

PETRÓLEOS MEXICANOS

*The devastating pathology
that the country faces*



PETRÓLEOS MEXICANOS

The devastating pathology that the country faces¹



SYNTHESIS

As a result of the reduction in demand for crude oil of almost 10% at the international level, caused by the stoppage of economic activities and the excess in the level of production, the price of oil has plummeted to levels never seen before. In this context, Petróleos

Mexicanos (Pemex) maintained its production rate close to 1.7 million barrels per day in the most critical month -although in July it reduced to 1.55 million barrels per day² its lowest level in 40 years-, which produces losses in the extraction of the most mature wells. For example, in the field in Akal where the average production cost (without considering taxes or administration expenses) is 17.27 dollars per barrel, the average price in April was 12.23 dollars per barrel, so it had a loss of \$5.04 for each barrel that was extracted. Therefore, the oil production, alone generated a

¹ The data used here comes from official sources of information. In the case of oil production per field, the measurement frequency is monthly from January 1996 to June 2020 and comes from the Hydrocarbons Information System (SIH) for its acronym In Spanish, of the National Hydrocarbons Commission (CNH) for its acronym In Spanish; The information related to production costs is gathered from the reports presented by Pemex to the Securities and Exchange Commission (SEC); and the export volumes with monthly frequency for 2020 are taken from Pemex's institutional database.

² Considering only the allocations (without migrations), production was 1.48 million barrels per day.

gross loss for (Pemex) of at least 82.6 million dollars during April, since only three of 199 active fields generated profits in the extraction. However, considering administrative expenses, the losses in oil production amount to 12,723 million pesos³ during the second quarter of 2020.

OIL, AN ADDICTION THAT HURTS US MORE AND MORE

The pandemic found Mexico in an environment of economic weakness that accelerated the reduction of global demand, and also an induced stoppage of aggregate supply that has ended up depressing economic activity. Such reduction has brought with it drastic effects on the international hydrocarbon market. In fact, since before the pandemic, member countries of the Organization of the Petroleum Exporting Countries (OPEC) had to reduce their supply by approximately 10 percentage points due to oversupply.

However, the reduction in demand has led to increased inventories of petroleum products. The excess was such that there was a surplus of oil in the world and

³ 2013 Prices.

there was no place to store it, nor was it required as in previous months. This led to negative oil prices, an event not seen before in the markets. However, in Pemex production, the strategy to follow was to continue with the extraction and not to reduce the offer.

How the world resumes its activities will determine the demand for oil in the medium term, and in general how much more energy will be required, such as oil and electricity. The information we have at this time is that in 2020 the entire global economy, and in particular the Mexican economy, will be reduced drastically and the recovery will be relatively slow.

WHAT ARE THE SIGNS OF A RECOVERY?

Based on high-frequency indicators prepared by Harvard University,⁴ it is observed that private consumption in the United States does not show a robust recovery, which is the component with the greatest weight and dynamism in the said economy. The North American market is the most important for Mexican export products, especially in the case of oil, since this market represents 65.4% of Pemex's sales abroad.

⁴ <https://tinyurl.com/y5bkkg35>.

For their part, the changes seen in urban mobility in recent months have led the world to become aware of the improvement of the environment due to the decrease in economic activity. This may end up perpetuating some ways to work, such as the home office or the 4X10 measure that is intended to be implemented in the City of Mexico CDMX (for its acronym in Spanish) among other proposals that would reduce mobility. Likewise, the intensive use of other means of transport such as bicycles and the increase in the length of bicycle lanes, to which the local governments of large cities have been made to implement.

The reduction in demand suffered by the aviation industry due to the multiple restrictions on mobility around the world will also decrease the demand for jet fuel as long as these restrictions are prolonged. Such conditions can have serious implications on the consumption of hydrocarbons⁵ and, in general, on energy consumption.

Likewise, the regulation of the use of petroleum products in the world has tightened in recent years. The one related to the number of electric car sales in Europe stands out, such as restrictions on the use of fuel

⁵ In this section we limit ourselves to dealing with those effects on the hydrocarbon market. A more in-depth analysis can be seen in the first section of the quarterly report.



Image: A PEMEX platform in the Gulf of Mexico Photo: Gustavo Miranda at <https://www.proceso.com.mx/501172/petroleras-extranjeras-se-aduenan-del-golfo-mexico>

oil in large ships internationally. In the global aspect, both the countries and the main companies in the sector have chosen to reduce the supply of oil and their investments, due to the expectations of a slow recovery in the market.

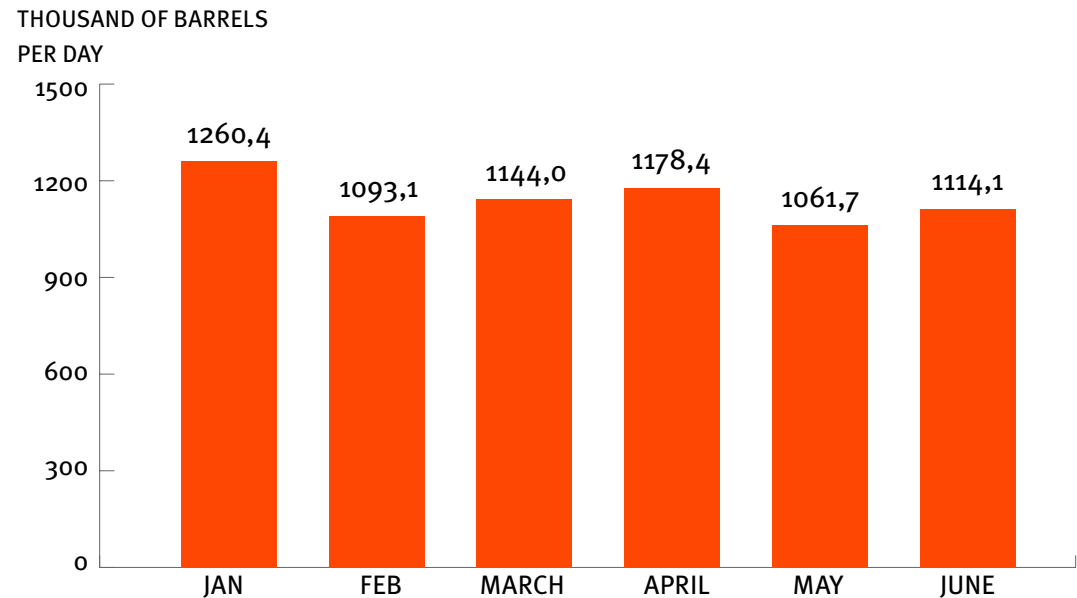
The regulation of the use of petroleum products in the world has tightened in recent years.

THE LOSE-LOSE STRATEGY

In this context, the decision of the federal executive in Mexico has been to increase crude oil production and to reach 1.8 million barrels per day in the short term. This figure is much lower than the government's original goal of producing 2.4 million barrels a day. In a statement on April 21st,⁶ the President of the Republic spoke of increasing the volume of refining in order to reduce gasoline imports, but this would have the effect of reducing oil exports. In other words, oil production can have two destinations: exportation and/or refining by Pemex for internal sales, while any surplus

⁶ <https://tinyurl.com/y47eebyt>.

CHART 1. THE VOLUMEN CRUDE OIL EXPORTS 2020



Source: In-house elaboration with information from the Energy Information System (SIE) for its acronym in Spanish.

becomes part of the inventories. In the first case, the main destination is the United States. However, the reduction in external demand caused a drop in exports of 15.8% between January and May of this year.

As for the domestic market, the main destination of oil is the transformation into petroleum products, such as gasoline, diesel, liquefied petroleum gas, fuel oil, jet fuel, among others. These final products are intended for internal sales and different uses. During the last months, the gasoline demand was reduced by 40%, and the reduction of diesel was 35% at an annual rate.

Despite clear market signals, the volume of oil production remained constant during April. And with exports reducing as well as the domestic demand for petroleum products, this strategy immediately resulted in an increase in refining due to the excess supply generated in the short term, but also the level of petroleum inventories increased.

On the other hand, increasing refining has the effect of increasing the production not only of gasoline but also of fuel oil, which is petroleum with low demand in the market (both internal and external) due to its high levels of sulfur. Its domestic use is for the generation of electricity in the combined cycle plants of the Federal Electricity Commission (CFE) for its acro-



Image: Petróleos Mexicanos (Pemex) Photo: Agencia Reforma at <https://www.elimparcial.com/mundo/Pemex-es-la-novena-empresa-mas-contaminante-del-mundo-20191010-0012.html>.

nym in Spanish, which generates PM_{2.5} pollutants, which are highly hazardous to health. And according to the Health Effects Institute and the Institute for Health Metrics and Evaluation, it is the cause of 32,800 deaths a year in Mexico (as many as crime).⁷ Also, recent studies show that prolonged exposure to this type of pollutant increases the death rate from COVID-19⁸ by 8%.

⁷ <https://tinyurl.com/y6pfrzrz>.

⁸ <https://tinyurl.com/yxjcl7f6>.

FIELDS ON INTENSIVE CARE

The challenge then for Pemex is to operate in a context of low prices and reduction in demand and, as for any company, to maximize profits. For this, at least one premise must be met: income must be greater than costs.

There are fields with differentiated direct production costs. That is places where oil extraction is more or less expensive. This is the case of the Akal field (one of the most important given its reserves), which has an average production cost of \$17.27 per barrel. The

average cost in Ku-Maloob-Zaap (the fields with the largest proven reserves) is \$10.37 and in the rest of the fields, this cost is \$16.32 per barrel. Overall, the average cost of the single extraction per field is \$14.06. In April, the average price was 12.23 per barrel and increased to 36.43 dollars per barrel on average in July. Given that, at these costs, it is necessary to increase taxes, duties, and administrative and distribution costs of Pemex, the business of extraction of crude oil at low prices makes it unviable in that region.

TABLE 1. PRODUCTION, THE AVERAGE COST OF PRODUCTION PER FIELD, AND GROSS PROFIT (LOSS), APRIL 2020

FIELD	PRODUCTION (THOUSANDS OF BARRELS PER DAY)	THE AVERAGE COST OF PRODUCTION (DOLLARS)	AVERAGE PRICE (DOLLARS)	INCOME (MILLIONS OF DOLLARS)	TOTAL COST (MILLIONS OF DOLLARS)	GROSS PROFIT (LOSS) (MILLIONS OF DOLLARS)
Akal	39,8	17,27	12,23	14,6	20,6	-6,0
Ku	73,6	10,37	12,23	27,0	22,9	4,1
Maloob	364,3	10,37	12,23	133,7	113,3	20,3
Zaap	292,7	10,37	12,23	107,4	91,1	16,3
Rest of the fields	956,2	16,32	12,23	350,8	468,1	-117,3
					Total	-82,6

Source: In-house elaboration with information from the CNH and SEC.

This implies that since the extraction, Pemex lost 5.04 dollars per barrel during April in the Akal field; in the Ku-Maloob-Zap fields, it barely made a surplus of \$1.86 per barrel. In the rest of the fields, it had a loss of \$4.09 per barrel. And on average had a loss of \$1.83 for each barrel of oil that Pemex extracted during the most critical month, April. This implies that extraction alone –considering 1,726.6 thousand barrels per day– generated losses for Pemex of the order of 82.6 million dollars (at market prices) during April, this without considering taxes, duties, and administration expenses and of distribution. In other words, this measurement underestimates the loss (profit) of the company’s oil production, but it is enough to show the critical situation it faces.⁹

Even in May, the oil company faced serious problems due to the uncertainty in international markets, when the average price was 24.72 per barrel. This offset the reduction in exports of almost 16% compared to January, despite the slight recovery in exports to the United States.

From the information available at the oil field level, it can be observed that there is a strong dependence

⁹ An approximation to the cost of production is shown below, introducing administrative expenses, which better reflects the operational reality of Pemex.

on a small set of fields to meet production goals and minimize the losses generated by extraction in the most expensive wells. As of June 2020, 199 fields are producing, and from the SEC information previously exposed, we know that 196 of them operated with negative revenues (98.5% of the total) during April.

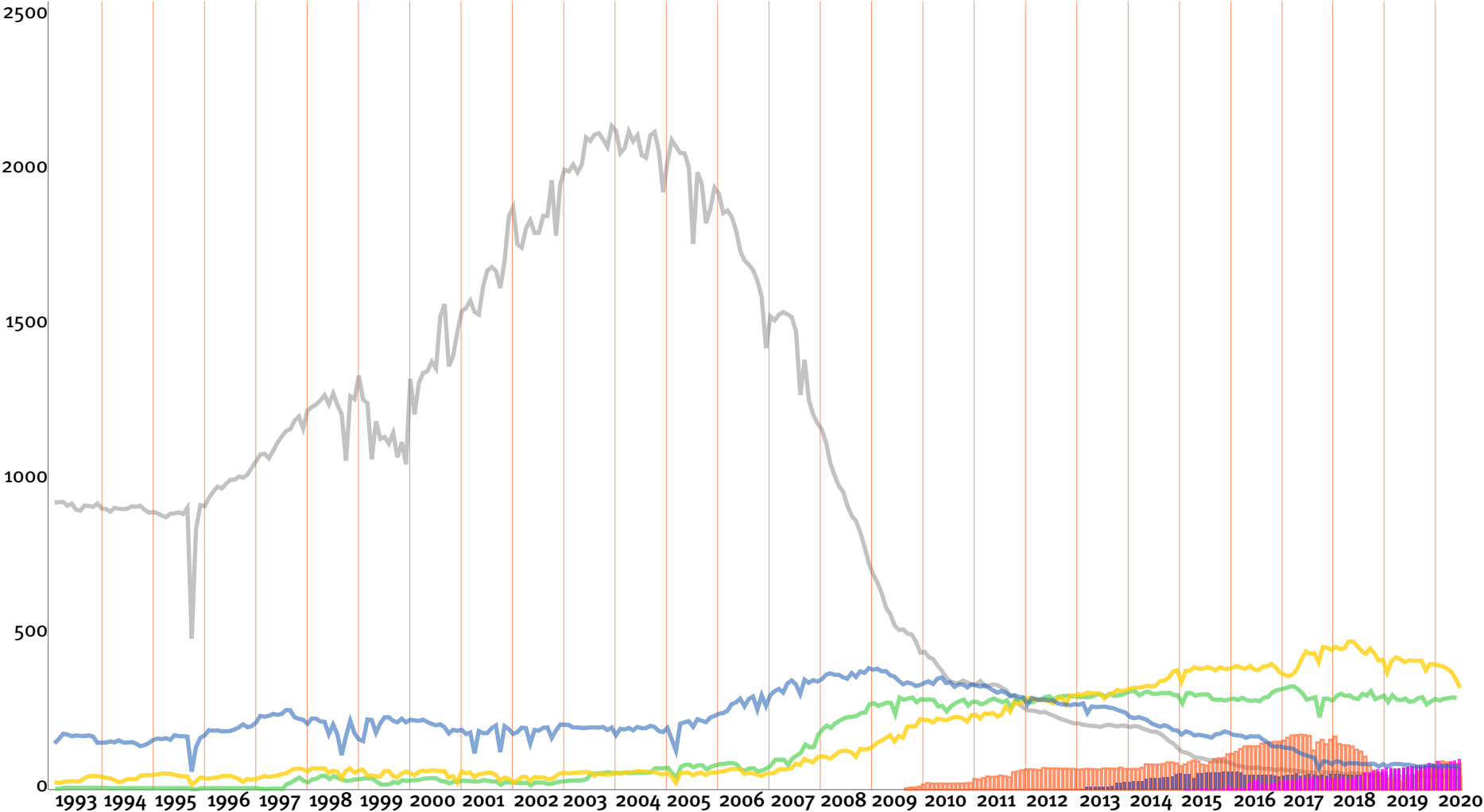
By analyzing the data from the Akal, Ku-Maloob-Zap wells as well as the six with the highest production as of June 2020, we can see that the best years for Pemex are gone. The peak in field production in Akal marked a before and after in the country’s production level.¹⁰ The increase in prices in the years after the peak in production was accompanied by a decline tending to its depletion, which was partially offset by the increase in the production of the Ku-Maloob-Zap fields as can be seen in Chart 2.

¹⁰ The highest point of oil production between December 2018 and July 2020 was 1,746.8 thousand barrels per day (including the participation of private companies), which represents 83% of the maximum level of production only from the field in Akal in December 2003, and 50.6% with respect to the historical maximum of Pemex production.

CHART 2. PRODUCTION VOLUME IN THE MAIN FIELDS

THOUSAND OF
BARRELS PER DAY

XANAB MALOOB KU ZAAB AKAL ONEL AYATSIL

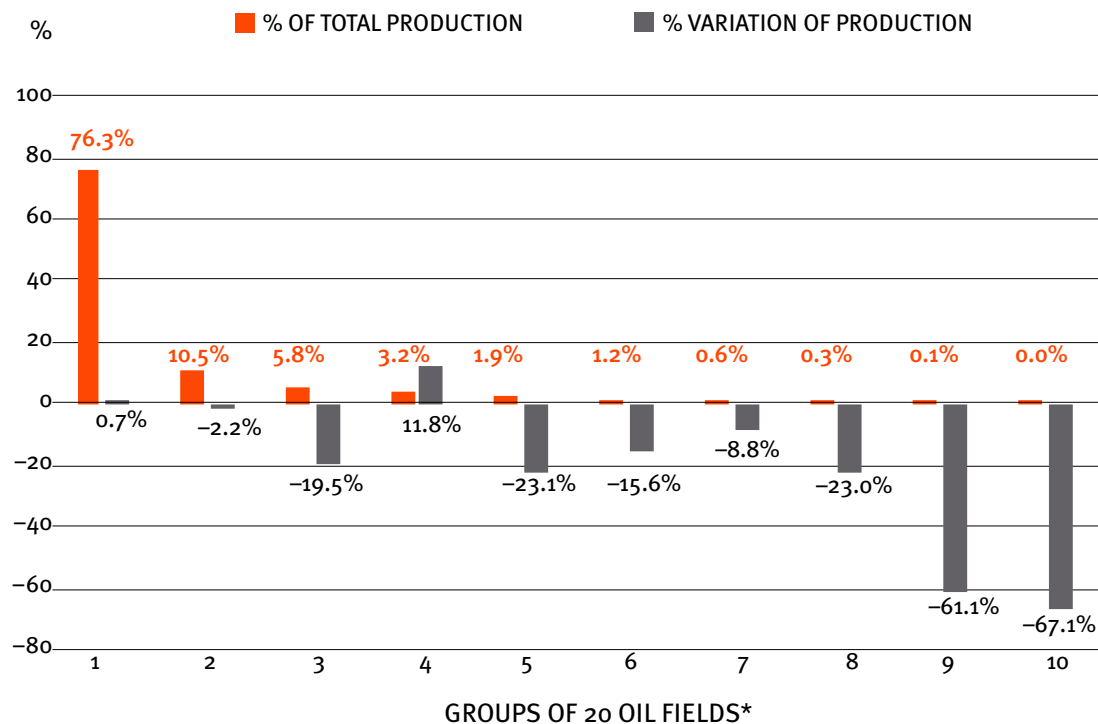


Source: In-house elaboration with information from the CNH.

The longer it takes to accept what the data tells us the worse the company's situation may be. What was once the most prolific field has been depleted, and extracting more oil from that field leads to losses. And it may be too early to say that the top producing Maloob and Zaap fields have peaked production, but at least the former peaked in April 2018 and the latter in March 2017. From there, its production has stagnated and even in recent months, its production has declined, even before we had a decline in economic activity in March 2020.

Chart 3 shows the behavior of production in groups of 20 fields per sphere,¹¹ the contribution to total production is expressed by its size, and its respective growth is given on the vertical axis. The group with the highest oil production represents 76.3% of the total, it has a growth rate of 0.7% from June 2019 to June 2020. On the other hand, 8 of the 9 remaining groups show negative growth rates in the same period, which accounts for 20.5% of the total production. If both groups maintain these growth rates, the level of production shortly will not exceed 1.8 million barrels per day for the remainder of 2020.

**CHART 3. PRODUCTION VARIATION (%),
JUNE 2020 COMPARED TO JUNE 2019, BY FIELDS**



*Each group is formed by 20 fields (the first group is the exception which is formed by 19, organized in descendent order, where group 1 has the (19) fields with the largest production and group 10 (20 fields) with least production.

Source: In-house elaboration with information from CNH.

¹¹ Except for the first group, which is made up of 19 fields.

On the other hand, 1P reserves¹² have been in decline since 2001, which has been reduced by 73.2 % between 2001 and 2020. Similarly, these reserves for the 19 fields with the highest production (19+) as of June 2020 have been reduced by 67.8%. And between 2003 and 2020, the reserves of the 19+ have seen their participation in the total diminished, going from 67.2% to 59.8%.

However, the only way to increase proven reserves is through discoveries and these can be carried out through exploration, an activity that has been negatively affected in its investment given the red numbers of the company. Pemex is at a crossroads.

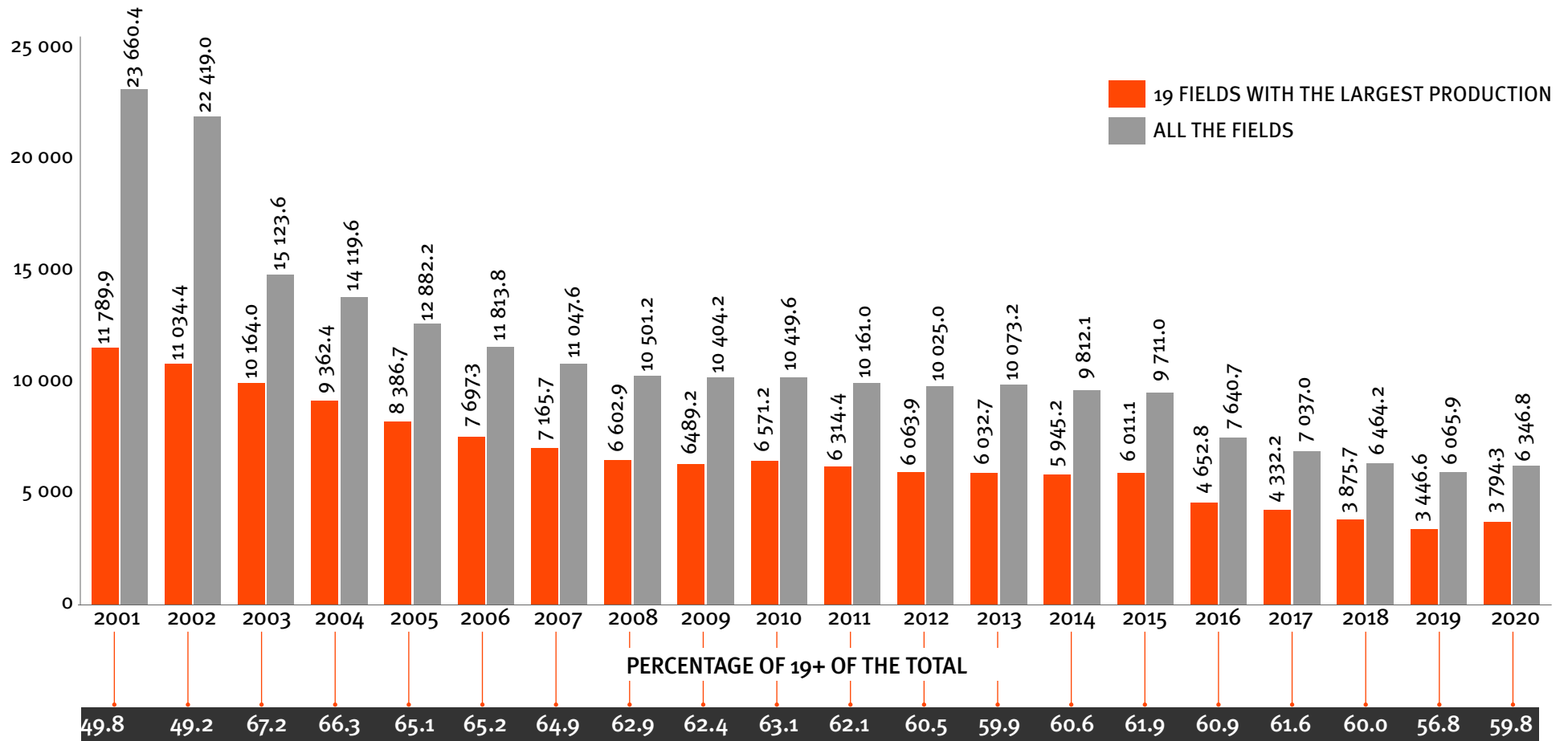
By analyzing the data from the Akal, Ku-Maloob-Zap wells as well as the six with the highest production as of June 2020, we can see that the best years for Pemex are gone.

¹² 1P reserves are those with a probability of at least 90% that the volume to be recovered will be equal to or greater than that calculated.



Image: Unification of a shared field with a private enterprise. Photo at <https://www.economista.com.mx/empresas/Pemex-va-por-su-segunda-unificacion-de-un-yacimiento-con-un-privado-en-aguas-someras--20200902-0029.html>.

CHART 4. EVOLUTION OF PROVEN RESERVES 1P ALL FIELDS AND THE 19 WITH THE HIGHEST PRODUCTION



Source: In-house elaboration with information from the CNH.

PRODUCTION AND ITS IMPACT ON FINANCES

All of the above is relevant due to the fact that the company's main line of business has been extraction. Under the current scenario, the results at the end of the year may end up being more than catastrophic, if we consider that from January to June 2019 this segment presented better results than now, and despite this, the company had considerable losses.

During the second quarter of 2020, the losses are obvious. The company barely had a favorable gross return (5.6% concerning total revenues), but the difference with the same period last year is -88.8% in real terms. Only for the exploration and production segment, gross income decreased by 97.9%. This line of business only obtained 1 peso of profit for every 100 pesos it sold, 99 pesos were costs.

TABLE 2. FINANCIAL INFORMATION FOR THE EXPLORATION AND PRODUCTION, INDUSTRIAL TRANSFORMATION, AND TOTAL PEMEX SEGMENTS (BILLIONS OF PESOS, 2013 = 100) 1/2

BILLIONS OF PESOS OF 2013 (FIGURES ROUNDED TO INTEGERS)*	APRIL - JUNE 2020			APRIL - JUNE 2019			REAL ANNUAL VARIATION (%)		
	Concept**	EP*	TRI	Total	EP	TRI	Total	EP	TRI
Total sales	71	83	137	147	189	286	-52	-56	-52
Impairment (Reverse) of wells, pipelines, property, work sites and equipment	9	5	14	26	1	3	-67	583	311
Cost of what was sold	62	85	115	87	192	214	-29	-56	-46
Gross return (loss)	1	-7	8	34	-3	68	-98	141	-89
Distribution and transportation expenses	0	5	4	0	5	4	-46	-9	-7
Administration expenses	22	13	29	11	10	26	105	32	12
Operating performance (loss)	-21	-25	-22	22	-16	40	-192	49	-156

TABLE 2. FINANCIAL INFORMATION FOR THE EXPLORATION AND PRODUCTION, INDUSTRIAL TRANSFORMATION, AND TOTAL PEMEX SEGMENTS (BILLIONS OF PESOS, 2013 = 100) 2/2

BILLIONS OF PESOS OF 2013 (FIGURES ROUNDED TO INTEGERS) *	APRIL - JUNE 2020			APRIL - JUNE 2019			REAL ANNUAL VARIATION (%)		
	CONCEPT**	EP*	TRI	Total	EP	TRI	Total	EP	TRI
Financial Cost	-27	-2	-29	-24	-2	-24	16	44	22
Financial Income	12	0	3	14	1	2	-10	-92	11
Exchange Profit (loss) - Net	33	2	37	13	3	17	159	-28	119
Total duties, taxes and others	11	0	18	79	0	78	-86	-	-77
Net return (loss)	-8	-25	-33	-48	-15	-40	-84	68	-17

Source: In-house elaboration with information of Pemex.

*The financial state presents the most relevant items for two business segments, so the sum of the partials may not be equal to the totals;

**EP: Exploration and production; TRI: Industrial Transformation.

After said gross profit, the administrative expenses and the payment of amortizations must be considered. But only by adding the administrative cost to the gross yield, without considering the deterioration (reverse) of wells, pipelines, properties, worksites, and equipment; we have as a result the closest thing to a figure of the profit of oil production, which results in a loss of -12,723 million pesos.¹³

It should also be considered that the damage is not only taken by Pemex but also by the public treasury

as said segment of the company contributes to a lesser extent. In addition, the federal government made the governmental decision to reduce the tax burden on Pemex. Thus, the payment of taxes and duties in the second quarter of 2019 was 79 billion pesos, which was reduced to only 11 billion in 2020: -85.9% in real terms.

On the other hand, operating income decreased by 192.5% in the case of exploration and production, and the company as a whole had a reduction of 155.6%. In part, the difference is explained by the fact that other

¹³ Amounts are expressed in 2013 pesos.

lines of business showed positive variations. However, both reductions are unsettling to the extreme. Nor should we fail to notice the increase in administrative expenses during the second quarter of 2020, of 104.8% in Pemex exploration and production, opposite to the behavior of income and almost nine times higher than the increase in administrative expenses of the entire company.

Since the industrial transformation (refining) business generates losses, each additional barrel sent to refining generates more losses. Given the company's decision to reduce sales abroad and direct them to transformation (be it gasoline, diesel, jet fuel, fuel oil, among others), gross losses in the industrial transformation sector almost doubled compared to last year. The operating loss was -24,600 million pesos. In other words, Pemex loses from oil extraction and loses even more by refining it.

Pemex loses from oil extraction and loses even more by refining it.

CONCLUSIONS: A CLASH... OF REALITY

With the recovery of international prices due to the gradual increase in economic activity, the outlook has improved compared to April of this year. However, expectations continue to show a pessimistic scenario as long as the propping up of Pemex continues to be one of the priority objectives of the federal government.

Given the current production level and the downward trend in proven reserves, it is technically impossible to set a goal of 1.8 million barrels per day in the short term, even with the increase in production by private companies. In addition to this, investment in exploration has decreased, thus limiting the capacity to grow production in the medium and long terms.

However, in the remote case of increasing production and deciding to refine crude oil in Mexico, the company's losses will increase and the effects on the domestic market will be devastating given the serious deterioration of the refineries. Sending a greater quantity of crude to refining implies increasing the production of fuel oil, which is used in combined

cycle power plants for the generation of electricity, which will lead to an increase in the cost of production. Finally, such use will have harmful effects on health due to the increase in air pollution.

The company's financial situation requires financing for new investments in the company's main business, exploration, and production. However, the cost of international financing will increase as the risk rises with the deterioration of the company, and as a negative perspective of it is maintained. It is imperative to evaluate the opportunity costs of the company based on what is best for itself and the country. A

better path must be found to secure energy and one in which the company has financial viability in the medium and long term.

We, therefore, warn about the scarce cash flow generated by Petróleos Mexicanos in its main line of business, which becomes insufficient to meet its short-term liabilities. Faced with a depressed market, and with administrative expenses in constant growth, the questions are how will the problem be solved and at what cost? And where will the injection of capital come from to the company?



