



# Pemex's corporate responsibility to the test:

## The case of the social and environmental impacts of the Miguel Hidalgo refinery

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*Before the 2013 Energy Reform, the State conceived a form of social welfare generation through total control of the oil value chain. Under the leadership of the state-owned company Pemex, and through its corporate responsibility policy, the State sought to transfer philanthropic resources to the states and municipalities with an oil vocation in the country through donations. This policy remains in effect. However, today companies must incorporate a more advanced standard **of environmental, social and governance sustainability (ESG)** as part of the value creation formulas. Global trend points towards the generation and diffusion of ESG indicators as a complement to the ways of estimating financial performance of companies, both private and state-owned. This has important implications in costs and access to financing sources.*

*In this study, we evaluate the effectiveness of Pemex's current corporate responsibility policy at the aggregate level and with respect to comparable companies in light of the Sustainalytics ESG standard. Also, from the environmental and social spheres, we evaluate the refining segment of Pemex under the ESG standard of SASB. Finally, with the case study of the Miguel Hidalgo refinery in Tula, Hidalgo, we exemplify some potential ESG risks that, in our opinion, Pemex could consider in order to design better corporate responsibility policies that contribute to increasing its value in the long term.*

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## Introduction

Today companies must not only pass the profitability test, but also the performance test, measured according to ESG sustainability metrics and the way in which they disclose the performance of their corporate sustainability policy. This approach is driven primarily by the IFRS Foundation, and supported by such important regulators as the Securities Exchange Commission (SEC) of the United States of America. Signs show that in coming years, the ESG standard, which adds an objective sustainability factor<sup>1</sup> to the traditional formulas of value creation, will be an accounting standard and a global financial reference. The objective is to help guide the decisions of users of financial statements in a market context; that is, companies with good ESG ratings will have better global financing opportunities in the financial markets.

Stakeholder capitalism<sup>2</sup> is related to this new way of evaluating performance. In fact, it is one of the axes of post-COVID-19 economic recovery strategies, and the starting point of numerous international efforts aimed at meeting the UN Sustainable Development Goals (SDGs)<sup>3</sup>, which seek to guarantee a balance between economic growth, care for the environment and social well-being, as well as ensuring that present development won't compromise the capacity of future generations. Serving society better is the global business consensus, which involves adjusting the criteria by which value creation is measured.

In Mexico, before the 2013 Energy Reform, the State conceived that generation of social welfare should be done through oil and Petróleos Mexicanos (Pemex). That is, oil income was placed at the center of the model, and redistributed by the State as social spending. The mechanism known as 'development lever' had its heyday

during the peak of oil production in the 20th century. At that time, and as a corporate responsibility policy, Pemex developed donation programs that are still in force to date, but which, in the face of the new requirements of the ESG standard, could be insufficient.

The company's challenges, however, are broader. The current administration's energy policy seeks to increase the country's fuel production levels to achieve autarky, regardless of its financial<sup>4</sup>, social and environmental cost. And that cost is very high: 4.2 million premature deaths annually in the world (Greenpeace, 2020, p.2) are attributed to air pollution. In Mexico, according to data from 2019, about 17.8 thousand deaths and 444.6 thousand years lost would be attributable to poor air quality (The Institute for Health Metrics and Evaluation [IHME], 2020). Mexico ranked 4th place in the world in anthropogenic emissions of sulfur dioxide (SO<sub>2</sub>) in 2018. According to the North American Aerospace Agency (NASA), the critical points of SO<sub>2</sub> emissions in the country are in the region of refining and power generation in the vicinity of Tula, Hidalgo, which contribute to air pollution in nearby areas, including Mexico City. (Greenpeace, 2020, p.7)<sup>5</sup>.

In 2018, the National Human Rights Commission (CNDH) issued a series of general recommendations to various authorities at all levels of government on violations of various human rights: to health, to an adequate standard of living, to a healthy environment and access to public information; caused by pollution such as that generated in Tula, Hidalgo, one of the nine most polluted areas in the country, according to their diagnosis.

From this panorama a compelling question arises, which is the motivation for our case study: Is the current policy of *corporate responsibility* (CR) of Pemex in its *environmental*

<sup>1</sup> In 2020, the IFRS Foundation convened a global public consultation to create a new Sustainability Standards Board (SSB) to develop internationally accepted standards on sustainability based on a standardization of current methodologies. The document subject to consultation and the opinions of numerous stakeholders can be seen at: <https://www.ifrs.org/projects/work-plan/sustainability-reporting/comment-letters-projects/consultation-paper-and-comment-letters/#consultation>

<sup>2</sup> According to Klaus Schwab, this concept deals with a category of capitalism in which companies not only seek to optimize short-term benefits for shareholders, but also seek the creation of long-term value based on the needs of stakeholders related to the company, and the needs of society in general. (WEF, 2021)

<sup>3</sup> Details of these objectives can be read at: <https://www.un.org/sustainabledevelopment/es/objetivos-de-desarrollo-sostenible/>

<sup>4</sup> According to Pemex 2020 financial report, the refining variable margin was 0.76 dollars per barrel, a lower result than in 2019. Pemex TRI has shown that it loses billions of pesos when making fuels. At the end of 2020, this subsidiary reported a worrying negative gross margin equivalent to -24%, that is, only when discounting the cost of sales from the business income, Pemex is the loser. (Pemex 2020)

<sup>5</sup> According to the interactive map made available to the public by NASA# the Tula thermoelectric plant contributes 136 thousand tons of sulfur dioxide SO<sub>2</sub> per year. Although this case focuses on reviewing the case of the Tula refinery, it is pertinent to mention that there is a close link between the by-product of refining, fuel oil, and the generation of electricity. The Tula CT is a huge thermoelectric plant with five generation units and a total capacity of more than 1,500 MW. It currently uses 80% fuel oil.



and social fields effective? To respond, we will review in detail the new trends in measurement through ESG indicators<sup>6</sup>. Then, based on public information, we will evaluate Pemex's ESG standard. We will learn about some ESG sub-indicators for the refining business segment. Finally, we will go down to 'field level' at the Miguel Hidalgo refinery, located in Tula, Hidalgo, to identify, based on secondary sources of information, some risks that could be significant for Pemex. We will reflect on some opportunities that the company could take advantage of to strengthen its strategy of social responsibility, if it decides to orient its policy to contribute to the improvement of the environment and the quality of life of people and communities, as companies in its field already do around the world.

## I. Effectiveness of Pemex's CR policy in light of ESG indicators

The demand for information on sustainability continues to grow as business models are more exposed to social and environmental issues, including regulation related to climate change. Investors and creditors need high-quality information that enables them to assess how companies are managing these issues and the impact they have on long-term prospects. Although a variety of sustainability frameworks and standards already exist, international financial public calls for convergence and a single framework that provides consistency and comparability<sup>7</sup>. In the world of sustainability indicators and reports, there are several companies that are dedicated to generating methodologies and risk assessments, in this study we will use two highly recognized: *Sustainalytics* and *Sustainability Accounting Standard Board (SASB)*.

### *Sustainalytics ESG Risk Ranking*

Sustainalytics, owned by Morningstar, is an ESG risk assessment company that makes annual company-specific risk ratings available to the public free of charge. In its methodology, the ESG risk rating of a company consists of a quantitative score and a risk category. The quantitative score represents unmanaged or uncontrolled ESG risk units, with lower scores representing less risk. Uncontrolled risk is measured on an open scale, which groups five basic categories of risk: insignificant, low, medium, high, and severe.

According to Sustainalytics (2019), a problem is considered "material" (in the sense that it has a certain magnitude or substance) if its presence or absence in the financial information is likely to influence the decisions of investors; that is, if it can have a substantial impact on the economic value of a company and, therefore, on its profitability profile and financial risk, from an investment perspective. This definition basically coincides with the definitions of materiality used by various specialized authors. According to the Association of International Certified Professional Accountants (AICPA), the underlying premise of the concept of materiality in the field of ESG risks is that its proper identification and management is associated with the generation of long-term value. This is particularly challenging for the assessment of the materiality of more qualitative problems, which involve subjective assessments, as can happen when estimating the magnitude of a social impact, for example<sup>8</sup>.

### *Pemex's CR policy effectiveness evaluation: Sustainalytics*

From a universe of more than 12,000 companies spread across 40 industries, the Sustainalytics database allows access to and comparison of ESG risk ratings by company,

<sup>6</sup> For a broader view of these methodologies, please visit: <https://www.sustainalytics.com/> and <https://www.sasb.org/>

<sup>7</sup> It is important to consider that, for the purposes of reports sent to the Securities Exchange Commission (SEC), the submission of false or misleading information could cause liability to companies and professionals under US federal securities laws. The SEC encourages companies to disclose ESG information in their Annual Report and on Forms 10-K or 20-F. Audit teams must coordinate closely as they complete their respective engagements. To the extent that there is material information, both historical and prospective, on ESG risks of the business, the SEC will be more demanding in its requirements on trends, events and uncertainties that are reasonably estimated to have effects on the financial or operating position, performance and the company's assets. (Caroll, 2021)

<sup>8</sup> The AICPA offers a manual to deepen the methodology for these cases It can be accessed here: <https://www.aicpa.org/content/dam/aicpa/interestareas/frc/assuranceadvisoryservices/downloadabledocuments/auditdatastandards/materiality-considerations-for-attestation-engagements.pdf>



to gain insight into uncontrolled risk management performance. ESG risk rating combines management and exposure concepts from specific sub-industries, which in turn are comparable against other industries. These are the quantitative scores in the five risk categories:

Negative	Low	Medium	High	Severe
0-10	10-20	20-30	30-40	+40

In order to know the position in the scale of Pemex and comparable companies, we analyzed the public database of Sustainalytics. We identified in it the ESG risk ratings of 93 companies in the oil and gas sector, updated as of April 8, 2021. *(The complete list of comparable companies can be consulted in Annex A of this study.)* Thus, we calculated a comparability range for Pemex<sup>9</sup>, ranging from 14.5 to 59.7, as described in Table 1.

**Table 1: ESG Risk Rating Range for the Global Oil and Gas Industry**

Minimum	14.5
Lower quartile	32.6
Median	36.9
Upper quartile	45.0
Maximum	59.7

Source: Sustainalytics with data updated on April 8, 2021

**For Pemex, Sustainalytics has calculated an ESG risk rating equivalent to 56.7 points, which is located in the highest part of the ESG risk range.** This indicates that the company presents a severe risk in terms of ESG, compared to its peers. Companies such as the Italian ENI (with a rating of 25.7) are in the lower part of the range, while the

Colombian Ecopetrol (37.3) or the Norwegian Equinor (33.4) are placed in the middle part. The Brazilian company Petrobras (48.2), for example, also ranks at the top of the table. Among the riskiest companies we find the Chinese company Guanghui Energy, Parsley Energy from the United States and Pemex. Table 2 allows a direct comparison.

**Table 2: Companies rated with the highest ESG risk metrics (+50 points)**

Companies	Nationality	ESG Risk
Guanghui Energy	China	59.7
Parsley Energy	United States	57.3
Pemex	Mexico	56.7
WPX Energy	United States	56.4
Continental Resources	United States	55.6
PetroChina	China	55.6
Oil and Natural Gas Corporation	India	53.6
Cimarex Energy	United States	52.1
China Petroleum & Chemical	China	51.7
Saudi Arabian	Saudi Arabia	50.5
Diamond Back Energy	United States	50.1

Source: Own elaboration with data from Sustainalytics to 2021.

<sup>9</sup> Sustainalytics Public ESG Risk Ratings can be accessed at this link: <https://www.sustainalytics.com/esg-ratings/>.



An ESG risk rating greater than 50 points could reflect that the company in question faces severe obstacles at the corporate governance level to manage environmental, social and / or governance risks.

From a general perspective, the ESG risk indicator alerts about the effectiveness of Pemex's CR policy. To take a closer look, we decided to explore the oil and gas refining business segment based on the ESG risk methodological manual of the Accounting Standard Board (SASB).

### **Pemex Refinación's CR policy effectiveness evaluation: SASB<sup>10</sup>**

While the Sustainalytics ESG risk metric is an objective indicator that helps making comparisons between companies and industries, it tells us little about the internal aspects of companies that can be improved. Since it is a private company whose information and formulas are protected under confidentiality contracts, we did not have access to further information about the ESG rating for Pemex. Therefore, if what we want is a greater approximation to the weaknesses and strengths of the aspects that make up the CR policy, it is necessary to use complementary methodologies and a few grams of creativity to identify signs or *proxies* of the problems that could configure unmanageable risks, in the framework that we have described. Thus, we will take the case of a Pemex business segment, that of refining, and we will apply the methodology designed by SASB.

The *Accounting Standard Board* is an independent non-profit organization that establishes standards to guide the dissemination of information on sustainability, mainly aimed at the financial field. SASB standards identify subsets of problems (ESG) for 77 industries.

According to the organization, for decades traditional accounting developed in a world in which tangible assets constituted the most important part of the market valuation of companies. **In today's economy,**

### **sustainability issues affect not only financial condition, but also operating performance and business value.**

Data security, social problems in communities, water management, environmental problems, management of conflicts of interest between employees, industrial safety, health of employees and the communities surrounding the industrial facilities are examples of problems that can pose risks to business performance, as they translate into operating costs, environmental liabilities, and impacts on brand equity or competitive position (SASB, 2018).

As part of its methodology applied to the oil and gas industry –in the refining segment–, SASB proposes a list of 17 metrics corresponding to nine topics related to environmental pollution, industrial safety, regulation and operational performance. The categories of analysis are adapted according to specific facts or circumstances, in such a way that it is possible to add or remove sustainability issues to what SASB standardizes as a “typical company”. In addition, unlike the Sustainalytics risk rating, SASB's ESG standard allows for greater flexibility, by categorizing with quantitative and qualitative indicators (SASB, 2021).

Based on the above, and with the purpose of knowing more about ESG risks of Pemex Refinación, we only considered those related to the effects on the environment and social environment of SASB's manual for Pemex Transformación Industrial (Pemex TRI), the one in charge of oil refining in the country through six refineries<sup>11</sup>. First, we take the public information of Pemex available in its annual reports, both financial and sustainability, for 2018 and 2019, as well as data obtained through requests for information to Pemex administration. Then, we built a ESG risk chart of Pemex TRI in light of SASB, in order to identify signs of uncontrolled ESG risks. We have selected those that we consider most important and on which it would be advisable for Pemex to check if it has the necessary information to include them in its sustainability report, or if it should include them in a sustainability strategy in order to evaluate them, mitigate negative impacts and compensate damages.

<sup>10</sup> A materiality or relatively important assessment in light of SASB's methodology, in the accounting, finance and auditing fields, refers to the process of identifying, refining and evaluating potential environmental, social and governance issues that could affect a company and / or its stakeholders; it even takes into account qualitative characteristics that are useful to assess the scope of sustainability. To explore ESG materiality categories by industry, SASB organization makes a map available to the public (<https://materiality.sasb.org/>), in which the categories for the oil and gas industry can be seen.

<sup>11</sup> The methodology can be consulted at [https://www.sasb.org/wp-content/uploads/2018/11/Oil\\_Gas\\_Refining\\_Marketing\\_Standard\\_2018.pdf](https://www.sasb.org/wp-content/uploads/2018/11/Oil_Gas_Refining_Marketing_Standard_2018.pdf)



**Table 3. ESG environmental and social risks for the refining business segment of Pemex Transformación Industrial (2018 and 2019)**

Topic	Metric	Category	Unit of measurement	SASB Code
Greenhouse gas emissions	Gross global emissions of Scope 1, percentage covered by emission limitation regulations.	Quantitative	Thousand tones (t) CO <sub>2</sub> -e, 2 Percentage (%)	EM-RM-110a.1
	Short and long-term discussion, strategy or plan to manage Scope 1 emissions, emission reduction objectives, and a performance analysis against those objectives.	Qualitative	N/A	EM-RM-110a.2
Air quality	Atmospheric emissions of the following pollutants: (1) NO <sub>x</sub> (excluding N <sub>2</sub> O), (2) SO <sub>x</sub> , (3) particulate matter (PM <sub>10</sub> ), (4) H <sub>2</sub> S and (5) volatile organic compounds (VOC).	Quantitative	Thousands of Tons (t)	EM-RM-120a.1
	Number of refineries in or near densely populated areas.	Qualitative	Number	EM-RM-120a.2
Water	(1) Extracted fresh water, (2) recycled percentage, (3) percentage in regions with extreme water stress	Quantitative	Millions of cubic meters. Percentage	EM-RM-140a.1
	Number of incidents of non-compliance associated with water quality permits, rules and regulations	Quantitative	Number; Percentage (%)	EM-RM-140a.2
Product Specifications and Clean Fuel Mixtures	Percentage of low-emission fuels	Quantitative	Percentage (%)	EM-RM-410a.1
	Total addressable market and market share for advanced and associated biofuels.	Quantitative	Percentage (%)	EM-RM-410a.2
Legal and regulatory climate	Regulations and / or government policies on the environment and social impacts related to the corporate operation and the industry.	Qualitative	N/A	EM-RM-530a.1

Source: own elaboration based on the SASB methodology for the environmental and social dimensions and with data from Pemex (2018-2019).



Pemex (Total - All business units) (2019)	Growth 2018-2019	Pemex Refinación (2019)	Growth 2018-2019
48 Mt of CO2e	↑ 3.7% annual	19 Mt	↑ 32%
14.2 MtCO2e from flue gas burning	↑ 36%	4.8 MtCO2e	↑ 55%
According to Pemex (2019), goals were not met, but reports that it is in the redesign of the strategy and plan to correct. However, it does not specify details about it.			
84.4 Mt NO2	↓ 0.3%	18% = 15.19 Mt	↓ 20%
882.5 Mt SOx	↑ 36%	71% = 629 MtSOx	↑ 69%
10.5 Mt PM10	↓ 12%	80% = 8.4 Mt PM10	↑ 4%
46.5 Mt COV	↑ 5%	44% = 20.46 Mt COV	↓ 6%
6	Pemex has a refinery under construction and recently acquired control of the Deer Park refinery in the United States of America.		
(1) 164.7 MMm3	↓ 5%	157.2 MMm3	↓ 4.5%
(2) 30.8 MMm3	Without changes	30.8 MMm3	Without changes
(3) Regions with water stress are registered: Guanajuato (86.1%) and Puebla (11.9%). Tula is not mentioned in the 2019 sustainability report.			
In the 2019 report, no detailed information or indicators are reported on compliance with quality standards in the water discharges of Pemex refineries.			
Pemex reports that 93% of the gasoline and more than 57% of the diesel produced by Pemex were UBA (Sustainability Report 2019); In 2018, 100% of the gasoline and more than 42% of the diesel produced by Pemex were UBA.			
The SCJN protected a group of environmental associations on NOM-016-CRE-2016. The commercialization of biofuels in Mexico is limited or suppressed.			
Pemex allocates a budget to its social responsibility programs: PACMA (41.2%), in-kind donations program (54.4%), sustainable development clauses contained in the Comprehensive Exploration and Production Contracts (2.66%); and Works of Mutual Benefit (1.75%).			



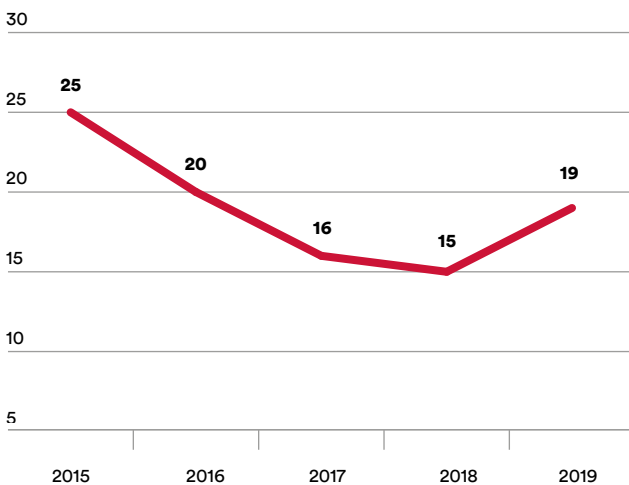
From this risk visualization we obtain **positive** and **negative indicators**. Among the former we can observe decreases in some emission variables such as nitrogen oxides (NOx) and volatile organ compounds (VOC); there is also a decrease in the total water extracted. Another positive indicator is waste management: data published by Pemex for 2019 indicates that an inventory of 16.9 Mt<sup>12</sup> of hazardous waste was registered, a lower amount than previous year (38.95 Mt). (Pemex, 2019, p.44)

Meanwhile, the negative indicators give us grounds for the following observations:

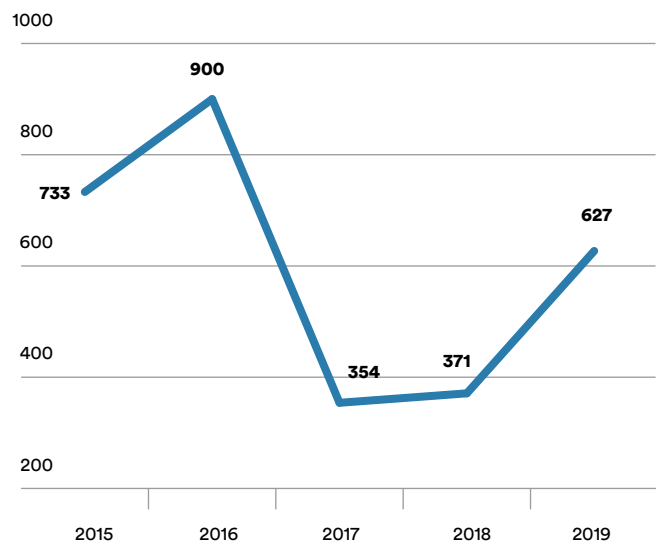
- **Environmental (atmospheric)**. Between 2018 and 2019, a significant increase in greenhouse gas emissions, and a lack of information on clear strategies to mitigate these increases are identified. Pemex TRI presents increases of 32% in CO<sub>2</sub>eq<sup>13</sup> emissions and 69% in sulfur oxides (SOx)<sup>14</sup>, only between 2018 and 2019. If we observe the historical data, between 2015 and 2017 we can see a 41% decrease in CO<sub>2</sub>eq emissions, and in terms of SOx, there is a significant increase (23%) between 2015 and 2016, that falls by 61% between 2016 and 2017 and increases again since 2017.

- **Water**. In its sustainability reports, Pemex does not provide detailed information or data, in light of applicable regulations, on water quality and discharge. However, there is evidence of evaluations carried out by the Federal Commission for the Protection against Sanitary Risks (COFEPRIS) that support a declaration of sanitary risk issued in November 2018 for the municipalities of Tula de Allende and Tepetitlán, located in the Endhó Dam and its peripheries. It states that “extraordinary conditions and urgent health care” are imminent risks to the health of the inhabitants of that area. Such declaration, to which México Evalúa had access, argues that the water for human consumption in those territories contains levels of arsenic, mercury, lead and manganese that exceed the maximum limits allowed in the regulations. Likewise, COFEPRIS confirms that it did not observe actions, programs, schemes, activities or strategies aimed at solving the problem, although it did point to its causes: “public and private companies that discharge water and waste at the Endhó dam, whose systems and measurements have not been adequately audited and that put the sanitary conditions of the dam and its periphery at risk”<sup>15</sup>.

### CO<sub>2</sub>eq emissions (Mt) - Pemex TRI



### SOx emissions (Mt) - Pemex TRI



Source: Own elaboration with data from Pemex sustainability reports (2016-2019).

<sup>12</sup> Mt is Pemex's way of saying 'thousands of tons'.

<sup>13</sup> CO<sub>2</sub> absorbs radiation and prevents heat from escaping from the atmosphere; global warming is produced by an excess of CO<sub>2</sub>. Furthermore, water vapor, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), chlorofluorocarbons (CFCs) and tropospheric ozone (O<sub>3</sub>) are gases that cause this effect. All together they make up the well-known greenhouse gases. To calculate the carbon footprint, we use the CO<sub>2</sub> equivalent (tCO<sub>2</sub>eq), a unit of measurement in tons that calculates the emission of these gases.

<sup>14</sup> Sulfur oxide is considered a pollutant because it is responsible for generating acid rain, is harmful to the lungs and causes breathing problems.

<sup>15</sup> COFEPRIS (2018) Official Letter No. S00 / 155/2018.





- Fuel quality:** Pemex reports high percentages of production of low sulfur fuels (ULS). However, regarding this issue there is a problem that could be an ESG risk for Pemex to consider. The National Human Rights Commission pointed out in 2018 various breaches of fuel quality standards that directly impact the increase in the levels of pollutants, mainly PM10 and PM2.5, which cause serious damage and put the health of people living in urban areas at risk. In its recommendation, the CNDH pointed out that environmental and energy sector authorities “did not comply with the proper supervision and inspection of the observance of the norms on the distribution of ULS fossil fuels throughout the national territory” (CNDH, 2018, p. 119).

Likewise, the current federal administration did not heed the call of the CNDH; on the contrary: it insisted on adding to the problem. In December 2019, the Energy Regulatory Commission (CRE) granted Pemex Transformación Industrial an extension of the term of five years to comply with the obligation of maximum sulfur content in automotive diesel of 15mg / kg (the fuel that complies with NOM-016- CRE-2016<sup>16</sup> It is colloquially known as ultra-low sulfur diesel [ULS]), for production and sale throughout the country<sup>17</sup>. In the resolution, the CRE warned that Pemex Transformación Industrial lacked the necessary infrastructure for the production of ULS fuels -especially diesel- in sufficient quantities to satisfy national demand. The CRE also recognized that Pemex lacked the logistical capacity to manage the transition from the supply of high-sulfur fuels to ULS fuels.

Later, in 2020, the CRE issued additional resolutions<sup>18</sup>, which allow Pemex to be excluded from the obligation to distribute ULS fuels by specific geographic zones. The decision, already in times of pandemic, was justified by excess fuel inventories, given the decrease in demand that Pemex suffered that year and which prevented it from efficiently managing the transition to the total supply of low-sulfur diesel. As a result, the dates of application of the Official Mexican Standard NOM – 044, which establishes the maximum permissible limits of pollutants, by vehicles that use diesel were adjusted in parallel.<sup>19</sup> Worse still, in September 2020 the CRE

authorized Pemex to sell conventional diesel high in sulfur in areas where there was already an obligation to market only ULS diesel for a period of up to six months after the federal government determines the end of the contingency due to COVID-19. This measure, which has the objective of benefiting Pemex by exempting it from its obligations, harms consumers by denying them the right of access to an offer of high-quality petroleum products, which guarantees less pollution for the benefit of the environment, population's health, and increased durability of consumer-owned vehicle engines. **From this perspective of the welfare of consumers and citizens, the application of this exemption policy to Pemex could be valued as an ESG risk for the company.**

- Social impact:** in the **legal and regulatory climate** category, we notice a qualitative indicator that gives us an overview to analyze the vision that Pemex has about its own social responsibility policy. In accordance with the definitions set forth by the company in its documents, it understands the concept as the “commitment towards the communities where it carries out hydrocarbon production, transformation and transportation activities for the benefit of Mexicans (...) Through its social responsibility policy, Pemex seeks to offset the environmental impacts of oil activity and generates benefits shared with stakeholders and communities that support operational continuity through the maintenance of the Social Operating License “<sup>20</sup> (Pemex, 2021, p. 87).

As we mentioned earlier, **Pemex's social responsibility policy has not changed substantially for decades.** Over the years it has been modifying the format of the information in its reports, but it maintains its original programs, mainly the Community and Environment Support Program (PACMA), through which Pemex and its contractors allocate resources to various projects that, with prior authorization from the General Directorate of Pemex, seek to meet specific needs of states and municipalities with an oil vocation with donations in kind (Pemex, 2019b, p.135). Other Pemex social responsibility initiatives are included in the sustainability clauses of comprehensive exploration and production contracts, and in mutually beneficial works. In 2020, the Board of Directors authorized

<sup>16</sup> The purpose of this Official Mexican Standard is to establish the quality specifications that oil companies must meet at each stage of the production and supply chain, in national territory, including their importation, in accordance with international regulations on the matter.

<sup>17</sup> Resolution RES / 1817/2019

<sup>18</sup> Resolutions RES / 717/2020 and RES / 1042/2020

<sup>19</sup> NOM-044-SEMARNAT-2017 is available at: [http://www.dof.gob.mx/nota\\_detalle.php?codigo=5604713&fecha=11/11/2020](http://www.dof.gob.mx/nota_detalle.php?codigo=5604713&fecha=11/11/2020)

<sup>20</sup> The Social License to Operate (SLO) is the permission granted by the communities for the development and viability of present and future projects. Said permit is managed in the place of origin, with social responsibility actions that promote the communion of interests and the improvement in the quality of life of the communities that are located in oil entities (Pemex, 2019, p.78)



a budget of 1,441 million pesos, an amount 8.3% higher than the previous year, which represented 0.85% of its annual operating expense. (Pemex 2020).

In its section on social responsibility, Pemex also includes some descriptions of success stories. In its 2019 sustainability report, it makes a note on the social impact assessments (EVIS) that were carried out in the year and presents a statistical summary of the social problems that were addressed, categorized by level of risk. It is noteworthy that Pemex reports most of these problems (48 out of 52) as 'low' risk and 'medium' risk according to its own risk categorization -details are not public-, it also groups them into five categories: claim due to operation, non-compliance by Pemex in agreements and commitments, claims -spills or clandestine intakes-, damage to road infrastructure and the presence of pressure groups (Pemex, 2019c, p.79).

Although Pemex's sustainability reports include a section on human rights, in which Pemex reports some statistics - number of due diligence processes carried out annually, training, litigation status, allegation of complaints before the CNDH, among others-, compared to the initiatives and policies in this matter of equivalent companies, Pemex falls short. Although the ESG risk framework is not an accounting standard, **the most important energy companies in the world have gone ahead and have already opened spaces for the diagnosis, documentation and assessment of risks due to social impacts, and particularly in terms of human rights due to impacts on the communities surrounding energy projects.** The aforementioned framework includes aspects that are deeper than the mere presentation of statistics; for example, BP considers in its 2019 sustainability report areas of focus such as labor rights, safety and human rights, examples of design and implementation of damage reparation mechanisms, population health and socioeconomic status of the communities (BP, 2019, p.47). For their part, Chevron (2021) and ENI (2019, p.27) consider similar ESG risk categories, while the French oil company Total (2019, p.27) emphasizes and explains in detail the description of its ESG risks and its actions for the mitigation, control and repair of damages in due diligence processes.

An important difference between the traditional presentation of results in terms of social responsibility and the ESG risk framework is that the latter enables companies to document difficult cases (even failures), as well as deep and thoughtful analyzes that justify the materiality of the cases, which express a clear position on the part of the company regarding the risks and which define the

strategic routes that the companies have chosen to follow to mitigate the risks and / or take specific remedial actions. This contrasts with the practice, present in Pemex reports, of preferably reporting success stories.

### *Simultaneity of the environmental and social components of the impact*

There are many examples of change in commercial strategies based on climate action plans in the oil sector. They are very useful, since they imply a transformation in the business model itself, and in the formulas to generate commercial value, they are also linked to new mechanisms for measuring and disseminating corporate social responsibility. Likewise, the willingness of companies to influence laws, regulations and public policies can positively or negatively affect the reputation and value of their brand. Within the area of legal and regulatory climate, SASB notes that relevant opportunities include the improvement of financial conditions for the company, but are not limited to it: they also open the possibility of improving relations with the community, based on the positions of companies facing certain problems in short-, medium-, and long-term horizons (SASB, 2018, p.27).

Can we know something concrete about Pemex's position on environmental problems? In 2013, the company developed a Climate Action Plan (CAP) to work on the direct mitigation of greenhouse gases. Said plan considered conservation and reforestation projects designed to offset the emissions of these gases produced by their operations, maintain the balance of ecosystems, protect the surrounding communities, the environment and promote social development (Pemex, 2014, p.110). In the sustainability reports from 2015 to 2017, the company reported the progress in climate action plans, strategies and programs; however, for 2018 and 2019 it stopped doing so, which does not reflect anything other than the abandonment of an internal strategy that allows directing efforts, orienting investments and evaluating results in the matter.

As can be seen, reducing environmental impact is a priority for both the makers of evaluation methodologies and the companies evaluated. However, this accent does not detract from the concern to measure and report the risks of the social component of ESG, whose standardization of criteria is still under construction, to date. In the next section we will go to the bottom of SASB's legal and regulatory climate category that we have already begun to explore here, with a focus on human rights. We will exemplify some areas of opportunity for Pemex in Tula, Hidalgo, where the Miguel Hidalgo refinery operates.



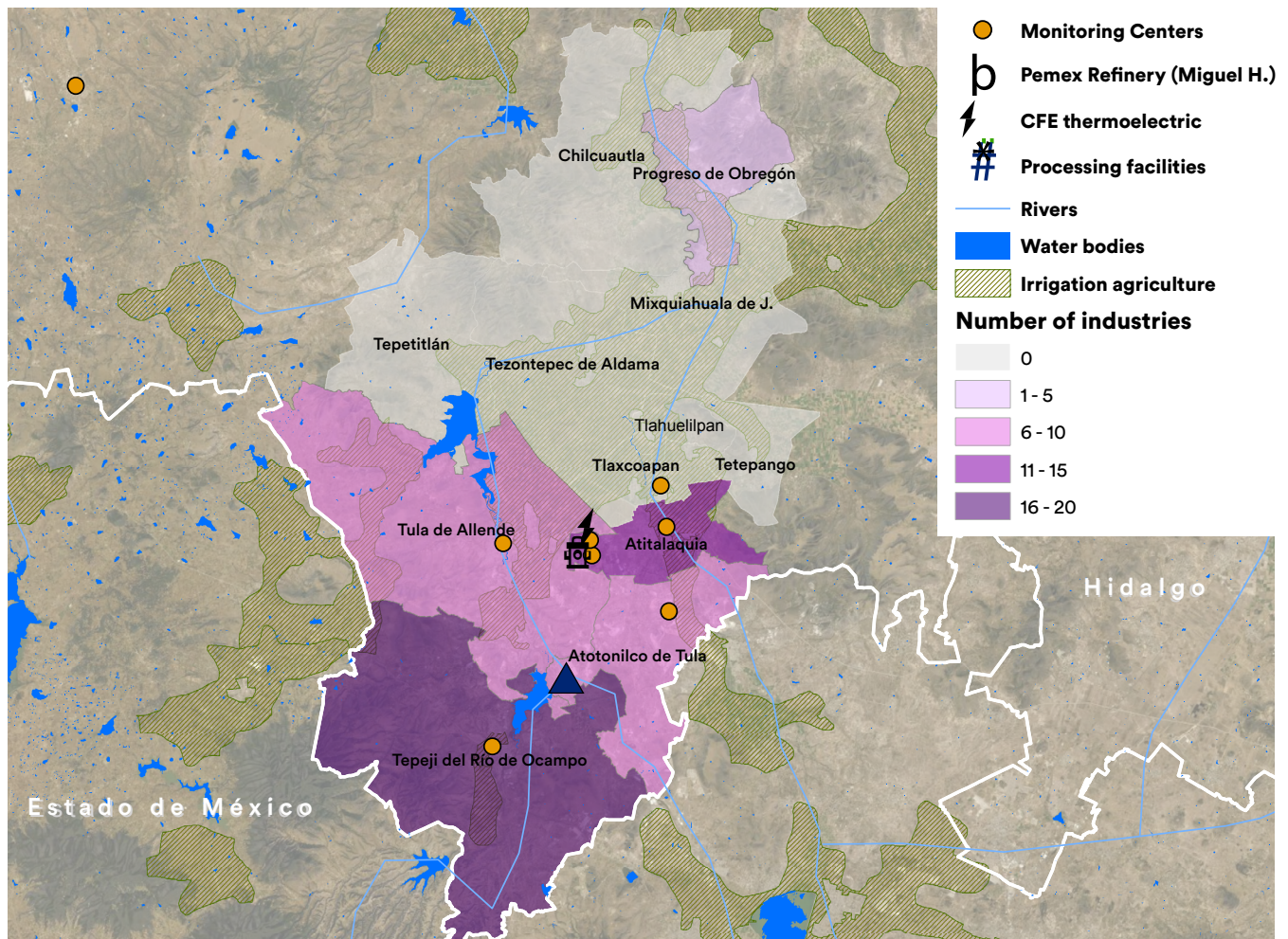
## II. Miguel Hidalgo refinery. Tula, Hidalgo

Hidalgo is a federative entity with an area of about 20,800 km<sup>2</sup> (1.1% of the national territory) and has three main atmospheric basins, in which 1.5 million inhabitants are concentrated (INECC, 2020). In the Tula basin, formed by 12 municipalities, 58 local and federal companies are registered, including the Miguel Hidalgo refinery of Pemex, two electricity generation plants - one conventional thermoelectric and one combined cycle with natural gas - of the Federal Electricity Commission (CFE), six cement companies, four lime scale plants and various industries in the metal-mechanic and chemical industry. According to data from the Comisión Nacional de Población (2021), 562,501 people live in the 12 municipalities. Agricultural activities converge in that same territory. The main products grown correspond to corn, green alfalfa, beans,

green forage oats, squash, green tomato, red tomato, forage corn and coriander. (García Salazar, 2019). The INEGI allows us to know (National Survey of Occupation and Employment [ENOE], 2020) about the occupations of that region registered in 2020: those related to support in agricultural activities occupy 44% of the population, construction 28%, sales and dispatchers in shops, to 27%, and other activities, 1%.

The Miguel Hidalgo de Pemex refinery (hereinafter, the Tula refinery) was inaugurated on March 18, 1976, and currently employs 6,000 workers<sup>21</sup>. The facility has an area of 749 hectares, where there are 33 plants for refining and processes, seven boilers, five turbogenerators, two demineralization units, nine cooling towers and a wastewater treatment plant. Information provided by Pemex via transparency indicates that as of July 2020 the refinery in Tula employed 6,000 workers, approximately. If we consider that in the

### The Tula atmospheric basin



<sup>21</sup> Request for information via transparency with folio 1857200160620



fourth quarter of 2020, the economically active population (EAP) of Hidalgo was 1,269,809 people, therefore, the employment that the refinery contributes to the state covers only 0.4% of the EAP of said entity.

According to the inventory of polluting emissions of the state of Hidalgo, after the CFE's electricity generation plant complex, the Tula refinery is the second plant with the highest polluting emissions within the megalopolis of the Metropolitan Area of the Valley of Mexico (Benítez, 2016). It has an installed capacity to process 315,000 barrels per day. However, it has not been alien to the context of the Peña Nieto administration, when the national production of fuels was decreasing due to a policy that promoted more gasoline imports. In 2013, the Tula refinery was operating at 76% of its capacity; for 2017 it fell to 47% and in 2018 to 40%. As of June 2020, it was operating at 36% (Badillo, 2020). Under new federal administration as of December 2018, energy policy took a 180° turn, to orient itself towards fuel autarky. Following this logic, Pemex Transformación Industrial tried to reverse the historical trend of decreasing oil production. In 2021, for the first time in four years, it managed to rebound the production of oil products. At the end of the first quarter of 2021, Pemex registered an increase in its production of 30%, compared to the same quarter of the previous year (Pemex, 2021d).

Focusing on the EM-RM-530a.1 analysis category, by SASB (see Table 3) and in three subcategories, related to the discussion of regulations and / or policy proposals that address environmental and social factors that affect the value and interests of companies, we present in Table 4 some indications of ESG risks that were identified as present in the Tula area. Pemex could evaluate these issues to integrate them into its ESG risk map, and develop specific mitigation or remediation strategies. Later, we will explain them one by one.

### Identified potential ESG risks

In terms of environmental and health impacts, the potential risks observed that are present in Tula, coincide with the characteristics of ESG risks in the SASB subcategories indicated in Table 4<sup>22</sup>.

Based on these categories, we analyzed public information, both from official, academic and journalistic sources, to infer -in the light of SASB's methodology- if potential ESG risks are observed for Pemex that should be included in its risk estimates and in its social responsibility policy.

**Table 4:** Indications of ESG risks at the Tula, Hidalgo refinery

No.	Subcategoría SASB - EM-RM-530a.1.	Indicio de riesgo ESG
1	EM-RM-530a.1.1. (Identification of risks in the legal and regulatory environment)	Impact on air quality
2	EM-RM-530a.1.2. (Risk categorization due to increased compliance costs, public policies setback, incentives setback, reputational damage)	High inventories of fuel oil
3		Environmental remediation and asset retirement obligations
4		Health effects on the population due to polluted air and water
5		Declaration of health emergency in the Tula basin
6	EM-RM-530a.1.3. (Identification of opportunities and implementation of policies to improve relations with communities, in relation to the entity's positions regarding the legal and regulatory environment, to contribute to improving their standard of living and respect for human rights, and other benefits in alignment with the entity's long-term strategies).	Pemex's relationship with the communities: human capital
7		Standard of living of the communities surrounding the refinery and energy poverty

<sup>22</sup> "EM-RM-530a.1.1. The entity will identify the risks and opportunities it faces related to legislation, regulation and / or rule making (hereinafter collectively referred to as the "legal and regulatory environment") related to environmental and social factors that are relevant to the entity's business. EM-RM-530a.1.2. Relevant risks include, but are not limited to, risk of increased compliance costs; risk of policy reversal; risk of loss of financial incentives; reputational risk due to the entity's posture, and actions related to the legal and regulatory environment; and the risk of misalignment with the expectations of customers, investors and other interested parties." (SASB, 2019)



### Impact on air quality

According to data from the National Air Quality Report published by the National Institute of Ecology and Climate Change (INECC), in 2018, in the Tula air basin, the regulated limits for the protection of the population health were breached due to the effect of pollutants such as PM10 and PM2.5 suspended particles, and ozone (O3). Atitalaquia and Atotonilco are the municipalities in which concentrations higher than the limits of suspended particles established in the standard are registered with the greatest frequency; while Tepeji del Río and Tula de Allende register higher concentrations of ozone (INECC, 2020, p.6).

The Tula air basin is the largest annual generator of pollutants in Hidalgo; it contributes with 97% of sulfur dioxide (SO2), 45% of PM2.5 particles and 43% of nitrogen oxides (NOx) emitted in the state (INECC, 2020, p.3). And no wonder: refining is an intensive process that results in the generation of polluting emissions into the atmosphere if it does not have the appropriate technologies to capture polluting gases. According to the Emissions Inventory of the State of Hidalgo (IEEH), in 2011, this process represented 25% of SO2 emissions from certain sources in the state. And among the main causes is the use of heavy fuel oil in combustion processes. In the aforementioned inventory, the fixed sources, which are the generation of electricity, in charge of the CFE, and the refining of oil, in charge of Pemex, together contribute 38% of PM10 and 35% of PM2.5 (Hidalgo State Government, 2020, p.86).

To have a clearer perspective on the impact on air quality of industrial activity in this basin, use the reference of the Official Mexican Standard NOM-022-SSA1-2019, its update came into effect in early 2020. It sets the criteria for evaluating the quality of ambient air, with respect to sulfur dioxide (SO2). The INECC carried out a calculation model based on the information available in 2018 for said pollutant, and found that if this new regulated model had been in force in 2018, the Tula air basin would have registered more than 140 days a year with concentrations above said limit (0.075 ppm as an average of one hour), being Tepeji del Río the municipality with the highest number of days in this condition (142 days), followed by Atitalaquia (86 days), Tula (66 days) and Atotonilco de Tula (61 days) (INECC, 2020, p.7).

Regarding the dispersion of pollutants, the INECC points out that given the volume generated and the wind patterns in the region, the impact on air quality is not limited to

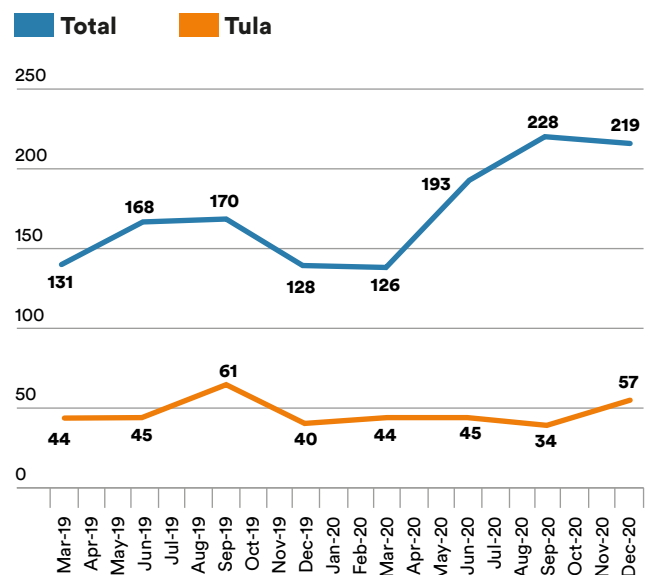
the areas surrounding the emission sources. This impact reaches more distant areas, such as the Valley of Mexico. For example, an analysis carried out for the period from June 5 to 18, 2020 by the Secretariat of the Environment of Mexico City, shows the dispersion of SO2 and PM2.5 suspended particles from the Tula-Tepeji area to the Valley of Mexico, which represents 18% of the pollution registered in Mexico City. To put it simply, the pollution generated in Tula reaches Mexico City because the prevailing winds in the region go from north to south almost all year round.

### High inventories of fuel oil

Refining processes make it possible to separate a part of the sulfur, which is concentrated in the heavier oil fractions. Thus, fuel oil is a by-product of this process; it was mainly destined for maritime transport.<sup>23</sup> However, after the very recent global restriction to the use of high sulfur fuel on the high seas, the current federal administration decided to increase its use for electricity generation. And so it was: between the first quarter of 2019 and the last of 2020, fuel oil production in the National Refining System increased 67%; the Tula refinery, in particular, increased its annual production by 30%.

The 2018 Pemex sustainability report indicates two concrete results regarding the Tula refinery for said year. One positive: the 38% increase in the volume of water

### Fuel oil production 2019 - 2020 (Thousands of barrels per day)



Source: Own elaboration with data from Pemex (2021d)

<sup>23</sup> Today, the IMO 2020 standard requires ships to use only fuel with a maximum of 0.5% sulfur content. This standard began to apply on January 1, 2020.



treated in the complex (p.124)<sup>24</sup>; and a negative one: the intermittent operation of the primary plant number 1, from January to September of that year, due to the “deficit in the supply of light crude oil, plant equipment failures and high fuel oil inventories” (Pemex, 2018, p.118).

We will stop at the high level of fuel oil inventories. Pemex has a project to take advantage of residual compounds at the Miguel Hidalgo refinery, as part of its reconfiguration, registered in its 2019-2023 Business Plan. The goal: to reduce fuel oil production. In section 4.1 of its strategy, it explains that its goal is to produce higher value products to increase the profitability of refineries, by modernizing and increasing the capacity and efficiency of the process infrastructure. Specifically, for the Tula refinery, it establishes goal 4.2: “Take advantage of the residuals by installing the optimal configuration of the process, producing gasoline, diesel and coke, eliminating the production of fuel oil in a scheme of participation with private parties.” For this, the investment and start-up of the coker plant is an essential phase that has yet to be completed.

The first facilities of said coker plant had already been inaugurated in 2017 by former President Peña Nieto. It was planned to contribute to the improvement of refining quality levels, by achieving up to an 80% recovery factor, which would raise gasoline and diesel production from 150,000 barrels to more than 200,000 barrels, and decrease secondary production of fuel oil. The plant required an investment of 2.6 billion dollars, the largest in Latin America for a refinery of this size. However, the administration of President López Obrador canceled the project of the coker plant at the beginning of his six-year term, which delayed the progress of the reconfiguration works to modernize<sup>25</sup> the plant and achieve an increase in the production of low-sulfur fuels, less underproduction of fuel oil and lower emissions of polluting gases. Recently, in October 2020, Pemex announced the relaunch of said project with an investment of 40 billion pesos. In terms of environmental impact, the goal established in the 2019-2023 Business Plan would reduce polluting emissions and increase the value of Tula's production. However, even though Pemex's 2019 Annual Report states that the coker's work as of December 2019 was 63% complete, the progress required to implement the Tula refinery reconfiguration project

requires more elements. According to experts consulted for this research, the complete installation of the coker plant would not be enough to achieve the desired objectives in terms of environmental impacts. It would also require the investment and installation of two hydrodesulfurization plants for coke naphtha and coke diesel, as well as start-up work that requires time and margins of error to achieve the desired objectives in terms of greater efficiency in the production of petroleum products, lower environmental impacts and profitability of the refining business. The status of coking in the SNR is still very precarious. In the Pemex Statistical Yearbook, it is possible to verify that between 2014 and 2019 coking has remained at 156,000 barrels per day throughout the SNR (Pemex, 2019a, p.45)

### *Environmental remediation and asset retirement obligations*

In its new Business Plan (2021-2025) Pemex admits an increase of 11.6% in its environmental liabilities - sites with possible environmental effects - between 2018 and 2019, and although Pemex affirms that said increase is due to increases in production, the Superior Audit of the Federation, in its review of the 2018 Public Account, pointed out that operational failures, meteorological events, clandestine seizures and vandalism are also listed as the main causes of contamination in sites, in which Pemex has an obligation to carry out remediation activities to correct damage to the environment and communities (ASF, 2018, p.6).

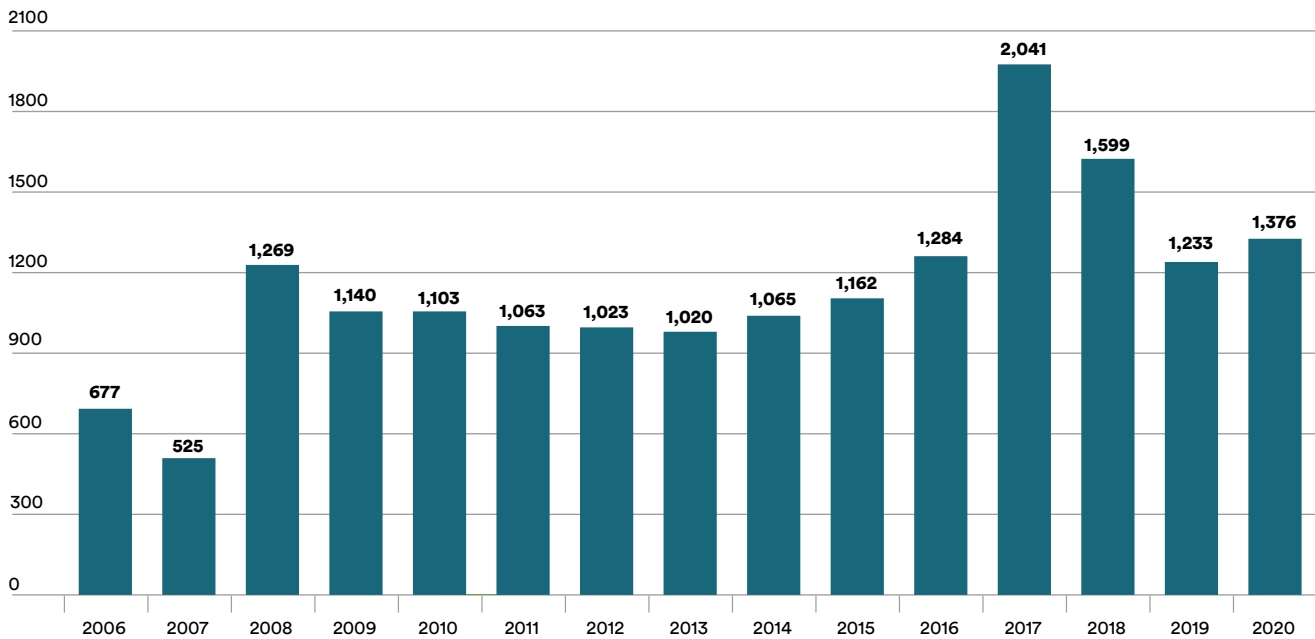
Regarding environmental remediation, Pemex does not recognize in its 2019 annual report obligations related to future costs for the removal of assets associated with the main refining processes, and affirms that there is no information available to reasonably determine the date on which they could be disincorporated; therefore, the removal obligation is not recognized (Pemex, 2019, p. 232). This contrasts with the request for information 1867900043420, in which Pemex recognizes, dated September 2020, the existence of very old environmental liabilities, originating in 1995, at the Tula refinery. Which are damages caused by excavations in an area of 3.4 hectares, which were quantified in a total amount of remediation equivalent to about 62 million pesos.

<sup>24</sup> The goal established by Pemex in its 2017-2021 Business Plan for the use of treated water established to achieve in 2021 an increase of 60% with respect to the volume registered in 2016 (28.1 MMm<sup>3</sup>), in order to reach a total volume of 45 MMm<sup>3</sup>. This goal seeks to replace the water supply from natural sources with reused water, and depends mainly on the adequate performance of the treatment plants located in the six refineries of Pemex Transformación Industrial. (Pemex, 2019, p.33) By 2020, the percentage of reused water barely reached 14.8% (Pemex, 2021, p.79)

<sup>25</sup> According to experts consulted for this research, the complete installation of the coker plant would not be enough to achieve the desired objectives in terms of environmental impacts. It would also require the investment and installation of two hydrodesulfurization plants for coke naphtha and coke diesel, as well as start-up work that requires time and margins of error to achieve the desired objectives in terms of greater efficiency in the production of petroleum products, lower environmental impacts and profitability of the refining business.



## Pemex inventory of sites with possible environmental liabilities (Hectares)



Source: Pemex (2021) Business Plan 2021-2025. Page 84.

### Effects on the health of the population

#### i) Due to air pollution

Air pollution by particles is ranked as the fifth risk factor to health by the number of premature deaths, according to the Global Burden of Disease indicator<sup>26</sup> of 2015 of the World Health Organization, for Mexico, it was estimated that in 2015 about 29,000 deaths and almost 558,000 disability-adjusted life years (DALYs) were attributable to poor air quality<sup>27</sup> (IHME, 2016). The fundamental vector of public health problems derived from air pollution are suspended particles, specifically those smaller than 2.5 microns, technically called PM2.5. On a global scale, air pollution by PM2.5 was responsible for more than four million deaths in the world in 2016, while the loss in life expectancy attributable to pollution by these particles is estimated at almost three years. PM2.5 particles are recognized for their causal relationships on a number of serious diseases, such as cardiovascular, cerebrovascular, neurological and respiratory diseases. In addition, there is

scientific evidence that confirms an 8% increase in the risk of death from COVID-19 for every 1 µg / m<sup>3</sup> increase in exposure to PM2.5 (Mexico Climate Initiative [ICM] 2020).

A very relevant concern in Mexico is that PM2.5 concentrations, especially in the Metropolitan Area of the Valley of Mexico, are usually higher than national and international standards. Acute risks for diseases associated with air pollution have been identified for the elderly and children between zero and 15 years of age.

It is estimated that due to poor air quality, around 11,000 people die each year in the Metropolitan Area of the Valley of Mexico (MAVM) (CIEP, 2019). Children and older adults are the most exposed to pollution values higher than those established in the regulations, which increases their risk factors and decreases their life expectancy (INSP, 2016). For its part, the Secretary of Health of the state of Hidalgo has identified as frequent diseases in the Hidalgo population, acute respiratory infections, which represent 60% of the morbidity detected in that entity (Government of Hidalgo, 2016-2022).

<sup>26</sup> The global burden of disease is a gap indicator that measures the distance between the current state of health and the ideal state of health for a given society. Expanding the demographic and geographic knowledge of the health profile in a jurisdiction or territory, making comparisons, monitoring health changes that occur over time, as well as other important applications have been possible thanks to this indicator.

<sup>27</sup> The INECC made this estimate according to the Health Impact Assessment (HIA) methodology recommended by the World Health Organization (WHO, 2016) and its economic valuation by the Willingness to Pay (WTP) method, using the software BenMAP-CE from the United States Environmental Protection Agency. In turn, epidemiological evidence derived from a specialized and updated review of the main health effects was used.



Despite all these data, in its sustainability reports Pemex does not report any health risk related to the communities where its refineries operate.

Additionally, and as we have already mentioned, the National Human Rights Commission<sup>28</sup> (CNDH, 2018) issued a series of recommendations to different federal government authorities to address the problem of air quality in the country and metropolitan areas. This recommendation establishes that there are human rights violations, especially to a healthy environment, health protection, access to information and an adequate standard of living. The Commission explains the seriousness of the omission to update the environmental health NOMs, for not observing the principle of progressivity. Article 12 of the International Covenant on Economic, Social and Cultural Rights (ICESCR)<sup>29</sup>, to which Mexico is subscribed, establishes the right to enjoy the highest possible level of health (ICESCR, art. 12), which requires compliance with international parameters and the maximum limits established in the Air Quality Guidelines of the World Health Organization (WHO) (Gálvez, 2020).

On the quality of fuels, the CNDH quotes several studies on the correlation between the mortality rate and the cases of chronic bronchitis that could be avoided with the distribution of low-sulfur fossil fuels (ULS). SEMARNAT, the entity in charge of one of the aforementioned studies, maintains that the introduction of this type of fuel could prevent an average of 1,640 deaths and 5,462 cases of bronchitis per year, based on a 10-year projection that covers the national territory. The CNDH denounces that the introduction to the ULS fuel market could not take place, since said fuels were not available due to lack of investment by Pemex in the necessary technology. Let us remember that during the current administration the CRE has issued several resolutions in favor of extending the deadlines for Pemex to continue producing and distributing high-sulfur diesel, which contravenes the recommendations of the CNDH. Since these observations would help Pemex to integrate this problem into its risk map and address them as soon as possible, we consider that violating them is a very clear indication of ESG risk for the company.

## ii) Due to polluted waters

As we have already seen, an important source of contamination of the water tables that feed the drinking water wells of the communities of the Tula basin are the discharges of wastewater from industry and the Valley of Mexico. In that territory there is also part of the Mezquital Valley<sup>30</sup>, which, as we've already mentioned, is characterized by being a region dedicated, to a great extent, to agriculture, since its production represents 59% of the total production of the state. According to García Salazar (2019, p.8), in the municipalities of Tula de Allende, Atitalaquia, Atotonilco de Tula and Tepeji del Río de Ocampo, industrial discharges are made to bodies of water without prior treatment. Due to this situation, around 273 localities are affected day by day. The sector most affected by the use or consumption of contaminated wastewater are farm workers, who are in direct contact with this water, followed by consumers in cities, due to the consumption of hazardous crops. Among the main health effects, parasitic, gastrointestinal, carcinogenic and dermatological diseases are identified, due to the number of heavy metals that are present in the water in the area. (García Salazar, 2019). In addition, the waters of the Endhó dam serve as an area for the reproduction of mosquitoes that make the living conditions of the communities even more difficult.

Two of the most important citizen movements that have emerged in response to the actions of the federal and state governments are the Social Movement for the Land (MST) and the Front of Communities Against Incineration (FCCI). For several years, the MST has carried out an intense management in the region. It demands, among other things, the regularization of mosquito control actions and attention to contaminated water wells. Likewise, the FCCI has repeatedly stated its fight against polluting emissions (Ortiz-Espejel, 2020, p.82).

Ortiz-Espejel warns that the state of water and air in the region is alarming. Studies carried out by the National Water Commission (CONAGUA) have counted seven wells for urban public use with the presence of lead, arsenic, mercury and manganese at levels that exceed the limits

<sup>28</sup> The full text of the CNDH recommendation can be found at: [https://www.cndh.org.mx/sites/default/files/doc/Recomendaciones/Generales/RecGra\\_032.pdf](https://www.cndh.org.mx/sites/default/files/doc/Recomendaciones/Generales/RecGra_032.pdf)

<sup>29</sup> The full text of the pact can be consulted at: <https://www.ohchr.org/sp/professionalinterest/pages/cescr.aspx>

<sup>30</sup> The Mezquital Valley, a geographic area thus identified for ethnological purposes, groups 84 municipalities of Hidalgo, 12 of which coincide with the 12 municipalities of the Tula basin. The indigenous population of the Mezquital Valley amounts to 86,476 people, representing 24% of the total indigenous population of the state. The predominant native group in this region is the Otomí (García Salazar, 2019).





of official standards. In addition, the health status of the population is not properly documented or studied, despite the repeated calls for attention from local populations, who manifest a high number of cases of cancer and infectious, dermatological and kidney diseases. Given the seriousness of this situation, local society has self-organized (García Salazar, 2019, p.22).

It is interesting to mention that very close, only 17 kilometers from the industrial zone, is the Atotonilco wastewater treatment plant (WWTP Atotonilco), the largest in Latin America with a capacity of 35,000 liters per second, which is dedicated to the treatment of 60% of the wastewater that comes from the Metropolitan Area of the Valley of Mexico<sup>31</sup>; it is pertinent to point out its existence, since it is very close to the Tula refinery. The media have reported on demonstrations by peasants in front of their facilities. They claim that the plant has brought them harm rather than benefits; they denounce an incomplete treatment process that continues to generate, in their opinion, damage to the health of those who live in the periphery and that affects agricultural production in the area. They point out, for example, that the alfalfa cut lasts up to three months, when before it was done every month (Martínez, 2020). For its part, the Afectados Ambientales Association points out that “the Atotonilco Wastewater Treatment Plant (...) exposes toxic sludge that damages health and generates harmful insects, flies, larvae and infections on the skin of children”. (Afectados Ambientales, 2019).

An evaluation of the wastewater treatment plant, based on the Envision methodology<sup>32</sup> and sponsored by Harvard University and by the Inter-American Development Bank in 2016, serves to set a perspective, since it yielded positive results regarding technology and infrastructure during the first phase of construction and first year of operation of the plant (Bello, 2016, p.3). However, from that stage the research also noted that there were opportunities for improvement in measuring the needs and expectations of the community, as well as in the strategies to solve the problems and needs of minorities and needy groups in the area (Bello, 2016, p.14). Moreno et al. (2006, p. 14) mention that “the benefited indigenous communities prefer to face the decline in health in order not to lose the waters that have allowed the region to escape poverty.” This has led to a fight for black water or “black gold”, as it is known in the region, coupled with the fact that the Atotonilco WWTP for them has implied increases in the price that communities

pay for water or the loss of nutrients derived from water treatment (García Salazar, 2019).

Finally, there is the aforementioned Official Letter No. S00 / 155/2018 issued in November 2018 by COFEPRIS, in which it expresses the Declaration of Sanitary Emergency for the municipalities of the Tula basin adjacent to the Endhó dam, for the presence, in various water wells for human consumption, of levels of arsenic, manganese and mercury higher than the maximum allowed, as well as lead contents higher than the maximum permissible levels in all the water wells analyzed with the support of CONAGUA laboratories. This situation is serious because, as COFEPRIS points out, it goes against “the right to use and consume clean water and adequate sanitation for human development, in accordance with the provisions of article 32 bis of the Organic Law of Public Administration Federal; 1 fraction VI, 4,5,15 fraction XII, of the General Law of Ecological Balance and Environmental Protection”. In this document, COFEPRIS calls on the various administrative units to carry out actions and take the measures deemed necessary to contain and address the health emergency described above.

Once again, Pemex does not mention in its annual reports (neither financial nor sustainability for 2018 or 2019) information on investigations and evaluations regarding such health situation, despite the fact that the Miguel Hidalgo refinery greatly contributes to the environmental impacts and social issues regarding the health of the population living near it. Nor does it report on initiatives, synergies, collaborations or joint efforts with other government agencies, both federal, state or municipal, in face of the declaration of health emergency, issued by -it should be noted- the highest federal regulatory body on health risks.

### *Declaration of environmental emergency in the Tula basin*

In July 2020, the then head of SEMARNAT, Víctor Toledo<sup>33</sup>, informed that it would promote with the Executive Power a Declaration of Ecological Restoration Zone in the 135 towns located in the Tula region, due to the serious environmental and health problems faced by 5,000 inhabitants of native peoples and the concentration of mercury, arsenic, lead, barium and phenols that come from the industrial activity of the area (Declaration of the Tula region as an ecological restoration zone goes forward, 2020). And, as we have

<sup>31</sup> Formed by 75 municipalities of Mexico City and the State of Mexico plus a municipality of the state of Hidalgo: Tizayuca, which is not part of the Tula basin.

<sup>32</sup> The Envision system consists of a set of criteria with the objective of optimizing sustainability of an infrastructure project during the planning phase and preliminary designs, in addition to quantifying the relative sustainability of the project. The study is available at: [https://research.gsd.harvard.edu/zofnass/files/2016/08/05\\_Atotonilco\\_SP\\_FinalDocument.pdf](https://research.gsd.harvard.edu/zofnass/files/2016/08/05_Atotonilco_SP_FinalDocument.pdf)

<sup>33</sup> Dr. Víctor Manuel Toledo served as Secretary of the Environment and Natural Resources from May 27, 2019 to August 31, 2020.



observed, the Tula basin region presents an extremely delicate environmental problem, which is shaping up to constant ecological and social degradation. The route of contamination is the Tula River, which works as a collector for sewage and industrial waters from Mexico City and the State of Mexico, and which has discharged its waters in the Endhó dam for 40 years.

According to public sources, Toledo pointed out that, based on a robust diagnosis, SEMARNAT was in coordination with the Presidency of the Republic to define the path towards the declaration; however, up to date said declaration has not been published in the Official Gazette of the Federation, which has prevented its execution with a wide-ranging budget and programs.<sup>34</sup> Moreover, in response to a request for information made by México Evalúa, SEMARNAT responded that it had not found information in its files on such a declaration.<sup>35</sup> However, multiple calls from actors, ranging from the state government, federal agencies and local and federal legislative powers, realize the urgency of an ambitious ecological restoration plan in the area. Unfortunately, the declaration is still pending resolution and the negative effects of pollution on air, water, soil and biodiversity increase significantly (Gálvez, 2020, p.3).

Pemex does not mention in its annual sustainability or financial reports any information on the investigations and evaluations regarding such environmental emergency, not even with the leading role that the Miguel Hidalgo refinery has in the environmental and social impacts in the area.

### *Pemex's relationship with the communities*

In many communities where energy companies operate, social problems emerge as symptoms of legal and regulatory complex contexts. Thus, the management of human rights issues is becoming increasingly important within the best corporate responsibility practices. Corporate policies that involve process management, community investment programs and participation in voluntary initiatives should be part of strategies that reinforce the company's commitment to promoting greater awareness in employees regarding respect for human rights, and work in creating

and strengthening capacities to identify and manage human rights issues related to employees, security issues, neighboring communities, suppliers and contractors, and other business partners.

These best practices involve: i) ensuring that in terms of labor relations, contracting and procurement, operational excellence and security, all procedures have a human rights perspective; ii) train personnel to work in operational environments where human rights problems may be more frequent; and iii) establish clear responsibilities for the implementation of policies, and be firm in the commitment to provide the necessary resources for their viability. (Chevron, 2019, p.1)

In this matter, the potential risks that we observe in Tula and that could be evaluated by Pemex in terms of their materiality coincide with the characteristics of the ESG risks in the following SASB subcategory<sup>36</sup>.

### *Human capital of Tula in Pemex*

In its 2019 sustainability report, Pemex underlines that its internal "training" model has its own pedagogy, and gives a long account of its results based on statistics on training, mainly to its employees. However, at the community level, Pemex does not report training activities that link communities with the company's job offer. A review of the database of upper secondary school programs operated by CONALEP<sup>37</sup> gave us null results for these programs in Hidalgo. Likewise, in the municipalities near the Miguel Hidalgo refinery, we were not able to identify records on the operation of the Mexican Dual Education Model (MMED), which operates in other entities of the country.<sup>38</sup> We were able to identify the existence of some schools in the area, and they include in their study programs some technical careers that may be related to the energy sector. Enrollment for 2019 registers a total of 12,076 students in 10 municipalities of the Tula basin who study technical careers related to industrial electromechanics, electronics, environmental laboratory analysis, logistics, nursing, construction, medical sciences, chemical laboratory analysis, industrial welding, programming, mechatronics,

<sup>34</sup> The declaration of environmental emergency would have been supported by two administrative instruments, one referring to article 78 of the General Law of Ecological Balance and Environmental Protection, which establishes the power of SEMARNAT to issue an ecological restoration program, and article 78 bis, which gives the Executive the power to issue the declaration.

<sup>35</sup> Application with folio 0001600016321.

<sup>36</sup> "EM-RM-530a.1.3. Relevant opportunities include, but are not limited to, better financial conditions, improved community relations due to the entity's position, and actions related to legal and regulatory environment, and other benefits due to the alignment of the regulatory environment with the entity's long-term strategy." (SASB, 2018)

<sup>37</sup> The National College of Technical Professional Education (CONALEP) is the body in charge of operating the upper secondary education programs in Mexico

<sup>38</sup> The Dual Model proposes the training in the company and in the school of the students of the technological baccalaureate, technical professional or technical professional bachelor of Public Institutions of Higher Secondary Education. From 3rd semester, the student joins the company according to an individualized training plan, alternating learning in the classroom and the workplace for a minimum of one and two years, according to the type of career. The student develops activities or tasks in the company that correspond to its line of business. Thus, there is almost immediate application of the principle "learning by doing" in the real environment of the profession. <https://www.gob.mx/sep/acciones-y-programas/modelo-mexicano-de-formacion-dual>



industrial production, and automotive maintenance, among others. To have a perspective, the students enrolled in Tabasco who study technical careers similar to those of Hidalgo add up to 25,646 students in 14 municipalities. On the other hand, our attention was drawn to the fact that the database did not observe records of schools with training in this type of competency in the municipalities of Progreso de Obregón and in Tlahuelilpan, where in 2019 an explosion caused by a leak occurred as an effect of fuel theft activities.

Based on the foregoing, we infer that there are important opportunity areas for greater collaboration between Pemex and the communities surrounding the refinery, through training and the implementation of the Dual Model program<sup>39</sup>; a greater synergy with CONALEP could help Pemex carry out community service actions, social training and general programs.

### *Living standards of neighboring communities: employment and energy poverty*

In 2018, 43.8% of the population of Hidalgo lived in poverty, a percentage slightly above the national average (41.9%), and equivalent to approximately 1.3 million people. Of this universe, 37.8% - about 1.1 million people - were in a situation of moderate poverty, while 6.1% were in a situation of extreme poverty<sup>40</sup>, about 181,500 people.

Of the nearly half a million people who inhabit the Tula basin, 102,600 live in a situation of moderate poverty and 101,200 live in a vulnerable situation due to deprivation<sup>41</sup>. It can be said that in some municipalities such as Atotonilco de Tula, Tepetitlán, Tepeji del Río de Ocampo and Tula de Allende, the population has a level of well-being a little higher than the rest, since they have certain vulnerabilities due to social deprivation<sup>42</sup> but they are not in a situation of poverty. The INEGI data also shows that in this area there is a percentage of energy poverty equivalent, on average, to 0.52% of the homes in the basin; that is, approximately 2,936 people would suffer from electricity or gas shortages<sup>43</sup>. That is, poverty understood according to the CONEVAL concept as marginalization in terms of energy or lack of access to

basic electricity services in homes that force people to use firewood or charcoal as fuel to heat water or cook (Trust for the Saving of Electric Energy, 2020, p.8.)

Regarding the destination and the way that Pemex chose to make some of the donations corresponding to projects in Hidalgo we collected the following findings: a request for information<sup>44</sup> allowed us to know that Pemex, in 2019 and as part of PACMA, donated an advanced emergency ambulance to the municipality of Tlahuelilpan, with a value of 1,075,000 pesos, and a package of 1,500 ecological stoves, at a cost of 3,232,770 pesos to residents of said entity. Both donations, in effect, met the needs of the most vulnerable population, which is a sign of attention to corporate responsibility on the part of Pemex in those populations. However, we must broaden the scope: in the data on donations through PACMA, it was observed that the state of Hidalgo received that year additional donations to those already reported, and that together they totaled 14.8 million pesos, which represented 1.8% of the total donations via PACMA made by Pemex in 2019 (Pemex, 2019, p.83). We are aware, via request for information, of the main donations for 2020 in Hidalgo: the management of a property for the benefit of the population of the municipality of Tlahuelilpan for an amount of 37.9 million pesos, and the construction of a dome in a school campus Cetus for an amount of 3.18 million pesos. According to Pemex's annual report, for 2020 the budget exercised for PACMA was 727.2 million pesos. That is, in that year, Hidalgo received 5.6% of the total donations via PACMA made by Pemex.

It is true that Pemex is not a governmental entity responsible for solving Hidalgo's poverty problems, but since it is responsible for important environmental and social impacts in Tula (which could be material or significant in terms of ESG risks for Pemex), it would be desirable if it could allocate more resources to corporate responsibility projects, which could contribute to improving the standard of living of neighboring communities, and follow-up on PACMA projects aimed at the energy transition, such as the donation of solar stoves to people living in energy poverty, like the one carried out in 2019.

<sup>39</sup> Details on the operation of these actions can be reviewed at: <https://www.gob.mx/CONALEP/documentos/bases-para-la-operacion-de-atencion-a-la-comunidad>

<sup>40</sup> According to the National Council for the Evaluation of Social Development Policy (CONEVAL), the population in extreme poverty has at least three of the six social deprivations (food, social security, health, housing, public services such as water, drainage and electricity, and access to education) and has an income so low that, even if it were entirely dedicated to purchasing food, it would not be able to acquire the necessary nutrients for a healthy life.

<sup>41</sup> According to CONEVAL, moderate poverty is that presented by a person who, being poor, is not extremely poor. The incidence of moderate poverty is obtained by calculating the difference between the incidence of the population in poverty and that of the population in extreme poverty.

<sup>42</sup> According to CONEVAL, the vulnerable population due to social deprivation is one that presents one or more social deprivations, but whose income is higher than the welfare line, that is, the reference that allows identifying the population that does not have sufficient resources to acquire the goods and services it requires to satisfy its basic needs (food and non-food).

<sup>43</sup> According to data from the INEGI 2020 Census, the average number of occupants per dwelling maintains a decreasing trend. From 4.4 occupants in 2000 it went to 3.9 in 2010, and to 3.6 in 2020. For the purposes of this calculation, we considered four inhabitants per household.

<sup>44</sup> Request for information with folio 1857200487719



### III. Conclusions and recommendations

In this case study we show important flaws in Pemex's corporate responsibility policy and its evaluation. We particularly provide a description and a perspective of potentially uncontrolled risks for Pemex's refining activities, to 'land' with a similar exercise at the Tula refinery.

**These findings point to flaws in Pemex's corporate governance.** As we have seen, ESG risk assessment will become increasingly relevant and influential in investment matters. That is, international standards to measure performance and generation of value aim for the inclusion of sustainability ratings, which will function as a condition for accessing better financing conditions. Pemex's relationship with society can no longer be circumstantial; should move to the center of the considerations of investors and other *stakeholders*.

**The operation of an oil company such as Pemex can have an impact on the human rights of local communities.** Its production projects are, of course, aimed at boosting the profitability of the company, but by being temporarily or permanently inserted in a specific territory, they can also affect the environment and health of specific populations. If these effects are not adequately measured, the harmful effects on the communities' standard of living could be profound and long-lasting; that is, they could translate into increases in morbidity, mortality, standard of living and poverty indicators.

Indeed, Pemex must evaluate in terms of materiality, as we have stated, issues such as access to land for local communities and their right to health and an adequate standard of living. They must be a priority of the corporate governance. The body designated for this is its Board of Directors. According to Joseph and Lamb-Hale (2020), Boards are the bodies that must comprehensively assess as a routine ESG risks, in relation to all their *stakeholders*. The Board of Directors must formulate a coherent, flexible and realistic plan, in order to include priorities, crisis strategies and opportunities to generate value.

One option for Pemex would be to appoint an ESG manager, in charge of evaluating and reporting to the Board on the company's standards, relationships and practices. It can be articulated through special committees that review the press dossier and social communication, as there is a risk that litigation and regulatory resolutions could compromise the company with costly payments and reputational damage. It is also necessary for the company to develop a system of compliance that considers the risks derived from the ESG framework.

As a general framework, it would be recommended that the Board of Directors rethink its corporate responsibility policy in light of the ESG indicators, and take up the Climate Action Program, which already established specific strategies and programs. Likewise, it is desirable that the Council analyzes the recommendations issued by the CNDH in 2018, and implement solutions in light of the best ESG practices, some of which have been discussed here.

**Based on the analysis carried out, and considering the categories of legal and regulatory environment in environmental matters of SASB, in the case of the Miguel Hidalgo refinery we recommend:**

1. **Full recognition of environmental liabilities by the Board of Directors**, and the Declaration of Sanitary Emergency issued by COFEPRIS in 2018, which must be accompanied by the design and publication of remediation and compensation plans for environmental and social damage.
2. That Pemex demonstrate greater involvement through **generation of alliances with other government agencies and international organizations**, oriented to the implementation of extraordinary strategies to achieve the rehabilitation of the area. As a first step, it must collaborate with state, municipal and federal health institutions to refine the diagnoses of the effects in the area, and establish agreements to provide immediate, free and effective care to the affected population.
3. **The definitive implementation of the coker plant, hydrodesulfurization plants and other necessary infrastructure** to increase the productivity and performance of the production of petroleum products, and reduce the production of fuel oil and highly polluting emissions.
4. **Greater collaboration with the Ministry of Public Education**, which results in the incorporation of Pemex in the upper secondary education programs run by CONALEP and other local technical institutions, in order to establish closer ties with the communities and achieve a greater impact on the level of employment in the area.
5. **Carrying out a diagnosis on donations and contributions via PACMA in Hidalgo**, and give continuity to the most effective actions (such as the delivery of solar stoves) to integrate them into community development strategies and combat energy poverty in the Tula area.



## IV. Annex A: ESG ratings by Sustainalytics – filtered by oil & gas industry sector

No	Companies	ESG Risk Rating
1	Aker BP ASAOSL:AKRBP	47.7
2	Antero Resources Corp.NYS:AR	48.5
3	Apache Corp-	38.9
4	ARC Resources Ltd.TSE:ARX	32
5	Banpu Public Co. Ltd.BKK:BANPU	34.2
6	Beach Energy Ltd.ASX:BPT	36.1
7	BP p.l.c.LON:BP	37.6
8	Cabot Oil & Gas CorpNYS:COG	49.9
9	Cairn Energy PLCLON:CNE	32.5
10	Canadian Natural Resources Ltd.TSE:CNQ	33.1
11	Cenovus Energy Inc.TSE:CVE	34.2
12	Chesapeake Energy Corp.NAS:CHK	42.5
13	Chevron CorporationNYS:CVX	36.8
14	China Petroleum & Chemical Corp.HKG:386	51.7
15	China Shenhua Energy Co LtdHKG:1088	32.5
16	Cimarex Energy CoNYS:XEC	52.1
17	CNOOC LtdHKG:883	41.4
18	Coal India LimitedBOM:533278	36
19	Compañía Española de Petróleos SA CEPESAMCE:CEP	35.8
20	Concho Resources Inc-	48.3
21	ConocoPhillipsNYS:COP	35.4
22	Continental Resources IncNYS:CLR	55.6
23	Cooper Energy Ltd.ASX:COE	45
24	Crescent Point Energy Corp.TSE:CPG	43.2
25	Devon Energy CorpNYS:DVN	33.8
26	Diamondback Energy IncNAS:FANG	50.1
27	Diversified Gas & Oil PlcLON:DGOC	46.4
28	DNO ASAOSL:DNO	42.3
29	Ecopetrol S.A.BOG:ECOPETROL	37.3
30	Energean PlcLON:ENOG	35.7
31	Enerplus Corp.TSE:ERF	32.3
32	Eni SpAMIL:ENI	25.7
33	EOG Resources IncNYS:EOG	39



34	EQT CorpNYS:EQT	39.9
35	Equinor ASAOSL:EQNR	33.4
36	Exxaro Resources LtdJSE:EXX	28.1
37	Exxon Mobil Corp.NYS:XOM	35.1
38	Freehold Royalties Ltd.TSE:FRU	19.1
39	Galp Energia, SGPS, S.A.LIS:GALP	26.7
40	Gazprom PJSCMIC:GAZP	37.5
41	Guanghai Energy Co., Ltd.SHG:600256	59.7
42	Hess CorpNYS:HES	29.2
43	Husky Energy Inc.-	39.6
44	Imperial Oil LtdTSE:IMO	33.4
45	Inner Mongolia Yitai Coal Co.,Ltd.SHG:900948	36.8
46	INPEX Corp.TKS:1605	30.8
47	KazMunayGas NC JSCKAZ:KMGZ	34.7
48	Korea Gas CorpKRX:036460	49.1
49	Lundin Energy ABOME:LUNE	29.2
50	Marathon Oil Corp.NYS:MRO	42
51	MEG Energy Corp.TSE:MEG	41.4
52	MOL Hungarian Oil & Gas PlcBUD:MOL	45.6
53	Murphy Oil CorpNYS:MUR	25.1
54	National Fuel Gas CoNYS:NFG	40
55	Neptune Energy Group Ltd.-	45.9
56	New Hope Corp. Ltd.ASX:NHC	26.1
57	Noble Energy, Inc.-	36.9
58	NOVATEK JSCMIC:NVTK	32
59	Occidental Petroleum Corp.NYS:OXY	36.9
60	Oil and Natural Gas Corporation LimitedBOM:500312	53.6
61	Petroleo Brasileiro	48.2
62	Petróleos Mexicanos	56.7
63	Polskie Gornictwo Naftowe i Gazownictwo SAWAR:PGN	44.1
64	PrairieSky Royalty LtdTSE:PSK	14.5
65	PT Adaro Energy TbkJKT:ADRO	39.8
66	PT United Tractors TbkJKT:UNTR	36.1
67	PTT Exploration & Production PlcBKK:PTTEP	28.6
68	PTT Public Co., Ltd.BKK:PTT	26.5
69	Repsol, S.A.MCE:REP	22.4
70	Rosneft Oil Co.MIC:ROSN	34.7
71	Royal Dutch Shell PLCLON:RDSA	35.3
72	Santos Ltd.ASX:STO	38.5
73	Sasol Ltd.JSE:SOL	32.6
74	Saudi Arabian Oil Co.SAU:2222	50.5
75	Seplat Petroleum Development Co. PlcLON:SEPL	34.9
76	Seven Generations Energy Ltd.TSE:VII	40.7



77	Shaanxi Coal Industry Co., Ltd.SHG:601225	45.9
78	Shanxi Coking Coal Energy Group Co., Ltd.SHE:000983	48.4
79	Shanxi Lu'an Environmental Energy Development Co LtdSHG:601699	47.5
80	Shanxi Meijin Energy Co., Ltd.SHE:000723	42.9
81	Suncor Energy Inc.TSE:SU	48.8
82	Surgutneftegas PJSCMIC:SNGS	37.5
83	Tatneft PJSCMIC:TATN	44.8
84	Total SEPAR:FP	27.1
85	Tourmaline Oil Corp.TSE:TOU	39.5
86	Vermilion Energy Inc.TSE:VET	31.5
87	Washington H. Soul Pattinson & Co. Ltd.ASX:SOL	35.1
88	Whiting Petroleum Corp.NYS:WLL	47.1
89	Wintershall Dea GmbH-	28.1
90	Woodside Petroleum LtdASX:WPL	23.8
91	WPX Energy Inc-	56.4
92	Yanzhou Coal Mining Co LtdHKG:1171	43.5
93	YPF SABUE:YFPD	45.1

Source: Sustainalytics 2021. Updated data as of April 8, 2021 for oil & gas industry.



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