

INTEGRATION WITH THE OIL SECTOR

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Deputy Minister of Oil, Gas and Biofuels
Brazil, 2016 to 2019



Harmonious coexistence
between **biofuels**
and **traditional fuels**
is field-proven in **Brazil**
and brings **continuity** to
the oil industry in the
energy transition



BRAZIL'S ETHANOL JOURNEY 1975-2020



1975

Beginning of tetraethyl lead replacement (E12)

1979

E100 first vehicle

2003

Flexible Fuel Vehicle
E100 or E27

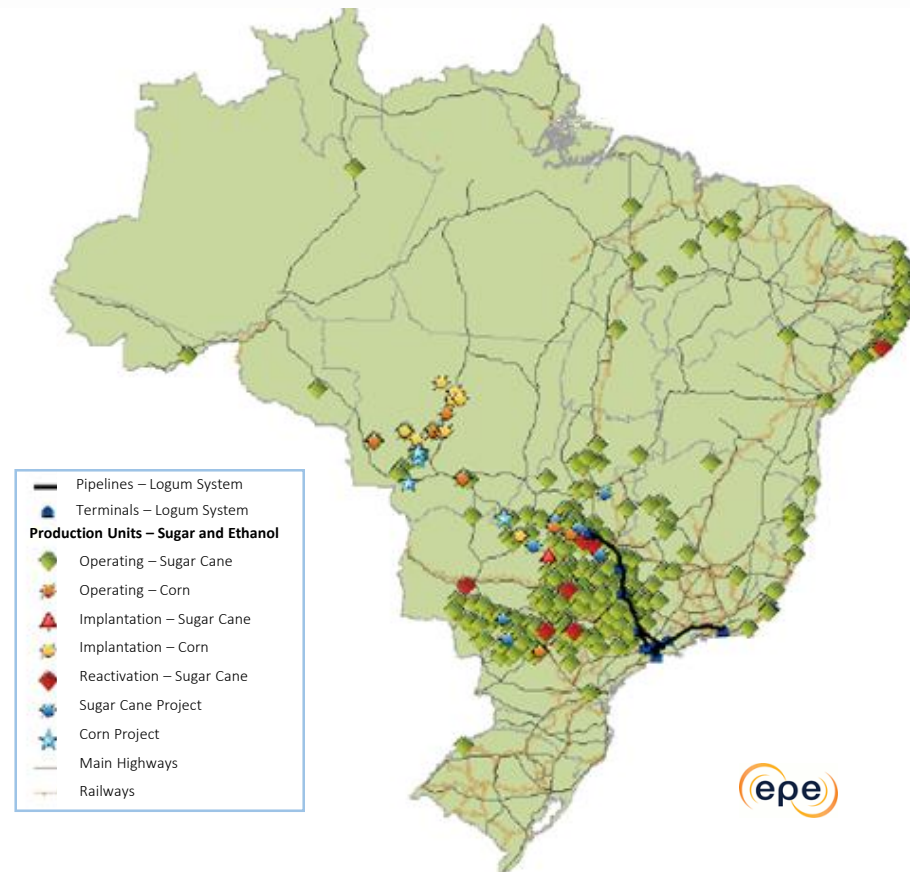
2019

Hybrid Flex Vehicle
E100, E27 or electric

Large-scale introduction of biofuels in the Brazilian transportation system, with the use of E100 or ethanol mixed with gasoline

Brazil has avoided emitting more than **600 million tons** of carbon dioxide

ETHANOL AND GASOLINE SHARE THE DISTRIBUTION INFRASTRUCTURE, INCLUDING PIPELINES



E27 and E100 are distributed over **8.5 million km²** of the Brazilian territory in more than **40,000 service stations**

FUELS DISTRIBUTION MAP



Oil Refineries
(15)



Ethanol Producers
(Cane + Corn)
(321)



Pipelines



Distribution
bases
(261)



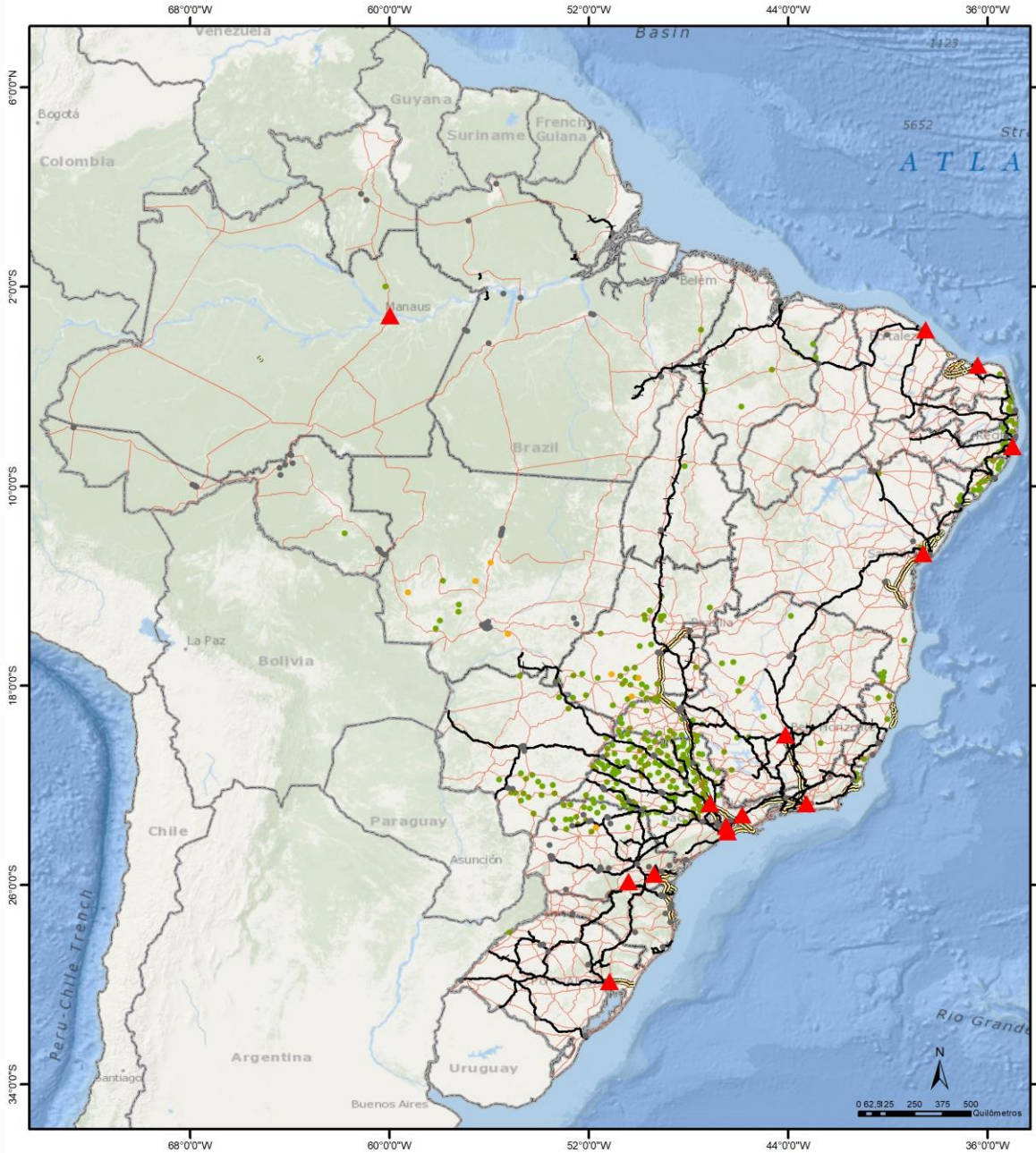
Highway



Railway



Retail Stations
+ 40,000.



- Cane mills (312 units)
- Corn mills (9 units)
- ▲ Oil Refineries (15 units)
- Fuel Distribution Base (261 units)
- Pipeline
- Highways
- Railroads

ETHANOL AND OIL DERIVATIVES HAVE BEEN TRANSPORTED IN SEQUENCING BATCH THROUGH PIPELINES FOR OVER 30 YEARS IN BRAZIL

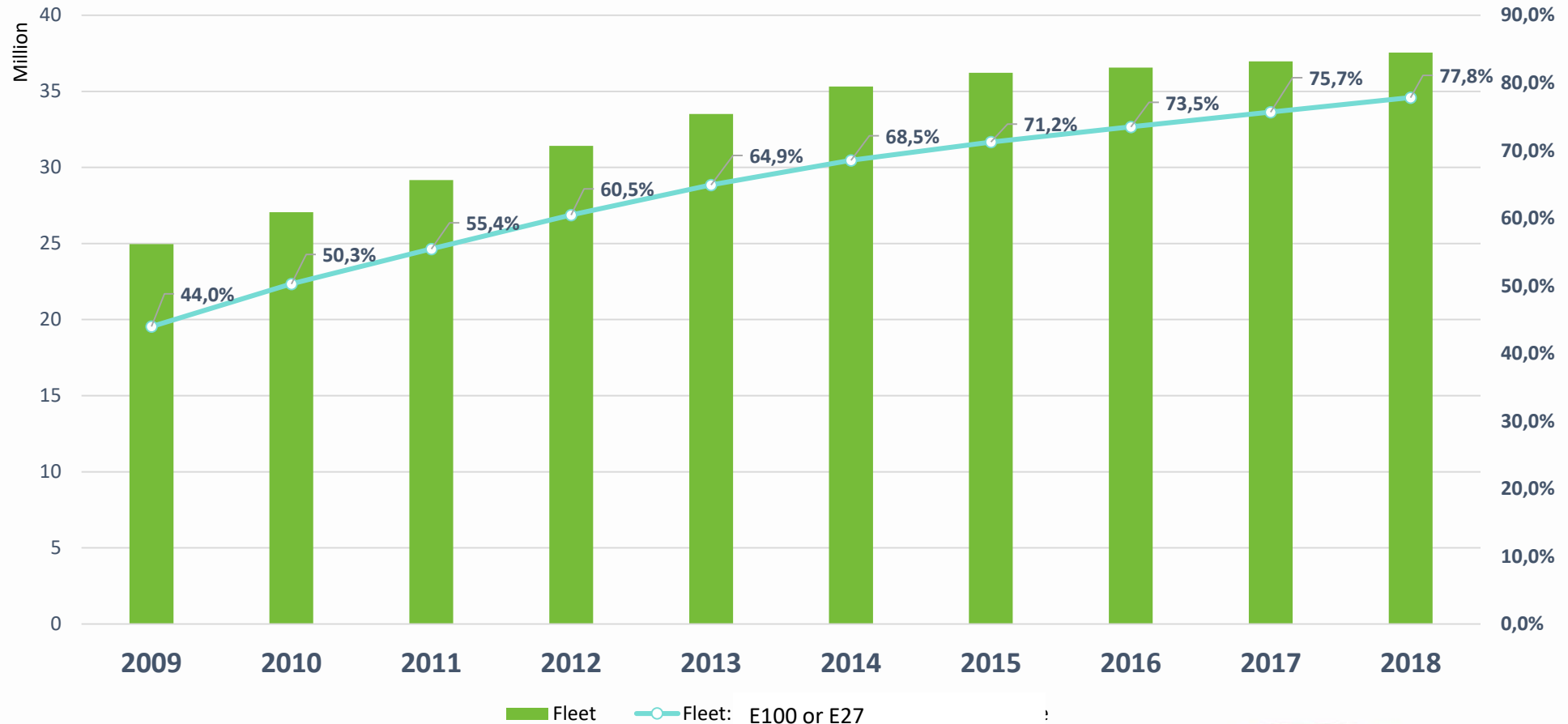
ETHANOL TRANSPORTATION

SOURCE: TRANSPETRO

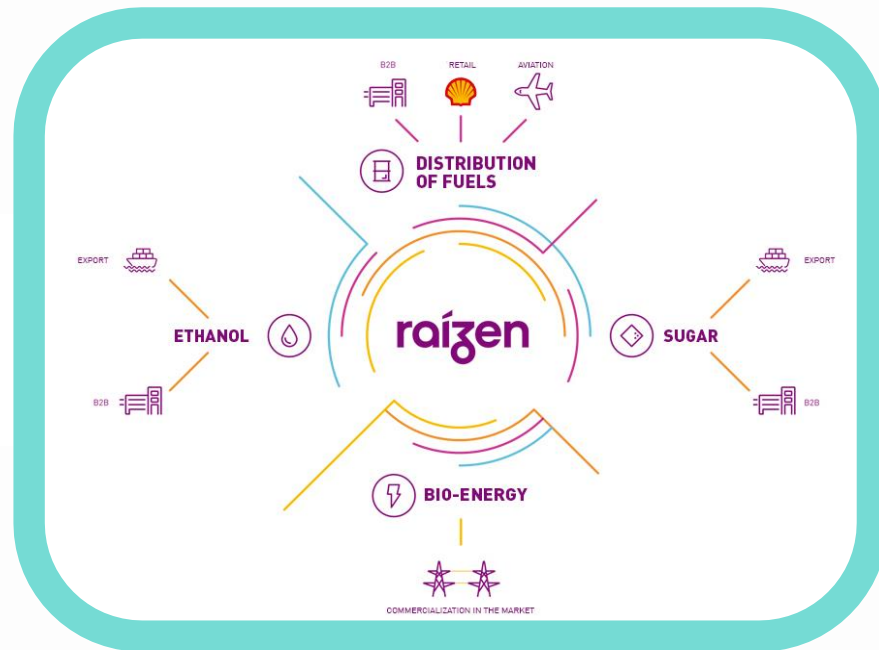


— Ethanol transportation — Oil transportation — Gas transportation

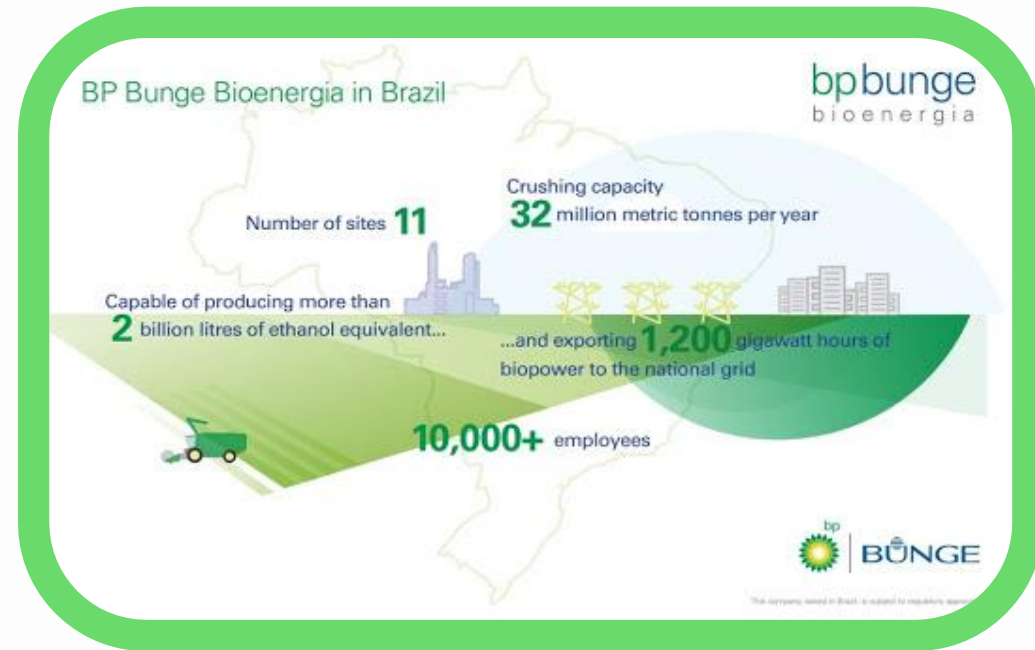
BRAZILIAN FLEET (OTTO CYCLE)



BRAZIL HAS BEEN A FIELD FOR GLOBAL MAJOR OIL COMPANIES ETHANOL PRODUCTION INVESTMENTS



2010



2019

ETHANOL IS VERY IMPORTANT FOR TRADE BALANCE SAVINGS IN **BRAZIL**

The country is an important oil exporter (**more than 1 million barrels per day**), but it is not self-sufficient in refining and therefore imports gasoline and diesel

The use of ethanol plays a fundamental role in balancing the need for imported products. It also avoids overloading port and road infrastructure, leaving room for the export of the Brazilian agricultural harvest

In **2019**, the country avoided importing **450 thousand barrels of oil per day**, equivalent to **US\$ 13 billion dollars**

Foreign exchange savings with oil imports: **US\$ 540 billion dollars from 1975 to 2019**

THE BRAZILIAN OIL AND ETHANOL SUSTAINABLE ENERGY TRANSITION



Shell and **BP** have joint ventures with **ethanol producers** in Brazil

Integrated systems distribution of **biofuels** and **oil derivatives** are **possible** and **advantageous**

Hybrid cars reinforce the **energy transition in Brazil** being an example of successful **synergy** among **oil, ethanol** and **automotive industries**

Ethanol is very important for **trade balance** savings
US\$ 540 billion dollars from 1975 to 2019

The integration between **ethanol and fossil fuels** is field-proven in Brazil and brings **sustainability** and **longevity** to the oil industry in the energy transition



SUSTAINABLE MOBILITY: ETHANOL TALKS THAILAND

REALIZATION:



BRAZIL
Sugarcane Bioenergy Solution



PROMOTION:



ApexBrasil

MINISTRY OF
FOREIGN AFFAIRS



TECHNICAL SUPPORT

DATAGRO