ALEMANHA

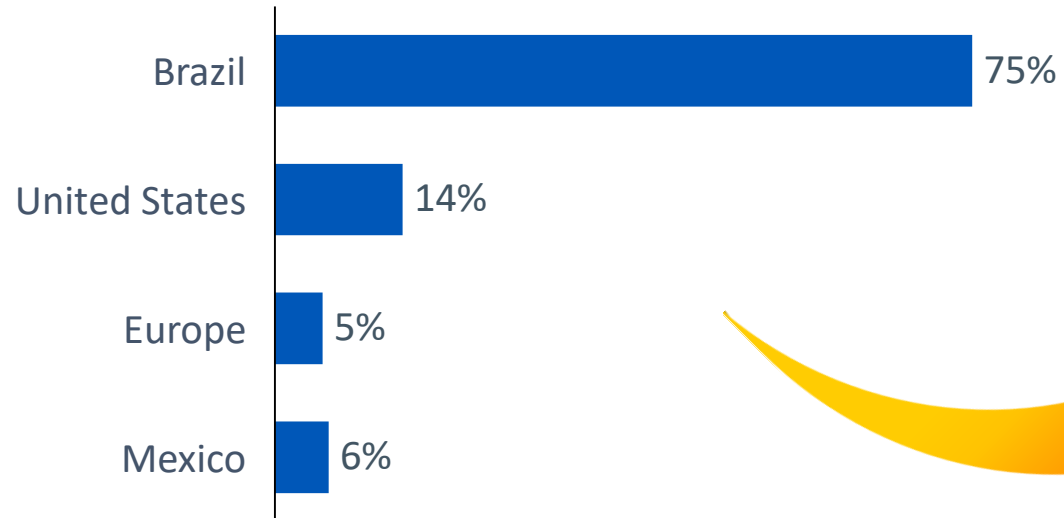
North Rhine - 1 PP
Saxony-anhalt - 1 PP

MÉXICO

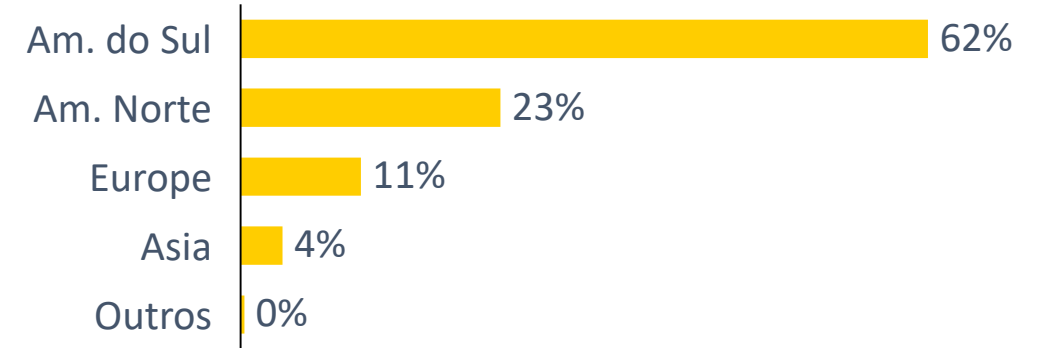
Veracruz - 1 cracker | 3 PE

GEOGRAPHICAL DIVERSIFICATION STRATEGY

Net revenue per country



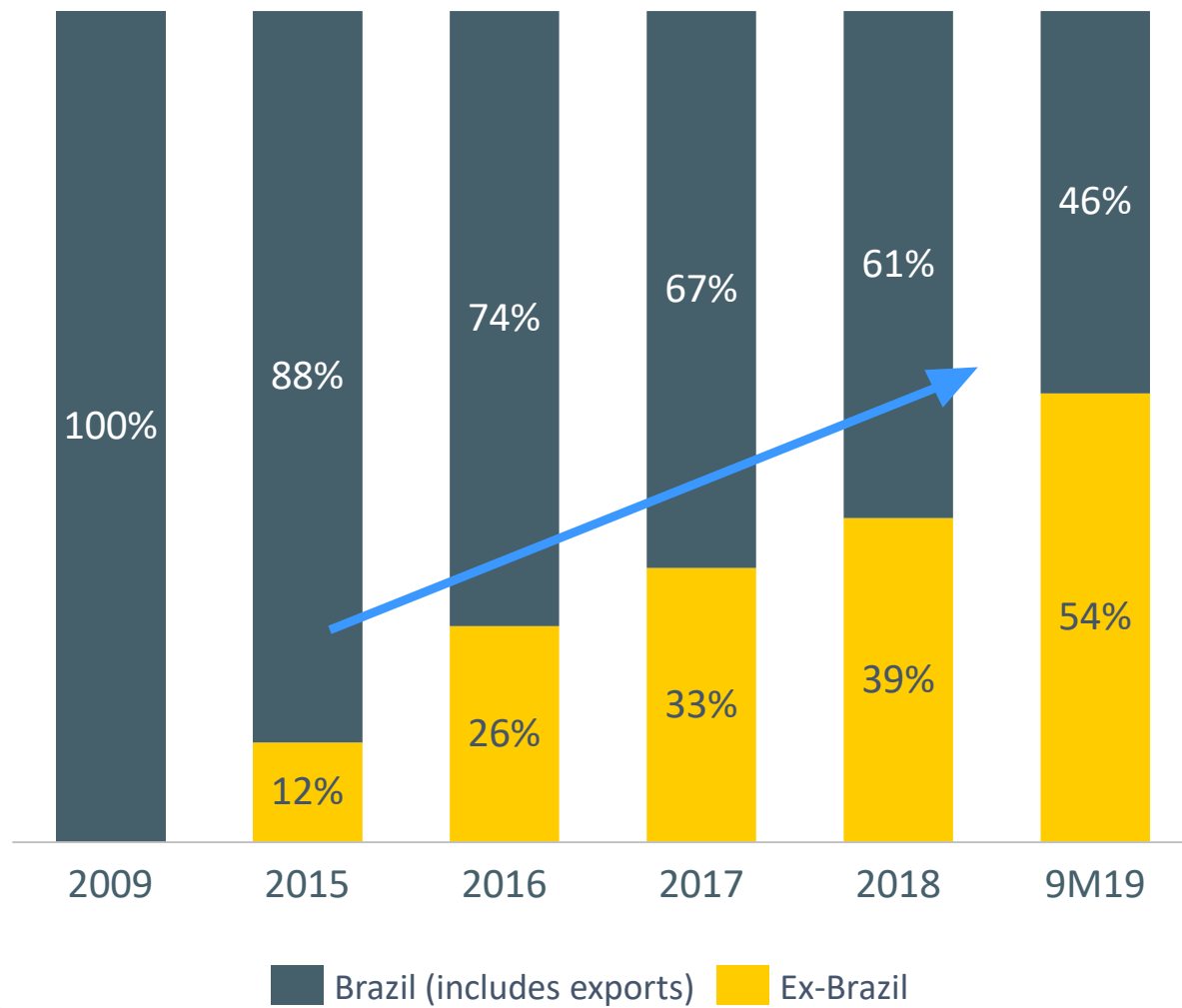
Net revenue per destination



Sales to over **80 countries**

GEOGRAPHICAL DIVERSIFICATION STRATEGY

Increasing ex-Brazil participation in EBITDA



Brazil: natural hedge

Domestic Demand
Stronger BRL /
Dollar Cash Cost



Braskem: Leading position



4 Plants
#1 - Leader

PE



6 Plants
1 Plants in
construction
#1 – PP Leader

PP

FOOTPRINT EXPANSION

New PP plant in the US

- Capacity of **450 kton/year**, starting up in **2020**
- **Physical completion** of **78,1%**

New office in India

- **New growth opportunities**
- Greater **proximity** with **Asian clients**

Singapore office expansion

- Greater communication with the **Asian market**, facilitating **potential future Braskem operations**
- Greater **proximity** with **Asian clients**



MAIN DELIVERIES OF 2019

PRODUCTIVITY
AND
COMPETITIVENESS

FEEDSTOCK AND
SUPPLIERS
DIVERSIFICATION

GEOGRAPHICAL
DIVERSIFICATION



PEOPLE,
GOVERNANCE,
AND REPUTATION

CAPITAL ALLOCATION
/ FINANCIAL
DISCIPLINE

➤ Implemented improvements

IMPLEMENTED IMPROVEMENTS



Flexwork implementation

New career philosophy, with **greater role of the team member**

Greater flexibility to **work abroad**

100% completion of Compliance Program Initiatives

Related Party Policy implementation

Implementation of **Information Disclosure and Securities Trading Policy**

Update of **4 governance policies / guidelines**



SER+ Program **expansion**, with **10 new cooperatives**

I'm green™ brand expansion towards **circular economy** product line

MAIN DELIVERIES OF 2019

PRODUCTIVITY
AND
COMPETITIVENESS

FEEDSTOCK AND
SUPPLIERS
DIVERSIFICATION

GEOGRAPHICAL
DIVERSIFICATION

PEOPLE,
GOVERNANCE, AND
REPUTATION

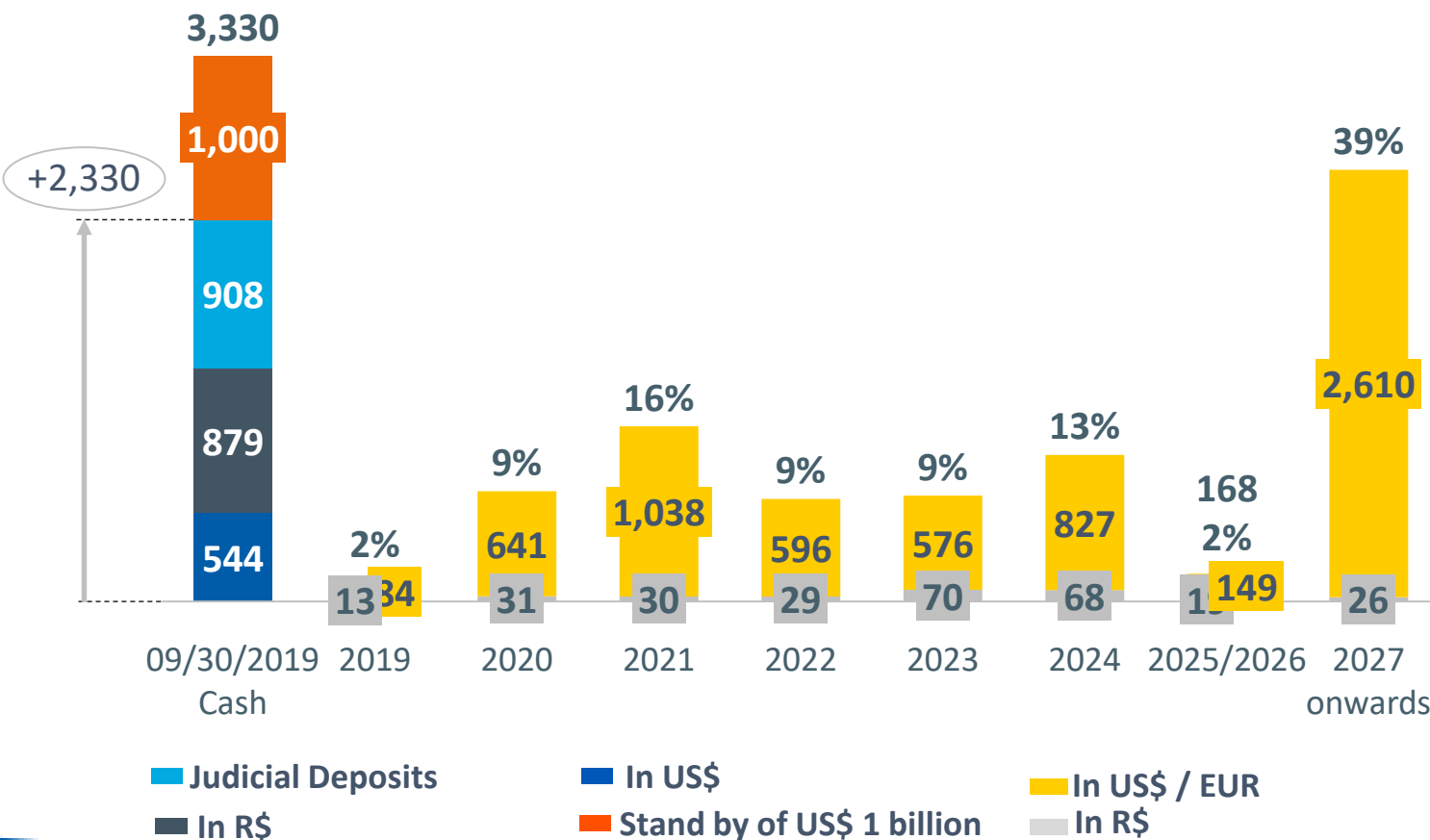


CAPITAL ALLOCATION
/ FINANCIAL
DISCIPLINE

- Debt refinancing
- Capital allocation

DEBT REFINANCING

Corporate Debt Profile (09/30/2019) before bond issuance¹



Credit rating

Agency	Rating	Outlook	Date
Fitch	BBB-	Negative	11/26/19
S&P	BBB-	Negative	11/26/19
Moody's	Ba1	Stable	04/26/18

Debt Indicators

Net Debt/EBITDA ^{2 3}	2.78x
Average debt term ⁵	13 years
Debt coverage ⁴	43 months ⁵
Average weighted cost of debt	5.36%

(1) Does not include Braskem Idesa debt, leniency agreement and transaction costs

(2) Does not include net debt and EBITDA from Braskem Idesa

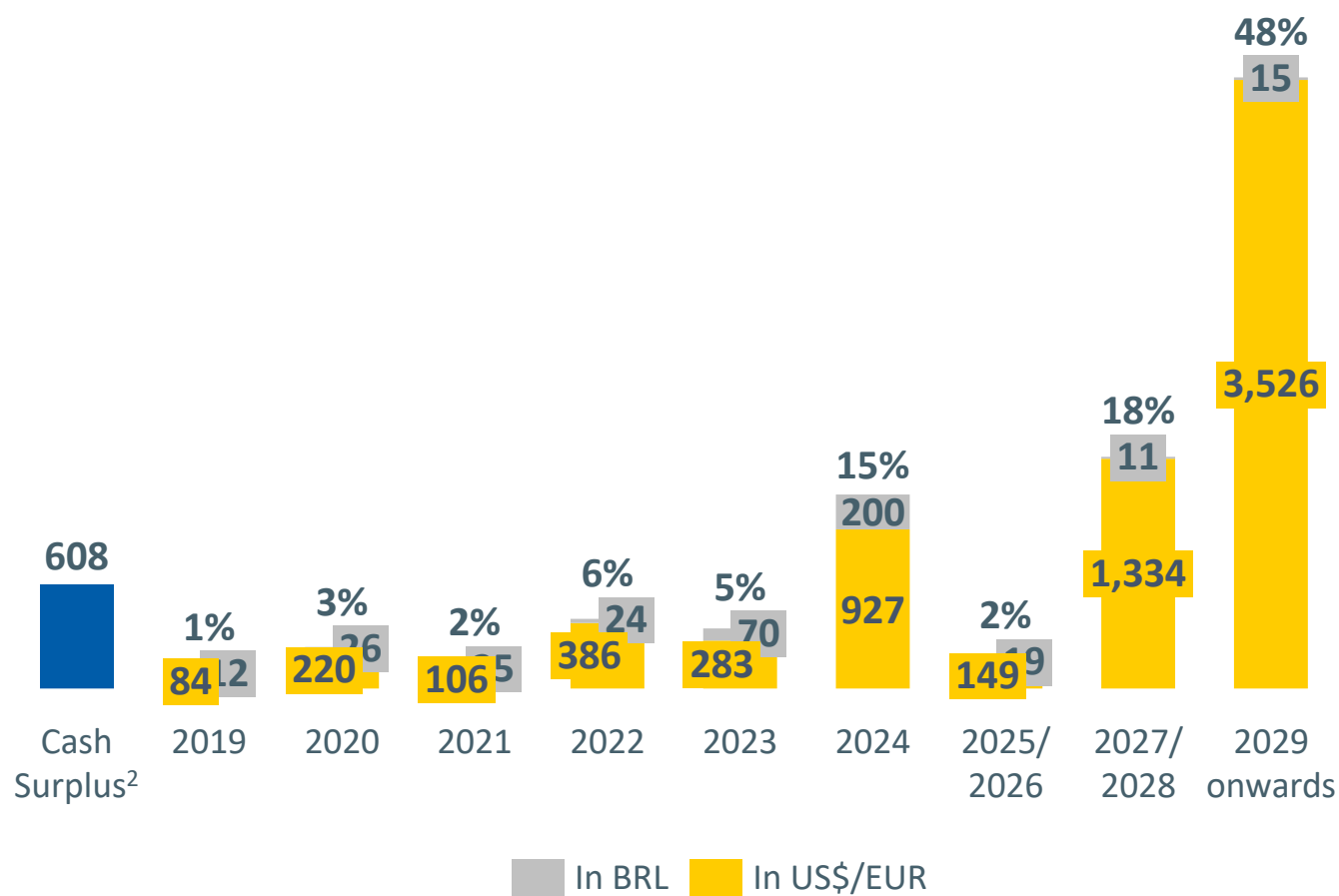
(3) Includes Leniency Agreement

(4) The US\$ 1 billion Stand-by expired on 2023

(5) Considers 30 years of duration for the perpetual bond

DEBT REFINANCING

Corporate Debt profile after bond issuance¹



Variation in debt indicators after refinancing

	Before	Proforma	Delta
Average debt term ²	13 years	18 years	+5 years
Debt coverage ³	43 months	99 months	+56 months
Average weighted cost of debt	5.36%	5.13%	-23 bps

(1) Does not include Braskem Idesa debt, leniency agreement and transaction costs

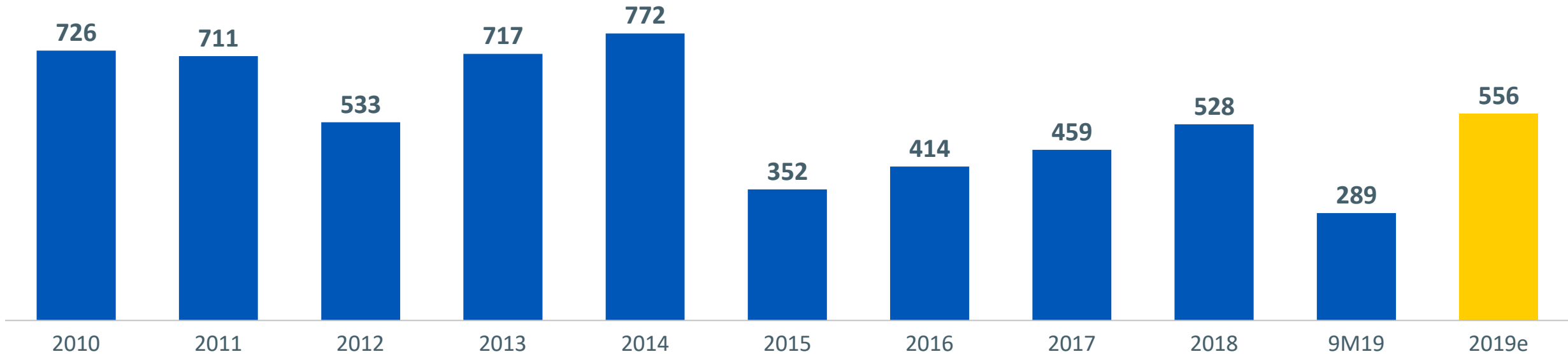
(2) Considers 30 years of duration for the perpetual bond

(3) The US\$ 1 billion Stand-by expired on 2023

CAPITAL ALLOCATION

Operational CAPEX ¹

The Company has already announced a maintenance **CAPEX reduction** of approximately **US\$ 100 million**



Dividends

Payment approval of **mandatory minimum dividends** in the amount of **R\$ 667 million** (equivalent to 25% of 2018 net income)

BRASKEM VALUATION

EV/EBITDA Indicator¹

Multiple
2009

5.8x

- **100% Brazilian** Company
- **100% naphtha-based** feedstock profile
- **18 plants**, with annual production capacity of **~11 million tons**

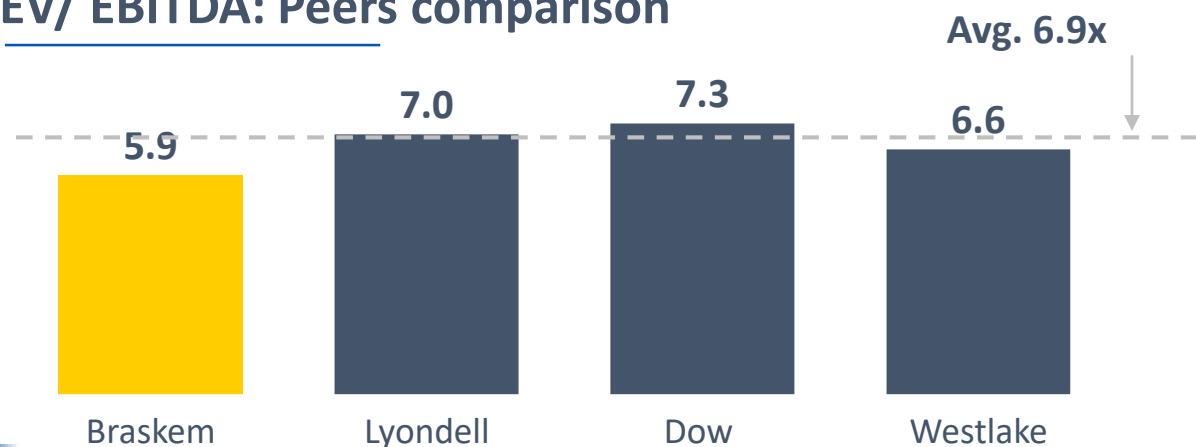


Multiple
2019

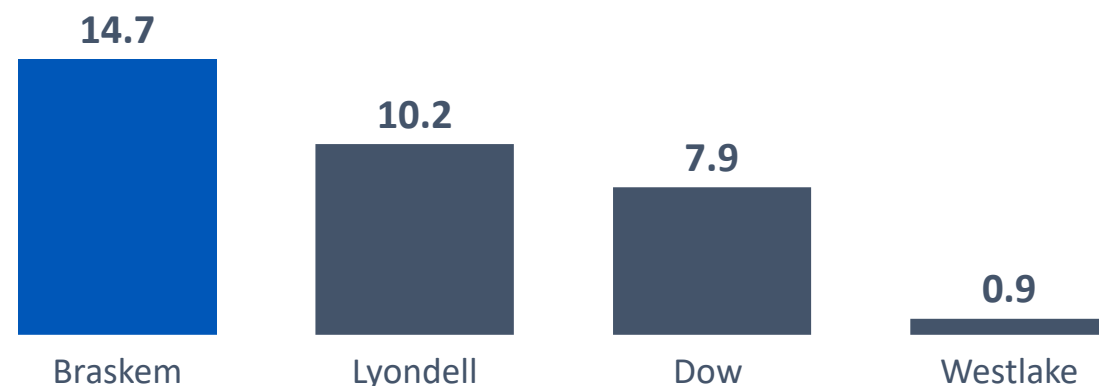
5.9x

- **Global company:** Brazil, US, Europe, Mexico
- New **PP plant** in the US and **fast track** in Mexico
- **41 plants** with annual capacity of **~21,5 million tons**
- **Commercial presence in Asia**
- Feedstock: **naphtha (38%)**; propylene (35%); gas (22%); flex (3%); ethanol (2%)

EV/ EBITDA: Peers comparison



FCF yield² (%) : peers comparison





NEW PP PLANT IN THE UNITED STATES

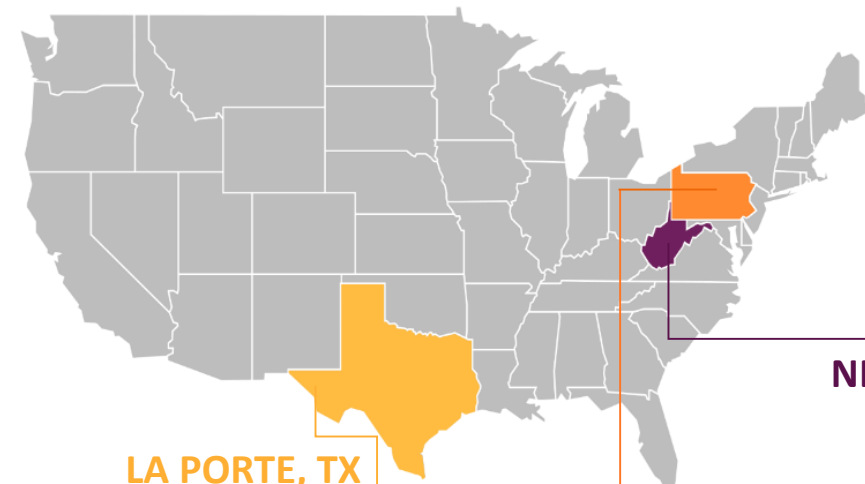


Main Milestones

- **2010:** acquisition of 3 Sunoco's PP business and an I&T center
- **2011:** acquisition of 2 DOW's PP business
- **2012:** acquisition of a propylene splitter at Marcus Hook refinery / propylene based propane supply contract with Enterprise Products (virtual integration)
- **2016:** expansion of Marcus Hook plant
- **2017:** start up of UTEC plant in La Porte

Operational Highlights:

- Total PP production capacity: **1.6** million t/year
- United States **PP market leader**



LA PORTE, TX

Ultra high molecular weight polyethylene plant (UTEC)

LA PORTE, TX

354 M t/year
Technology: Spheripol

OYSTER CREEK, TX

336 M t/year
Technology: Spheripol

SEADRIFT, TX

227 M t/year
Technology: Unipol

PHILADELPHIA, PA

Headquarter

MARCUS HOOK, PA

414 M t/year
Technology: Unipol

PITTSBURGH, PA

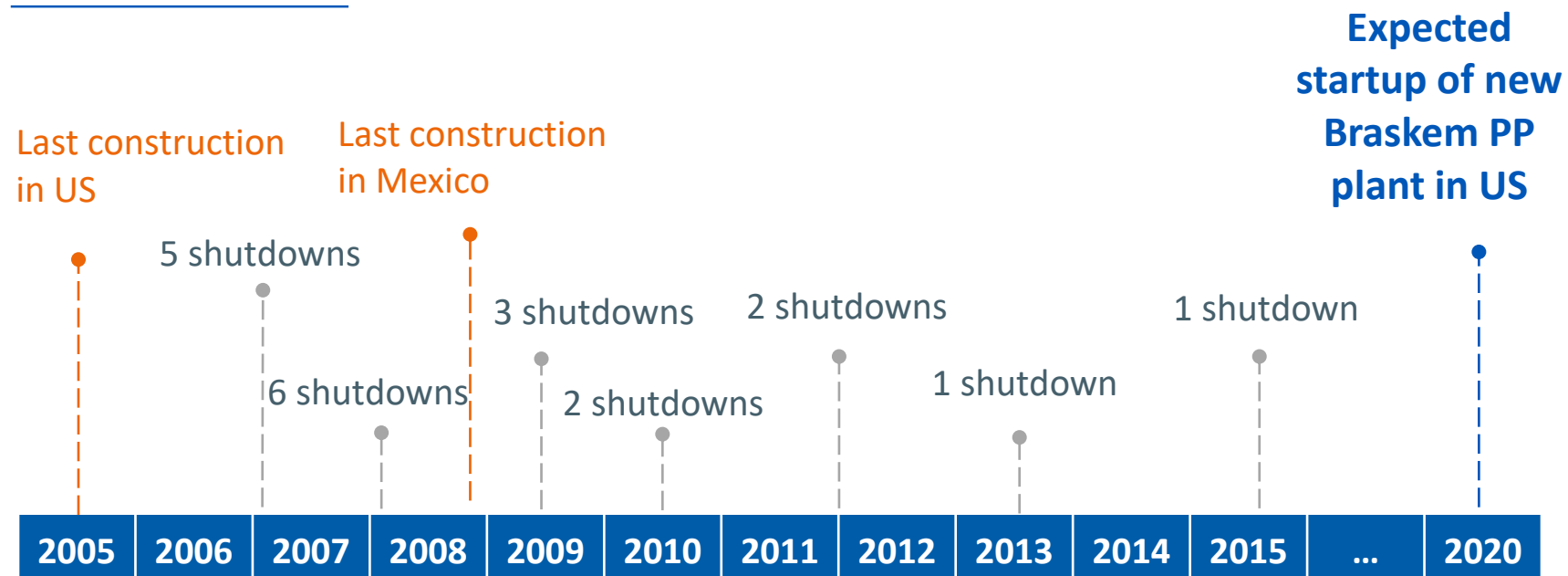
Innovation & Technology Center

NEAL, WV

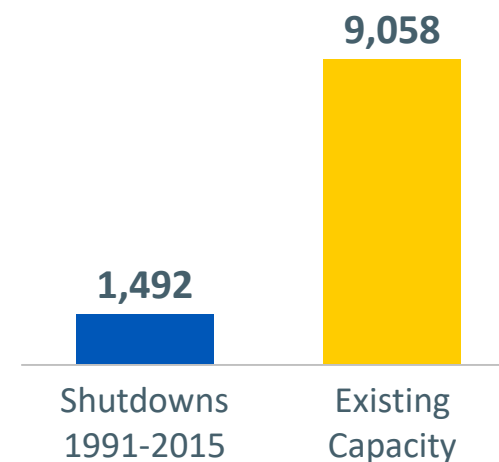
240 M t/year
Spheripol Technology

NORTH AMERICA PP MARKET

Addition/Closing of capacities in North America



North America PP Capacity *in Million Tons*

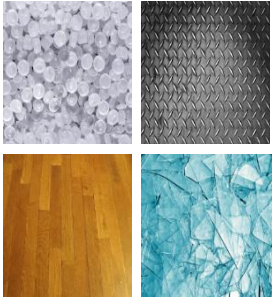


- **No new PP capacity additions** in the region since 2008
- **Shutdowns of 1.4 million tons of PP capacity** between 1991-2015
- New **Braskem PP plant will be the first one to startup** in the region since 2008

NORTH AMERICA PP DEMAND

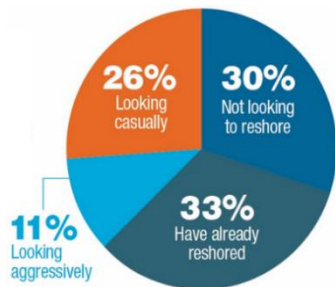
Growth drivers of demand from 2017

Competitiveness



Higher PP competitiveness against other plastic resins and other conventional materials

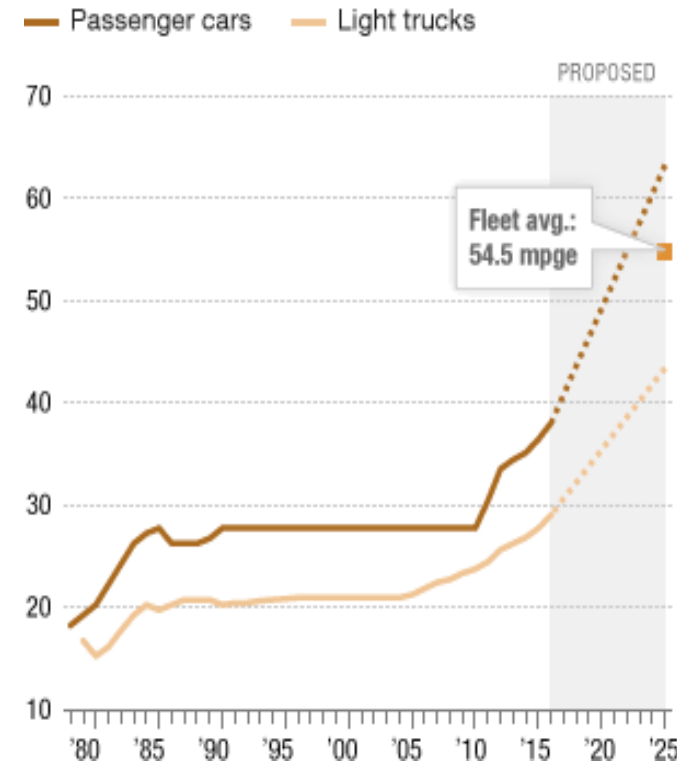
Production Re-shoring



Nexant source about plastic industry: 70% of the companies were analyzing its production re-shoring

Fuel Economy Average

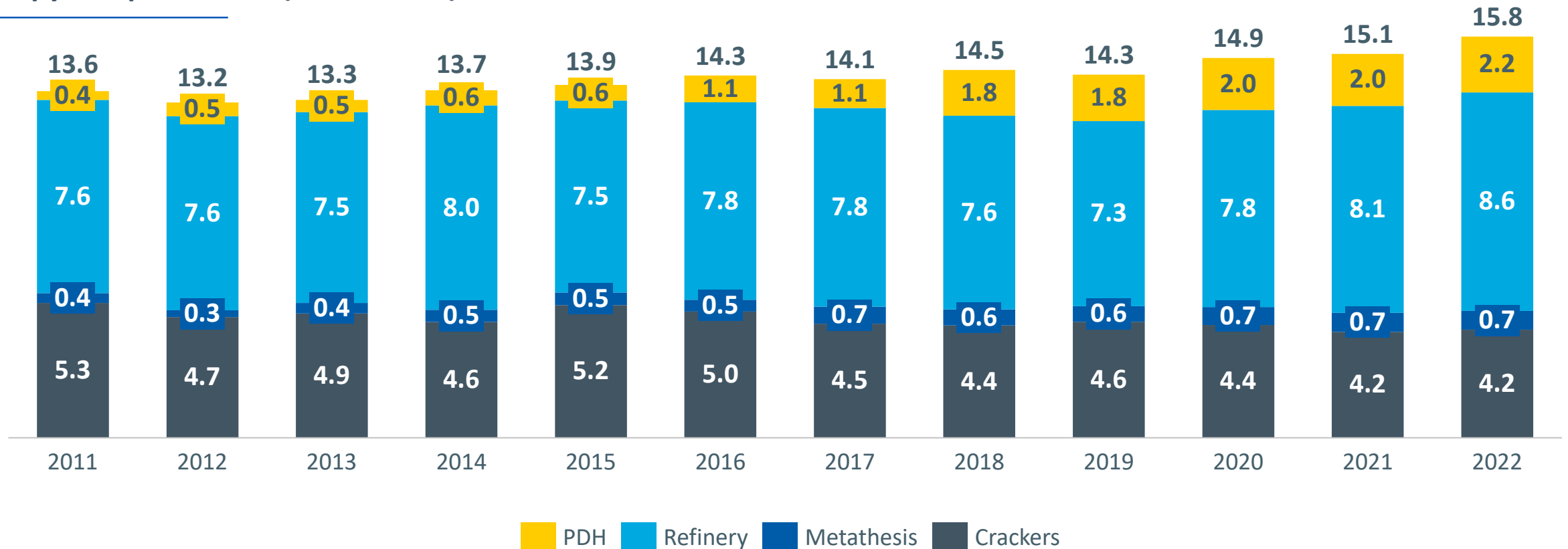
Fuel economy standards by model year
(in miles per gallon equivalent)



New emission standards of polluting gases
Light vehicles demand

NORTH AMERICA PROPYLENE PRODUCTION

Propylene production (million tons)

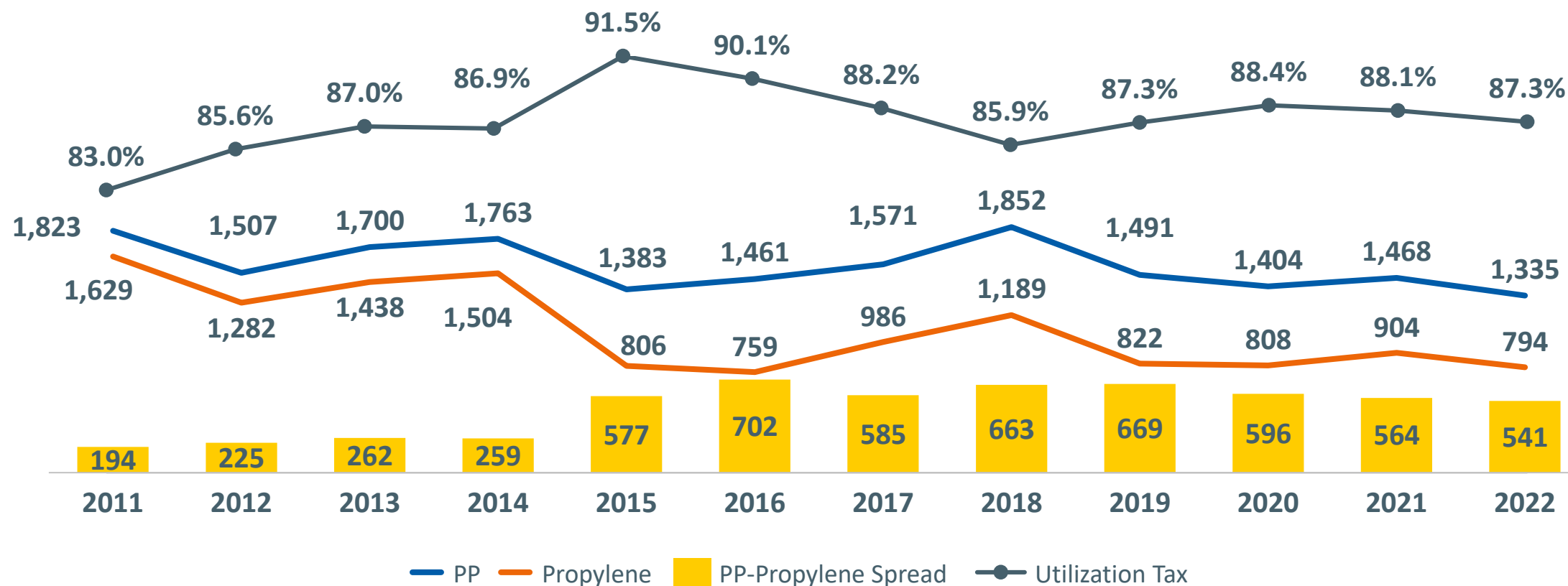


While **PP market** is **short**, the **propylene availability has been growing** due to **PDH** capacity additions in the region

UNITED STATES PP SPREADS

Transition from an **exporter** market to an **importer** market from 2016

Historical Spreads (US\$/t) and Utilization Tax (%)



PP-Propylene Spreads in the region still healthy even after the startup of new PP capacities

NEW PP PLANT IN THE UNITED STATES

The project is in line with Braskem's **feedstock and geography diversification**, besides reinforcing the **PP production leadership position** in the region

► Capacity

450 thousand of tons per year

► Total investment

US\$ 675 million

► Location

In the already existing Braskem complex at La Porte, Texas, allowing to the new plant:

- Proximity and connectivity to many propylene suppliers base crackers, refinery and PDH
- Already existing logistic system
- Lower fixed costs (including personal costs)
- Infrastructure designed for future expansions

Project Status

► Physical completion

78.1% till Sep/19

► Investment made

US\$ 523 million till Sep/19

► Start up

Scheduled for 1H2020



PROJECT TO IMPORT ETHANE IN MEXICO

BRASKEM IDESA



Overview

- Joint Venture between **Braskem (75%)** and **Idesa Group (25%)**
- **Petrochemical complex for ethylene, high and low density polyethylene production** at Nanchital City, state of Veracruz
- Production capacity: **1.1 million t/year**
- 4 plants: **1 cracker and 3 PE plants**
- Feedstock:
 - ✓ **Natural Gas** supplied through a **20 years contract with PEMEX**
 - ✓ Clauses of **delivery or pay for PEMEX / take or pay for Braskem Idesa**
- Start up: April of **2016**
- Investment: **US\$ 5.2 billion**
 - ✓ Financing of **US\$ 3.2 billion through Project Finance Limited-Recourse** with 17 banks



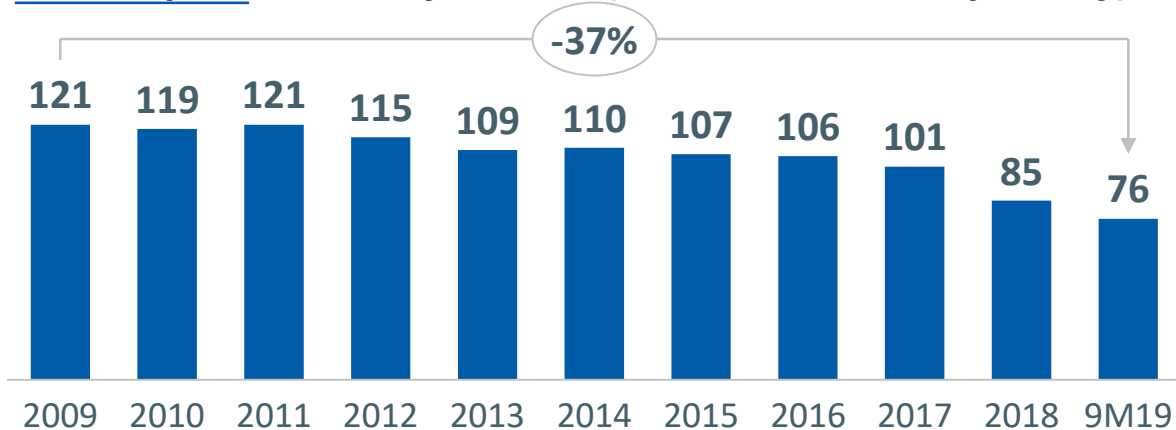
Largest petrochemical complex in Latin America and higher private investment ever made in Mexico

FEEDSTOCK SUPPLY

Main Milestones

- **2009:** Braskem and Idesa are the winners of PEMEX auction
- **2010:** Braskem Idesa and PEMEX sign a supply contract of 66 thousands barrels per day of ethane
- **2016:** complex start up
- **9M19:** PE plants utilization rate of 72%

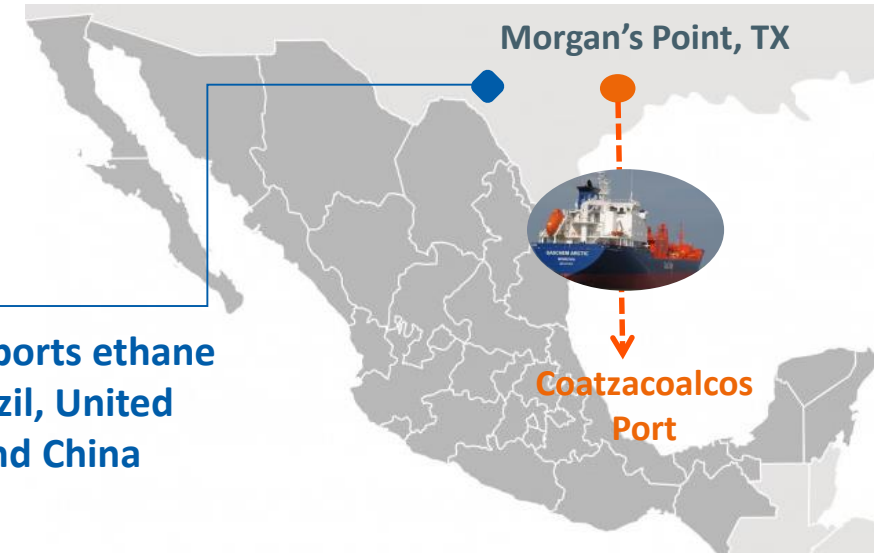
Ethane production by PEMEX (thousand barrels per day)



Diversification



Location



USA already exports ethane for India, Brazil, United Kingdom and China



Capacity

Ethane in USA (million bpd)	2018	2019	2020e*
Production	1.71	1.98	2.19
Consumption	1.44	1.65	1.81
Export	0.27	0.33	0.38

Source: External Consulting
* Projection till 2023

“FAST TRACK” PROJECT TO IMPORT ETHANE

1st Phase: Fast Track

➤ Overview

- Start up: **end of 2019**
- Terminal: operated by Smart Pass
- Trucks: operated by Enestas

➤ Operation

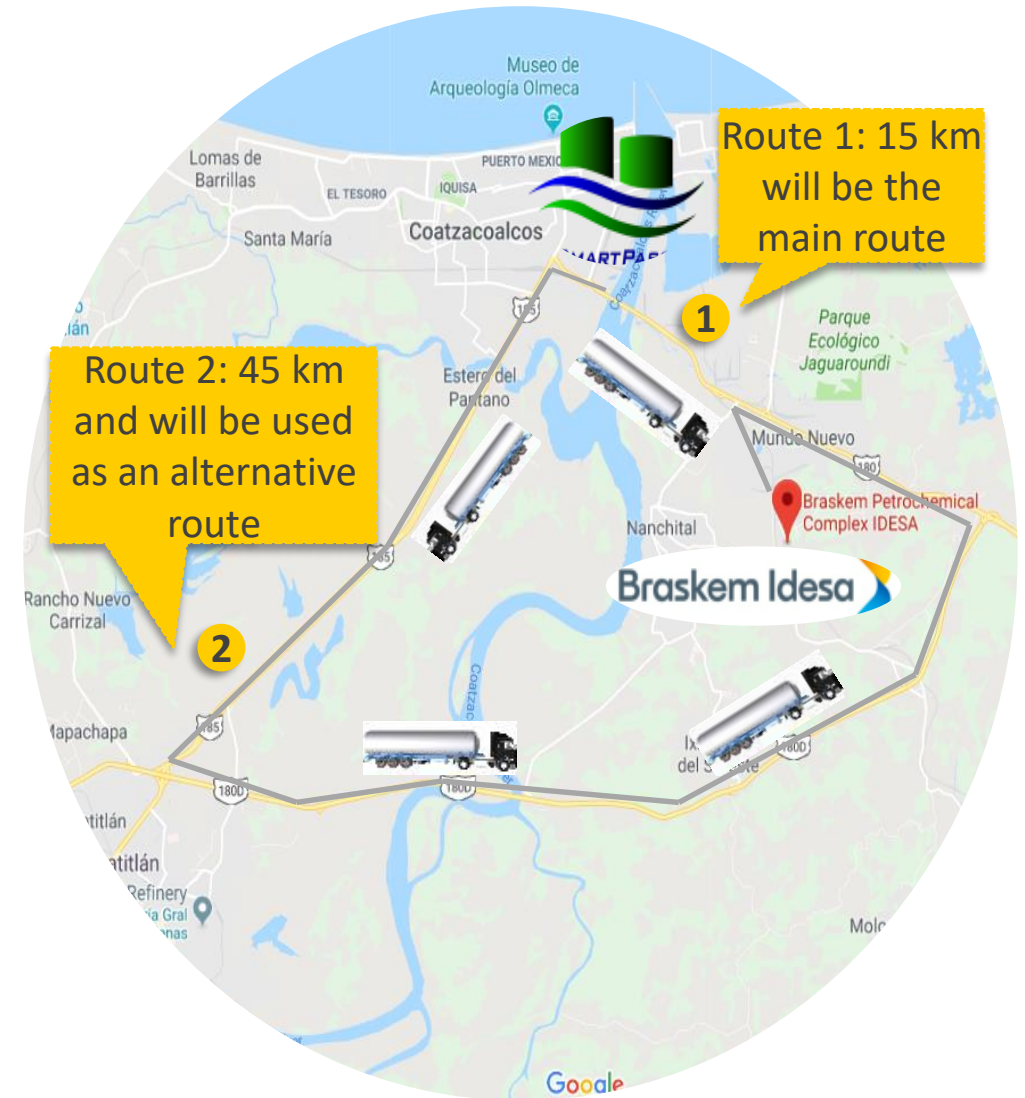
- 2 vessels of 22.000 m³ in full time
- 12 trucks with 2 isocontainers each, working 12 hours

➤ CAPEX and Capacity

- **Total Investment of US\$ 2.4 million**
- Capacity of 12,800 to 25,400 barrels per day

➤ Import Cost

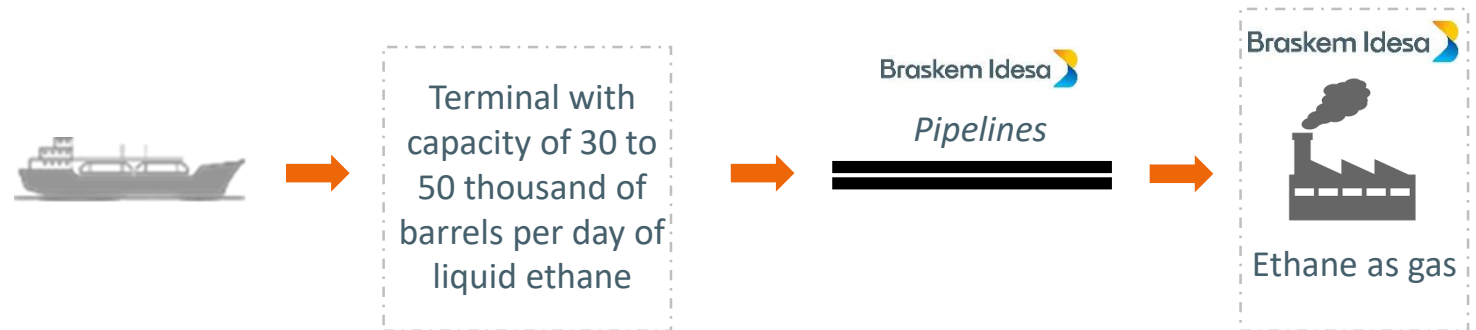
- Ethane Mont Belvieu + **intern cost**
- Includes expenses with terminal and trucks operations



PROJECT TO IMPORT ETHANE

2nd Phase: Complementation

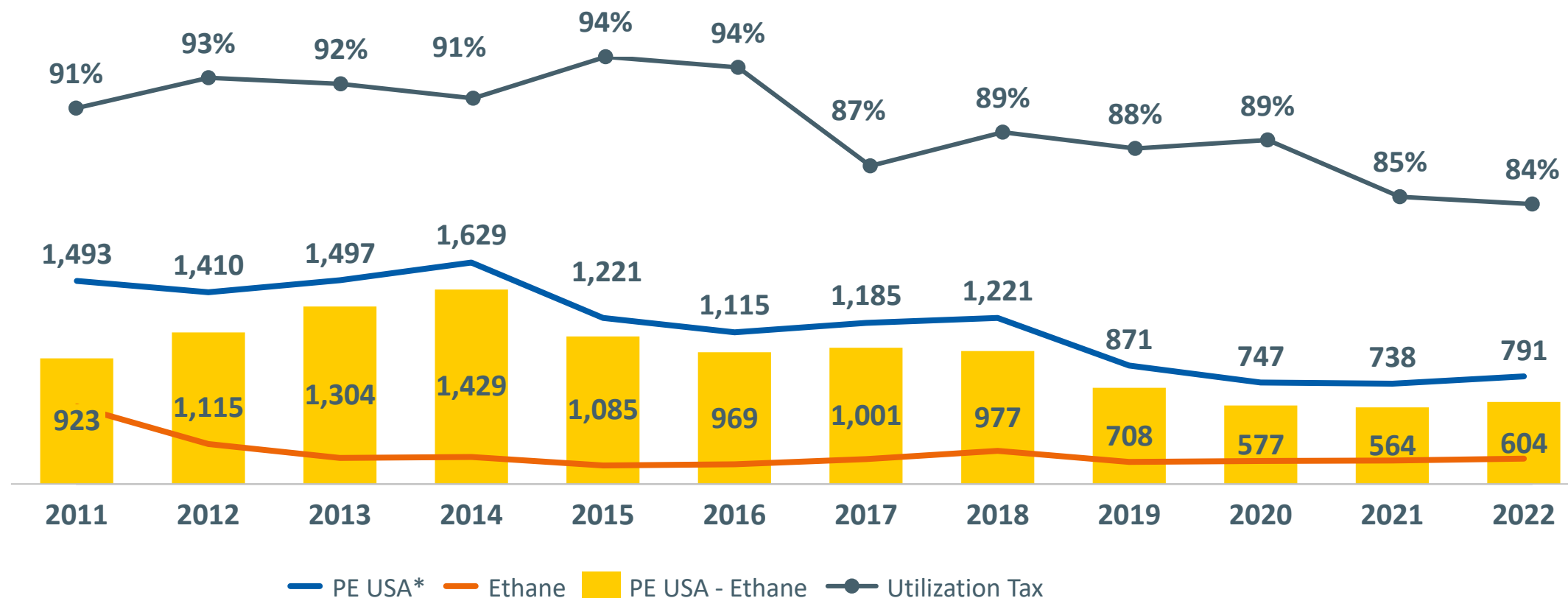
Braskem Idesa is analyzing a solution with higher capacity to import ethane, which consists in the **construction of an ethane import terminal** and a **pipeline to transport it** to BI's petrochemical complex



- Planned construction for the beginning of 2020 and start up in the end of 2021
- Additionally to the 2nd phase of the project, Braskem Idesa is planning to expand the capacity of its cracker between 10% and 20% in 2021

UNITED STATES PE SPREADS

Historical Spreads (US\$/t) and Utilization Tax (%)



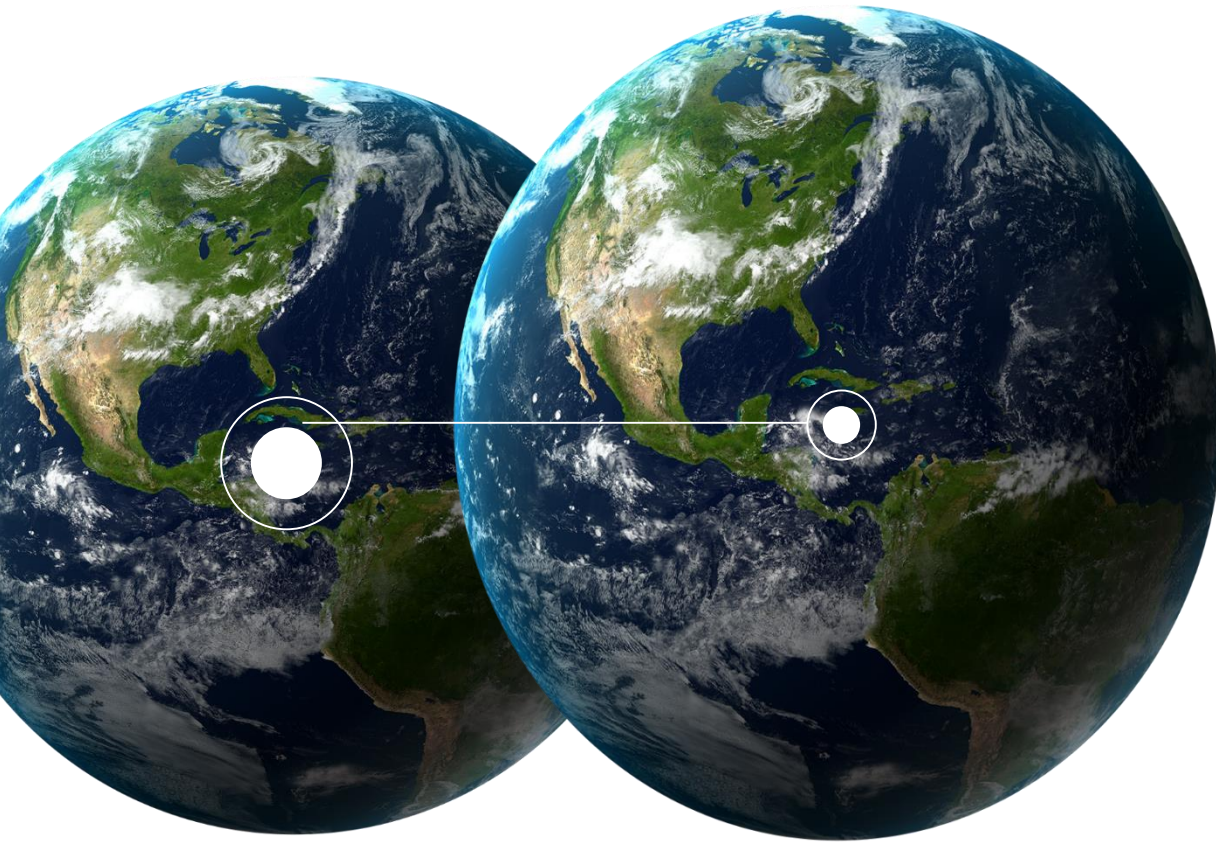
* As production capacity mix of PE in Mexico

Source: External Consulting



CIRCULAR ECONOMY

PLASTIC AND CIRCULAR ECONOMY



OUR WORLD IS CHANGING

It would be necessary around 1.5 planets to produce, regenerate and absorb everything that we consume in the actual standards¹

The **CO2 emission** and other greenhouse gases are considered as the main causes of the global warming effect

Global waste generation in 2016 was **2.01 billion tons**, estimated to achieve **3.4 billion annually in 2050**²

In Brazil, only **22% of municipalities have selective collection**, and of the collected material, 13% is made up of plastic, 22% paper and cardboard, 12% aluminum, 10% ferrous metals and 9% glass³

Sources:

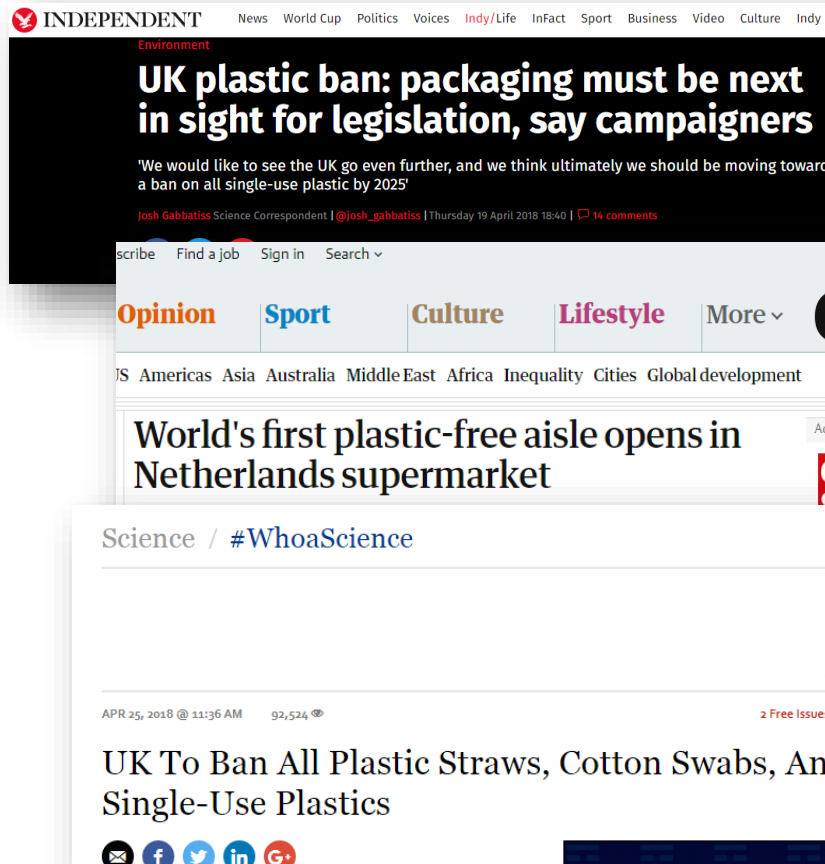
1. WWF Living Planet Report 2016

2. World Bank Group – What a Waste 2.0

3. Abrelpe Panorama 2017

PLASTIC

Global Scenario



MARINE LITTER

G7 recognises urgency of ocean plastics pollution / Lost value of plastics in waste stream / Ellen MacArthur Foundation to form coalition of businesses and governments



GERAL AMBIENTE

A GUERRA AOS CANUDOS

Depois que o vídeo de uma tartaruga sufocada por um cilindro de plástico viralizou na internet, ganhou força a grita contra um símbolo do nosso tempo

ANDRÉ LOPES E TATIANA BABADOBULOS



Share 1

acts to address marine litter

In this First Person column, Steve Russell, VP of Plastics at the American Chemistry Council, compliments packaging's sustainability efforts, but packaging must provide benefits beyond its initial use as part of a 'circular economy.'

BUT WHY SHOULD WE BANISH PLASTIC

Isn't it the ideal solution?

FOOD



2g of plastic:

- + 11 days in a cucumber
- + 26 days in meat
- Food waste

AGRIBUSINESS



- + 21.5% of productivity
- Cost of R\$11 thousand/hectares
- 95% of pesticides
- + Same food quality

TRANSPORT



- + Energy efficiency
- + Car life cycle
- CO2 emission
- + Safety
- ✗ Greater flammability (flame retardant additives)

BUT WHY SHOULD WE BANISH PLASTIC

Isn't it the ideal solution?

IN HEALTH

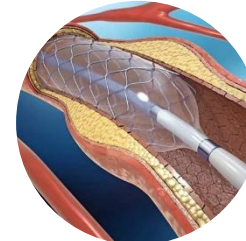
- Risk of contamination
- + Accessibility (lower cost)
- + Compatibility
- + Comfort
- + Flexibility
- + Prevention



ABSORDABLE
SUTURES



POLYPROPYLENE
FABRICS



CATHETERS
AND STENTS



HEARING
AIDS



CORNEA
PROSTHESIS



BAGS



SYRINGES



CAPSULES



CONDOMS



PROTHESIS

PLASTIC: A SMART AND SUSTAINABLE SOLUTION

Unique characteristics for the benefit of society



Lightness and resistance

Energy efficiency and protection



Relatively Cheap

Society welfare



Low energy consumption

Reduction of greenhouse gas emission



Low conductivity and waterproof

Energy efficiency

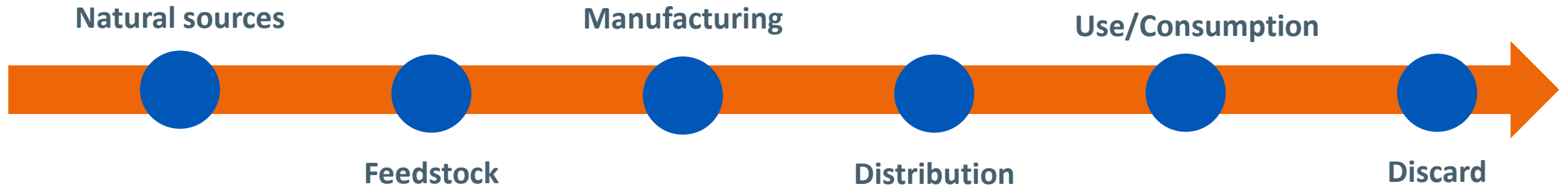


100% recyclable



Non toxic

THE MARKET MODELED IN THE LINEAR ECONOMY



Since Industrial Revolution, companies have developed its business around the linear economy and the consumer habits linked to this economy



The designers have learned to design linear economy packaging with a focus on aesthetics and performance to attend consumer demand

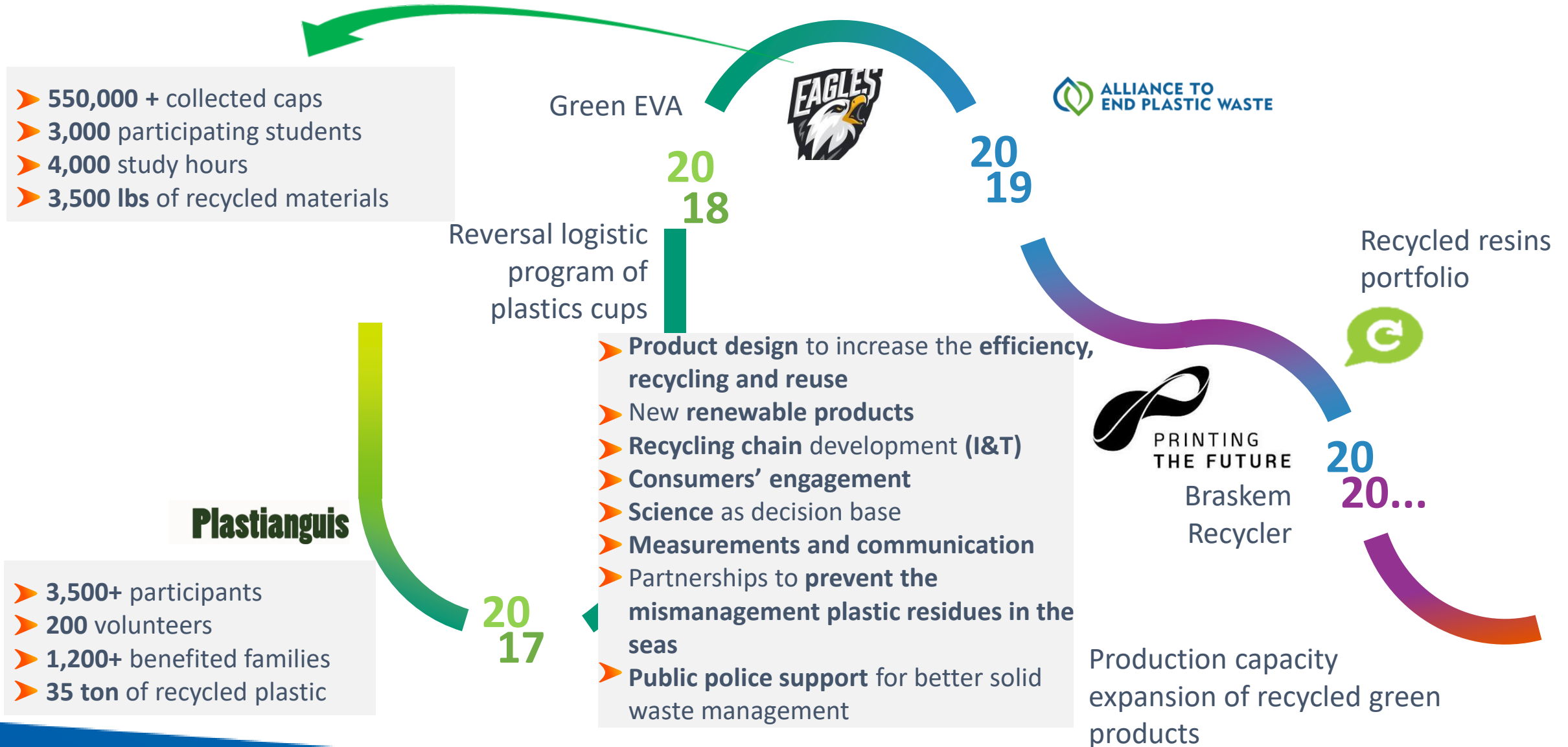
THE TRANSFORMATION TO A CIRCULAR ECONOMY



OUR JOURNEY TOWARDS CIRCULAR ECONOMY IN THE LAST 17 YEARS

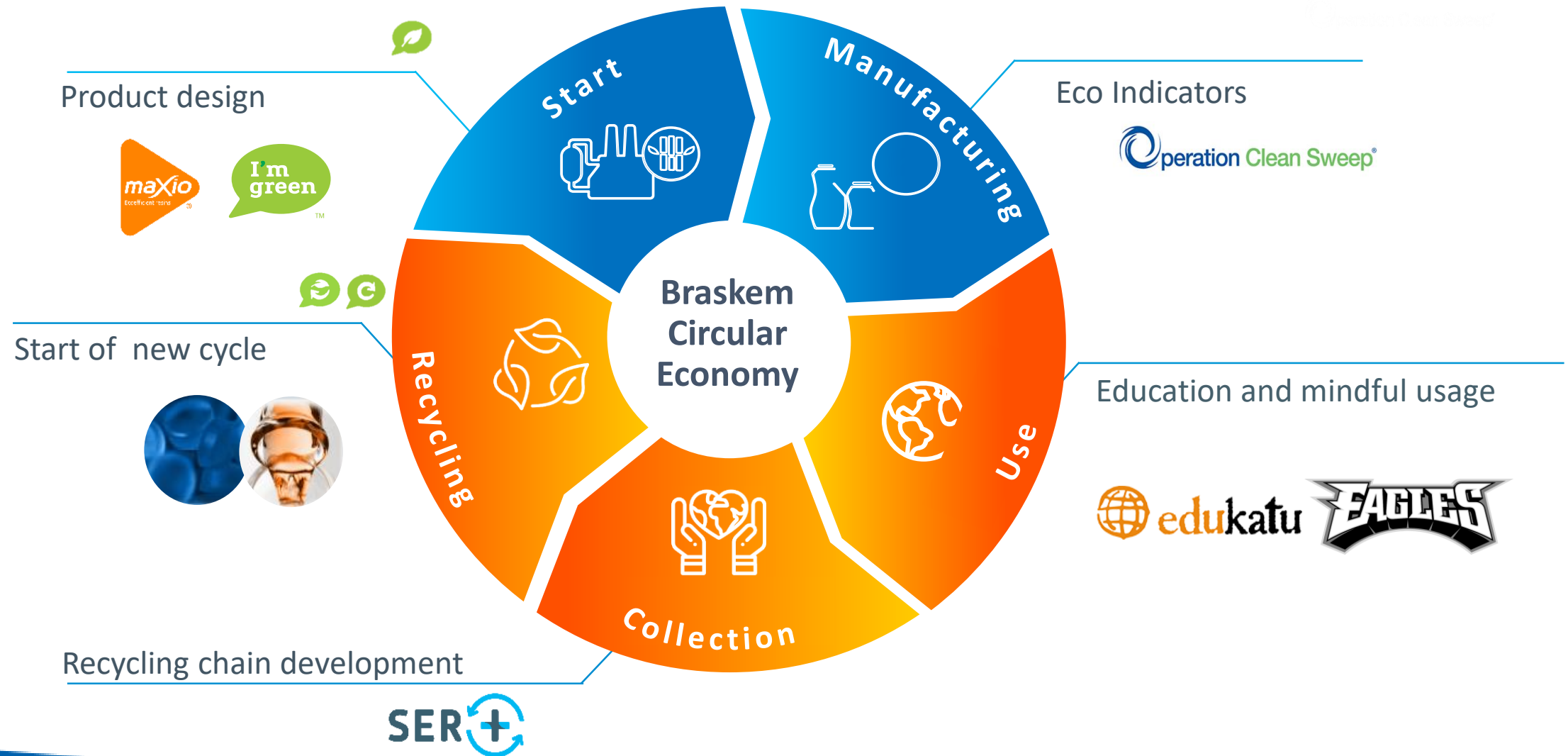


OUR JOURNEY TOWARDS CIRCULAR ECONOMY IN THE LAST 17 YEARS



OUR VISION ON CIRCULAR ECONOMY

Nothing is lost, everything is transformed!



DEVELOPMENT

Recycling System

Mechanical Recycling

Process

Collect

Segregation

Milling

Cleaning

Recycled pellets



The challenge of producing quality material beyond the restriction of food contact packaging

Chemical Recycling

Process

Collect

Warming

Hydrogenation

Gasification

Pyrolysis

Fuel

Gases

Pyrolysis Oil

Virgin raw material

Chemical recycling is a technology in development, but with huge expectations to the future



SENAI CETIQT

cetrel

COPPE
UFRJ

CIRCULAR SOLUTIONS

OVERVIEW by solution type





ALAGOAS

BRASKEM IN ALAGOAS

- **1975:** start up of Salgema operations in Alagoas, with salt extraction and chlor-alkali production
- **2002:** Braskem is created with the merger of several companies, including operations in Alagoas
- **2012:** on its 10th anniversary, Braskem opens a new PVC plant in Alagoas, turning into the biggest producer of this polymer in the Americas
- **2018:** a 2.4 degree on the richter scale earthquake is felt in Pinheiro neighborhood at Maceió, Alagoas, and cracks appear in some buildings and on the streets
- **2019:**
 - **April:** signature of a cooperation agreement: donation of monitoring equipment for Civil Defense of Maceió and pavement and drainage works
 - **May:** suspension of salt extraction in Maceió and the operations of the chlor-alkali and dichloroethane plants located in the district of Pontal da Barra in Maceió, Alagoas, preserving the teams
 - **November:** Braskem proposes to the authorities measures to permanently end salt extraction activities in Maceió with the closure of its wells



BRASKEM IMPORTANCE IN ALAGOAS

► Production Capacity

- **PVC:** 460 kt/year
- **Caustic-Soda:** 460 kt/year
- **Chlor-alkali:** 400 kt/year
- **EDC:** 520 kt/year

► Jobs

- More than **550 direct jobs**, **1,600 third parties** and **11 thousand indirect jobs** generated in the production chain

► Production Chain

- Engagement with approximately **55 small, medium and large companies**
- Serving to **180 PVC customers** and **80 of caustic-soda**

TECHNICAL FRONT

Comprehensive assessment of geological event to identify the **cause** and **drive solutions** for the community **safety**

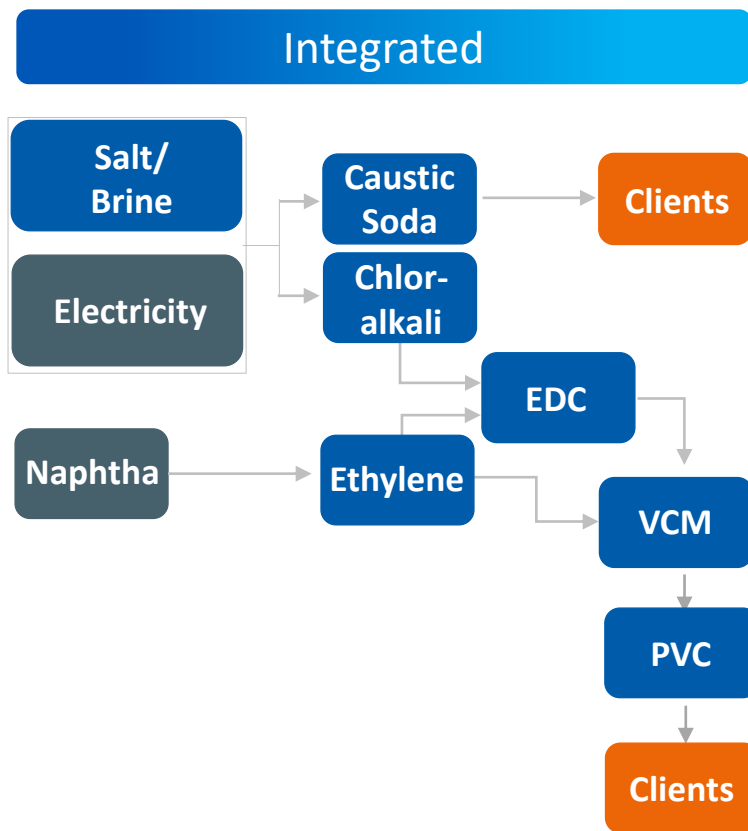
Geological Event

- Complementary studies are ongoing
- External experts indicate that the mechanisms that causes disturbances in the neighborhoods are complex and may have different origins that act in isolation or in combination
- **1st quarter of 2020 is the estimated deadline to conclude the studies and drive solutions**

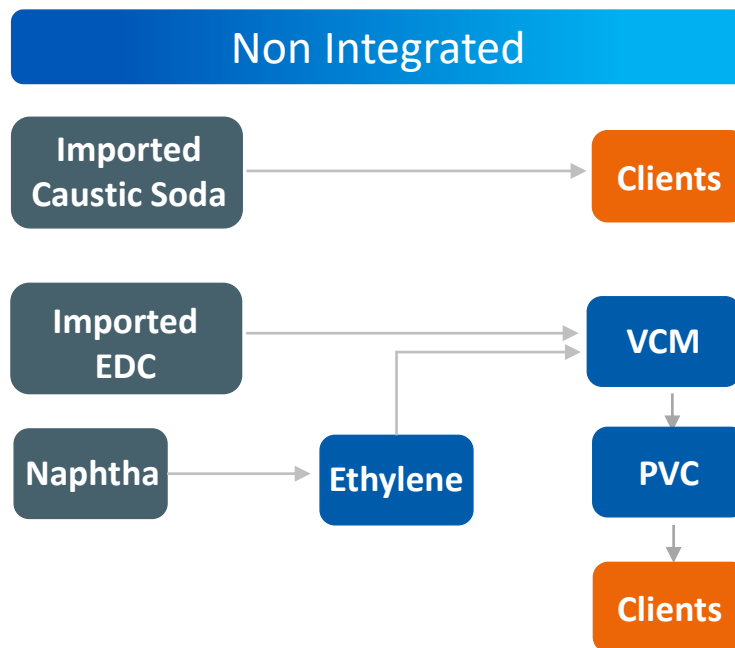


OPERATIONAL FRONT

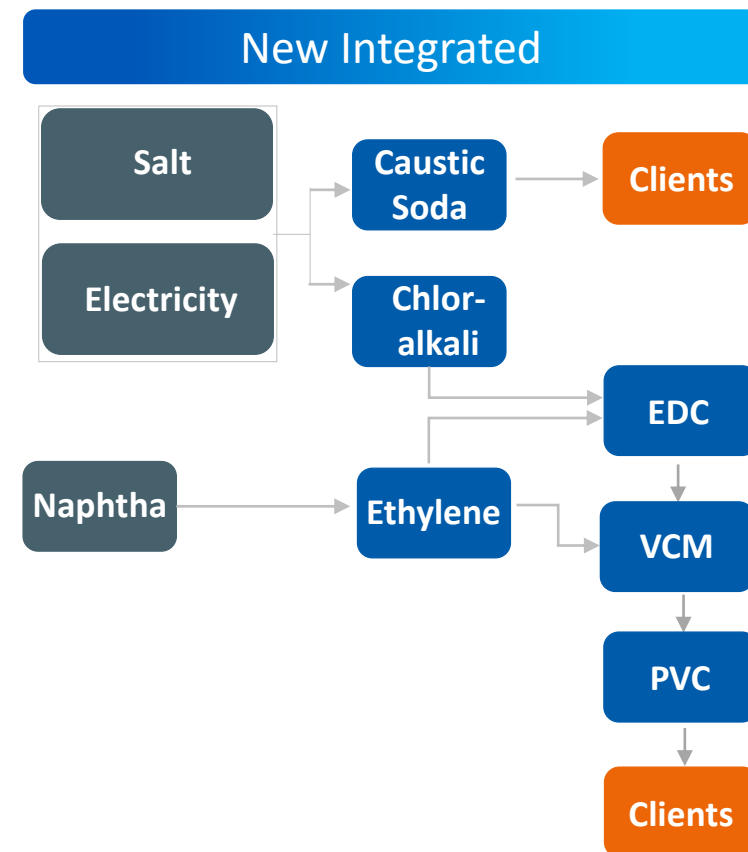
Business Model



- EBITDA 2018: **US\$ 103 MM** (3% of Braskem consolidated EBITDA)



- Suspension of** salt extraction in Maceió and the **operations of** the chlor and soda



OPERATIONAL FRONT

Assessment of the salt mines in order to **drive the measures to permanently and safely close the wells**

Salt Extraction Wells

- Braskem has submitted to the National Mining Agency ("ANM") the measures to permanently end salt extraction activities in Maceió with the closure of its wells
- Creation of a protection area around certain wells, which will involve resettling people, vacating properties and taking additional monitoring measures
- The Company's preliminary estimate, to be confirmed in dialogues with the authorities, is that this protection area covers approximately 400 properties and 1,500 people
- For other wells, the recommendation is that additional monitoring measures be taken, without the need to vacate properties and resettle the inhabitants

LEGAL FRONT

- R\$6.4 billion in insurance bond added to the R\$100 million frozen and made available by the Company if it is held guilty
- Awaiting release of R\$3.7 billion already authorized by the Superior Court of Justice
- Denial of injunction filed by the State Labor Prosecution Office to freeze amount of R\$2.5 billion
- Civil Action of the Federal Prosecution Office under analysis to: (i) pledge security interest in the amount of R\$20.5 billion; (ii) constitute a fund in the amount of R\$3.1 billion, of which R\$2 billion in working capital in the respective fund; and (iii) suspend the receipt of government financing and incentives, as well require the early maturity of obligations with government agencies

Technical Cooperation Agreement 1

- Formalized in April/2019 with MPE-AL, MPF-AL, MPT-AL, CREA-AL, to implement emergency measures in the Pinheiro neighborhood

Technical Cooperation Agreement 2

- In dialogue with municipality of Maceió, Alagoas to implement new measures in Pinheiro, Mutange and Bebedouro neighborhood

Recovery works

- **100 stretches of streets and avenues with cracks and holes were recovered**, ensuring road safety and reducing risk of water seepage
- **Donation of projects and materials** to install a **surface drainage system** and **macro drainage** system recovery

Inspection

- **Inspection** in the **drainage system**
- **Building inspection** in houses, housing estates and 4 schools

Monitoring and preventing systems

- installation of meteorological station to forecast weather variations, including rainfall
- Installation of **8 DGPS**: high precision monitoring system to measure soil movements
- Installation of **meeting point signs** in case of emergencies
- Donation of equipment to the **Monitoring Central of the civil defense of Maceió**

SUMMARY – BRASKEM'S ACTIONS FRONT

Technical Front

- Identification of the causes of the **geological phenomenon** in Maceió, Alagoas
- Hiring **national and foreign experts**

Operational Front

- Structuring of a **new operating model** to attend Brazilian caustic soda and PVC market
- **Implementation of measures to definitive to permanently end the salt extraction activities** in Maceió, with the shutdown of its wells

Legal Front

- **Cash release in the amount of** R\$ 3.7 billion
- Conduct of the **legal actions**

Community Actions

- **First Cooperation Agreement** signed
- Structuring the **Second Cooperation Agreement**



PETROCHEMICAL SCENARIO

MAIN TRENDS, UNCERTAINTIES AND IMPLICATIONS

Economic and petrochemical scenarios

Main forecast

Base case view

Main uncertainties

1

Brazilian economic growth

- Brazilian economy is recovering from the 2015/16 crisis, and the **forecast is a moderated growth for the period**

- **Economic growth** directly attached to the **approval of the relevant reforms** (e.g. tax, administrative)

2

Negative global outlook

- **Short term expectation is uncertain.** By 2020, economic growth in both US and Europe, should be at a lower pace.

- **For the next five years, economic recession probability is increasing,** mainly due to protectionist measures taken by US-China

3

Crude oil and natural gas at current price levels

- **Crude oil** and **natural gas** prices at marginally lower levels compared to 2019.

- Crude oil price may continue to be **pressured by geopolitical issues**. On the other hand, **global economic slowdown** may lead to lower prices.

MAIN TRENDS, UNCERTANTIES AND IMPLICATIONS

Economic and petrochemical scenarios

Main forecasts

Base case view

Main uncertainties

4

Competitiveness gap between naphtha-based and ethane-based ethylene increases

- **Stable competitiveness gap**, associated with slightly lower naphtha prices and stable ethane

- **Fractional restrictions** are raising prices in the short term. If restrictions persist, ethane prices may rise

5

Polymer markets to be long in the next following years

- **In PE**, start up anticipation of new capacities exceeds supply over demand; **In PP**, although oversupplied, margins are still at healthy levels

- **PE capacity additions** outpaces demand growth. Uncertainty related to gradual PE price recovery.

6

Trade war to continue to be a point of attention

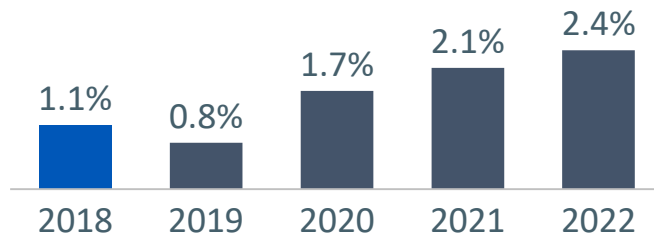
- **Expected short-term price volatility** until trade flows and volumes rebalance between regions

- **New tariff rounds** may start to impact global GDP growth

BRAZIL'S ECONOMIC OUTLOOK

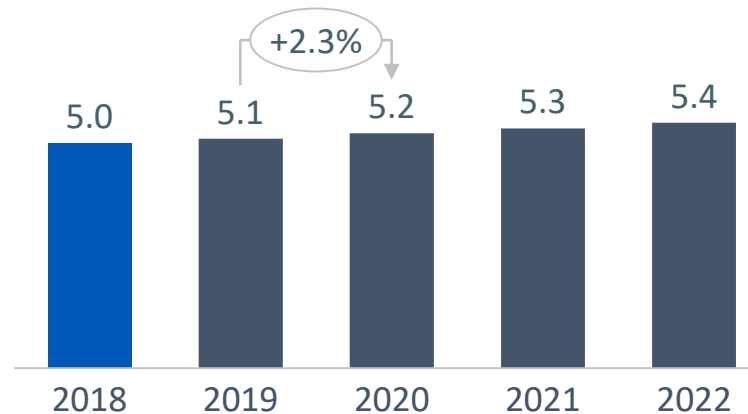
Improvements in the economic scenario will leverage growth in the domestic market, shifting exports

GDP growth* %



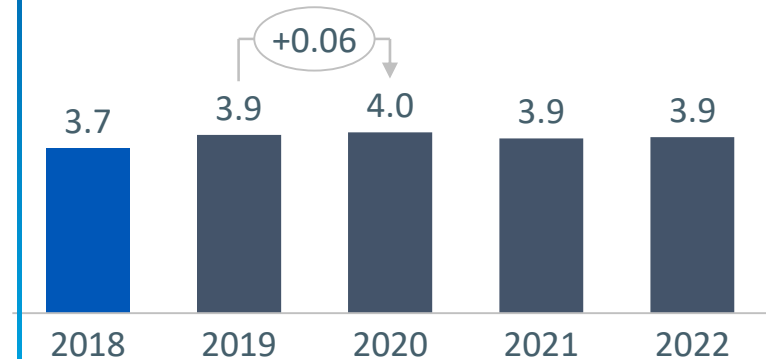
Low interest rates, development on **reforms agenda** and unemployment reduction should drive **GDP growth**

Brazilian demand**
(PE+PP+PVC)
million tons/year



Brazilian market growth may **shift** products previously destined to **exports**

Avg. FX rate*
BRL/USD

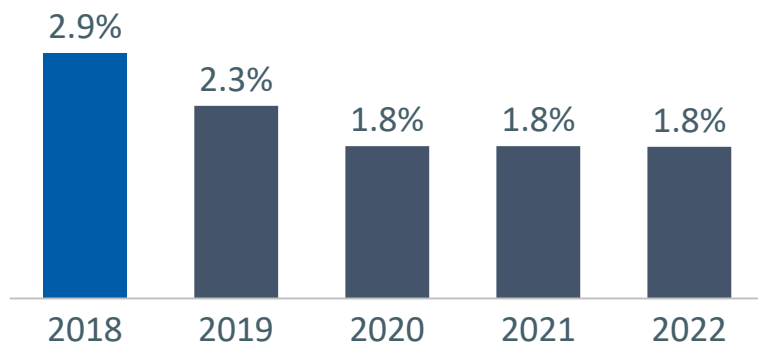


FX rate expected to be slightly higher than 2019 **positively impacting Braskem's results**

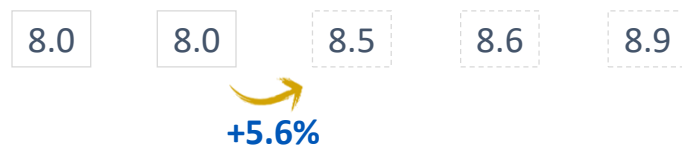
ECONOMIC OUTLOOK FOR INTERNATIONAL BUSINESS

Enfraquecimento industrial e tensões comerciais entre EUA-China pioram a perspectiva

United States GDP growth* %

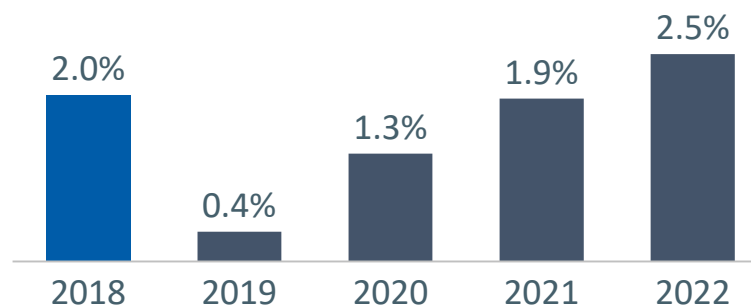


US PP demand** Million tons/year



Persistence of reduced fiscal stimulus, slower global growth and trade uncertainty

Mexico GDP growth* %

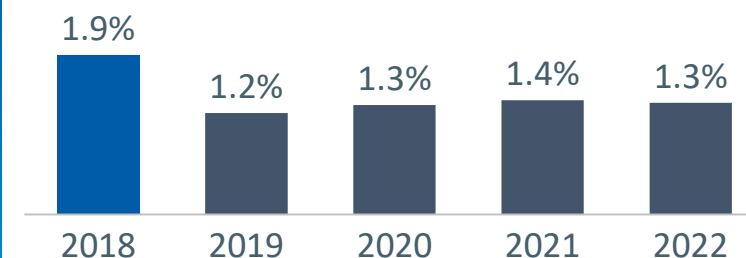


Mexico PE demand** Million tons/year



Domestic consumption, spending cuts and exports to drive growth for the next coming years

Crescimento do PIB União Europeia* %



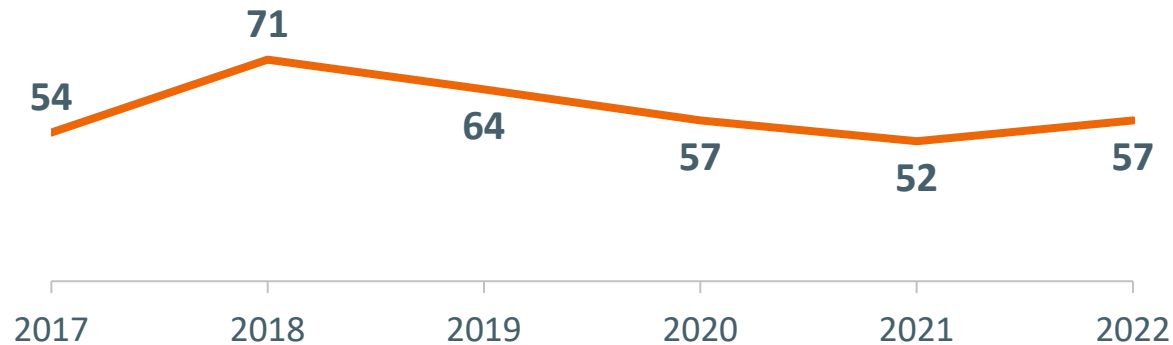
Europe PP demand** Million tons/year



Although GDP decreased in 2019 due to weakened industrial activity, demand to remain stable

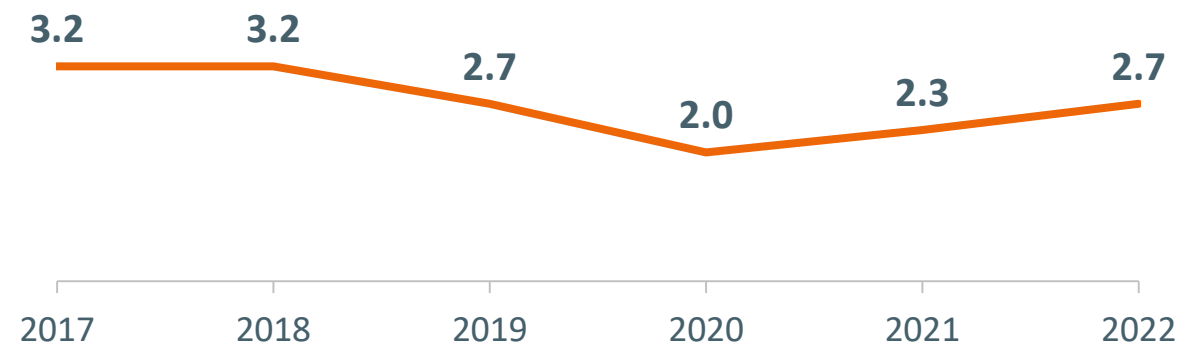
OUTLOOK FOR CRUDE OIL AND NATURAL GAS PRICES

Crude oil - Brent (US\$/bbl)



- **Slight fall in 2020**, driven by **higher stock levels** and **trade war impacts**. From 2021, global economic recovery, **increasing oil prices**

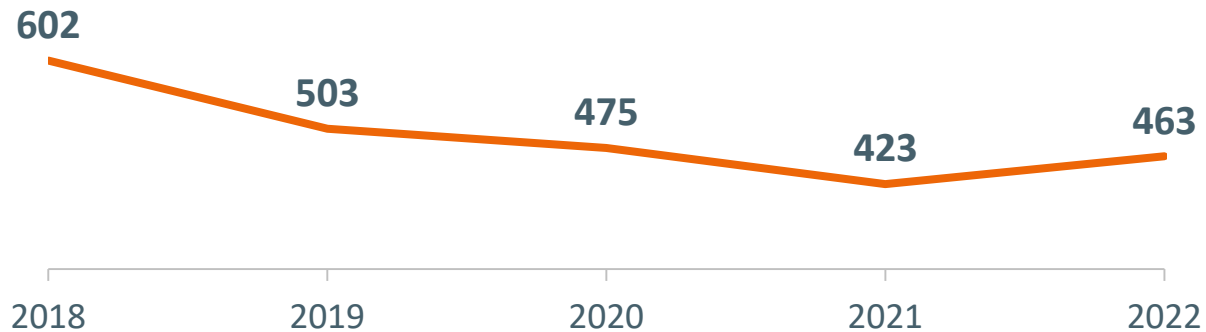
Natural gas – Henry Hub (US\$/MMBTU)



- **Record shale gas production** is maintaining **natural gas prices at low levels in the short term**. From 2021, prices are expected to rise gradually with **increasing demand** for power generation and export (pipeline and LNG)

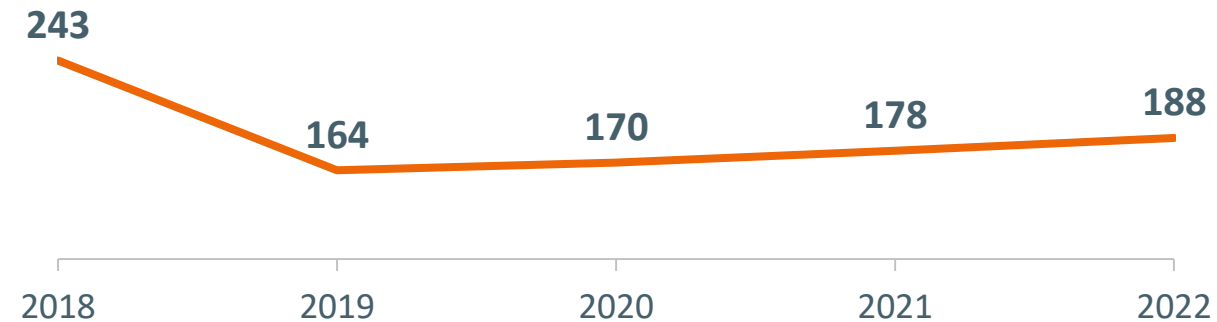
OUTLOOK FOR NAPHTHA AND ETHANE PRICES

Naphtha ARA (US\$/t)



- **Naphtha** to follow crude oil price curve with a slight drop in 2020
- Refineries with **incentive to run lighter oil** creates an **oversupplied environment**, maintaining crack spreads at US\$ 6-7/bbl, reflecting prices below US\$ 600/t

Ethane – Mont Belvieu (US\$/t)

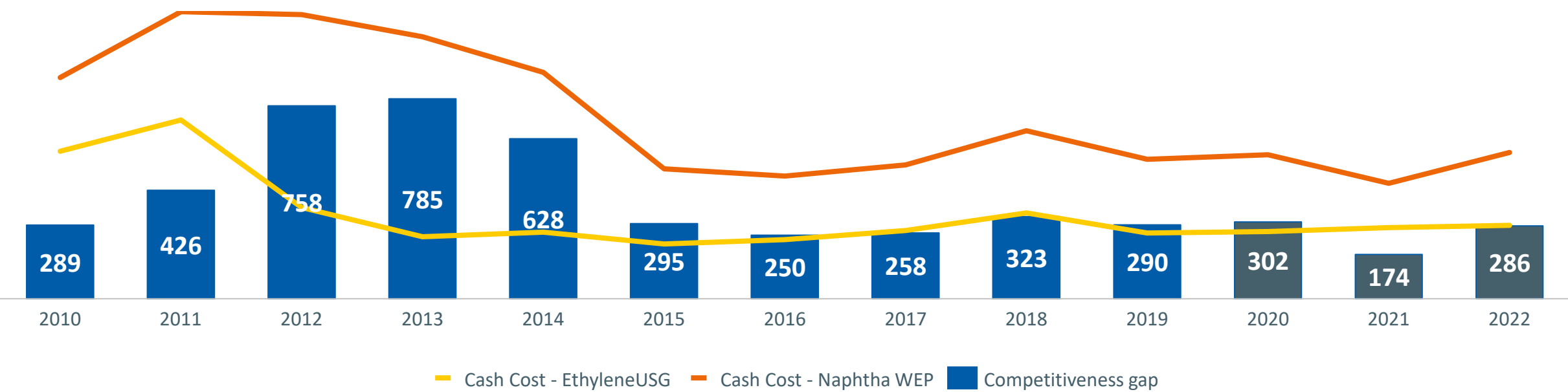


- Ethane prices with a slight **upward movement** driven by **stronger demand** as a result of new US crackers
- **Production increase** offset by demand increase, from both **new crackers** and **exports increase**

ETHYLENE CASH COST

Competitiveness gap in 2020 **expected to be stable** compared to 2019

Competitiveness gap & ethylene cash cost (US\$/t)

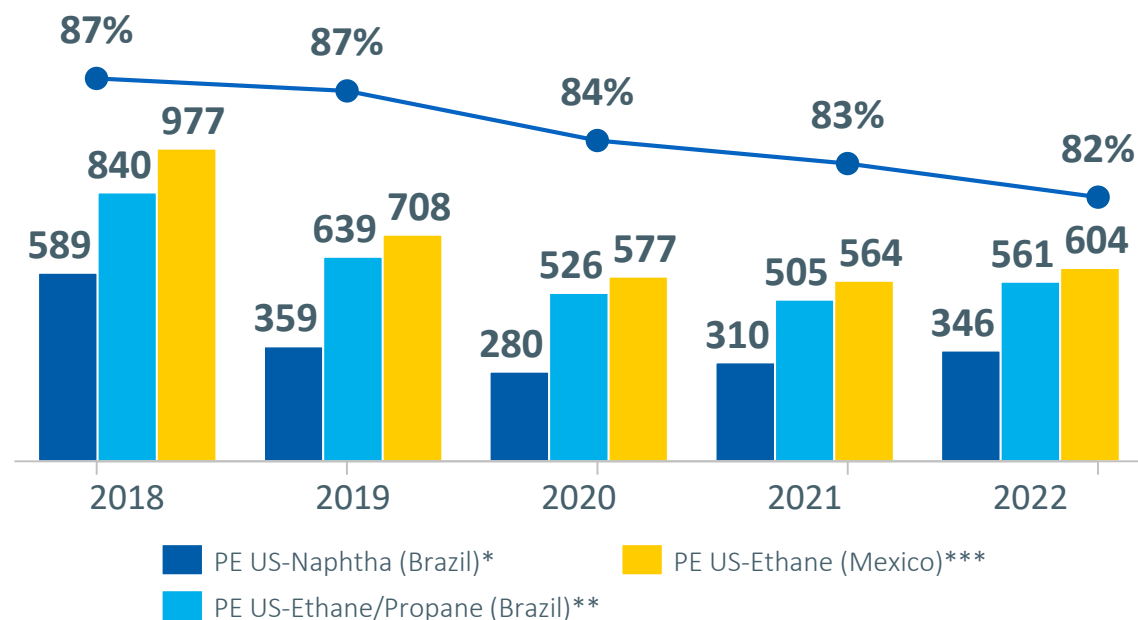


Stable competitiveness gap in 2020, but narrowed in 2021 due to low naphtha prices, along with crude oil price decreases and challenging crack spread scenario

OUTLOOK | PE AND PVC

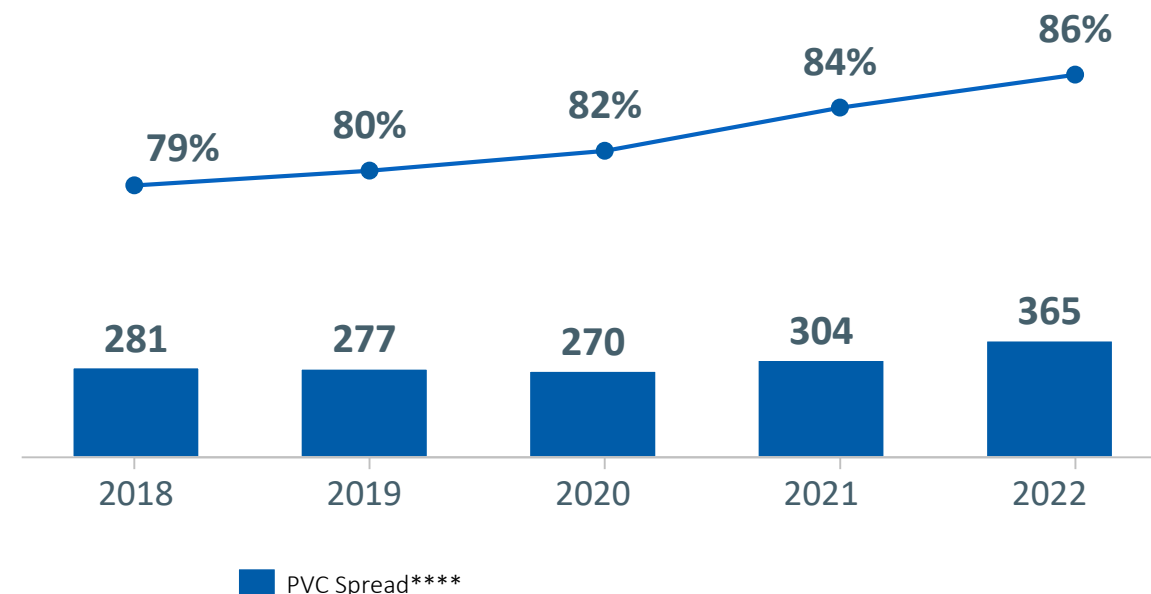
Challenging for PE and positive for PVC

Spread PE – naphtha / PE – ethane (US\$/t)
& PE utilization rate (%)



- Oversupply caused by new capacities coming online in the US remains pressuring resin price and squeezing spreads in 2020
- **Margins recovery** forecast for 2021

Asia spread par (US\$/t) & e PVC utilization rate (%)



- For PVC, Asia's **recent capacities rationalization** along with PVC's global **demand growth** sustains spreads at **healthy levels**, with a forecasted growth for the upcoming years.

*PE US price – naphtha ARA price

** PE US price – 50% US ethane price– 50% US propane price

*** PE US price – US ethane price

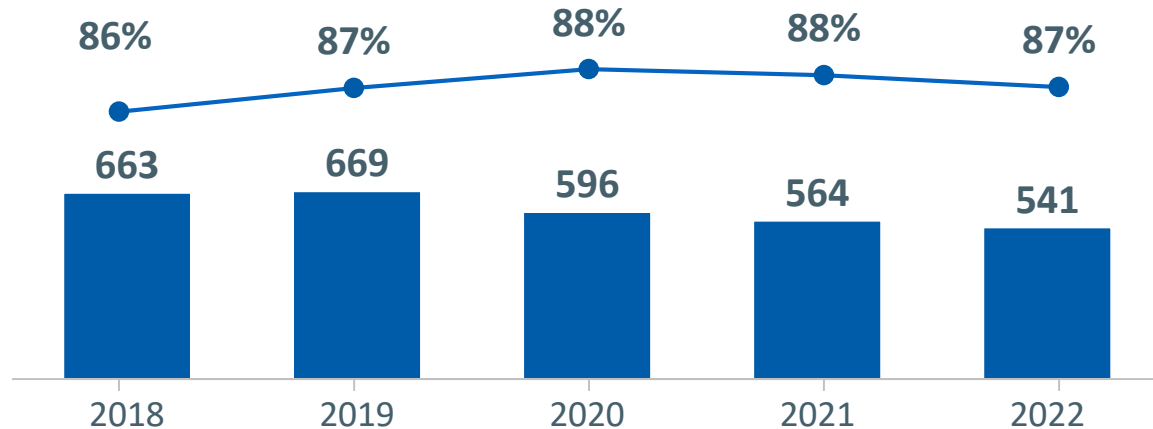
****PVC Asia price - (0.23*3* naphtha ARA price) - (EDC US price*0.832)

Source: External consulting

OUTLOOK | PP

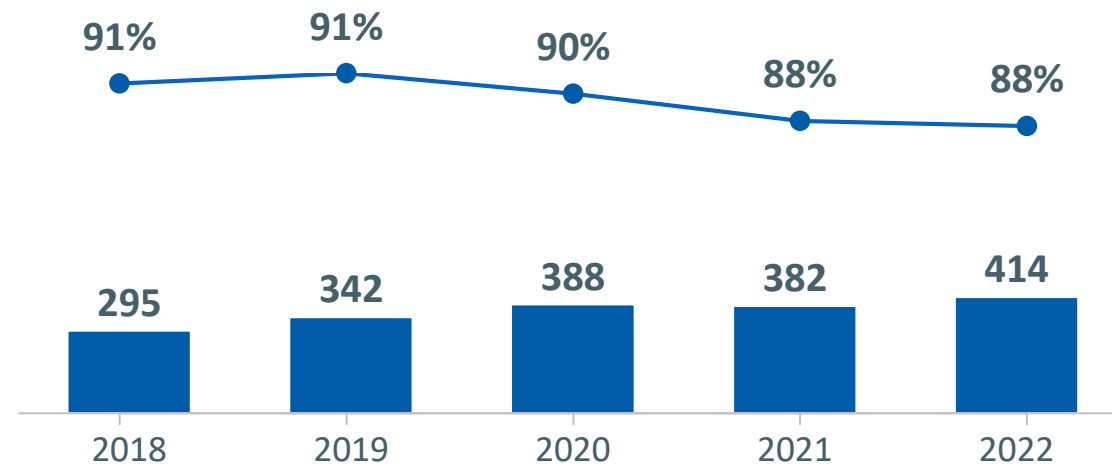
Despite new capacities in the US, spreads should remain at healthy levels

Spread PP – Propylene* (US\$/t)
& PP utilization rate (%)



- **Healthy spreads** even with the new PP capacities startup in the 2H20

Spread PP – Propylene** (US\$/t)
& PP utilization rate (%)



- **Healthy spreads** during the entire period

*PP US price- propylene US price
**PP EU price- propylene EU price
Source: External consulting

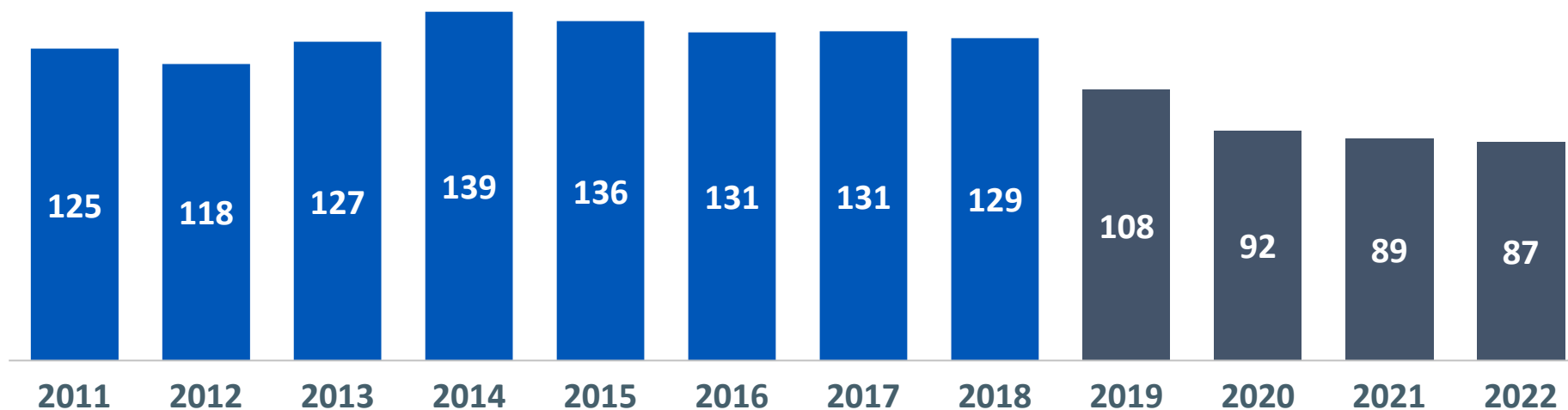
PETROCHEMICAL SCENARIO | BRAZIL

The isolated spread scenario suggests a decrease in spreads by 2020, further stabilizing by 2021 and 2022, before a more robust recovery

Evolution of petrochemical spreads applied to Braskem's sales volume*

Base 100 = 2000

Products prices – feedstock prices





OUTLOOK,
STRATEGIC
ACTIONS AND
PRIORITIES FOR
2020

OUTLOOK BRASKEM | 2020 VERSUS 2019

Brazil

Crackers utilization rate	↑	Brazil demand growth
Sales volume	↑	Shifting product from exports
Petrochemical spreads	↓	
Recurring EBITDA	→	

United States

Utilization rate	↑	New PP plant to come online on 1H20
Sales volume	↑	
Petrochemical spreads	↓	Still at healthy levels
Recurring EBITDA	→	

Mexico

PE plants utilization rate	↑	Ramp-up of “fast track” project
Sales volume	↑	
Petrochemical spreads	↓	
Recurring EBITDA	↑	

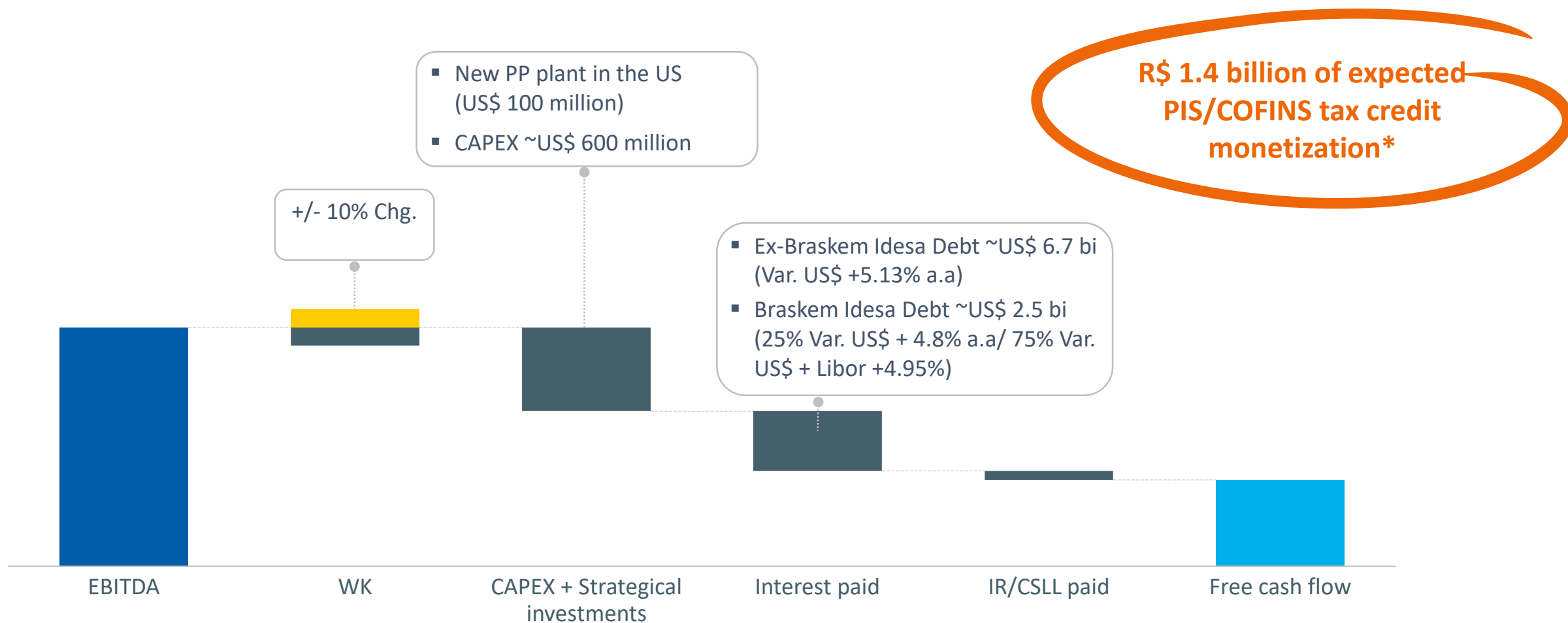
Braskem

Europe

Utilization rate	↑	Propylene supply stabilization
Sales volume	↑	
Petrochemical spreads	→	
Recurring EBITDA	↑	

OUTLOOK BRASKEM | FREE CASH FLOW

Conceptual cash generation



* PIS/COFINS tax credits monetization recognized in previous years, registered in the current assets as per explanatory note nº 8 of the Condensed Quarterly Information for the period ended September 30, 2019

STRATEGIC ACTIONS AND PRIORITIES FOR 2020



- Supply assurance for PVC and soda clients, mitigating impacts caused by the temporary non-integrated business model
- Feedstock supply contracts negotiation with Petrobras



- Approval of the complementary ethane import solution in Mexico



- Start up of the new PP plant in the US in the 1H20
- Strengthening Relationship with Global Customers



- Closure of external monitoring program
- Address Alagoas issues in conjunction with authorities to ensure people safety and safe return of operations
- Expand recycled resin supply



- Spending discipline, CAPEX and favorable liquidity position, allowing the Company to go through the downward petrochemical cycle without any financial constraint



APIMEC 2019

DECEMBER 6, 2019

Braskem 

BRASKEM S.A.

