THE FUTURE OF OIL IN MEXICO

/ *EL FUTURO DEL SECTOR PETROLERO EN MÉXICO*



Beyond Efficiency: The Politics of Investment Policies in the Oil Industry

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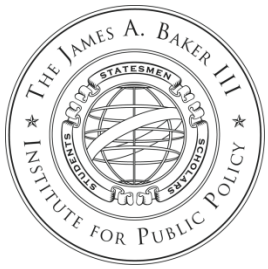

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Prepared for the study
"The Future of Oil in Mexico/El futuro del sector petrolero en México"
sponsored by the
James A. Baker III Institute for Public Policy
and
The Mexican Studies Programme at Nuffield College, Oxford University

April 29, 2011

Study Acknowledgments

The Energy Forum and the Latin American Initiative of the James A. Baker III Institute for Public Policy, as well as the Mexican Studies Programme at Nuffield College, Oxford University would like to thank Richard Gilder for his support of the study. The contributions by study researchers and writers are further acknowledged.

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The James A. Baker III Institute for Public Policy would like to thank the sponsors of the Baker Institute Energy Forum for their generous support of the Energy Forum.

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The energy industry plays an important role in the Mexican economy, and energy trade is a major component to the U.S.-Mexico relationship. The Mexican government relies on the oil industry for 35 percent of total government revenues, including taxes and direct payments from Petróleos Mexicanos (Pemex), the state oil company. Mexico is the third-largest foreign crude oil supplier to the United States. However, with declining production and rising demand, Mexico could become a net oil importer in the coming decade. President Calderón pushed for energy sector reform in Mexico, but more reforms will be needed for Mexico to reverse its current path toward importer status. This study identifies the dynamics of the political trends in Mexico that will impact future energy policy. The aim of this study is to promote a better understanding of the challenges facing Mexico's oil sector and to enhance the debate among policymakers, the media and industry on these important issues.

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About the Mexican Studies Programme at Nuffield College, Oxford University

Since its establishment in 2002, Oxford's Mexican Studies Programme has conducted research and promoted graduate teaching in Mexico's external relations; democratization and the functioning of democratic institutions in Mexico; and on various Mexican public policy issues, including economic and energy policies.

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I. Introduction

In 2009, President Felipe Calderón announced a major investment project (US$9 billion) for a new oil refinery in Tula, Hidalgo (expected capacity: 300,000 barrels per day [b/d]). Tula was selected as the refinery site after a long and unusual competition between different state governments, which bid to attract the investment. The decision was also preceded by a heated political debate on the urgent need to implement comprehensive legal reforms that expanded private participation in the oil sector; to grant Pemex more independent decision-making powers; and to reduce Pemex's fiscal load and free more resources for capital investment.

Although detailed engineering studies are currently under way, doubts still surround the project, and it is uncertain whether the Tula refinery will ever get built. A few academics, consultants, individual members of the Partido Revolucionario Institucional (PRI) and the Partido de la Revolución Democrática (PRD), and even public servants inside the governing Partido Acción Nacional (PAN) have questioned the appropriateness of investing billions in an oil refinery when Mexico has other public spending priorities and Pemex has a poor history of efficiency and productivity in the downstream segment. Others have welcomed the decision in view of Mexico´s growing dependence on imported oil products and the paramount role that Pemex supposedly plays in guaranteeing energy supplies.

In this context, there are three reasons why this case study sheds light on the future of Mexico's oil industry. First, if the new refinery in Tula were ever completed, it would be Pemex's first significant investment in the downstream sector in 30 years. Furthermore, in addition to the impacts on the national oil industry, an increase in refining capacity would impact key macroeconomic variables such as balance of payments and public spending. Second, the decision-making process that led to the selection of Tula—which was characterized by a struggle between technical experts and different government factions—is an example of how politics might shape investment decisions in the future and vice versa. Third, the success of the project is connected to the prospects for deeper reform in the oil sector.

With this in mind, the primary aim of this paper is to answer the following questions: (1) How and why did the project for a green field refinery in Tula prevail over alternative policy proposals?; (2) How did political factors shape technical discussions?; (3) How does the 2009 case of Tula compare to previous investment decisions in the Mexican oil industry?; (4) Based on the analysis of these issues, what are the implications for the future of the oil in Mexico? To answer these questions, this paper compares arguments for and against the project and describes how political dynamics shaped the decision-making process.

This paper argues that the assessment of projects in Mexico's oil industry has improved significantly (evaluations now go beyond traditional technical and financial analyses), and that the process is more open compared to previous decades. However, it also argues that the impact of these improvements has been limited by a decision-making process that tends to focus on the wrong issues; in other words, the right questions are not put on the table. Among other reasons, this is due to discretionary policymaking in the infrastructure sector, the role of technical experts and their vested interests, and an interaction between politicians and technical experts that has become open-ended and unpredictable as political power is redistributed in Mexico.

II. The Case of Tula: A White Elephant or an Elephant Seen from Different Perspectives?

The Mexican refining industry faces a number of challenges, including an increased demand for refined oil products associated with economic development; new environmental regulations, including the need to produce cleaner fuels; and efficiency and profitability gaps in comparison to the global refining industry. As other papers in the study "The Future of Oil in Mexico" show, these challenges cannot be separated from Pemex's broader problems, which include the current decline in proven reserves of crude oil; the company's current tax regime and chronic financial problems; the problem of historical underinvestment in transport and distribution infrastructure; and the role of the oil workers' union, to mention the most significant factors.

To a certain extent, the current situation in the Mexican refining industry is explained by the fact that its processing capacity has remained virtually stagnant while domestic consumption of refined oil products has grown at an average annual rate of 3.4% between 1980 and 2008. This

is a core argument of those in favor of building a new refinery in Mexico. These supporters include left-wing politicians from the PRI and the PRD, technical professionals inside some areas of Pemex (e.g. the Mexican Oil Institute [IMP]), left-wing academics who worry about Mexico´s dependence on imported oil products, and independent consultants convinced that the goal of regional development should be taken into account when evaluating investment policies and large infrastructure projects.

Although these actors do not necessarily constitute a consolidated policy coalition because they do not show a high level of coordinated activity over time,[1] refinery advocates generally share a number of assumptions about the origin of Pemex's problems. Their first argument is historical and refers to the fact that no green field refinery has been built in the three decades since the Cadereyta, Salina Cruz, and Madero refineries were completed in the late 1970s and early 1980s. The three refineries were built after the 1973 oil shock made evident the need to minimize Mexico's dependence on external energy, and the director of Pemex, Antonio Dovalí Jaime (1970-1976), promoted an ambitious program to expand Mexico's refining capacity and achieve energy self-sufficiency.[2]

Self-sufficiency was never fully achieved, but refinery advocates assert that processing capacity increased significantly between 1970 and 1982, which helped Mexico achieve its lowest levels of imports as a proportion of national consumption of refined oil products.[3] Thus, the second argument of refinery advocates is based on the idea of energy security. Without any new green field projects, with only a few expansions, and with fewer refineries after Azcapotzalco and Poza Rica were closed due to environmental concerns in 1991, Pemex processing capacity has remained virtually the same and imports have increased to 22% of domestic consumption.

[1] Sabatier (1999) proposes that groups of actors and organizations within a policy subsystem form advocacy coalitions to compete for dominance of that particular subsystem. The cohesion of such coalitions is determined by two factors: sharing of normative and causal beliefs and coordinated activity over time.
[2] See Snoeck (1989, 62).
[3] Refining capacity increased from 0.592 million b/d in 1970 to 1.476 million b/d in 1980 and 1.789 million b/d in 1985 when expansions in Poza Rica and Salamanca were also completed. The average level of import dependency during the first half of the 1980s was 1.8% and the lowest level of import dependency was 0.7% in 1982. See Bazán (2008, 144-149) and Snoeck (1989, 193 and 201).

It is unclear if Mexico has a "dangerous external dependency regarding oil products"[4] and what an acceptable import/consumption ratio should be. However, refinery advocates often support their position by arguing that Mexico has become increasingly dependent on oil imports. Compared to its NAFTA partners, Mexico (22%) has a higher dependency on imported oil products than the United States (9.23%) and Canada (12.4%). Mexico is also more dependent on oil imports than most Latin American countries, including Argentina (3.3%), Brazil (13.3%), Colombia (2.16%), and Venezuela (0%). In addition, Mexico has a higher dependency in comparison to BRIC countries such as Russia (0.03%), India (15.7%), China (11.6%), and South Africa (15.23%).[5] Furthermore, most of the world's major crude oil producers have an import/consumption ratio that is less than 15%.[6]

A third argument that refinery advocates mention is the potential impact of the project on selected macroeconomic variables. They argue that the value of gasoline imports not only represents a significant proportion of the balance of payments but also that it will keep growing in the future as the gap between demand and domestic production of processed oil products widens. For example, in 2009 gasoline imports in Mexico amounted to US$14 billion. This surpassed international tourism revenues and was equivalent to almost 20% of total imports of manufactured products, 50% of direct foreign investment, and 66% of remittances in the same year.[7] Thus, according to refinery advocates, investing US$10 billion is justified and will be quickly amortized if the value of imports decreases in the long term.[8]

A fourth argument of refinery advocates is that technical solutions to oil production deficits should take into account production problems specific to various regions of Mexico. In other words, a division of the country according to the zone of influence of each refinery shows that production deficits are geographically localized. For example, Tula and Salamanca supply the

[4] This is how President Calderón framed the issue of gasoline imports a few months before instructing Pemex to start the necessary studies to expand the capacity of the NRS (see *El Universal*, March 18, 2008).
[5] Author's calculations based on data from the U.S. Energy Information Administration for the year 2008 (http://www.eia.gov).
[6] These include the United States, Canada, Brazil, Venezuela, Iran, Libya, China, Russia, and Saudi Arabia. Three notable exceptions are Nigeria, United Arab Emirates, and Norway.
[7] See BANXICO, Balance of Payment Statistics (http://www.banxico.org.mx).
[8] Although this is not firsthand information, knowledgeable observers claim that this was one of the main arguments used by former Pemex director, Jesús Reyes-Heroles, to defend the project in Tula.

central region—i.e., Mexico City and other industrial cities in the so-called crown of secondary cities[9]—but production is insufficient, and their deficit accounts for almost 53% of current oil imports. Minatitlan supplies the southeast but has a production deficit that accounts for 26% of imports; Salina Cruz, which supplies the Pacific Coast, is in a similar situation with a deficit that accounts for 20% of imports.[10]

Thus, it is argued that increasing the production of refined products in the central region should be the first priority in a plan to decrease the overall deficit in the NRS. A new refinery in Tula would enjoy advantages in terms of transportation costs because the site is near the market that is currently suffering from the highest supply deficits. At the same time, at least according to the project advocates, Pemex's inefficiencies and excessive production costs could be partially offset, vis-à-vis the alternative of importing gasoline from more efficient plants situated on the North American Gulf Coast, due to differences in transportation costs.

Refinery proponents also add that chronic underinvestment in infrastructure has created risks and bottlenecks that should be taken into account when deciding whether a new refinery should be built, where it should be built and, if it is not built, to what extent current import volumes are sustainable. Existing pipeline, storage, and seaport infrastructure is old[11] and saturated to the extent that Pemex has been forced to use more expensive means of oil transport, such as trucks, which cost an additional US$250 million each year. Even if decision-makers choose not to expand Mexico's refining capacity and to rely more heavily on imports, transport infrastructure constitutes a key variable that will impact the ability to supply refined oil products across different regions of the country.

Finally, refinery advocates insist that one of the main problems of the NRS is that low-value residuals must be processed and disposed of. They argue that this issue should be considered when assessing the convenience of a new green field development. Mexico grappled with low-

[9] This concept refers to the cities that surround the Metropolitan Zone of Mexico City (MCMZ) and that have a close functional relationship with this megalopolis, especially in economic terms. These cities include Cuernavaca, Pachuca, Puebla, Querétaro, and Toluca, among other minor towns. Together with the MCMZ they form the "region's urban subsystem" (Garza 2000).
[10] See Pemex (2009a, 14).
[11] For example, oil and gas pipelines are on average between 26 and 30 years old.

value residuals even after the new projects and capacity expansions of the 1970s. Those expansions were inadequate, and refineries could not process the massive reserves of heavy crude Maya oil that were found in the Coast of Campeche. The mismatch between feedstock requirements and available refining processes caused bottlenecks, raised costs, undermined production margins, and increased the volume of fuel oil residuals.[12]

Plans to upgrade production processes have been implemented very slowly due to financial and technical difficulties. At the same time, different circumstances[13] have driven the industrial and electricity sectors in Mexico to consume natural gas rather than fuel oil; therefore, higher volumes of low-value residuals produced by heavy oil processes cannot be absorbed domestically. As a result, Pemex pays the high cost of transporting residuals that are sold at considerable discounts outside of Mexico. Thus, a new refinery—especially one designed to process heavy crude oil—would not only reduce gasoline imports but also reduce the amount of residuals that need to be disposed.

In summary, refinery advocates mention five arguments to justify the development of a green field project: (1) historical underinvestment in downstream activities; (2) energy security and import dependency; (3) the increasing value of gasoline imports and their effects on macroeconomic variables; (4) regional imbalances in the NRS; and (5) other technical arguments, such as the disposal of low-value residuals.

In contrast, those who oppose the project insist that the initiative represents a risky and costly white elephant that should never be implemented. For example, in response to the argument about historical underinvestment, project detractors state that Pemex has a poor history of dealing with technological issues in the downstream sector. They argue that all refineries, particularly the last three projects that were planned during the time of Pemex director-general Antonio Bermúdez (1970-1976) and completed under the directorship of Jorge Díaz Serrano (1976-1982), faced difficulties and delays that caused significant cost overruns. They also cite

[12] According to Snoeck (1989,113), refining equipment was sometimes ruined due to the wrong proportion of Maya in the feedstock.

[13] An example in the early 1980s was the failed attempts to export natural gas to the United States during the directorship of Jorge Díaz Serrano, which forced the industry to adapt to a higher domestic supply of this product. See Morales (1988, 85-91).

expansion projects in the 1980s[14] and recent upgrading projects in Madero, Cadereyta, and particularly Minatitlán[15] as evidence that Pemex suffers from serious technical and engineering deficiencies that make a new refinery unnecessarily risky and expensive. Critics of the new refinery argue that operating costs will be high, given the unusual concessions that the oil workers' union has historically enjoyed.[16]

Refinery critics assert that there is no reason why high volumes of gasoline imports should be considered a threat to energy security. They argue that energy markets in the context of the North American Free Trade Agreement (NAFTA) are integrated to the extent that Mexico can safely rely on the supply of processed oil products from the North American Gulf Coast. Moreover, even when Pemex was close to achieving self-sufficiency in the production of crude oil and refined oil products in the early 1980s, the 1982 and 1986 crises made clear that such an ambition was impossible to fulfill without creating deep distortions and long-term imbalances in the oil sector specifically and the overall economy in general. Thus, at least according to refinery critics, historical experience should teach Mexican policymakers that the myth of self-sufficiency was difficult to achieve three decades ago and is simply unattainable in today's even more open and integrated economy.

In response to macroeconomic arguments, project opponents assert that gasoline imports will not be a problem as long as Pemex keeps exporting crude oil and the oil trade balance is, on average, positive. Thus, even if the Mexican oil industry has indeed suffered from underinvestment in the downstream sector, the priority in the short and medium terms should be to invest in exploration and prospective activities to increase the level of proven oil reserves. In any case, critics argue that investment in the refinery sector should focus on more cost-effective projects, such as expanding and upgrading existing facilities, rather than on building new refineries from scratch.

[14] The few expansion projects undertaken after 1982 include Ciudad Madero (1987), Tula (1987), and Salina Cruz (1989).
[15] According to some indirect sources, upgrading plans in Minatitlán show delays of almost three years and cost overruns of almost US$2 billion.
[16] For example, at least 2% of investment projects should go to the workers' union. Personnel requirements set out in collective bargaining agreements oblige Pemex to hire around 50% more personnel in comparison to other players in the global refining industry.

On the subject of regional imbalances, refinery opponents argue that transportation costs do not significantly impact gasoline imports. From their point of view, there is little difference whether production deficits in the central region are covered by a new refinery or through improvements in transport and distribution infrastructure from Tuxpan on the Mexican Gulf Coast, where most gasoline imports enter Mexico. At the same time, they argue that upgrading programs in existing facilities would help solve the problem of residuals.

There are other arguments and counterarguments that advocates and opponents use when debating the new refinery. For example, advocates argue that Pemex´s refining margins are not that different from those of other global players, especially in facilities that have already been upgraded—e.g., Madero and Cadereyta. In response, critics dispute the estimates used by Pemex, saying they are based on a period of unusually high margins in the mid-2000s, while historical margins have been much lower and even negative.

Table 1. In Brief: Those In Favor and Those Against

ARGUMENT	***IN FAVOR***	***AGAINST***
EFFICIENCY AND INVESTMENT	Historical underinvestment in the downstream sector justifies a new green field development. Transportation costs compensate for low margins, production overruns, and Pemex's inefficiencies.	Inefficiencies, low margins, and production deficits are due to Pemex's technical and engineering limited capacities. There is no guarantee that this will change with the new refinery.
ENERGY SECURITY	Mexico suffers from a dangerous dependence on gasoline imports in comparison to other countries.	Increasing exploration activities to maintain levels of proven reserves is more urgent than dependence on gasoline imports. NAFTA energy markets are sufficiently integrated.
MACROECONOMIC CONSIDERATIONS	Investment in a new refinery could be amortized if the value of gasoline imports decreases in the long term.	Gasoline imports do not represent a problem, particularly if Mexico keeps exporting crude oil.
REGIONAL IMBALANCES	The highest production deficit is localized in the central region.	Transportation costs are not that significant.
OTHER TECHNICAL CONSIDERATIONS	Investment decisions should take into account problem of fuel oil residuals.	Upgrading and expanding existing refineries could help reduce the problem of residuals.

Is the project for a new refinery a white elephant, as critics insist, or is it simply a large infrastructure project with complex and multiple implications that should be analyzed from different perspectives, like the parable of the elephant and the blind men?[17] In either case, a critical question is how and why the project for a new refinery became a policy priority and prevailed over other policy alternatives, such as improving infrastructure to facilitate gasoline imports, increasing Pemex's stake in refineries on the North American Gulf Coast, investing more resources to upgrade existing refineries, and/or simply using a higher proportion of resources to increase productivity in the upstream sector. As the following sections of this paper show, part of the answer lies in understanding the interaction between oil policies and broader political dynamics in Mexico.

III. How Politics Shape Investment Policies in the Mexican Oil Industry

Although the idea of building a new refinery surfaced for the first time in the early 1990s, the proposal for a green field development did not stay on the policy agenda. Even when Pemex anticipated the need to increase the overall capacity of the NRS after two refineries were closed due to environmental concerns in 1991, policy responses focused on expanding and upgrading some of the existing facilities rather than building a new one.[18]

Toward the end of his mandate, President Vicente Fox (2000-2006) announced the Mexican government's intention to build refineries in Central America. However, the plan never went beyond the talking stage; the technical and financial arguments for pursuing such a plan instead of expanding processing capacity on Mexican soil were never clear. The National Development Plan and the Energy Program for 2007-2012, published during the administration of President Calderón, established the need to increase Mexico's capacity to process heavy crude oil and to improve the country's existing transport and distribution infrastructure. None of these documents mentioned the need to develop new green field refineries. Thus, the question is how and why the

[17] The parable goes that a group of wise blind men once gathered around an elephant. Each of them touched a different part of the elephant and tried to figure out what it was. The one touching the tail thought it was a mouse, the one touching the trunk thought it was a snake, and the one touching the belly thought it was a rhino. The parable is used to illustrate the relativity of truth and the need to respect different perspectives.

[18] The Azcapotzalco and Poza Rica refineries closed down in 1991 while upgrading projects have been implemented in Cadereyta, Madero, and Minatitlán.

project gained importance on the agenda and took off during the first half of the Calderon administration, just a few months after the energy program was published.

It is likely that an inflection point in proven oil reserves and a dramatic decline of crude oil production during the mid-2000s, together with the prospect of Mexico eventually becoming a net oil importer, combined to give the final push to the proposal of expanding the NRS. It is also worth remembering that left-wing rhetoric on behalf of PRD and PRI congressmen made it difficult to negotiate comprehensive energy reform measures that allowed a higher degree of private participation in the oil sector and that gave Pemex greater flexibility and more financial and management autonomy. It is also likely that some PRI governors exerted pressure in the senate and chamber of deputies because more financial independence for Pemex meant fewer financial resources for states and municipalities that had been milking the oil stabilization fund.[19] Based on interviews with different stakeholders and knowledgeable observers,[20] the idea to build a new refinery cannot be attributed to one single identifiable actor but was a proposal that, little by little, began to circulate in the corridors of Congress, among selected federal government offices, and around Pemex itself during the late 1990s and during the Fox administration. By the time Calderón wanted to push his energy reforms, the proposal had snowballed, and it was clear that negotiations with left-wing politicians from the PRI and the PRD could not be addressed without talking about the refining industry and, more specifically, without talking about the prospect of building a new refinery. In other words, the project was already an issue when Calderón proposed his energy reforms, and even if it was not explicitly offered as a sort of negotiating chip, it was difficult to avoid the discussion.

At the same time, as mentioned above, pro-refinery arguments not only echoed in certain political factions of the PRI and PRD, but also inside selected areas of Pemex itself.[21] Thus, it

[19] The oil stabilization fund was originally established to administer the excess resources that were generated by the difference between international oil prices and the estimated price that is used by the Mexican Congress to calculate the public budget every year. Although this fund was originally created to ameliorate the impact of unforeseen changes in the international price of oil, the spirit of the fund changed slightly during a short period of high oil prices between 2002 and 2008. According to the latest operative rules of this stabilization fund, 25% of these resources should be transferred to local and state governments.

[20] These include anonymous informants from Pemex and political consultants that have kept track of the political process in the Mexican energy sector in the last decade.

[21] Interviews to Del Rosal, Ortega, and other senior officials who spoke on the basis of anonymity.

should not be discarded that the project for a new refinery was also seen as a necessary requirement to bargain with conservative factions at Pemex which felt threatened by higher degrees of private participation and favored nationalistic ideas such as fuel self-sufficiency. After all, even if the oil workers' union did not have a clear position during the discussions about the new refinery, it should not be forgotten that it had a stake in large investment projects because at least 2% of each project should go directly to the union's budget. The same applies to some sectors of public opinion which still endorse nationalistic rhetoric about Pemex's role in Mexico's development: if the right-wing administration of President Calderón wanted to show that reforms allowing private participation in the oil industry were not the end of Pemex's nationalistic significance, the announcement of a megaproject in the refining sector seemed perfect.

In this context, it is hardly surprising that just a few months before presenting his reform bill for the energy sector, President Calderón instructed Pemex and the Ministry of Energy (SENER) to start the necessary studies to analyze the convenience and feasibility of building a new refinery on Mexican territory.[22] According to interviews with staff members who worked in different areas of Pemex at the time, preliminary analyses had already been conducted years before the presidential request. By complementing previous analyses with more detailed evaluations, Pemex completed a comprehensive feasibility study in July 2008.

Pemex originally considered nine possible sites[23] and a broad collection of technical, environmental, economic, and social variables for its comparative analysis. Interviews with participants in this process and with former workers of Pemex, including technical experts from the Mexican Oil Institute (IMP), suggest that no previous decision regarding the site for a new refinery was subject to such extensive analysis. Earlier investment decisions were based exclusively on technical, economic, and political considerations; today, decision-makers also consider social and environmental factors, which are crucial to good public policy.

[22] See Pemex (2008, 6).
[23] These nine alternatives included Cadereyta, Nuevo León; Campeche, Campeche; Dos Bocas, Tabasco; Minatitlán, Veracruz; Lázaro Cárdenas, Michoacán; Manzanillo, Colima; Salina Cruz, Oaxaca; Tula, Hidalgo; and Tuxpan, Veracruz.

The process that led to the decision to locate the refinery in Tula is an example of how Pemex's role in investment decisions has been transformed in the last decades. In general, the number of factors considered during the project appraisal stage has increased; similarly, the number of cognitive institutions[24] that participate directly or indirectly in the process of agenda-setting and project evaluation in the oil industry has also multiplied significantly, expanding the notion of what counts as expertise.

From a historical perspective, it should not be forgotten that Pemex's policy monopoly in the oil sector has not only been buttressed by nationalistic rhetoric; to a certain extent, Pemex's claims to legitimacy have also been grounded in an emerging policy image[25] of technical progress and accomplishment that was projected mainly between the 1950s[26] and the 1980s.[27] This was a period when cognitive skills increased considerably but few actors could match the technical language and expertise of Pemex. For example, the Mexican Institute of Chemical Engineers (IMIQ) was created in 1959, and the IMP was created in 1965. The latter group was comprised by a group of professionals devoted to developing new technologies and training human resources for the oil sector—i.e. Pemex. The role of IMP and, to a lesser extent, the IMIQ would become paramount for the performance of the industry until the economic shocks of 1976 and 1982 severely limited the resources for research and development.

[24] The concept of cognitive institutions may be defined as "...sustained organizations that collect, process, analyze, and deliver the kind of information about a society that is necessary to monitor and interpret the impact of policy measures and to adjust and reformulate them." See Santiso and Whitehead (2006, 8).

[25] A dominant policy image is often based on a one-dimensional definition of problems, even when these are in reality multidimensional (Baumgartner and Jones 2002, 21). In this way, actors with access to these monopolies are able to guarantee that their decision-making power is not questioned by external actors. The classic example is the case of nuclear power for civilian uses in the United States (Baumgartner and Jones 1991). Between 1944 and the late 1960s, policy discourses emphasized the benefits of this technology in terms of efficiency and technical progress. During this period the regulation and monitoring of nuclear energy was in the hands of one single governmental agency—the Atomic Energy Commission (AEC), which enjoyed a closed monopoly that prevented other government and nongovernment actors from scrutinizing its activities. Nevertheless, this has changed drastically since the late 1960s, when other actors successfully introduced new conflict dimensions, replacing a positive image based on the ideas of "progress and efficiency" with a negative image based on the ideas of "risk and danger."

[26] Broadly speaking, the 1950s marks the period when Pemex transitioned from being an oil company that faced the possibility of extinction due to technical and commercial difficulties caused by the expropriation process in 1938 to an entrenched cognitive institution with authoritative claims to expert knowledge.

[27] The policy image of Pemex deteriorated when the oil boom revealed the excesses of the state-owned company in terms of corruption and inefficiency.

Like any policy monopoly, Pemex isolated itself from participatory politics and enjoyed considerable autonomy on issues such as where to explore, where to drill, and where to extract crude oil. As many cases of displacement and environmental degradation in Chiapas, Oaxaca, Tabasco, and other southeastern states illustrate, the 1970s and 1980s were also times when megaprojects were implemented without much accountability or regard for their social and environmental impacts. Some examples include the burning of gas into the atmosphere; the innumerable cases of contamination near Pemex facilities; and the accident in Ixtoc I in 1979, an oil field on the coast of Campeche that caused a massive leak of four million barrels of oil and considerable ecological damage to the area. In those times, environmental variables were only considered after serious problems had emerged.

Although far from perfect, Pemex's project appraisal process has improved in comparison to previous investment decisions. As mentioned above, the factors considered by Pemex's staff when assessing the prospects for a new refinery are by far more numerous than those considered in the late 1970s, when refineries were last built in Mexico. Even in the most basic aspects, such as the project's financial and technical assessments, the comparison of so many alternative sites based on their net present value (NPV) and contribution to the NRS represents a huge improvement over the assessments made for refineries built 30 years ago.

Furthermore, although still developing, the policy process in 2009 benefitted from a diversification of cognitive institutions that participated in the assessment of Tula. In other words, the epistemic community grew beyond the traditional engineering sector of Pemex, IMP, or IMIQ. International consultants and environmental think tanks like the Mario Molina Centre for Energy and Environmental Studies collaborated with Pemex in the assessment of possible environmental impacts in Tula and alternative sites. At the same time, new methodologies were developed to assess the social and political impacts in those localities that would be affected by the new refinery. Pemex also collaborated with international consultants and with the United Nations Development Programme (UNDP) in Mexico.[28]

[28] According to knowledgeable observers, the project of Chicontepec also constitutes a case that exemplifies how assessment criteria and project management has changed in the last two decades.

"La Pasarela"

However, the comparative exercise undertaken by Pemex was restricted to answering the question of where to locate a new refinery—not how best to meet the domestic demand for oil products or how best to meet the domestic demand for energy in general. Thus, focused on the narrow issue of where to develop a green field project, decision-makers opened the door for competition between state governments bidding to attract the multi-billion dollar investment. Such competition constitutes another important difference between three decades ago and today.

Historically, Pemex's investment decisions had often been the result of intra-elite struggles between technical experts in the oil company and government officials from different branches of the federal government. For example, discussions that emerged in the late 1950s over the orientation of Mexico's oil policy continued to crescendo until they peaked during the administration of President José López Portillo (1976-1982). On the one hand, employees who had participated in the nationalization of the oil industry in 1938 advocated a conservative policy based on the principles of self-sufficiency, an anti-export orientation, and restrained oil production. This group included engineers and technical experts like Francisco Inguanzo, who was under-director for primary production, and Heberto Castillo, who would later become a key opposition politician.

On the other hand, there was another group of younger and more open-minded managers who favored a rapid exploitation of oil resources and higher export levels. As Morales and other authors have documented,[29] these divisions were also reflected in confrontations between Mexico's minister of planning and industrial development (SEPAFIN) and the minister of finance. Whereas the former advocated a broader oil policy, oriented toward industrial development and energy efficiency, the latter advocated more ambitious production and export goals.

Although discussions over oil exports continued throughout the mandate of López Portillo, it became clearer that the pro-export coalition would prevail over the anti-export group when Jorge Diaz Serrano was appointed as director of Pemex in 1976. Furthermore, as proved oil reserves

[29] See Morales et al. (1988); Snoeck (1989); and Vernon (1984).

experienced dramatic growth from 16,000 to 72,000 million barrels between 1977 and 1982, the discussion of what to do with production surpluses seemed less important.[30] This situation coincided with two additional factors: the oil crisis of 1973 had opened a window of opportunity for non-OPEC producers like Mexico to play a more important role in international oil markets, and the 1976 financial crisis had put Mexico under pressure to promote exports, increase foreign currency inflows, and correct existing macroeconomic imbalances.

But this dynamic has changed, and other actors now have more leverage to shape investment choices both directly and indirectly. One example of indirect influence is the case of state governors and their interest in keeping Pemex's current tax regime so they may continue to enjoy the benefits of higher tax transfers from the federal government. An example of direct pressure is precisely the case of state governors lobbying for a new refinery.

When Pemex officials in July 2008 submitted the feasibility study regarding the location of the new refinery, the government of Guanajuato began to exert pressure on the president through contacts in the PAN and meetings with different officials from SENER. It is not clear how frequent or how intense these meetings were, but representatives from Guanajuato apparently claimed that the site of Salamanca, Guanajuato, had been excluded from the feasibility study that Pemex had submitted to the Congress.

According to high-level employees of Pemex, there were three good reasons behind the decision to exclude Salamanca. First, there were not enough land reserves to develop a second refinery in the area. Second, the Salamanca area suffers from serious water supply problems. Third, and most importantly, before the controversy about the new refinery started, the government of Guanajuato and a number of local environmental groups had pressured Pemex to actually close the existing refining complex due to environmental concerns. Thus, Pemex officials were taken by surprise when Guanajuato state authorities changed their position and went from demanding the closure of one refinery to demanding the possibility of building a second one.

[30] See Gálvez (1988).

SENER had usually played a passive role in defining oil policies, but this also changed in 2008. When Pemex delivered the first feasibility study to the Congress in July 2008, high-ranking officials from SENER realized they needed—and wanted—to play a more active role to influence the final decision on where to locate the new refinery, and started to question the validity of the analyses presented by Pemex technicians. According to key observers, the confrontation between both institutions was heightened by personal and political differences between SENER minister, Georgina Kessel, and Pemex's executive director, Jesús Reyes Heroles.

While Congress analyzed the Tula refinery project and the discord between Pemex and SENER grew, the pressure from state governors intensified. Representatives from Campeche, Oaxaca, Veracruz, and many other states demanded that other potential sites be considered through a more open decision-making process. Eventually, Pemex was forced to expand the list of potential location alternatives. Thus, Pemex used the second half of 2008 to improve the quantitative evaluation of certain variables, such as risk from extreme weather conditions, and to refine the qualitative analysis of potential social impacts.

Pemex was also forced to increase the list of potential sites from nine to more than 15 contenders. Since the Mexican oil industry has historically been a highly sophisticated policy area—primarily dominated by Pemex and a few government officials from a limited number of ministries—state governments did not necessarily have the human resources and technical expertise to articulate a coherent refinery construction proposal. Thus, basic considerations such as the choice of technology or complementary transport and distribution infrastructure were often not taken into account or simply not considered in enough detail by state governments. As a result, Pemex was not only forced to assess the proposals of state governments but also to serve as a sort of technical adviser to improve and standardize them.

In March 2009, in a move that has no precedent in the history of investment decisions in Mexico's oil sector, Pemex organized a series of public meetings and forums to grant all interested governors the opportunity to present their projects and the reasons why the new refinery should be located in their territory. Ten governors participated in this event; each

presented the advantages of one or many possible sites in their respective states.[31] To a great extent, the decision of the location was forced upon Pemex by the office of the president and SENER, whose representatives nevertheless were visibly displeased that Salamanca had supposedly not been taken seriously.[32]

This decision-making process contrasted sharply with the process that led to the construction of three new refineries in the 1970s and early 1980s. Although political considerations and lobbying from local and national actors did play a role in the final decision on location, most such activities were historically conducted behind the scenes. Two examples involve pressure from the Monterrey business community to develop a green field project in Cadereyta and the pressure from businessmen from the emerging tourist industry in Mazatlan to cancel a new refinery at this site and pick an alternative site in Salina Cruz, Oaxaca.

There is scarce information about these two cases, but it seems that the struggle between different actors was limited due to two main factors. First, the oil epistemic community—i.e. Pemex, IMP, and IMIQ—was much more closed, compact, and isolated from participatory politics. Second, interaction between politicians and technical experts was less messy and unpredictable.

In the past, when other refineries were built, the president would listen to basic technical arguments and then make a decision based on political considerations. This was the case when the Cadereyta refinery was built to serve the business community of Monterrey. In this situation, Pemex would simply follow along and work out the rest of the details. But politics and expertise clashed in 2009 when the president, a member of PAN, insisted on finding a technical reason to favor Salamanca in PAN-governed Guanajuato over Tula in PRI-governed Hidalgo (perhaps because the issues of legitimacy and technical merit had gained more importance as justifications for this kind of investment). High-ranking officials from Pemex said that they were willing to

[31] For more details on the proposals by different state governments see Pemex (2009b).
[32] It is worth noticing that Guanajuato, where the Salamanca project would be located, was the only PAN government that was considered by Pemex, whereas most of the other alternatives were located in states that were governed by the PRI.

support Salamanca if that was the president's decision, but they would not manipulate technical information to justify the choice.

500 Hectares in 100 Days

Only a few weeks after the public meetings, the executive director of Pemex announced that the final decision was to build the new refinery in Tula, Hidalgo. However, also in an unprecedented move in the history of Mexican infrastructure, it was decided that the government of Hidalgo had only 100 days to solve any land conflicts and acquire the necessary land reserves to develop the project. If this did not happen within the stated deadline, the new refinery would be built in Salamanca, Guanajuato.[33] How is it possible to explain such an unexpected procedure for a US$10 billion investment?

Again, it seems that the decision can be explained by the tensions between President Calderón, technical experts from Pemex, and representatives from SENER. On the one hand, Pemex kept running financial and technical models to analyze the relative convenience of Tula, Salamanca, and other potential sites, particularly those that showed net present values similar to that of Tuxpan. Over and over again, under different scenarios, Tula emerged as the optimal location for the new refinery. On the other hand, the presidential office and SENER became increasingly worried about how to deliver the news to the other competing governors and how to deal with party pressures inside the PAN. Thus, the idea of granting state governors an opportunity to discuss and defend their projects publicly was part of a way to lend the process an air of legitimacy.

As time passed, the clash between the different actors intensified. Pemex was forced to incorporate new evaluative criteria, though most favored Tula over other alternatives.[34] For example, building a new refinery did not automatically rule out the need to upgrade existing facilities to improve their ability to process heavy crude oil, as required by Mexico's 2007-2012 National Development Program. However, additional analyses showed Pemex that the existing refinery in Tula did not have to be upgraded because residuals could be easily channelled to the

[33] See *El Universal* (April 15, 2009).
[34] An example was the case of water supply as the position of Tula against other alternatives improved when taking into account the project for a huge water treatment plant that had been announced just a few months before.

new refinery, saving significant resources.[35] This was not possible in Salamanca due to longer distances between the old refinery and the proposed new one.

The advantages of Tula multiplied as more and more analyses were conducted. In the meantime, pressure from President Calderón and his nearest associates grew; they even got involved in debates that were purely technical or financial and that had traditionally concerned Pemex technical experts—e.g. the specific qualities and size of a pipeline or the impact of land prices on net present values and internal rates of return.

In the end, Pemex did not succumb to outside political pressures, and Tula survived on the decision agenda. The next challenge, however, fell to the government of Hidalgo. As recent policy failures have shown, negotiating the acquisition of land reserves and rights-of-way are uphill battles that have permanently doomed or indefinitely postponed many large infrastructure projects. The most illustrative example in recent years is the project for a new airport in Mexico City—a US$3.5 billion project promoted by President Vicente Fox (2000-2006) in 2002 and cancelled a few months later when the government faced violent opposition and failed to get the necessary land reserves.[36]

Even when land conflicts are eventually sorted out, they are rarely solved in a short period of time. Thus, from the beginning, the 100-day deadline was not very realistic; together with the second condition—that the failure in Tula meant a de facto triumph for Salamanca—the requirements seemed to be an open attempt to kill the project preferred by Pemex. At the same time, it is worth remembering that Congress had already approved imperfect energy reforms, which widely differed from the original bill presented by President Calderón in March 2008, when the 100-day race took place. Thus, another likely hypothesis is that SENER and the executive power had lost interest in a huge investment project originally used as a negotiation chip to facilitate more ambitious reforms. There were now few reasons to locate such project in a PRI rather than a PAN state.

[35] In other words, a second refinery in Tula could process residuals from the existing refinery, making unnecessary a future upgrading plan.
[36] See Domínguez (2008, 2011).

Still, state government officials from Hidalgo had foreseen the possibility that a new refinery could be built in Tula a few months before Pemex submitted the first feasibility study to Congress. Thus, aware of the complexity of land negotiations and keeping in mind the earlier dramatic failure of the new airport project, they started to approach people in those localities within the project's zone of influence before an official announcement was made.

They first approached *ejido*[37] leaders individually and then began general talks with the rest of the residents. The intervention was so carefully done that different state ministers were assigned as "godfathers" of each *ejido* that could potentially be affected to make sure that they kept working as channels of communication between local communities and the state government. In this way, government mediators had already made some progress negotiating with affected communities when the competition between Tula and Salamanca was announced. The adopted measures did not make the final negotiations necessarily easier, but they definitely helped avoid a major confrontation with landowners within the 100-day deadline.

Negotiations with landowners were not the only obstacle the government of Hidalgo faced. Observers in the affected localities and Pemex sources agree that the federal government obstructed the required processes to regularize and acquire the land in the Tula area.[38] The Ministry of Land Reform (SRA), which was in charge of the legal aspects of land acquisition, moved slowly, provided insufficient information, or kept changing the public servants appointed to oversee and approve the different regularization steps. At some point, SRA's sluggishness created yet another confrontation between Pemex officials and the executive branch; the former argued that the least the federal government could do was to provide all possible assistance so that Hidalgo could meet the 100-day deadline.[39]

One of the main obstacles created by SRA was the provision of insufficient data on the exact location and size of the land reserves for the new refinery. Without such details it was impossible to change the status of the land from communal to private property, and the whole process could crumble. But the government of Hidalgo was fortunate to find former public servants who had

[37] According to Mexican law, *ejidos* are plots of land held by the State for communal use.
[38] Interviews with Ortega and Pedraza.
[39] Ibid.

worked inside SRA during the Fox administration and had actively participated in the enormous process of geographical digitalization. Curiously, the former employees had kept in their computers all of this information even after they were dismissed.[40] With the help of these consultants, the correct data on the location and size of land reserves were acquired, and land acquisition was completed in mid-August 2009. Tula was chosen over Salamanca as the site for the new plant.

Investment Decisions in the Oil Sector: The Answer Depends on the Question

The involvement of more actors in the decision-making process should, in theory, enhance the interaction between politicians and technical experts and help balance respective arguments so that decisions are technically sound, financially feasible, and socially acceptable. Such an arrangement is crucial in an emerging democracy like Mexico, where one of the most significant policy challenges is to find the right way to integrate democratic politics with specialized technical expertise. Was this the case for the new refinery project in Tula?

On the one hand, disagreements between state governors, technical experts, independent professionals, certain branches of the executive power, and other stakeholders are good news because different perspectives should, in theory, improve the quality of policy debates. At the same time, a significant expansion of assessment criteria and the number of institutions that contribute their analyses are significant steps toward better decisions in the oil industry and in other areas of infrastructure development.

However, the case of Tula also shows that despite these improvements, the interaction between democratic politics and technical expertise falls well short of producing optimal and well-founded policy decisions. As with other large infrastructure initiatives, the executive power, both at the local and national levels, still enjoys certain discretionary decision-making powers that affect the quality of policymaking in the oil industry. For example, when President Calderón decided to give a push to the refinery proposal—probably as part of a broader strategy to convince congressmen opposed to the project, certain factions inside Pemex, and the public—he inadvertently restricted issues that technical experts were supposed to answer. As mentioned

[40] Interviews with Ocampo and Pedraza.

above, larger and more important questions such as the best way to meet the domestic demand for oil products and the best way to meet Mexico's energy supply were displaced by the smaller and less important question of where to locate a new refinery.

At the end of the day, the case of Tula confirms that arriving at the right answer depends on asking the right question. As a renowned oil industry professional argues, "if you look carefully at the comparative assessment by Pemex, the difference in NPV between the first and the second best alternatives was very narrow. This is because the question of where to locate the new refinery is not very relevant if you do not compare it also with other alternatives such as the alternative of not building a new refinery ... but Pemex did not make this comparison because it was instructed to study where was the ideal site to build it in the first place."[41]

Why is the decision-making system in the oil sector incapable of putting on the table the right questions regarding investment policies? A plausible explanation is the nature of large infrastructure projects and a lack of democratic governance in this area. Mexican governments have constantly used large infrastructure initiatives to publicize government achievements and to promote images of progress and development in order to seek legitimacy. Due to their visible long-term impacts, including potential modifications of the physical and social space, megaprojects are appealing to government leaders.

This is not an exclusively Mexican phenomenon. However, it has been particularly salient in Mexico due to historically strong presidential and one-party systems that prevailed between the late 1920s and the late 1990s. Even today, when recent democratic changes have seriously undermined this feature of the political system and one-party policymaking has virtually disappeared,[42] infrastructure policy still suffers from a shortage of institutionalized democratic procedures. As a result, the executive branch—at the federal and state level—still enjoys ample opportunity for discretionary decision-making.

[41] Interview with Rogelio Gasca.
[42] For a more detailed discussion, see Lehoucq et al. in Stein and Tommasi (2008).

This might also explain why doubts still surround the prospects of building the new refinery. Many months after the announcement, why haven't proponents moved ahead with plans or why haven't detractors managed to kill the project completely? Given that large infrastructure projects have always been loaded with political meaning and have become an important arena for party competition in Mexico, the current administration has no incentive to start building the refinery (among other reasons, because it would be completed during the next administration). But at the same time, the administration has no incentive to officially cancel the project because it could prove to be an unpopular move with enormous political cost just a few months before the 2012 elections. In addition, at this stage, refinery proponents have few effective methods to force the Calderón administration to break ground on construction.

Infrastructure decisions in Mexico are not necessarily made on the basis of development needs or optimal solutions to existing infrastructure gaps. Tourist developments, new airports, water treatment plants, highways, wind energy parks, and oil refineries may actually make sense from a development point of view, may simply constitute pharaoh-style monuments, or as the case of Tula illustrates, may also work as "chips" in negotiations with opposition groups in the Congress. In this regard, the danger of having the right answers to the wrong questions will persist as long as Pemex suffers from unnecessary political intervention when defining investment policies, and as long as Pemex's decisions are not made within the broader context of sustainability and energy supplies. The challenge lies in balancing the right kind of autonomy with more accountability and participatory politics, without compromising efficiency goals.

A second explanation for why the right questions are not asked is that technical experts do not want to shoot themselves in the foot. Ideally, they should work as "anchors" who provide rational arguments and dissuade politicians from making key policy decisions on the basis of political considerations—as happened during the Tula and Salamanca discussions. However, it is difficult to provide technical arguments that also tend to question the technical abilities of Pemex itself. It is difficult to picture professionals from Pemex arguing that the best solution to production deficits is to buy a new refinery on the North American Gulf Coast, or that the best way to supply refined oil products is to import them; doing so would undermine Pemex's

credibility. Other vested interests, such as the workers' union or construction companies, might also contribute to biased decision-making.

Third, the interaction between politicians and technical experts has become open-ended and unpredictable due to a new political process characterized by electoral competition, administrative decentralization, and a redistribution of political power. Although these factors enrich policy debates, the result might sometimes be counterproductive when old and new political actors lack basic knowledge of highly technical issues—as is often the case in the oil industry. Without these requirements, it should not be surprising that decision-making is often focused on the wrong questions.

IV. Conclusion

This work has offered an overview of how political and technical factors intersected and shaped the decision to build a new refinery in Tula. During the first stage, a Congress hostile to comprehensive energy reform forced the executive power (and Pemex) to promote the project, restricting a technical debate that should have been broader. As a result, comparative studies were narrowed down to the issue of where to locate the new facility, leaving out the analyses of other policy issues.

During the second stage, technical comparisons evolved into a regional competition between different state governments, which led to the questionable proposal of organizing a public forum to analyze the potential advantages and disadvantages of all possible locations. Another questionable step was the decision to force a race between Salamanca and Tula regarding the issue of land acquisition. This unprecedented decision might be partly explained by party politics, the pressure from PAN groups to favor the project in Salamanca, and the president's insistence on finding a technical reason to disqualify the project in Tula.

The case study illustrates important contrasts to previous investment decisions in the refining sector. The assessment of many factors—including social and environmental impacts—and the contribution of cognitive institutions beyond traditional actors in the oil industry are both

significant advances toward a more informed and cohesive decision-making process. Leaving aside undesirable episodes such as the so-called "pasarela" and the 100-day land acquisition race, the process also illustrates the public openness and consultations that should characterize future infrastructure projects.

However, the case study is also an example of how policymakers in Mexico are sometimes unable to pose the right questions. Going back the original arguments for and against a new refinery, Pemex should have analyzed other policy solutions beyond a green field project. This does not necessarily mean that the chosen alternative is wrong, but its justification would be stronger and the decision would enjoy more legitimacy if it had also been compared to policy alternatives proposed by refinery critics. Two examples are investing in transport and distribution infrastructure to facilitate imports of refined oil products and increasing Pemex's stake in existing refineries on the North American Gulf Coast.

Pemex would have had a stronger argument for a new refinery if alternatives such as relying on imports or buying existing U.S. facilities had been comprehensively analyzed and compared to a green field project. Among other things, Pemex would have needed to carefully consider the reasons why refineries on the North American Gulf Coast are sold at considerable discounts. Is it simply because they have excessive capacity or is it because global players are making adjustments to keep the most competitive processing facilities and sell those with technical difficulties, upgrading requirements, labor conflicts, and/or problems meeting environmental regulations? Is it due to a global excess capacity or the geographical re-distribution of global demand and refining capacity of growing markets such as Asia?

In the same line of thought, Pemex should have conducted an analysis of how future climate change regulations could eventually undermine margins in both Mexico and the United States. For example, according to industry experts in the United States, cap-and-trade costs could cancel between 50% and 100% of net refining margins if these margins remain close to their average historical levels of USD 2 per barrel.[43] What does this mean for the alternative of increasing

[43] See EPRINC (2009).

Pemex's stake in U.S. refineries? If a cap-and-trade scheme is imposed on North American refineries, how will it affect the refining industry in Mexico?

When comparing a green field project and improvements to import infrastructure, the relevant figure is not the initial investment (US$10 billion, in the case of Tula) but the comparison of alternatives at NPVs. If the NPV of transportation costs over a 20- or 30-year period—imported oil products and exported fuel oil—surpasses excessive capital spending in the present, then Tula may have a slight edge over other alternatives.

Finally, Tula and any other downstream project should have also been compared to investment needs in other sectors. Unfortunately, as other papers in this series show, the deficit in refined oil products is not the only challenge that Mexico faces in the near future. The most important challenge is the decline in proven reserves, which seriously compromises the future of the oil industry, its role in economic development, and its contribution to public finances. If oil reserves decline and Mexico becomes a net oil importer, then investments in the refining sector would make less sense because downstream activities are not a good business if they are not integrated with a strong and competitive upstream segment.

Most international players—both public and private—keep a balance between capital spending in the downstream and upstream segments, but such a balance is subordinate to the goal of keeping a high rate of reserve replacements. Without such replacements, the main advantages of integrated oil firms—i.e. diversifying risk between upstream and downstream—vanish. Although Pemex is currently investing massive resources in exploration and prospective activities,[44] it is still uncertain whether these efforts will eventually be successful and whether proven reserves will keep declining. Thus, until oil reserves are replenished, it seems that the investment priorities should focus on the upstream sector.

These and other issues should be part of a broader analysis that goes beyond the question of where to locate a new refinery. However, investment decisions—both in downstream and upstream sectors—will always be conditioned by political changes, partisan politics, and the

[44] See Pemex, annual reports, various years.

clash between local governments and different branches of the executive power. Politics will always shape policies; this is nothing new, and it is not an exclusively Mexican phenomenon.

In the case of the Mexican oil industry, the product of these interactions are likely to remain unsatisfactory as long as more ambitious energy reforms do not meet three conditions: (1) more autonomy for Pemex, particularly from discretionary political decisions; (2) the greater commitment to market-based principles and the weakening of vested interests that hinder technical experts from putting forward (and defending) the right questions from the beginning; and (3) better articulation of how Pemex´s investment decisions relate to broader energy national energy imperatives. Without these conditions, any progress in participatory politics and any improvement in assessment methodologies will be of limited use as Mexico seeks to implement and justify sound investment policies in the oil industry.

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