



**A New Beginning for Mexican Oil:  
principles and recommendations for a reform in  
Mexico's national interest**

November, 2012



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During 2012 the Mexico Institute of the Woodrow Wilson International Center for Scholars and the Instituto Tecnológico Autónomo de México convened a select group of experts in the Mexican energy sector to three meetings held in Mexico City. In these meetings an active and in depth discussion took place over the requirements for a successful and meaningful reform of the laws governing the country's oil and gas sector. This report is the result of that process. The discussions were held under Chatham House rules, stating that no opinion expressed in the meetings could be attributable to any one participant, but all of the individuals listed below contributed to the discussion and the conclusions expressed in this report.

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## **A New Beginning for Mexican Oil:** **principles and recommendations for a reform in Mexico's national interest**

### **EXECUTIVE SUMMARY**

Based on the collaborative work of a high-level group of Mexican energy experts during the first half of 2012, this report focuses on the issues facing Mexico's hydrocarbons sector and the most important principles that must underlie the forthcoming reform of the country's oil and gas industry. Although multiple diagnoses of the sector exist, in recent years there has been no fundamental examination of the principles that should underlie the nation's energy policy.

The most important conclusions of this report are:

- i) The health of the energy sector is fundamental to the future development of Mexico and to determining its prosperity and competitiveness.
  - ii) The serious problems affecting the national oil company, Pemex, and the oil and gas sector more broadly, require urgent and determined action on the part of the Mexican state.
  - iii) These problems, as well as the multiple lost opportunities that have occurred as a result, are by now well known and accepted, both by the Mexican political and economic elites, but also by broader public opinion. This stands in stark contrast to the situation prevailing in 2008, when the seriousness of the looming problems of the sector was still heavily disputed.
  - iv) The current hydrocarbons model, in terms of its legal, regulatory and organizational structure, has reached the limit of its usefulness. A new Mexican model must be found that facilitates the creation of a comprehensive national energy policy, one that serves the needs and goals of the Mexican economy in the 21<sup>st</sup> century.
  - v) Mexico's economy has become dynamic and modern in recent decades, but the energy sector has not. It must be updated in order to meet the medium- and long-term needs of the Mexican economy.
  - vi) The nation must seek a constitutional change and a reform of the broader legal and regulatory framework that governs the sector. The existing constitutional and legal framework has been stretched to its limit by successive governments seeking to accommodate changing circumstances.
  - vii) In seeking a new framework, the twin principles of economic pragmatism and operational flexibility should be given a central position.
  - viii) The constitutional reform should be as simple and straightforward as possible and should open rather than close policy options for the Mexican state. This will provide the national authorities with the opportunity to drive forward growth and will give them regulatory tools to manage the sector in a modern and effective way.
  - ix) The energy reform discussion must be undertaken using clear and concise concepts. It is crucial, for example, that a conceptual differentiation is made between the owner of the national hydrocarbon resource, which is the nation, and the operators who are permitted to extract and transform that resource, who could be public or private firms. The state and the nation can maximize value from its ownership of the resource in multiple ways, and must consider a more diverse array of options when it comes to authorizing the operation of Mexican oil and gas fields.
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- x) Pemex can no longer fulfill its responsibilities to extract, transform and transport hydrocarbons alone. Mexico needs more operators. It is now imperative that Pemex be given greater freedom of action in terms of both its financial affairs and its operations and choice of partners. Third party participation is needed in areas where Pemex cannot satisfy the nation's energy needs.
  - xi) The current regulatory regime has failed to promote confidence and efficiency while attracting investment, technology, and talent to the hydrocarbons sector, and innovations in regulation are needed to meet those objectives.

## **INTRODUCTION**

### The Energy Working Group

Between February and July of 2012, a diverse group of academics, analysts and energy industry representatives met under the auspices of a program sponsored by the Woodrow Wilson International Center for Scholars and the Instituto Tecnológico Autónomo de México to discuss the future of the Mexican hydrocarbons sector and to examine the fundamental energy requirements of the Mexican economy, as well as the role of the National Oil Company, Petróleos Mexicanos (Pemex) and other possible actors in the sector. Rather than engage in an exhaustive but repetitive diagnosis of the multiple challenges of the oil and gas sector in Mexico, the group was determined to go beyond these failings and to propose a set of guiding principles for a national energy policy, principles that will guide Mexico's political elites towards a successful and sustainable hydrocarbons future that will guarantee energy security and contribute to the development of the national economy.

### The Political and Economic Context

During the election year of 2012, the issue of reforming Mexico's energy sector became a recurring theme in the campaigns of the Presidential candidates. The reasons for this are abundantly clear. The failure of the 2008 energy reform to fully resolve the fundamental issues afflicting oil production and reserves, or to answer to the needs of the national economy, means that the same problems that were discussed during the campaign remain a priority for the incoming government. Mexico's hydrocarbons sector has missed out on decades of progress in terms of modernization and technological advance, and the future will demand much more of the sector, given the growing dynamism of the economy.

The statements of then Presidential candidate for the Partido Revolucionario Institucional (PRI), Enrique Peña Nieto, in particular raised awareness of the need for a new push towards energy reform. The coincidence between the views of the PRI candidate, and his counterpart in the Partido Acción Nacional (PAN), Josefina Vazquez Mota, suggested the potential for a constructive debate over the future of energy policy, with an emphasis on opening the sector to private and foreign actors in an effort to improve efficiency and output. However, the differences exhibited by the candidate of the leftist parties, Andres Manuel López Obrador, who vigorously opposed the notion of an opening of the sector, hinted at the still highly contested nature of energy policy in Mexico.

Having won the July election, President-elect Enrique Peña Nieto and his transition team have continued to focus on the issue. Since then, the President-elect has made various statements about the importance and need for a profound reform of the sector. For example, during his tour of Brazil in September of 2012, he

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praised the model employed by Brazilian national oil company, Petrobras, adding to the speculation that a legislative initiative to reform energy policy is imminent. Although the timing of the reform initiative is uncertain, it is imperative that the parameters of any discussion on the future of energy policy are established and agreed upon by the country's leading political actors ahead of time.

The coming debate on how to solve the country's looming oil and gas problems will be complex and could be contested. A clear and precise discussion of the country's energy needs, as well as an understanding of the limitations and opportunities present in the country, are essential to creating the bases for a fruitful and meaningful national energy policy, one that extends far beyond the demands and challenges of the present time. This work hopes to make a contribution to achieving such an understanding.

### The Challenges Facing the Mexican Hydrocarbons Sector

Although the purpose of this paper is not to provide a comprehensive diagnosis of the challenges facing the oil and gas sector and the national oil company in Mexico, it is nonetheless important that we state clearly what both the short- and long-term problems are, so that we can then move on to discuss potential solutions. In recent years, these problems have become well-known to the Mexican public and to the political and economic elites in the country. The most notable, and most pressing energy problem facing Mexico, of course, concerns the rapid decline in oil production experienced by the company over the past 8 years. From a high point of 3.4 million barrels a day in 2004, crude production has fallen to a low of 2.55 million in 2012, that is to say that there has been a 20 percent drop in national production. Although Pemex has had success in 2011 in stabilizing production at this level, the outlook for the next few years is worrying, as experts are predicting significant declines in the nation's two most productive fields, Ku Maloob Zaap and Cantarell, even at faster rates than those predicted by official sources. Declines at these fields could cut as much as half a million barrels per day from national production. The significance of the decline in production to date is a story that has been told many times: not only does the extraction of less oil impact Pemex as a company, it hits national finances hard since oil revenues continue to account for around 30% of the Federal government's income.

Mexico's dwindling proven reserves present a similarly worrying picture. Although no one now doubts that Mexico has huge remaining reserves of oil to be discovered in the national territory, over the past decade Mexico has failed to add to existing proven reserves. It is only in 2012 that Pemex has been able to claim a 100% restitution rate, helped in part by a slower rate of exploitation of existing reserves. At the present rate of extraction, the nation has enough oil to last for 9 years, a number that is acceptable for a company, but wholly insufficient from the perspective of the Mexican economy and the national interest. If production is to be boosted and then sustained in the medium term, the discovery and certification of massive new reserves must be ensured at rates much higher than what is currently being achieved.

These twin drops in reserves and production have come at a time when the "easy oil" on land and in shallow waters in the Gulf of Mexico no longer represents the future. Having used up most of its reserves in these areas, Mexico now faces the prospect of discovering and extracting more difficult oil reserves in the deep waters of the Gulf and trying to extract oil from complex onshore reserves such as Chicontepec, which has proven difficult and costly to produce. We have passed from a world in which extracting oil from Cantarell cost only a few dollars a barrel, to one in which oil can cost as much as 70 dollars a barrel to

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produce. This difficult oil represents a growing drain on the budget of Pemex as well as an evolving technological challenge.

The current model, which gives Pemex all of the responsibility as operator, gives the Instituto Mexicano del Petróleo all of the responsibility for technological development, and puts all of the economic cost of extracting oil on the budget, is not adequate for the era of difficult oil. Under the current model, Mexico is incapable of investing in the discovery of new reserves, in the development of new exploration and production (E&P) technologies, and in the maintenance and construction of the infrastructure needed to guarantee the future of the sector. Pemex has never been allowed to operate as an independent company, operating instead on the basis of generating rents rather than generating value, and very often having to pay exorbitantly high tax rates. The “milking” of Pemex has meant that resources are stripped away from the firm in a way that leaves it without the necessary funds to be able to replace reserves, or even to cover its own costs in the present time. The fact that Pemex has frequently had to pay more than 100% of its profits to the government in the form of taxes and charges is clearly an entirely unsustainable and irresponsible situation, but increasing its available financial resources alone would not solve the problem. A new model is needed in which Pemex is responsible for its own destiny, and that promotes Mexican economic growth, as well as granting the Mexican state the fiscal resources it needs to reduce inequity and poverty.

The strict controls placed on Pemex spending by the Mexican Treasury Department (Secretaría de Hacienda y Crédito Público) have also meant that the national oil company is essentially prevented from making its own strategic business decisions, and from the innovation and risk taking that are fundamental to achieving success in the oil industry. The close political controls placed on the firm are understandable in the context of the fiscal importance of Pemex to the federal government, but they prevent Pemex from achieving success and prevent the country from realizing its potential.

Not only does Pemex lack the independent ability to invest in its future, but it is also technically bankrupt due to the immense burden of its debt, acquired from years of trying to reverse the decline in production and exploration, as well as from its pensions and benefits liabilities. Decades of yielding to demands by the oil workers’ union, combined with a failure to put aside funds to cover future outlays mean that, at the present time, Pemex will need to make an extraordinary effort and achieve high levels of success in order to cover its liabilities. Unless a radical change in the current model is brought about, it would be irresponsible for the Mexican state to absorb these liabilities, as it would create a moral hazard encouraging Pemex to repeat its error.

Pemex’s dismal record is matched by its lack of technological and technical resources. Mexico, and Pemex in particular, have not invested in the development of new R&D and new knowledge in the hydrocarbons industry, despite having received record budgets from the federal government in recent years. Moreover, due to the nature of the national oil sector, Pemex has remained isolated from new ways of thinking and technological cooperation that have revolutionized the global oil industry. By preventing Pemex from working with private and foreign firms who are on the cutting edge of hydrocarbons technologies, the firm has been condemned to technological obsolescence and dependency.

At the same time, the Mexican government has failed to give sufficient financial and technical support to national research organizations, such as the Instituto Mexicano del Petróleo and university-level

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engineering, law and policy programs that focus on the energy industry. Moreover, due to the extreme limitations on private participation in the sector, the incentives for investment in R&D by the private sector are few and far between. More investment from both public and private organizations is urgently needed in developing national research capacity, and incentives must be created to attract cutting edge technologies to Mexico, along with the experience and knowledge needed to operate them.

### The Need for Change

Just this brief overview of the challenges facing the oil industry in Mexico shows us that fundamental change is desperately needed. Current arrangements were largely designed to satisfy the political, social and economic needs of previous generations, and economic models, and were not designed to face the multiple challenges of the modern hydrocarbons industry and national economy that is much bigger and more dynamic than ever before. As this paper will discuss below, the global oil and gas industries (as well as the global economy in general) have gone through unprecedented change in the past two decades, with unforeseen new challenges and innovations fundamentally altering the business of exploration and production. During this same period Mexico's national hydrocarbons sector has stagnated, held back from reacting to these changes by constitutional, policy, financial and regulatory limitations, and above all the perverse incentives provided by a huge and ready supply of easy oil. Now that the multiple problems facing the sector are obvious, and the easy oil has been used up, Mexico must empower the sector with the capacity to react to these past developments and to be able to predict future transformations.

## **GUIDING PRINCIPLES FOR THE OIL AND GAS SECTOR**

Though there is a prevailing belief that Mexico's energy policy is guided by considerations of the national interest, there is very rarely any discussion of what should be the specific principles of such a policy. Just as we have become accustomed in recent years to question the role of the financial sector, and to demand that it serves the interest of the real or productive economy, so we should ask ourselves what it is that we expect of our oil and gas industry. Traditionally the answer to this question has been that the nation's hydrocarbons must be exploited by the state in order to maximize the nation's sovereignty, and to serve as a driver of national development. To achieve this, the decision was taken to limit the operation of the sector to one firm only, and to use the resulting rents to sustain the nation's fiscal balance. This notion may have made sense thirty years ago when the country was in the midst of a financial crisis, but today it no longer seems to serve the national interest.

In recent years, industry analysts, and public policy specialists have begun to consider that the energy sector should fall into line with the rest of the economy and should focus on one main priority that should seem self-evident: the provision of energy to the nation's economy and society. Around the world this simple idea has been encapsulated in the notion of **energy security**, which we should interpret as the guarantee of quality, continuity and adequacy of supply of energy to the nation. It is clear that, despite the richness of the natural endowments enjoyed by Mexico, our nation's hydrocarbon's industry ability to guarantee energy security has become increasingly challenged in recent years.

While it is frequently claimed that the cause of declining production and reserves as well as the lack of investment in refining capacity is Pemex's lack of investment in exploration and production (E&P), the true

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cause has been the de-petrolization of the economy. That is to say, whereas the Mexican economy today has diversified, evolved and adapted to new demands and needs, a hydrocarbons model based on one single company that is often removed from market demands and incentives, has been slow to adapt and fails to meet the nation's needs. While the national economy has industrialized, globalized and grown impressively over the past 25 years, the same cannot be said for the oil and gas sectors.

It is for this reason that, despite record budgets for Pemex in recent years, the problem of declining oil production and reserves continues, and this is why a national debate has emerged on how to reverse this situation. The country needs a greater and improved execution capacity in the sector, better quality and higher levels of financing to cover investment needs, and regulatory tools that encourage sustainability and technological progress. This will require making Pemex more autonomous, forcing the company to depend on its own resources rather than the national budget, and allowing other operators to enter the sector. By doing so, we should expect that the state's current tax take from the sector will not only be maintained, but will likely increase over time as production levels and therefore overall payments to the state grow. This will, of course, require a constitutional reform.

A similar situation can be seen in the natural gas sector in Mexico. Thanks to insufficient investment in the extraction of natural gas, and in the building of a pipeline network to get gas to consumers, Mexico currently faces an underdeveloped market in natural gas, in both the residential and business sectors. At the same time, industry across the country has faced serious shortage of natural gas over the past 12 months, in response to production cuts on the part of Pemex in the face of low prices. For Mexican economic competitiveness, this is a serious problem. Allowing a more open and responsive structure for gas production in Mexico will greatly benefit not only the consumer, but overall national growth.

In addition to this primary goal of energy security, many of the experts in the group agreed that the nation's energy policy should contribute to **economic growth**, both through the maximization of value and the creation of quality employment opportunities. As nations such as Norway have shown, the oil and gas sector can serve as a motor of national economic development, not only in the sense of extracting and processing hydrocarbons, but by generating investments in human capital, technologies and a diverse petroleum services industry. Today, Mexico this has failed to be accomplished, and the nation must consider ways in which any future reform can optimize the economic opportunities that are associated with a successful oil and gas industry.

Lastly, a successful energy policy should be based in considerations of **sustainability**. In recent years this term has come to be associated with questions of environmental protection, and this is an important dimension. However, this report calls on the government to recognize the importance of a national hydrocarbons strategy that allows future generations to enjoy the benefits from the national patrimony. This means investing in the discovery of new reserves, in employing extraction practices that maximize the recoverable oil from discovered reserves, and the implementation of energy efficiency policies that result in a rational use of the hydrocarbons produced. Moreover, the state's share of profits from the sector should not be squandered on political and economic projects of short-term benefit to the today's population, but rather invested in areas such as education and infrastructure that will provide long term payoffs for the nation. In addition, the nation should consider the creation of a sovereign wealth fund based on a percentage of oil revenues, to guarantee that future generations of Mexicans benefit from the natural oil wealth of the nation. Investing the oil rents in a fund that gives long-term economy returns is as

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important as investing in education and infrastructure, and it is to these three priorities that a large percentage of the oil rents should be dedicated.

### THE NEED FOR CONCEPTUAL CLARITY

The ongoing national conversation over energy reform in Mexico suffers from a serious and debilitating weakness. Political and business elites, as well as the general population, have shown a notable tendency to confuse key terms in the debate that lead to misunderstanding and contradictory meanings. A clear example of this lies in the way in which two concepts, those of **owner** and **operator**, are commonly confused by commentators and policy-makers. Around the world the distinction is made between the two terms, with the nation commonly assuming ownership of the resource but allowing non-state actors the right to operate oil and gas fields. In some countries this can take the form of an alliance between the national oil company and private actors, in others the operation of the nation's oil reserves is left entirely to the private sector. In Mexico, according to our constitution, the nation is the owner of the country's hydrocarbons and, since 1958, governments have legislated that Pemex has been given the exclusive responsibility to operate all levels of the hydrocarbons value chain (between 1938 and 1958 mixed investment in the sector was allowed, although rarely did it occur). In this sense, operators are responsible for monetizing reserves and supplying energy to the economy, whereas it is the responsibility of the Mexican state to determine how to maximize the benefit derived from hydrocarbon resources for the nation, and to efficiently regulate the sector with clearly defined rules. This is surely how one should understand the concept of state management of the sector. It is under this premise that one should ask if the national interest would benefit from having multiple operators, rather than the current monopolistic arrangement.

It is important to also take care to distinguish between the term **operator**, and its counterpart, **contractor**. A contractor can be hired by the operator to perform certain functions in exchange for a fee, that is to say, the contractor earns its fee independently of the outcome, and for that reason, runs no risk in the process. These functions are carefully determined by the operator, and are commonly limited to areas where the operator lacks technical or technological expertise, or the capacity to successfully execute its goals, in order to reduce costs. In the case of Pemex, the operator has employed the contract model since its creation as the national oil company, working closely with private sector firms, in many cases, to compensate for lack of capacity in essential areas. The operator is the actor that has the responsibility of taking decisions and risking capital, and only makes money if those decisions and risks are well managed.

One way of understanding this is that an operator is like an engineer or an architect who undertakes a major project, whereas the electricians, plumbers, glass workers, etc., are the contractors who receive their pay regardless of the success of the project. In the world of oil this means that contractors are paid if oil is found or not, or if the project is lucrative or not for the operator. In contrast, operators are only paid if they are successful, and absorb losses if projects fail. Using this definition, we can see that since 1958 in Mexico private participation has been restricted to contracting with the single operator, although in recent years an attempt has been made to persuade contractors to take on more operational risk, with very little success. By contrast, in the rest of the world, where multiple operators are permitted, the Nation transfers the risk to them, in exchange allowing them to keep a percentage of the profits. In other words, the

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operators are given the right and the responsibility to develop reserves over a specified number of years. Whereas a contractor, though receiving a fee for its services, is not entitled to book oil and gas reserves, neither can it claim ownership of the hydrocarbons it is helping to exploit; the operator is entitled to do this.

This raises the question of the difference between **ownership** of reserves and the **booking** of reserves. Ownership refers to the right of an actor (in this case, the Mexican nation) to determine the ways in which the resource is exploited and to derive economic benefit from that exploitation. Globally, the ownership of hydrocarbons reserves is given either to the nation, or in some rare cases like the United States of America, to the individuals or corporations that own the land under which the reserves are located. The booking of reserves, however, refers to the process of financial reporting undertaken by oil and gas companies in which they declare the extent of the reserves to which they have access for extraction and sale. It is commonly the case that a firm is able to book reserves without having ownership of those reserves in the subsoil, but has been given a concession or production-sharing agreement with another firm to be able to exploit the reserve. This in no way affects the reserve position of the nation. They are always the owner of all of the reserves, while each operator can only book what it is allocated by its contract or concession, and as national reserves and the booked reserves of each operator are different concepts, there is no danger of double booking.

At this point it is important that a second distinction is made. In hydrocarbons policy discussions in Mexico, confusion commonly occurs between the terms **economic rent**, **economic benefit** and **utility**. All three are commonly assumed to refer to the governmental income that is derived from the oil and gas industry. However, in economic terms we should focus on the fact that, whereas rent does indeed refer to the monies that flow to the state from exploitation of the resource, economic benefit refers to the capacity of the sector to satisfy the needs or wants of society, whereas utility refers to the incentive received by operators in exchange for generating rent and economic benefit. Under this definition, the oil rent should be understood as the flow of funds to the nation that come from exploiting Mexico's national oil revenues, minus the utility that is paid to the operators and contractors. To seek to maximize economic rent from the hydrocarbons industry in Mexico, therefore, should be seen as a less desirable goal than that of maximizing economic benefit, but both ultimately depend on the utility that is paid to the operators.

## **THE CHANGING GLOBAL OIL AND GAS INDUSTRY**

Having established this conceptual clarity, it is important to enter into a brief discussion of the ways in which the hydrocarbons sector around the world has changed in recent years. First, over the past twenty years there has been a fundamental change in **the availability of oil**. The so-called "easy" oil reserves of the past are gradually being used up, and new discoveries have been in increasingly challenging locations, either in deep water or in fields such as Chicontepec which require a massive investment in technology and infrastructure to successfully extract. This, in turn, has required oil companies to invest heavily in the development of new technologies and human resources so that they can efficiently and safely extract and transport the oil to market. Paradoxically, although oil has become more and more difficult and costly to extract, technological advances are making it more abundant than ever before.

Partly in response to this, we have seen a dual process of **consolidation** of the global oil industry with mergers taking place between major private oil companies, and the emergence of a plethora of smaller,

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specialized companies that are taking advantage of niches in the industry. At the same time, national oil companies, such as Saudi Aramco, Petrobras and Statoil, have become bigger and stronger than before, as they have capitalized on their ownership by the governments of major oil states. But it is crucial to recognize that these national oil companies have been able to prosper in large part thanks to the alliances that they have formed with private oil firms, which have helped them to gain access to the technologies they require, and to share the risk involved in extracting oil from today's more complex and challenging fields, in exchange for sharing the operation and the profits from extraction. This new reality of shared operation is becoming ever more dynamic in response to rising energy demands and new operational challenges.

The third major development in the global hydrocarbons industry in recent years has been the discovery of huge reserves in the form of **shale gas and shale oil and other unconventional hydrocarbon resources**. These unconventional reserves of energy will revolutionize the global energy industry through lower prices and massive supply, but they will require the application of specific technologies and business models to facilitate their extraction. These models are very different from those employed to exploit conventional hydrocarbons, which has led to the evolution of regulatory models in some countries, such as Canada, the United States and Colombia. The world's leading example of shale gas and oil development, the United States of America, has significantly increased its hydrocarbons production, tying Saudi Arabia in first place for oil production, while its reserves have been boosted dramatically in the face of new unconventional discoveries. This extraordinary boon for national production has been brought about by private companies, many of which are smaller, although in recent years low prices have pushed a consolidation of the sector.

Mexico, as is now commonly noted, holds the fourth largest shale gas reserves, gigantic reserves in Chicontepec (a unconventional oil reserves), and has a huge potential for discovering and exploiting shale oil. In this way Mexico stands to benefit from the effective exploitation of this resource in terms of a low cost fuel for the national economy that will greatly boost competitiveness, increasing the flow of funds to the federal government in terms of fiscal revenue, and seeing significant regional development within national territory. In order for this to happen, Mexico will need to find the appropriate regulatory model. At the present time, the national oil company has proven itself unable to efficiently exploit the resource. A shale gas well in Mexico costs three times as much as one in the U.S. or in Canada, and although Chicontepec has received injections of billions of dollars, it has failed to reach its production goals. As long as Mexico lacks the regulatory model required to drive unconventional hydrocarbons development, and the private sector is prohibited by the constitution from entering into exploration and production, an effective development of unconventional resources in Mexico will remain out of reach.

### **THE NEED FOR A RADICAL CHANGE**

The evidence presented above clearly demonstrates that there is the need for a **radical change** in the management and organization of Mexico's hydrocarbons sector. The current system has shown itself to be unable to respond to changing circumstances and has left us on the brink of a disastrous decline in oil production and reserves. Moreover, new drops in production and reserves may well be around the corner and the national economy can no longer rely on Pemex as the sole provider of oil and gas. It is clear that the

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utility of the current model has been exhausted, and that a profound rethinking of the goals of Mexico's energy industry must be undertaken.

The fundamental shifts in the global oil and gas industries described above highlight the need for Mexico's national energy model to be **responsive and flexible**. The current model was created for an oil industry that was focused on onshore shallow water production, an economy that was closed and based on consuming national oil production, and the restrictions imposed by the constitution, while the federal government's insistence on maximizing rent from the national oil company has meant that Pemex has not been able to respond to the challenges of the modern oil and gas industry. Any new model must be open-ended enough to allow for adaptation in the face of significant change.

In other words, Mexico's oil and gas model must be flexible enough to allow policy makers to adapt to new developments and challenges. Rather than proscribing options, the legal framework surrounding the sector should afford future governments the capacity to pursue hydrocarbons strategies that serve the national interest.

The other guiding principle for the nation's legislators as they ponder a new model must be **pragmatism**. Instead of basing the nation's energy policy on the idea of ideological principles or lofty philosophical concerns, Mexico's decision-makers must adopt a model that is based on satisfying the nation's needs. A classic example of this has been the concern of successive Mexican governments to preserve sovereign control over the oil industry despite the fact that such control has led to sub-optimal returns for the nation. The experience of other countries (see below) has shown that basing the nation's hydrocarbons strategy on pragmatism goes much further in advancing the national interest and at the same time can increase the power and wealth of the state without undermining national sovereignty. In fact the contrary is the case, with the nation emerging as richer and stronger, and therefore with a higher degree of sovereignty by being in greater control of its own destiny.

Such a change requires a fundamental shift in thinking about the sector. First, a constitutional change is needed that at least opens the option to reduce operational risk for the federal government, transferring it to a broader array of operators of diverse sizes and specializations. Effective and efficient regulation is clearly essential in order to meet the range of challenges that are presented by an era of difficult oil and rapid technological innovation. It should also be the role of the state to determine the best mix of public and private participation in the sector in such a way as to maximize the nation's economic benefit from oil and gas. New constitutional dictates governing the hydrocarbons sector, instead of engaging in complex descriptions of what governments can or cannot do, should instead empower the federal government to make the choice of what is in the national interest according to the needs and circumstances of the time, and not to assume that circumstances will not change.

## **DIFFERENT HYDROCARBONS MODELS**

Around the world national governments have adapted the organization of their oil and gas industries to meet the joint challenges of energy security and economic competitiveness. The cases of three countries, Norway, Colombia and Brazil, highlight the need to innovate and tailor the organization of the hydrocarbons sector to the changing interests of the nation. In each of these countries a pragmatic and flexible approach has been adopted, one that seeks to maximize the benefit of the hydrocarbons sector for

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the nation as a whole. In each of these countries ownership of sub-soil hydrocarbons remains in the hands of the nation, but operation of the resources is permitted by multiple actors, public and private, national and foreign. In each of these countries the national oil company has been reformed in such a way as to maximize its capacity to extract existing reserves and secure new reserves for the future. This has been achieved by allowing the firm to apply business principles to its corporate strategy, rather than forcing it to obey a political logic. This includes allowing the firm to keep a higher proportion of its profits for reinvestment in new E&P projects and new technologies, to sign production sharing agreements with private companies (both national and foreign) and to operate outside of national territory to encourage international experience, the securing of new reserves, and the forming of useful long term alliances with foreign partners. These are models that represent the thinking of the third way, halfway between pure statism and the free market.

**Norway's model** is perhaps unique among petroleum producing nations, basing its model on **maximizing economic benefit** for the nation. It has resulted in the creation not only of a highly profitable national oil company (called Statoil), a vibrant petroleum industry including advanced services, refining and petrochemicals sector, and high levels of income for the State, but also the creation of a sovereign wealth fund (the Government Pension Fund) that has accumulated assets around the world, with its investments totaling 1% of global equity markets, making it the world's largest investor. The huge size of the fund means that every Norwegian citizen has the equivalent of US\$ 140,000 set aside for their retirement. This has been achieved by investing the rent from the petroleum industry in Norway, including taxes, exploration and production licenses and dividends from Statoil, both nationally and globally. Such an investment in the future of the Norwegian people means that, as the country's hydrocarbons production reaches its natural limits, a portion of that wealth has been preserved for future generations. At the same time, the sovereign wealth fund has given Norway considerable influence globally, and the model is the source of enormous international prestige for the small Scandinavian nation.

The investment of the nation's oil rents is the best-known element of the Norwegian success story, but there are two other elements that should be emphasized. First, the national oil company, Statoil, is majority-owned by the Norwegian state, with 67% of the shares, but benefiting from crucial capitalization from investment by private actors. The firm is recognized as a global leader in E&P projects around the world, having developed the expertise and technologies required to discover and successfully extract oil and gas in some of the world's most challenging environments, including the North Sea, the Gulf of Mexico, Algeria, Angola, Azerbaijan, Brazil, Canada, China, Libya, Nigeria, Russia, and Venezuela. This has allowed the company to secure contacts to develop oil reserves that will last far longer than those found in Norwegian territorial waters. Second, the model has allowed for the development of an advanced national oil services industry, as national firms have invested in developing capabilities to meet the challenges involved in oil exploration and production found in the North Sea. Engineering and construction companies, as well as shipbuilding and offshore drilling companies stand out among these, with national firms coming to be recognized as world leaders in their area.

In summary, Norway's successful experiment in oil and gas has depended on:

- The benefit of an explicit and generally consistent policy focus on long-term wealth management;
  - Limited non-commercial policy interference in Statoil's operations;
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- Competition as a value-adding force in oil and gas policy; and
  - The government's application of an evolutionary attitude toward the role of Statoil and other Norwegian companies operating in the E&P sector, recognizing the changing nature of the industry and the need for internationalization.

**Colombia's** successes in the hydrocarbons sector are more recent, with spectacular recent discoveries and production increases, as the country has used **pragmatism** as the basis for its national oil and gas model. In 1999, faced with peaking production and declining reserves, the Colombian government took a number of steps to make the oil sector more attractive to foreign investment and to free the hands of the national oil company, Ecopetrol. In late 2003, as the outlook for production and reserves worsened and there emerged a real prospect of Colombia having to import oil to meet national demand, the government engaged in a wholesale revision of the regulation of the hydrocarbons sector. First, with the creation of the Agencia Nacional de Hidrocarburos (ANH), a new regulatory framework was created that has offered a highly competitive contractual environment for private and foreign oil companies. This has also helped to more clearly define roles between the government and the national oil company. In addition to this positive regulatory change, the terms of E&P improved with royalties being lowered to offer one of the most attractive tax and royalty regimes in Latin America, in particular for unconventional resources, which has attracted investments that would otherwise have gone to other countries with larger reserves. The government offered new concessions, generating great interest from private companies at a time when the major corporations were all looking to secure new reserves. International oil companies were no longer required to associate with Ecopetrol, and thus have complete control over their operations, however as has been seen in round after round of contracts, private actors still prefer to ally themselves with the national oil company.

Partly as a result of the new competitive environment, Ecopetrol has become a much more efficient and effective oil company, and saw its production double between 2008 and 2012. The company has come to be seen as a reliable partner by foreign firms, and has been encouraged by the government to expand its activities abroad, investing in E&P activities in Peru, Brazil, and the Gulf of Mexico. More than this, Colombia is also the home of Latin America's largest private oil company, Pacific Rubiales, a firm created only a short time ago to exploit marginal and mature fields, and which has internationalized its operations, all of which has brought new profits and employment to Colombia.

In summary, Colombia's recent success in turning around its hydrocarbons industry can be explained by:

- The adoption of a pragmatic approach to the management of the nation's oil and gas reserves;
  - An open and competitive environment that has encouraged greater efficiencies on the part of companies operating in the sector;
  - A competitive contractual environment for private and foreign oil companies that has led to extensive investment;
  - The creation of a regulatory framework for unconventional resources, the first of its kind in Latin America, in addition to a cutting edge regulatory framework for conventional hydrocarbons, which has allowed the country to manage its resources successfully and has attracted great interest from the private sector in a country with relatively minor oil and gas reserves; and
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- A restructuring of the national oil company, Ecopetrol, that keeps majority ownership of the firm in the hands of the Colombian state but allows it to operate according to business principles.

The final case that was extensively discussed by the energy working group, was that of **Brazil**, a hydrocarbons model based on **pragmatism, flexibility and the development of national capacity**. Brazil has become the most well-known oil and gas success story in recent years as the national oil company, Petrobras, has dramatically increased its production, stock market capitalization and profitability. At the same time Brazil has seen its national oil reserves multiply and the country has achieved oil independence as national supply has equaled national consumption for the first time in history. In more recent years, the Brazilian model has also highlighted the errors of excessive state intervention and the speed with which these errors can impact national economic development.

Beginning in the 1970s, at a time when Brazil was a large oil importing nation and when the profound impact of the OPEC oil price crisis was felt intensely in the national economy, the Brazilian state has progressively engaged in multiple reorganizations of the oil and gas industry. The most profound changes in the system came in 1997, when the Petroleum Investment Law was passed by the national congress, which created a new regulatory framework and autonomous regulatory bodies, and at the same time liberalized the oil and gas sector to create competitive forces. At the same time as the State's monopoly on oil and gas production was ended, Petrobras itself was reformed in such a way as to allow it to operate in the same way as a privately owned company, with private investment but majority control firmly held by the Brazilian State. The operational autonomy of the firm, through which it is allowed and even encouraged to partner with private and foreign firms, combined with its ability to reinvest profits in new E&P projects and the development of technical and technological capacities, has allowed Petrobras to become a world leader in deep water projects. Collaboration with the private sector has been key, both to develop these new capacities and to share the enormous financial risk of deep water oil projects and to make the discoveries in the Pre-Sal that have placed Brazil firmly on the world's oil map.

Petrobras highlights the importance of distinguishing between potential for private investment in the national oil company and the question of control. Whereas the company has benefited enormously from the injection of capital from the private sector both in Brazil and abroad, the State has maintained overwhelming control of the voting shares in the company. This allows the government to continue to benefit from the profits from the company's success, as well as using the company as a tool of development. However, although it maintains majority control, the Brazilian State has allowed Petrobras a very high level of operational autonomy, and rarely interferes in business decisions. This autonomy, both financial and operational, is one of the primary factors that explain the company's success in determining its own future and in maximizing its positive economic impact on the national economy.

Unfortunately, in the last two years Brazilian authorities have adopted a more interventionist approach, determining that Petrobras must be a majority partner in all operations, and creating a series of mechanisms to intervene in technical and operational decisions. Moreover, the authorities have slowed down the development of the industry and the reserve by setting excessive demands in terms of national content, regulatory slowness, and delaying bidding rounds. The results have been clear: investors have been put off and have lost interest, Petrobras has repeatedly failed to meet its production targets and has begun to report losses, and the industry has witnessed an inflationary spiral for services. The emphasis on

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the national oil company at the expense of the private sector has therefore damaged the national interest and the sector.

The Brazilian model's success can be summarized as the result of:

- A willingness to change the constitution to meet the energy needs of modern Brazil that has led to oil independence;
- A pragmatic approach to production-sharing and business partnerships through multiple operators;
- Heavy investment in the national oil company, Petrobras, that has allowed it to become a world leader in deep water technologies; and,
- An injection of private capital into the national oil company without losing control of the firm, as well as the encouragement of international private capital participation and the development of private national firms.

#### **A NEW BEGINNING FOR MEXICAN OIL**

Based on all of these observations, the WWICS/ITAM energy-working group makes the following recommendations to the nation's legislators and policy makers:

1. **There is an urgent need for reform of Mexico's national hydrocarbons industry.** The existing model has reached its limits and can no longer guarantee the nation's energy security. Furthermore, the model has long since ceased to maximize economic benefit for the nation, and is now getting to the point where it will no longer be able to provide economic rent to the Federal government at the levels required by the government.
  2. **The coming debate over reform must be based on clear and common concepts of key concepts** to avoid confusion and to ensure that a true political and social consensus is reached on the question of how to organize the nation's hydrocarbons industry. A common language of reform is crucial to avoiding unnecessary misunderstandings and semantic conflicts.
  3. **The reform process must be based on considerations of energy security and maximizing economic benefit** from the oil sector in national interest rather than merely focusing on maximizing rent for the government. The experience of countries such as Norway points to ways in which this may be achieved.
  4. **A constitutional change is required to be able to satisfy these goals.** The current prohibitions on risk contracts, production sharing and concessions, as well as the monopoly granted to Pemex prevent the oil and gas sector from overcoming the very deep challenges it faces.
  5. **This constitutional change should be ambitious and sweeping.** The current economic and political climate is conducive for a major change in the sector, with an emerging consensus over the need for reform among the main political actors. What's more, it must include reforms not only to the constitution but to the broader legal and regulatory framework that governs the sector.
  6. **The new constitutional arrangement must be written in such a way as to maximize flexibility.** It is essential that any new constitutional arrangement for hydrocarbons is simple and clear and allows for government policy to react to changing economic and market conditions.
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7. **Pemex needs to be granted greater financial and operational freedom.** The new constitutional arrangement and the secondary laws that govern the national oil company must allow it to operate according to an economic and business logic, rather than merely serving the fiscal needs of the federal government. That is to say, we must make Pemex responsible for its own decisions and future. Pemex, as it stands today, lacks the technology, experience and capital to be able to exploit the potentially huge hydrocarbons reserves that exist in the deep waters of the Gulf of Mexico and in unconventional fields, in particular shale gas and shale oil. A reform is needed that will grant Pemex these faculties and allow it to continue providing for the nation's energy security. It should be allowed to form alliances and to choose its business partners and be allowed to keep a greater percentage of its profits for reinvestment in E&P and technology and human capital, as well as keeping a larger share of its profits, which will remove Pemex from the national budget and allow the state to redirect these valuable resources to sectors of society that have more urgent needs.
  8. **There is an urgent need to strengthen national oil and gas regulators.** Unless a level playing field is provided for actors in the hydrocarbons sector, one that ensures competitive rules for all participants, private interest in the sector will be limited. The experience of countries such as Colombia shows us how effective and efficient regulation can greatly boost the competitiveness of the sector. Moreover, it is through regulation that the state can exercise its management of the sector, and for this Mexico needs stronger, more professional and more autonomous regulatory bodies, which will embrace a longer-term view of the national interest.

## **CLOSING THOUGHTS**

Mexico stands at a critical juncture in the development of its hydrocarbons sector, with multiple pressing oil and gas challenges, and a looming crisis for federal government revenue for several years that have been compensated by high international prices for oil. To respond to this situation, a fundamental shift in the management of the sector is needed to harmonize the structure of the sector to the needs of the rest of the economy, making it more competitive and sensitive to market signals. The country's legislators will soon engage in an intense debate over how best to address these challenges, and there are encouraging signs that the incoming government of President-elect Enrique Peña Nieto is willing to seek a far-reaching reform. What is now needed is a rational, informed and comprehensive national conversation about the best way to equip Mexico's hydrocarbons sector for the future.

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