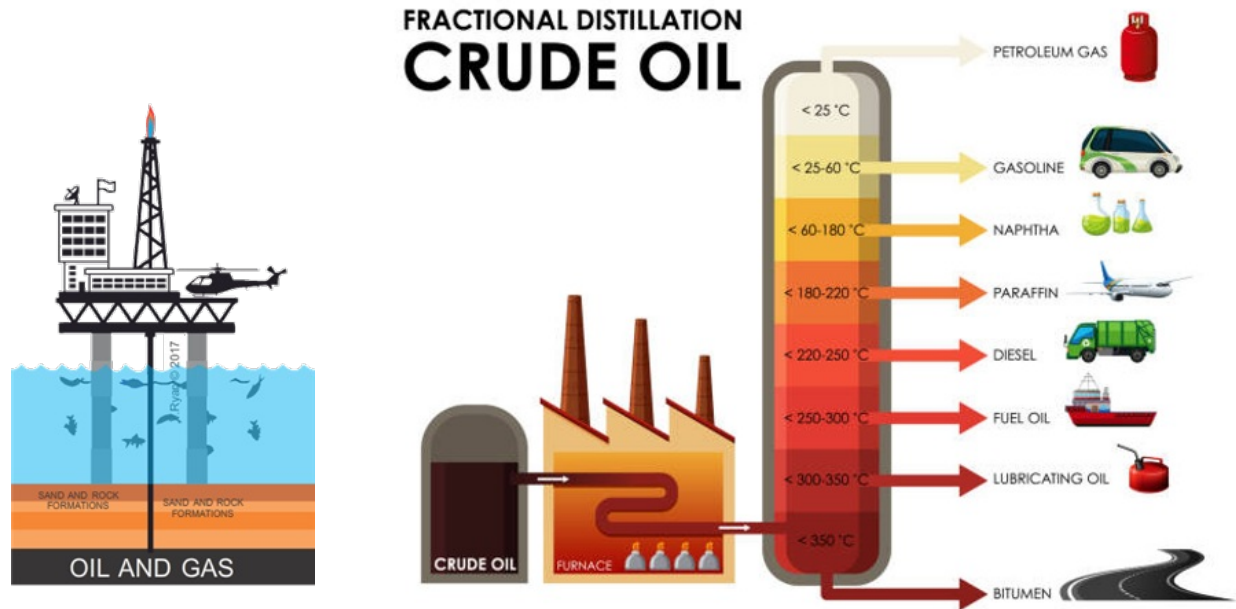


PETR Refining Business

Our business and products	Oil Supply	Reserves and Production	Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Product..
---------------------------	------------	-------------------------	-------------------------------	----------------------------------	----------------------	------------------------------

How does our business work?



The Earth’s surface is drilled and petroleum is extracted by oil rigs.

90% of all crude oil extracted in Brazil is offshore

Crude oil goes through a fractional distillation process in order to obtain different products.

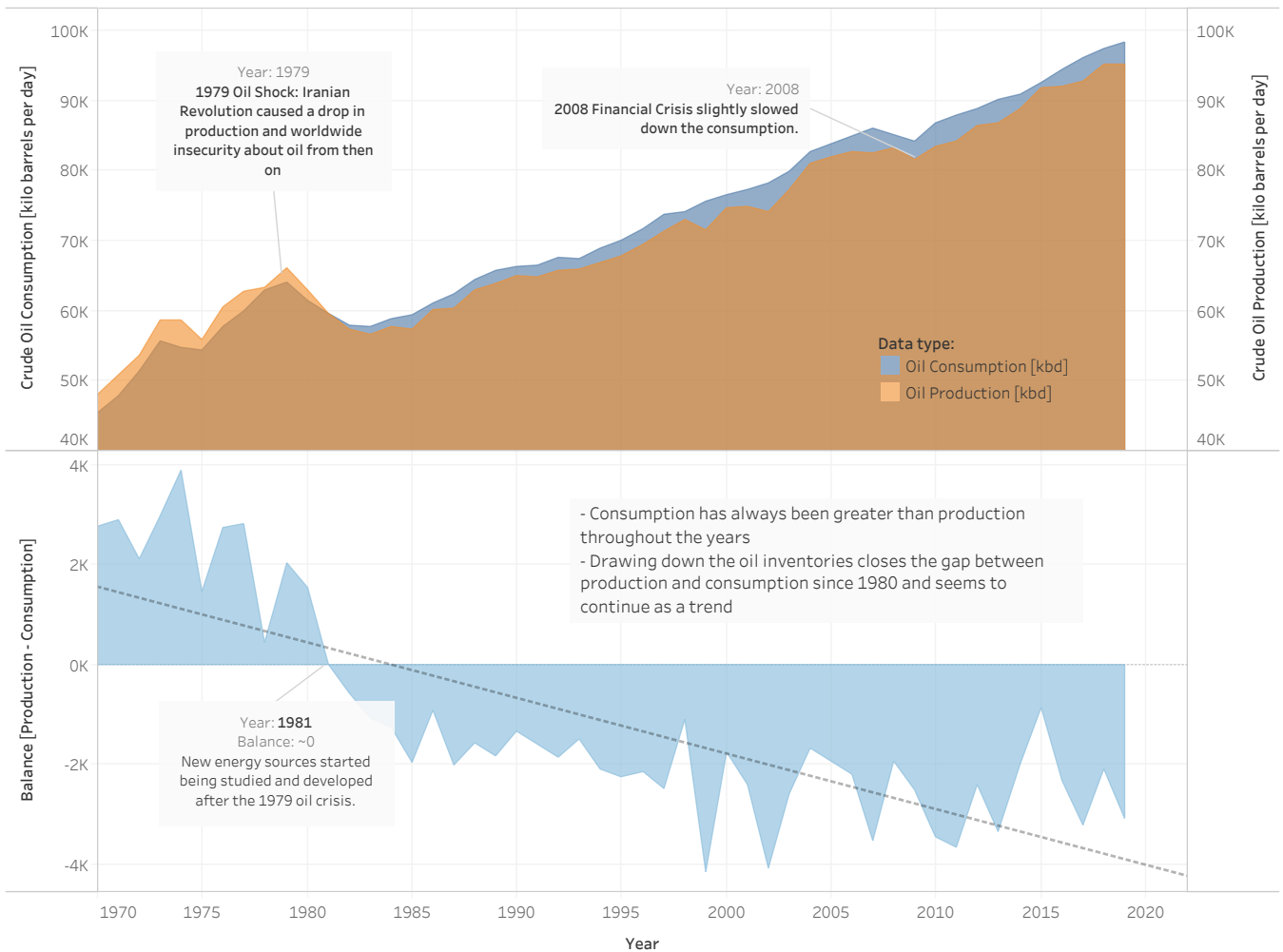
Most of these products are fuels such as gas, gasoline and diesel.

Some non-fuels products such as asphalt, paraffin and lubricating oil are by-products.

PETR Refining Business

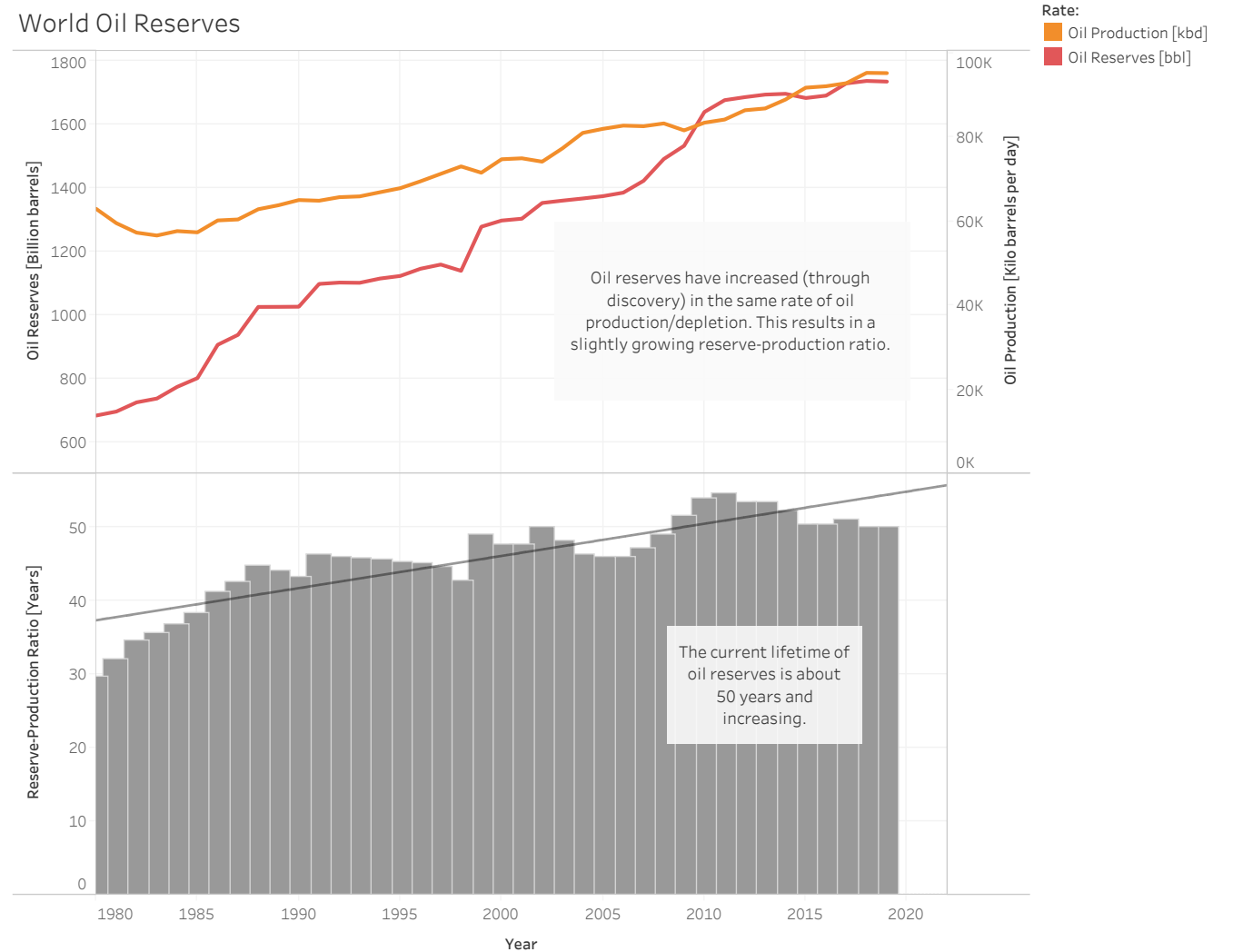
Our business and products	Oil Supply	Reserves and Production	Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Product..
---------------------------	------------	-------------------------	-------------------------------	----------------------------------	----------------------	------------------------------

World Oil Production and Consumption



PETR Refining Business

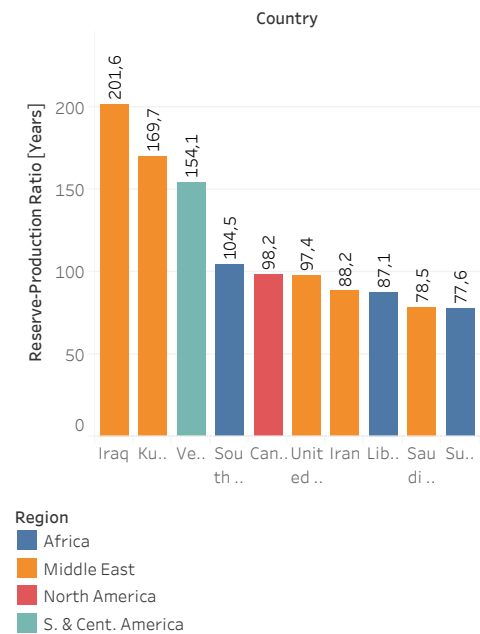
Our business and products	Oil Supply	Reserves and Production	Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Product..
---------------------------	------------	-------------------------	-------------------------------	----------------------------------	----------------------	------------------------------



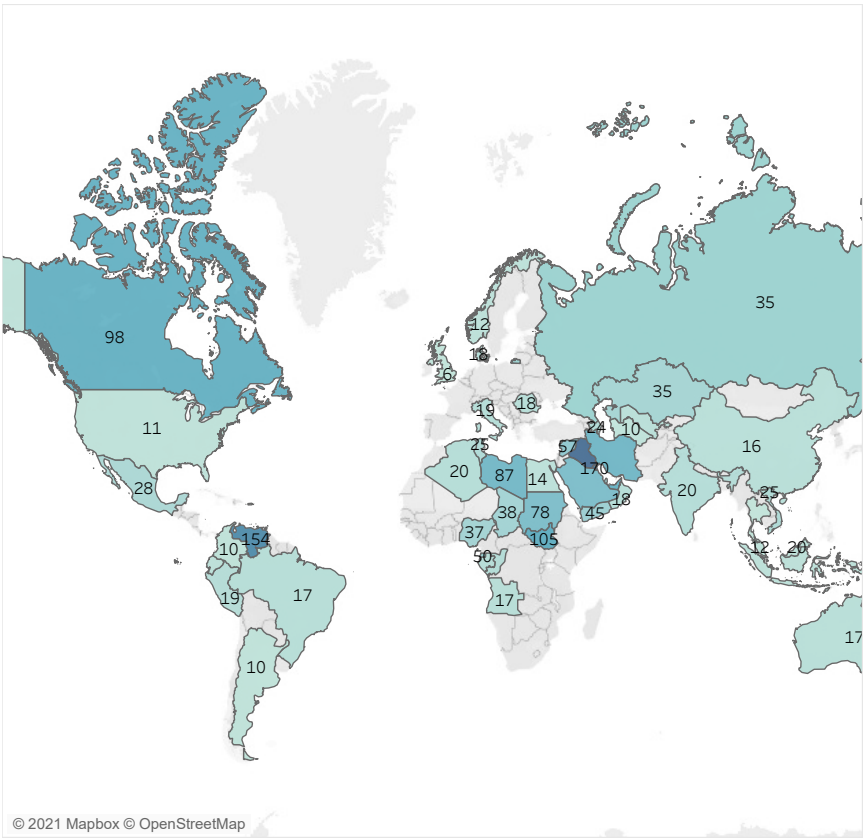
PETR Refining Business

Our business and products	Oil Supply	Reserves and Production	Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Products in Brazil
---------------------------	------------	-------------------------	-------------------------------	----------------------------------	----------------------	---------------------------------------

Lifetime of current reserves by country



Lifetime of current reserves by country



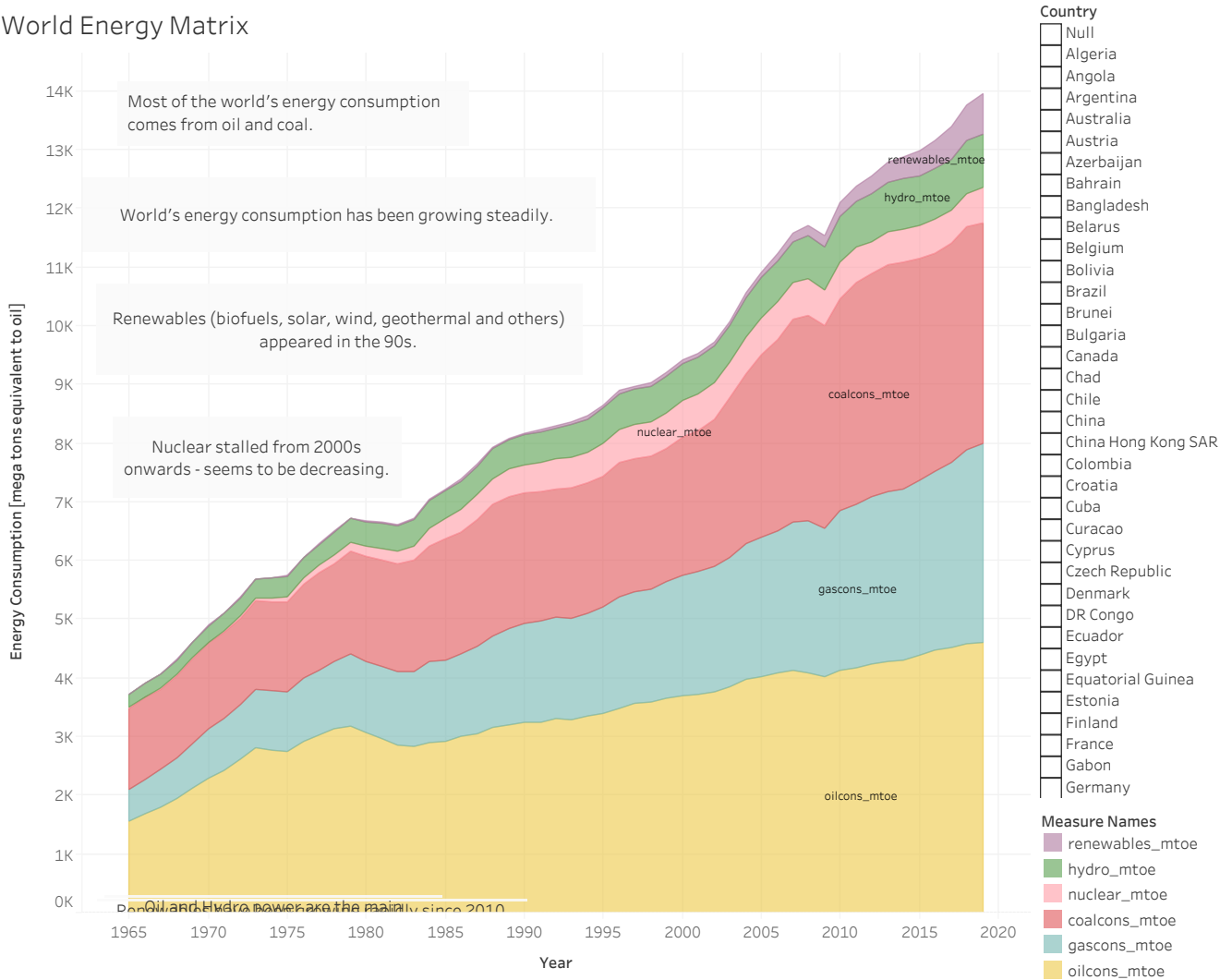
Avg. Reserve-Production Ratio
6,344612317 to 201,570851193



PETR Refining Business

Oil Supply	Reserves and Production	Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Products in Brazil	Product Mix in Brazil
------------	-------------------------	-------------------------------	----------------------------------	----------------------	---------------------------------------	-----------------------

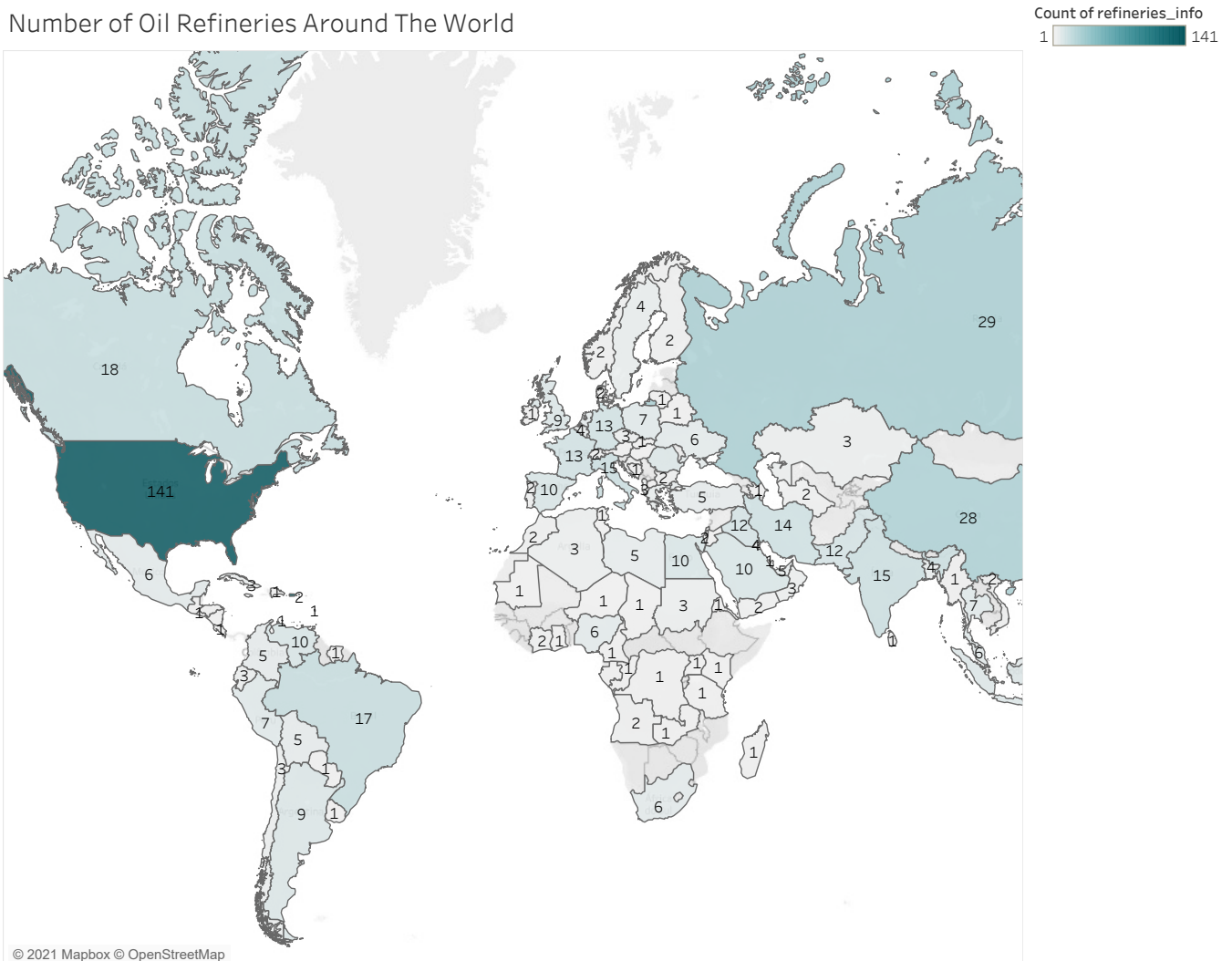
World Energy Matrix



PETR Refining Business

Reserves and Production	Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Products in Brazil	Product Mix in Brazil	The Virus
-------------------------	-------------------------------	----------------------------------	----------------------	---------------------------------------	-----------------------	-----------

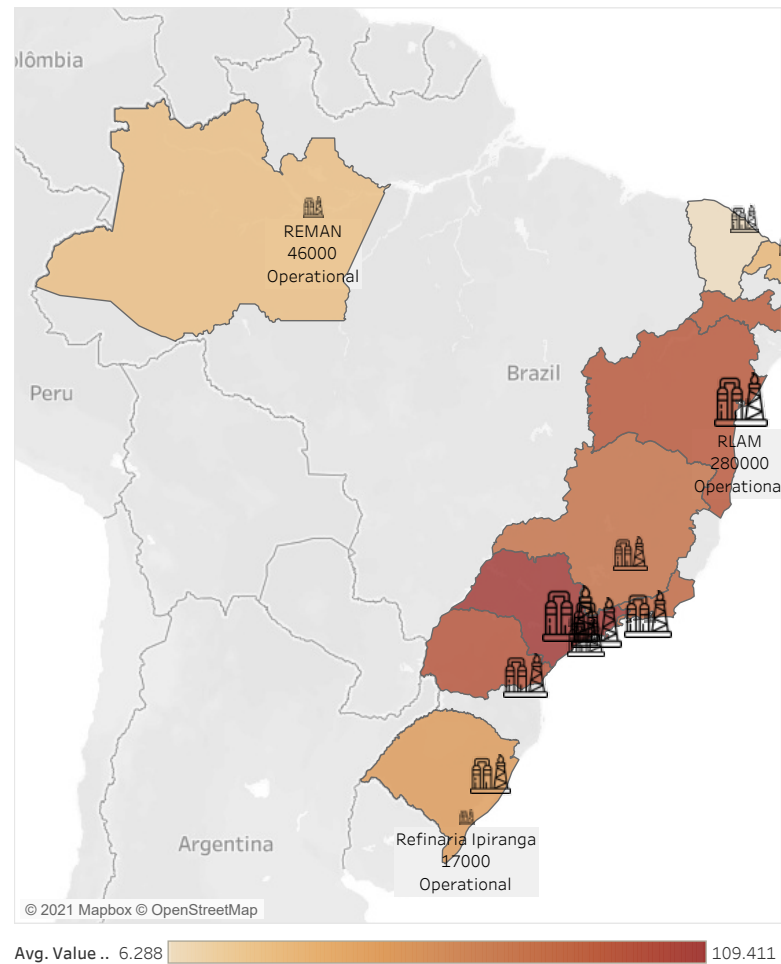
Number of Oil Refineries Around The World



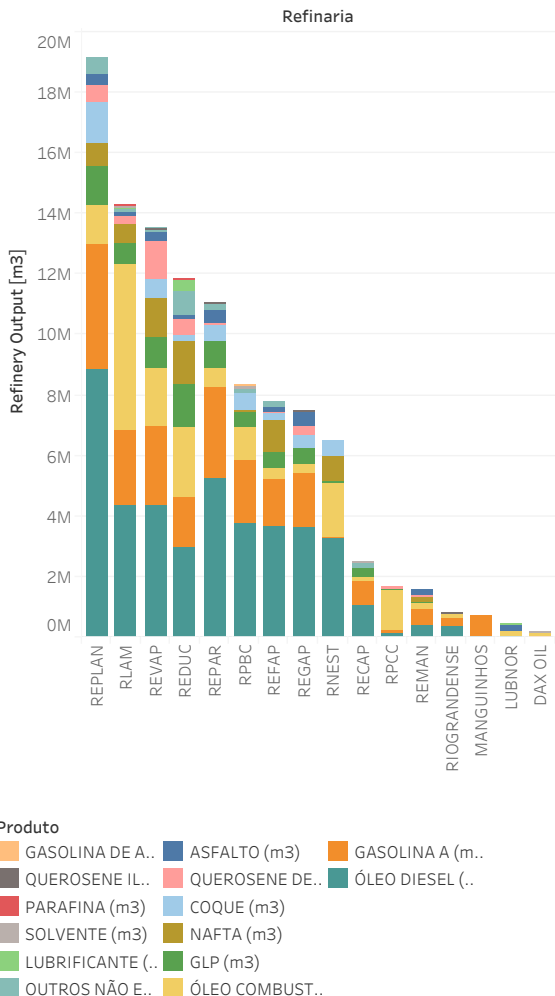
PETR Refining Business

Reserve location and strategy	Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Products in Brazil	Product Mix in Brazil	The Virus	Closing borders and lockdowns
-------------------------------	----------------------------------	----------------------	---------------------------------------	-----------------------	-----------	-------------------------------

Refinery Nominal Capacity and Average Production by State



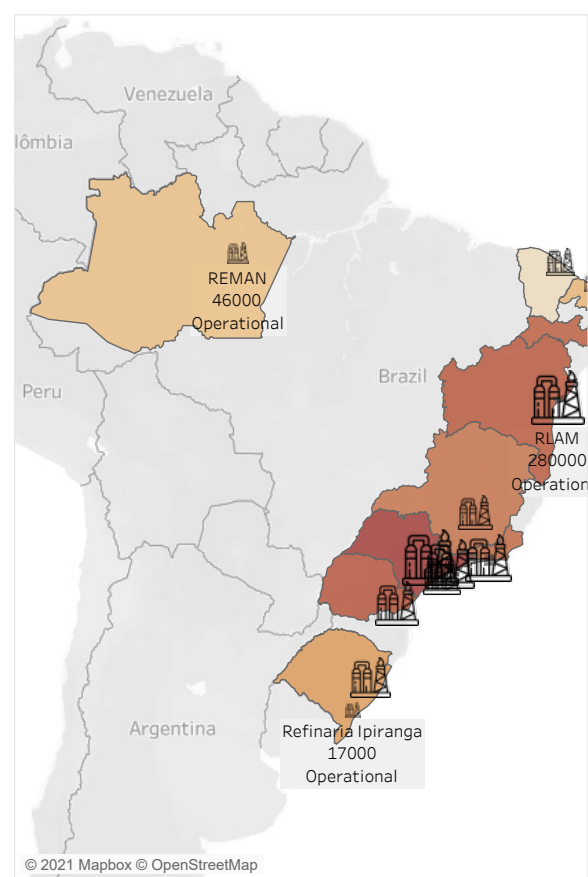
Top Refineries in Brazil and its Output



PETR Refining Business

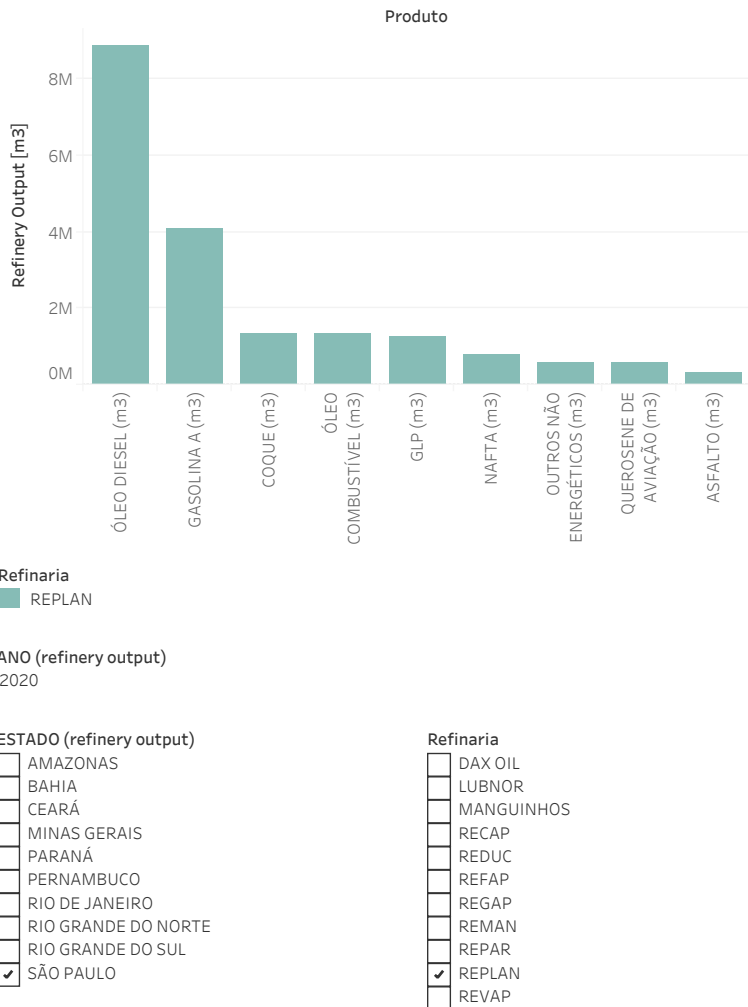
Energy Matrix (World and Brazil)	Refineries Worldwide	Top Refineries and Products in Brazil	Product Mix in Brazil	The Virus	Closing borders and lockdowns	Relationship between stringency and fuel consumpti..
--	----------------------	--	-----------------------	-----------	----------------------------------	--

Refinery Nominal Capacity and Average Production by State



Avg. Value (refinery output)
6.288 109.411

Product Mix by Refinery

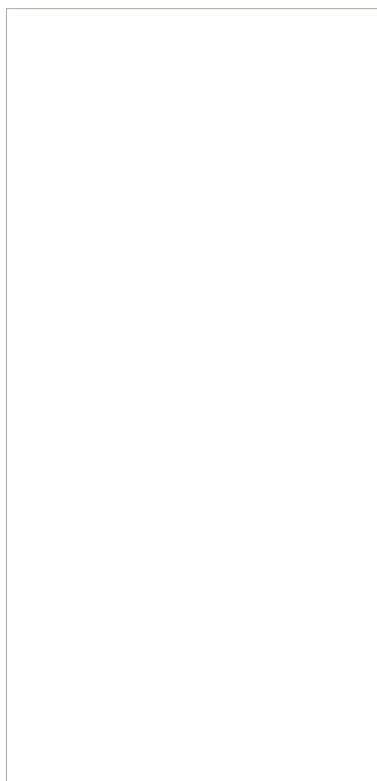


PETR Refining Business

Refineries Worldwide	Top Refineries and Products in Brazil	Product Mix in Brazil	The Virus	Closing borders and lockdowns	Relationship between stringency and fuel consumption	Sales by type of fuel
----------------------	---------------------------------------	-----------------------	-----------	-------------------------------	--	-----------------------

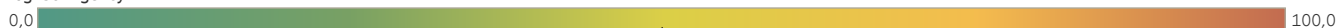
Stringency: index created by Oxford to measure governments response to COVID (close borders, cancel flights, home lockdown, etc.)

Stringency Index Worldwide on Heatmap



Country Na..	Month of Date Value						
	janeiro de 20..	fevereiro de ..	março de 20..	abril de 2020	maio de 2020	junho de 2020	julho de 2020 a
Grand Total	1,6	8,3	40,7	78,5	73,2	63,3	58,1
Afghanistan	0,0	2,0	40,8	80,7	84,3	80,2	78,7
Albania	0,0	3,5	58,6	86,7	87,4	70,5	63,9
Algeria	0,0	0,0	37,5	86,2	77,6	70,6	72,5
Andorra	0,0	0,0	21,6	53,2	50,9	42,8	39,5
Angola	0,0	4,6	24,4	87,5	78,5	76,4	76,5
Argentina	3,3	11,1	51,7	98,5	90,3	89,1	91,5
Aruba	0,0	0,0	24,0	85,6	74,5	50,2	45,0
Australia	2,6	19,4	38,2	71,5	67,4	55,0	69,8
Austria	0,0	2,3	52,9	78,6	60,6	47,7	38,7
Azerbaijan	0,2	4,1	49,8	89,8	82,6	85,7	95,9
Bahamas	1,9	6,1	42,7	96,3	95,8	80,6	67,5
Bahrain	3,2	17,5	49,2	76,0	75,0	75,0	70,5
Bangladesh	3,7	13,9	44,4	91,5	90,6	68,8	77,4
Barbados	3,7	12,5	34,8	86,9	82,2	71,4	53,3
Belarus	0,0	0,0	4,8	16,4	16,7	16,7	16,7
Belgium	0,9	11,1	49,2	81,5	76,6	57,1	51,3
Belize	0,0	5,4	33,2	75,2	81,4	74,1	69,4
Benin	0,0	4,3	24,0	70,8	61,9	42,2	41,7
Bermuda	3,7	17,7	31,6	91,9	73,1	65,4	49,0
Bhutan	6,4	13,9	38,4	83,3	83,3	83,3	66,5
Bolivia	0,0	0,0	49,9	96,3	95,7	89,3	89,8
Bosnia and ..	0,4	11,1	54,2	91,3	79,4	53,0	56,6
Botswana	7,4	13,9	36,1	85,3	74,1	59,6	57,1
Brazil	0,6	5,6	44,0	75,0	80,5	77,3	80,0
Brunei Daru..	10,2	19,4	39,6	56,5	55,3	49,2	47,6
Bulgaria	0,0	7,4	48,8	72,3	61,2	39,4	37,6
Burkina Faso	0,0	0,0	36,0	84,3	65,6	45,4	45,7
Burundi	0,0	5,6	11,3	13,9	13,9	13,9	13,9
Cambodia	0,0	0,0	31,9	60,5	57,4	40,7	39,3

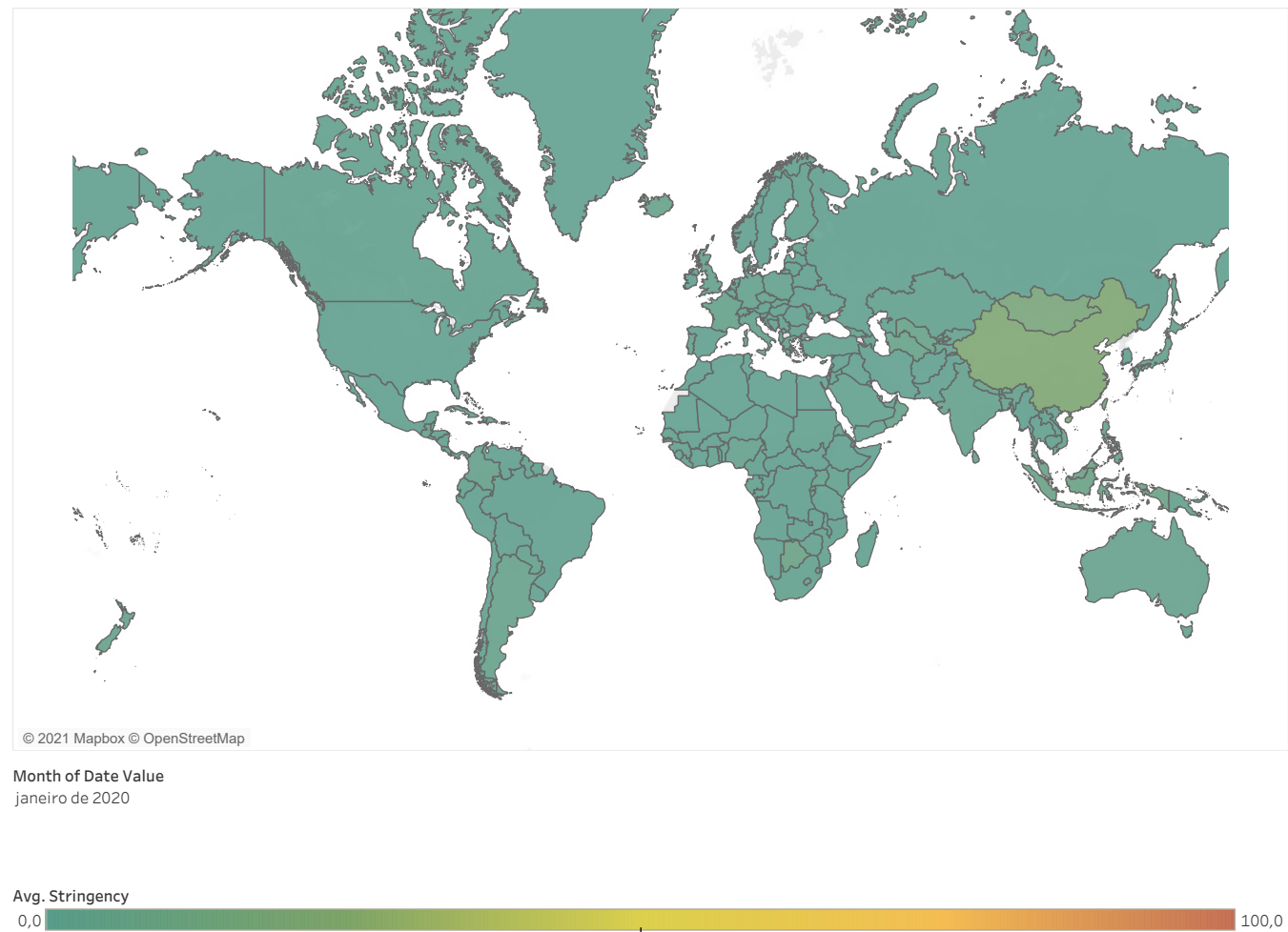
Avg. Stringency



PETR Refining Business

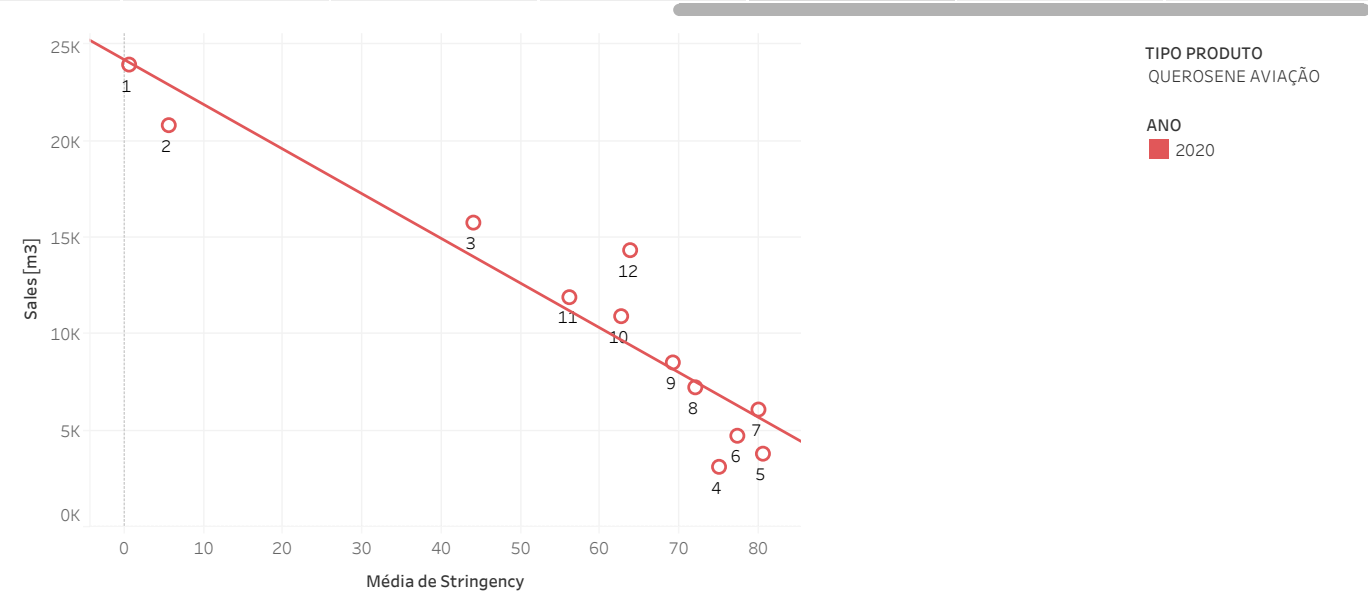
Top Refineries and Products in Brazil	Product Mix in Brazil	The Virus	Closing borders and lockdowns	Relationship between stringency and fuel consumption	Sales by type of fuel	Conclusion and new strategy
---------------------------------------	-----------------------	-----------	-------------------------------	--	-----------------------	-----------------------------

Stringency Index Worldwide on Map



PETR Refining Business

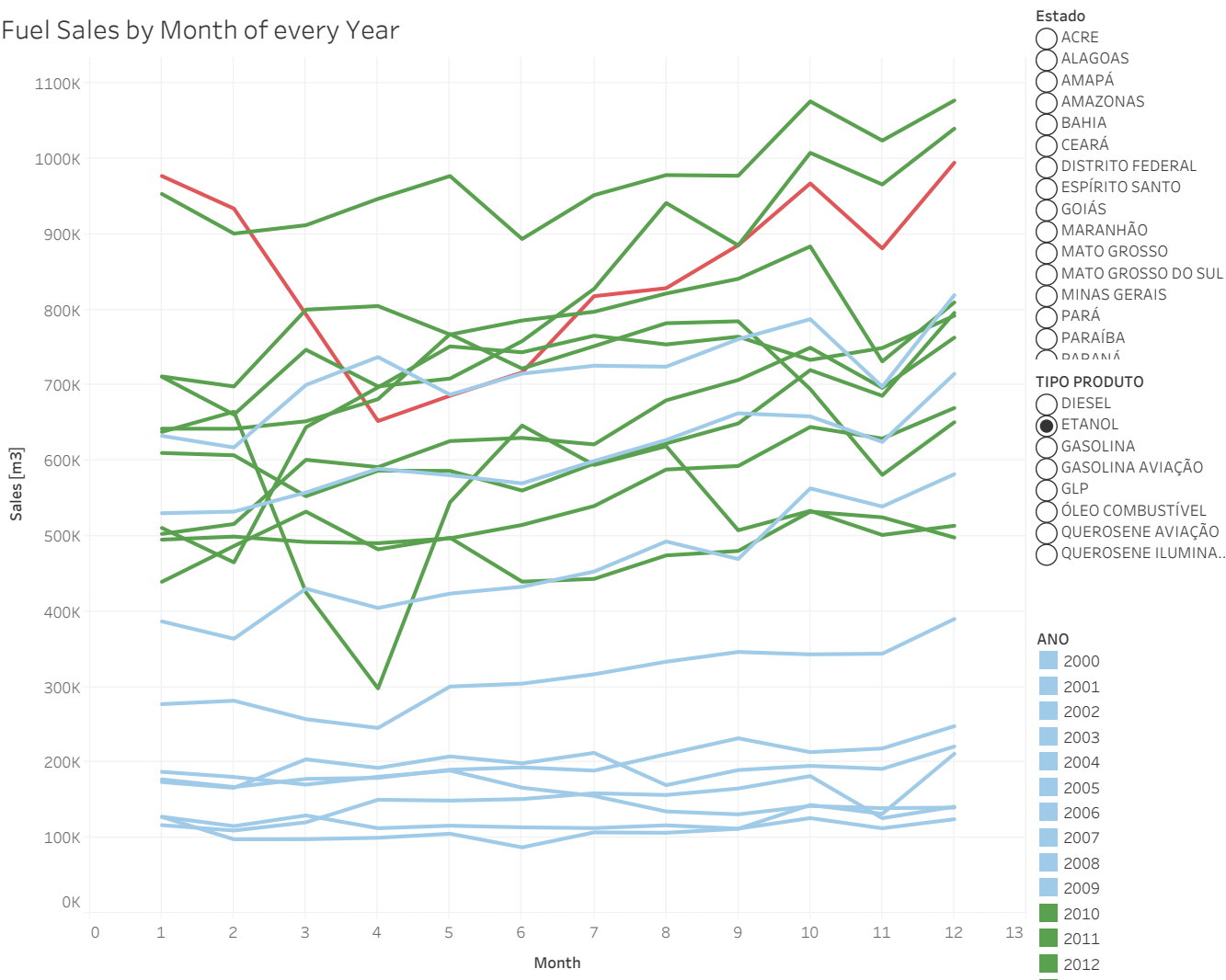
Top Refineries and Product..	Product Mix in Brazil	The Virus	Closing borders and lockdowns	Relationship between stringency and fuel consumption	Sales by type of fuel	Conclusion and new strategy
------------------------------	-----------------------	-----------	-------------------------------	--	-----------------------	-----------------------------



PETR Refining Business

Top Refineries and Product..	Product Mix in Brazil	The Virus	Closing borders and lockdowns	Relationship between stringency and fuel consumption	Sales by type of fuel	Conclusion and new strategy
------------------------------	-----------------------	-----------	-------------------------------	--	-----------------------	-----------------------------

Fuel Sales by Month of every Year



PETR Refining Business

Top Refineries and Product..	Product Mix in Brazil	The Virus	Closing borders and lockdowns	Relationship between stringency and fuel consumption	Sales by type of fuel	Conclusion and new strategy
------------------------------	-----------------------	-----------	-------------------------------	--	-----------------------	-----------------------------

What conclusions can we get from the data?

- Most reserves are in Middle East. We have about 17 years of reserves to extract in Brazil.
- Discovery of new reserves have increased country's reserve lifetime.
- The world is moving towards more gas and oil. Renewables and hydro are growing at a fast rate but are still small compared to others. Nuclear and coal shares stalled and seem to be falling.
- São Paulo has the majority of the refineries. The biggest refinery at the moment is REPLAN in Paulínia. Almost half of its production is diesel.
- Diesel and gasoline are the main outputs of brazilian refineries.
- From April 2020 on, COVID caused governments to close borders, force lockdowns and cancel flights. They seem to be slowly coming back but we can't be sure when it will come back to normal.
- Sales for aviation fuels (querosene and gasoline) seem to have been hit harder than for cars/trucks.
- Sales for ethanol and GLP are good even compared to past years. We should focus our production on these two products.
 - People are cooking more at home
 - Ethanol became more competitive to gasoline (taxation)

--	--	--