RESOURCE Management in Latin America

Humberto Campodónico

REVENUE WATCH INSTITUTE

COMPARATIVE STUDIES, 2000-2005

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Summary

The purpose of this study is to assess the effects of types of mixed management in predominantly private hydrocarbon companies involved in upstream exploration and exploitation in Latin America. In some cases, aspects related to the transport, distribution and downstream marketing sectors are also addressed.

The first case study is of predominantly public mixed management between public and private enterprises in Ecuador and Colombia. The second case deals with primarily private mixed management in Argentina, Bolivia and Peru.

For each type of management, recent legal changes in the upstream sector are examined first, which in turn determine each country's hydrocarbon sector policy. Then, to assess the effects, investment in the upstream sector and its impact on oil and natural gas reserves and production is analyzed. Similarly, financial statements of public enterprises are looked at to assess their outcome, as well as the fiscal impact of policies applied to the hydrocarbon sector.

Part One of this study assesses the results of public oil companies across several countries in Latin America where the state controls upstream exploration and exploitation in the hydrocarbon sector. In some cases, aspects related to the transport, distribution and downstream marketing sectors are also addressed. The countries chosen were Brazil, Chile, Mexico and Venezuela.

For each case, this section first examines recent legal changes in the upstream sector, which in turn determine each country's hydrocarbon sector policy. Then, to assess the effects of public management in these countries, it analyzes investment in the upstream sector and its impact on oil and natural gas reserves and production. Similarly, Part One examines financial indicators of public enterprises in order to assess their outcome, as well as the fiscal impact of policies applied to the hydrocarbon sector and the corresponding social expenditure. Whenever applicable, energy internationalization and integration policies are also considered.

The purpose of Part Two is to assess the effects of types of mixed management in predominantly private hydrocarbon companies involved in upstream exploration and exploitation in Latin America. In some cases, aspects related to the transport, distribution and downstream marketing sectors are also addressed.

The first case study in this section involves predominantly public mixed management between public and private enterprises in Ecuador and Colombia. The second case deals with primarily private mixed management in Argentina, Bolivia and Peru.

For each type of management, recent legal changes in the upstream sector are examined first, which in turn determine each country's hydrocarbon sector policy. Then, to assess the effects, investment in the

upstream sector and its impact on oil and natural gas reserves and production is analyzed. Similarly, financial statements of public enterprises are looked at to assess their outcome, as well as the fiscal impact of policies applied to the hydrocarbon sector.

Annexes and bibliographical references for both Part One and Part Two are included at the end of the book.

Introduction

Recent years have brought important changes to the oil sector in several Latin American producing countries. Regional news and events sometimes suggest a trend towards tighter state control over the industry, which run contrary to the investor-friendly policies that seemed firmly established during the 1990s. Under scrutiny, however, the region in fact reveals a much more diverse environment of trends and practices.

Countries in the Western Hemisphere have been experimenting with policies to guide the petroleum sector, some relying on state-owned monopolies or a mix of public and private companies, and others consigning the sector to private enterprise and the free market. While international headlines have featured several Latin American leaders increasing state control over the oil sector in recent years, this report reveals the more complex reality of a region trying to use a range of policies and approaches, based most of all on the pragmatic and political constraints of each country and its industry.

This survey by economist Humberto Campodonico offers insight into these diverse approaches to oil sector management in eight Latin American countries between 2000 and 2005. The analysis of this period is crucial to understanding the recent transformation of the regional environment for petroleum operations.

The countries under study were classified according to each state's level of control over its upstream oil sector at the time the study was first published in Spanish. From 2000 to 2005, state-owned companies predominated in Brazil, Chile, Mexico and Venezuela; in Colombia and Ecuador mixed management prevailed; while Argentina, Bolivia and Peru allowed private companies to dominate exploration and production.

The report assesses each country's performance against a common set of questions: What legal changes to the upstream sector were enacted in recent years? What changes, if any, resulted in investment flows to the upstream sector? How have financial indicators for national oil companies (NOCs) and other state-owned oil been affected? And, how have governments benefited from revenue generated by petroleum exploration and production? Although the report does not offer cross-comparisons, it provides valuable information for anyone seeking to understand the choices each country has made as it develops its oil reserves.

Each country case study begins with an assessment of legal changes in the oil industry from 2000 to 2005, and an overview of oil sector management. The study also includes information about national oversight of oil companies and the special institutional arrangements that each country made with its industry.

Additional findings offer insight on NOC capacity to make independent investment decisions. While some companies act as commercial entities and remain separate from the national government, others operate with budgets, investments and projects under government control.

There is some indication of increased capital spending in all eight countries, but each case is unique in the specifics of who is allowed to invest, the results (as measured by expansion of reserves), and the national political events that often interfere with investment.

The picture emerging from this survey is of a region sampling different policies to develop its resource base, and where countries are not averse to midstream adjustments if they appear to be in the national interest.

High oil prices drove a climate of ongoing change, and RWI recognizes that some of the report's conclusions are outdated. Bolivia nationalized its oil industry in May 2006, for instance, and Venezuela had shifted international oil companies into a service provider role by late 2007. At the same time, Colombia deepened its market approach through an initial public offering of its national oil company, which has gained private shareholders, but lost its monopoly over the oil market.

Though these changes alter the specific circumstances at the national level, RWI is releasing this report to contribute to the wider discussion of these policies in Latin America, and to provide sound information as a basis for ongoing dialogue on how to turn mineral resources into sustainable development. The end of the remarkably long cycle of high oil prices is bound to bring further changes to the region. As countries brace for declines in export earnings and faltering investments, new policy experiments are likely to emerge.
In Venezuela, the government has recently signaled some openness to private oil companies, while still furthering nationalization in other areas of the sector. In Mexico, reform has continued "in slow motion," with a gradual opening of opportunities for service companies. In Brazil, the success of Petrobras has attracted increased scrutiny from politicians concerned about possible abuses, or keen on increasing control over the company. Bolivia and Peru both saw corruption scandals erupt at the end of the high price cycle, which will likely spur the desire for tighter controls.

The original report, written by Humberto Campodonico with the assistance of Jhon Valdiglesias, was published in Spanish in March of 2007. Revenue Watch would like to thank the publisher ECLAC and the author Mr. Campodonico for their authorization to translate and publish this English version.

| PART ONE |

Public Management in the Hydrocarbon Industry

Introduction

Prior to analyzing management styles, it is necessary to study the legal and regulatory framework governing each country. Furthermore, legal reforms have different purposes that range from reinforcing predominantly public management schemes to upholding purely private management systems.

This section analyzes the results obtained in the hydrocarbon industry for those countries with predominantly public management schemes. It focuses on the upstream stages in four countries of Latin America: Brazil, Chile, Mexico and Venezuela. Part Two analyzes mixed management in Colombia and Ecuador, as well as predominantly private management in Argentina, Bolivia and Peru, at least during the first five years of this century.

Public management is defined by the key active role played by public enterprises, where the state owns the bulk of reserves and is responsible for exploration, exploitation and domestic supply. This management style has yielded different results in Brazil, Chile, Mexico and Venezuela depending on their particular legal provisions, the sui generis relation of state companies with other state institutions (especially with tax agencies, as in Mexico) and available oil resources. (Even though Chile is a net importer, it still matches this profile.)

In order to assess the results of different management styles, it is essential to analyze whether they have led to increased investment, and subsequently to a rise in hydrocarbon reserves and production. This way, the domestic market self-supply target is achieved and surpluses for export are generated, thus increasing the inflow of foreign exchange.

Other indicators taken into account when assessing management styles relate to the economic and financial circumstances of public enterprises wherever these are present and their relation with the central government. The impact of taxes originating in the hydrocarbon sector collected by governments is also examined. In some instances, in spite of attaining the targeted reserves, production and foreign exchange levels, the healthy economy of state-owned enterprises is affected (as is the case with Mexico.) Internal and external auditing policies (the fight against corruption), together with energy internationalization and integration, are also important.

This section is divided into five chapters. The first chapter begins by highlighting the effects of the management style analyzed for the above four countries. Chapters 2, 3, 4 and 5 review management styles adopted in Brazil, Chile, Mexico and Venezuela, respectively.

PART ONE

List of Boxes, Figures, and Tables

Boxes

Figures

Tables

I. Overview and Findings

This section analyzes state-owned companies in countries where state activities are predominant. Such is the case in Brazil, Chile, Mexico and Venezuela. It is worth noting that reserves and production levels vary from one country to the next. For instance, Mexico and Venezuela rank first in the region in terms of reserves and production, and are subsequently net exporters. In the case of Brazil, reserves are lower than Mexico's and Venezuela's, and Brazil attained self-supply only this year, which explains why Brazil is not an oil net exporter. Concerning Chile, the country has almost no oil resources, which is why it must import more than 90% of the oil it consumes. In Chile, 98% of the scarce hydrocarbon exploration and production activities are performed by the *Empresa Nacional de Petróleo* (ENAP), as are 100% of refining activities.

A. Legal Modifications During the Current Decade

In the above countries, legal modifications to the hydrocarbon sector during the current decade have not followed a common pattern, in contrast with the changes that took place during the 1990s. Therefore, analysis must be performed on a per country basis.

In the case of Chile, no legal modifications have been implemented. Legislation allows for private participation in all industry stages, whereas ENAP is in charge of 98% of exploration and 100% of production. This reflects the country's scarce oil resources and inability to lure private investors. As for refining activities, the Chilean government has opted to maintain state ownership over the two largest refineries. Although private companies may freely operate in the sector, there are no private refineries. The state does not intervene in the fuel retail distribution sector, since the private sector performs all related activities.

In Brazil, the 1997–1998 laws and regulations opening the oil sector to private investment and terminating PETROBRAS's monopoly are still in force. Nevertheless, almost 10 years later, private capital is still scarce and insignificant in the exploration and production sector, as well as in refining activities and pipeline transportation. Thus, the presence of PETROBRAS in these activities is still predominant. There have been no changes in fuel distribution either. Private investment is significant, as is PETROBRAS's.

In Mexico no legal modifications have been implemented, thus ensuring PEMEX's monopoly in oil and natural gas exploration, production and refining activities. In spite of governmental efforts, no significant modifications have occurred regarding PEMEX's taxation regime, and the state-owned company still transfers 60.8% of total revenues to the Treasury.[1] In 2006, an amendment to PEMEX Law referred to power co-generation.

Since 2001, Venezuela has introduced substantial amendments to the legal system governing the hydrocarbon sector. The trend has been to increase the state's share in the ownership of hydrocarbon assets to at least 51% of stock ownership, a new trend that breaks away from the developments of the past decade. Likewise, in 2006 income tax legislation was modified to increase taxes on strategic partnerships along the Orinoco Belt. These legal provisions explicitly prescribe the subordination and subjection of *Petróleos de Venezuela S.A.* (PDVSA) to the Ministry of Energy and Petroleum (*Ministerio de Energía y Petróleo*.) Likewise, new legal provisions determine the weight of social expenditure by PDVSA at the same level as other activities related to its operational management in the sector.

B. Management Style

In Brazil, Chile and Mexico the state companies analyzed herein have each adopted a holding scheme to organize their productive activities. Thus, all business units are independently managed, reporting their activities to a central unit that in turn consolidates management results. In Venezuela, the management scheme has been altered, going from three vertically integrated companies corresponding to the producing areas to two companies, which, although maintaining their vertical integration, exploit oil and gas separately.

ENAP, PETROBRAS and PEMEX each have an exploration and production business unit devoted to the upstream sector. However, in the downstream sector the different business units are characterized by different management styles.

PEMEX has a separate business unit devoted to refining activities. The same does not apply to PETROBRAS and ENAP, where the refining business unit goes hand in hand with other activities such as logistics, transportation and commercialization. Moreover, PEMEX has created a separate unit specializing in basic petrochemicals and natural gas, and yet another one covering the petrochemical industry.

In total, PETROBRAS is made up of six areas, and stands as the company with the highest number of business units. As previously mentioned, in addition to the area devoted to exploration and production, PETROBRAS has a business unit specialized in refining, marketing, petrochemicals and transportation. The four remaining areas are distribution, natural gas, energy and international affairs.

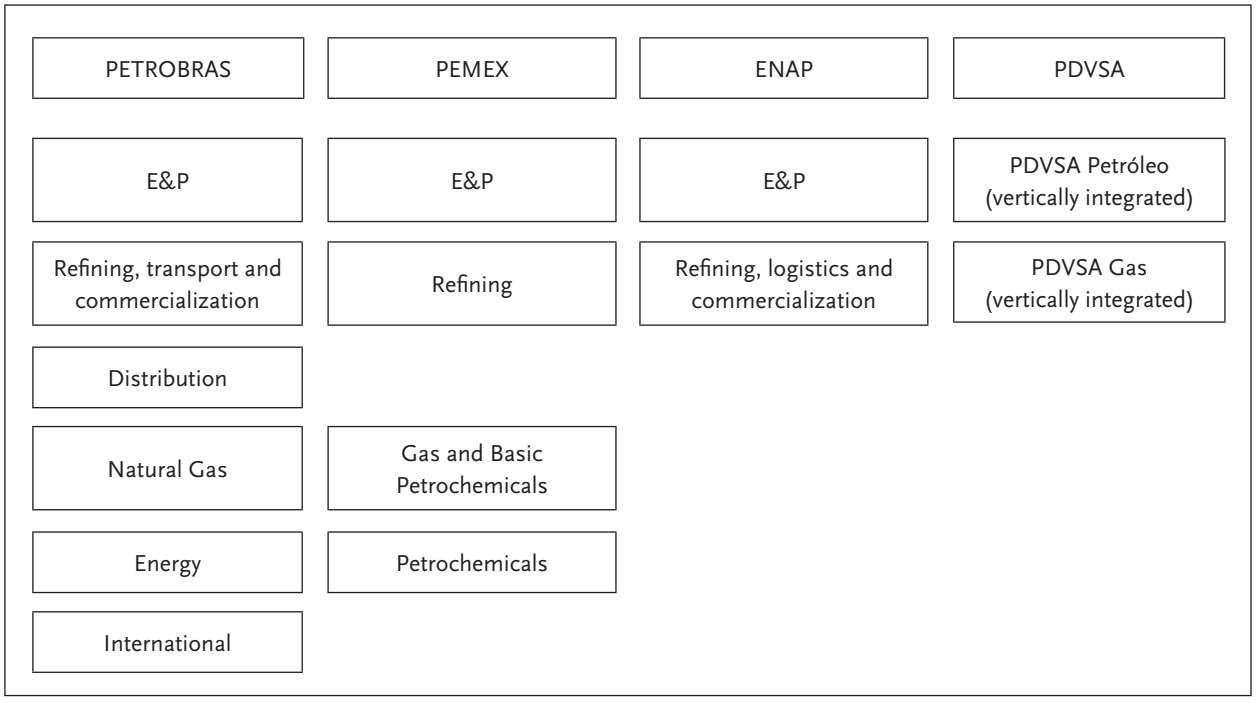
ENAP features two business lines: one focused on exploration and production, the other on refining, logistics and marketing. The first line deals with the upstream sector in the oil industry, the second with the downstream sector. It is worth noting that both business lines have been internationalized.

Until 1997, PDVSA's holding consisted of the Lagoven, Maraven and Corpoven companies, all vertically integrated. In 1998, the three companies were merged into one entity called PDVSA *Petróleo y Gas S.A.*

In 2001, the company was divided into two entities, PDVSA *Petróleo* and PDVSA *Gas*, both subsidiaries of the parent company, *Petróleos de Venezuela S.A.*

On an international scale, *Petróleos de Venezuela* carries out crude refining operations in the United States through its subsidiary PDV Holding Inc., and in Europe through *PDV Europa B.V.* On the other hand, PDVSA Finance was created in 1998 as PDVSA's main financial agency, charged, for instance, with debt issue.

Figure 1
Business Units in State-owned Company Holdings



C. Company Auditing

In ENAP, there is an Internal Auditing Committee composed of three members from the company's Executive Board: a representative from *Sociedad de Fomento Fabril* (SOFOFA, on behalf of national employers) who chairs the committee; and two representatives from *Corporación de Fomento* (CORFO). The committee abides by an annual internal auditing program. The committee also chooses outside auditors for ENAP's financial statements. It must issue an opinion *a priori* before the Executive Board on the reports issued by outside auditors and on the report by the *Contraloría General de la República* (Office of the Comptroller General of the Republic).

In PETROBRAS, the articles of association establish the creation of a Fiscal Council (*Consejo Fiscal*) (Art.43) composed of five permanent members elected by the General Shareholders Meeting. Two are elected by private shareholders, one by non-controlling shareholders and another by preferential shareholders in separate elections. A fifth member representing the Public Treasury is designated by the Minister of Economic Affairs.

This Fiscal Council has a wide mandate (Art. 46): any of its members may audit the managers' actions and verify compliance with their legal and administrative duties. It may also issue an opinion on investment plans and capital budgets, dividend distribution and the company's merger or demerger. Any of its members may denounce the management entities if they do not implement the necessary measures to safeguard the company's interest and may report any frauds or crimes committed.

Petróleos Mexicanos (PEMEX) has approved a Program for Transparency and Fight Against Corruption (*Programa de Transparencia y Combate a la Corrupción*, PTCC) in compliance with the Federal Law on Transparency and Access to Governmental Public Information (*Ley Federal de Transparencia y Acceso a la Información Pública Gubernamental*). PEMEX's officials are in charge of implementing the PTCC. They are also in charge of a General Steering Commission (*Comisión General Directiva*) composed of General Managers, Corporate Managers and Internal Comptrollers.

The General Steering Commission assesses the acquisition, public works and marketing programs, as well as human resources and the projects' financial cycle. The General Steering Commission holds advisory panels with different business entities. It has its own Code of Conduct and methodology to review bidding conditions.

As for PDVSA, its articles of association do not envision any specific auditing mechanisms. There are corporate internal auditing offices at the company's different management units.

D. Decision-Making over Investment

Among the companies examined in this study, PETROBRAS and ENAP retain their economic and financial independence, which allows them to fund investment, using either their own resources or bank financing. Part of ENAP's utilities are transferred to the Treasury Department, although this does not restrict its cash flow and it allows the company to finance a substantial portion of investment with its own resources. On the other hand, PETROBRAS funds investment with its own resources and third party debt, whether through the state's development bank *Banco Nacional de Desenvolvimiento Económico y Social* (BNDES) or through international private banks or bond issues both in the domestic and international market.

As for PEMEX, it is subject to significant fiscal restrictions, since it must transfer 60.8% of its revenues to the Treasury Department, which in the past few years has implied losses, resulting in liabilities exceeding its assets. Congress must approve PEMEX's investment needs and budget. This explains why it has resorted to funding mechanisms based on indebtedness (Pidiregas type) which in turn has seriously compromised the company's viability.

In the case of PDVSA, the articles of association (Clause 13) grant the General Shareholders Meeting the power to approve the investment budget. However, recent legal modifications have subjected the company to state control via the Ministry of Energy and Petroleum (*Ministerio de Energía y Petróleo*), as well as the growing social investment assumed by the company, leading to a new scenario that could limit its investment capacity.

E. Investment Behavior

The four countries analyzed have recorded a significant increase in investment by state-owned companies (although in the case of PDVSA it fell in 2002 and 2003 due to a strike). However, investment has had a different impact in each country in terms of increased reserves and production. Only in the case of Venezuela has Foreign Direct Investment (FDI) been relevant.

In Brazil, investment by the state-owned PETROBRAS has been predominant and led to the increase of reserves and production alike. Production amounted to 2 million barrels per day (MMBD), thus ensuring

Brazil's self-supply. FDI has slightly increased in the upstream sector, without altering the above scenario. Thus, Brazil's management style has proven to be successful.

In Chile, investment by ENAP in the upstream sector abroad has grown considerably, remaining stable inside the country. This is due to Chile's scarce oil resources and to ENAP's targeted investment abroad, aimed at mitigating the hydrocarbon production deficit in the country. The strategy was successful insofar as ENAP has reserves abroad and its oil production abroad is seven times higher than Chile's.

In Mexico, investment by PEMEX has increased considerably in recent years, although it is still deemed insufficient to increase the existing production and reserves (it is worth noting that the main reason behind falling reserves is the change in technical specifications to determine proven reserves). In order to increase investment, PEMEX has resorted to mass indebtedness (Pidiregas), since current legislation decrees that PEMEX transfer more than 60% of its revenues to the state. Thus, PEMEX's management is currently facing a series of issues mostly due to the inadequate relations between the company and the state. If the regime remains unaltered, PEMEX's problems will prevail.

In Venezuela, until 2001 the management style combined FDI with investment by the state-owned PDVSA. Concerning FDI, operating agreements resulted in a total investment of US$15.2 billion during 1993–2005, with the bulk of investment materializing in the mid-1990s. Production rose from 20 to 500,000 barrels per day in 2001, remaining stable in the past few years. Another FDI arrangement was the strategic partnerships formed to promote heavy crude oil along the Orinoco Belt. Investment in four partnerships amounted to US$12.4 billion for 1995–2005; most investment materialized in 1997–2002. Production began in 1996, and by 2005 amounted to 620 kbd. Combined production for operating agreements and strategic partnerships represented 34% of the total 3.2 million barrels per day produced in Venezuela in 2005.

Thus, it would be fair to say that the "Apertura Petrolera" (Openness Policy) of PDVSA in the 1990s achieved the investment and production targets. Nevertheless, this policy has been seriously criticized since 1998–1999 by the new government in Venezuela. Criticism has essentially focused on the insufficient share of the state in the ownership of these companies and has advocated for changes. Likewise, the government states that tax share is also inadequate and should be modified.

Thus, since 2001, new legislation has been enacted to better capitalize on income taxes, and at the same time increase income tax rates. Concerning operational agreements, service fees paid to companies have been reduced. Royalties have increased for strategic partnerships.

In 2005, the government decided that the state should have a majority share in capital stock both in operational agreements (enforced in 2005 and 2006) and strategic partnerships (the process is already underway).

With respect to PDVSA, its annual investment amounts had fallen since the beginning of the new millennium. The fall was aggravated in 2002 and 2003 due to the company's strike; however, it began to recover in 2004 and in 2005 investment exceeded US$3.878 billion. Likewise, PDVSA designed an ambitious investment plan in the framework of the *Plan Siembra* (oil sowing plan) whereby in 2006–2012 investment would amount to US$56 billion (an average US$8.0 billion per year.)

Despite the fact that PDVSA has decreased its foreign debt considerably, from US$8.0 billion in 2001 to US$3.165 billion in 2006, uncertainty remains regarding the funding of new investment, and subsequently the company may again resort to debt.

F. Reserves and Production Indicators

The four countries reviewed are characterized by different oil reserves. Three of them, Venezuela, Mexico and Brazil, rank first in the region with 79.0, 11.8 and 11.8 billion barrels, respectively. In Venezuela, the government has executed a project seeking to certify heavy crude reserves located in the Orinoco Belt, in the framework of *Plan Siembra Petrolera* (2006–2012), with planned investment amounting to US$15.32 billion (30% of the *Plan Siembra Petrolera*), amounting to an additional 270 billion barrels and transforming Venezuela into the country with the largest oil reserves worldwide. Of the four countries analyzed herein, Chile holds the scarcest reserves, amounting to 150 million barrels (MMB), most of them belonging to the public oil company ENAP.

This study found that predominantly public management has not been determined by the amount of reserves, since this type of management is present in countries with large reserves, but also in countries with small reserves, such as Chile.

Likewise, it is worth mentioning that in all cases except for Mexico, legislation allows for participation of private companies in the exploration of new reserves through international bidding procedures, while public companies have dominated in the acquisition of new fields. Especially in Venezuela, legislation prescribes that private companies may invest in the sector through partnerships with PDVSA, with the latter owning a minimum 51% of reserves.

Regarding the evolution of oil production, the countries analyzed exhibit positive trends; however, there have been periods when production has fallen, for different reasons in each case. For instance, Venezuela recorded the largest fall (13%) in 2003 due to the strike staged from December 2002 to February 2003; the industry recovered in subsequent years. Mexico witnessed a slight reduction in production during 2005—the only case for the period under analysis (2000–2005)—caused by the lack of investment in assets. Nevertheless, Mexico ranks first in production for Latin America.

The situation in Chile is two-fold: on the one hand, oil production by the state-owned ENAP has fallen sharply year after year; on the other, production outside Chile has exhibited a growing trend. Nevertheless, production has decreased at certain points due to external factors present in the countries where ENAP operates, such as the social movements that have taken place in Ecuador and Argentina. On the other hand, Brazil has performed best in terms of production growth, so that the country and PETROBRAS's shareholders have benefited from significant increases in oil revenues.

G. Relation with Foreign Investment

In Brazil, the oil opening starting in 1997–1998 was aimed at luring Foreign Direct Investment in the sector. However, participation of foreign investors in the bidding rounds did not have the expected results. (At the same time, PETROBRAS has been very dynamic when it comes to investment activities.) In the refining sector, no significant foreign investment has been recorded, although it is already present. In the fuel wholesale and retail distribution sector, foreign capital, domestic capital and PETROBRAS investment are widely present.

In Chile, current legislation provides many incentives to foreign investment in the hydrocarbon sector. Nevertheless, the scarce domestic oil resources resulted in a small contract for oil exploration. In the fuel retail distribution sector, foreign and domestic capital are widely present, but ENAP has not invested in this activity.

In Mexico, oil legislation has remained unchanged, granting PEMEX a monopoly over oil exploration and production.

In 2001, Venezuela began to redefine relations with foreign companies, leading to greater state control, as described above. This redefinition has not resulted in significant conflict with foreign companies present in the sector. For instance, only three companies refused to migrate operational agreements to mixed investment companies. Concerning strategic partnerships, all companies decided to keep operating in the country. However, it is too early to assess the impact of this redefinition in future investment plans.

Concerning new investment, the *Plan Siembra Petrolera* began a tender procedure (in August 2006) with 13 bidding foreign companies for the Deltana-Caribbean Platform.

H. Energy Internationalization and Integration

All the state-owned companies in the countries analyzed have internationalized their activities. However, performance has varied greatly from one company to the next.

The most successful company has been PETROBRAS, with the largest investment amounts abroad, highly diversified in several regions: Africa, Asia (China), the United States and Latin America. Most investment has focused on exploration and production activities, resulting in a production of 250 kbd. Eighty percent of PETROBRAS's international activities take place in Argentina, as reflected in the acquisition of Pérez Companc in 2002. Bolivia is the next largest; PETROBRAS operates the country's large natural gas fields. Additionally, PETROBRAS owns smaller fields in Colombia, Ecuador and Peru. PETROBRAS is also involved in refining activities, primarily in Argentina and Bolivia (here, the new government has decreed the nationalization of the two refineries previously owned by PETROBRAS). The company also intends to build a refinery in Venezuela.

In the domain of energy integration, in 1998–1999, PETROBRAS, together with other companies, built a gas pipeline from Santa Cruz (Bolivia) to Sao Paulo. PETROBRAS is very interested in the *Gaseoducto del Sur* (Southern Gas Pipeline), a project led by PDVSA.

Chile's ENAP has undergone a significant internationalization process (according to its size) of investment in exploration and production in several countries, including Egypt, Iran and Yemen. In South America, ENAP produces oil in Argentina and Ecuador, and owns exploration blocks in Colombia and Venezuela. In recent years, ENAP has begun to operate in the fuel retail distribution sector in Ecuador and Peru (it purchased Shell's assets in both countries), which in turn allows the company to export surpluses of oil products from its refineries.

The state-owned PEMEX has not made any progress in recent years in its internationalization process, mainly due to budgetary restrictions. Together with Shell, PEMEX owns 50% of the Deer Park refinery in the United States. Furthermore, PEMEX owns 5% of Repsol's stock. Recently, PEMEX announced it intends to perform activities in the upstream and downstream sectors in Bolivia and Peru.

Traditionally, the state-owned PVDSA has significant internationalization of its activities. PVDSA owns a refinery and several gas stations in the United States (CITGO); it is also the co-owner of several refineries in Europe (with refining capacity of approximately 2 MMBD). In recent years, PVDSA began its investment plan in Latin America. Several upstream and downstream projects are underway in Bolivia, and PVDSA affiliates have settled in Argentina and Colombia. In Uruguay and Paraguay, PDVSA has acquired a number of assets in

the downstream sector. In the domain of energy integration, PDVSA is building, together with ECOPETROL, a binational gas pipeline, and has designed ambitious plans for the execution of the *Gasoducto del Sur* (Southern Gas Pipeline) which is now under review. Through PDVSA, the Venezuelan government entered significant energy partnership agreements with several countries in the Caribbean region and Central America. It also promotes the design of integration projects through Petroamérica, which includes Petroandina, Petrocaribe and Petrosur.

II. Industry Management in Brazil

In Latin America, Brazil ranks third in terms of reserves, which amounted to 11.8 billion barrels in December 2005, behind Venezuela and Mexico. Production in 2005 came to 1.718 billion barrels per day, while consumption totalled 1.819 billion barrels per day. This accounts for a significant decrease in the gap between domestic production and internal consumption, one of the explicit goals of PETROBRAS. Brazil attained oil self-sufficiency in 2007.

In Brazil, PETROBRAS previously operated as a monopoly in the hydrocarbon sector in accordance with Brazilian legislation in force. This changed in 1997, when the government decided to open the sector to a higher number of competitors and to deregulate prices. Subsequently, it created the *Agencia Nacional de Petróleo* or ANP (Oil National Agency), responsible for granting exploration and production licenses and for regulating the sector.

From 1999 to date, eight bidding rounds have been launched for different oil blocks, most of which have been awarded to PETROBRAS, whether alone or in partnership with third parties. Thus, foreign investment in the sector is relatively insignificant.

PETROBRAS stands as the most internationalized company in Latin America, investing in exploration, production and refining activities in more than 14 countries. In 2003, its assets abroad amounted to US$7.827 billion.

A. Legal and Regulatory Framework

The liberalization of Brazil's oil policy formally began in November 1995, when the Parliament approved Constitutional Amendment No. 09, which allowed for the inflow of private capital in hydrocarbon activities. Its stated purpose was to promote investment in the sector in order to achieve full self-sufficiency for the country, whose production was exclusively in the hands of the state-owned PETROBRAS.

After more than two years of intense political debate in the country, in mid-1997 the new Oil Law (Law 9478) deregulated the oil sector, which consequently opened oil field exploration and exploitation to the private sector, both domestic and foreign, thus putting an end to PETROBRAS's monopoly, which dated back to 1988.

The *Asociación Nacional de Petróleo* or ANP (Oil National Association) was created as the regulating agency in the oil sector, reporting to the Ministry of Energy. The ANP's main purpose is to promote regulation, contracting and monitoring of all economic activities related to the oil industry.

Essentially, the ANP has been charged with two tasks: (i) authorization of refining, transportation, import and export activities, and (ii) auditing these activities. In 1999, it launched its first annual bidding round for the exploration of oil fields. Several foreign companies participated together with PETROBRAS in a free competition.

ANP granted PETROBRAS most of the areas it claimed, which included the bulk of proven reserves. In exchange, it set a number of deadlines to begin operation in said areas as a prerequisite to retain its control over them, thus putting to the test the company's technical and financial ability.

Under the new legislation, foreign companies could produce oil in Brazil through exploration contracts in new areas or as PETROBRAS partners in the areas assigned to the state-owned company.

In general, the bidding terms depended upon the blocks' characteristics: continental, shallow water, deep water and ultra-deep water. The participating companies' operational capacity was certified depending on their technical background. Due to the characteristics of Brazilian sediment basins, the greater reserves are possibly found in deep and ultra-deep waters.

Each block comes with a mandatory working plan, audited by ANP. The program is divided into three stages. In the case of offshore blocks, the working commitment for the first stage is three years long, and consists of a 2D/2,000 km or 3D/600 km seismic application. During the second stage, two to three years long, exploratory wells are to be drilled. Finally, in the third stage, three additional wells must be drilled during three years. Going from one stage to the next requires at least 50% completion of the previous stage.

The criteria set by the ANP to grant licenses are: (i) 85% of weight per bond price; and (ii) 15% of purchase agreement for local goods and services. Furthermore, the ANP must set a royalty rate for each concession, ranging from 5% to 10%, and at the same time establish a percentage for domestic purchases by the operating companies.

Law 9478 envisioned the creation of a fund designated for research and development projects in the oil industry. Its resources will come from the royalties derived from oil and natural gas exploitation. The fund will be managed by the Ministry of Science and Technology (*Ministerio de Ciencia y Tecnología*).

B. Management Style

PETROBRAS is a mixed investment company governed by the *Ley de Sociedad por Acciones* (Art. 1), or Law for Public Limited Liability Companies. Under this law, the company is listed on the stock market. PETROBRAS consists of both private and public capital, although Article 1 states that: "State control will be exerted through the ownership of at least 51% plus one share of the capital stock with voting rights."[2]

PETROBRAS features two types of shares: common shares with voting rights and preferred shares without voting rights.[3] As illustrated in Table 1, the state owns more than 50% of common shares through the following shareholders: *Unión Federal*, with 55.7%, and BNDES, with 1.9% of total shares. Therefore, the state exerts PETROBRAS's ownership. Again, as Table 1 shows, private capital holds the majority of preferred shares (without voting rights).

PETROBRAS's capital stock has been set at 48.264 billion *reales*, equivalent to US$19.834 billion (at the December 2005 exchange rate). It is worth mentioning that in December 2005, the company's market value stood at US$74 billion, in marked contrast with the US $42 billion market value for 2004.[4]

PETROBRAS has been streamlined and acts as any other private company listed on the stock market, though it retains more than 56% of common shares (with voting rights) on behalf of the state, with the

remaining 27.5% in the hands of private companies. PETROBRAS's articles of association state that economic activities linked to its corporate purpose will be performed in free competition with other companies, according to market conditions and applicable laws (Art. 3).

The articles of association protect the rights of minority shareholders. Art. 18 establishes that the General Shareholders Meeting (where the state holds the majority stake) elects the members of the Management Board (no less than five and no more than nine), but minority shareholders and preferred shareholders are entitled to at least one (1) director each.

The Management Board designates the company's Executive Board, consisting of a Chairman (who must be a member of the Management Board) and six directors elected for three-year terms (reelection is permitted), who in turn may be dismissed by the Management Board (Art. 20). Before and after taking their position, the members of the Management Board and the Executive Board must submit their Assets Statement (Art. 22). The Management Board audits the directors' performance, sets their powers and reviews at any time the company's business records.

Table 1
PETROBRAS Shareholders (Number of Shares)

Capital stock composition		
Shareholders	**(07/31/2006)**	**Percentage**
	Shares	
Common shares	2 536 673 672	100.0
Unión Federal	1 413 258 228	55.7
BNDESPar	47 246 164	1.9
ADR Nivel 3	688 643 348	27.1
FMP—FTGS Petrobras	113 687 876	4.5
Foreign (Resolution No. 2689 C.M.N.)	68 451 155	2.7
Other individuals and legal entities (1)	205 386 901	8.1
Preferred shares	1 850 364 698	100.0
BNDESPar	287 023 667	15.5
ADR Nivel 3 e Regra 144-A	686 680 620	37.1
Foreign (Resolution No. 2689 C.M.N.)	276 193 816	14.9
Other individuals and legal entities (1)	600 466 595	32.5
Capital stock	4 387 038 370	100.0
Unión Federal	1 413 258 228	32.2
BNDESPar	334 269 831	7.6
ADR (ON Shares)	688 643 348	15.7
ADR (PN Shares)	686 680 620	15.7
FMP—FGTS Petrobras	113 687 876	2.6
Foreign (Resolution No. 2689 C.M.N.)	344 644 971	7.9
Other individuals and legal entities (1)	805 853 496	18.4

Source: PETROBRAS (*) Including BOVESPA and other entities.

Perhaps most important is the Fiscal Council (Art. 43), consisting of five permanent members chosen by the General Shareholders Meeting. Two are elected by private companies: one by minority shareholders (with voting rights) and the other by preferred shareholders, in separate elections. A third member is designated by the Ministry of Economic Affairs as a representative of the Public Treasury.

Any member of the Fiscal Council has wide powers to audit the actions of managers and to verify their legal duties and those relative to the articles of association (Art. 46). The Fiscal Council also issues opinions on investment plans and capital budgets, dividend distribution and the merger or demerger of the company. Any of its members may denounce management units if they do not implement the necessary measures to safeguard the company's interest and prevent fraud or crime.

In other words, the company may compete while maintaining its independence. Shareholders have access to wide auditing powers, which ensure the smooth operation of the company.

C. PETROBRAS's Corporate Strategy

PETROBRAS's corporate strategy is based on a series of targets of growth, profitability and social and environmental responsibility. In addition, it seeks to lead the oil, natural gas, by-products and biofuel market in Latin America, acting as an energy-integrated company that covers petrochemicals, renewable energy and international activities. Some of its main strategies are:

- Consolidating and leveraging the competitive advantages in the oil and petroleum products market in Brazil and the rest of South America.
- Promoting and leading Brazil's natural gas market and acting globally in the gas and electricity markets in South America.
- Extending globally its international actions to the company's business activities.
- Extending its participation to the biofuel market, leading domestic production of biodiesel and increasing its share in the ethanol business.

Business strategies are as follows:

- **Exploration & Production**
  - Increasing production and reserves, optimizing proven reserves or promoting new reserves, focusing on increasing light oil production and natural gas production and supply.
- **Supply**
  - Increasing Brazilian sales and products abroad and extending the industry's actions to biorefining activities, biomass, petrochemicals and fertilizers.
  - Distribution.
  - Leading the Brazilian market of petroleum by-products and biofuels, positioning PETROBRAS's brand as consumers' favorite brand and acting globally in the energy business.

- **Gas & Energy**
  - Promoting and consolidating the gas market while maintaining its profitability, looking for integration in South America, ensuring the structure of a reliable, flexible and competitive system to supply the country. Participating globally in the biofuel business, leading domestic biodiesel production and increasing its share in the ethanol business.
- **International**
  - Ensuring its leadership as an integrated energy company in Latin America and extending its actions in the exploration and production (E&P) in the Gulf of Mexico and Africa; expanding two international businesses, in addition to oil production in Brazil, and generating higher added value.

D. Investment

PETROBRAS investment exhibits a growing trend, amounting to US$4.148 billion in 1999 and US$9.580 billion in 2005. On average, investment in E&P amounted to almost 60% of total investment, US$5.758 billion in 2005. Secondly, investment in refining activities added up to approximately 15% of total investment, US$1.349 billion in 2005.

Table 2
PETROBRAS: Evolution of Investment (US$ billions)

Year	E&P	Supply	Gas and energy	International	Distribution	Other	Total
2000	2.927	0.558	—	0.318	—	0.345	4.148
2001	2.723	0.561	0.231	0.500	0.092	0.120	4.227
2002	2.875	0.858	0.443	2.008	0.150	0.101	6.435
2003	3.110	1.533	0.472	0.640	0.108	0.149	6.012
2004	4.309	1.335	0.214	0.797	0.418	0.368	7.441
2005	5.758	1.349	0.627	1.297	0.203	0.346	9.580

Source: PETROBRAS.

Under the 2007–2011 business plan, total investment comes to US$87.1 billion. Investment in E&P amounts to almost half of total investment, US$40,700 billion.

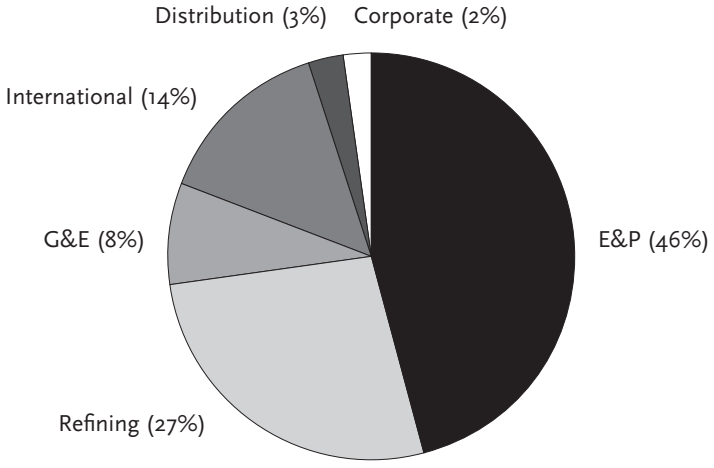
It is worth mentioning that a large portion of PETROBRAS investment projects are funded by the development bank (BNDES), as illustrated in Table 3.

Table 3
PETROBRAS's Investment Funded by BNDES, January 2003–June 2005 (US$ billions)

Business activity	Contracted, approved and under analysis		Arranged and under study	
	Investment	Funding	Investment	Funding
Exploration and Production*	2.444	1.022	1.976	0.855
Support Ships	0.648	0.550	0.149	0.134
Gas Transportation	1.126	0.295	1.621	1.459
Gas Distribution	0.372	0.195	0.035	0.024
Thermoelectrical to Gas	1.741	0.572	—	—
Suppliers	0.049	0.029	0.050	0.028
Total	6.380	2.664	3.831	2.501

Source: PETROBRAS, Memorandum 2005.
Note: * Including platform and refining.

Figure 2
PETROBRAS: 2007–2011 Investment Program (US$87.1 billion in percentages)



Source: PETROBRAS.

E. Oil Revenues

According to PETROBRAS's estimates, the added value[5] of its activities in 2005 was 115.309 billion *reales*, equivalent to US$43.426 billion. The methodology used is as follows: inputs, cost of goods, depreciation and amortization are subtracted from final sales amounting to 179.660 billion *reales*. The resulting figure is the annual added value (AAV.)

Therefore, the AAV equals 64% of total sales by PETROBRAS in 2005. By subtracting personnel expenses (in order to obtain an added value similar to Mexico's and Venezuela's in terms of methodology used), the resulting AAV comes to 105.667 billion *reales*, or US$43.426 billion.

AAV distribution—not including personnel expenses—(see Table 4) is as follows: 60.4% goes to the state in the form of taxes (income tax and indirect taxes); 16.2% corresponds to financial expenses (payments to financiers and suppliers), and 23.4% goes to profits for shareholders. PETROBRAS states that 6.7% goes to covering interest payments, 1% to profits distributed among shareholders not controlling the company, and 15.8% to non-distributed profits which remain within the company.

It is worth noting that the 23.4% ratio (profits/AAV, not including personnel expenses) is significant and comparable to the best in the industry.

Table 4
PETROBRAS: Annual Added Value Not Including Staff Expenses (US$ billions)

Business activity	2005		2004	
	Value	%	Value	%
Taxes	26.223	60.4	19.143	63.7
Payments to financiers and suppliers	7.032	16.2	4.546	15.1
Profits	10.170	23.4	6.347	21.1
Interest	2.897	6.7	1.724	5.7
Non controlling	0.420	1.0	0.575	1.9
Non distributed profit	6.852	15.8	4.047	13.5
Annual Added Value	43.426	100.0	30.037	100.0

Source: PETROBRAS, Análise Financeira e Demonstracoes Contábeis 2005, pp. 15–16.

F. Oil Opening in Brazil

Since the creation of the Brazilian hydrocarbon industry in 1997, seven international bidding rounds have been held. Private companies showed no interest in the fourth and fifth rounds. Later, during the sixth and seventh rounds, interest picked up among private companies and in terms of signature bonuses.

In fact, during the sixth round in August 2004, 154 blocks were sold. However, the majority of blocks with potentially large reserves were awarded to PETROBRAS. Brazil held its seventh bidding round in October 2005. The ANP reported a record high of 144 companies, which obtained licenses for 1,134 blocks. During this round, PETROBRAS and BG Group acquired the offshore block S-M-508 in the Santos field for US$72 million.

According to the Energy Information Administration (EIA), most foreign investors, such as Shell, BP and EnCana, avoided acquiring the direct operation of new bids and chose instead to enter partnerships in the fields operated by PETROBRAS.

Table 5
Brazil: Results of the Oil Bidding Rounds (Percentages and US$ Millions)

	1999	2000	2001	2002	2003	2004	2005	Total
	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	
Local content (%)								
Exploration stage	25.4	41.8	28.4	39.1	78.8	35	74	
Development stage	26.7	47.9	39.9	53.8	85.6	65	81	
No. of bidding companies	n/a	n/a	n/a	14	6	21	85	
No. of blocks awarded	12	21	34	21	101	154	251	
Total surface awarded (km²)	54,659	48,111	48,629	25,289	21,951	39,657	194,739	
Signature bonuses (US$ millions)	178	256	252	32	9	227	485	1,440

Source: Agencia Nacional de Petróleo (ANP.)

After seven bidding rounds, only one private company, Royal Dutch Shell, produces oil, in the Campos field.[6] Consequently, PETROBRAS retains 95% of domestic production.

On November 28 and 29, 2006, the eighth bidding round was held, offering 284 blocks covering approximately 101,000 km², located across 14 sectors in seven sediment basins. Although the round was not completed due to a last-minute court order, significant results were obtained. Fifty-eight blocks were sold off, of which 38 were assigned to the bidding companies, obtaining US$268 million in signature bonuses.

According to the information provided by the *Agencia Nacional del Petróleo* (ANP), the seven bidding rounds collected more than 3.0 billion *reales* (US$1.44 billion) in signature bonuses and E&P activities. Leasing agreements could generate around US$30.8 billion in minimum investments through 2010 (mostly due to PETROBRAS's investment). In total, 594 blocks were tendered. Taking into account the returned blocks, there are 558 blocks under concession agreements and 56 concessionaires. Total surface under concession agreements adds up to 313,000 km², equivalent to 4.9% of Brazilian oil and natural gas sediment basins.

According to the EIA, the reason why foreign investment has not had great relevance is the high tax rates and modest results of exploratory efforts. However, the ANP has repeatedly stated its interest in luring foreign investment to the hydrocarbon sector.

Planned investments by basin, as well as production targets, are illustrated in Table 6. Production is expected to increase by 1.63 billion barrels per day, of which 81% correspond to PETROBRAS and 19% to private companies, an increase with respect to the previous year.

Table 6
Brazil: Recent and Future Investments in the Oil Industry (Thousands of Barrels per Day)

Field	Operator	Tentative date	Maximum production (kbd)
Albacora Leste	PETROBRAS	April 06	180
Golfinho Mod 1	PETROBRAS	May 06	100
Piranema	PETROBRAS	October 06	20
Jubarte 1	PETROBRAS	September 07	60
Polvo	Devon Energy	July 07	50
Roncador P-52	PETROBRAS	4T–2007	180
Roncador P-54	PETROBRAS	4T–2007	180
Espadarte RJS-409	PETROBRAS	4T–2007	100
Golfinho Mod II	PETROBRAS	3T–2008	100
Marlim Sul Mod 2 P-51	PETROBRAS	4T–2008	180
Frade	Chevron	4T–2008	100
BC-10	Royal Dutch Shell	2Q–2009	100
Golfinho Mod III	PETROBRAS	1T–2010	100
Jubarte II P-57	PETROBRAS	2T–2010	120
Chinook	Norsk Hydro	2T–2010	60
Total			**1,630**

Source: Energy Information Administration, www.eia.doe.gov/cabs/brazil.html.

G. Internationalization

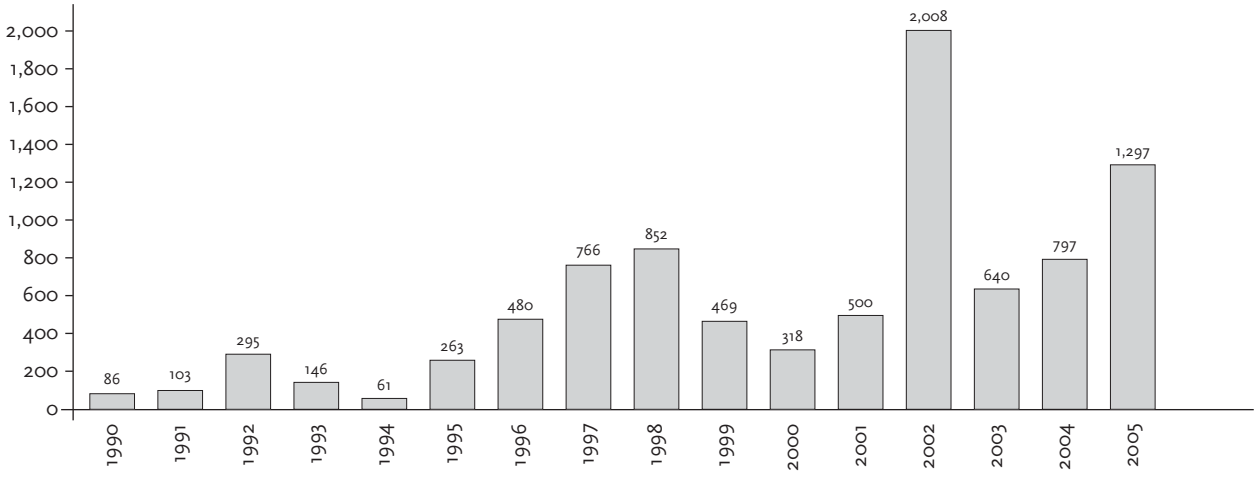
PETROBRAS stands as the most internationalized state-owned company in the region. According to UNCTAD, its external assets amounted to US$7.827 billion in 2003.[7]

Its internationalization became more dynamic in the 1970s due to the rise in oil prices and to Brazil's need to increase reserves. Since then, PETROBRAS entered technical assistance agreements abroad, and established exploration areas and trade relations with third countries.

In 1997, the year when the sector was deregulated, Braspetrol—PETROBRAS international subsidiary—maintained relations with more than 70 oil companies and nearly 140 exploration contracts in nine countries: Angola, Argentina, Bolivia, Ecuador, Lebanon, Peru, the United Kingdom and the United States.

Today, the company has begun to invest in Iran, Tanzania and other countries. At the same time, it has acquired competitive advantages in exploration technologies and offshore production, especially useful abroad.

Figure 3
Investment Abroad by PETROBRAS (US$ Millions)



Source: PETROBRAS.

Table 7
Countries where PETROBRAS Operates

	Oil		Natural gas		Electricity
	Upstream	Downstream	Upstream	Downstream	
Countries where it performs activities through owned companies					
Angola	x				
Argentina	x	x	x	x	x
Bolivia	x	x	x	x	
Colombia	x	x	x	x	
Nigeria	x				
United States	x	x	x	x	
Countries where it performs activities through other offices					
China	x	x			
Ecuador	x	x			
Equatorial Guinea	x				
Iran	x				
Lybia	x		x		
Mexico			x		
Paraguay		x			
Peru	x				
Tanzania	x				
Turkey	x				
Uruguay		x		x	
Venezuela	x				

Source: PETROBRAS.

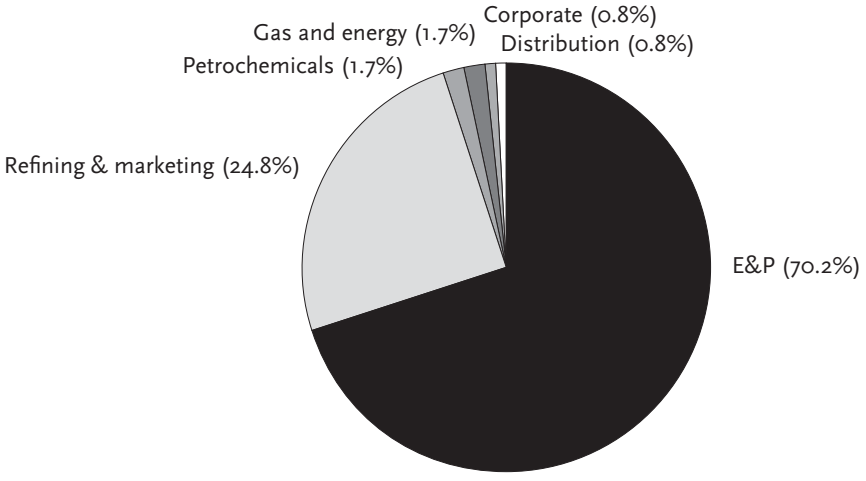
These regulatory changes boosted PETROBRAS's internationalization, since the Brazilian company is forced to invest in all stages of the oil activity in neighboring countries in order to consolidate and eliminate uncertainty and risks during all stages of oil activity in the domestic market in the new deregulated framework. Internationalization was possible in neighboring countries thanks to domestic privatization and reform.

In 2005, PETROBRAS's investment abroad amounted to US$1.297 billion, almost 70% more than the previous year. It is worth mentioning that the largest investment amount—US$2.008 billion—was recorded in 2002, when PETROBRAS acquired Pérez Companc's assets, thus obtaining significant assets in Argentina and other countries such as Peru with Block X.

It is worth mentioning technical cooperation in deep waters with the state-owned *Petróleos Mexicanos* (PEMEX). PETROBRAS expects to expand its business activities in Mexico. To do so, it has taken into consideration the interest shown by the Mexican administration to enter a partnership agreement with PEMEX for deep water operations in the Mexican sector of the Gulf of Mexico.

PETROBRAS's actions abroad are performed through the International Business Unit, whose assets, operations and activities are distributed today across 18 countries. Likewise, it is listed on the main international energy markets and is present in trade operations.

Figure 4
PETROBRAS: Planned Investment for 2011 (US$ 12.1 billion)

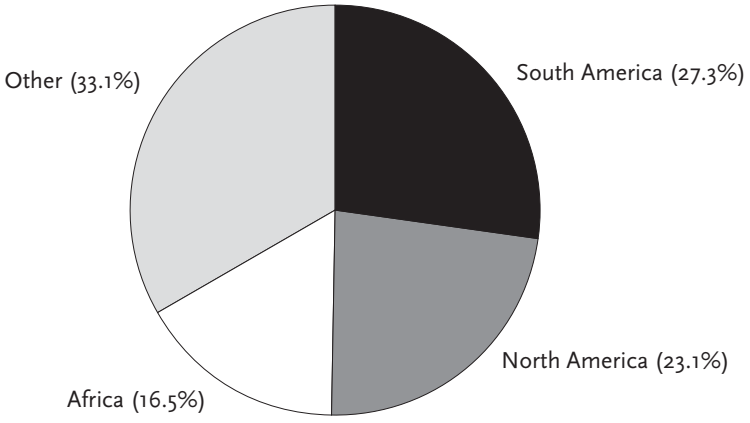


Source: PETROBRAS.

In December 2005, just like other companies such as Chile's ENAP, PETROBRAS profited from the restructuring of the Dutch firm Royal Dutch Shell to acquire the fuel business in Colombia and all operations in Paraguay and Uruguay for approximately US$140 million.

PETROBRAS is expected to become the most significant company in the energy sector of Latin America and to participate in other regions as well. The company plans to accumulate US$12.1 billion in assets abroad between 2007 and 2011. It is worth noting its presence in Latin America with 27% of investment, followed by North America with 23% and finally Africa with 17%.

Figure 5
PETROBRAS: Planned Investment Abroad for 2011 by Regions (US$ 12.1 billion)

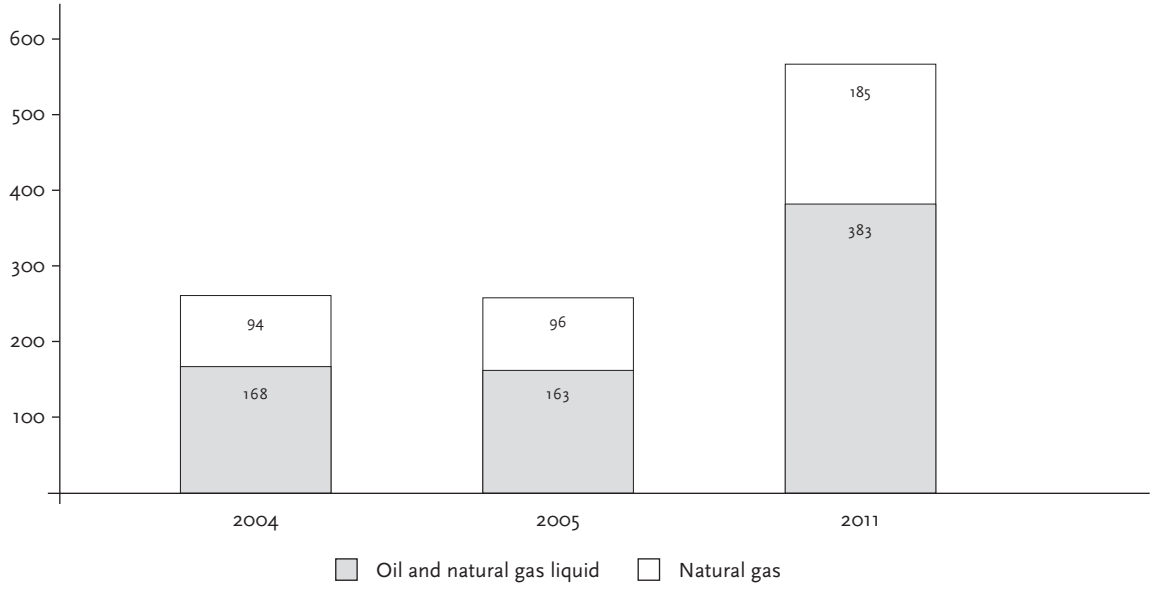


Source: PETROBRAS.

PETROBRAS's main activities abroad will focus on liquid and gas hydrocarbon exploration and production, as well as refining activities aimed at obtaining fuel. In both cases, investment abroad will come to 95%. The first activity will require 70% of total investment, whereas the second will receive 24.8%.

PETROBRAS's prospects for 2011 focus on continuing its growth in terms of oil production both in Brazil and abroad. Thus, in 2011 it intends to produce 568 kbd abroad, a 120% increase with respect to 2005, when production amounted to 259 kbd. Furthermore, it plans to adapt and expand its refining capacity and subsequently improve the quality of its products and the value of domestic oil.

Figure 6
PETROBRAS: Production Targets Abroad—2011 (Thousands of Barrels per Day)



Source: PETROBRAS.

It is worth noting that PETROBRAS's good management abroad for the year 2005 yielded a US$233.3 million profit, 63% more than in the previous year. This increase is due to the rise in commodities' international prices and to the increased sales of natural gas by Bolivia to Brazil and Argentina.

On the other hand, there were also negative factors, such as the decline of mature fields in Argentina and Angola, the lower increase than planned in gas production in Bolivia due to the increased royalty payments from 18% to 50% in May 2005, and the reduction of trade margins for fuels in Argentina resulting from limits to sales prices imposed by local administrations.

III. Industry Management in Chile

Chile is characterized by its scarce oil resources, which forces the country to import crude oil in order to supply domestic demand, resulting in significant foreign exchange payments. Oil reserves in Chile amount to barely 150 million barrels, the bulk owned by the *Empresa Nacional del Petróleo* (ENAP).

In 2005, oil production in Chile stood at 4 kbd, a slight decrease (3%) with respect to the volume produced in 2004. Since oil and petroleum products consumption in Chile amounts to 244 kbd, the gap between production and consumption is obvious. In economic terms, oil imports added up to US$3.78 billion in 2005, a 31% increase from 2004 (Chile's Central Bank).

To close this gap, ENAP, through its affiliate SIPETROL, has begun to produce oil in other countries. In 2005, SIPETROL produced 23 kbd.

A. Legal and Regulatory Framework

Chile was the first country in the region to implement legal reforms in the oil subsector. In 1975, the Decree Law 1089 provided for the deregulation of exploration and exploitation activities. Since then, ENAP ceased to monopolize the sector. New regulations established special operational agreements in hydrocarbon exploration and production.

The downstream sector was fully deregulated, together with consumer prices, imports, transportation and distribution. Likewise, ENAP's monopoly over refining activities was brought to an end. Today, any private company may import and refine crude oil.

Consequently, today in Chile, ENAP and its affiliates perform their activities in an open market economy where any investor may freely explore and exploit oil (by previously entering a special oil operational agreement with the state or obtaining the corresponding license), and may also refine, import and distribute hydrocarbon products and by-products.

This said, 100% of oil and gas production in Chile remains in the hands of ENAP. Furthermore, although any private company may invest in the refining industry, all refineries operating in Chile are owned by ENAP. A large number of agents, not including ENAP, operate in the domain of retail distribution of oil by-products. The state does not have a share in gas distribution, since 100% is in the hands of private companies.

B. Management Style

The management of the National Oil Company (*Empresa Nacional de Petróleo* or ENAP) is based on two key strategies: (i) ensuring domestic supply of crude oil and natural gas in Chile; and (ii) improving and extending its refining capacity.

ENAP is organized around two business areas: (i) exploration and production, which includes its international subsidiary Sipetrol and the wells in Magallanes; and (ii) refining, logistics and marketing, which includes the refinery in Chile and its refining subsidiary abroad.

ENAP is owned by the Chilean state. It was constituted in compliance with Law No. 9.618, enacted on June 19, 1950. Its articles of association were approved by Decree No. 1.208, enacted on October 10, 1950 by the former Ministry of Economic Affairs and Trade.

An executive board is in charge of the company's higher management. It consists of eight members and is chaired by the Minister of Mining. The deputy chairman is the executive deputy chairman of *Consejo de la Corporación de Fomento de la Producción* (CORFO). CORFO also elects another six directors, including three representatives of the Institute of Mining Engineers (*Instituto de Ingenieros de Minas de Chile)*, the National Society of Mining (*Sociedad Nacional de Minería)* and the Society for the Promotion of Manufacturing (*Sociedad de Fomento Fabril)*.

Additionally, the managers' group makes up the Auditing Committee (*Comité de Auditoría*), which plays the same role as in any other public limited company in Chile (Responsabilidad Social 2005, page 37).

The Committee is chaired by a member of ENAP's Executive Board representing the *Sociedad de Fomento Fabril* and is made up of two managers designated by CORFO.

The Auditing Committee's main powers and tasks are:

- Approving the annual corporate internal auditing agenda and monitoring its implementation.
- Electing external auditors for ENAP's and its affiliates' financial statements.
- Assessing the balance and other financial statements, as well as reports by external auditors and the General Comptroller's Office of the Republic.
- Issuing opinions before submission to the Executive Board for approval.
- Reviewing the operations between ENAP and other related entities.
- Analyzing and submitting proposals to the Executive Board on policies related to interest conflicts and any other disputes that may arise in this field.

As for human resources management, in 2005 the state and several unions belonging to ENAP and its affiliates deepened the so-called *Proyecto Común de Empresa* or PCE (Common Company Project), setting up joint working roundtables in order to endorse a series of new documents ensuring workers' participation to achieve the company's strategic goals.

In 2005, two events are worth mentioning: (i) ENAP's *Protocolo de Gestión Laboral frente a las Empresas Contratistas* (labor management protocol for contractors); and (ii) the *Protocolo de Desarrollo de la Dirigencia Sindical* (protocol for the promotion of union leadership). This management model is known within the company as "representative participation."

Table 8
ENAP: Evolution and Staff

Business lines	Unit	2000	2001	2002	2003	2004	2005
E&P–ENAP Sipetrol S.A.	ENAP Sipetrol	185	234	286	382	364	1,421
	Magallanes	1,521	1,337	1,269	1,228	1,214	
RL&C–ENAP Refinerías S.A.	Bío Bío Refinery	629	633	626	633	649	
	Aconcagua Refinery	566	562	559	553	555	1,431
	DAO	129	124	124	118	107	
Parent Company		171	171	172	176	178	127
Total		3,201	3,061	3,036	3,090	3,067	2,979

Source: ENAP.

Table 8 illustrates the trend towards the reduction of the company's staff. In 2005, the existing 2,979 employees, including personnel with contracts of indefinite duration, were divided into 2,797 workers, 93 department managers and directors, 59 experts and 30 administrators.

On the other hand, ENAP has entered different strategic partnerships for certain projects. For instance, the E&P business line arranged for a partnership between ENAP and the Italian company ENEL to jointly develop a series of studies for geothermal exploration and exploitation in Chile through the *Empresa Nacional de Geotermia S.A.*

ENAP's environmental management seeks to ensure the sustainability of its exploratory, exploitation and refining activities through specific measures aimed at minimizing their environmental impact. These measures come hand in hand with the enhanced quality of ENAP's production activities, particularly of fuels.

ENAP bases its operations on the provisions contained in the *Ley de Bases del Medio Ambiente* (1994), or Law of Environmental Foundations, and the *Reglamento del Sistema de Evaluación de Impacto Ambiental* (1997), or Regulations for the Assessment of Environmental Impact. One of its main environmental actions was the repair of pits where waste and scrap generated by these activities are dumped.

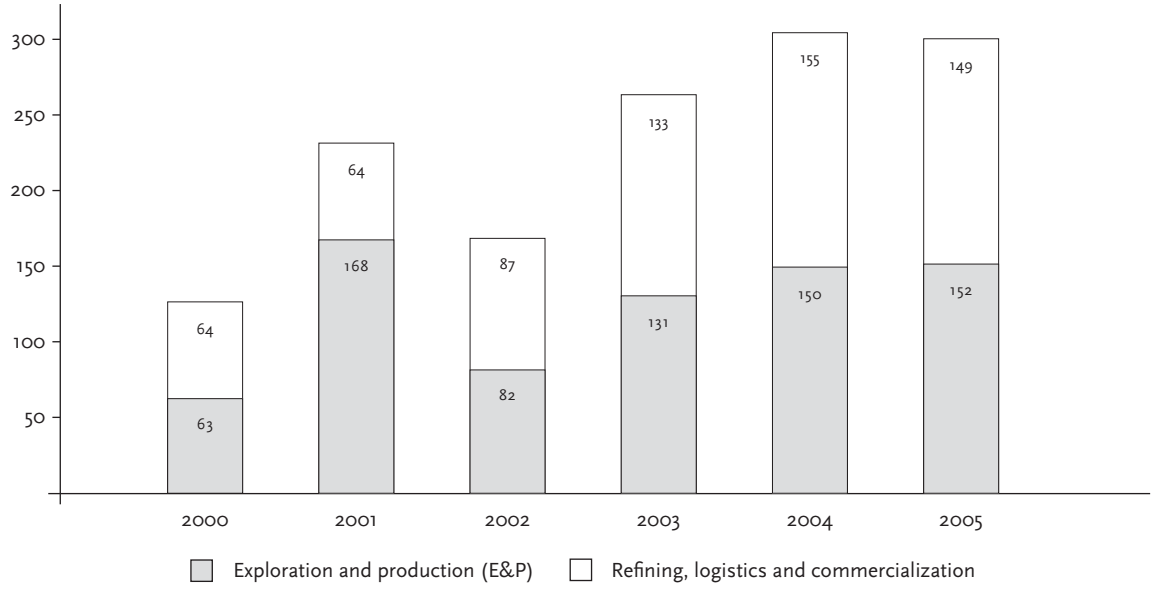
C. Investment

In 2002, ENAP's Strategic Business Plan sought to increase the value of the company's assets (US$2.157 billion) by 50% together with its tax contributions of US$700 million for the 2002–2006 period. Investment targets for the company were: (i) exploring new hydrocarbon fields, both in Chile and abroad; (ii) increasing its refining capacity; and (iii) improving production quality.

All targets have been almost accomplished, since during the 2005 fiscal year, the company's value came to US$3.442 billion (a 60% increase since 2002) and its owner was paid US$771 million between 2002 and 2005 (ENAP, Memoria Responsabilidad Social 2005, p. 28). ENAP plans to transfer US$969 million to the state between 2002 and the end of 2006.[8]

In 2005, the company's investment added up to US$301 million, of which US$152 million was designated for exploration and production, and US$149 million was allocated to refining, logistics and marketing activities.

Figure 7
ENAP: Evolution of Executed Investment (US$ Million)



Source: ENAP.

As for the E&P business line, US$113.8 million was invested in ENAP's contracts abroad, and the balance went to domestic activities. Sipetrol's activities abroad are focused on Ecuador, Argentina, Egypt and Iran.

With regards to the RL&C, in 2005 investment totaled US$149 million, the bulk being invested in the Aconcagua and Bío Bío refineries in central Chile. Remaining investment went to partnership projects with third parties in the way of capital assistance.

D. State Oil Company Activities

Concerning the upstream sector, in 2004 oil production amounted to 27 kbd, of which 23 kbd were produced abroad by the affiliate Sipetrol S.A., and the remaining 4 kbd were produced in Magallanes, Chile.

Table 9
ENAP'S Production in Chile and Abroad (Thousands of Barrels per Day)

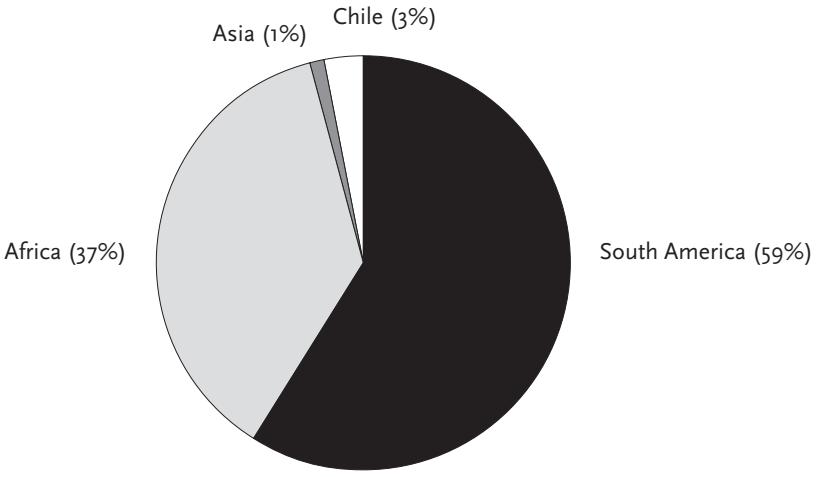
Production	2000	2001	2002	2003	2004	2005
ENAP Chile	5.6	5.3	4.4	3.6	3.5	3.0
Sipetrol	13.1	24.2	22.3	23.3	23.9	22.0
Total ENAP	**18.7**	**29.6**	**26.7**	**26.9**	**27.4**	**25.0**

Source: ENAP–Memoranda 2001–2005.

In 2005, oil production decreased to 25 kbd due to external factors such as the strikes staged in Ecuador and Argentina and restrictions to marketing in Ecuador. On the other hand, crude oil production in both Chile and Colombia remained stable. Production abroad amounted to 22 kbd, while domestic production was 3 kbd, 6.5% less than in the previous year.

ENAP's main activities in Chile are refining and marketing. The company must resort to international markets to get the crude oil needed to produce fuel and fulfill its trade commitments. Most of the crude oil supplied to Chile comes from South America and Africa, with Argentina and Angola acting as primary suppliers.

Figure 8
Source of Crude Oil Processed by ENAP in 2005



Source: ENAP.

Table 10
ENAP 2005: Refining, Logistics and Marketing (Thousands of Barrels per Day)

Product	kbd	Percentage
Liquefied gas	22.5	9.6
Gasoline	49.7	21.3
Kerosene	14.9	6.4
Diesel	77.1	33.0
Fuel oil	38.4	16.4
Industrial production and others	30.9	13.2
Total	**233.4**	**100.0**

Source: ENAP.

Supply is covered by contracts with foreign companies. The main providers were Sonangol, Chevron Texaco, Chevron San Jorge, PETROBRAS, British Petroleum, Vintage Oil, Glencore, Trafigura, Total and ENAP Sipetrol S.A., ENAP's international affiliate.

In the downstream sector, refining, logistics and marketing activities are concentrated in the Magallanes region, which in 2005 sold 233 kbd in gasoline, kerosene and diesel oil, 2.7% more than in the previous year. These sales include deliveries to central and southern Chile.

The company is the leading supplier in the Chilean market, its share bordering on 90% inside the country and 100% in the southern region. In recent years, it has begun to export, mainly in the Latin American market. Some of the fuels produced by ENAP are occasionally sold to other providers operating in the country. Likewise, the company exported 43 kbd to several countries, which accounts for 18% of production by ENAP's refineries (see Table 12).

Table 11
ENAP: Domestic Market Share in 2005 (Thousands of Barrels per Day and Percentages)

Production	Domestic sales	Domestic consumption	Market share (%)	Imports	Exports
Liquefied gas	19.1	31.4	60.8	1.3	3.6
Gasoline	45.0	50.8	88.7	7.3	17.7
Kerosene	15.6	15.5	100.7	1.5	0.0
Diesel Oil	97.0	104.6	92.7	22.1	2.8
Fuel Oil	32.0	32.2	99.4	1.8	10.8
Industrial products and others	10.3	10.3	100.0	0.1	7.7
Total	**219.0**	**244.8**	**89.5**	**34.1**	**42.7**

Source: ENAP.

Table 12
ENAP Exports in 2005 (Thousands of Barrels per Day)

MBD	ARG	PERU	ECU	BOL	BRA	U.S.A.	MEX	EL SAL	GUA	HON	PAN	Total
LPG		0.1	3.3			0.2	—	0.1				3.7
Gasoline	0.3	1.8				11.9	0.3	2.6	3.2	1.2	2.8	25.0
Diesel Oil	0.9	1.9	—	0.02	0.9							2.8
Fuel	1.9					8.9						10.8
Others												0.4
Total	**3.0**	**3.8**	**3.3**	**0.02**	**0.9**	**21.5**	**0.3**	**2.7**	**3.2**	**1.2**	**2.8**	**42.7**

Source: ENAP.

E. Oil Contracts and ENAP's Internationalization

According to Chilean legislation, oil fields belong to the state, which may exploit them through ENAP, by means of administrative concessions or Oil Operation Special Contracts (*Contratos Especiales de Operación Petrolera*, CEOP). This last option has been the most widely used in recent times. The governmental agency in charge of granting CEOPs is the Ministry of Energy and Mining.

Under CEOPs, private companies interested in exploring and exploiting hydrocarbons may benefit from a series of breaks, allowances and exemptions guaranteed by the state, such as tax invariability, freedom to export and availability of foreign exchange.

Table 13
ENAP'S Operating Agreements

Project	Country	Operator	Sipetrol's share (%)	
			2004	2005
Magallanes region	Argentina	Sipetrol Argentina S.A.	50.0.	50.00
Campamento Central Cañadón Perdido	Argentina	Repsol YPF	50.0.	50.00
Pampa el Castillo	Argentina	Sipetrol Argentina S.A.	100.00	100.00
Cam 2A Sur	Argentina	Sipetrol Argentina S.A.	50.00	50.00
Caguán Río Ceibas	Colombia	Petrobras International S.A. Braspetro	27.27	27.27
Dindal	Colombia	ENAP Sipetrol S.A. Colombian Subsidiary	90.60	90.60
Río Seco	Colombia	ENAP Sipetrol S.A. Colombian Subsidiary	90.60	90.60
North Bahariya	Egypt	Norpetco (Joint Venture Company)	50.00	50.00
Paraíso, Biguno, Huachito	Ecuador	ENAP Sipetrol S.A. Ecuadorian Subsidiary	—	—
Mauro, Dávalos, Cordero	Ecuador	ENAP Sipetrol S.A. Ecuadorian Subsidiary	—	—

Source: ENAP, 2005 Memorandum.

Table 14
ENAP'S Operating Agreements

Project	Country	Operator	Sipetrol's share (%)	
			2004	2005
Cam 3	Argentina	Sipetrol Argentina S.A.	50.0	50.0
Cam 1	Argentina	Sipetrol Argentina S.A.	50.0	50.0
La Invernada	Argentina	Wintershall Energía S.A.	50.0	—
Huila Norte	Colombia	ENAP Sipetrol S.A.	54.0	54.0
Altamizal	Colombia	ENAP Sipetrol S.A.	54.0	54.0
Acevedo	Colombia	ENAP Sipetrol S.A.	30.0	30.0
Doima	Colombia	Hocol S.A.	50.0	50.0
Tafura	Colombia	Braspetrol	50.0	50.0
East Rast Qattara	Egypt	Sipetrol International S.A.	50.5	50.5
El Diyur	Egypt	Apache El Diyur Corporation	41.0	41.0
Mehr Block	Iran	OMV (Iran) Onshore Exploration GmgH	33.0	33.0
Block 35	Yemen	Oil Search	37.5	37.5
Bseal-3	Brasil	Sipetrol Brasil Ltda.	—	—
Bpot-3	Brasil	Tecpetrol do Brasil Ltda.	—	—
Bseal-4	Brasil	Devon Energy do Brasil Ltda.	—	—

Source: ENAP, 2005 Memorandum, page 213.

Under this arrangement, no new oil discoveries have taken place; however, it has facilitated the funding of risk exploration investment expenses, which would otherwise have been financed by ENAP. Therefore, the results so far in terms of oil location have not been positive.

In order to ensure domestic oil supply, in May 1990 the affiliate Sipetrol (*Sociedad Petrolera Internacional*) was created for crude oil exploration and production abroad. It is worth noting that the stated purpose requires modernizing its refineries, in addition to carrying out Sipetrol's activities abroad.

ENAP's position and leadership in domestic fuel supply in Chile have played a key role in the company's internationalization process, just like the experience and quality of its human resources. Today, it operates in Argentina, Colombia, Ecuador, Egypt, Iran and Yemen.

Among the main results derived from the internationalization process in 2005, it is worth mentioning five oil discoveries in Egypt and one in Iran. Furthermore, ENAP entered an agreement in Ecuador with its state-owned company, PETROECUADOR, which envisions the transfer of technology and executives and the purchase of Ecuadorian crude oil.

Sipetrol's exploration activities are concentrated in Egypt. In 2005, four exploratory wells were drilled in El Diyur Block, resulting in the discovery of three oil fields, which began production that same year.

ENAP *Refinería S.A.* is in charge of the internationalization of the downstream sector. It began operations in January 2004.

Table 15
Chile: Exploration Agreements

No.	Block	Main efforts	Contract duration	Participants	Investment (MUS$)	Results
1	Chiloé—Golfo de Penas: Continental Shelf	2,097 km seismic exploration Exploratory wells: Lacuy I, Lacuy 1-A and Lacuy 1-B, 2,044 m abandoned; Chepu 1, 3,054 m and Darwin 1, 2,293 m	From 12/7/77 to 07/09/82	Arco Petróleos Chile, S.A. Amerada Hess, Petróleos Chile S.A., ENAP	39,123	Lacuy 1-B: Dry Chepu 1: Dry Darwin 1: Dry No commercial discoveries
2	Continental shelf Isla Diego de Almagro/Isla Diego Ramírez	4,814 km seismic exploration Exploratory well: A-1X, 2,541 m, dry.	From 12/21/78 to 11/18/82	Phillips Petróleos Chile S.A., Arco Petróleos Chile S.A., Amerada Hess Petróleos Chile S.A. ENAP	27,743	A-IX: Dry No commercial discoveries
3	Salar de Atacama	Geology 1000 km seismic exploration Exploratory well: Toconao 1, 5,340 m, Toconao 1ffi, directional	From 8/30/88 to 8/29/91	Chile Hunt Company, ENAP	29,108	Toconao 1: Dry
4	African Plateau	Geology Gravimetric analysis 750 km seismic exploration	From 3/13/89 to 09/06/98	Chile Hunt Company, ENAP	659	No data available
5	San Pedro de Atacama Imilac	Geology 277 km seismic exploration	From 3/14/89 to 3/13/90	Pecten Chile Company, ENAP	1,99	Second stage was not completed

Table 15 (*continued*)
Chile: Exploration Agreements

No.	Block	Main efforts	Contract duration	Participants	Investment (MUS$)	Results
6	Pampa de Chiu-Chiu	Geology 200 km seismic exploration	From 5/9/89 to 12/01/98	Eurocan (Bermuda) Limitada de Chile, ENAP	1,228	No dataavailable
7	Salar de Pedernales—Maricunga	Geology 200 km seismic exploration Exploratory well: Fortuna 1X, 2,684 m	From 5/9/89 to 01/31/98	Eurocan (Bermuda) Limitada de Chile, Hamilton Oil (Chile) Co, Norcen International Ltd. (Chile). ENAP	5,934	Fortuna 1X: "The planned target was not accomplished."
8	Salar Punta Negra	Geology 250 km seismic exploration	From 8/9/89 to 8/8/91	Maxus Energy Corporation Inc., ENAP	2,003	The consortium abandoned the area. Contract expires.
9	Lago Mercedes Tierra del Fuego	Geology Seismic exploration Exploratory wells: Lago Mercedes 1, 4,204 m Laguna EMA 1, 3,448 m	From 1/15/90 to Date	Texaco Exploration Lago Mercedes Chile Inc., Anderman/Smith Chile Inc. and Argerado (Chile) INC., ENAP	7.79	Lago Mercedes 1: discovery of gas and condensate Laguna Ema 1: Dry
10	African region	No data available	From 5/23/91 to 08/18/91	Petresearch Internacional (Chile) Inc. ENAP	No data available	No data available
11	Altiplano Iquique	Geology	From 10/25/ 1991 to	Chile Hunt Company	411	Contractor ends contract. Considers the area as secondary

No.	Block	Main efforts	Contract duration	Participants	Investment (MUS$)	Results
12	Lago Blanco Tierra del Fuego	Geology Gravimetric Analysis	From 02/14/ 1992 to 06/08/1993	Anderman/Smith (Chile) Inc., ENAP	411	Gave up contract
13	Tamarugal Norte	Exploration activities planned for the second exploration period for both blocks. Magneto-telluric profiles were recorded	From 6/6/1997 to 06/06/2007	Evergreen Resources Inc., ENAP	153	During the first stage, data was obtained for the sediment basins
14	Tamarugal Sur			Evergreen Resources Inc., ENAP	152	Natural gas accumulations were observed in the Molino 5 and Santiago Norte 1 wells
15		3D survey 2D and 3D seismic readings	Stage 1: 31/2 years Stage 2: 6.5 years	Cordex Petroleums, Inc. ENAP	No data available	

Source: CNE.

The most relevant factor in the company's internationalization was its entry into the fuel distribution market, first in Peru and later in Ecuador. Thus, in 2004 and in partnership with Grupo Romero,[9] it purchased Shell's assets when the latter was undergoing a restructuring process. One year later, through Primax, it would cover 27% of sales, becoming the leading company in the market.

Later on, also through Primax, the partnership decided to acquire Shell's assets in Ecuador, 60 gas stations in total. However, this acquisition is under assessment by the Ecuadorian authorities. If ENAP finally acquires these assets, it would position itself as the leading company along the Pacific coast.

F. Liquefied Natural Gas Project

When Argentina restricted natural gas exports to Chile during the first half of 2004, electric companies, being the most affected actors, expressed their concern. Most Chilean consumers also protested this decision. Faced with criticism, President Ricardo Lagos started to diversify energy sources, including the building of a Liquefied Natural Gas (LNG) facility capable of importing liquefied natural gas from anywhere in the world.

ENAP was charged with the international tender procedure for the LNG project in 2004. The tender was held in February 2006. The project envisioned building an LNG facility, including the building and operation of a sea terminal designed to unload, store and regasify natural gas and then distribute it via gas pipelines located in the central region. The facility will be built in the Quintero bay, in central Chile.

The project will be implemented through a newly created consumers pool or group originally consisting of ENAP, Endesa de Chile, Metrogas, Colbún and ASGener. Its main purpose is to guarantee a minimum demand and to generate long-term economies of scale.

On February 16, 2006, Chile awarded British Gas (BG Group) the LNG facility. The company committed to invest US$350 million through an "exclusive negotiation" memorandum of understanding signed with the consumers' pool. In March 2006, Colbún and AESGener announced their intention to abandon the project's consumer group.

In August 2006, the government announced construction works would begin by the end of 2006. ENAP's spokesperson stated that engineering works in the field were making progress. The energy complex, including a loading deck, two storage tanks and an LNG facility, would start operating in 2008, a year earlier than planned. BG Group said that the gas supplied to the facility located in the Quintero Bay will be transported in ships originating in Nigeria or Guinea.

IV. Industry Management in Mexico

With 4.8% of world production, Mexico was the fifth crude oil producer in the world in 2005, behind Saudi Arabia, Russia, the United States and Iran. In terms of oil reserves, Mexico ranked 15th with 1.1% of proven reserves worldwide (British Petroleum Statistical Review of World Energy 2006, London, 2006). Its 1.7% refining capacity is intermediate, ranking 15th worldwide (British Petroleum, op cit, pages 16, 20 and 22).

Mexico ranks second in Latin America in oil reserves, behind Venezuela. Its proven reserves amount to 11.8 billion barrels (December 2005). Mexican reserves have fallen in the past few years due to the demanding methodology imposed by the U.S. Securities Exchange Commission and the decline of the Cantarell field. It is worth mentioning that most reserves consist of crude oil whose gravity is lower than 25° API. Thus, the reserves/production ratio has decreased from 20 years in 2002, to 10 years in 2005 (Energy Information Administration, U.S. Department of Energy, www.eia.doe.gov). Likewise, most production is located in offshore areas south of the country.

According to the Constitution, only PEMEX is entitled to produce oil and gas in Mexico. Nevertheless, the company does not have enough funds to invest in exploration and production, due to the heavy tax load imposed by the government. This has given way to protests by PEMEX and the Ministry of Energy.

A. Legal and Regulatory Framework

Article 27 of the 1917 Constitution decrees PEMEX's monopoly over the exploration, exploitation, refining, storage, transportation, distribution and marketing of crude oil and its by-products. So far, this constitutional provision has not been altered. Significant changes have taken place only in the domain of natural gas, where private participation has been authorized in natural gas exploitation, transportation and distribution activities.

The *Secretaría de Hacienda y Crédito Público* (SHCP) or Department of Finance and Public Credit is in charge of setting and reviewing prices and tariffs for goods and services belonging to the federal public administration, as well as the conditions to set such prices and tariffs, taking into account the views of the *Secretaría de Economía* (Department of Economic Affairs) and the corresponding agencies (Article 31, Section X of the Organic Law on the Federal Public Administration or *Ley Orgánica de la Administración Pública Federal*). Additionally, the SHCP publishes retail prices each month.

According to the *Ley Federal de las Entidades Paraestatales* (Article 26), prices and tariffs for the goods and services provided by state agencies are set according to economic efficiency and financial reorganization criteria. Concerning gasoline and other oil by-products, "prices and tariffs for goods and services susceptible of being marketed abroad will be set taking into consideration international market prices." Furthermore,

"prices and tariffs for goods and services not susceptible of being marketed abroad shall be set taking into consideration production costs derived from an assessment of inputs at their real opportunity cost."

PEMEX is characterized by an unfavorable tax relation with the Mexican Federal Government. The company must transfer 60.8% of its revenues to the government, around 33% of all fiscal revenues collected by the state. This hinders PEMEX's ability to address its investment and development plans. In addition, the company has no legal capacity to determine its own budget, since current legislation prescribes Congress with approval of its annual budgets.

Furthermore, whenever PEMEX's sales revenues decline and the government faces a corresponding deficit, the latter must decide whether to cut down on the company's exploration and production costs in order to close the gap.

This has led PEMEX to resort to a system called PIDIREGAS (*Proyectos de Infraestructura Diferidos en el Registro del Gasto*) in order to fund its infrastructure projects. The system prevents the company from registering its investment as debt, which is outlawed under Mexican legislation.

In December 2005, a tax reform was aimed at providing greater opportunities for PEMEX to increase its investment based on the amendment to the Law of Rights (*Ley de Derechos*). The company was expected to receive US$2.3 billion in 2006. By mid-2006, experts praised the reform based on its impact on PEMEX's viability, although still considered it insufficient.

B. Management Style

PEMEX is divided into four subsidiaries operating in the subsectors: (i) PEMEX *Exploración y Producción*; (ii) PEMEX *Refinación*; (iii) PEMEX *Gas y Petroquímica Básica*; and (iv) PEMEX *Petroquímica*. It is also backed by several other companies: PMI *Comercio Internacional, S.A. de C.V.*, its petrochemical affiliates (Camargo, Cangrejera, Cosoleacaque, Escolín, Morelos, Tula and Pajaritos), the *Compañía Mexicana de Exploraciones, S.A. de C.V.*, *Instalaciones Inmobiliarias para Industrias, S.A. de C.V.*, and III *Servicios, S.A. de C.V*, responsible for service provision and for real state activities undertaken by the different companies making up the consortium.

PEMEX's current organizational structure was set in July 1992 under the so-called *Ley Orgánica de PEMEX y Organismos Subsidiarios*. The law does not contain any changes to the oil regime decreed by the Constitution, since its main purpose is PEMEX's streamlining.

The streamlining goals for PEMEX are: increasing its efficiency and productivity; energy saving; fulfilling the needs of domestic consumption for petroleum products; increasing exports; improving product quality; mitigating environmental pollution generated by its activities; and fostering private investment in certain areas of the oil industry.

PEMEX modified its organizational structure in order to speed up and decentralize its operations. Thus, it replaced its large, centralized structure and divided into several departments designed along four business lines, coordinated by a corporate executive responsible for the strategic management of the company.

The four resulting companies have a technical, industrial and commercial nature, are recognised as legal entities with their own assets, and are governed by a Management Board that is a higher governmental agency for the oil industry, without prejudice to their independence (Art. 6).

The Management Board is composed of 11 members: six state representatives, one of them named as chairman of the board, designated by the federal executive branch, and five representatives of PEMEX's workers union.

The four companies making up PEMEX are:

a) PEMEX—*Exploración y Producción*: oil and natural gas exploration and production, transportation, storage in terminals and marketing.

b) PEMEX—*Refinación*: industrial refining processes; manufacturing of petroleum products and by-products susceptible of serving as industrial raw materials; storage, transportation, distribution and marketing of the said products and by-products.

c) PEMEX—*Gas y Petroquímica Básica*: natural gas, liquid natural gas and artificial gas processing; storage, transportation, distribution and marketing of these hydrocarbons, as well as any by-products susceptible of serving as basic industrial raw materials.

d) PEMEX—*Petroquímica*: industrial petrochemical processing of products not belonging to the basic petrochemical industry; storage, distribution and marketing.

Under this law, the strategic activities of the first three companies above may only be performed by the designated companies.

Each of these subsidiaries is led by a general manager designated by the President. The company's policy is designed by an eight-member management board. Four members are designated by the President, three deputy managers for PEMEX and the Chairman of PEMEX's Management Board (holding). The subsidiaries determine their own budget, design their plans and carry out the transportation, storage and sale of their products. Each subsidiary manages its own staff, operations, investment and assets. At the time of reorganization, assets were distributed in the following manner:

- Management Board 3.0%
- PEMEX—*Exploración y Producción* 55%
- PEMEX—*Refinación* 20%
- PEMEX—*Gas y Petroquímica Básica* 12%
- PEMEX—*Petroquímica* 10%

Several experts highlighted a series of issues faced by PEMEX in terms of management and organization: "There are overdimensioned structures, too many hierarchical levels, lack of accountability, absence of performance assessment criteria, scarcely innovative management, little consistency between objectives and performance, delayed responses, high tolerance of failure, strategic and administrative irrelevance of the Management Board, etc."

Table 16
PEMEX: Evolution of the Company's Staff (Number of Filled Positions)

Company	2000	2001	2002	2003	2004	2005
PEMEX *Exploración y Producción*	42,642	43,208	44,658	46,332	47,975	48,371
PEMEX *Refinación*	46,151	47,710	47,341	46,692	44,899	45,335
PEMEX *Gas y Petroquímica Básica*	11,579	11,716	11,977	12,104	11,923	12,018
PEMEX *Petroquímica*	14,837	14,578	14,360	14,203	13,895	13,939
Corporativo de PEMEX	5,043	5,121	6,207	6,272	6,441	6,687
Medical Services	10,712	10,745	10,863	10,870	10,855	11,097
Telecommunications	1,764	1,774	1,728	1,752	1,734	1,724
Total	**132,728**	**134,852**	**137,134**	**138,225**	**137,722**	**139,171**

Source: PEMEX.

Furthermore, there are delays and voids in the institutional and regulatory framework, as well as management issues in the organizational structure (executives' designation and terms), accounting systems, purchase arrangements, corporate organization and union relations.[10]

There were 139,171 employees and blue-collar workers at PEMEX in 2005, up from 132,728 in 2000, a 4.9% increase. Experts argue that PEMEX should make efforts to increase its productivity, since it produces 24 barrels per worker, whereas PDVSA in Venezuela—similar in size—produces 43 barrels per worker.

At PEMEX, there is a program for transparency and the fight against corruption (*Programa de Transparencia y Combate a la Corrupción,* PTCC) in compliance with the Federal Law for Transparency and Access to Public Governmental Information (*Ley Federal de Transparencia y Acceso a la Información Pública Gubernamental*) enacted in 2002, whose main purpose is to transform the public federal administration into a modern organization, oriented to service provision and closer to the needs and interests of citizens.

The coordination of this program entails the following activities: acquisitions, public works, marketing, human resources, financial cycle and strategies.

The PTCC program has held several consultive commissions with the participation of chambers and associations, as well as partnership agreements with chambers, associations and educational institutions. Cutting-edge methodology has been applied to the following areas:

- Reviewing bidding conditions
- Generating savings
- Unified code of conduct
- Improving IPT's perception
- Implementing human resources information systems
- Implementing information systems for suppliers and creditors
- Implementing a follow-up system for penalties
- Standardizing best practices
- Central management

C. Investment and Funding Sources

In 2005, total investment by PEMEX amounted to US$10.214 billion, less than in 2003 and 2004, when investment came to US$10.541 billion and US$10.89 billion, respectively. Most investment went to exploration and production, which amounted to US$9.693 billion in 2005.

Although these investment amounts are high in absolute terms, they are still insufficient for the company to renew oil reserves and assets. In addition, PEMEX has not been able to replace the production in the declining Cantarell megafield.

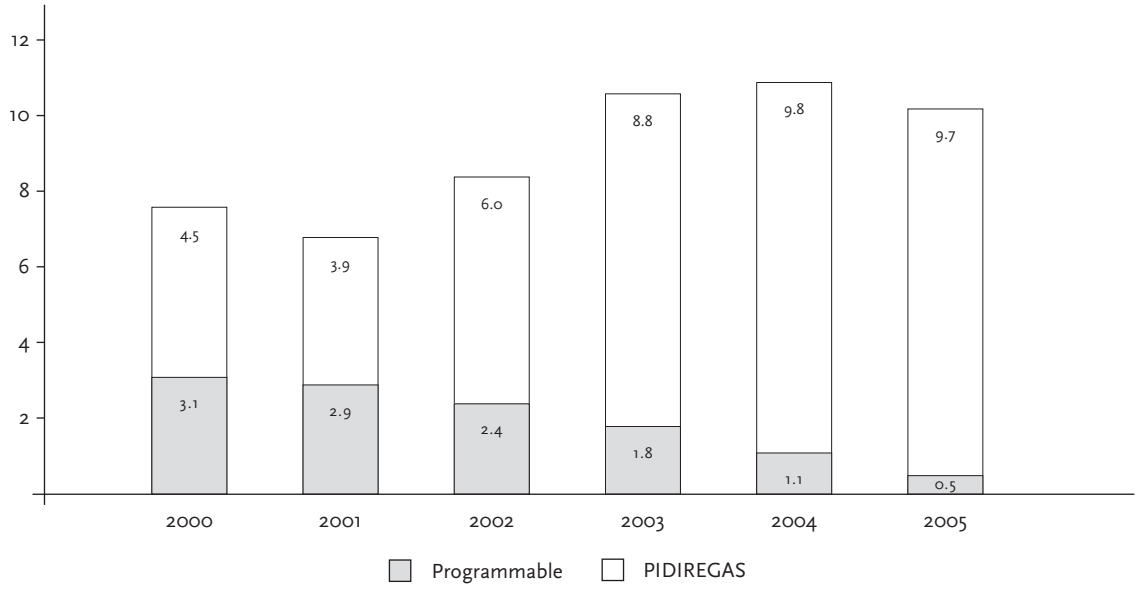
The reason behind the scarce investment resources is the heavy tax load imposed on PEMEX, which is headed for a serious crisis and is on the brink of decapitalization, since in 2005 its assets were negative by US$2.47 billion.

Table 17
PEMEX: Investment by Business Line (US$ Billions)

Company	2000	2001	2002	2003	2004	2005
PEMEX *Exploración y Producción*	4,70	5,70	6,50	8,20	10,00	9,80
PEMEX *Refinación*	2,33	0,59	1,46	1,84	0,45	0,28
PEMEX *Gas y Petroquímica Básica*	0,38	0,24	0,19	0,30	0,22	0,13
PEMEX *Petroquímica*	0,11	0,11	0,15	0,15	0,14	0,00
Corporativo de PEMEX	0,05	0,04	0,04	0,05	0,03	0,04

Source: PEMEX.

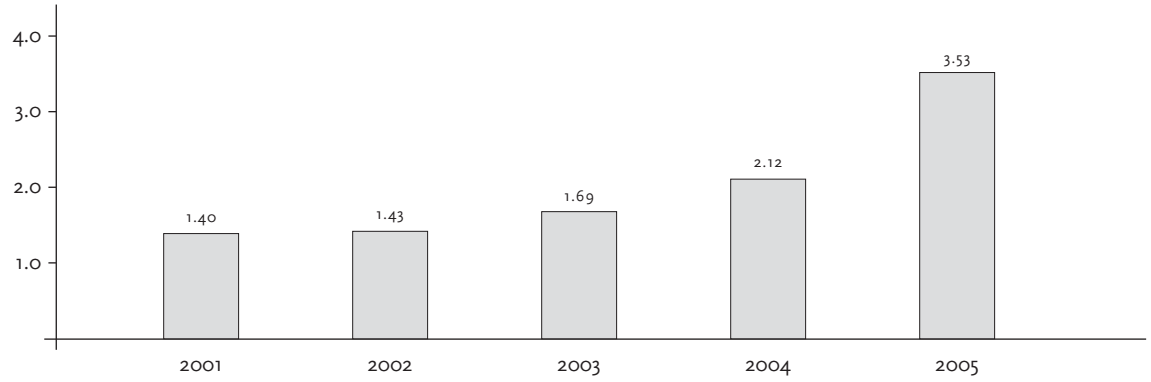
Figure 9
PEMEX: Investment by Type of Funding (US$ Billions)



Source: PEMEX.

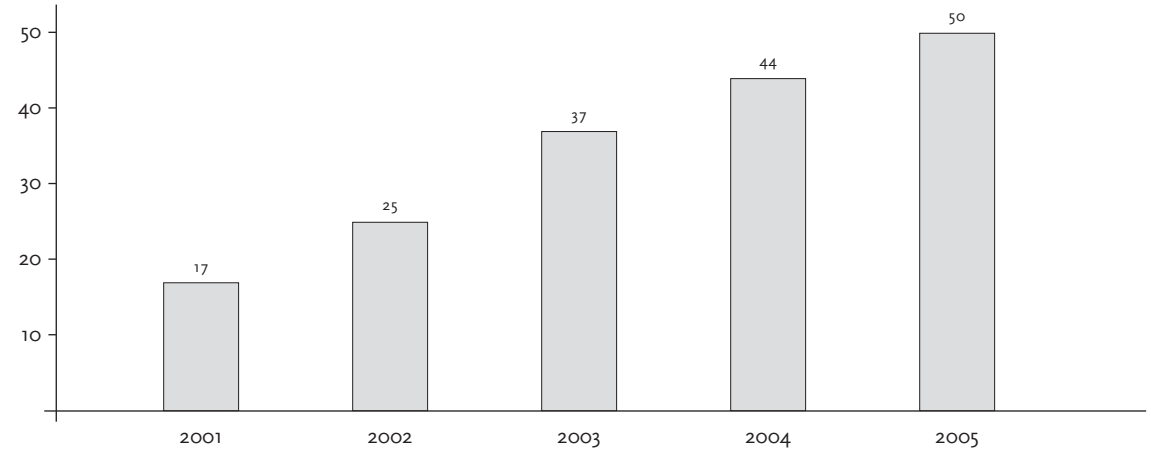
To solve this situation, the company has resorted to foreign debt via the Pidiregas mechanism, which allows the company to borrow without infringing Mexican laws.[11]

Figure 10
PEMEX: Annual Debt Payment Amount (US$ Billion)



Source: PEMEX.

Figure 11
PEMEX: Total Consolidated Debt (US$ Billion)



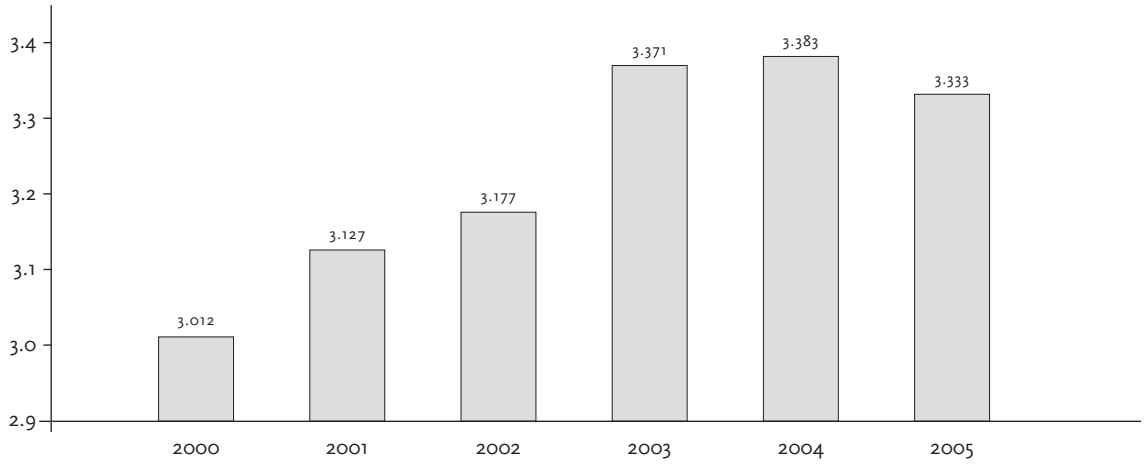
Source: Annual Reports 2002–2005.

The significance of this mechanism has increased considerably in the past few years. In 2005, Pidiregas funding was 95% with respect to total investment. However, its use is not sustainable for the company, since its long-term liabilities have increased from US$21.0 billion in 1998 to more than US$61.0 billion in 2003, reaching US$85.0 billion by the end of 2005.[12]

Funding sources for the 2005 total investment, which amounted to US$10.1 billion, may be disaggregated as follows: US$2.6 billion came from international capitals; US$3.8 billion from the Mexican capital market; US$2.1 billion from bank loans; and US$1.6 billion through export credit agencies.

Therefore, PEMEX's total debt has almost tripled, going from US$17.0 billion in 2001 to US$49.9 billion in 2005. It is worth mentioning that long-term debt represents on average 95% of total debt, whereas the remaining 5% consists of short-term debt due in less than 12 months.

Figure 12
PEMEX, Mexico: Evolution of Crude Oil Production (Millions of Barrels per Day)



Source: PEMEX.

Total debt consists of secured debt by *Petróleos Mexicanos*, and of PEMEX's financial vehicles such as Project funding Master Trust, Trust F/163,RepConLux S.A. and PEMEX Finance Ltd.; additionally, a series of contractors must also be included as part of PEMEX's total debt.

D. International Production and Trade

In 2005, oil production rose to 3.3 MMBD, placing Mexico as the leading producer in Latin America, whereas consumption stood at 1.5 MMBD. That same year, Mexico exported 1.8 MMBD, 90% going to the U.S. market. Likewise, during 2005, Mexico was the second largest oil supplier to the U.S.

In 2005, PEMEX's hydrocarbon activities took place in 357 producer fields, 5,682 operating wells and 193 offshore platforms. Production came to 3.3 MMBD. This amount signals a slight reduction with respect to the two previous years.[13]

Table 18
PEMEX, Mexico: Evolution of Refined Petroleum Products (Millions of Barrels per Day)

	2000	2001	2002	2003	2004	2005
Production	1.450	1.473	1.481	1.556	1.587	1.554
Exports	0.113	0.103	0.156	0.179	0.152	0.186
Imports	0.446	0.382	0.350	0.287	0.310	0.392
Domestic Sales	1.729	1.713	1.660	1.685	1.719	1.772

Source: PEMEX Annual Statistics 2006, page 4.

One of PEMEX's main goals is to supply high-quality refined products with low sulphur content. In 2005, 1.554 MMBD were refined, a 2% reduction from 2004, mainly due to the significant increase in pipeline

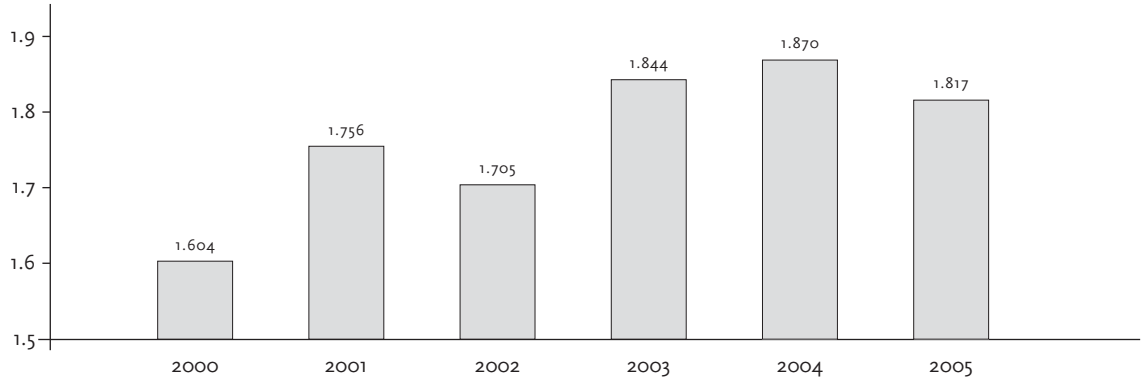
and facility maintenance services resulting from the implementation of the *Programa Emergente de Seguridad, Salud y Protección Ambiental* or SSPA (Emerging Program for Safety, Health and Environmental Protection).[14]

On the other hand, the marketing of refined products through PEMEX PMI *Comercio International* allowed PEMEX to accomplish its domestic market supply goal. Thus, faced with the slight decrease in the production of refined products in 2005, 0.392 MMBD were imported and 0.186 MMBD were exported, aside from the additional volume available for the domestic market. Domestic sales thus increased by 3.1% from 2004 to 2005, from 1.719 to 1.772 MMBPD. It is worth noting that all these marketing operations were accompanied by logistics activities and inventory accumulation.

PEMEX exports almost 50% of the crude oil it produces domestically. Likewise, the company is forced to import a certain amount of petroleum by-products. This is due to the country's insufficient refining capacity. According to PEMEX, six refineries need to be reinforced.

One of Mexico's main problems is that, in spite of its significant proven reserves, PEMEX could not make the necessary investment to find new reserves capable of maintaining production levels in the next few years. Therefore, experts at PEMEX, as well as oil experts, argue that proven reserves depletion could occur as early as 2014.[15]

Figure 13
PEMEX, Mexico: Evolution of Crude Oil Exports (Millions of Barrels per Day)



Source: PEMEX.

In 2005, investment in exploration of new reserves amounted to US$1.215 billion. Seventy-four exploratory wells were drilled,[16] allowing for replacement of barely 26% of the proven reserves extracted that same year. This low investment level in exploration by PEMEX is the result of the government's tax policy, as described below.

E. Taxation Regime

The taxes imposed by the Mexican state on PEMEX have become the main funding source of the federal budget. In 2004 alone, the state received from PEMEX US$56.7 billion. From 1999 to 2004, 32% of budgetary revenues came from PEMEX. This is the reason why since 1999 the company has not yielded any profits but rather losses adding up to US$2.0 billion and US$3.0 billion per year. The taxation regime applied to PEMEX is completely different from the one applied to other state-owned companies in the country.

Box 1
PEMEX Taxation Regime

Mexican legislation establishes a special taxation regime for the state-owned PEMEX and its main bodies and subsidiaries. PEMEX's taxation regime does not resemble the one applied to other state-owned companies, that is, it pays income taxes on its profits. The state decreed that PEMEX must pay 60.8% of total revenues in extraction rights among others. The taxation regime consists of:

Oil extraction rights are estimated applying a 52.3% rate over the cash flow resulting from the difference between crude oil sales and extraction costs and expenses.

Extraordinary and additional taxes over oil extraction are estimated using a 25.5% and 1.1% rate, respectively, applied on the same basis.

The tax rate applied to oil performance stands at 35% and equals income taxes applied to Mexican companies, except for *Petróleos Mexicanos* and its subsidiaries.

Added up, all the taxes and rights already described equal 60.8% of total sales to third parties. Additionally, PEMEX pays the *Aprovechamiento sobre Rendimientos Excedentes* (ARE), corresponding to 39.2% of revenues generated by crude oil exports exceeding the price set by the Mexican government, which was US$23.0 per barrel for 2005. ARE increased in 2005 to 56.4 billion *pesos*, whereas in 2004 it paid 35.6 billion *pesos* and the price set was US$20.0 per barrel.

By the end of 2005, tax legislation was modified (the so-called New Taxation Regime), and enforced in 2006. It decreed that 50% of the ARE generated on the basis of US$27.0 per barrel would be designated for PEMEX's investment in exploration, production, refining, gas and petrochemicals. Furthermore, the remaining 50% would go to investment programs and projects in infrastructure and equipment for federal entities.

Although the new taxation regime helped increase PEMEX's investment budget by US$2.9 billion, it is still deemed insufficient to cover the company's needs.

Source: Campodónico (2004).

In fact, PEMEX does not pay income taxes over its profits but rather "taxes over oil extraction rights" and other additional taxes. In total, the taxes paid by PEMEX amount to 60.8% of its total sales. This is the reason why, in spite of the company's large operational profits—US$40.0 billion in 2004—it still reported losses adding up to US$1.25 billion during the same year.

Table 19
Mexico: Evolution of Tax Revenues, July 2006 (US$ Billions)

	2000	2001	2002	2003	2004	2005	2006
Total Fiscal Revenues	125.6	136.1	143.6	148.4	157.2	178.9	123.2
Oil Revenues	41.6	41.4	42.4	49.5	56.7	66.7	44.6
Share (%)	33.1	20.4	29.5	33.4	36.1	37.3	36.2

Source: Secretaría de Hacienda y Crédito Público.

F. Finance

PEMEX's financial results show that operating income (income before applying taxes and interest) yields positive values and high margins. This value has risen from US$29.010 billion in 2000 to US$46.477 billion in 2005. In 2005 there was a 14% increase with respect to the previous year.

Operating profit margins stand in marked contrast to the net income negative results. This is essentially due to the high and growing revenues obtained by PEMEX.

In the second case, negative results may be explained by the taxes and contributions paid by PEMEX, such as oil extraction rights, taxes on oil yield and the special tax on production and services (IEPS), among others. The sum of all taxes and rights represented approximately 60.8% of total sales to third parties.

Table 20
Mexico: Financial Evolution (US$ Billions)

	2000	2001	2002	2003	2004	2005
Revenues	49.568	47.744	49.842	57.993	68.570	85.279
Expenses	20.392	22.185	21.214	23.910	28.221	39.478
Operating income	29.010	24.734	27.238	31.507	40.712	46.477
Taxes	31.097	28.246	30.395	35.642	42.044	53.321
Net income	–2.086	–3.655	–3.157	–3.769	–2.260	–7.005

Source: PEMEX, 2005 Statistics Yearbook.

PEMEX's issues are the result of its lack of independence in terms of management and of the taxation regime prevailing in the country. Due to its high accumulated losses, PEMEX shows a negative net worth, in 2005 recorded at less than US$2.514 billion.

G. Internationalization

Although PEMEX owns abundant oil reserves, it has not implemented an international expansion policy, unlike PDVSA, which also owns substantial reserves, and PETROBRAS, which has smaller reserves.

V. Industry Management in Venezuela

With 4.0% of world production, Venezuela ranked eighth among world crude oil producers in 2005, behind Saudi Arabia, Russia, the United States, Iran, Mexico, Canada and China. As for oil reserves, Venezuela ranked sixth, with 6.5% of world proven reserves.[17] Its refining capacity is intermediate, with 1.6% of world capacity, ranking 14th worldwide.[18]

Venezuela is the leading country in Latin America in terms of oil reserves, with 79 billion barrels (December 2005). It also owns significant unaccounted for heavy and extra-heavy oil reserves along the Orinoco Belt, amounting to 270 billion barrels.

Oil activity in Venezuela takes place under four types of arrangements: production by the state-owned PDVSA; PDVSA's operational agreements with private enterprises; PDVSA's strategic partnerships with private companies along the Orinoco Belt; and risk sharing contracts (just now in the exploration stage). The bulk of production is exclusively generated by PDVSA, whereas operational agreements and strategic partnerships were entered into at the beginning of the 1990s.

In recent years, Venezuela implemented significant changes in oil legislation, mainly the 2002 Organic Law on Hydrocarbons (*Ley Orgánica de Hidrocarburos*) and the May 2006 Reform of the Organic Law on Hydrocarbons. These changes (analysed below) are completely different from the oil reforms implemented in many Latin American countries during the 1990s, which favored oil opening and deregulation of the hydrocarbon sector in order to lure foreign investment through greater incentives.

A. Legal and Regulatory Framework

Upstream sector regulations are contained in the Constitution of the Bolivarian Republic of Venezuela. Under Title VI of the Economic System, in accordance with Chapter I, Article 302, the state, through the corresponding organic law and for reasons of "national convenience," will retain oil activities and other strategic industries, operations, services and goods of public interest. Likewise, Article 303 states that: "For reasons of economic, political sovereignty and national strategy, the state will retain all shares in *Petróleos de Venezuela, S.A.*"

In January 2002, the new Organic Law on Hydrocarbons (LOH, Decree 1510) was enacted, revoking and replacing all previous legal provisions. Among the main changes introduced by the new LOH were:

- The LOH modifies the state's share in the so-called primary activities (initial exploration, extraction, collection, transport and storage). In the past, its share added up to a maximum 35%. Today, the state's share exceeds 50% in mixed investment companies devoted to crude oil exploration, extraction, transportation and storage activities (Art. 9).

- The LOH increases oil royalties (Art. 44). In the past, royalties amounted to 16.66 %, whereas the new law increases this rate to 30%. However, in the case of fields that are not economically profitable —mature fields or extra-heavy oil fields in the Orinoco Belt, with low commercial value, royalties may be reduced to 20%. As for bitumens found along the Orinoco Belt, royalties may be reduced to 16.66%.
- On the other hand, income taxes went down, from 67% to 50%.
- The LOH defines the following taxes (Art. 48): (i) superficial tax, (ii) tax on own consumption, and (iii) tax on general consumption. The first kind consists of one hundred tax units per square kilometer or surface fraction and it sets a 5% annual increment. Taxes on own consumption equal 10% for each cubic meter of by-products consumed and produced; the estimation is based on the selling price to final consumers. The rate for taxes on general consumption range between 30% and 50% of the selling price for each liter of hydrocarbon product sold in the domestic market.
- As for processing activities of natural hydrocarbons (distillation, purification and transformation), the LOH (Art. 50) prescribes that the state, state-owned companies, mixed investment companies with a state share and private companies shall carry out such activities directly.
- Concerning marketing activities, the LOH (Art. 60) decrees that supply, storage, transportation, distribution and retail of hydrocarbon products are public services. Thus, the Executive Branch, through the Ministry of Energy and Mines, shall fix prices for hydrocarbon by-products and adopt the necessary measures to guarantee supply and service efficiency and prevent any interruption of service.

Through Decree No. 1478 of October 4, 2001, the Investment Fund for Macroeconomic Stabilization (*Fondo de Estabilización para la Estabilización Macroeconómica*) was reformed. During the fiscal years corresponding to the 2003–2007 period, 6% of oil tax revenues were to be transferred to this Fund for 2003. This percentage was to be gradually increased by 1% every year, until it reached 10% in 2007.

1. Reform of the Organic Law on Hydrocarbons

In 2005, the Venezuela government rendered illegal 32 operational agreements signed between 1990 and 1997 and proposed new legislation. In May 2006, the National Assembly approved the Law for Partial Reform of Decree No. 1510, recognized as organic law governing the operation of "mixed investment companies."

This reform was designed to carry out the migration of operating agreements to "mixed investment companies" so that the state would retain more than 50 % of stock capital (Art. 22). Under articles 24 and 25, private companies in partnership with the state may become operating companies (their share may reach at most 49%).[19]

Reforms were also introduced to increase tax collection coming from the oil sector. Article 44 establishes the payment of royalties at 30% of the volume of extracted hydrocarbons, to be paid either in currency or in kind (Art.45).

The Tax on Extraction was also created, equalling 33.33% of the value of liquid hydrocarbons extracted from fields (Art. 48). The 30% royalty payment may be deducted from this Tax on Extraction.[20]

The Tax on Export Registration (*Impuesto de Registro de Exportación*) (Art. 48) was also created, equalling 0.1% of the value of all exported hydrocarbons. Its estimation is based on the selling price set for the hydrocarbons buyer.

2. Reform of Taxes on Oil Revenues

In August 2006, the National Assembly agreed to set the Income Tax Rate (*Impuesto sobre la Renta* or ISLR) at 50%. This change implied that strategic partnerships along the Orinoco Belt, which paid a 34% rate, must pay 50% starting in 2007. In order to do so, articles 11 and 57 were modified and article 56 on discounts was revoked.

3. Migration of Strategic Partnerships to Mixed Investment Companies

Bernard Mommer, Deputy Minister of Energy and Oil, announced that the government intended in 2006 to promote migration of strategic partnerships along the Orinoco Belt to mixed investment companies. The deputy minister said that this measure seeks to standardize the taxation regime for all partnerships exploiting crude oil in the country and stated that PDVSA had already begun this process, under which the state will hold the majority stake—at least 51%—in the Orinoco Belt.

B. Management Style

Until December 1997, PDVSA operated in Venezuela through three operational subsidiaries: (i) Corpoven, S.A.; (ii) Lagoven; S.A.; and (iii) Maraven, S.A. Since then, PDVSA has adopted a new operational structure based in business units and began transforming its operations in order to increase productivity, streamline management and guarantee capital return. The process entailed two main developments:

- The merger of Lagoven, S.A, Maraven, S.A. and Corpoven, S.A. into a new company, PDVSA *Petróleo y Gas, S.A.* ("PDVSA P&G") in January 1998.
- In May 2001, PDVSA *Petróleo y Gas, S.A.* ("PDVSA P&G") began its demerger, resulting in two new companies: PDVSA *Petróleo* and PDVSA *Gas*. The former is in charge of oil operations and affiliated gas, and the latter is responsible for non-affiliated gas assets. The process was completed by the end of 2001.

PDVSA Petróleo's organizational structure is divided into two business units: one domestic and another devoted to international business. Likewise, PDVSA Petróleo has undertaken internal organizational adjustments in order to reinforce control over its operations based on a corporate model that fits its organizational structure with long-term corporate strategies. These strategies include the adoption of a new framework for the company's operational structure, which intensifies the managers' commitment and at the same time reinforces PDVSA Petróleo's operational independence.

At the international level, Petróleos Venezuela's holding conducts crude oil refining operations in the United States through its subsidiary PDV Holding Inc., while working in Europe through PDV Europa B.V. On the other hand, PDVSA Finance, created in 1998, is PDVSA's main financial vehicle, for instance, to issue debt.

The Bolivarian Republic of Venezuela is the exclusive owner of the so-called *Petróleos de Venezuela*. Through the Ministry of Energy and Oil, it sets domestic energy policies, and regulates and monitors the operations of PDVSA Petróleo and PDVSA Gas. The President of Venezuela designates the Chairman of *Petróleos de Venezuela* as well as the members of its Executive Board, setting their duties and those of its subsidiaries. Such duties do not fall upon the government of Venezuela.

The following are the main affiliates of PDVSA:

- *Corporación Venezolana de Petróleo* (CVP): This affiliate governs and manages everything related to PDVSA businesses with foreign or domestic oil companies. It is responsible for maximizing the value of hydrocarbons on behalf of the Venezuelan state through the efficient and effective management and control over business deals with third parties, making sure that profits are used to provide for the common good through sustainable development.
- Palmaven: Through this affiliate, PDVSA undertakes actions aimed at promoting social policies, the active and foremost participation of communities, in line with the principles stated by the Venezuelan state and the values and ideas contained in the Constitution of the Bolivarian Republic of Venezuela.
- Deltaven: This affiliate is in charge of marketing the products and services associated to the PDV brand, supplying the domestic market with fuel, lubricants, asphalt, solvents, oils and other hydrocarbon by-products. Deltaven operates through a distribution and business network with high added value, managed according to excellence criteria, which ensure consumers' preferences and maximum performance for shareholders.
- PDVSA Gas: The gas business, which represents a great opportunity for growth of the domestic industry, is in the hands of this affiliate of *Petróleos de Venezuela S.A.* The company is in charge of everything related to the marketing of gaseous hydrocarbons in the domestic and international market.
- PDVSA Marina: This PDVSA affiliate is in charge of sea transportation and distribution of hydrocarbons and by-products, supplying the demand of PDVSA's international clients.
- Intevep: Scientific research and technological advances are essential when it comes to guaranteeing the operational continuity and ongoing growth of PDVSA. This affiliate is the corporation's technological and scientific branch, devoted to the development and application of the new technologies required by the oil industry on behalf of Venezuelan citizens.

Prior to oil reform, *Petróleos de Venezuela* operated as an independent institution since its foundation. However, recent legal changes in the oil sector have imposed significant commitments on PDVSA, which is now dependent on the state, with the corresponding implications in terms of savings capacity and, indirectly, of its marketing activity. Furthermore, there is now a degree of uncertainty due to the power exerted by the government over the company.

1. The Plan Siembra 2005–2030

The *Plan Siembra* (Oil Sowing Plan) consists of the energy policy guidelines in Venezuela prevailing until 2030. It includes six large development projects divided into two stages: (i) between 2005 and 2012, with investment amounting to US$56.0 billion, and (ii) between 2012 and 2030.

Likewise, the 2006–2012 Business Plan prescribes that crude oil production shall increase from 3.2 MMBD in 2005 to 5.8 MMBD in 2012. During this stage, also known as "the new PDVSA," management will undergo changes, including the reinforcement of the OPEC, the company's subordination to the state and its role in social transformation.

The following are the projects contained in the Oil Sowing Plan:

- Magna Reserva Project: Determination and certification of the existing reserves along the Orinoco Belt. Not taking into account the Orinoco Belt, Venezuela has 80 billion barrels of oil, whereas in this region there is an estimated additional 235 billion barrels.
- Orinoco Project: Developing and exploiting hydrocarbons along the Orinoco Belt. Twenty-seven blocks have been selected to be exploited by the state-owned company and third companies. This project is said to be crucial for population dispersion and is linked to the creation of new services and dwellings.
- Delta-Caribe Project: Adding this asset to the existing energy supply. It seeks to promote offshore gas in the Deltana platform, north of the Sucre state (Mariscal Sucre Projects, Industrial Complex Gran Mariscal de Ayacucho) and in the surroundings of the Gulf of Venezuela and the Paraguaná peninsula (Rafael Urdaneta Project.).[21]

Table 21
PDVSA's Corporate Agenda 2006–2012

	2005	2006	Difference
Proven reserves (Billion Barrels)	77.100	77.178	0.078
Crude oil production (MMBD)	3.2	5.8	2.6
Refining (MMBD)	3.1	4.1	0.9
Investment budget (US$ Billion)	6.732	8.067	1.335

Source: 2006–2012 Strategic Plans, PDVSA.

- Refining: Increasing refining capacity by 500 kbd. In this case, the project aims to improve the existing refineries (El Palito, Puerto La Cruz and Centro Refinador Paraguaná) and create new refining facilities: Cabruta (with a processing capacity of 400 kbd of extra-heavy oil per day), Batalla de Santa Inés (50 kbd) and Caripito (50 kbd of asphalt).
- Infrastructure: New tanks, multipurpose pipelines and gas stations will be built for crude oil, by-products and gas in order to guarantee fuel supply across the country.
- Integration: Oil is considered to be a tool for the integration of the different peoples inhabiting the continent. Venezuela will directly supply crude oil, gas and by-products to the region through Petrocaribe and Petrosur.

Box 2
Social Districts under the Oil Sowing Plan

The Oil Sowing Plan also features a social component termed "Social Districts." According to PDVSA, these "cover directly those areas where the company undertakes oil, gas and by-products exploration, exploitation, processing and distribution activities. Its main purpose is to foster sustainable social and economic development which should translate into improved quality of life for the population through the exploitation and better use of liquid and gas hydrocarbons."

PDVSA's businesses and affiliates are responsible for negotiating development plans with the communities in their respective Districts and in accordance with the oil and gas plans as well as with the local entities and ministries.

Plan execution is assigned to the managers of the different Oil and Gas Social Districts, who may in turn fully execute plans with their own assets or may opt to complement these with services provided by Social Production Companies (*Empresas de Producción Social*) which, according to their articles of association, must direct 5% of their revenues to social activities.

According to PDVSA, "each business shall coordinate the activities performed in the Districts. For instance, the affiliate *Corporación Venezolana del Petróleo* shall supervise all offshore projects along the Orinoco Belt and under mixed investment companies as well as the exploration and production business in the operational areas of the East, West and Center South, and the refining activities in Puerto La Cruz, El Palito and Paraguaná."

Funding for Social Districts will come from 10% of the investment budget envisioned by the Oil Sowing Plan. According to PDVSA, "during the first stage, from 2006 to 2012, the plan will invest US$56.0 billion, of which at least US$5.6 billion will go to these projects. Non-oil and gas producing regions will be covered by Palmaven, the PDVSA affiliate."

Source: Petróleos de Venezuela (PDVSA).

C. PDVSA's Social Approach

Under the current administration, PDVSA is not exclusively devoted to productive activities related to the hydrocarbon business, but also plays a significant social role and contributes at the same time to the sustainable development of the Bolivarian Republic of Venezuela. This approach is contained in Article 3 of the Constitution of the Bolivarian Republic of Venezuela and Article 5 of the 2002 Organic Law on Hydrocarbons.

Several social development plans are funded by PDVSA's own assets. Funding has increased in recent years, amounting to US$4.8 billion in 2005. According to PDVSA's latest figures, the contribution to social development from January to July 2006 added up to US$5.6 billion, 16.6% of the company's revenues for the same period. The main social plans include:

a) Fondo para el Desarrollo Económico y Social del País (Fondespa)

Fondespa was approved by PDVSA Petróleo's General Holders Meeting in May 2004 "to ensure the adequate linkage of revenues generated by hydrocarbons to the domestic economy." Afterwards, in May that same year, the Central Bank of Venezuela, responsible for controlling foreign exchange, confirmed its approval.

Table 22
Projects Funded by Fondespa (in US$ Billions)

Projects	Amount	Percentage
Viability	0.609	26.0
Transportation	0.567	24.2
Electric power	0.477	20.4
Endogenous development of medium-sized enterprises	0.294	12.5
Services, the environment and communications	0.201	8.6
Agroindustry	0.195	8.3
Total funded projects	**2.343**	**100.0**

Source: Ministry of Energy and Oil.

Fondespa was created to fulfill Article 5 of the Organic Hydrocarbon Law.[22, 23] The government states that "the use of oil surpluses in investment projects contributes not only to economic and social development but also reduces the funding needs of the National Treasury and improves the medium-term financial solvency of the country."[24]

The funding of Fondespa comes from the extraordinary revenues generated by PDVSA Petróleo's hydrocarbon exports. The fund's revenues will come to US$2.0 billion per year, its trust settler being *Corporación Venezolana de Petróleo, S.A.* (CVP), a PDVSA affiliate. The deposit was made at the *Banco de Desarrollo Económico y Social* (Bandes).

Contributions by Fondespa for the execution of programs and projects for works, goods and services designated for the promotion of infrastructure, viability, agricultural activities, health and education in the country are possible thanks to price surpluses.

From May 2004 to May 2005, Fondespa's funds amounted to US$2.343 billion, which were used in road projects, transportation, electric power, small enterprises support, etc.

b) Missions

Social missions are mass strategies aimed at guaranteeing fundamental rights to the population, emphasizing aid to the most disadvantaged population groups. They are funded through the extraordinary assets generated by PDVSA's exports. The program is coordinated by several institutions and ministries, and one of the key elements for planning, execution and follow-up is the active and foremost involvement of the affected communities.

Table 23
Mission Budget 2004–2005

	(US$ Millions)
Ribas	425.9
Misión Identidad	37.7
Barrio Adentro	91.6
Vuelvan Caras	293.0
Robinson	n/a
Guaicaipuro	10.7
Sucre	46.5
Mercal	377.7
Total	**1,283.0**

Source: PDVSA.

According to PDVSA, the company supports eight missions: Ribas, Sucre, Barrio Adentro, Mercal, Identidad, Vuelvan Caras, Guaicaipuro and Robinson. The content of missions varies, covering, for instance, initiatives to provide identity cards to all Venezuelan and foreign citizens (*Misión Identidad*) or to ensure full access to global quality health services (*Misión Barrio Adentro*). According to PDVSA data, mission funding in 2004 and 2005 came to US$1.283 billion.

2. Núcleos de Desarrollo Endógeno (NDE)

PDVSA defines endogenous development as follows: "Through endogenous development, power is transferred to organized communities so that they may promote their agricultural, industrial and tourist potential in each region. This is achieved through the use of previously abandoned state infrastructure (industrial complexes, machinery, idle lands) in order to generate goods and services."

NDEs (endogenous development nuclei) "are activated whenever a community organizes and discovers its potential, which may be exploited for the common good. An abandoned mill, a dismantled industrial complex, idle lands, silos which have not stored grain in years, beautiful beaches lacking adequate access, all of them may provide an opportunity for local development to an organized community which transforms it into an Endogenous Development Nucleus."

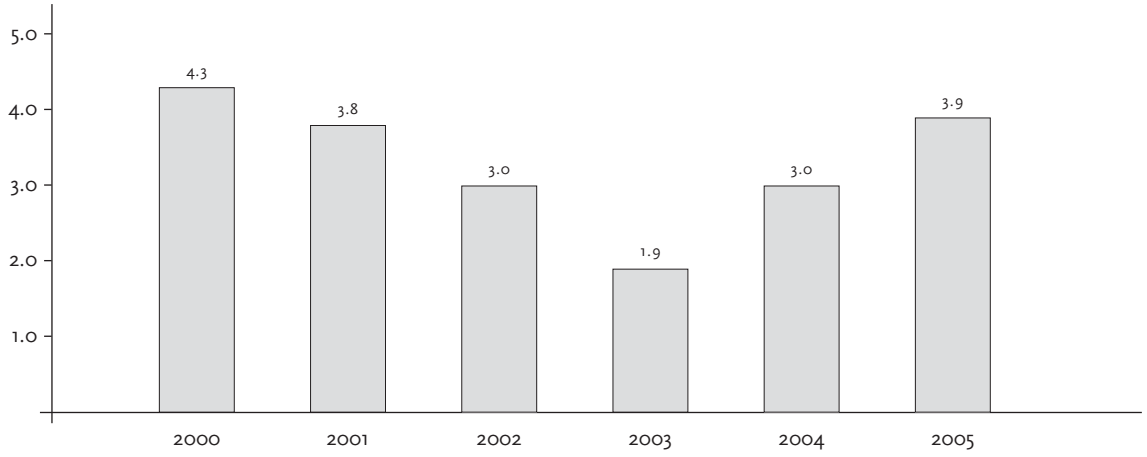
Guidelines for the creation of an NDE are set forth by the *Ministerio Para la Economía Popular* (MINEP) or the Ministry for the People's Economy, and are then submitted to the Ministry of Energy and Oil (*Ministerio de Energía y Petróleo*, MEP), the top regulating entity of the hydrocarbon sector (and thus of PDVSA, as the sector's operator). The MEP's *Oficina de Coordinación Nacional del NDE* (Office for NDE Domestic Coordination) plans local projects aimed at creating nuclei, and PDVSA is in charge, through its affiliate Palmaven, of providing financial and operational support, since the company is responsible for executing all NDE projects. PDVSA invested 76.5 billion *Bolívares* (US$35.0 million) between 2004 and May 2005.

D. PDVSA's Investment and Financial Aspects

The 2004–2009 PDVSA Investment Plan set a US$26.0 billion target for this period in order to increase its hydrocarbon production to 5 MMBD by 2009. In August 2005, PDVSA designed the 2006–2012 Business Plan (already mentioned), setting a new production target for 2012 at 5.84 MMBD.[25]

In 2005, PDVSA's investment amounted to US$3.878 billion, a 30% increase with respect to the previous year. Almost 50% of investment in 2005 was designated for exploration and production (PDVSA). In order to accomplish the set targets, the company expects to increase investment above US$8.0 billion by 2012.

Figure 14
Evolution of Investment by PDVSA (US$ Billions)



Source: PDVSA.

PDVSA has entered significant trade agreements in the international markets. Although significant amounts of oil have been supplied at international prices, analysts do not quite understand how funding for PDVSA's ambitious investment plans will be attained and expect foreign debt to increase.

It is worth noting that PDVSA's debt has decreased from US$8.0 billion in 2001 to US$3.165 billion by March 2006. The largest portion of PDVSA's debt corresponds to the four projects found along the Orinoco Belt.

On the other hand, the Oil Sowing Plan envisions PDVSA investment in the hydrocarbon sector during the first stage (2006–2012) to add up to a total US$95.709 billion. Of this, US$56.0 billion will go to investment disbursements, while US$39.781 billion will go to operating expenses.[26]

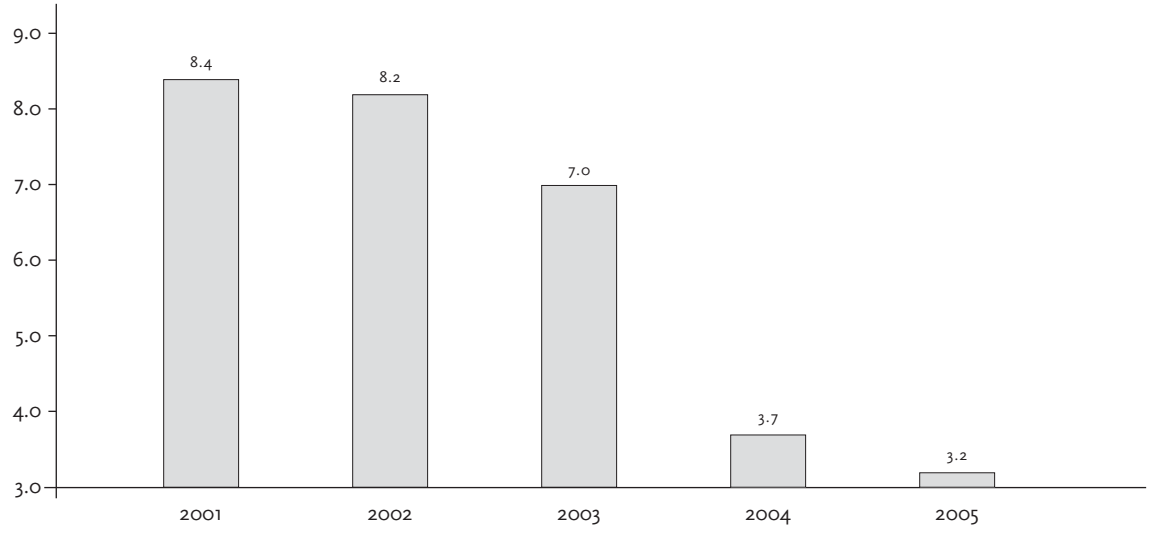
Of the US$56.0 billion that PDVSA plans to spend between 2006 and 2012, 73% will be designated for activities in the "upstream sector, amounting to US$40.782 billion." On the other hand, the Oil Sowing Plan allocates the remaining 27% (US$15.146 billion) to downstream activities.

Table 24
PDVSA: Financial Results for Venezuela for January–July 2006

	(US$ Billions)
Revenues	33.8
Costs and expenses	–7.8
Payable royalty	–10.2
Operational profit	15.8
Contribution to social development	–5.6
Payable taxes	–4.0
Net domestic income	6.2
Contributions to the nation	19.1

Source: PDVSA, Press Release 08/28/2006.

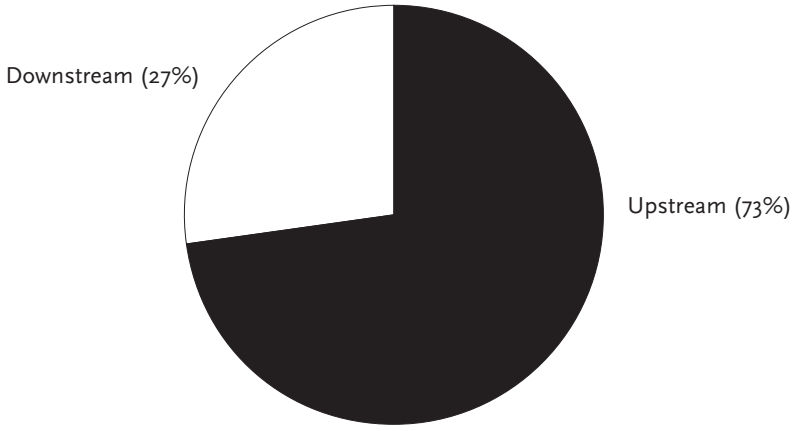
Figure 15
Evolution of PDVSA's Foreign Debt (US$ Billions)



Source: PDVSA.

In the upstream sector, disbursement designated for exploration will come to US$16.699 billion, corresponding to 40% for that stage. As for investment in hydrocarbon production, the most significant investment amounts go to the "mixed investment companies" production arrangements, up to US$8.396 billion, or 17% of total investment in the upstream sector. The new arrangement was the result of migration of operating agreements to mixed investment companies, followed by production arrangements under risk sharing contracts, with US$6.932 billion, the least significant production arrangement to date.

Figure 16
PDVSA: 2006–2012 Investment Plan



Source: PDVSA Petróleos de Venezuela Strategic Plans, March 2006.

The third type of production arrangement receiving the largest investment amounts corresponds to PDVSA's own assets, US$3.562 billion, a significant change in Venezuela's oil structure, where the main production arrangement would be relegated to second place, as the sector's authorities prefer production arrangements involving partnerships between PDVSA and private companies.

Investment along the Orinoco Belt will amount to US$2.14 billion, of which US$583 million will correspond to new fields; investment in natural gas production will come to US$609 million; finally, US$2.444 billion will go to promoting oil production in offshore areas.

Of the US$15.146 billion invested in the downstream sector, 94%, that is, US$14.277 billion, will go to refining, and 4% to fuel distribution within Venezuela. A smaller portion goes to promoting Deltaven's and PDV Marina's projects, with US$93 million and US$161 million, respectively.

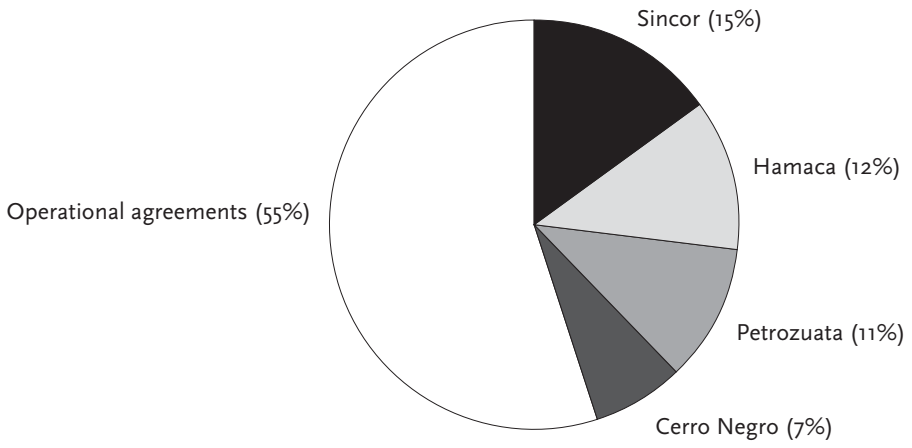
E. Foreign Direct Investment

At the beginning of the 1990s, the so-called "Oil Opening" took place in Venezuela. Private investment was thus introduced in oil exploitation under three arrangement types: operational agreements, strategic partnerships and risk sharing contracts, the former two being the most significant ones.

From 1993 to 2005, FDI in the first two headings amounted to US$27.6 billion. FDI in operational agreements equaled 55% of total investment, while FDI in strategic partnerships along the Orinoco Belt accounted for the remaining 45%.

As for operational agreements, the first disbursement of US$16 million took place in 1993. Since that year, three international bidding rounds have been held, with investment increasing up to US%1.6 billion in 1999.[27] Later, investment flows declined sharply. In total, between 1993 and 2005, investment amounted to US$15.2 billion.[28]

Figure 17
Foreign Investment in Venezuela: 1993–2005 (US$ 27.6 Billion)



Source: Cámara Venezolana de Empresas Consultoras, www.cavecon.com.

Table 25
Strategic Partnerships –Orinoco Belt
Partner Companies and Investment: 1997–2005 (Percentages and US$ Billions)

	Company	Share (%)	Investment
Petrozuata	Conoco (USA)	49.9	1.497
	PDVSA	50.1	1.503
Subtotal			3.000
Hamaca*	PDVSA	30.0	0.960
	Phillips (USA)	40.0	1.280
	Texaco (USA)	30.0	0.960
Subtotal			3.200
Sincor	Total (FRAN)	47.0	1.974
	PDVSA	38.0	1.596
	Statoil (NOR)	15.0	0.630
Subtotal			4.200
Cerro Negro	Mobil (USA)	47.0	0.940
	PDVSA	38.0	0.760
	Veba Oel (SWE)	15.0	0.300
Subtotal			2.000
Total			**12.400**

Source: PDVSA.

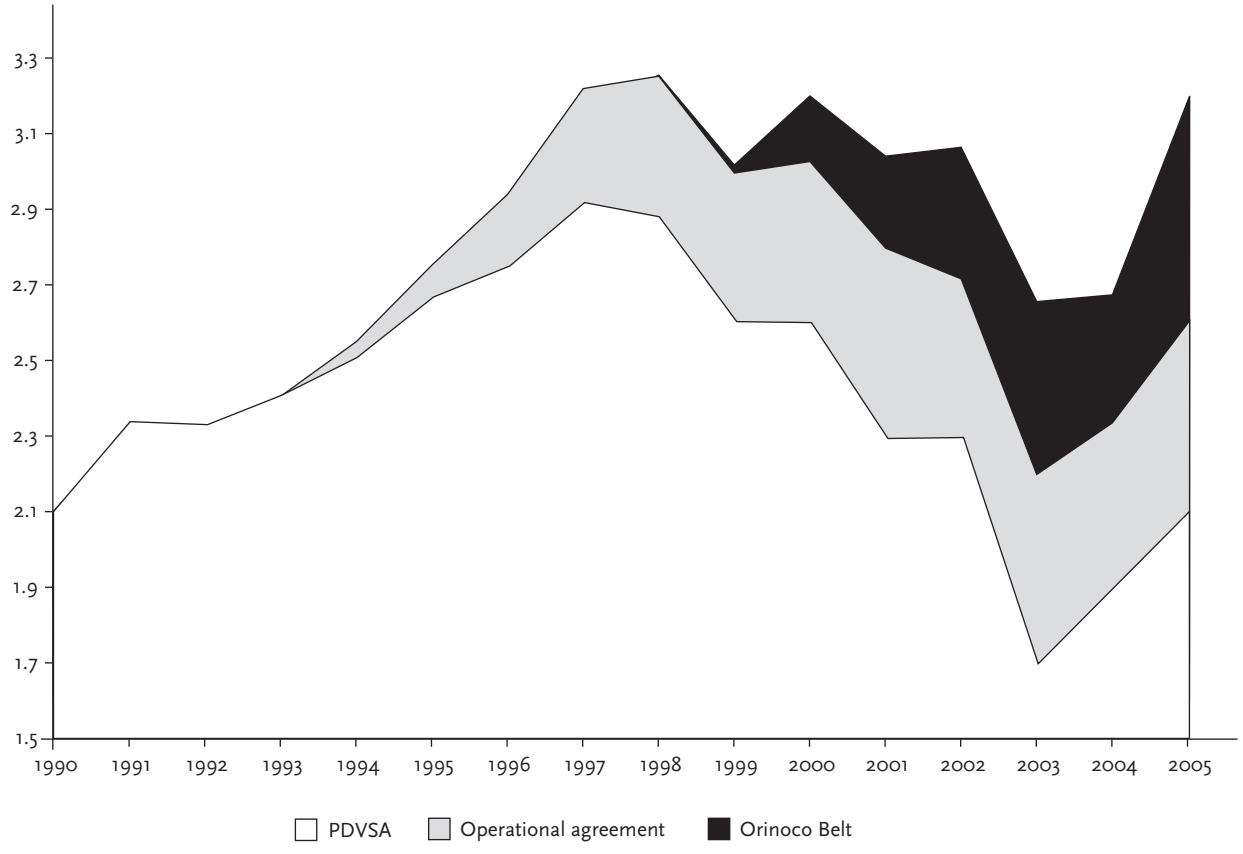
Investment in strategic partnerships along the Orinoco Belt began in 1997 with US$1.387 billion and rose up to US$2.88 billion in 1999, to fall again in the following years due to projects' completion.

The Orinoco Belt includes four projects where PDVSA participates together with several foreign companies (see Table 25). Petrozuata began in July 1997 and by 2005 investment amounted to US$3.0 billion. The second project was Cerro Negro (January 1998), with investment amounting to US$2.0 billion by 2005. The third project was Sincor (Augist 1998), with investment amounting to US$4.2 billion by 2005, the most significant project in terms of investment. The last project was Hamaca (August 2000), with investment amounting to US$3.2 billion by 2005.[29]

F. Production

Oil production remained stable between 1999 and 2002. In 2003, it fell sharply due to a strike that lasted more than three months (from December 2002 to February 2003). In 2004, it picked up again, reaching 3.1 MMBD by 2005.

Figure 18
Venezuela: Distribution of Crude Oil Production by Operator (Millions of Barrels per Day)



Source: PDVSA.

Oil production in Venezuela stems from four different sources: first, PDVSA's own production; second, the 32 operational agreements signed by private companies (the same that in 2006 became mixed investment companies) with PDVSA to extract oil in marginal areas; third, the four strategic partnerships entered by PDVSA to exploit extra-heavy crude oil along the Orinoco Belt. Fourth, risk sharing contracts, most of them still in the exploration stage. In 2004, barely 4.4 kbd were produced under these contracts.

The bulk of production corresponds to PDVSA, in spite of the fact that it has fallen since 1999. On the other hand, production under operational agreements began in 1994 (it is worth noting that the oil produced belonged to PDVSA; the contractor received a compensation fee for the services rendered), whereas strategic partnerships (in this case, joint ventures between PDVSA and private companies) began in 1995 and reached the targeted production by 2004.

a) From Operating Agreements to Mixed Investment Companies

The exploitation of marginal fields[30] has taken place under operating agreements between PDVSA's affiliates and private companies since 1992. This arrangement, also known as operational agreements, attracted a large number of applicants, some of which entered partnership agreements with Venezuelan private companies to bid for the tendered fields.

In 2005, these operating agreements were denounced by the current administration. Subsequently, the National Assembly enacted a new law prescribing the termination of operating agreements and the mandatory migration of companies to a new contract arrangement termed as mixed investment companies, with PDVSA holding the majority stake.

It is worth noting that those areas initially assigned to 32 operating agreements were reduced to 64% after their migration to mixed investment companies, going from 43,000 to 15,259 square kilometers being effectively exploited. The Venezuelan authorities are assessing whether the remaining 27,700 square kilometers should be reassigned to the same oil companies participating in mixed investment companies or should remain instead in the hands of PDVSA.

Of the 32 existing operating agreements, 30 companies showed their willingness to migrate to mixed investment companies. Only two companies, Eni SpA (Italy) and Total (France) refused to migrate. On the other hand, Exxon Mobil sold its share in the Quiamare-La Ceiba field (150 kbd) to Repsol-YPF. Oil production under operating agreements rose in 2005 to 500 kbd.

During the time when operating agreements were enforced, investment exceeded US$10.0 billion, the same figure reflected in PDVSA's financial statements.[31] This amount should be added to US$2.192 billion for the third round bid bond, that is, the payment issued by investor companies in order to participate in operating agreements. It is worth noting that some of these agreements were exclusively reserved to Venezuelan oil companies, although their share was considerably limited with respect to total investment.

Table 26
Migration of Operating Agreements to Mixed Companies

Venezuela, June 2006	
Petroperijá S.A.	CVP (60%) and British Petroleum de Venezuela (40%)
Petrocabimas S.A.	CVP (60%) and Suelopetrol (40%)
Petroorinoco S.A.	CVP (60%) and Harvest-Vinccler C.A. (40%)
Baripetrol S.A.	CVP (60%); Tecpetrol (17.5%);Lundin Latina de Petróleos (5%) and Perenco Oil and Gas (17.5%)
Petroregional del Lago S.A.	CVP (60%) and Shell (40%)
Petroboscan S.A.	CVP (60%), Chevron (39.2%) and Ineboscan (.8%)
Petrocuragua S.A.	CVP (60%), OPEN (12%) and Cartera de Inversiones Petroleras (28%)
Petrowayu S.A.	CVP (60%), PETROBRAS (36%) and Williams International Oil and Gas (4%)
Petrocaracol S.A.	CVP (75%) and CNPC Venezuela (25%)
Petroven-Bras S.A.	CVP (60%), PETROBRAS (29.2%) and Coroll (10.8%)
Petrolera-Mata S.A.	CVP (60%), PETROBRAS (29.2%) and Inversora Mata (10.8%)
Lagopetrol S.A.	CVP (80%), Hocol (17%), Ehcopek Petróleo (2%), Cartera de Inversiones Petroleras (1%)
Boquerón S.A.	CVP (60%), British Petroleum Venezuela (26.666%) and PEI Venezuela (13.334%)
Petroguárico S.A.	CVP (70%) and Teikoku Oil Venezuela (30%)
Petroquiriquire S.A.	CVP (60%) and Repsol YPF (40%)
Petroritupano S.A.	CVP (60%), PETROBRAS (18%), APC Venezuela (18%) and Corod Producción (4%)
Petromiranda S.A.	CVP (60%) and Vinccler Oil and Gas (40%)
Petronado S.A.	CVP (60%), Compañía General de Combustibles (26.004%), Banco Popular de Ecuador (8.356%) and Korea National Oil Corporation (5.640%)
Petroindependiente S.A.	CVP (74.8%) and Chevron (25.2%)
Petrolera Kaki S.A.	CVP (60%), Inemaka (22.667%) and Inversiones Polar (17.333%)
Petrowarao	CVP (60%) and Perenco (40%)

Source: Gaceta Oficial de Venezuela.

b) Strategic Partnerships

The 2006 legal amendments to the Organic Hydrocarbon Law and to the Income Tax Law also had an impact on strategic partnerships signed by PDVSA and foreign companies to exploit extra-heavy crude oil along the Orinoco Belt. These partnerships began in 1995 with the participation of some of the largest oil companies,[32] such as Mobil, Texaco, Conoco and Phillips, as well as the French Total and the Norwegian Veba Oil.

The reform of the Organic Hydrocarbon Law increased royalties paid by strategic partnerships from 16.66% to 30%. Furthermore, it established a 33% tax rate on extraction. The royalty rate may be deducted

to estimate the payment of the tax on extraction. On the other hand, in August 2006, the National Assembly modified the Income Tax Law governing strategic partnerships, increasing it from 34% to 50%.[33]

In addition, the government established PDVSA's majority stake in oil production under strategic partnerships, to be enforced in 2006. Under Hamaca's strategic partnership, PDVSA's share stands at 30%, whereas in Sincor and Cerro Negro, its share adds up to 38%. In Petrozuata, PDVSA has a 50.1% share.

c) Risk Sharing Contracts

The third partnership arrangement consists of exploring new oil reserves of light and intermediate crude oils. Corporación Venezolana de Petróleo S.A. (CVP) is PDVSA's affiliate in charge of coordinating, controlling and supervising all activities related to the exploration and exploitation of hydrocarbon fields in new areas through partnership agreements with private investor companies. These areas were assigned to CVP by the Ministry of Energy and Mines in January 1996.

To date, the following exploration risk-sharing contracts are still in force, with the participation, among others, of ExxonMobil, Petrocanada, Ineparia and Conoco Phillips.

- La Ceiba (Trujillo, Mérida, Zulia)
- Golfo de Paria East and West (Corocoro)
- Golfo de Paria Oeste (Sucre)
- Guarapiche (Monagas)
- Guanare (Portuguesa)
- San Carlos (Cojedes)
- El Sombrero (Guárico)
- Catatumbo (Zulia)
- Punta Pescador and Delta Centro (Delta Amacuro)

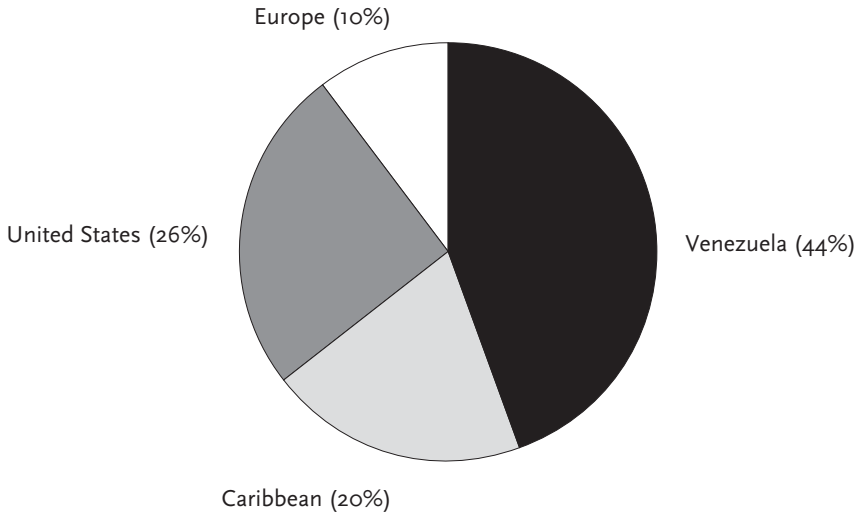
G. Internationalization and Regional Integration

PDVSA's presence abroad translates into different activities, mainly in the refining sector (or downstream). This holding owns companies in several countries and operates in two continents, America and Europe. It is worth noting that this activity is aimed at ensuring a market for the crude oil produced in Venezuela.

The bulk of PDVSA's refining capacity may be found abroad, with 55% of total refining capacity, whereas 45% takes place in Venezuela. The main recipient is the United States, with a 721 MMBD refining capacity. In the United States, PDVSA operates through its subsidiary, Citgo, which, along with producing petroleum by-products, is one of the main suppliers of petrochemical products in the United States.

Citgo owns five refineries: (i) Lake Charles; (ii) Corpus Christi; (iii) Lemont; (iv) Paulsboro; (v) Savannah. Additionally, Citgo has a share in the Lyondell refinery in Houston, with a 265 kbd capacity; its main competitive advantage lies in its deep conversion schemes. Furthermore, Citgo owns 13,500 gas stations across the country, its production nearing 1 MMBD. In 2005, the company transferred dividends to Venezuela amounting to US$785 million.[34]

Figure 19
PDVSA's Refining Capacity by Region (2.9 Million Barrels per Day in 2006)



Note: * Including its own assets and those under partnership agreements
Source: EIA.
Source: PDVSA.

The second most important region is the Caribbean, with 567 kbd. In 1998, PDVSA acquired 50% of the Hovensa refinery in the Virgin Islands, with a 495 kbd capacity in 2005. Here, the company Amerada Hess retains the remaining 50% share. Likewise, PDVSA is present in the Island of Curacao (Netherlands Antilles), where it leases the Emmastad refinery, with 320 kbd refining capacity. Petroleum by-products produced in this area are mainly designated for exports to the United States market.

In Europe, PDVSA has a 50% share in two joint ventures, with a resulting refining capacity of approximately 300 kbd. PDVSA retains a 50% share in AB Nynas, a Swedish company operating five refineries: (i) Nynashamm (Sweden), Gottenburg (Sweden), Antwerp (Belgium), Eastham (United Kingdom) and Dundee (Scotland). PDVSA's refining capacity adds up to 50 kbd.

PDVSA also retains a 50% share in the German company Ruhr Oel, together with British Petroleum, with a refining capacity of 250 kbd. At the same time, Ruhr Oel has a share in four other German refineries: (i) Gelsenkirchen, (ii) Neustad, (iii) Karlsruhe, and (iv) Schwedt. It is worth noting that PDVSA is currently looking for a purchaser to sell the whole property (Source: EIA).

PDVSA plans to expand its refining capacity in South America. In February 2005, PDVSA signed an agreement with PETROBRAS to build a new refinery located north of Brazil (Pernambuco) with a refining capacity ranging from 150 to 250 kbd and investment amounting to US$2.8 billion.[35]

Likewise, PDVSA has entered several energy agreements with Argentina, Bolivia and Colombia and plans to increase its presence in South America.

1. Operations in Bolivia

Since January 2006, when the President of the Republic of Bolivia, Evo Morales, began his term of office, the governments of Bolivia and Venezuela have signed several energy agreements aimed at:

- Fuel supply
- Technical assistance
- Personnel exchange
- Creation of mixed investment companies
- Project development

That same month, PDVSA Bolivia[36] was inaugurated. Subsequently, the president of the Bolivarian Republic of Venezuela, Hugo Chávez, and his Bolivian counterpart, Evo Morales, signed eight agreements for cooperation in the field of energy, agriculture, education, sports, social development, health and the joint declaration known as *Declaración de La Paz* (La Paz Declaration).

Furthermore, they both signed the *Acuerdo de Cooperación Energética de Caracas* or ACEC (the Caracas Energy Cooperation Agreement), whereby Venezuela, through PDVSA, would supply up to 6.6 kbd in crude oil, diesel oil and LPG to Bolivia; it also envisions a payment mechanism for energy supply that allows Bolivia to exchange products or services in return.

In May 2006, new agreements were entered to provide, among other things, training for 200 workers from the Bolivian energy industry at INTEVEP, PVDSA's technological branch. Similarly, a future agreement would aim at certifying gas and oil reserves in Bolivia. Another cooperation agreement would facilitate training for 250 young Bolivians at the *Escuela de Polímeros de la Petroquímica de Venezuela* (Pequiven) to subsequently promote the petrochemical industry in Bolivia. By May 2006, 13 agreements covered the whole production chain in the hydrocarbon sector.

In September 2006, Venezuela announced it would invest US$2.1 billion in Bolivia to build four hydrocarbon facilities and to create a company between PDVSA and the Bolivian YPFB devoted to petrochemicals and liquid gas facilities.

2. Operations in Colombia

In June 2006, in the bordering area of La Guajira (north of Colombia), construction works for the "Arturo Ricaurte" Gas Pipeline began. This 225-kilometer pipeline will connect Colombia and Venezuela, from Punta Ballena in Colombia to Maracaibo, in the state of Zulia. More specifically, 88.5 kilometers will sit in Colombia, and the remaining in Venezuela. It should be inaugurated in March 2007, with a transport capacity of 150 million cubic feet per day (MMCFPD) of gas from Colombia to Venezuela.

Investment in this gas pipeline is approximately US$335 million, of which 10% will go to social projects in the areas affected by the pipeline, particularly aimed at health, education, culture and sports.

Subsequently, the Republic of Panama joined the project, so that Antonio Ricaurte's pipeline will be extended to the Trans-Caribbean Gas Pipeline, connecting the three countries. In July 2006, the presidents of all three countries signed a memorandum for the constitution of a negotiations committee on gas interconnection between the Bolivarian Republic of Venezuela, the Republic of Colombia and the Republic of Panama (*Memorando de Constitución de un Comité de Negociación en materia de interconexión gasífera entre*

la República Bolivariana de Venezuela, la República de Colombia y la República de Panamá), designating the Ministries of Energy as the project's executing agencies.

Thus, the new project envisions a second stage starting in 2011, when PDVSA will complete the necessary infrastructure to exploit and transport large gas reserves from east to west of the country. Venezuela will export 250 MMCFPD of gas to Colombia and then, according to Ramírez's statements, delivery capacity will rise to 1,000 MMCFPD and the pipeline will be extended to Panama.

3. Operations in Argentina

In March 2006, ENARSA PDV S.A. was officially created. PDVSA Argentina[37] will have a 60% share and ENARSA will retain the remaining 40%.

PDVSA Argentina's consolidated businesses in the region include the acquisition of 46% of the Uruguayan refinery Ancap's stock; contracting the construction of the Eva Perón ship with the Río Santiago shipyard; and entering a trust agreement with the managing company in charge of electric power wholesale distribution in Argentina (Cammesa) to supply up to 22 kbd of fuel oil designated for thermal plants.

Additionally, ENARSA, together with Ancap, an affiliate of PDVSA Intevep in Venezuela, will work on the quantification and certification of reserves found at Block Ayacucho 6 along the Orinoco Belt, considered to be the largest hydrocarbon reservoir in the world.

In February 2005, the first ENARSA/PDV gas stations were inaugurated in Buenos Aires as part of the energy partnership between Interven Venezuela S.A., an affiliate of *Petróleos de Venezuela S.A.* (PDVSA), and the *Empresa Nacional de Energía de Argentina* (ENARSA), thus reinforcing partnerships between both companies.

4. Energy Regional Integration Plans

The Venezuelan government has been fostering the creation of four regional companies that would in turn promote energy integration in Latin America. Petrocaribe would cover the Caribbean region; Petroandina in the Andean region; Petrosur in the South American region; and Petroamerica for all Latin America. It is worth noting that the above three companies are subprojects of Petroamerica.

These initiatives include, on the part of Venezuela, aid to promote oil activities, investment in refining capacity, and the sale of oil and petroleum products at preferred prices.

Of the three subprojects, the most advanced is Petrocaribe's, which already entered a preliminary agreement with 13 countries in 2005. Jamaica was the first country to sign. Through Petrocaribe, Venezuela will offer oil and petroleum products to the Caribbean countries under preferential terms and prices. By April 2004, PDVSA had already completed the construction of a new export terminal. The four regional integration companies are described below.

5. Petroamérica

Petroamérica is a proposal by the Bolivarian government of Venezuela based on the 2003 OLADE declarations and the Caracas declaration of September 2005—signed by the Ministers of Energy or its representatives. In the latter declaration, the parties agreed to proceed with the creation of Petroamérica. The company was thus conceived as a strategic partnership between energy operators in their respective countries in order to ensure supply in the region and long-term integration in accordance with the principles of economic complementarity

and solidarity among nations. Three additional initiatives are included in Petroamérica: (i) Petrocaribe, (ii) Petrosur and (iii) Petroandina.

The institutional consolidation of Petroamérica is still underway. Its policy aims at integrating state energy companies and governments alike. It also envisions the involvement of private companies, which must nevertheless adjust their goals to those of the government. Progress in the consolidation of Petroamérica will translate into the gradual implementation of bilateral and subregional actions and agreements. The proposal of Petroamérica seeks to address energy costs derived from speculation and geopolitical conditions in the region. The proposal includes building the South Gas Pipeline (*Gaseoducto del Sur*).[38]

It is worth noting that Petroamérica was designed as an alternative option in a context where energy integration was based in the past on the privatization of the sector's companies and trade opening. Thus, Petroamérica's first actions have aimed at integrating the state-owned companies of Latin America and the Caribbean to jointly implement agreements and carry out the exploration, exploitation and marketing of oil and natural gas.

The guidelines proposed by the Bolivarian government of Venezuela to further Petroamérica's energy integration initiative are as follows:

- Redefining the existing relations among nations based on their resources and potential.
- Leveraging the economic, social and cultural complementarity in order to reduce asymmetries in the region.
- Minimizing the negative effects of energy costs on the countries in the region generated by speculation and geopolitical factors.
- Reinforcing other regional initiatives such as Mercosur, CAN, Alba and the Community of South American Nations.

Likewise, Petroamérica's specific actions are based on the promotion of joint initiatives among nations, including global cooperation agreements; identifying cooperation areas and bilateral agreements between state companies and/or entities; and creating companies and/or specific cooperation agreements.

Once these actions have been implemented, a higher level will be reached, which, based on Petroamérica, will help attain integration of state energy companies in Latin America and the Caribbean.

a) Petrocaribe

Petrocaribe is the most advanced integration initiative. Its foundational agreement was signed on June 29, 2005 by 14 countries in the Caribbean region: Antigua and Barbados, Bahamas, Belize, Cuba, Dominica, Grenada, Guyana, Jamaica, Dominican Republic, San Cristobal y Nieves, Santa Lucia, San Vicente and Granadinas, Surinam and Venezuela. The agreement was signed after the Energy Cooperation Agreement on Petrocaribe entered during the first energy meeting by Heads of State and/or Government in the Caribbean, held in the city of Puerto La Cruz, east of Venezuela. Petrocaribe's foundational agreement implies the binding of previously existing agreements such as the San Jose Agreement and the Caracas Energy Agreement.

Petrocaribe seeks to solve unequal access to energy resources by participating countries, providing a new exchange scheme that is favorable, equitable and fair. In order to do so, it aims to improve terms of supply funding. Supply used to be financed with 25% of the invoice, one grace year and a 15-year payment deadline at 2% interest rate. Now, with Petrocaribe, terms improve, taking as a reference the price of crude oil; the grace

period has been extended from one to two years; and the payment deadline has been extended from 17 to 25 years, reducing interest rates down to 1% whenever the price of oil exceeds US$40 per barrel. On the other hand, short-term payments are extended from 30 to 90 days.

Likewise, Venezuela is ready to accept goods and services as a form of payment, in certain cases offering special prices. Venezuela could receive products at preferential prices such as sugar, banana, and other goods or services affected by trade policies implemented in wealthier countries.

b) Petrosur

Petrosur is an energy integration initiative gathering Argentina, Brazil, Venezuela and Uruguay. In this framework, Petrosur was conceived as a political and commercial facilitator promoted by the Bolivarian Republic of Venezuela and aimed at establishing cooperation and integration mechanisms based on complementarity and at using energy resources in a fair and democratic manner to improve the social and economic conditions of their peoples.

This initiative acknowledges the importance of fostering cooperation and strategic partnerships among state oil companies in Brazil, Argentina, Uruguay and Venezuela—*Petróleos Brasileiros* (PETROBRAS), *Energía Argentina S.A.* (ENARSA), *Administración Nacional de Combustibles, Alcohol y Portland* (ANCAP) and *Petróleos de Venezuela S.A.* (PVDSA)—to globally promote businesses along the hydrocarbon chain.

Petrosur seeks to minimize the negative effects of speculation and geopolitical factors on energy costs for the countries in the region. It intends to do so by reducing transaction costs (eliminating intermediation), providing access to preferential funding and leveraging trade synergies to solve economic and social inequalities in the region.

c) Petroandina

During the XVI Andean Presidential Council held in Lima on July 18, 2005, the energy integration initiative known as Petroandina was agreed on as a common platform or "strategic partnership" between oil and energy state agencies in the five countries making up the CAN (Bolivia, Colombia, Ecuador, Peru and Venezuela) in order to "promote electric and gas interconnection, mutual provision of energy resources and joint investment in projects."

During this summit, the representatives of Bolivia, Colombia, Ecuador, Peru and Venezuela signed the *Acta Presidencial de Lima. Democracia, desarrollo y cohesión social*, whereby the representatives of the member states acknowledge the proposal of the Bolivarian Republic of Venezuela for the creation of Petroandina and studied the convenience of devising an Andean energy agenda in the context of South American integration, taking into account the different existing bilateral agreements and the significant energy potential of oil, coal and gas fields, as well as of water, wind and solar energy sources in the region, which are essential to modern development in the Andean and South American integration processes.

Taking these premises into consideration, the member states also stated their interest in reinforcing regional integration by promoting energy interconnection projects in South America based on the agreements already enforced and the existing trade schemes.

The first beneficiary of the new Andean cooperation scheme is Ecuador, a net oil exporter and former member of the OPEC as well a as gasoline importer, which today is negotiating refining activities in Venezuela with part of its crude oil, thus saving some of the US$1.0 billion per year it pays for imported fuel.

d) South Gas Pipeline[39]

The South Gas Pipeline project was born during MERCOSUR's 29th Presidential Summit of December 2005, held in Montevideo, which granted Venezuela full membership in this economic block. During this meeting, the Presidents of Argentina, Brazil and Venezuela signed a memorandum of understanding giving way to technical, economic and viability studies for the construction of the South Gas Pipeline. The project entails building a gas pipeline ranging from 8,000 to 10,000 kilometers in size, which will go from Venezuela to southern Argentina. Funding issues have not yet been addressed.

The purpose of this project is to ensure long-term natural gas supply in South America. Likewise, it intends to guarantee the viability of energy integration among Latin American nations, as well as domestic development.

Progress so far has been very modest. By August 2006, the pipeline's engineering design was still being discussed. Thus, a *Comisión Permanente de Ingeniería y Coordinación*[40] (Permanent Commission on Engineering and Coordination) was established, a technical team made up by representatives of state energy companies and the Ministries of Energy from Argentina, Bolivia, Brazil and Venezuela and headquartered in Caracas. The commission plans to issue the corresponding bidding terms in two months.

Further positive developments include the recent adhesion of Uruguay and Paraguay to the project during MERCOSUR's summit of Heads of State (July 21, 2006).

On the other hand, two additional working groups, the Ministerial Committee for Coordination and Decision (*Comité Ministerial de Coordinación y Decisión*) and the High Level Coordinating Group (*Grupo Coordinador de Alto Nivel*), composed of experts belonging to state-owned companies, has been analysing and planning key aspects of the Great South Pipeline such as: markets and marketing; environment and social development; tariffs, engineering and technology; business model and financing; and finally, legal, fiscal and institutional regulations.

Endnotes

1 A minor modification to the taxation regime was introduced in December 2005 to decrease said rate, although it does not alter the main contents of this analysis.

2 For more information, see PETROBRAS's articles of association at www2.petrobras.com.br/portal/frame_ri.asp?pagina=/ri/port/ConhecaPetrobras/EstatutoSocial/EstatutoSocial.asp.

3 "Art. 5 The company's shares will be: common, with voting rights, and preferred, without voting rights". The same article states that: "Preferred shares shall not be convertible to common shares, and viceversa."

4 "The leap taken by PETROBRAS in 2005 is reflected in figures. In December, the company registered a market value of US$74 billion, in contrast with its 2004 market value of US$42 billion. Its excellent performance brought about international recognition for the oil company. PETROBRAS jumped 68 positions in the Business Week rank, the U.S. business magazine. It ranked 56 among those open capital companies with the highest market value according to the international Standard & Poor's Global 1,200 index. This is estimated taking into account the company's stock available in international markets times the company stock's value" (Tiempos del Mundo, 02/02/2006, www.tdm.com/Economia/02/20060202-870142.htm.)

5 PETROBRAS: Análisis Financieros y Demostraciones Contables 2005, www.petrobras.com.br, page 9.

6 "Shell's Bijupira-Salema project in the Campos field is the only oil field in Brazil not operated by Petrobras. Production began in 2003, amounting to 50 kbd. Shell is expected to star producing 100 kbd under project BC-10 at the end of 2008." (U.S. Department of Energy, www.eia.doe.gov)

7 See World Investment Report 2003, www.unctad.org.

8 Through Notice No. 25 of August 11, 2005, the Ministry of Finance established a new mechanism for the capitalization of utilities starting in 2006. Thus, ENAP must transfer a minimum amount of resources, whether via income taxes or paying in advance of 50% of utilities over a 14% rate of return (return on equity).

9 Peru's main business group. Specifically, ENAP and Romero Trading (linked to Grupo Romero) entered this partnership agreement.

10 "Política de empleo PEMEX-12004," Patricia del Hierro, pages 10 and 11.

11 The Pidiregas mechanism works as follows: long-term strategic projects fulfilling a number of set requirements in terms of profitability and generation of resources are internationally tendered as turnkey contracts, including the financing cost required during the building stage. Once the facilities have been delivered in a satisfactory manner, the provider is paid the agreed price with assets hired by PEMEX in

international financial markets with the specific warranty of having received the facilities in a satisfactory way. Funding is extrabudgetary since PEMEX only records those credit brackets not used and those maturities due during that particular period, whereas the amounts debited corresponding to the credit used are registered outside the ordinary budget as off-balance-sheet items.

12 "By the end of June 2006, PEMEX, the largest oil company in Latin America, reported total assets of one trillion 114 billion *pesos*, exceeded by total liabilities, which amounted to one trillion 124 billion *pesos*." (El Economista, August 4, 2006.)

13 In December 2005, PEMEX began drilling the Noxal-1 well. This is the deepest well drilled in Mexican waters, at 935 meters deep. This well is very significant since it led to identifying a new producing region with great potential in the deep waters of the Gulf of Mexico.

14 The SSPA is a continous evolution and improvement process, which introduced the advances, tools and best practices of the systems in force (PROSSPA and SIASPA.) Through this program, during the first stage a series of actions were identified and implemented, aimed at reducing the number and severity of personal and industrial accidents at PEMEX (PEMEX, 2005 Annual Report).

15 "In the case of crude oil, it is obvious that the policy aimed at maintaining the current growing trend in production levels and 0% in proven reserves replacement will lead us to total depletion by the year 2014. If replacement levels stood at 25%, depletion would take place by 2017. Only through 50% reserve replacement level would we guarantee the availability of this resource until 2020. Nevertheless, in all cases the situation would be dramatic, since crude oil reserves would barely cover the needs of domestic and international demand for a little over twelve years under Germán Alarco Tosoni's administration." *Relaciones intersectoriales y la macroeconomía de los hidrocarburos en México*, Secretaría de Energía, Subsecretaría de Planeación Energética y Desarrollo Tecnológico, page 15, (2005).

16 On the other hand, 668 development wells were drilled, reaching a record high of 742 wells drilled.

17 British Petroleum (BP), Statistical Review of World Energy 2006, London 2006, pages 4 and 6.

18 British Petroleum, op cit, pages 16, 20 and 22.

19 Out of 32 companies, 30 reached agreements. Only two European companies, Eni SpA (Italy) and Total (France) rejected the creation of "mixed investment companies."

20 "When estimating the Tax on Extraction, the tax payer is entitled to deduct any royalty payments, including the additional royalty paid as a special tax break" (Art. 48).

21 So far, 13 companies from 12 different countries have acquired at the headquarters of the Ministry of Energy and Oil (MENPET) the information package to participate in the concession of the Deltana-Caribe project: Shell, from the Netherlands; Petrobras, from Brazil; Teikoku and Mitsubishi, from Japan; Total, from France; Chevron, from the United States; Lukoil, from Russia; Hocol, from the United Kingdom; Eni, from Italy; ONGC, from India; Repsol YPF, from Spain; Statoil, from Norway; and Vinccler Oil, from Canada. Each company cancelled US$350,000. Petróleos de Venezuela (PDVSA) keeps an optional share in each block for both regions. In Block A, Blanquilla, the industry will have a 70% share, whereas in the three remaining blocks (Blanquilla and Punta Pescador), the share will stand at 35%. (Portal Oriente Venezolano, August 23 2006, http://enoriente.com/content/view/3008/37/.)

22 "The revenues generated by hydrocarbons and transferred to the Nation will be used to fund health, education, macroeconomic stabilization funds and productive investment so that petroleum is adequately linked to the domestic economy, all of it for the good of the people" (LOH, Article 5).

23 According to the government, "the use of oil surpluses in investment projects not only contributes to economic and social development but also reduces the funding needs of the National Treasury and improves the medium-term financial solvency of the country."

24 www.pdvsa.com/fondespa.

25 Analysts estimate that PDVSA should invest US$3.0 billion just to maintain production levels in the existing fields, which in some cases have decreased production by 25%.

26 It is worth mentioning that for the same period, the Oil Sowing Plan plans a third party disbursement of US$48.224 billion, of which US$39.781 billion will go to investment and US$8.443 billion to operational expenses. Total disbursement in the sector in Venezuela will amount to US$123.959 billion.

27 Figures provided by Ramón Espinasa.

28 For a more detailed list of companies, see section F of the present chapter.

29 The *Asociación Venezolana de Hidrocarburos* (AVHI, 2006) estimated that between 1993 and 2005, investment under operational arrangements and strategic partnerships along the Orinoco Belt contributed 10% of the GDP, generated 45,000 jobs (13,000 direct jobs and 32,000 indirect jobs) and domestic sales amounting to 65% and 80%.

30 Marginal or depleted fields are those which have not been exploited since they are not economically profitable, due to the company's advanced technological level or to the high investment needed to reactivate those fields.

31 Under these agreements, all hydrocarbons produced are owned by PDVSA and its affiliates; once crude oil production has been established, contractors may recover their investment and receive payment or compensation for each barrel delivered to PDVSA's affiliate. PDVSA paid for operational fees, capital and wages associated with the services provided (these amounts could match or not annual investment by the companies). The current administration questioned whether payments for services issued by PDVSA to these companies should be tied to international oil prices.

32 For a detailed analysis of strategic partnerships, see *Reformas e Inversión en la Industria de Hidrocarburos de América Latina*, Natural Resources and Infrastructure Series, ECLAC, 2004.

33 "The increase of income taxes does not affect in any way the economics of the Sincor project, where Total, Petróleos de Venezuela and Statoil participate. It is an extremely sound project which already enjoyed very favorable conditions even before it was launched: the price per barrel stood below US$15. Obviously, when the price stands at US$70 (...) profitability is not easily accepted in any country," Presentation on the group's financial prospects by Christophe de Margerie, "*Alza fiscal sin efectos para Total,*" El Universal, Caracas, 9/7/2006.

34 Diario El Universal, "*Citgo 'repatría' $785 millones,*" Caracas, 04/24/2006.

35 "According to an interview published in the financial magazine *Valor Económico,* the manager of Supply and Refining at PETROBRAS, Paulo Roberto Costa, stated that the final design of this company will be defined by the end of 2006," Associated Press, 8/30/2006.

[36] Its facilities will hold the *Banco para el Desarrollo Económico y Social* (BANDES) and the *Banco Industrial de Venezuela*.

[37] A local affiliate of the Venezuelan state-owned company.

[38] The natural gas supply project consists of transporting gas reserves from Venezuela to southern Argentina across Brazil.

[39] *PDVSA Informa*, August 8, 2006, www.pdvsa.com.

[40] This commission was created by the Ministers of Energy from Argentina, Bolivia, Brazil and Venezuela during the Second Meeting of the Ministerial Committee for the Coordination and Decision on the Great South Gas Pipeline Project (*Comité Ministerial de Coordinación y Decisión del Proyecto Gran Gaseoducto del Sur*) held in Caracas on June 27, 2006.

| PART TWO |

Mixed and Private Management in the Hydrocarbon Industry

Humberto Campodónico

Introduction

This section reviews the effects of two types of management in the upstream hydrocarbon sector (oil and gas) in several countries in Latin America. The first type corresponds to a scheme of predominantly public mixed enterprise management that involves both public and private companies. This case is illustrated by Colombia and Ecuador. The second type of management is that of predominantly private mixed management operating in the subsector. In this case the countries examined are Argentina, Bolivia and Peru.

As mentioned at the start of Part One, legal reforms can reinforce predominantly public management schemes, as well as uphold purely private management systems. Thus, this section addresses the legal aspects of the hydrocarbon sector for each country and their particular trends, i.e., asking whether the 1990s tendency has persisted or if it has changed and led to new developments.

In order to assess the effects of each management style, it is necessary to analyze whether such styles have led to an increased investment (whether public, private or mixed) that subsequently raised levels of hydrocarbon reserves and production. This way the goal of self-supply for the domestic market is attained and surpluses for export are generated, increasing the inflow of foreign exchange.

Other indicators taken into account when assessing management styles relate to the economic and financial circumstances of public enterprises and their relationship to the central government, wherever these are present. Furthermore, the impact of taxes originating in the hydrocarbon sector collected by governments is examined. In some instances, in spite of attaining the targeted reserves, production and foreign exchange levels, the healthy economy of state-owned enterprises is affected (as is the case of Ecuador). Internal and external auditing policies (the fight against corruption), together with energy internationalization and integration, are also important.

This section is divided into two parts. Each chapter begins by highlighting the effects of the management style analyzed, summarizing the results achieved by those countries that adopted a certain management style. Following this summary, the chapter goes on to analyze the effects of the management style in each country, including, among others, aspects related to legal reform, public and private foreign investment indicators, reserves, production, public enterprise financial indicators, social accountability and internationalization.

PART TWO
List of Boxes, Figures, and Tables

Boxes

Figures

Tables

I. Comparative Analysis of Predominantly Public Mixed Management

This chapter analyses those countries characterized by mixed management, i.e. wherever there is a significant presence of public enterprises and, at the same time, incentives to attract investment from foreign companies, principally in the upstream sector. It also analyzes the different relations existing between public and private enterprises wherever these might be evident.

It is worth mentioning that reserve levels in Colombia and Ecuador characterize them as "medium" producers in the region. Reserves amount to 1.453 and 3.780 billion barrels respectively. Both countries are self-sufficient in terms of oil and have surpluses for export. In the case of Ecuador, which has a gross domestic product (GDP) of US$ 32.0 billion, the importance of oil activities is clear. In Colombia, reserves have been in decline for the past few years and the government has set up a series of legal changes to boost the discovery of new fields. In 2006, the Colombian government planned to capitalize 20% of ECOPETROL, the state-owned oil company.

In both countries, public enterprises play a significant role. In Ecuador, policies towards PETROECUADOR have varied with different governments. Up until 2004, they did not prioritize funding of exploration, nor did they promote public enterprises. They opted instead to assign management of the main oil fields to private companies (which eventually did not come into being). From 2004 to date, constant political changes in the country have not yielded a clear picture concerning the continuity of public enterprise activities.

As for foreign direct investment (FDI) in Ecuador, two different periods can be observed in the past decade. From 1998 to 2004, policies aimed at luring foreign companies achieved significant investment both in exploration and development, as well as in the downstream sector (construction of the oil crude pipeline). Nevertheless, during this same period there were a series of conflicts in several fields: environmental, relations with indigenous communities and the tax system. Since 2004, all of these issues have led to increasingly tense relations with foreign companies.

In Colombia, the activities of public-owned ECOPETROL have two main features. The first refers to its activities as an independent public enterprise and the second to its partnership agreements with foreign companies. In the latter the public-owned enterprise holds a 50% share, which was subsequently reduced to 30% in 2000. ECOPETROL has maintained significant investment levels, thereby becoming the first oil producer in the country (when adding up its individual shareholding to that of its partnership agreements). On the other hand, FDI has had an important presence. Although it decreased in the first few years of this decade, it picked up considerably in 2005.

In 2006, two important events took place. First, 51% of the public-owned refinery in Cartagena was sold. Second, in December 2006, Congress passed a bill submitted by the Executive to modify the 2003 D-L 1760. Accordingly, Law 1118 decrees the capitalization of ECOPETROL and plans to sell 20% of the company's shares.

1. Legal Changes in the Last Decade

In the last decade, legal changes have been introduced in both Colombia and Ecuador. In Colombia, the changes have been oriented to provide greater incentives to FDI. The level of royalties has been decreased, as has ECOPETROL's shareholding percentage in partnership agreements. Furthermore, in 2006 the government decided to sell the second largest refinery in the country to private interests.

In the domain of public enterprise, the *Agencia Nacional de Hidrocarburos* (ANH, domestic hydrocarbon agency) was created to take charge of tendering oil contracts, a task formerly under ECOPETROL's control. Additionally, ECOPETROL has become a public limited company and the government recently submitted a bill to Congress to sell 20% of its shares in the stock market. The government stated its wish to capitalize this company and specified that it does not imply its privatization.

In Ecuador, during 2000, a new series of articles were issued to modify the Hydrocarbon Law (*Ley de Hidrocarburos*), whereby private companies could also intervene in the downstream sector. This resulted in the construction of the *Oleoducto de Crudo Pesado* (OCP, Crude Oil Pipeline). Another bill was proposed which would have allowed FDI in the fields owned by PETROECUADOR, but it was not passed.

In April 2006, Law 2006-42 (Reform of the Hydrocarbon Law) was enacted. This established that once the average monthly effective FOB selling price of Ecuadorian oil exceeds the average monthly price prevailing on the date of signature of contracts, then contractors must grant the Ecuadorian state at least a 50% share in the extraordinary income generated by price differences. The Ecuadorian government plans to collect around US$2 million per day. In August 2006, the Constitutional Court declared Law 2006-42 constitutional. Also in 2006, as a consequence of Occidental Petroleum's administrative infringements, the government announced the expiration of its contract.

2. Management Style

In Colombia and Ecuador, the state-owned companies analyzed herein have adopted a holding scheme to organize their productive activities. Therefore, all of their business units are independently managed, reporting their activities to a central unit, which in turn consolidates management results.

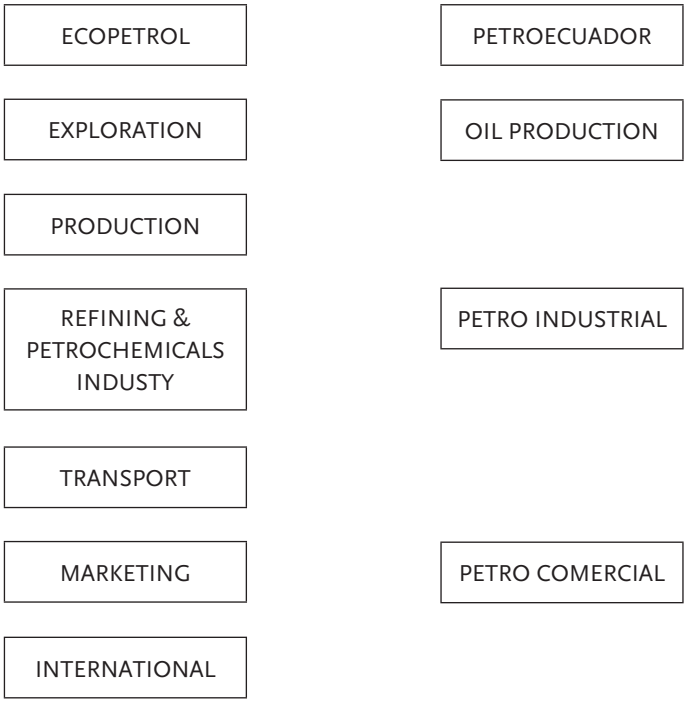
The upstream business areas of the two companies analyzed differ in the company's management style and the legal framework governing the country. In the case of Ecuador, the company is integrated in the upstream sector, and the affiliate PETROPRODUCCION is responsible for oil exploration and production. In Colombia, ECOPETROL has assigned exploration to one of its affiliates and production to another under two arrangements: direct production and production through strategic partnerships.

ECOPETROL's refining business unit in turn performs petrochemical activities, still scarcely developed. On the other hand, PETROECUADOR's affiliate PETROINDUSTRIAL is in charge of managing the Esmeraldas and Amazonas refineries in Ecuador.

Additionally, ECOPETROL created a transport unit responsible for the transportation of petroleum products; while in PETROECUADOR, its affiliate PETROCOMERCIAL is in charge of petroleum products transportation and marketing within the domestic market in Ecuador.

As for marketing activities, only ECOPETROL set a specialized unit in this domain. It is worth mentioning that this is the smallest business unit in the company, and that investment amounts assigned to it are almost non-existent. On the other hand, PETROECUADOR has integrated the marketing and transportation of petroleum products, as noted in the previous paragraph.

Figure 1
Business Units of State-owned Companies' Holdings



Source: ECOPETROL and PETROECUADOR Memoranda.

3. Auditing of Business Activities

In the case of PETROECUADOR, the Executive Board has its own internal auditing unit responsible for the administrative, operating and financial control of the company. There is no outside involvement in the auditing of business activities, except for the actions undertaken by the *Contraloría General de la República* (Office of the Comptroller General of the Republic) and other auditing agencies present in every state institution.

In Colombia, under Decree Law 1760 of June 2003, ECOPETROL became a public limited company and was renamed as ECOPETROL S.A. The company decided to adopt a Good Governance Code whose principles are transparency, integrity and accountability before the market, capital donors and lobbies. It created an internal control office whose head officer is designated by ECOPETROL's chairman after completing a selection process. Furthermore, ECOPETROL's activities are audited by the Office of the Comptroller General of the Republic and other state agencies.

4. Decision-Making Relative to Investment

The fact that ECOPETROL became a public limited company implied greater economic, financial and administrative independence. This decision facilitated adequate planning of investment and expansion.

In the case of PETROECUADOR, the company is governed by a Special Law (*Ley Especial*) that establishes that royalties and other legal provisions in force, as well as special allocations, must be deducted from PETROECUADOR's consolidated gross revenues. PETROECUADOR's and its affiliates' costs and expenses should be deducted as well. The resulting balance after the above deductions is then distributed through the Central Bank.

This means that, of the revenues obtained, only PETROECUADOR retains the amounts necessary to cover its costs and expenses. These are distributed among PETROECUADOR and its affiliates based on the financial budget approved by the company's Executive Board and in accordance with the procedures set forth by its Management Board.

5. Investment, Reserves and Production Results Indicators

Mixed management in Colombia and Ecuador has yielded different results in terms of public investment. In Colombia, ECOPETROL increased its investment levels at a constant pace, from US$641 million in 2000 to US$1.297 billion in 2005. It is worth noting that, in this case, public investment in the oil sector behaved similarly to private investment. In 2005, there was a significant increase in both public and private investment, which was one of the government goals to promote the discovery of the new reserves much needed in the country. On the other hand, in Ecuador, state-owned PETROECUADOR was characterized by an uneven evolution of investment, achieving a maximum of US$192.3 million dollars in 2002 and falling again in 2004. In 2005, investment picked up, amounting to US$178 million.

With respect to oil reserves in both countries, so far the existing assets have generated surpluses for export. Nevertheless, in recent years, these reserves have been decreasing, especially in Colombia, where starting in the year 2000 there was an annual 6% decrease in reserves, and self-supply will last only until 2010 if no new reserves are discovered and investment in exploration is not increased. In 2005, oil reserves in Colombia amounted to 1.453 billion barrels. In Ecuador, reserves have decreased as well, although supply does not yet concern the sector's high officials. In 2005, Ecuador's oil reserves amounted to 3.780 billion barrels, 1.1% less than the previous year.

Oil production indicators suggest different results for the two countries with mixed management in the hydrocarbon sector. In Colombia, production has decreased at a constant pace, from 687,000 barrels per day (kbd) in 2000 to 526 kbd in 2005. This decrease has been felt on two fronts, both in ECOPETROL and in the private sector. Nevertheless, the fall in private production has been greater than ECOPETROL's, so that public share in domestic production has increased from 55.7% in 2002 to 59.1% in 2005. On the other hand, Ecuador has witnessed a positive trend in oil production, from 384 kbd in 2000 to 532 kbd in 2005. In this case, PETROECUADOR's production has been decreasing from year to year, while the private sector's has been extremely dynamic, its share in domestic oil production going from 32.5% in 2000 to 63.5% in 2005.

6. Social Accountability and the Environment

ECOPETROL's management has devoted increasingly larger allocations to social projects, especially in those communities located in the sites where the company operates. In 2002, 2003 and 2004, ECOPETROL invested US$13.5, 11.5 and 13 million, respectively, in social projects across the country.

On the other hand, in Colombia certain legal provisions assign funding directly to the indigenous communities, in compliance with the provisions of the International Labor Organization's (ILO) Convention No. 169.

In 2001, Ecuador issued Executive Decree 1215 (Environmental Regulations for Hydrocarbon Operations). It specifies the duties of all oil operators regarding the preservation and respect for the environment. Additionally, the *Fondo de Estabilización, Inversión Social y Productiva y Reducción del Endeudamiento Público* (FEIREP) (the Stabilization Fund, Social and Productive Investment, and Reduction of Public Debt) devotes a percentage of its income to funding education and health.

The *Instituto para el Ecodesarrollo Regional Amazónico* (ECORAE), founded in 1992 through Law 010 (and then again Law 020), plans and promotes sustainable human development in the Amazon region. This foundational law determines the annual growth of ECORAE's share, establishing the following: "ECORAE's fixed income shall be based on a specific numerical value, equivalent to US$.10 for each barrel of oil sold (notwithstanding the selling price.) From the year 1998, ECORAE has been granted an annual US$.05 increase per barrel up to a maximum of US$ 0.50" (Law 020 for the Foundation of ECORAE).

7. Internationalization

At the end of 2005, ECOPETROL started its internationalization process for the first time. To do so, it was aided by a series of legal provisions that authorized company investment abroad. These provisions were approved under the 2003 Decree 1760, which demerged the company and created the *Agencia Nacional de Hidrocarburos* (ANH). In order to implement this strategy, the company approved an initial budget of US$150 million in 2006.

A. Industry Management in Colombia

1. Introduction

With 1.453 billion of proven reserves by the end of 2005, Colombia stands as an oil producing country, ranking sixth in the region behind Venezuela, Mexico, Brazil, Ecuador and Argentina. Oil reserves have decreased gradually in the past few years (in 1993, they amounted to 3.6 billion barrels), which caused concern among high officials and led to a series of changes in oil legislation aimed at promoting exploration.

Oil production, after growing during the 1990s—reaching its record high in the year 1999 with 816 kbd—fell to 526 kbd in 2005. Production in 2004, 2003 and 2002 amounted to 528 kbd, 541 kbd and 578 kbd, respectively. Similarly, the proven reserves/production ratio fell from 10 years in 1998 to 6 in 2005.

This generated lower surpluses for export for both ECOPETROL and contractors. Thus, crude oil exports reached a maximum of 515 kbd in the year 2000 (50% by ECOPETROL), down to 292 kbd in 2002 (ECOPETROL's share fell to 39 %).

Oil exploration and exploitation in Colombia has taken place under two arrangements: (i) through state-owned ECOPETROL and (ii) through partnership agreements between ECOPETROL and foreign private companies.

Total oil production in 2005 was 526 kbd (as already mentioned), of which 312 kbd was produced solely by ECOPETROL (59% of the total amount), 138 kbd was generated by direct production (26% of the

total amount) and 174 kbd through ECOPETROL's partnership agreements (33 %). The remaining 41% was produced by private companies.

It is worth noting that in recent years ECOPETROL's direct production has increased, thus helping in mitigating the domestic decline. ECOPETROL's direct production increased 12%, from 123 kbd in 2004 to 138 kbd in 2005.

Total domestic refining capacity amounts to 333 kbd, of which 71.4% is processed at Barrancabermeja's refinery, 22.8% in Cartagena, 0.8% in Orito and 0.75% in Apiay, all of them operated by the state-owned oil company (until 2005). The private sector, represented by Refinare, amounted to 4.2%, which equals 14 kbd of refining capacity.

The existing legislation allowed for the implementation of private refineries, though only the above-mentioned Refinare fits the definition. In 2006, 51% of Cartagena's refinery shareholding was privatized and was subsequently acquired by the Swiss company Glencore for US$656 million, including an investment plan aimed at doubling its current refining capacity.

From 1999 onwards, the government adopted a policy of fuel prices deregulation, so that new prices would follow their opportunity cost, which in this case corresponds to the parity of imports, taking as its reference the Gulf of Mexico coast. Nevertheless, to date, this policy of fuel price deregulation has not materialized completely yet.

2. Overview of the Legal and Regulatory Framework

The 1974 Legislative Decree 2310 was the basis for oil legislation in Colombia until it was modified in the mid-1990s. This law established partnership agreements with a 20% production royalty for the state, regardless of the field's size. The remaining 80%, once costs had been covered, was equally divided between ECOPETROL and its partner.

Under partnership agreements, the state, through ECOPETROL, becomes partner in the company that successfully undertakes oil exploration, thus ensuring stable oil legislation. Upon oil discovery, the agreement grants ECOPETROL 50% of the necessary investment for the company assuming the exploration risk. Thus, ECOPETROL's share has implied higher capital needs, especially for those agreements which resulted in significant oil discoveries, as in the case of Cupiana and Cusiagua during the second half of the 1990s.

In July 2000, ECOPETROL's Board of Directors approved certain adjustments to the agreements, basically those referring to the company's share in future partner agreements (they apply to the new fields discovered under partnership agreements and declared for commercial use), which would go from 50% down to 30%, implying that ECOPETROL will: a) assume 30% of investment; b) own 30% of the acquired assets until the expiration of contract; and c) obtain an initial 30% share of hydrocarbons production (oil and/or natural gas).

In 2002, Law 756 was issued to modify the royalties scheme even for those agreements signed during the 2000 round. The law basically allowed for a variable royalty dependent on the size of the field, as well as for a higher bottom limit. It thus set a minimum royalty at 8% for fields producing up to 5 kbd.

The government believed these measures to be capable of luring investment for the discovery of new oil reserves. Nevertheless, even though there was a record high number of agreements signed during 2000–2002 (64), new investments have not materialized. Accordingly, Colombia passed new legislation to grant additional incentives to investment, in order to achieve the necessary levels for the discovery of new reserves.

The most important modification to the sector's legal framework was the enactment of D-L 1760 in the year 2003. The decree's first and foremost feature is that it revokes all those laws contradicting it, "and, in particular, Decree 0030 of 1951 and D-L 2310 of 1974."[1]

Furthermore, new agreements included a full clause referring to the abandonment of fields and the need to create, from the start of exploration activities, a fund aimed at preventing environmental liabilities.

D-L 1760 envisioned the restructuring of ECOPETROL, eliminating its double role as regulating entity and operating company subjected to regulations. The new law decrees ECOPETROL's demerger and modifies its organizational structure. As a result, two entities were created: the *Agencia Nacional de Hidrocarburos* (ANH) and *La Sociedad Promotora de Energía de Colombia S.A.*

The ANH is a special administrative unit belonging to the Ministry of Mines and Energy (*Ministerio de Minas y Energía*) with its own legal personality, equity and administrative and financial self-government; its main role is that of global manager of state-owned hydrocarbon reserves. Officially, the ANH began operating on January 1, 2004. The second demerged entity, known as *Sociedad Promotora de Energía de Colombia S.A.*, is designed to participate or invest in companies whose corporate purpose is related to activities in the energy sector and other similar, related or complementary activities.

On the other hand, ECOPETROL is in charge of promoting industrial and trade activities owned by the state. In order to be assigned exploration and exploitation sites by the ANH, ECOPETROL must compete with private companies and participate in the whole oil production chain both internally and externally, except in the transportation of natural gas across the country.

D-L 1760 also foresees the employees' share in the company's equity; it provides basic governance tools and introduces the necessary features for the company to achieve competitive standards. Law 756 of 2002 still applies to the royalties scheme.

3. Management Style

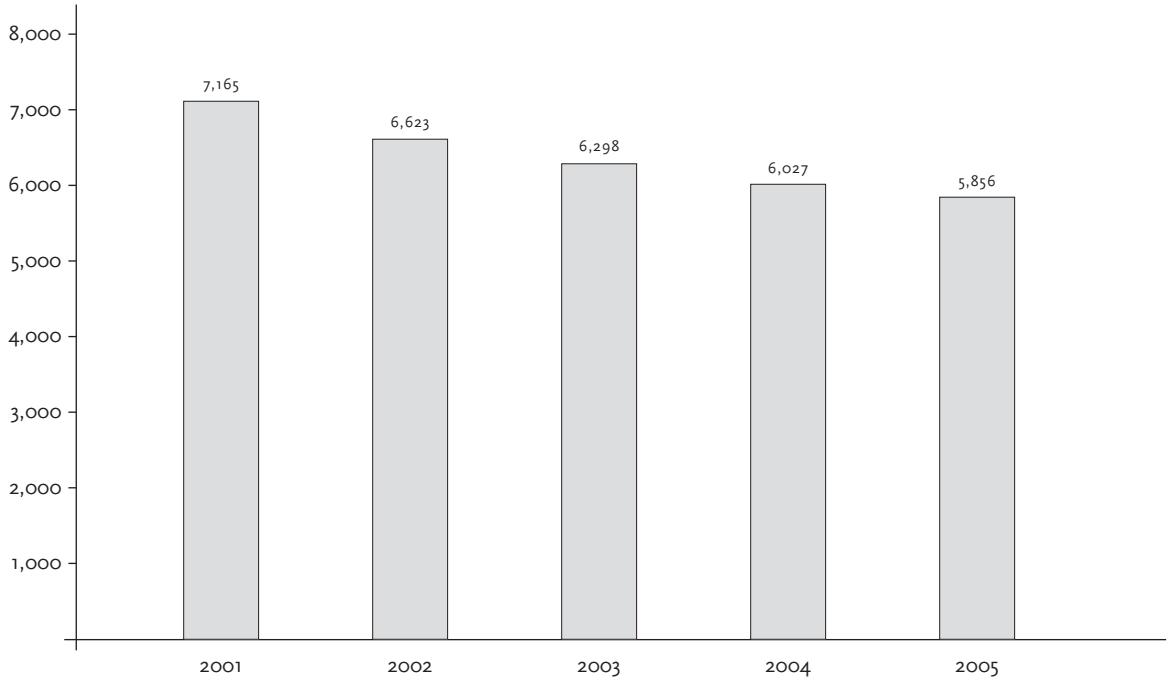
D-L 1760 of 2003 (ECOPETROL's Transformation Decree) turned the company into a public limited company tied to the Ministry of Mines and Energy, and named it ECOPETROL S.A. The company could subsequently create subsidiaries, branches and agencies in the country and abroad.[2] In fact, 99% of ECOPETROL's shareholdings were owned by the Ministry of Finance, and the remaining 1% by four other public entities also owned by the state.

In accordance with Article 26, D-L 1760, the company's management and administration was vested in the General Shareholders' Meeting, the Board of Directors and a Chairman. The General Shareholders' Meeting designated the members of the Board of Directors and the latter in turn named its Chairman.

D-L 1760 also introduced changes in ECOPETROL's organizational structure, since the Board of Directors' makeup was no longer exclusively limited to state representatives. Today, almost 50% of its members are representatives of the private sector. In Colombia, according to high officials in the sector, this measure allows for a more dynamic decision-making process.

Consequently, ECOPETROL began an internal transformation process in order to adjust to the new circumstances. It needed to guarantee its future viability and get ready for competition on an equal footing with other companies operating in the Colombian market and abroad.[3]

Figure 2
ECOPETROL: Company Staff Evolution



Source: ECOPETROL.

The restructuring process intended to free ECOPETROL from its double role as businessman and manager of oil resources and instead become the lead global manager of hydrocarbon reserves owned by the nation, supported by the following three pillars:

- Tendering for company contracts
- Planning exploitation activities
- Managing resources

ECOPETROL's business units are divided into 5 areas: (i) Exploration, (ii) Production, where the company operates under two arrangements, one direct and the other in partnership with other private companies, (iii) Refining and Petrochemical Industry, (iv) Transport, and (v) Marketing.

In recent years, the number of employees at ECOPETROL has decreased at an average annual rate of 5%. In 2002 there were 7,165 employees, falling to 5,856 in 2005.

Additionally, from a fiscal point of view, ECOPETROL behaves like any other private company in the country; that is, it pays taxes just like the rest.

In December 2006, Congress approved a bill submitted by the Executive Branch to modify D-L 1760 of 2003. Subsequently, Law 1118 foresees ECOPETROL's capitalization and the sale of 20% of the company's shareholdings (see Box 1).

Box 1
ECOPETROL as a Mixed Enterprise

In December 2006, Congress approved Law 1118, transforming ECOPETROL into a mixed investment company where 20% of its shareholdings are in the hands of private partners, allowing the company to rid itself of fiscal accounts and to enjoy administrative and financial independence. Once the company has been legally established, it shall be managed by its General Shareholders' Meeting, Board of Directors and the company's Chairman. According to the law, the Colombian state shall keep most shareholdings.

The Law authorizes the company to issue shares to be placed in the market and may be purchased by individuals or legal entities. During this process, the Law ensures the state's strategic control of ECOPETROL by retaining 80% of its voting shares (Art.2).

The stock issuance and placement program will take place in three rounds. The first two shall aim at pension funds, cooperatives, compensation funds, ECOPETROL's employees and pensioners, territorial entities and Colombian citizens in general (the so-called "*sector solidario*"). Once the two rounds have been completed, the remaining shareholdings shall be offered to the general public, individuals and legal entities. Furthermore, the law sets two additional requirements related to the top amounts to be invested in stockholdings by the parties involved. In the case of individuals (Art. 3), the law allows for the purchase of a maximum of five thousand current minimum wages, approximately two thousand million pesos (US$830,000). On the other hand, legal entities shall purchase at most 3 % of ECOPETROL's outstanding shares.

Law 1118 envisions ECOPETROL's involvement in research, promotion and marketing activities related to conventional and alternative energy sources; and in the production, mixing, storage, transportation and marketing of oxygenating components and biofuels; in any other related activities.

Source: Elaborated by the authors based on official data.

4. Investment

In 2004 and 2005, ECOPETROL's total investment grew considerably, amounting to US$1.08 and US$1.296 billion, respectively, which constitute record highs; furthermore, during this period growth rates stood at 72% and 20%.

ECOPETROL's total investment focused on the whole hydrocarbon chain, exceeding private investment most of the time.[4] From 2000 to 2005, the state-owned company's average investment amounted to 59% of total investment. In 2005, ECOPETROL drilled nine of the 35 exploratory wells drilled across the country. At the same time, ECOPETROL increased its drilling activities, taking into account the fact that in 2004 and 2003 it only drilled one and three wells, respectively.

Table 1
ECOPETROL: Evolution of Investment (US$ Millions)

	2000	2001	2002	2003	2004	2005
Cusiana Cupiagua	163	166	99	63	79	0
Joint Venture	161	108	107	114	139	294
E&P	75	114	189	153	268	405
Refining	87	119	115	149	118	138
Transport	45	44	28	36	29	36
ICP Research	2	4	2	3	3	5
Natural Gas	0	0	0	0	0	0
Others	108	10	11	111	448	418
Total	**641**	**564**	**552**	**629**	**1,084**	**1,297**

Source: Unidad de Planeamiento Minero Energético (UPME).

ECOPETROL's investment in exploration activities adds up to US$96 million, which represents an increase with respect to the previous years, compared to US$92 million in 2004 and US$52.8 million in 2003.

5. Reserves

Proven oil reserves have been falling at an average 6% rate in the past five years, due to a decline of the main fields under partnership schemes, mainly Caño Limón and Cusiana. In 2005, reserves fell to 1.453 billion barrels, 2% less than the previous year.

Most oil reserves in Colombia—53.5% in 2005—belong to companies operating under partnership agreements between ECOPETROL and private companies. The second type of reserves belong exclusively to ECOPETROL and amount to 48.5% of the total. Furthermore, an additional .7% belong to private concessions leased before partnership agreements were enforced.

Table 2
Colombia: Evolution of Proven Oil Reserves (Billions of Barrels)

	2000	2001	2002	2003	2004	2005
Partnership	1.223	1.095	0.955	0.915	0.829	0.777
ECOPETROL	0.726	0.727	0.664	0.618	0.633	0.666
Concession	0.023	0.020	0.012	0.009	0.016	0.010
Total	**1.972**	**1.842**	**1.632**	**1.542**	**1.478**	**1.453**

Source: UPME

In the past few years, reserves in the hands of operators under partnership agreements decreased more than the rest, at an annual rate of 8.6 % in 2000–2005. On the other hand, reserves exclusively owned by

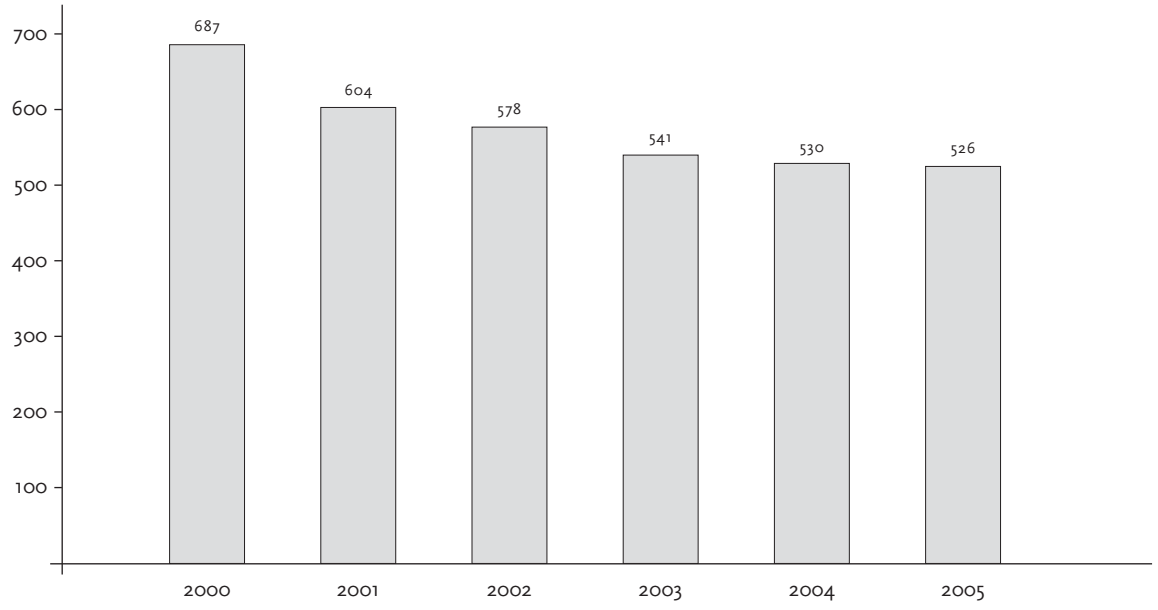
ECOPETROL decreased at a 1.6 % annual rate during the same period. Nevertheless, reserves have registered 2.4% and 5.2 % growth rates for 2004 and 2005, respectively.

6. Production

In 2005, Colombia produced 526 kbd, which represented a 0.4% decrease from 2004, when production amounted to 528 kbd. Of the 2005 production, 138 kbd came from fields operated directly by ECOPETROL, a 15 kbd (12%) increase from the 123 kbd obtained in 2004. Of this, 131 kbd was generated in already operating fields and 7 kbd resulted from incremental production in fields operated by ECOPETROL (this increase resulted from the improved performance of fields located in Apiay, Castilla and others found in Magdalena Medio). Total production of ECOPETROL (ECOPETROL's direct and partner production) amounted to 311.7 kbd, 5 kbd more than the previous year.

The refining sector showed progress in 2005 in the way of improved operational reliability and lower accident rates, along with the increased margins. Additionally, a selection process was undertaken to designate a strategic partner for the Master Development Plan of Cartagena's refinery.

Figure 3
Colombia: Evolution of Crude Oil Production (Thousands of Barrels per Day)



Source: ECOPETROL

7. Financial Indicators

ECOPETROL's financial indicators show good performance. The company's utility has increased in recent times (see Table 3) due to the increase in international oil prices and the company's efficient management. Thus, net income grew from US$529 million in 2002 to US$1.401 billion in 2005, a 41% average annual growth rate for this period. It is worth mentioning that in the previous year the growth rate stood at 74%.

Table 3
Colombia: Evolution of ECOPETROL'S Operational Revenues (US$ Billions)

	2002	2003	2004	2005
Net Income	0.529	0.553	0.807	1.401
Assets	9.628	9.113	10.670	14.099
Equity	2.881	3.200	3.824	5.735
Operational Revenues	3.867	4.000	5.010	6.683

Source: Memoranda. ECOPETROL

In turn, ECOPETROL's operational revenues increased from US$3.867 billion in 2002 to US$6.683 billion in 2005.

8. Internationalization and Energy Integration

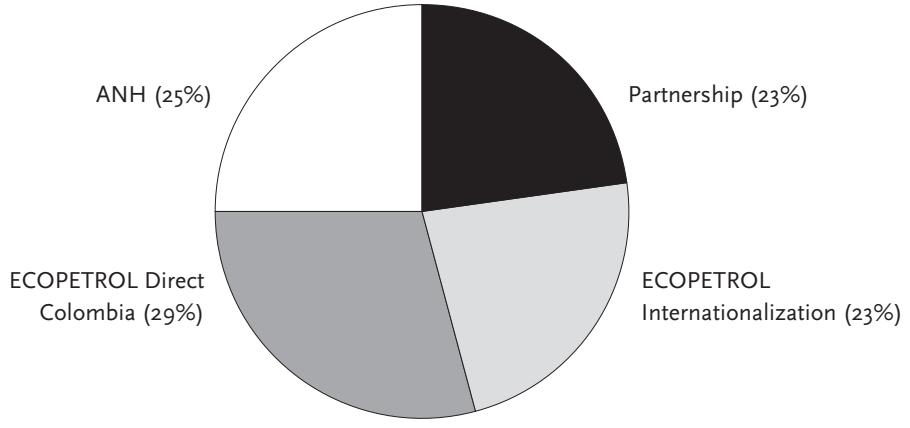
The legal provision authorizing ECOPETROL's investment abroad is the result of the approved Decree 1760 of 2003, which only recently came into force, at the end of 2005.

The internationalization process made progress in the consolidation of information and the definition of new business opportunities. In this sense, new devices were created in order to obtain financial resources and select target countries (Argentina, Brazil, Ecuador, Peru, Venezuela, Trinidad & Tobago, the United States and Canada) as potential partners in oil exploration and production activities.

To implement this strategy and materialize acquisitions, Colombia has planned an exploration budget of US$650 million in 2006, which includes an initial budget of US$150 million (23%) for exploration activities in third countries (internationalization). It is worth noting that, for the first time in the history of ECOPETROL, funding was devoted to oil exploration in neighboring countries.

This budget included a US$160 million (25%) investment for exploration activities in Colombia to be carried out by ANH. ECOPETROL will also invest US$189 million (29%) in its own fields. Finally, ECOPETROL, with its partners in association contracts, will invest US$150 million (23%).

Figure 4
Colombia: Distribution of Planned Investment in Exploration for 2006 (Total Investment US$ 650 Million)



It is worth noting that ECOPETROL's investment abroad will be contingent upon several aspects, among them:

a) It will focus on low-risk projects and act as minority partner side-by-side with a prime contractor.

b) Resources will be preferably designated for projects with proven reserves.

Recently, the Colombian government offered to aid Ecuador in PETROECUADOR'S operation of the fields previously covered under the expired Occidental agreement. Furthermore, ECOPETROL is considering exploration alternatives in Argentina and the Gulf of Mexico.

In Peru, ECOPETROL is interested in the Natural Gas for Vehicles (NGV) business in partnership with PETROPERU. ECOPETROL's main interest lies in residential gas and NGV. The proposal submitted to PETROPERU in September 2006 by ECOPETROL's high officials included joint hydrocarbon exploration and exploitation activities as well.

In June 2006, in the bordering region of La Guajira (north of Colombia), construction works began on the Binational Gas Pipeline "Antonio Ricaurte" linking Colombia and Venezuela via a 225-kilometer-long pipeline starting at Punta Ballena (Colombia) and ending in Maracaibo (state of Zulia); more specifically, 88.5 kilometers will sit in Colombia and the rest in Venezuela. The gas pipeline will start operating in March 2007, with a transport capacity of 150 million cubic feet per day (MMCFPD) of gas going from Colombia to Venezuela.

Investment amounts to US$335 million, 10% of which will be designated for social projects in the affected regions, specifically in health, education, culture and sports. Later on, the Republic of Panama joined the project, so that the Antonio Ricaurte gas pipeline will connect to the TransCaribbean Gas Pipeline, thus linking the three countries. In July 2006, the prime ministers of all three countries signed a memorandum for the constitution of a negotiations committee on gas interconnection between the Bolivarian Republic of Venezuela, the Republic of Colombia and the Republic of Panama (*Memorando de Constitución de un Comité de Negociación en materia de interconexión gasífera entre la República Bolivariana de Venezuela, la República de Colombia y República de Panamá*), designating the ministries of Energy as the project's executing agencies.

9. Social Accountability

ECOPETROL's management has increased its allocations to social projects, especially in those communities inhabiting the areas where the company operates. The largest allocations are directed at the execution of several projects involving community training and improvement of basic social infrastructures related to education, health, community water services, energy, gas and communication routes. Additionally, ECOPETROL implements environmentally friendly plans and promotes social development.

In 2002, 2003 and 2004, ECOPETROL invested US$13.5, 11.5 and 13 million, respectively, in social projects across the country.

10. Foreign Investment

Until 2003, FDI in oil-related activities in Colombia was characterized by specific features due to the special arrangements of partnership agreements in the form of joint ventures between the state-owned company and foreign contractors, where ECOPETROL's shareholding amounted to 50% (30% since the year 2000) and the remaining share is owned by contractors.

During the 1990s, FDI in exploration and production was slightly higher than ECOPETROL's for the same activities. Nevertheless, from 2000 to 2004, this trend was reversed. In 2005, both sectors, ECOPETROL and private companies, increased their investment considerably, reaching US$710 and 789 million, respectively. In the past year, once again private contractors invested more than ECOPETROL.

In 1998, FDI in exploration activities reached a high of US$343 million, subsequently falling as a consequence of political violence. In 2000, a consortium led by PETROBRAS discovered the Guando field, with 117 MMB in reserves. Today, the field produces 33 kbd.

Table 4
Colombia: Investments in Exploration and Development

		1998	1999	2000	2001	2002	2003	2004	2005
1) ECOPETROL (ECP)	ECP–Exploration	56	45	26	20	62	53	92	96
	ECP–Development	319	399	380	369	333	278	388	614
Sub-Total ECP–E&P		375	444	406	389	395	331	480	710
2) FDI	FDI–Exploration	343	128	86	262	145	137	127	167
	FDI–Development	576	340	315	274	213	99	140	622
Sub-Total FDI–E&D		919	468	401	536	358	236	267	789
Total Colombia (1+2)		**1,294**	**912**	**807**	**925**	**753**	**567**	**747**	**1,499**

Source: ECOPETROL.

Regarding investment in development projects, between 2000 and 2005, ECOPETROL has maintained investment levels of approximately US$300 million, increasing considerably in 2005. On the other hand, FDI in development had exhibited a declining trend until 2004, when it reached US$140 million, though rising again in 2005 to US$622 million.

As for production chain activities, ECOPETROL's total investment exceeded FDI for all years. FDI focuses essentially on exploration and production, whereas ECOPETROL is present in the upstream and downstream sector.

At the beginning of 2006, the following projects were likely to be funded with private investment: (i) a project aimed at transforming natural gas into liquid fuel and requiring a US$3.0 billion investment. The project, designed by British Petroleum (BP), was later discarded; (ii) the Meta project, characterized by a processing of crude oil similar to that of Faja del Orinoco in Venezuela, required an investment of US$1.6 billion; (iii) the sale of 51% of the Cartagena refinery's shareholdings; and (iv) ECOPETROL's capitalization, with a 20% share owned by private partners.

British Petroleum (BP), operating in the Cusiana and Cupiagua fields northwest of Colombia, planned to invest US$3.0 billion in the project designated for convert natural gas into liquid fuel (GTL, gas to liquids), which required building an industrial plant. The decision was motivated by the dramatic fall in the production of the Cusiana and Cupiagua fields compared to the abundant natural gas reserves found in the region. In October 2006, BP announced its decision not to go ahead with the project and opted instead to boost marketing of the extracted gas.

In April 2006, ECOPETROL announced that 8 oil companies qualified to bid for the US$1.6 billion crude oil extraction and processing project, similar to that of Faja del Orinoco (Venezuela). This project was known as Meta, the most important oil project in the history of Colombia. It could produce around 200 kbd of synthetic crude oil and would be operated by some of the qualified companies in the bidding process: Exxon Mobil, BP, Chevron, PETROBRÁS, Total, Repsol, Lukoil and China Petroleum.

As for Cartagena's refinery, the second largest refinery in the country, the state sold 51% of its shareholdings in September 2006. The winning company in the bidding process was the Swiss Glencore, which offered US$656 million, including the shares price and investment plans. British BP, Japanese Marubeni Corp. and Brazilian PETROBRÁS also participated in the bidding process.

B. Industry Management in Ecuador

1. Introduction

Oil reserves in Ecuador increased in 2005 to 4.6 billion barrels, of which 3.78 billion barrels belonged to PETROECUADOR and the remaining to oil contractors. This reserves level places Ecuador fourth in the region behind Venezuela, Mexico and Brazil.

In 2005, crude oil production in Ecuador amounted to 532 kbd, of which PETROECUADOR produced 194 kbd (35% at the domestic level), while private companies generated an average 317 kbd (62 %). It is worth noting that in past years, contractors' production has increased considerably, mainly Occidental's, Encana's and Repsol's.

In 2005, consumption of oil products amounted to 149 kbd. Therefore, in terms of oil production-consumption ratio, Ecuador is self-sufficient thanks to its significant surpluses for export.

Three refineries operate in Ecuador, with a total refining capacity of 175 kbd. Esmeraldas' refinery is the most important, with 110 kbd, followed by La Libertad with 45 kbd, and finally Shushufinfi's industrial complex, with a 20 kbd capacity.

The oil sector plays a significant role in the Ecuadorian economy. In 2005, it represented 40% of governmental revenues.[5] Additionally, it represents 40% of total exports, which implies greater vulnerability to international price fluctuations. In global terms, the oil sector accounts for 12% of the GDP.[6]

2. Overview of the Legal and Regulatory Framework

The legal framework governing the oil upstream sector includes the 1998 Political Constitution, the Hydrocarbon Law (*Ley de Hidrocarburos*) and provisions contained in Article 35 of the Supreme Decree No. 2463 of May 1978, as well as the Regulations for Hydrocarbon Operations (*Reglamento de Operaciones Hidrocarburíferas*) in accordance with the Ministerial Agreement No. 389 RO/671 of September 2002.

The 1998 constitutional changes, the amendments to the Hydrocarbon Law and several other legal provisions were aimed at promoting private participation and new opportunities for partnership agreements between PETROECUADOR and private companies. Thus, Law 44 of 1993 introduced production sharing agreements, whereby contractors are entitled to receive payments in oil based on a prefixed rate.[7]

State and contractors will negotiate oil sharing in accordance with Art. 12 of the Hydrocarbon Law. It was not possible to obtain individual data for each of the 14 contracts in force. Nevertheless, official documents from the World Bank state that shareholding rates for such contracts stand at 25%.[8]

Once the state has received its share in production, contractors freely dispose of their corresponding share in hydrocarbons. Similarly, Law 44 decreased the income tax rate to 25% and provided incentives for foreign exchange movements within the country and abroad.

The Hydrocarbon Law in force sets different payment rates for royalties depending on the volume of crude oil extracted. The rate is applied to the joint production of each company, including its affiliates, subsidiaries and associates. The sector's ministry determines payment of royalties to be either in the form of money, in kind, or both. In the case of operating contracts with companies that do not pay royalties, they are paid by PETROECUADOR as exclusive owner of resources. In the case of sharing contracts, they will be cancelled by the respective parties. Table 5 illustrates the royalties' scheme.

Table 5
Ecuador: Royalties Rate

Rate (%)	Barrels/day
12.5	0–30,000
14.0	30,000–60,000
18.5	60,000 or more

Source: Hydrocarbon Law.

In 2000, a series of amendments to the Hydrocarbon Law were issued. In fact, Law No. 4 of March 2000, also known as the Law for the Economic Transformation of Ecuador (*Ley de Transformación Económica del Ecuador*)[9], established that private companies can intervene in the downstream sector: "Transport of hydrocarbons via oil pipelines, multi-purpose pipelines and gas pipelines, refining, processing, storage and marketing activities will be undertaken by PETROECUADOR and other domestic or foreign companies entitled to perform such activities and legally constituted in the country. These companies shall assume the responsibility and risks associated to their investment without jeopardizing public resources."

This modification facilitated the construction and management by private companies of the planned crude oil pipeline.[10]

In accordance with the law, the Oil Stabilization Fund (*Fondo de Estabilización Petrolera*, FEP) in Ecuador is managed by the Executive Branch.[11] The Fund was modified in 2005 (see following sections).

Article 72 Chapter VII of the Hydrocarbon Law designates the Republic's President as the person in charge of the pricing for hydrocarbon products, a fact that sparked great controversy in Ecuador due to the subsidy assigned to those prices, which are lower than their opportunity cost.

In compliance with these criteria, each month PETROCOMERCIAL publishes the retail prices and selling prices for the marketing agent's clients (vendors, consumers, armed forces, electric companies).

Regarding environmental impacts, the country lacks an effective control of oil activities, which has resulted in oil spills and other polluting accidents affecting rivers, residential areas, etc. On the other hand, environmental regulations are weak and the scarce environmental legislation available is often infringed.

Communities find themselves in an unfavourable position to defend their land, resources and lifestyle due to the government's policy, which has opted to give preference to international trade and investment, providing legal devices to private investors which aid them in undertaking activities that affect those communities living in the vicinity of oil wells.

During his brief term as Minister of Economic Affairs (April to August 2005), Rafael Correa eliminated the Oil Revenues Stabilization Fund (FEIREP), alleging that the institution only favored the interests of government bond holders, since the law allocated a percentage of oil revenues to their payments. He replaced it with a "productive and social recovery account" (*Cuenta de Reactivación Productiva y Social*, CEREPS) to promote social and productive investment instead of foreign debt relief.

Box 2
PETROECUADOR's Financial System

A Special Law for PETROECUADOR and its affiliates sets a specific financial system for its basic and complementary activities:

1. Basic activities include exploration, production, transport, storage, refining and marketing of oil, gas and by-products.

   In these cases, the financial system establishes that royalties (of which a certain rate must be assigned to the *Junta de Defensa Nacional* or domestic defense board), and other legal provisions in force, as well as special allocations, must be deducted from PETROECUADOR's consolidated gross revenues generated by such activities. In accordance with current legislation, the resulting balance after applying the above deductions is then distributed through the Central Bank.

   This means that, of the revenues obtained, PETROECUADOR only keeps the necessary amount to cover its costs and expenses. These are distributed among PETROECUADOR and its affiliates based on the financial budget approved by PETROECUADOR's Executive Board and in compliance with procedures set by its Management Board.

   Additionally, PETROECUADOR is responsible for managing the Oil Investment Fund, which results from a governmental allocation and represents 10% of the balance after applying the above deductions. Once approved by the Executive Board, it must allocate at least 40% of this heading to exploration and production activities, while the remaining balance is designated for other investment lines depending on its priorities.

2. As for complementary activities in the processing of hydrocarbons, such as the manufacturing of oil, lubricants and petrochemical products and the selling of services, PETROECUADOR and its respective affiliate recover costs and transfer surpluses to the Ministry of Finance and Public Credit.

3. Management Style

In accordance with the provisions contained in the Hydrocarbon Law and its Special Law, PETROECUADOR's purpose is the execution, control and management of all activities related to the hydrocarbon industry such as: exploration, production, refining, marketing and transportation of oil and its by-products.[12]

PETROECUADOR is a holding consisting of a parent company and three affiliates:
(i) PETROPRODUCCIÓN (in charge of hydrocarbon exploration and exploitation as well as transportation to

storage centers); (ii) PETROINDUSTRIAL (responsible for the management of the Esmeraldas and Amazonas refineries); and (iii) PETROCOMERCIAL (in charge of the transportation and marketing of petroleum products within the domestic market). Each affiliate in turn is represented by a vice chairman in PETROECUADOR.

PETROPRODUCCIÓN is the upstream affiliate. It is comprised of several offices, including the operations, exploration and promotion, administration and financial affairs offices, which in turn rely on a number of support units: management control, systems, legal consultancy and public relations. The other two are downstream affiliates.

Aside from the holding's three affiliates, there are various departments devoted to international trade, oil pipeline, management, economic and financial affairs, and the environment.

PETROECUADOR's organizational structure consists of three main bodies in charge of executive decision-making, aside from the technical and administrative offices necessary for the company's management:

a) The Executive Board is chaired by the Minister of Energy and Mines and a representative of the President of the Republic acts as alternate chairman. Additional members are the Minister of Finance and Public Credit; the Minister of Foreign Affairs; the Joint Commander of the Armed Forces; the General Secretary for Planning at CONADE; a workers' representative; and PETROECUADOR's Chief Executive Officer. The Executive Board's operations are supported by a secretariat and an internal auditing unit responsible for exerting the administrative, operational and financial control.

b) The Management Board is a decision-making body made up by the company's CEO, who chairs the board, and four members designated by the Executive Board.

c) The Chairman designated by the Executive Board is the company's legal and executive authority. The company's technical, financial and administrative management is under his/her direct responsibility.

PETROECUADOR's main role is to plan its activities in compliance with the policy set by the President of the Republic and executed by the Minister of Energy and Mines. Its aims are:

- Optimizing the use of hydrocarbon resources.
- Preserving and increasing current reserves.
- Preparing contracts.
- Hydrocarbon international trading.
- Contractors' utilities investment.
- Hydrocarbon-related monetary system.
- Coordinating and supervising the affiliates' activities.
- Entering agreements for oil exploration and exploitation with domestic and foreign companies.
- Implementing the system's budget consolidation.
- Carrying out internal audits.
- Training its staff and promoting technological research.
- Issuing and supervising regulations aimed at preserving the environmental balance.

PETROECUADOR's management is subject to the Hydrocarbon Law, to its Special Law, to regulations issued by the President of the Republic and to rules and procedures set by the company itself.

PETROECUADOR's Political Board is responsible for approving the operational plan for PETROECUADOR and its affiliates. It sets objectives, goals and strategies regarding reserves, production, the environment, industrial safety and action plans (including investment plans).

Pursuant to the Organic Law of Transparency and Access to Public Data, Section 1, Article 7, PETROECUADOR must provide public accountability mechanisms such as management targets, reports and performance indicators.

4. Investment

In 2005, PETROECUADOR's investment (not including operational partnerships) amounted to US$178 million, a significant increase of a little over 38% from the previous year. Nevertheless, the highest investment levels in recent years were recorded in 2002 with US$192.3 million. The company's financial troubles were caused by its dependency on the Ministry of Economic Affairs (see Box 2, PETROECUADOR's Financial System), which had negative repercussions on the company. Added to several external issues, investment invariably turned out to be lower than the amounts planned for the beginning of the period.

Table 6
PETROECUADOR: Investment by Affiliates

	2000	2001	2002	2003	2004	2005*
Petroproducción	31.8	50.9	100.1	78.2	53.8	110.9
Petroindustrial	10.6	17.0	20.7	11.3	21.1	7.8
Petrocomercial	1.8	6.3	27.1	12.0	8.0	N/A
Oil Pipeline	2.9	5.2	5.9	3.5	3.4	N/A
Parent Company	0.6	15.3	38.4	10.6	7.0	59.4
Total	**47.7**	**94.7**	**192.3**	**115.6**	**93.3**	**178.0**

Source: PETROECUADOR.

Note: For 2005, no disaggregated data was available for Petrocomercial, Oil Pipeline and Parent Company.

Investment in exploration and production by the affiliate PETROPRODUCCIÓN represented the largest proportion of expenses, an average 60% of total yearly investment. This amount equaled US$111 million in 2005, an increase of more than 100% with respect to the previous year. Investment by affiliate PETROINDUSTRIAL ranks second with an average 15% share.

The remaining 25% of investment belongs to affiliate PETROCOMERCIAL, the Oil Pipeline and Parent Company divisions, whose share in investment has exhibited a volatile behaviour.

Box 3
PETROECUADOR's Decapitalization

According to PETROECUADOR, the company's effective investment has been decreasing until reaching the minimum levels required.[13] The company points out that annual investment should be the sum of depreciation amounts plus 10% of the *Fondo de Inversión Petrolera* (FIP, Oil Investment Fund) created by PETROECUADOR's Foundational Law.

From 1993 to 2005, the minimum investment required by the company was US$3.941 billion (see Table 7), of which only US$1.432 billion was contributed by the government. Thus, the company covered barely 38% of its investment needs, resulting in decapitalization.

Table 7
PETROECUADOR's Decapitalization (US$ Billions)

Period	Depreciation	FIP	Minimum investment	Effective investment	Difference
	A	B	C = A + B	D	E = D – C
1993–1999	1.139	0.691	1.830	0.758	–1.071
2000	0.212	0.106	0.317	0.048	–0.270
2001	0.229	0.089	0.318	0.095	–0.223
2002	0.231	0.092	0.323	0.192	–0.131
2003	0.243	0.121	0.364	0.116	–0.248
2004	0.251	0.138	0.388	0.093	–0.295
2005	0.248	0.153	0.401	0.129	–0.272
Total	2.553	1.389	3.941	1.432	–2.509

Source: Ministry of Energy and Mines, Ecuador (2006).

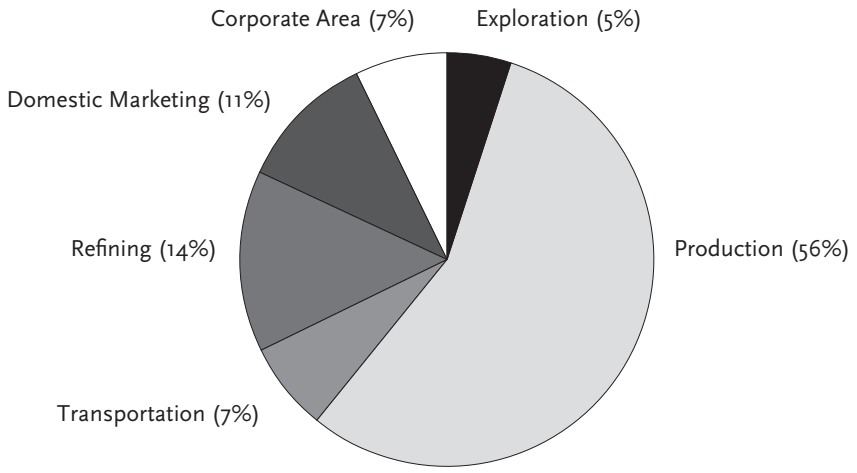
2006 Investment Plan

PETROECUADOR's planned investment for 2006 was US$314 million (not including investment by operational partnerships).[14] Of these, investment by affiliate PETROPRODUCCIÓN represented 60% of total investment, amounting to US$190 million in exploration and production activities. It is worth mentioning that US$3 million goes to (i) drilling vertical and/or directional wells in the Amazonas District; (ii) drilling and developing the Pañacocha field; and (iii) purchasing fixed assets, requiring an investment of US$112.6 million.

The second most significant activity in the budget is refining, which accounts for US$45 million and falls under affiliate PETROINDUSTRIAL's control. Third comes PETROCOMERCIAL's investment in domestic trade with US$36 million.

As for hydrocarbons transportation, planned investment for 2006 amounted to US$21 million. It is worth mentioning the construction of two crude oil storage tanks by the Gas Pipeline division and finally, in the corporate area, the amount designated for the Pollution Prevention Fund was US$12 million (55% of the corporate funds).

Figure 5
PETROECUADOR: Planned Invetsment for 2006 (US$ 314 Million)



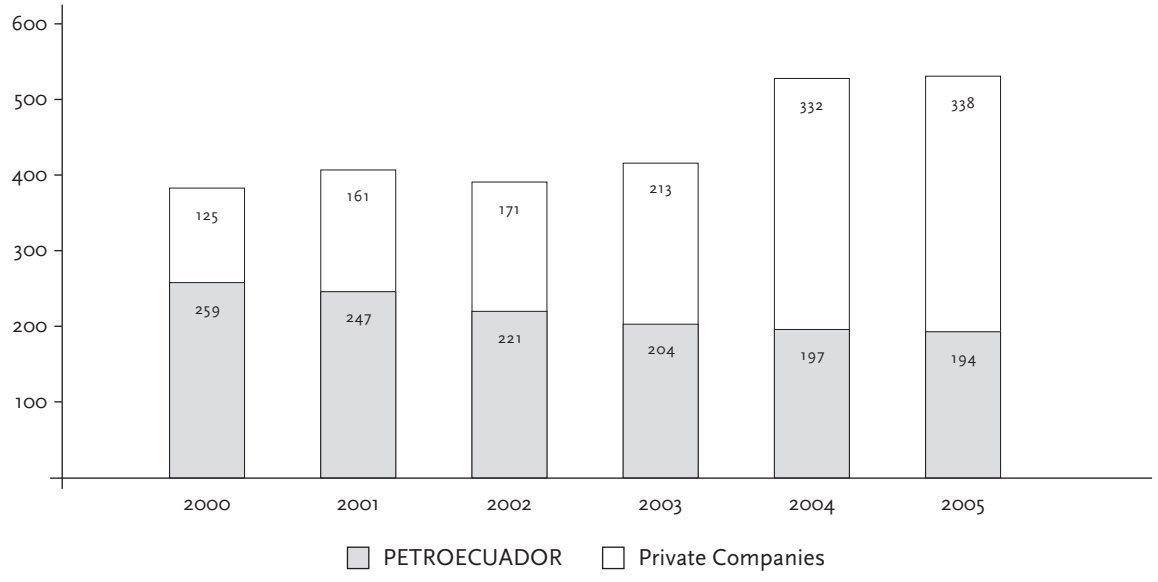
Source: PETROECUADOR.

Note: Not including investment under operational partnerships.

5. Production

From 2000 to 2005, Ecuador exhibited a sustained global growth in oil production at an average 6% yearly rate (falling only in 2000 to 3.7%). In 2004, there was a significant increase of 26.6%, reaching 529 kbd; while in 2005 there was a slight increase of .7% with respect to the previous year. It is worth noting that in recent years production increases resulted from the construction of the Crude Oil Pipeline, which in turn allowed for a greater share by private companies.

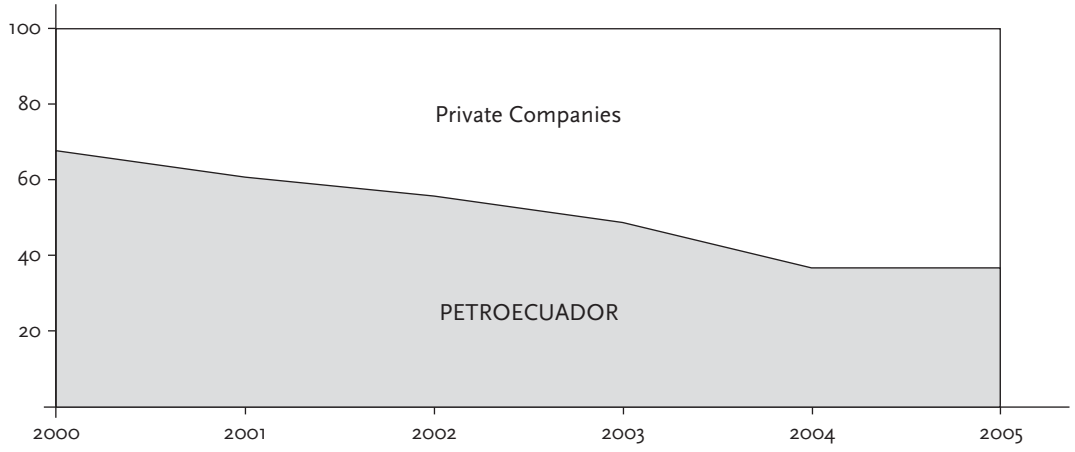
Figure 6
Ecuador: Crude Production by PETROECUADOR and Private Companies (Thousands of Barrels per Day)



Source: PETROECUADOR and the Ministry of Energy and Mines—National Hydrocarbon Directorate.

A number of reasons explain the scarcely dynamic production of 2005, such as the strikes orchestrated by settlers and indigenous communities in the Amazonas District and another strike in the provinces of Orellana and Sucumbíos in the middle of the year; and operational issues such as the high stock in Balao's Terminal, restrictions to production due to the collapse of the formation water reinjection system in Shushufindi and Libertador,[15] as well as PETROECUADOR's lack of equipment and long-term or definitive contracts for permanent services.

Figure 7
Production Share by PETROECUADOR and Private Companies (Percentage)



Source: PETROECUADOR and the Ministry of Energy and Mines—National Hydrocarbon Directorate.

Box 4
Ecuador: Self-Supply Horizion for Its Main Fields

The new minister of Energy and Mines publicly stated his concern regarding the supply horizon for Ecuador. The Ministry's recent study analyzed a sample of the 16 main fields in the country belonging to both PETROECUADOR and private companies. The sample covered 2.2 billion barrels of oil reserves (a little less than 50% of total domestic reserves). The findings revealed that, based on current production levels, the country's supply will only last another 14 years if no new reserves are discovered.

The first reserves to run out correspond to those fields exploited by private companies, among them Block 15 and Unificados, which belonged to Occidental and are now in the hands of PETROECUADOR, with a 6-year horizon. Other fields with low horizons are AEC and Perezco, with 4.7 and 6.9 years, respectively. In these cases there was evidence of overuse.

From 2000 to 2005, PETROECUADOR's crude production decreased steadily at an average 5.5% annual rate, with production ranging from 256 kbd to 194 kbd. On the other hand, production by private companies increased at an average 29% annual rate, reaching 317 kbd in 2005. Since the year 2003, private production has exceeded that of PETROECUADOR's. In 2004, there was a 59.1% increase, which considerably expanded private companies' share in total production.

Private companies, mainly operating in the Amazonas District and marginally along the coast of Ecuador, have exhibited great dynamism in contrast with PETROECUADOR's negative performance. On the other hand, the production of private companies was boosted by the construction of the Crude Oil Pipeline (COP) at the end of 2003.

Table 8
Ecuador: Reserves/Production Ratio for Main Fields

		Reserves MMB	Production MMB	R/P
Petroproducción	Libertador	135.3	7.3	18.5
	Auca	180.0	6.2	29.1
	Lago Agrio	32.4	1.9	17.2
	Shushufindi	511.4	18.8	27.2
	Sacha	508.0	15.0	34.0
	Petroproducción Subtotal	1,367.1	49.1	27.8
Block 15 & Unificados	Indillana Complex	27.1	5.7	4.7
	Limoncocha	11.8	4.3	2.7
	Edén—Yuturi	175.6	25.7	6.8
	Yanaquincha	13.1	1.5	8.7
	Block 15 Subtotal	227.6	37.2	6.1
Private Companies	Agip	124.6	10.5	11.9
	Ecuador TLC	72.9	9.4	7.7
	City Oriente	17.7	1.4	12.3
	AEC	93.4	19.9	4.7
	Perenco	56.1	8.1	6.9
	Repsol	218.1	19.3	11.3
	Encana	30.0	3.1	9.6
	Private Companies Subtotal	612.7	71.7	8.5
		2,207.4	**158.1**	**14.0**

Source: Ministry of Energy and Mines.

On the other hand, the time horizon for PETROECUADOR's main fields exceeds that of private companies. PETROECUADOR's reserves (1.367 billion barrels, that is, 36% of PETROECUADOR's total reserves) have an average time horizon of 27.8 years.

Crude oil domestic consumption in Ecuador remained stable, with an average of around 152 kbd per year, which represents approximately a third of the total audited production. Since production shows annual increases, domestic consumption with relation to production has fallen from 40% in 2000 to 29% in 2005.

Table 9
Ecuador: Audited Crude Oil Commercialization (Thousands of Barrels per Day)

	2000	2001	2002	2003	2004	2005
Audited Production	400	401	386	410	513	515
Domestic Consumption	159	156	150	142	156	150
Exports	239	244	231	253	355	361

Source: Ministry of Energy and Mines—National Hydrocarbon Directorate.

At the same time, crude oil exports have increased in recent years from 239 kbd in 2000 to 361 kbd in 2005, at a 10% annual growth rate. Furthermore, the share of crude exports in relation to production increased from 60 to 70% for the same period.

In 2005, crude exports recorded a slight increase of 1.7% from 2004. There is a marked contrast between this increase and the approximately 40% increase registered in 2004. Exports behavior is related to the dynamic domestic production. As for the destination of exports, on average more than 50% go to the United States, 15% to Peru, 12% to Central America and 9% to Korea.

Table 10
Ecuador: Oil Exports by Company (Thousands of Barrels per Day)

Companies	2000	2001	2002	2003	2004	2005
PETROECUADOR	78	87	72	65	66	74
Occidental	19	20	20	38	77	70
City Investment, Oriente, AEC	34	26	29	28	46	47
REPSOL–YPF	31	27	22	23	36	36
Other	14	22	22	28	58	61
Royalties	62	61	65	72	72	73
Total	**239**	**244**	**231**	**253**	**355**	**361**

Source: Ministry of Energy and Mines—National Hydrocarbon Directorate.

During the 2000–2005 period, PETROECUADOR exported an average of 27% of total production. Even though its share had decreased from 33% in 2000 to 21% at the end of this period, it remains the largest export

company in Ecuador. The other export companies are Occidental, with an annual average of 13%, followed by City Investment, Oriente, AEC with 12%, and Repsol with 10%; while the last two are characterized by a steady share over time, Occidental's went from 8% in 2000 to 19% in 2005.

6. Financial Indicators

PETROECUADOR's revenues amounted to US$5.306 billion in 2005, a 13% increase from the previous year. In the past three years, the utility for the fiscal year of the company's activities yielded positive results, increasing from US$1.617 billion in 2003 to US$2.301 billion in 2005. These results were generated by higher crude oil international prices, which exceeded the decreased volume produced and traded by PETROECUADOR.

Table 11
PETROECUADOR's Financial Indicators (US$ Billions)

	2003	2004	2005
Revenues	3.358	4.105	5.306
Operational Income	1.562	2.017	2.283
Non operational revenues	0.054	0.025	0.018
Income for the fiscal year	1.617	2.041	2.301
General State Budget	1.678	2.131	2.315
Balance	–0.061	–0.089	–0.015

Source: PETROECUADOR.

Nevertheless, due to the existing legislation related to the oil sector and to the financial system governing PETROECUADOR, the Ministry of Economic Affairs retains the company's utility via the Central Bank of Ecuador through the payment of royalties, taxes and funds designated for other parties, and leaving for consideration the refunding of the company's production costs. Based on PETROECUADOR's financial statement results, the remaining utilities balance for the company, once money has been distributed among the central government and the company's parties, turns out negative. This leaves virtually no headroom for the company's future investments.

7. Foreign Investment: Bidding Rounds for the New Millennium and Reform of the Hydrocarbon Law of May 2006

In the 1990s, four bidding rounds were held with positive results, since they increased considerably the presence of new companies in Ecuador and also generated significant investments. For a detailed analysis of these bidding rounds (see *Reformas e Inversión en la Industria de Hidrocarburos en América Latina*, Natural Resources and Infrastructure Series No. 78, ECLAC, Santiago, 2004).

In the new millennium, only the ninth bidding round of 2003 was held, concluding in October 2005. The bidding round was divided into four blocks: 4, 5, 39 and 40. Three blocks corresponded to the Pacific coast and one to Santa Elena's peninsula.

Since no bidders participated, the tender procedure was declared unsuccessful. None of the six companies (Agip, Conoco Phillips, Repsol YPF, ENAP, Hunt Oil and Occidental-EDC) that purchased the bases formalized their offerings before the Special Bidding Committee (*Comité Especial de Licitaciones*, CEL). Private companies signalled their lack of interest in the fields due to their location and the absence of geological information.

In 2005, two blocks, 4 and 5, were granted to the U.S. company Sundown-Clipper. Block 4 is 300,000 hectares wide and is located offshore, though it includes part of the Puná Island; Block 5, 200,000 hectares wide, is found on the mainland.

Bidding Attempts for PETROECUADOR's Fields

In November 2003, a new International Bidding Round (9th-II) was announced for hydrocarbon exploration and oil exploitation in four areas operated by PETROECUADOR:

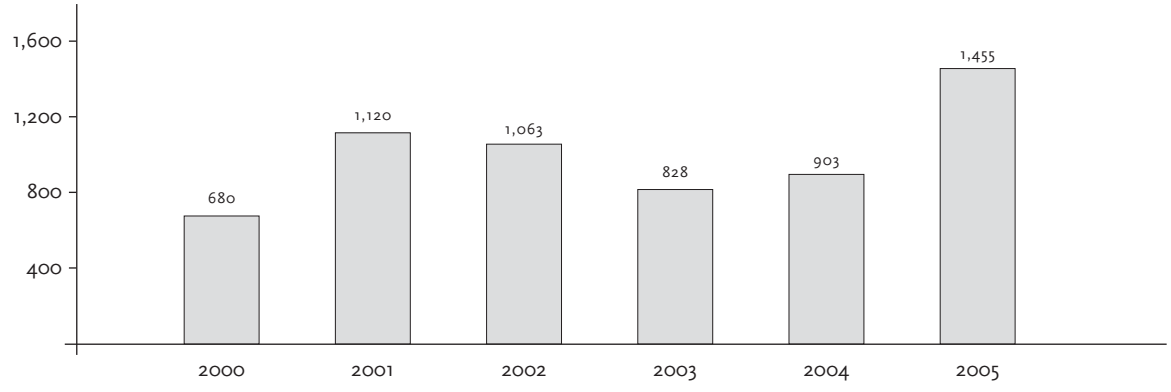
- Auca, with 199 MMB in reserves.
- Shushufindi, with 570 MMB in reserves.
- Culebra-Yulebra, with 73 MMB in reserves.
- Lago Agrio, with 65 MMB in reserves.

Even though several foreign companies showed interest, a series of legal issues, combined with loud political and social protests, led to the conclusion of the project in 2005, after Lucio Gutiérrez was ousted from power.

FDI in the New Millennium

An increase in FDI in exploration and production activities began in the 1990s as a consequence of the legal changes adopted.[16] This increase persisted during 2000–2005, when total FDI amounted to US$6.049 billion. FDI in exploration and production exceeded US$680 million in 2000, and rose to US$1.646 billion in 2005. In 2005, FDI increased by 61% from the previous year.

Figure 8
Ecuador: Foreign Direct Investment in Oil (US$ Millions)



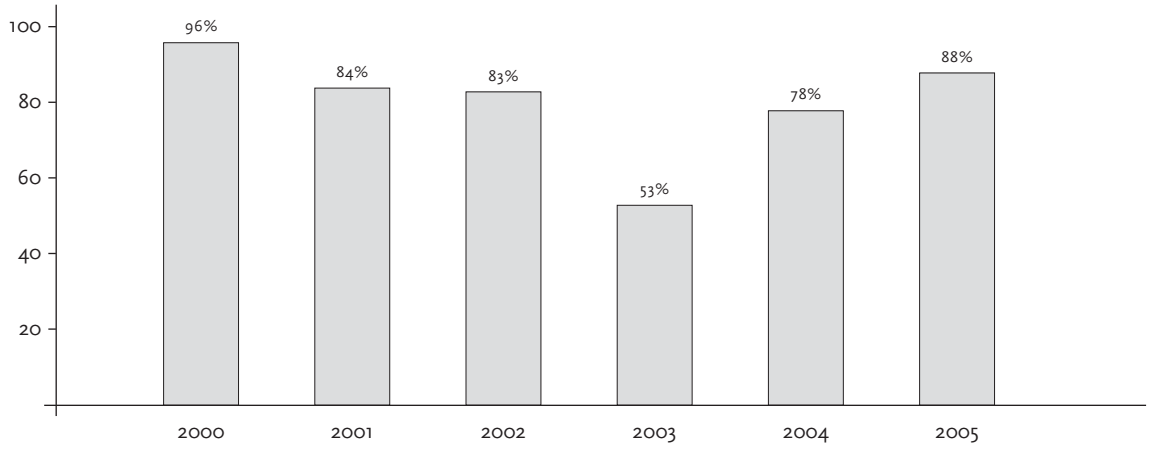
Source: Central Bank of Ecuador.

In the hydrocarbon sector, FDI for the past six years was on average 90% of total investment, while the remaining 10% was from state-owned PETROECUADOR. As a consequence of the dynamic investment recorded in exploration and promotion activities from the mid-1990s onwards, oil production by foreign companies increased significantly, as described in the previous section.

Increased FDI in the oil sector amounted to an average of 80% of total FDI in Ecuador, reaching its peak in 2000 at 96%.

Foreign companies with the largest shares in investment and production for recent years were Occidental Petroleum (United States), City Investing (an affiliate of the Canadian Alberta Energy), Repsol-YPF (Spain), Alberta Energy (Canada), which acquired City Investing, and Agip (Italy), which acquired ARCO's share.

Figure 9
Ecuador: Foreign Investment Share in the Oil Sector with Respect to Total Investment (Percentages)



Source: Central Bank of Ecuador.

In 2005, the foreign company with the most oil production was Occidental with 71 kbd (14% of domestic production). Second place was shared by City and Repsol, with 39 kbd each. In 2005, the Italian company AGIP (a subsidiary of the state-owned ENI) became the fourth-ranking foreign company with 28 kbd, most of them originating in Campo Villano (Block 10), which began production in 1997.

The Crude Oil Pipeline

Due to the insufficient transport capacity of the existing oil pipeline (SOTE, owned by PETROECUADOR), oil companies raised the need to build an additional oil pipeline, known as the Crude Oil Pipeline (COP), with the Ecuadorian government. For different reasons, the construction of the COP had been postponed since 1994, sparking this response on the part of foreign oil companies.[17]

The previously mentioned 2000 LTE in Ecuador introduced the necessary modifications for foreign companies to participate in downstream activities, giving the go-ahead for the construction of the COP. The COP is valued at US$1.1 billion and its construction began in June 2001. Works were completed in September 2003. The COP is 500 kilometers long and has a real sustainable capacity of no less than 410 kbd in segment one and 450,000 kbd in segment two.

The COP consortium members are the companies producing oil today in the Ecuadorian Amazonia: Alberta Energy Ltd. (Canada, 31.4%), Repsol-YPF (Spain, 25.69%), Pérez Companc (Argentina, 15%), Occidental Petroleum (United States, 12.26%), AGIP (Italy, 7.51%), Kerr-McGee Corp (United States, 4.02%) and Techint (Argentina, 4.12%).

In the year 2005, the COP transported 159 kbd, a smaller volume than planned.

Box 5
OXY's Contract Expiration and Its Implications for FDI

In May 2006, the Ministry of Energy and Mines of Ecuador announced the expiration of Occidental's contract. In 2004, government officials argued that the company had committed a number of illegalities, the most serious one being the transfer of 40% of its shareholdings to another company, Encana, in the year 2000, without prior authorization by the Ministry of Energy and Mines.[18] It is worth noting that the company started operating under a partnership agreement in 1999.

Occidental was Ecuador's largest private company, with a 14% share in total crude oil production by 2005. Under its contract clauses, the penalty imposed on Occidental would consist in transferring Block 15's (in the Amazon region) goods and assets to PETROECUADOR, without Occiental receiving compensation in return.

Asides from the illegal transfer of stocks, the company faced several disputes in recent years:

- VAT collection from oil companies, including OXY. It led to an international arbitration procedure won by the companies involved. There are also several conflicts surrounding oil companies, especially OXY, and indigenous communities in the Amazon due to issues related to environmental protection.
- Fined on six occasions for having disregarded the maximum production rates set by the National Hydrocarbon Directorate (DNH), which are designed to prevent depletion and thus production losses caused by early water encroachment.
- The company failed to notify the DNH upon the start-up of drilling activities, infringing articles 18 and 19 of the regulations substituting the Hydrocarbon Operations Regulations (*Reglamento Sustitutivo al Reglamento de Operaciones Hidrocarburíferas*).
- The company did not provide the National Hydrocarbon Directorate with the encoded data for the movement of crude oil in compliance with verbatim article 31 c) of the Hydrocarbon Law.
- Infringement of regulations on crude oil deliveries via SOTE.
- Infringement of its investment commitments.

Source: http://www.conaie.org/es/ge_informes_especiales/caducidad_oxy/page_03.htm

The 2006 Reform of the Hydrocarbon Law

In April 2006, Law 2006-42 was enacted. Its main purpose was to recover the economic balance of oil contracts signed with foreign companies. Article 2 of Law 2006[19] establishes that "whenever the average

monthly effective FOB selling price of Ecuadorian oil exceeds the average monthly price prevailing on the date of signature of contracts, contractors must acknowledge at least a 50% share in the extraordinary income generated by price differences on behalf of the Ecuadorian state."

The law applies to all oil companies operating in the country. Initially, Congress had approved the redistribution of surpluses of 60 to 40% on behalf of the state. Nevertheless, President Alfredo Palacio partially vetoed this reform, setting this percentage at "a minimum of 50%." According to different analysts, Ecuador could receive US$2 million per day thanks to this law.

In August, the Constitutional Court unanimously approved (eight votes) the constitutionality of Law 2006-42.

8. Social Accountability

In 2001, Ecuador enacted Executive Decree 1215 (Environmental Regulations for Hydrocarbon Operations.) It details the obligations of every oil operator regarding the preservation and protection of the environment. Furthermore, the Stabilization Fund, Social and Productive Investment (FEIREP) establishes that a share of its revenues must be invested in educational and health-related projects.

On the other hand, the Institute for the Regional Eco-Development of the Amazon Region (*Instituto para el Ecodesarrollo Regional Amazónico*, or ECORAE), created in 1992 by Law 010 (afterwards Law 020), plans and promotes sustainable human development in the Amazon region. The foundational law sets an annual growth rate for ECORAE's participation: "ECORAE's fixed income is based on a specific numerical value equivalent to US$0.10 per barrel of oil sold (notwithstanding the selling price). From 1998 on, ECORAE receives a US$0.05 yearly increase for each barrel of oil sold until reaching a maximum of US$ 0.50." (ECORAE's foundational Law 20.)

II. Private Management in the Hydrocarbon Industry

This chapter analyzes those countries with predominantly private management, particularly in the upstream sector. Such is the case in Argentina, Bolivia and Peru, where state-owned oil companies underwent privatization in the 1990s. At the same time, significant incentives were provided for foreign investment both in the upstream and downstream sector.

These countries differ greatly in their respective hydrocarbon industries. With respect to Latin America, Argentina's oil reserves are medium-sized, whereas Bolivia's and Peru's are small. As for natural gas, Argentinean and Bolivian reserves are medium-sized (in Bolivia's case, reserves have increased considerably in recent years). On the other hand, Peru's natural gas reserves, despite having increased, are still lower than Argentina's and Bolivia's.

The impact of the hydrocarbon sector on the GDP and total exports also varies from one country to the next. In Bolivia, which has a GDP of US$8.0 billion, the sector's share is significant both in relation to its GDP and its exports. In Argentina, with a US$180 billion GDP, its impact is much smaller. In Peru, with a US$80 billion GDP, the impact is much greater than in Argentina but smaller than in Bolivia.

In Bolivia, state policies regarding the hydrocarbon sector underwent important transformations in the past two years, including an attempt to recover hydrocarbons via a *sui generis* nationalization and the refoundation of *Yacimientos Petrolíferos Fiscales Bolivianos* (YPFB, Bolivian Oil Fields). State intervention is more significant in Argentina, both regarding domestic pricing policies and new taxes on oil exports, although instead of recovering YPF, a new state company has been created. In Peru, the predominantly private management scheme has suffered no alterations. Nevertheless, during 2006 the contract with Pluspetrol (Camisea) was renegotiated and new measures have reinforced the state-owned PETROPERÚ (whose operations were previously limited to the downstream sector).

1. Legal Modifications During the 1990s

During the 1990s, significant legal reforms were implemented in Argentina, Bolivia and Peru aimed at deregulating the oil sector and promoting private investment. One of the main incentives was the privatization of state-owned oil companies, as described later on.

Regarding oil legislation in Argentina, the 1991 *Plan Argentina* (launched after the unsuccessful *Plan Houston*) provided more incentives to foreign investors during the exploration stage. One of the most important

incentives was that oil discoveries were not to be shared with the state-owned YPF. Furthermore, investment commitments decreased during the exploration stage. On the other hand, in the downstream sector the fuel market was deregulated, and free-market pricing was introduced.

In Bolivia, Law 1689 of 1996 established that investments in the upstream sector could only be undertaken by private investors under risk-sharing contracts, prohibiting YPF's participation in the upstream sector. Law 1689 also modified the royalties scheme applied to investors, reducing royalties from 50 to 18% in the so-called "new" fields. Additionally, under the law, contractors could adjust their contracts to the new system set by Law 1689, as most eventually did. In the downstream sector, legislation was modified as to allow private investment in refineries, which was previously reserved to the state. Furthermore, private companies were allowed to participate in hydrocarbon transportation and natural gas distribution.

In Peru, the Hydrocarbon Law (*Ley de Hidrocarburos*) was enacted in 1993 to dissolve PETROPERÚ's monopoly over the oil industry's downstream sector (traditionally, private companies had participated in the upstream sector). On the other hand, the law provided greater incentives to companies by relaxing requirements for upstream investment, suppressing the obligation of supplying the domestic market, and authorizing the free disposal of foreign exchange and the use of dollars for accounting purposes, among others. In 2000, the Hydrocarbon Updating Law (*Ley de Actualización de Hidrocarburos*) relaxed contractor requirements during the exploration stage. In 2003, the method used for calculating royalties was modified in order to reduce them.

Subsequently, from 2003 onwards, a series of legal modifications regarding natural gas favored exports originating in Camisea's Block 88 (initially restricted to the domestic market). Legal changes reduced the mandatory 20-year "permanent horizon"—set by Law 27133 of 1999—to supply the domestic market, replacing it with the time period specified in each contract. In June 2005, the last modification relative to natural gas, Law 23552, was enacted.

2. Overview of the Privatization Process

In the 1990s, the only countries that privatized their oil companies were Argentina, Bolivia and Peru. For each case, the process was different in terms of the type of privatization scheme adopted and the number of privatized assets.

In Argentina, YPF was privatized as a vertically integrated company, although at the beginning of the 1990s the government decided to sell some of the company's assets, including its marginal fields. In addition, *Gas del Estado* (transport and distribution) ceased to be a YPF subsidiary (it would later be privatized). Privatization began in 1992–1993 when the state sold a few blocks of shares to the private sector, so that the state (with 20% of shares) retained control over the company in order to influence strategic decisions. In 1998–1999, the state sold 15% of YPF's shares to Repsol (out of its 20% block). Finally, in 1999, Repsol offered to purchase 100% of YPF, and the government accepted the deal.

In Bolivia, the privatization of oil fields and gas pipelines took place in a *sui generis* way termed as "capitalization." Through "capitalization," the state requires that investors contribute 100% of the company's market value; subsequently, investors obtain shares equalling 50% of the new company's total capital. The Andina and Chaco oil fields were capitalized this way, while gas pipelines were capitalized under the name of Transredes.

As for the two Bolivian refineries, the government opted for a "traditional" privatization, and both refineries were acquired by PETROBRÁS.

In Peru, PETROPERÚ's privatization begun in 1992. In contrast with Argentina, where the company was vertically integrated, PETROPERÚ was sold at different stages. The company was divided into different business units and these in turn were sold separately.

The process took place in two stages: the first in 1992–1993, when certain assets were sold, such as the oil fleet, the GLP packaging and distributing company and 85 petrol stations. During the second stage, in 1996–1997, PETROPERÚ's most important assets were sold, in particular the producing blocks found in *Costa Norte* (north coast) and *Selva Norte* (north jungle), as well as La Pampilla's refinery, the largest in the country. Later on, the supply terminals and the lubricants plant were sold. In 1998, the process was halted due to strong domestic criticism. Today, PETROPERÚ owns Talara's refinery, the North Peruvian Oil Pipeline and fuel supply terminals and plants across the country.

3. Argentina, Bolivia and Peru in the New Millennium

In Argentina, starting with the 2002 devaluation, the new government introduced the tariffs' conversion into pesos, the temporary freezing of wellhead prices, and several agreements between the state and oil companies aimed at restricting fuel prices. Furthermore, measures were implemented to provide for taxing of oil exports (deductions) and thus increasing fiscal revenues.

In 2004, *Energía Argentina S.A.* (ENARSA) was created. The company may participate in the entire hydrocarbon production chain, although its main role is to promote exploration. In October 2006, the enactment of Law 26.154 provided tax concessions for exploration and exploitation by ENARSA's partner companies.

Bolivia has implemented the greatest changes in its oil policy, once again embracing public management schemes. The 2004 referendum intended to redefine the country's energy policy. The results showed the majority's wish to recover natural resources and reinforce state-owned companies. Changes began in 2005 with Law 3058, which revoked the previous Law 1689 and announced that contracts signed with private companies had to be adjusted to the new arrangements in force. Additionally, a new tax known as *Impuesto Directo a los Hidrocarburos* (IDH) or direct tax on hydrocarbons that established a 32% rate went back to the 50% rate existing prior to Law 1689.

In May 2006, the hydrocarbon nationalization was decreed, rendering illegal the contracts in force, since they had not been approved by Congress, as set forth in the Constitution. Additionally, the law established that once the deadline set by Law 3058 (of May 2005) had expired for companies signing new contracts, a 180-day extension was granted for the signature of new service contracts.

Furthermore, an additional 32% rate was set, aimed at reinforcing YPFB. The payment of royalties and taxes thus amounted to 82% of gross production value. This additional rate is variable, since it will be partially designated for reimbursing companies for their new investments as arranged under their corresponding contracts.

On the other hand, there is a government bill pending approval which aims to recover the majority shareholding status in previously capitalized companies: Andina and Chaco (the oil producing companies), and Transredes (owner of oil and gas pipelines). The government also intends to recover its majority shareholder status in the two refineries that are 100% privatized, owned to this date by PETROBRÁS. In all cases, negotiations with these companies have not yet concluded.

In Peru, consecutive governments have maintained their deregulating policies and incentives to private investment. From 2000 to 2005, it is worth mentioning the relaxation of contract terms relative to the upstream sector, as well as alterations to natural gas legislation aimed at authorizing natural gas exports from Camisea's Block 88.

Nevertheless, from the beginning of this decade, public opinion has opposed the continuation of state companies' privatization, as evidenced by the large demonstrations in Arequipa. Consequently, in June 2002, the government suspended the privatization process. In June 2004, Congress enacted a law excluding PETROPERÚ from the privatization process. In June 2006, before the new government took over, Congress enacted a law designed to reinforce PETROPERÚ, including the possibility of upstream investment under strategic partnerships with other companies. Under the new government, this policy of reinforcement of PETROPERÚ was furthered with strategic partnerships both in the downstream and upstream sectors.

The new government also renegotiated the natural gas exploitation contract for Block 88 with respect to gas natural prices for the domestic market. These prices, which under the initial contract were indexed to fuel oil international prices, were altered so that a new formula allowed for variations determined by inflation. The government is negotiating a series of changes aimed at ensuring adequate and safe transportation as well as a higher number of clients in vehicle and residential natural gas with transport (gas and liquids pipelines to the coast) and distribution (Lima) companies.

4. Reserves and Investment

In Argentina, Bolivia and Peru, FDI in the oil and gas upstream sector has evolved in different ways, and therefore the implications for the discovery of new reserves and production capacity have been different in each country.

In Bolivia, FDI in exploration activities increased considerably at the end of the 1990s, giving way to a significant growth of gas reserves in the Tarija department. Nevertheless, no new oil discoveries took place, illustrating gas conditions in Bolivia. As for FDI in exploitation activities, it considerably increased gas production capacity (especially that of production designated for export), while oil production capacity maintained the existing low levels (50 kbd).

In Argentina, two types of FDI are observed: FDI designated for purchase the existing oil assets (the so-called Brownfield investment) and FDI aimed at promoting new exploration and exploitation projects (or Greenfield investment). Brownfield FDI reached its peak in 1999, when Repsol acquired YPF's assets. Afterwards, in 2002, PETROBRÁS purchased the assets of Pérez Compac, the second oil company in Argentina.

After YPF's full privatization, FDI in oil and gas exploration (Greenfield) decreased with respect to the 1980s and 1990s. The result was a decrease in oil and gas reserves from 2000 on, reaching alarming levels in terms of self-supply. In this case, private management performance was worse than before, when YPF was the main agent.

Investment in exploitation activities improved, leading to an increase in oil and gas production. This in turn allowed for an increase in oil and gas exports (especially to Chile). Nevertheless, from 2000 onwards, since oil reserves were not replaced, production decreased. In the case of gas, production increased during the entire period, even though reserves were not replaced either. Thus, the gas production horizon went from 17 years in 2000 to barely 8 years in 2005.

In Peru, FDI in oil and gas exploration increased considerably during the 1990s, although no new significant oil discoveries had taken place and subsequently reserves had not increased. As for natural gas, Block 56 was discovered in the southern jungle (it is worth noting that Block 88 was discovered in the 1980s, although FDI in exploitation began in 2001). Block 56 had natural gas reserves, although smaller than Block 88's.

FDI in oil exploitation has not recorded significant increases since no new discoveries have occurred. Investment in exploitation has not increased significantly in oil producing fields.

In Peru, FDI in natural gas development and exploitation has increased considerably from the time that Block 88 started production; investment amounted to US$850 million from 2000 to 2005 (additionally, US$800 million was invested in gas and liquid pipelines and US$70 million in distribution).

Today, investment has been allocated to Block 56's exploitation. The project would require a US$2.2 billion investment in Peru, disaggregated as follows: promotion of upstream fields (US$550 million); investment in the downstream sector in order to extend the existing gas pipeline (US$550 million); and building of a liquefaction plant (US$1.1 billion).

5. Management Style

In Argentina, private management did not have a positive impact on the discovery of new oil and natural gas reserves, as described above. On the contrary, reserves decreased and today the country faces supply issues.

Since the beginning of 2002, new governments have perceived the problem as being rooted in the lack of investment aimed at increasing reserves in Argentina under private management schemes. The reasons are many, but especially relevant is the logic behind the internationalization of these activities, where priorities are determined by the Parent Company, Repsol-YPF. This reasoning was based on the fact that there was a higher increase of natural gas reserves in Bolivia by Repsol, and the country will now increase its exports to Argentina. Also, new investments by companies in the 1990s (a time of low international oil prices) were mainly designated for the accelerated extraction of hydrocarbons in the existing fields, substantially decreasing investment in exploration of new reserves. On the other hand, the existence of different private contracts for gas exports to Chile (four gas pipelines were built since the mid-1990s) influenced the accelerated extraction of reserves.

This context gave way to the general perception that state intervention must take place in the hydrocarbon industry. This translated into the previously mentioned emergency measures (the conversion of tariffs into pesos and the freezing of prices due to devaluation), as well as higher taxes on exports (deductions). Additionally, the state decided to once again create a state company (ENARSA) to boost exploration and improve supply. In recent negotiations aimed at increasing Bolivian gas imports, ENARSA was assigned a greater business role in the process.

In Bolivia, the perception of an inadequate management of natural resources arises from a new political interpretation of the sector's public management. On the one hand, successive technical reports pointed out that reserves in natural gas megafields in Tarija had already been discovered by YPFB at the end of the 1980s, although these fields were not declared for commercial use. Nevertheless, the new Law 1699 of 1996 decreed that these fields should be defined as "new," so that royalties were reduced from 50 to 18%, in favor of the state.

On the other hand, due to different geopolitical issues that the Bolivian government deems to be unresolved, opposition grew among the existing political parties, mass media and public opinion in general to natural gas exports through Chilean ports, as voiced by the Pacific LNG export consortium. Strong popular protests were staged, bringing about the ousting of Sánchez de Losada's government in 2003. Later, in 2004, a referendum was held on oil policy, which determined that a clear majority advocated the recovery of Bolivian sovereignty over natural resources. In 2005, a new Hydrocarbon Law was enacted: it increased royalties and envisioned new contract arrangements with foreign companies. In 2006, the nationalization decree deemed illegal those contracts signed under Law 1689 of 1996, since they did not comply with the constitutional mandate that requires their approval by Congress. Furthermore, it states that the Bolivian state is the owner of

hydrocarbons in all stages of the productive chain, so that new service contracts should be signed with foreign companies. On the other hand, the Bolivian state also recovered its majority stockholder status in oil blocks and capitalized oil and gas pipelines, as well as in the two 100% privatized refineries.

Thus, Bolivia has completely reversed the policies adopted during the 1990s.

In the case of Peru, private management did not result in increased oil reserves, which remain stagnant. Nevertheless, significant investment has gone to gas exploitation in Camisea (in the Peruvian southern jungle), reaching the coast in August 2004.

The positive perception of Camisea's gas has been nevertheless mitigated by constant criticism of the downstream sector: GLP's high prices (which led to governmental intervention, decreeing that selling prices could not exceed exports parity); natural gas high prices, whose fluctuation was determined by international prices for residual oil; frequent bursts along the liquid pipeline going from the jungle to the coast; and the low mass demand of natural gas in the city of Lima. In this case too, the new government decided to assume a regulating role.

Regarding PETROPERU, since the beginning of 2000 the general view is that the company's remaining assets should not be privatized. Thus, in 2004, Congress enacted a law excluding PETROPERU from the privatization process, and in 2006 another law aimed at reinforcing and streamlining the company promoted its participation in all stages of the oil activity.

Finally, the LNG export project for the Camisea gas (Block 56) by the Peru LNG consortium started its investments in 2005. Criticism has been directed at the project, since gas exports may endanger the domestic market supply and export prices do not guarantee an adequate return for the Peruvian state.

Thus, it could be said that Peru has continued embracing a predominantly private management scheme, though the state's regulating role has increased and there is a process underway aimed at reinforcing PETROPERU.

A. Industry Management in Argentina

1. Introduction

Oil reserves in Argentina have fallen substantially after reaching a record high in 1999, with 3.076 billion barrels of proven reserves. In 2005, reserves amounted to barely 1.976 billion barrels, jeopardizing self-supply since the reserves/production ratio is just 8 years. In terms of oil reserves, Argentina ranks fifth in Latin America behind Venezuela, Mexico, Brazil and Ecuador.

In the 1990s, production registered significant growth, reaching 803 kbd in 1999. Since then, production started to fall, down to 666 kbd in 2005. Exports also increased considerably in the 1990s, decreasing again in recent years. In 2005, export volume stood at 329 kbd and was mainly designated for Chile, with smaller amounts going to Brazil and other neighboring countries.

Argentina's natural gas reserves are considerably large, although they have decreased as well, from 27 trillion cubic feet (TCF) in 2000 to 16 TCF, placing the country fourth in Latin America, behind Venezuela, Mexico and Bolivia. Argentina is the first producer and second consumer in the region (behind Mexico), having developed its industry since the end of the 1940s.

In 2005, Argentina produced 4.9 billion cubic feet per day (BCFPD), while consumption stood at 3.927 BCFPD. The remaining production, 630 MMCFPD, was exported to Chile (95%), followed by Brazil (4%) and Uruguay (1%.)

2. Overview of the Legal and Regulatory Framework

The hydrocarbon sector in Argentina has witnessed two reform periods with distinct purposes. During the first period, starting at the end of the 1980s, reform was aimed at ensuring domestic supply and lower prices through the implementation of deregulating sector policies and incentives to foreign investment that would guarantee future supply based on new exploration projects (Campodónico, 2004). This first period also included the privatization of state-owned YPF (Kosulj R., 2002).

At the beginning of 2002, triggered by the economic crisis, measures were adopted in the opposite direction. Thus, the government opted for greater state intervention policies and negotiations with producing companies. Hydrocarbon prices were frozen, as well as a deduction on exports. Other legal mechanisms were designed to promote exploration. In addition, ENARSA was created as the state-owned hydrocarbon company that can participate in the entire production chain, with its main role to promote exploration activities.

Legal Reforms for the Promotion of Foreign Investment Until 2002

Oil reform was carried out in the context of the privatization policies adopted in the beginning of the 1990s. Its stated purpose was to maximize the current value of hydrocarbons in order to help balance external accounts. Some incentives envisioned by the reform included the free disposal of oil in the market and the deregulation of prices for crude oil and its by-products. On the other hand, before privatizing YPF, all production contracts between YPF and private companies were converted into concessions, subjecting certain areas of YPF to tender procedures and selling some of its downstream assets.

In 1991, in order to provide more incentives for oil exploration, the *Plan Houston* concluded and was replaced with the *Plan Argentina*. One of the most important legal modifications included in the *Plan Argentina* was the provision whereby companies that discovered crude oil did not have to share it with YPF and could freely dispose of the oil discovered. The company would only pay oil royalties to the corresponding province, as well as taxes applied to all commercial profit.

YPF's privatization took place in two stages: between 1991 and 1993, some assets were privatized (sale of marginal areas, central areas and other assets). In 1994, YPF shares were sold on the stock market in a diversified way: the state kept a significant block of shares, which allowed for controlling the company without holding the majority stake. Later, since 1997–1998, the privatization process continued, concluding with the acquisition of 98.23% of YPF by Repsol (Kozulj, op.cit.)

The 2002 Economic Emergency and Modifications to the Hydrocarbon Law

Law 25.561 (the Economic Emergency Law) was the framework for the new legislation passed since 2002. Since convertibility was suspended, the Executive Branch was granted special powers to reorganize the economy. The main measures included were conversion to pesos and the temporary freezing of wellhead hydrocarbons. It is worth noting that legislation prior to 2002 only restricted investors' freedom in the sense that it prohibited hydrocarbon exports whenever available reserves could not guarantee supply for the domestic market.

Resolution No. 196/2002 of the Ministry of Economic Affairs (June 2002) ratified the Stability Agreement for GLP's wholesale prices. Producing companies agreed to maintain price levels.

Through Resolution No. 85/2003 of January 2003, the Energy Department (*Secretaría de Energía*) agreed to approve the bases for an agreement between producers and refiners aimed at stabilizing crude oil, naphtha and gas oil prices, the so-called "Bases Agreement."

In 2004, due to the energy crisis of natural gas and to domestic shortage, the government passed Resolution No. 208/04, which gave way to an agreement with producing companies aimed at guaranteeing domestic supply in exchange for gradual increments in prices ("path of prices") until reaching the levels that existed at the beginning of the convertibility period. As of December 2007, this goal remained unattained.[20]

In May 2004, with Resolution No. 337/2004, the government increased the tax on crude oil exports from 20% to 25%. In addition, it set a 20% deduction on natural gas exports, whereas deductions for refined petroleum products remained at 5%. Subsequently, in August of that same year, Resolution No. 532/2004 decreed yet another increment on the crude oil exports tax above the existing 25% rate, adding variable rates of 3% to 20%, dependent on the WTI crude prices between US$32 and $45/barrel, respectively, and setting a maximum 45% tax rate.

Table 12
Argentina: Tax on Crude Oil Exports

WTI price $US/barrel	Existing tax	Additional tax	Total taxes
From 32.01 to 34.99	25%	3%	28%
From 35.00 to 36.99	25%	6%	31%
From 37.00 to 38.99	25%	9%	34%
From 39.00 to 40.99	25%	12%	37%
From 41.00 to 42.99	25%	15%	40%
From 43.00 to 44.99	25%	18%	43%
From 45.00 and higher	25%	20%	45%

Source: Resolution No. 532/2004.

In July 2006, the tax rate applied to natural gas exports was increased from 20% to 45%, to be enforced in January 2007. Ninety-five percent of natural gas exports are sent to Chile, followed by Brazil and Uruguay. The increased deductions are due to the gas trading agreement signed by Bolivia and Argentina, whereby the latter accepted an increase in gas prices from US$3.20 to US$5.00 per thousand cubic feet, representing a 56% increase.

The payment of royalties is defined by article 59 of Hydrocarbon Law No. 17.319. Monthly payments go to the corresponding province, at a 12% rate on the value of extracted wellhead liquid hydrocarbon (once fleeting costs have been discounted).

In October 2004, Law 25.943 created a company, *Energía Argentina Sociedad Anónima* (ENARSA), entitled to carry out all productive activities in the hydrocarbon sector.[21] The law granted ENARSA a number of barely explored offshore sites.

In order to guarantee future supply, the government passed several provisions to favor exploration of new reserves. To regulate this activity, Decree PEN 1142/2003 was enacted. It designated the *Dirección Nacional de Exploración, Producción y Transporte de Hidrocarburos* for the follow-up and monitoring of the execution of hydrocarbon exploration and exploitation plans.

Box 6
ENARSA's Shareholding Structure

ENARSA is a public limited company. The state retains the majority shareholding status under a *sui generis* arrangement of its shareholding structure. There are 4 types of stock:

1) Common shares Class A, with voting rights, right to elect the Executive Board members. Through these shares, the state owns 53% of the company's capital

2) Common shares Class B and C. Like Class A stock, they confer voting rights and right to choose the Executive Board members. The twenty-three provinces plus the capital own this stock, amounting to 12% of the total.

3) Class D shares are preferential and amount to 35% of total share capital. They do not confer voting rights (holders are not a part of ENARSA's Executive Board). In turn, they yield greater dividends than common shares (5% more). Nobody may hold more than 3% of these preferential shares. This provision aims to prevent lobbies from controlling the company.

Table 13
ENARSA's Shareholding Structure

State (53%)	Provinces (12%)	Private (35%)
Common shares Class A	Common shares Class B and C	Preferential equity shares Class D
One vote per share	One vote per share	No voting rights
Not taxable	Not taxable	Dividends pari passu with common shares, more than 5% per share
	May only be sold to the state	Maximum holding: 3% of total Class D shares

Source: ENARSA.

Shares owned by the state and the provinces are common and not taxable; i.e. they may not serve any other purpose. In the event that provinces wish to sell their shares, these may only be acquired by the state.

ENARSA is audited in three ways. First, by the *Sindicatura General de la Nación* (SIGEN) or the Accounting Office of the State, which oversees all institutions where state money or shares are involved. Second, internal audits. Third, through the stock market (ENARSA is listed on the stock market), since its financial statements are reported on a regular basis to investors purchasing the company's preferential shares.

Source: ENARSA's Foundational Law (Law 25.943) and Ezequiel Espinosa's presentation, ENARSA's Chairman, in Ecuador's Ministry of Energy and Mines (2006).

In October 2006, additional incentives to oil and natural gas exploration and exploitation were provided under Law 26.154, which applies to all Argentinean provinces and to its continental shelf. Fiscal benefits have been devised, including early VAT refunds for capital goods and the accelerated amortization of all investment expenses in three annual, equal and consecutive payments, applying the tax rate only to profits. The new promotional law decrees that, in order to be eligible for these fiscal benefits, private operators must enter partnership agreements with ENARSA. Only when ENARSA explicitly relinquishes its right to partnership will the companies be entitled to go on with the adjudication process without entering a partnership agreement.

3. Management Style

Until 1998, domestic companies ruled in the upstream sector. YPF was first with 51.7% of total production, followed by Argentinean private companies such as Pérez Companc, San Jorge and TECPETROL, with 12.3%, 7.7% and 3.6% respectively (Kozulj, 2002, Chapter II). Thus, the state-owned YPF was predominant in the mixed management scheme. One should bear in mind that YPF opened its doors to private capital starting in 1992, even though the state retained the majority stake.

The situation began to change in 1997–1998, when YPF's large blocks of shares were sold in the international market, though the state maintained the ability to determine company policies. Later, in 1999, another dramatic shift occurred when the Spanish Repsol acquired YPF in its entirety. This led to a change in management style; previously mixed, it became predominantly private although it facilitated higher foreign investment in the Argentinean upstream sector.

In the same period, several foreign companies acquired Argentinean private oil companies. In 1996, Repsol acquired the Argentinean company Astra (the acquisition process concluded in 2000). In 1997, the Argentinean Bridas became part of the Panamerican Energy consortium, with a minority share of 40%; British Petroleum had a majority stake in the company, with 60%. That same year, Repsol acquired 45% of Pluspetrol Energy. In 1999, Petrolera San Jorge was acquired by Chevron. In 2002, PETROBRÁS purchased the second largest Argentinean company, Pérez Companc. In 2005, these changes resulted in 80% of crude oil production in Argentina being generated by foreign companies.

This predominantly private management style is reviewed in the following section. Even though it has resulted in significant changes in state policies, it has not altered (2006) the ownership structure of oil companies operating in Argentina.

4. Investment

Until 1998, YPF ranked first in investment in the Argentinean upstream sector, with an average investment of US$1.22 billion per year. From 1994 and 1998, investment in exploitation amounted to between 80 and 90% of total investment in the upstream sector (see Table 14).

Table 14
YPF Investment in Exploration and Exploitation (US$ Billions)

	1994	1995	1996	1997	1998	Total	Average
Exploration	0.100	0.348	0.25	0.280	0.250	1.228	
Exploitation	0.900	1.392	1.0	0.810	0.800	4.902	
Total YPF	**1.0**	**1.740**	**1.25**	**1.090**	**1.050**	**6.130**	**1.226**

Source: http://mepriv.mecon.gov.ar/YPF/.

In 1992, YPF was acquired by Repsol (see Section B.2 : Overview of the Legal and Regulatory Framework). Hence, investment amounts include the amounts paid for the value of the assets acquired (in 1999 and 2000), as well as upstream and downstream investment. Thus, Repsol's investment[22] amounted to US$16.234 billion in 1999 and US$2.04 billion in 2000 (when the company purchased the minority stocks in YPF S.A. and Astra Compañía Argentina de Petróleo).

From 2001 to 2006, REPSOL-YPF investment reached on average an annual US$1 billion, less than YPF's investment for 1994–1998. On the other hand, PETROBRÁS' annual average investment (between 2003 and 2006) stood at US$212 million, as a result of better conditions of profitability caused by the rise in international oil prices, as well as subsequent requests by the government to increase investment.

According to the data provided by Repsol, during 2000–2004 investment amounted to US$5.076 billion. Moreover, the company announced it would invest US$6.7 billion per area for the five-year period 2005–2009, 32% more than the previous five-year period.[23]

Table 15
REPSOL–YPF & PETROBRAS Investment in Exploration and Exploitation (US$ Billions)

	1999	2000	2001	2002	2003	2004	2005	2006(p)	Average 2001–2006
REPSOL	16.234	2.040	1.384	0.820	0.755	0.751	1.030	1.269	1.001
PETROBRÁS	n/a	n/a	n/a	n/a	0.143	0.184	0.222	0.300	
Exploration					0.003	0.004	0.012	0.040	
Exploitation					0.140	0.180	0.210	0.260	
Global Total	**16.234**	**2.040**	**1.384**	**0.820**	**0.898**	**0.935**	**1.252**	**1.569**	

Source: Repsol Annual Memoranda. For 2005, Repsol-YPF press release, 12/14/2005. For PETROBRÁS, statements by Alberto Guimaraes, PETROBRÁS Corporate Manager, Diario La Nación, 04/16/2006, http:://buscador.lanacion.com.ar.

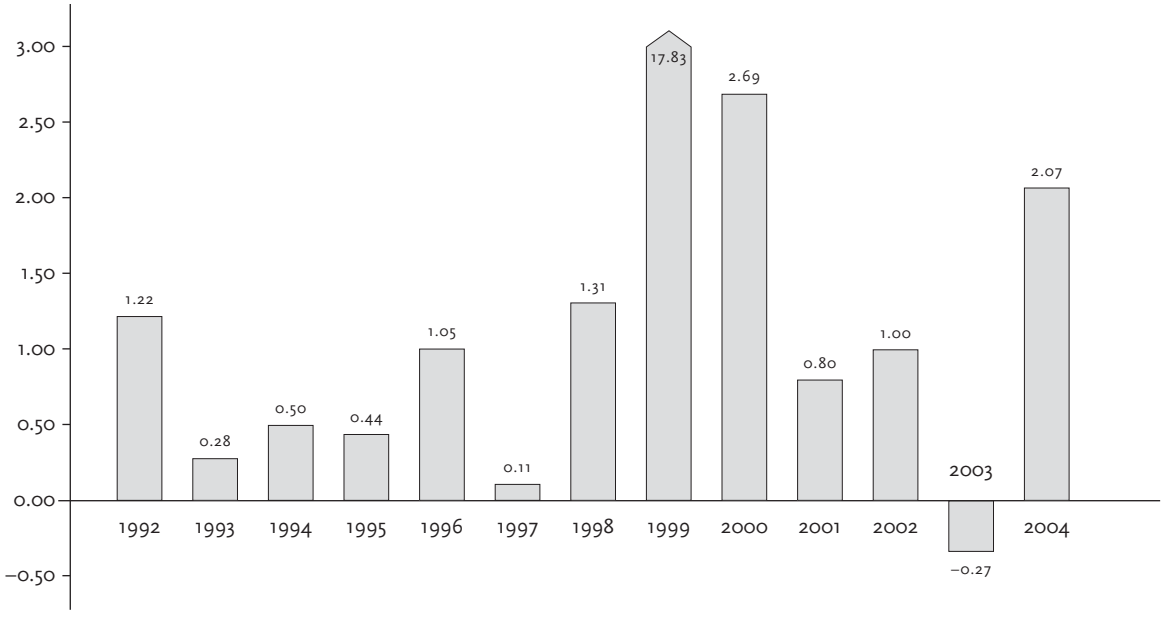
5. Foreign Direct Investment According to the INDEC

Another source used to study FDI behavior in Argentina is the *Instituto Nacional de Estadísticas y Censos* or INDEC (National Institute for Statistics and Census). While FDI data for the previous section was provided by companies, INDEC data uses information relative to the balance of payments, as well as direct surveys to companies and net lending flows. Therefore, these figures should not be compared against each other.
In recent years, foreign investment in the hydrocarbon sector has been characterized by deceleration. The highest figure was recorded in 1999, with US$17.8 billion, the year Repsol acquired YPF. Subsequently, the sector was exclusively operated by private companies, most of them foreign companies, which had gradually acquired domestic companies.

In 2004, foreign investment picked up again, reaching US$2.067 billion. In the previous years, FDI had fallen sharply due to different factors, among them the economic crisis of 2001–2002. In 2003, INDEC figures suggested a US$272 million disinvestment.

According to the INDEC, FDI share in the oil sector with respect to total FDI in Argentina amounted to 34% for the 1992–2004 period. Excluding 1999 and 2000 (due to YPF's assets purchase), FDI share in the oil sector decreased to 17%.

Figure 10
Argentina: FDI in the Oil Sector 1992–2004 (US$ Billions)



Source: INDEC.

Table 16
Investment in Exploration under the Plan Argentina: 1992–2005 (US$ Millions)

Basins	Committed investment	Executed investment
Neuquina	201.4	290.0
Costa Afuera Argentina	82.5	145.4
San Jorge Gulf	32.1	38.8
Cuyana & Bolsones	21.9	31.4
Northwest Basin	23.2	30.0
Austral	14.6	34.2
Chaco Paranaense	8.1	9.1
Claromecó	3.6	16.7
Salado	2.5	4.3
Colorado	1.6	3.6
Ñirihuau	0.8	0.0
Cañadón Asfalto	3.6	0.0
Total	**396.0**	**604.0**

Source: Department of Energy.

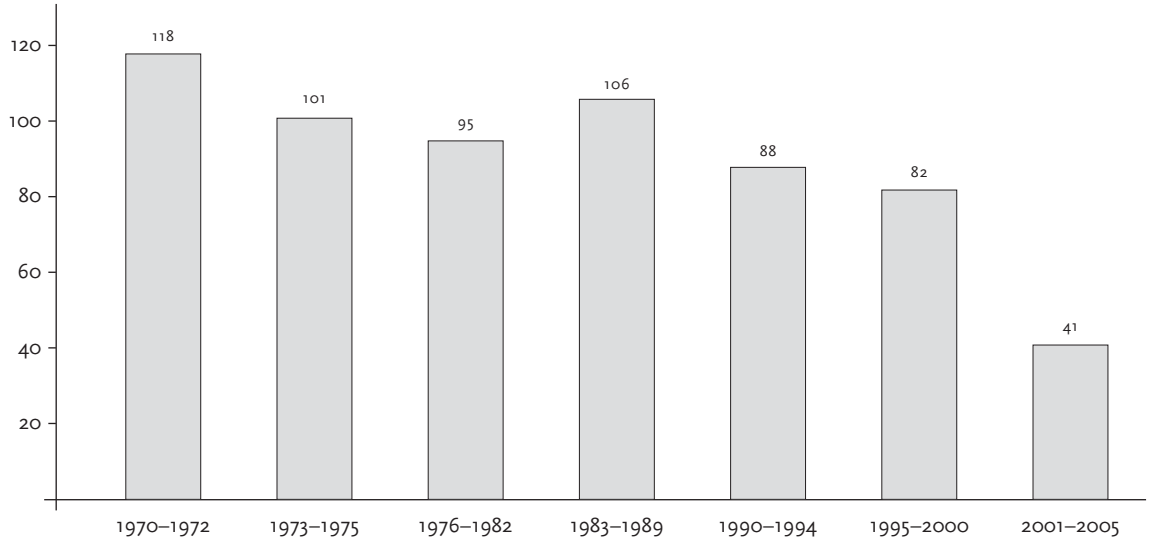
Concerning investment under the *Plan Argentina*, a significant portion was undertaken by foreign investors, among them Repsol, PETROBRÁS, Wintershall, Total and SIPETROL.[24] Results are obviously not relevant in terms of discovery of new hydrocarbon fields. From 1992 to 2005, 95 exploratory areas were assigned and US$604 million was invested. It is worth mentioning that this investment amount does not include previously assigned oil fields.

The main operational areas correspond to five basins and to the sea platform, which cover 94% of the executed investment in exploration activities. They are Neuquina, with US$290 million; followed by San Jorge's Gulf with US$39 million; Cuyana & Bolsones with US$31 million; the Northwest Basin with US$30 million and Austral with US$34 million; the sea platform was assigned US$145 million, the second largest area after the Neuquina basin.

6. Decrease in Exploratory Activities

From the beginning of the 1990s, exploratory activities in Argentina began to decrease, with drilling of around 80 wells per year (Kozulj, op. cit.) In the five-year period from 2001 to 2005, the reduction was even more dramatic, since the number of exploratory wells fell to an average of 40 per year..

Figure 11
Evolution in the Number of Annual Drillings of Exploratory Wells



Source: From 1970 to 2000, Kozulj (2005). Department of Energy, author's own calculations.

Argentina is characterized by unfavorable conditions for exploration activities, i.e. companies operating in the upstream sector only designate 10% of investment for exploration, whereas the remaining 90% goes to investment in hydrocarbon exploitation and promotion.[25] These figures are far from the world's average share of investment in exploration, which ranges from 20% to 30%. Hence, the situation in Argentina is characterized as unbalanced.

Box 7
The Debate on the Decline of Reserves and Exploration Investment

In recent years, the decline of oil and gas reserves has been widely debated in Argentina. The debate is linked to the fact that investment in exploration activities by private companies has also declined, as previously mentioned. Hence, the results of oil policies in the 1990s are at stake.

The responsibility of oil companies in the lack of discoveries of new reserves is due to the economy's conversion to pesos and to the freezing of prices at the beginning of 2002. Consequently, companies ceased to earn their revenues in dollars and the freezing of prices had a negative impact on profitability, which in turn served as a disincentive to investment in exploration. In order to solve the situation, it was necessary to go back to the previous system.

There are alternative interpretations to the entrepreneurial vision. For instance, Kozulj (2005) states that the lack of investment does not date back to 2001 but to previous years, as evidenced by the constant decrease of exploratory drillings: 80 wells per year during the 1990s, less than the previous years, when the number of wells reached 100.

The author states that the upstream's full deregulation in Argentina implied that market signals should be enough to foster investment in exploration activities. Nevertheless, this was not the case. In the era of globalization, capital is not necessarily reinvested where it originates. For example, since 1997, Repsol invested significant amounts in gas exploration in neighboring Bolivia. Kozulj says that, since the government cannot intervene in the companies' investments and is not aware of the real production capacity of companies, the state lacks the ability to ensure domestic supply.

Kozulj highlights the inconsistency of the Argentinean legal framework, since it sets free market criteria for the upstream sector (oil and natural gas exploration and production) and regulates criteria for public services in the natural gas downstream sector. As already mentioned, in spite of the deregulation of upstream prices, investment did not materialize in the 1990s.

ENARSA's chairman, Exequiel Espinosa, states that after YPF's privatization "Argentina has registered significant exploitation periods when the required exploration efforts were not undertaken to replace reserves" (presentation before the International Forum on the Transformation of State Oil Companies in Latin America, in the Ecuadorian Ministry of Mines and Energy, 2006, page 18.) Espinosa also stated that, before YPF's privatization, "our legislation prescribed for all years the discovery of 20% in additional reserves to replace the ones in use" (idem, p. 118).

According to Kozulj, the real causes of the energy crisis were the state's inability to control company operations in the sector and the fact that company behavior was not motivated by providing for domestic supply at low prices. The conversion to pesos and the freezing of prices do not explain the causes of disinvestment (not only because it already happened during the 1990s), since oil and gas revenues increased since 2003 due to the sharp increment in oil and natural gas international prices.

Therefore, Kozulj states that maximization of the companies' present value and their interest in regional and international integration do not match the reform's targets in Argentina; i.e. ensuring supply at lower prices. Companies have overstated the energy crisis in order to add pressure on the government and thus obtain higher tariffs. Finally, the fact that companies such as Repsol, PETROBRÁS

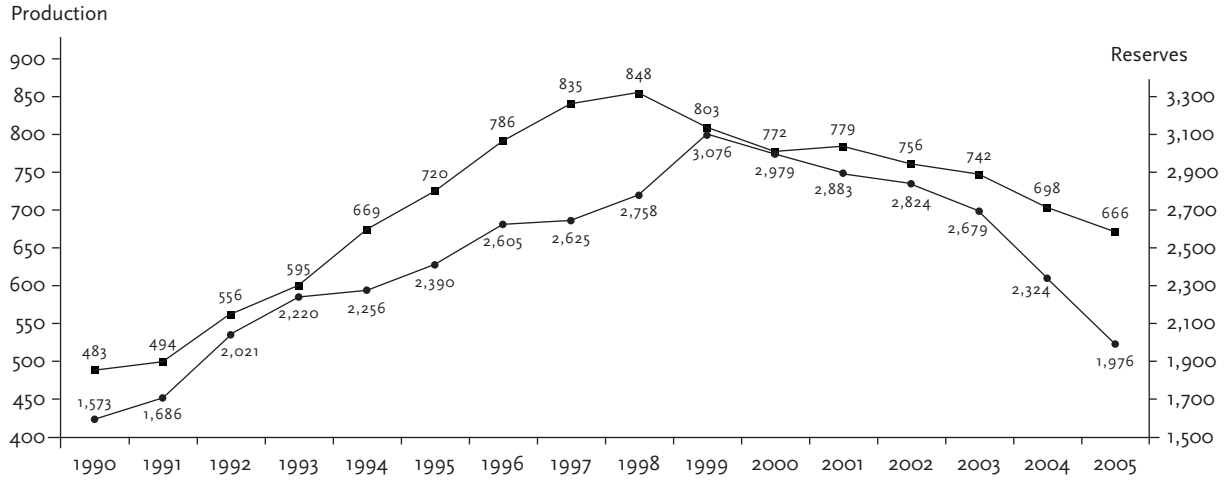
and Total supply the domestic market and own reserves in other countries like Bolivia does not motivate them to search for new reserves in Argentina and thus monetize the existing ones. Likewise, the higher cost of imported gas acts as a pressure mechanism on the increment of domestic prices.

Source: Kozulj (2006), Ecuadorian Ministry of Mines and Energy (2006).

7. Reserves

Oil reserves have fallen sharply since 1999. That year, proven reserves amounted to 3.076 billion barrels. Since then, reserves have decreased at an annual 3% rate, increasing to 15% from 2004 to 2005. At the end of 2005, reserves amounted to barely 1.976 billion barrels, the lowest level since 1992.

Figure 12
Argentina: Oil Production (KBD) and Reserves (MMB)



Source: Department of Energy.

Box 8
Decrease in REPSOL's Reserves

The situation is expected to worsen due to adjustment in Repsol-YPF's certified reserves. The company announced in mid-2006 a 25% decrease in the reserves declared in its balances. Forty percent of this decrease is due to the reserves found in Argentina. It is worth mentioning that, according to Repsol-YPF's statements, the reduction of Argentinean reserves is due to, among other things, the decreased estimated production capacity for the country. Reserves thus fall to 509 MMB, 50% corresponding to natural gas reserves in the Loma La Lata fields. According to Repsol's press release, the fields affected by the decrease in reserves for Argentina are as follows:

Table 17
Decrease in REPSOL's Reserves

Fields	MMB
Loma La Lata	252
Chihuido Sierra Negra	74
Ramos	37
Aguada Toledo	23
Rest of Argentina	125
Total Argentina	**509**

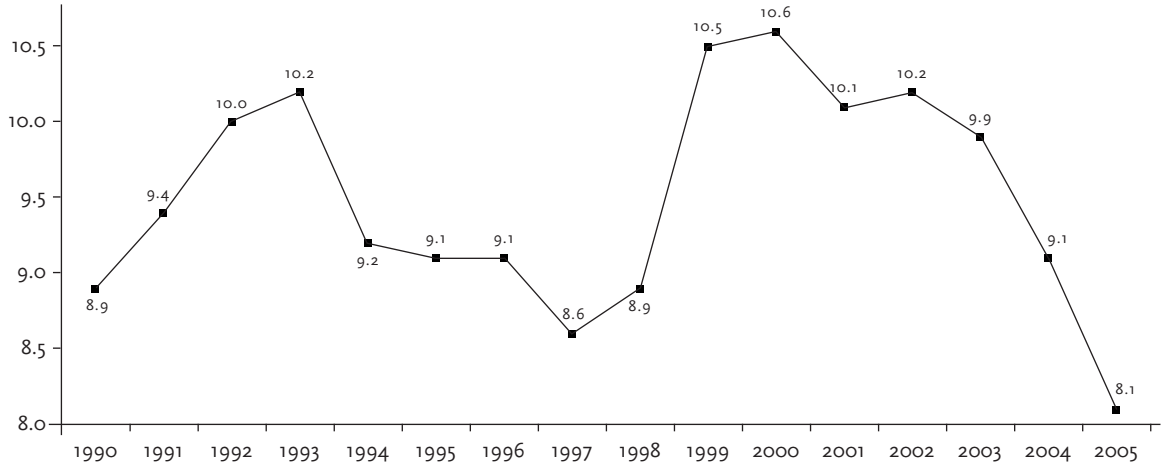
Source: REPSOL.

Worldwide, total reduction of Repsol's reserves amounted to 1.254 billion barrels, of which 40.6% corresponds to Argentina, 52.5% to Bolivia, 4.7% to Venezuela, and 2.2% in the rest of the world.

Source: REPSOL

Taking into account current production and reserves levels, self-supply could last 8 more years. Self-supply has decreased since 2000.

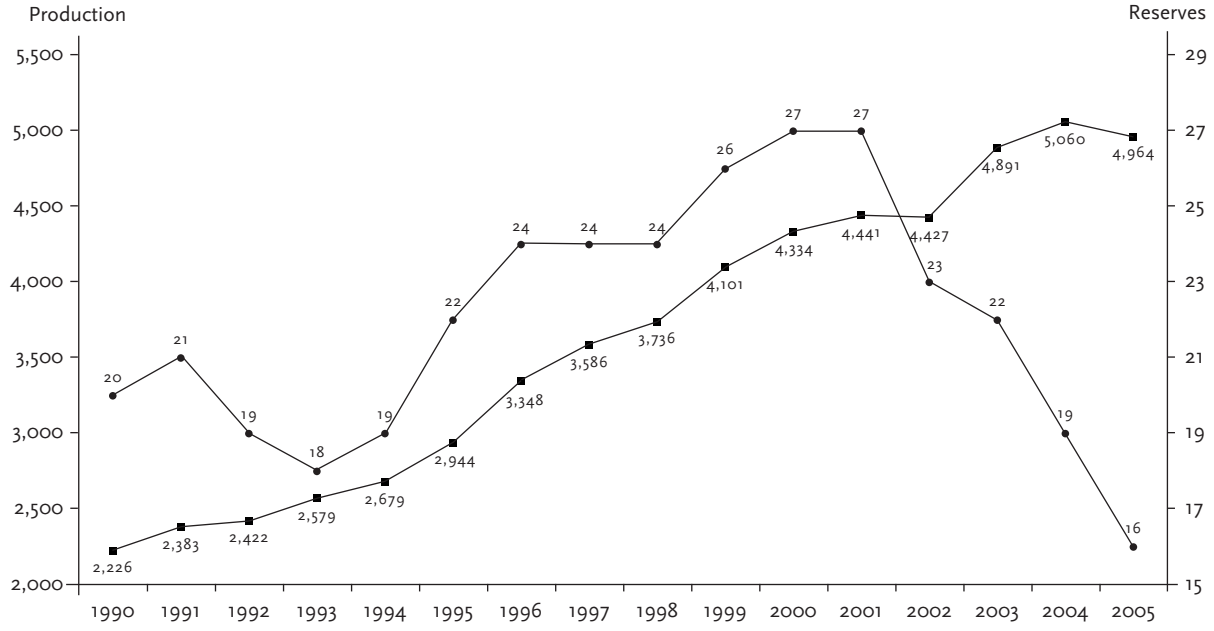
Figure 13
Argentina: Oil Self-Supply Horizon (Years)



Source: Department of Energy.

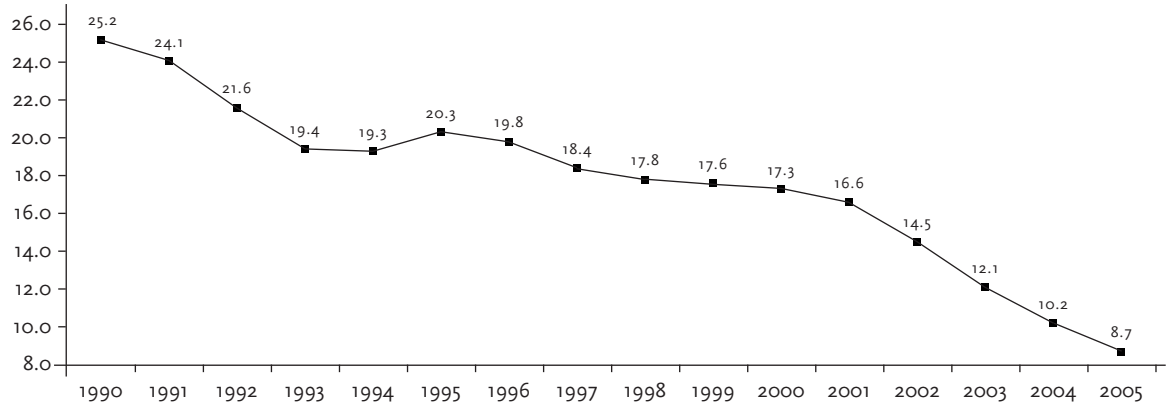
Just like oil reserves, natural gas reserves have also fallen. During the 1990s, reserves exhibited a positive trend with an average annual growth rate of 3.2% between 1991 and 2000. A sharp fall in reserves was recorded from the year 2000 onwards, with a negative growth rate of 10.4%. The record low took place in 2005, with a 16.7% fall. In 2005, proven reserves amounted to barely 15.7 TCF.

Figure 14
Argentina: Natural Gas Production (TCF)[a] and Reserves (MMCFD)[b]



Notes: a) Million cubic feet per day.
b) Trillion cubic feet.

Figure 15
Argentina: Natural Gas Self-Supply Horizon (Years)



Source: Department of Energy.

Although gas reserves increased in the 1990s, it was not enough to compensate for the fall in the reserves/production ratio. Thus, in 1999–2000, the natural gas self-supply horizon went from 25 to 18 years. The situation worsened in the first years of this decade, not only due to the absence of new reserves but also to the increased domestic demand (triggered by the economic recovery), and natural gas exports to Chile remained the same. Thus, since 2001, the self-supply horizon kept decreasing until reaching barely 8 years.

8. Production

From 1992 to 1998, production increased at an average 8% annual rate, reaching a record high in 1998 with 848 kbd. In contrast, from 1998 to 2005, the rate decreased to 3.4%. In 2005, production fell again to 666 kbd, a 5% decrease with respect to the previous year.

The main oil fields in Argentina are located in the provinces of Neuquén (30% of domestic production), followed by Chubut (23%) and Mendoza (14%).

In 2005, the five most important oil companies were foreign, producing 80% of Argentinean oil. Repsol YPF ranked first with 40% of production, followed by Pan American Energy, Chevron San Jorge and Vintage Oil with 15.9%, 9.7%, 9.1% and 5.1%, respectively. Compounded with Total Austral and SIPETROL, foreign companies own 86% of the oil produced in Argentina.

Table 18
Argentina: Oil Production, 2005

Operator	Country	KBD	Percentage
Repsol-YPF S.A.	Spain	269	40.4
Pan American Energy	United Kingdom	106	15.9
PESA (PETROBRÁS)	Brazil	64	9.7
Chevron San Jorge	United States	61	9.1
Vintage Oil	United States	34	5.1
TECPETROL S.A.	Argentina	33	4.9
Total Austral	France	25	3.8
Pluspetrol	Argentina	15	2.2
Sipetrol	Chile	14	2.1
CAPSA CAPEX	Argentina	12	1.8
Petrolera Entre Lomas	Argentina	11	1.7
Other		22	3.4
Total		**666**	**100.0**

Source: Department of Energy, *Instituto Argentino del Petróleo y del Gas.*

Natural gas production has exhibited a growing trend, with an annual average 6% growth rate. In 2005, natural gas production stood at 4.964 billion cubic feet per day (BCFPD), which represented a 2% decrease with respect to 2004, when 5.06 BCFPD was produced.

Natural gas is produced in Neuquén (approximately 51% of production), followed by Salta, Tierra del Fuego and Santa Cruz, with 14.2%, 10.2% and 9.8%, respectively.

The list of companies producing natural gas in Argentina is almost the same as those operating in the oil sector. Again, Repsol YPF is number one with 30%, followed by Total Austral with 23.5% and Pan American with 13.1%. These three foreign companies produce 66% of total gas in Argentina. Including the other five foreign companies (PETROBRÁS, Pioneer, Chevron, SIPETROL and Vintage), they amount to 81% of production.

Table 19
Argentina: Natural Gas Production, 2005

Operator	Country	MMCFPD	Percentage
Repsol-YPF S.A.	Spain	1,500	30
Total Austral	France	1,171	23
Pan American	United Kingdom	652	13
PLUSPETROL	Argentina	456	9
PESA (PETROBRÁS E.S.A.)	Brazil	441	9
TECPETROL	Argentina	240	5
Pioneer Natural Resources	United States	107	2
Chevron San Jorge	United States	99	2
CAPSA CAPEX	Argentina	96	2
SIPETROL	Chile	92	2
Vintage Oil	United States	51	1
Other		59	2
Total		**4,964**	**100**

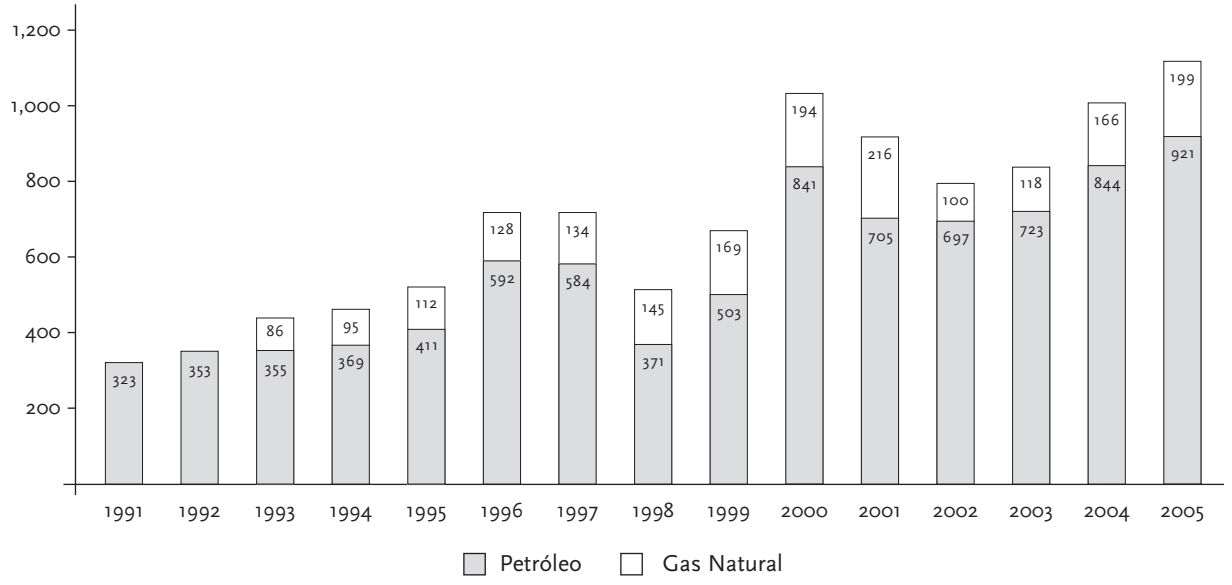
Source: Department of Energy, *Instituto Argentino del Petróleo y del Gas.*

9. Royalties and Tax Collection

According to Argentinean legislation, companies must pay royalties for 12% of the hydrocarbon production value, including both oil and natural gas. Royalties are designated for oil producing provinces, generating significant annual revenues. In 2005, according to the Department of Energy (*Secretaría de Energía*), royalties amounted to US$920.8 million, 9% more than in the previous year.

Higher tax collection was the result of the rise in international crude prices, capable of compensating and overcoming the negative impact of decreased production volumes. The main provinces benefiting from royalties were Neuquén (34%) and Santa Cruz (22%), followed by Chubut and Mendoza with 15% and 14%, respectively.

Figure 16
Argentina: Royalties Payment (US$ Millions)



Source: Department of Energy.

Royalties generated by natural gas are lower than those generated by oil. In 2005, they amounted to US$199 million, according to the Department of Energy. In this case, the situation is different than in the oil sector, since conversion to pesos and the freezing of prices affected gas prices. Nevertheless, collection improved in recent years due to the "path of prices" agreed upon in 2004. Hence, collection went from US$100 million in 2002 (it amounted to US$216 million in 2001), up to US$117 million in 2003 and US$165 million in 2004. In 2005, collection amounted to US$200 million.

Aside from royalties, the country also receives fiscal revenues collected by the government via two mechanisms.

According to AFIP, income tax has increased in the past few years. Hence, in 2003, 2004 and 2005, tax collection amounted to 4.140, 4.545 and 5.037 billion pesos, respectively. In U.S. dollars, these equalled 1.403, 1.545 and 1.640 billion dollars, respectively.

Taxes on exports were introduced in 2002 together with the economic emergency measures. From 2002 to 2005, average annual revenues amounted to US$629 million and have been increasing at positive and growing rates; 2005 witnessed a 60% increase. It is worth noting that the main reason behind the increase in deductions was international prices. In Argentina, export prices are higher than domestic prices, and are not subjected to any price controls. From 2002 to 2004, deductions on exports amounted to US$431, 447 and 629 million, respectively. In 2005 deductions on exports were US$ 1.0 billion (AFIP).

B. Industry Management in Bolivia

1. Introduction

Bolivia produces a small amount of oil by Latin American standards. Nevertheless, in the end of the 1990s and the beginning of this decade, important natural gas reserves have been discovered in the department of Tarija. In July 2005, Bolivia recorded 465 MMB in proven oil reserves and 391 MMB in probable reserves (both figures include natural gas liquids found in Tarija).

In 2003, with 28.7 TCF in proven natural gas reserves and around 58.7 TCF in both proven and probable reserves, Bolivia reached its record high. Since that year, reserves have fallen to 26.7 TCF in proven reserves and 48.7 TCF in proven and probable reserves in July 2005. Bolivia is the second ranking country in Latin America in terms of gas reserves, behind Venezuela.

Bolivia's 2005 oil production was 50.6 kbd, while consumption was 53 kbd, making Bolivia a net importer.

Bolivia produces 1.419 BCFPD of natural gas. Production has increased substantially in the past few years, and it is worth mentioning that the bulk of production is exported to Brazil. Annual consumption amounts to 171 MMCFPD.

2. Overview of the Legal and Regulatory Framework

In recent times, Bolivia was characterized by two clearly differing legal schemes. First, Law 1689, in force from 1996 to 2005, was designed to provide incentives to the private sector in order to lure investment.[26] The main changes were: a decrease in royalties from 50% to 18% for "new" investments; capitalization of YPFB's oil blocks, which were transferred to Andina and Chaco (51%); privatization of the two existing refineries, fully acquired by the state-owned Brazilian company PETROBRÁS; and renegotiation of oil contracts, including the migration of old contracts to comply with the new law.

The second period was marked by the July 2004 referendum on the hydrocarbon sector, which gave birth to Law 3058 of May 2005 and was followed by the enactment of the nationalization decree of May 1st, 2006.

Law 1689 of 1996

Since 1996, when Law 1689 was enacted, oil exploration and exploitation in Bolivia took place only under risk sharing contracts with private companies and YPFB on behalf of the Bolivian state. Law 1689 clearly prohibits YPFB from directly performing these activities along the productive chain. In turn, any individual or legal entity, whether foreign or not, may perform such activities by previously registering in SIRESE. Hydrocarbon transportation and natural gas distribution through networks are subjected to administrative concession for a limited duration.

The Law also modified the taxation regime. Hence, contractors were to pay different royalties depending on whether hydrocarbons were new or already existing. For the existing hydrocarbons, legislation remained unaltered and royalties reached 50% of production's value. For the so-called "new" hydrocarbons, total royalties were reduced to 18%. Additionally, contractors had to pay the taxes specified by Law 843.

Moreover, as a consequence of Law 1689, the privatization of oil fields and oil pipelines networks began under "capitalization" arrangements.[27]

The July 2004 Referendum

In April 2004, the government of president Carlos Meza enacted the Supreme Decree 27449, which constitutes the framework law for the referendum that would later on define the country's energy policy.[28] The Executive Branch was responsible for holding the referendum in less than 90 days; the Electoral National Court would be in charge of its implementation. In order for the "Yes" to win, each question needed to gather the majority of the votes issued.

Table 20
Bolivia: Issues at Stake in the July 2004 Referendum

1.	Do you agree with the repeal of the Hydrocarbon Law 1689 enacted by Gonzalo Sánchez de Lozada?
2.	Do you agree with the recovery of ownership over all wellhead hydrocarbons by the Bolivian state?
3.	Do you agree with the refoundation of Yacimientos Petrolíferos Fiscales Bolivianos, reinstating state ownership over the stock of capitalized oil companies so that all citizens may participate in the whole hydrocarbon production chain?
4.	Do you agree with the policy of President Carlos Mesa promoting the use of gas as strategic resource for the achievement of a useful and sovereign exit to the Pacific Ocean?
5.	Do you agree with Bolivia exporting gas in the context of a domestic policy fulfilling gas consumption needs of Bolivian citizens; promoting gas processing in the country; collecting taxes and/or royalties from oil companies, 50% of the gas and oil production value on behalf of the country; destining the resources obtained from gas exports and processing mainly to education, health, roads and employment?

Source: http://www.bolivia.gov.bo/BOLIVIA/paginas/referendum.htm.

The majority answered yes to the five questions posed. It is worth mentioning that Question No. 2 obtained a positive answer from 92.2% of those surveyed, in favor of recovering ownership over natural resources. The next highest vote totals were Question No. 3 with 87.3% of votes and No. 1 with 86.6%, supporting the proposed refoundation of the state-owned company YPFB in the first case and the revocation of Law 1689 in the second.[29]

Law 3058 of May 2005

The new Hydrocarbon Law of May 2005 (Law 3058) revoked Law 1689. The main change introduced was—in compliance with the referendum held on July 18 2004—the recognition of hydrocarbons as strategic resources for the country's economic and social development. Moreover, it recovered the ownership over all wellhead hydrocarbons on behalf of the Bolivian state. The state would exert its ownership rights through YPFB.

Contracts entered under the previous law (Law 1689) would necessarily adjust to the contract arrangements contained in the new law. A 180-day deadline from the date the law came into force was provided for this purpose.[30]

On the other hand, Article 6 of Law 3058 provided for the refoundation of the state-owned YPFB, recovering the majority stake in capitalized oil companies. Thus, YPFB could now participate in the whole

hydrocarbon production chain. Furthermore, the collective capitalization funds were restructured and BONOSOL's funding was guaranteed.

Concerning the economic scheme, the state would retain 50% of the hydrocarbons' value, both oil and gas, in accordance with the mandate contained in the Referendum Law of July 2004. Consequently, a Direct Tax on Hydrocarbons (*Impuesto Directo a los Hidrocarburos*, IDH) was created. Although fiscal in nature, its estimation follows the same formula applied to royalties.[31] Thus, the IDH's taxable base would be the hydrocarbon production, to which a 32% rate is applied. With this tax, the state obtains 50% of the hydrocarbons value (under the previous Law 1689, the rate was set at 18%).

Hydrocarbon Nationalization

In May 2006, president Evo Morales enacted the Supreme Decree 26701, which, in keeping with the July 2004 referendum's Question No. 2, and with Articles 136, 137 and 139 of the state's political constitution, defines hydrocarbons as domestic assets under the original, direct, inalienable and imprescriptible ownership of the state.

The decree highlights Subsection 5, Article 59 of the state's political constitution, which specifies that exploitation contracts for domestic resources must be authorized and approved by the Legislative Branch, as previously addressed in the Constitutional Court's Ruling No. 0019/2005 of March 2005. Based on this legal precedent, the government declares the exploration and production contracts in force unconstitutional and therefore illegal.

Likewise, it argues that, since the 180-day deadline had expired, as contained in Article 5 of Law 3058 of May 2005, previously analyzed, the state effectively recovers the ownership and full control over the hydrocarbon sector's resources.

Thus, in May 2006, the companies operating in the sector were forced to transfer all hydrocarbon production to YPFB's ownership. Today, YPFB fully exerts, on behalf of the state, its ownership rights over all hydrocarbons produced in the country, assuming its marketing; defining terms, volumes and prices both for the domestic market and export; and undertaking hydrocarbon processing.

Private companies may only operate according to the new nationalization decree and to the rules governing the country, complying with the set deadlines and following a negotiation process with the government. Furthermore, the nationalization decree envisions full auditing of the sector's activities.

Regarding the economic scheme, Article 4 of the nationalization decree establishes that the state shall receive 82% of the production value for fields whose production exceeds 100 MMCFPD; this means 18% of royalties, plus 32% in terms of IDH approved by Law 3058, plus an additional 32% as contributions to YPFB, as prescribed by the new nationalization decree..

3. Management Style

Management style between 1996 and 2004 was based on the fact that private companies performed the sector's activities, as described in the previous section. The state only had a monitoring role through YPFB and the Ministry of Hydrocarbons and Energy (*Ministerio de Hidrocarburos y Energía*). The same policy was applied to the downstream sector..

Legislation proved successful in luring upstream investment (natural gas exploration and exploitation in Tarija). However, the same could not be said of fiscal revenues, due to two facts: a) the decrease in royalties, from 50% down to 18%; and b) low export prices to Brazil and Argentina.

These facts, added to other political developments, led to the dramatic changes at the beginning of 2003 and then to the 2006 nationalization process. It is too early to assess this second period.

4. Investment

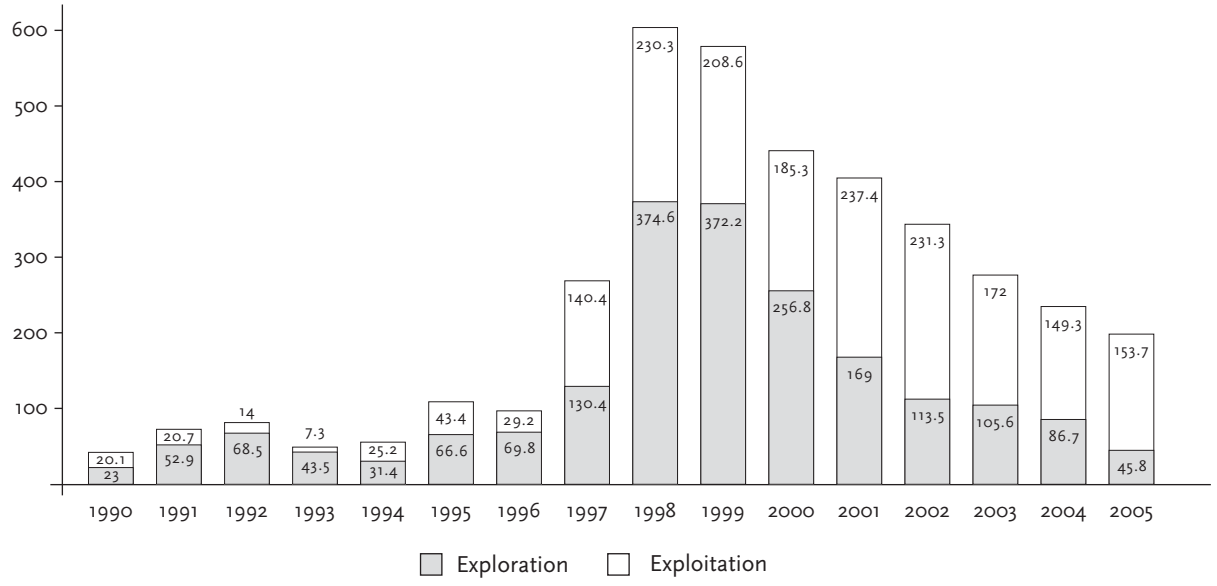
Investment in the hydrocarbon sector has gradually decreased since 1998, when it reached its record high of US$605 million, falling to US$199 million in 2005. Thus, Bolivia finds itself in a *sui generis* context with respect to the remaining countries in the region, where FDI has been picking up in recent years.

From 1990 to 2005, there was a positive growth in total investment at a 22% annual rate.

When analyzing investment figures since 1997 (the year when Law 1689 came into force), two stages may be distinguished: on the one hand, from 1997 to 2000, when investment annual growth rate stood at 67%. On the other, from 2001 to 2005, growth rate was negative (–15%) due to subsequent falls in investment (see Figure 17).

It is worth noting that from 1997 to 2000, investment in exploration exceeded that in exploitation. Investment amounts designated for exploration between 1997 and 2000 amounted to US$1.134 billion, while exploitation activities were assigned US$765 million. From 2001 to 2005, the figures change: investment in exploration came to US$524 million; almost doubled by exploitation, which represented US$944 million.

Figure 17
Bolivia: FDI in Hydrocarbons (In US$ Millions)



Source: Ministry of Hydrocarbons.

The analysis of private companies' investment in Bolivia is hindered by the following statistical difficulty: official data classifies investment according to the field's operator, despite the fact that several partners make up the company owning the field. This said, let us go back to official statistics.

Among the main investor companies in 2001–2005, PETROBRÁS Bolivia ranked first with 27% of executed investments.[32] Second was Repsol YPF with 20% of total investment, followed by the capitalized

Chaco (owned by Panamerican Energy) with 16%, and then another capitalized company, Andina (REPSOL) with 10%.

Table 21
Bolivia: Investment in Hydrocarbons by Operating Company (US$ Millions)

	2001	2002	2003	2004	2005
Repsol–YPF	7	—	—	97	43
Chaco	60	51	43	40	35
PLUSPETROL	59	14	2	16	25
PETROBRÁS Bolivia	108	171	61	17	17
BG	39	7	36	3	10
Andina	45	29	24	29	9
PETROBRÁS Energía	19	2	8	3	5
Total	9	25	46	29	4
Other	60	47	55	1	0
TOTAL	**406**	**345**	**276**	**236**	**147**

Source: Ministry of Hydrocarbons and Energy.

Another perspective on investment amounts is provided by companies themselves. Thus, between October 1997 and March 2006, REPSOL YPF[33] stated it had invested US$1.167 billion, paying the state US$1.275 billion in direct taxes, patents over the mining domain, royalties and shares.

PETROBRÁS reported investments in Bolivia amounting to US$1.5 billion in the past 10 years.[34]

5. Ownership of Natural Gas Reserves

Bolivian proven and probable reserves have been declining, from 54.9 trillion cubic feet (TCF) in 2003 to 48.78 TCF in 2005. This decrease was mainly the result of new estimates and certifications and, to a lesser extent, exports.

Table 22
Bolivia: Proven and Probable Natural Gas Reserves by Department (Trillion Cubic Feet, TCF)

	1998	1999	2000	2001	2002	2003	2004	2005
Tarija	1.6	3.2	25.6	40.2	45.7	47.8	45.0	41.8
Santa Cruz	3.4	3.9	5.0	4.8	4.9	5.3	5.6	5.2
Cochabamba	0.9	0.8	1.0	1.1	1.0	1.1	1.1	1.2
Chuquisaca	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6
Total	**6.6**	**8.6**	**32.2**	**46.8**	**52.3**	**54.9**	**52.4**	**48.8**

Source: Ministry of Hydrocarbons and Energy.

REPSOL is the main owner of reserves, with 33.6% of total reserves. SAM Andina owns 50% of the capitalized company (the remaining 50% belongs to Bolivian pensioners), equalling 1.17 TCF in reserves. Additionally, REPSOL owns 50% of shares in the San Alberto and San Antonio fields (the other stockholders are PETROBRÁS and Total), with shares amounting to 5.87 and 5.33 TCF, respectively. REPSOL (through its subsidiary Maxus) also holds a share in Caipipendi, with 37.5% of stocks (the other partners are British Gas and Panamerican Energy) with 4.01 TCF of total gas reserves. REPSOL is the block's operator.

Table 23
Bolivia: Proven and Probable Certified Natural Gas Reserves, 2005

	Share in blocks	Reserves (TCF)	Percentage
Repsol–YPF		16.38	33.6
Andina's capitalized fields (operator)	50.0	1.17	
San Alberto	50.0	5.87	
San Antonio	50.0	5.33	
Caipipendi (Margarita), operator	37.5	4.01	
British Gas Exploration & Production		6.44	13.2
XX Tarija Oeste	25.0	1.94	
Caipipendi (Margarita)	37.5	4.01	
Other fields		0.50	
PETROBRÁS		7.84	16.1
San Alberto (operator)	35.0	4.11	
San Antonio (operator)	35.0	3.73	
TotalFinaElf		6.54	13.4
XX Tarija Oeste (operator)	41.0	3.18	
San Alberto	15.0	1.76	
San Antonio	15.0	1.60	
Chaco S.A.		2.39	4.9
Capitalized fields	100.0	2.39	
ExxonMobil		2.64	5.4
XX Tarija Oeste	34.0	2.64	
Panamerican Energy		2.67	5.5
Caipipendi (Margarita)	25.0	2.67	
Andina (Pension Fund)	50.0	1.17	2.4
Other		2.71	5.6
Total		**48.78**	**100.0**

Source: Ministry of Mines and Hydrocarbons, YPFB. The author's own calculations.

The second most important company is PETROBRAS, which holds 16.1% of total gas reserves in Bolivia through its share in the San Alberto and San Antonio fields. It is worth noting that PETROBRÁS operates these fields but does not hold the majority stake in them. The third ranking company is TotalFinaElf, which holds 13.4% of total gas reserves in Bolivia; in addition to its 15% share in the San Alberto and San Antonio fields, the company holds 41% of the XX Tarija Oeste field. The French company British Gas Exploration and Production ranks fourth, with 13.2% of total gas reserves in Bolivia spread across different fields.

Box 9
San Alberto Field Reserves Discovered by YPFB in 1990

In May 2004, the President of Bolivia, Carlos Mesa, designated the Presidential Commissioner for the Review and Improvement of Capitalization (*Delegado Presidencial para la Revisión y Mejora de la Capitalización*) to carry out "a comprehensive research to clarify the process whereby the San Alberto field was defined as 'new', i.e, that no gas reserves had been previously discovered in that field."
The Commissioner's report found that significant natural gas reserves had been discovered in 1990 by state-owned YPFB in the San Alberto field (operated by PETROBRÁS with the participation of Repsol and Total). However, in 1996, they were rated as "new" reserves and subsequently sold according to this rating.

The report states that the following "fiscal criteria" were applied: "Existing hydrocarbons are defined as those which have already paid royalties and are thus in production." Obviously, according to Law 1689 of 1996, the San Alberto field did not fulfill this requirement since it had not yet begun production.

However, the report states that, had technical criteria been taken into account instead of fiscal criteria, San Alberto's deep reservoir, discovered by YPFB in 1990, should have been defined as "existing" instead of "new." The same criteria is applied to other fields with reserved deposits due to the lack of market or marketing conditions on the date of enactment of Law 1689.
The report concludes with the following recommendation:

"Even though San Alberto's rating as new hydrocarbons field fits the legal framework in force, based on its historical background and the said technical criteria, the Commissioner recommends that the Bolivian state, through YPFB and the Ministry of Mines and Hydrocarbons, negotiate with the oil companies which received (as in the case of the San Alberto field), on account of their certified deep reservoirs not in production, a compensation amounting to 50% of the hydrocarbon volume for those reservoirs certified on April 30, 1996."

The report was prepared by a technical and legal commission made up by Ms. Wilma Terrazas de Mirabal, Legal Consultant to YPFB; Mr. Oscar Mariaca, Head of YPFB's Investment and Tender Promotion Unit; Mr. Mario Candia, General Director for Hydrocarbons at the Ministry of Mines and Hydrocarbons; Mr. Mauricio Galleguillos, the Commission's General Coordinator; Mr. Luis Alberto Rodrigo, geologist and independent oil expert; and Commissioner Francisco Zaratti, Chairman of the Commission.

Source: Report by the Presidential Commission, May 2004

Oil and Liquid Hydrocarbon Reserves

In 2005, proven oil reserves amounted to 462 MMB. Most came from natural gas liquids found in the Tarija fields operated by PETROBRAS, Repsol and Total.

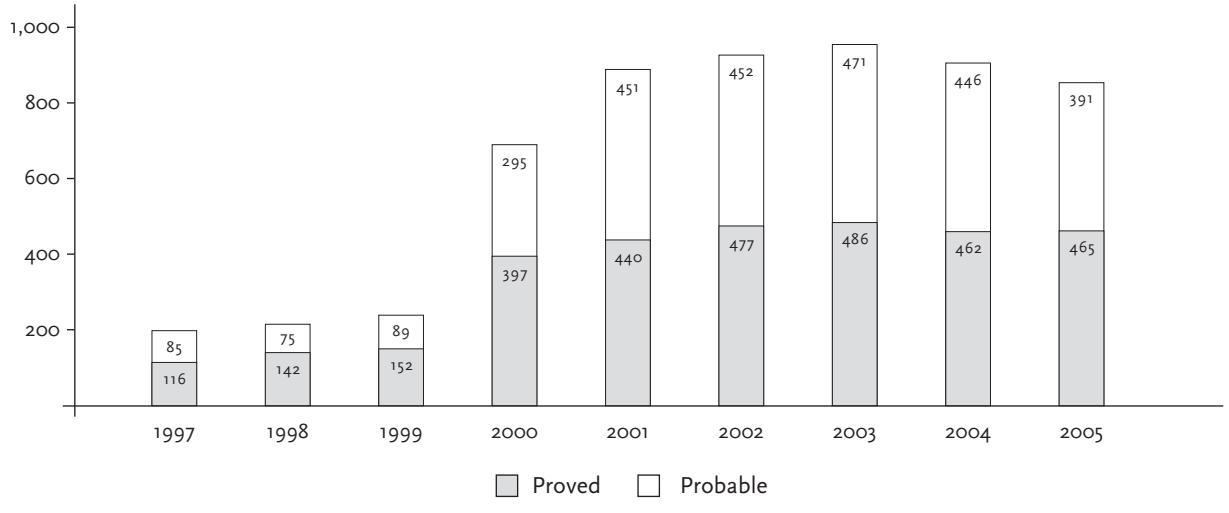
In recent years, reserves slightly increased. In 2005, the increase was barely .6% with respect to the previous year, and in 2004 it decreased by 5%. It is worth mentioning that most exploratory efforts have focused on the discovery of natural gas, due to its great potential in the country. This implies that most liquid hydrocarbons consist of natural gas liquids and, to a lesser extent, oil.

Table 24
Bolivia: Proven Oil Reserves, 2004 (Million Barrels)

Old fields		
Andina	27	
Chaco	25	
Subtotal	52	11.2
New Fields		
Maxus-Repsol	161	
Petrobras	183	
Total	50	
Other	17	
Subtotal	410	88.8
Global Total	**462**	**100.0**

Source: Ministry of Hydrocarbons and Energy.

Figure 18
Bolivia: Oil Reserves (Million Barrels)



Source: Ministry of Hydrocarbons.

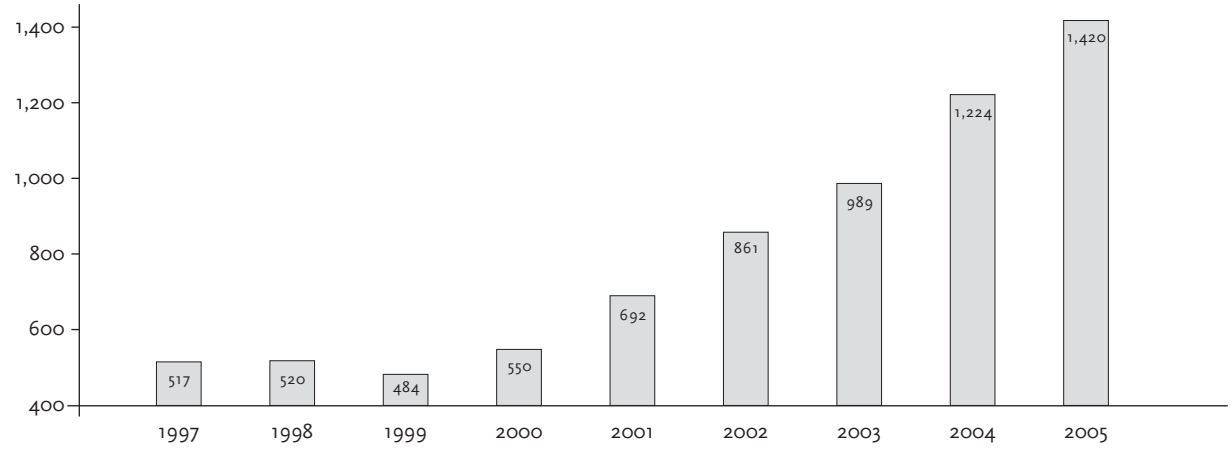
Older oil fields belong to capitalized companies (Andina and Chaco).

Moreover, the country holds large probable reserves that have declined substantially in the past two years. In 2003 they amounted to a maximum 471 MMB, decreasing to 391 MMB in 2005.

6. Production

In the past few years, natural gas production has increased at a steady pace, coming to 1,420 MMCFPD in 2005, a 16% increase from the previous year. Since 2000, production has increased at a two-digit growth rate (20% per year on average). This led to increased exploitation activities on the part of companies, as described in the section dealing with investment.

Figure 19
Bolivia: Natural Gas Production (Million Cubic Feet per Day)



Source: Ministry of Hydrocarbons.

Note: Data for the year 2005 has been updated to the month of October.

In 2005, gas production for the San Alberto and San Antonio fields (operated by PETROBRÁS) amounted to 49% of total production. It is worth noting that the bulk of production is exported to Brazil via the Santa Cruz-Sao Paulo gas pipeline.

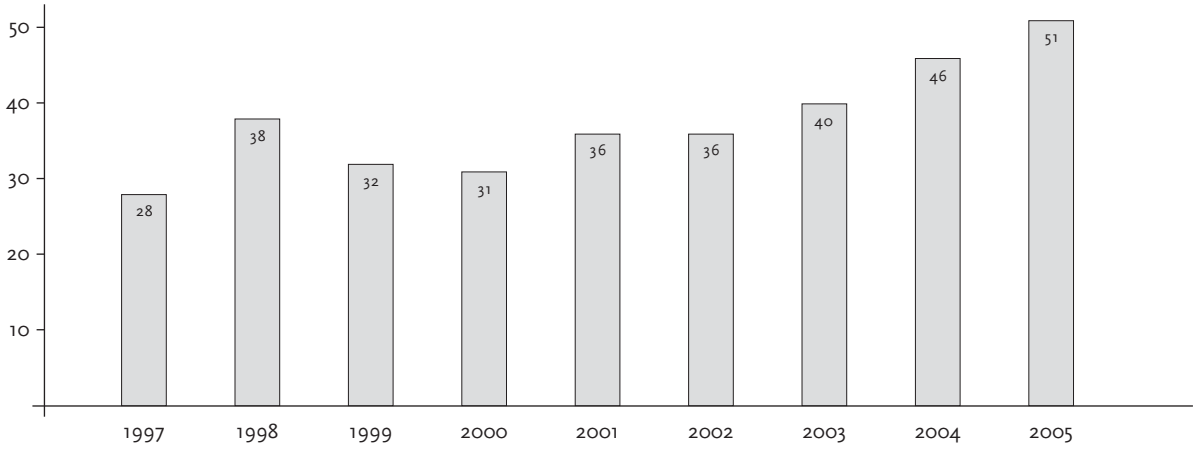
Oil and natural gas liquids (LPG, natural and condensate gasoline) in Bolivia are characterized by modest standards. In 2005, the country produced 50 kbd, a 9% increase from the previous year. On average, the annual growth rate since 1998 has been 9%; the years 1998 and 2004 recorded 35% and 17% rates, respectively. Therefore, the country's production and consumption of these hydrocarbons is moderate compared to natural gas.

Table 25
Bolivia: Total Natural Gas Production by Operator

Operator	2001		2002		2003		2004		2005	
	MMCFD	%	MMCFD	%	MMCFD	%	MMCFD	%	MMCFD	%
PETROBRAS	100.5	14.5	160.5	18.6	347.4	35.1	536.3	43.8	695	49.4
ANDINA	236.9	34.2	278.7	32.4	257	26.0	277.1	22.6	266.4	18.9
CHACO	172.9	25.0	203.4	23.6	206.6	21.0	221.1	18.1	211.6	15
REPSOL YPF	—	—	—	—	—	—	57.5	4.7	112.4	8
BG	43.2	6.2	82.2	9.5	40.3	4.1	58.4	4.8	59.7	4.2
PETROBRAS ENERGIA	—	—	—	—	40.9	4.1	38.9	3.2	39.2	2.8
VINTAGE	36.8	5.3	27.3	3.2	25.9	2.6	33.2	2.7	19	1.4
PLUSPETROL	4.9	0.7	10.4	1.2	9.4	1.0	1.1	0.1	2.5	0.2
MATPETROL	0.4	0.1	0.4	0.05	0.2	0.02	0.5	0.04	0.9	0.1
DONG WON	0	0.01	—	—	0.4	0.04	0.1	0.01	—	—
TOTAL	—	—	0.4	0.05	—	—	—	—	—	—
MAXUS	54.2	7.8	55.2	6.4	60.5	6.1	—	—	—	—
CANADIAN	0.3	0.04	0.2	0.02	0.05	0.005	—	—	—	—
PECOM	41.7	6.0	42.6	4.9	—	—	—	—	—	—
TOTAL	**692**	**100.0**	**861**	**100.0**	**989**	**100.0**	**1,224**	**100.0**	**1,407**	**100.0**

Source: Ministry of Mines and Hydrocarbons.

Figure 20
Bolivia: Crude Oil, Ccondensates and Natural Gasoline Production (Thousands of Barrels per Day)



Source: Ministry of Energy and Mines. * October 2005.

7. Exports in Volume and Monetary Value

In 2005, total exports in Bolivia reached 970 MMCFPD, of which 85% went to Brazil (804 MMCFPD) and the remaining 15% to Argentina (166 MMCFPD).

Exports to Brazil come for the most part from fields operated by PETROBRÁS (San Alberto and San Antonio).

Exports to Argentina come from fields operated by Repsol. In compliance with Argentina's agreements, exports to Argentina are partially and indirectly exported back to Chile.

Since mid-2005, high officials in the energy sector both in Bolivia and Argentina have been meeting on a regular basis in order to study the possibility of increasing exports from 247 MMCFPD to 706 MMCFPD. In October 2006, the increase was finally negotiated, along with a rise in prices and a greater share by state-owned companies in both countries.

Table 26
Bolivia: Natural Gas Exports (*Million Cubic Feet per Day*)

	1999	2000	2001	2002	2003	2004	2005*
BRAZIL	76.8	204.4	369.3	463.0	532.2	735.4	803.8
BG	—	—	11.7	53.0	6.7	16.0	—
CUIABA	—	—	6.0	44.7	40.7	30.7	24.1
GSA	76.8	204.4	351.6	365.3	484.8	688.7	779.7
ARGENTINA	—	—	—	6.3	8.3	131.7	166.5
PLUSPETROL	—	—	—	6.3	8.3	0.2	19.6
Temporary	—	—	—	—	—	131.5	146.9

Source: Bolivian Ministry of Mines and Hydrocarbons.
BG began exporting in July 1999.
Cuiaba began exporting in January 2001.
GSA (Pipeline to Sao Paulo) began exporting in January 2001.
PLUSPETROL ceased to export in February 2004.
October 2005.

With respect to the total exports of Bolivia, hydrocarbon exports went from 6% in 1999 to 54% in 2005. Thus, hydrocarbons have become a significant resource, which may allow for higher fiscal resources that can in turn be devoted to social expenses and investment in Bolivian physical infrastructure.

Table 27
Significance of Hydrocarbons in Bolivian Exports (US$ Millions)

	1999	2000	2001	2002	2003	2004	2005*
Hydrocarbon Exports	71.7	165.8	298.6	335.8	502.4	817.8	1,314.7
Total Exports	1,124.5	1,182.5	1,053.2	1,040.3	1,344.7	1,915.2	2,424.8
Hydrocarbon Share	6%	14%	28%	32%	37%	43%	54%

Source: Central Bank of Bolivia.

8. Tax Collection for the Hydrocarbon Sector

On average, tax collection for the hydrocarbon sector added up to US$425 million from 2000 to 2004; however, in 2005 it increased substantially, to US$842 million, an 85% increase, due to IDH collection since May 2005 under the newly enacted Law 3058. That same year, royalties and shares increased by 12%, while the remaining headings increased to a lesser extent.

Table 28
Bolivia: Fiscal Revenues for the Hydrocarbon Sector (US$ Millions)

	2000	2001	2002	2003	2004	2005
Royalties and shares	180	188	173	219	209	235
IDH (Law 3058 of May 2005)	—	—	—	—	—	335
Income Tax and Consignments	13	41	27	42	35	40
VAT and Other	119	217	196	188	200	200
Patents and penalties	17	19	20	14	12	12
Total	**329**	**465**	**416**	**463**	**456**	**842**

Source: YPFB, Central Bank of Bolivia, Domestic Taxes Services (Servicio de Impuestos Nacionales).

C. Industry Management in Peru

1. Introduction

In 2005, proven reserves of liquid hydrocarbons amounted to 1.097 billion barrels, of which 379 MMB corresponded to oil and the remaining 718 MMB to natural gas liquids, the bulk coming from reserves located in Camisea's Block 88.

Oil production has been declining during the past decade. In 2005, barely 75 kbd of oil were produced. However, natural gas liquids exploitation, which increased to 36 kbd in 2005, allowed for a higher production of fuels.

In Peru, oil consumption stood at 150 kbd in 2005. The country became a net oil importer in 1987. In 2005, the oil trade balance deficit amounted to US$742 million.

The situation could be partially reversed based on the growing production of natural gas liquids extracted from reserves found in Block 56 (Camisea 2). This field holds proven natural gas reserves amounting to 8.7 TCF and 600 MMB in natural gas liquids.

Peruvian natural gas reserves come to 11.47 TCF, of which 10.9 TCF come from Camisea and Pagoreni, and 0.7 TCF from other fields registered until 2004. In 2005, natural gas production amounted to 147 MMCFPD, including Camisea, the small fields north of the country and the central jungle.

In Peru, natural gas is an emerging industry in which consumption equals production. The main consumers are thermal power stations and several industries, while vehicle and residential gas consumption is still underdeveloped.

2. Overview of the Legal and Regulatory Framework

At the beginning of the 1990s, reforms relative to the sector sought to promote foreign investment along the whole hydrocarbon chain, but particularly in the upstream sector. The government undertook an institutional reform of the oil sector. In 1993, it enacted the new Hydrocarbon Law (Law 26221). In general terms, legal modifications were aimed at providing incentives for foreign investment both in the upstream and downstream sectors. Likewise, the arrangement for domestic pricing of oil by-products was altered, setting prices in accordance with international prices.

Subsequently, since the year 2000, new legal measures were passed that favored foreign investment in the sector, providing additional incentives to hydrocarbon exploration and exploitation.[35]

In December 2000, Law 27377 (Hydrocarbon Update) was enacted. It extended the deadline faced by contractors during the exploration stage by. In January 2002, the Hydrocarbon Law was again amended with the enactment of Law 27624, which introduced the IGV refund for oil companies performing exploration activities. It also allowed inclusion of this refund in fiscal and legal stability contracts.

DS 017-2003-EM modified the method used to estimate the R Factor for the payment of royalties. Previously, under Law 26221, there was only one method to calculate the R Factor, and royalties ranged from 15% to 35%. Now, royalties range from 5% to 20% and two methods may be used for estimation purposes: one is linked to the R Factor and the other to oil production levels by contractors.

In November 2003, Law 28019 was enacted. It set forth new reserve and production curves for marginal fields, allowing for lower royalties, which depend on the contractor's commitment to undertake a minimum working plan.

Concerning natural gas, since the year 2000 a series of legal changes were aimed at authorizing gas natural exports. The legislation in force (Law 27133 and DS 040 EM of 1999) on the date of signature for Block 88's contract with the Camisea consortium in November 2000, decreed a 20-year-long permanent time horizon for the domestic market supply.

Changes to the legal framework began in 2003 with DS-031-2003 EM, which amended DS-040-1999-EM. The change eliminated the obligation to supply the domestic market with a "20-year-long permanent horizon" and replaced it with the following line: the domestic market supply will be guaranteed (...) once proven reserves are sufficient to supply future demand for a minimum duration set in the contract." Subsequently, Law 28552 (June 2005) modified Law 27133, suppressing the line "minimum duration set in the contract" and replacing it with the following: "ensuring supply for the natural gas domestic market."

Legal changes even modified Block 88's contract, signed in November 2000 by PETROPERU and the consortium led by PLUSPETROL. In fact, in December 2005, DS 050-2005 EM was enacted, authorizing PETROPERU to negotiate and agree on a clause that would modify the License Agreement for Hydrocarbon Exploitation in Block 88 so that gas from this block could be exported in compliance with the legal modifications introduced by DS-031-2003 EM and Law 28552.

3. Management Style

In Peru, prior to 1996, upstream management in the hydrocarbon sector was mixed. In the upstream sector, state-owned PETROPERÚ performed oil exploration activities together with several foreign companies, Occidental and Petrotech among others. Hence, several foreign companies had a share in risk exploration investment in all sectors in the country.[36]

The main purpose of PETROPERÚ's privatization was to increase private investment in order to boost proven oil reserves. The privatization process began in 1992 with the sale of certain assets, and was accelerated by selling the producing blocks in Selva Norte and Talara, on top of the largest refinery in the nation.[37] Although the privatization process was eventually halted, the government's main goal was to privatize the company's remaining units (in 1997, PETROPERÚ's terminals and lubricant manufacturing plant were sold). Consequently, 100% of investment in the upstream, both in exploration and exploitation, was placed under private companies' control, all of them foreign.

Investment in risk exploration to date has not led to significant oil discoveries, despite the US$942 million invested from 1993 to 2005. In PETROPERÚ's privatized blocks, both in Talara and Block 8, no funds have been devoted to exploration.

Therefore, the stated purposes of privatization were not achieved. The main issue was that, due to higher oil prices, PETROPERÚ ceased to benefit from the significant revenues derived from the sale of its blocks. According to the state-owned PETROPERÚ, from 1992 to September 2005, privatization brought about losses amounting to US$1.324 billion (see Box 10).

Concerning investment in exploitation, the most significant achievement was the start-up of Camisea's Block 88. The investment project underwent two stages: from 1996 to 1998, Shell invested US$246 million, and in 2001–2005, the consortium led by Pluspetrol invested US$757 million.

In 2004, investment began in Block 56 (adjacent to Camisea), and to date US$80 million have already been invested.

Box 10
PETROPERÚ: Losses Due to Privatization

In 2005, PETROPERÚ published a report detailing the company's losses due to the privatization of its assets. According to the report, privatization entailed losses adding up to US$2.187 billion from 1992 to September 2005.

The company's revenues (US$863 million) should be subtracted from this figure: US$673 million for the sale of assets, plus US$190 million for the annual transfers derived from PETROMAR's fields and supply terminals spread across the country.

Net loss thus comes to US$1.324 billion.

The most significant assets sold were the oil producing blocks (Block 8, X, XI), as well as La Pampilla's refinery. The oil fleet (*Transoceánica*) was sold as well, together with the gas retail business (Solgas) and 85 gas stations (among others).

The most important losses are the oil producing fields: Block 8 (north jungle), Talara and the offshore fields (Block Z-2B), adding up to US$1.359 billion. The estimate is as follows: the volume of oil produced is multiplied by a US$6.8/barrel profit margin, which is the average margin from the time of privatization until September 2005.

Table 29
State Revenues Generated by PETROPERÚ's Privatization

Privatized Units	Month–year of privatization	Amount (MM$US)
Block Z2-B Petromar	November 1993	30
Sale of 85 gas stations	July 1992	39
Sale of SOLGAS	August 1992	6
Sale of oil fleet (Transoceánica)	December 1992	25
Transfer of Oil Blocks 8/8/X	July 1996	142
Sale of La Pampilla's Refinery	July 1996	181
Sale of lubricant manufacturing plant	September 1996	19
Electric and Natural Gas Plants	November 1996	20
Lease of Terminals (North-Center-South)	December 1996 March 1998	202 9
Total State Revenues		**673**

Source: PETROPERÚ.

Table 30
Operational Utilities Not Earned by PETROPERÚ Due to Privatization

Units	Month–year of privatization	Operational Utility (MM$US) 1992–2005*	Cases used for estimation
Block Z-2B Petromar Sale of 85 gas stations	November 1993 July 1993	484 106	Prod. 15KBD, margin US$6.8/Bl 1.8 Mgl/day. Margin US$.15/Gl.85 pumps 184 MMkg/year. Margin US$.88/10kg cil
Sale of Solgas	August 1992	64	47% market share
Sale of Transoceánica	December 1992	62	Margin US$4,000/day per operating ship
Transfer of Block 8 (producer)	July 1996	565	Prod.23 KBD. Margin US$6.8/Bl 60% Operational Utility

Units	Month–year of privatization	Operational Utility (MM$US) 1992–2005*	Cases used for estimation
Sale of La Pampilla's Refinery	July 1996	388	Ref. Pampilla; 96–05* period; US$646.2 million
Transfer of Northwestern Blocks (producers)	December 1996	310	Prod. 12 KBD. Margin US$6.8/Bl
Wholesale Marketing Business	July 1996	146	37 KBD. Trade Margin US$1.2/Bl
Lima/Callao Airport's Sales Plant	May 2001	62	Ceased to collect US$1.2 million/month
Total Economic Loss		**2,187**	

Source: PETROPERÚ. *September 2005.

Next was La Pampilla's loss (US$388 million, estimated), taking into consideration 60% (privatized portion) of the operational utility from 1996 to September 2005. The sale of 85 gas stations resulted in the loss of US$106 million, estimated as follows: sale of 1,800 gallons/day with a US$.15/gallon. With Sol Gas, losses amounted to US$64 million. (Sol Gas, today Repsol, controls 33% of the market.)

The sale of oil ships belonging to the affiliate Petrolera Transoceánica resulted in US$64 million losses. Now, PETROPERÚ pays an operational margin of US$11,000 per day; before it only paid US$7,000. When the Jorge Chávez Airport's sales plant was sold, PETROPERÚ ceased to collect US$62 million (US$1.2 million per month).

4. Foreign Direct Investment

Starting with the 1996 privatization process, the state-owned PETROPERÚ ceased to invest in exploration and exploitation. Subsequently, 100% of investment in the upstream sector now comes from foreign companies.

FDI behavior varied. In 2005, it amounted to US$305 million, a 70% increase with respect to the previous year. It is worth mentioning that, to date, the 1997 levels (with amounts adding up to US$528 million) have not been matched yet.

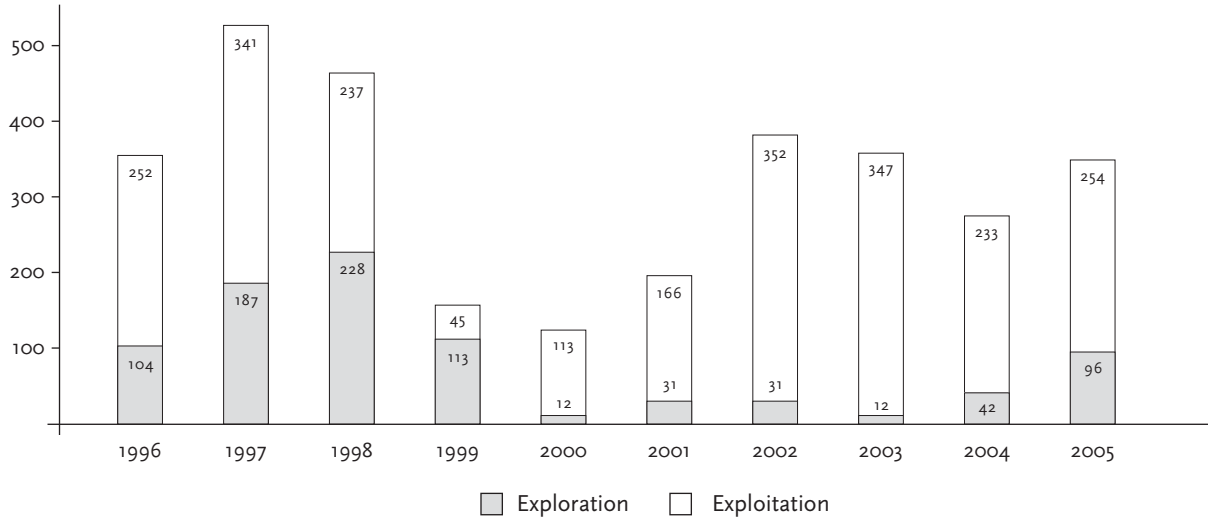
Within the upstream sector, the average amounts designated for hydrocarbon exploration for 1996–2005 were 25% of total investment, while 75% was allocated to exploitation. From 2000 to 2005, investment in exploration has decreased to 13% of total FDI in the upstream sector.

Between 1996 and 1999, investment in exploration increased to an average US$158 million per year. Since it did not lead to new oil discoveries, interest in exploration fell. Due to the new incentives contained in

the modifications to oil legislation, investment in the sector picked up to US$42 and US$95 million in 2004 and 2005, respectively. Most funds went to exploration in the jungle. Thus, in 2005, 88% was invested in this area by Occidental and Repsol.

Concerning exploitation, the largest investment amounts between 1996 and 1998 were in Camisea's Block 88 (then operated by Shell). Likewise, most investment in 2001–2004 was designated for the development of Camisea's Block 88, operated by the consortium headed by PLUSPETROL. In 2005, there was an increase in investment by PLUSPETROL in Block 8 and 1AB, as well as by PETROBRÁS and PETROTECH. It is also worth mentioning that in 2005 investment was directed to Block 56's exploitation by the consortium led by PLUSPETROL.

Figure 21
Peru: Foreign Investment in Hydrocarbons (Millions of dollars)



Source: Ministry of Energy and Mines.

Between 1996 and 2005, investment in exploitation amounted to an average of US$234 million per year. Investment was targeted at the jungle (especially Camisea), with 62%, followed by the northern coast, with 29% (mainly by PETROBRÁS), and more recently, in the continental shelf, by PETROTECH.

FDI share in the hydrocarbon sector amounts on average to 17% of total FDI. These investment amounts include the sale of privatized assets. The lowest share was 9%, in 1999, while the highest was 29%, in 1998.

One should keep in mind that figures relative to the hydrocarbon sector only include investment amounts in the upstream stages, so it could be said that considering investment in the downstream, the share should increase slightly.

Figure 22
FDI Share in the Hydrocarbon Upstream Sector with Respect to Total FDI

Source: Ministry of Energy and Mines and Central Bank of Peru (Banco Central de Reserva de Perú).

Box 11
Block 56 and Natural Gas Exports

In September 2004, Perupetrol, on behalf of the Peruvian state, together with the Camisea consortium, entered an operation contract for Block 56 (adjacent to Block 88). Its main purpose was to sell natural gas to Peru LNG consortium led by Hunt Oil, and proceed to export LNG (mentioning Mexico and maybe Chile), whereas the Camisea consortium would market natural gas liquids.

Peru LNG consortium is made up by Hunt Oil (50%), SK (30%) and Repsol (20%). In January 2006, the Ministry of Energy and Mines granted Peru LNG a license to build a liquefaction plant in Melchorita which would facilitate the export project. Exports are expected to add up to 625 MMCFD (equivalent to 0.0228 TCF per year) from Block 56 (in the vicinity of Camisea), with reserves of up to 2.85 TCF in 2005. Contract duration is 18 and a half years.

In Peru, the project would require an estimated investment of US$2.2 billion, disaggregated as follows: fields development, US$550 million; extension of the existing gas pipeline, US$550 million; building the liquefaction plant, US$1.1 billion. If the project goes ahead, it would result in the first LNG plant along the Pacific coast in South America.

Several experts have raised questions regarding the project. They state that there are not enough natural gas reserves in the country to serve the domestic market. Their recommendation is not to proceed to exports until certifying the discovery of new reserves. Also, export prices of natural gas agreed upon in the contract are lower than the selling prices for the domestic market.

Source: Data provided by the Ministry of Energy and Mines

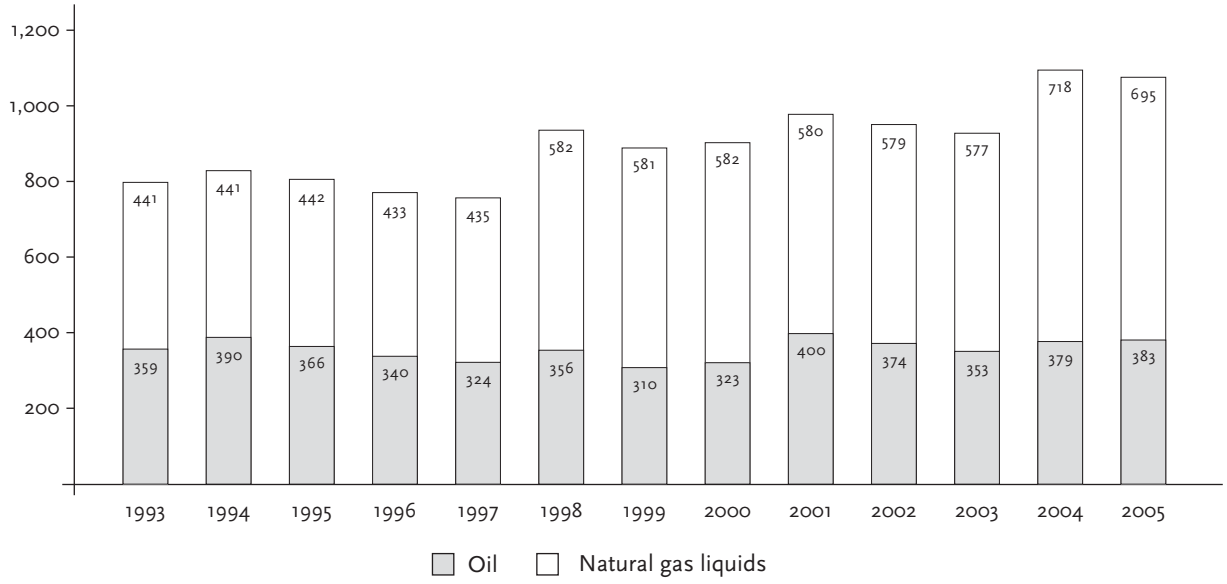
5. Reserves

In Peru, no significant oil discoveries have occurred since 1976, so proven reserves have remained stagnant: 358 MMB were recorded for 1993, increasing slightly to 383 MMB in 2005.

However, natural gas liquids reserves have increased in Camisea's fields (Blocks 88 and 56). Reserves increased to 695 MMB in 2005. More than 90% of natural gas liquids reserves come from Camisea I (Block 88) and II (Block 56) fields.

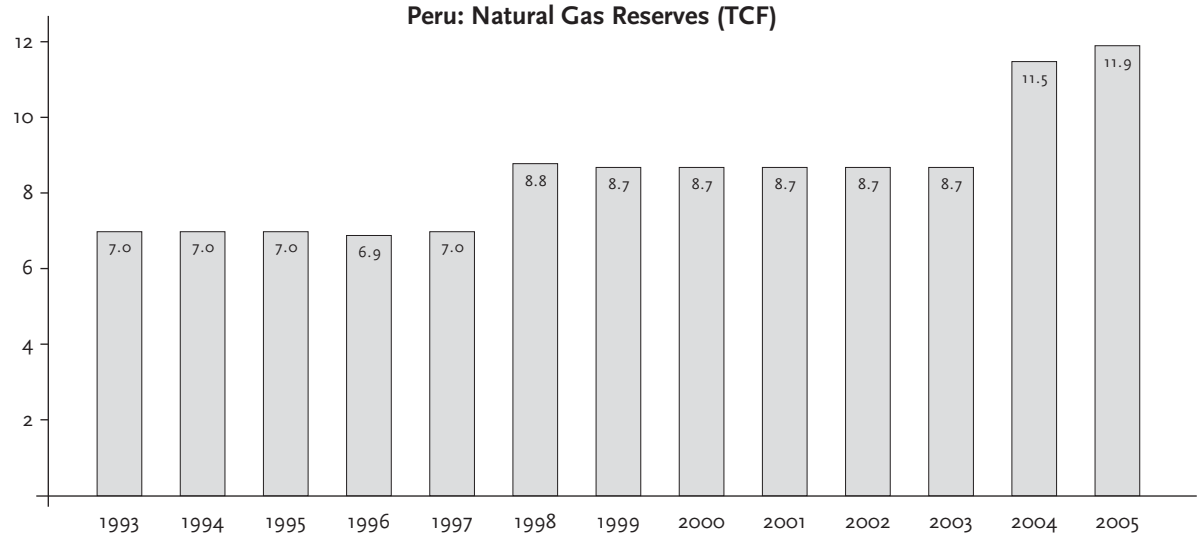
In total, oil and liquid natural gas reserves amounted to 1.01 billion barrels in 2005. Hence, natural gas liquids reserves double oil reserves.

Figure 23
Peru: Liquid Hydrocarbon Reserves (Million Barrels)



Source: Ministry of Energy and Mines.

Figure 24
Peru: Natural Gas Reserves (TCF)



Source: Ministry of Energy and Mines.

Natural gas reserves in Peru increased to 11.5 TCF in 2005. The Camisea fields located in the south jungle of Peru hold 94.6% of reserves.[38] One should keep in mind that Camisea's reserves come from two blocks: Block 88 (with the bulk of reserves and already in production) and Block 56 (getting ready for investment). The remaining reserves are found along the northern coast (3.3%) and central jungle (2.1%).

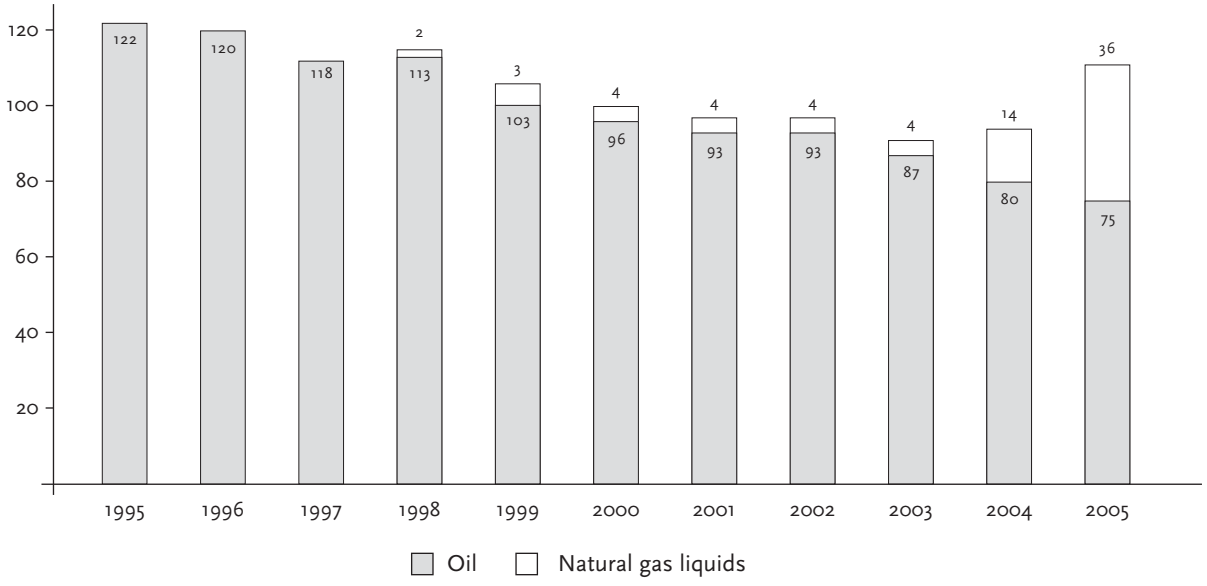
6. Production

Liquid hydrocarbon production has been declining since the 1990s, falling to 75 kbd in 2005. However, production in Camisea since 2004 (with 35 kbd of natural gas liquids) aided in the recovery, as described below.

Oil production has fallen since 1995, with 122 kbd (at that time, most liquid hydrocarbons consisted of oil). In 2005, production reached its lowest level with 75 kbd.

A positive trend began in 1998, when natural gas liquids production began in the Aguaytía fields (central jungle), though in small quantities (4 kbd in 2005). It was at this time that Camisea's natural gas liquids (Block 88) arrived in Lima, signalling a significant increase in production (33 kbd in 2005). In total, the 2005 production of natural gas liquids came to 36 kbd.

Figure 25
Peru: Liquid Hydrocarbon Production (Thousands of Barrels per Day)



Source: Ministry of Energy and Mines.

In Peru, the main producers of liquid hydrocarbons are Blocks 8 and 1AB (in the Peruvian northern jungle), with 41% of total production (see Table 31). Both blocks are operated by PLUSPETROL together with other companies (see Box 12). Along the North coast, PETROBRÁS and PETROTECH produce 11% and 10%, respectively. The state-owned Chinese company, Sapet, has a 3% share in oil production.

With respect to total liquid hydrocarbon production in Peru, the weight of natural gas liquids production has increased in the past years, amounting to 32%. Block 88's production represented 29%, and Maple's share stands at 3%.

Table 31
Peru: Liquid Hydrocarbon Production by Company (Thousands of Barrels per Day)

OIL	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 (%)
Block 1AB-PLUSPETROL (1)	52	50	48	40	37	35	37	36	32	25.0
Block 8-PLUSPETROL (2)	26	27	28	27	26	25	25	21	19	16.0
Block X-PETROBRÁS (2)	14	14	13	13	12	12	11	12	11	11.0
PETROTECH	18	17	16	14	13	13	12	12	11	10.0
Sapet-China (2)	3	5	4	4	4	4	3	3	4	3.0
Other	7	5	4	4	4	3	3	3	3	3.0
Oil Subtotal	**120**	**118**	**103**	**103**	**96**	**93**	**93**	**87**	**80**	**68.0**
NATURAL GAS LIQUIDS (NGL)										
PLUSPETROL-Block 88	0	0	0	0	0	0	0	0	10	29.0
Maple-Aguaytía	0	0	2	3	4	4	4	4	4	3.0
NGL Subtotal	0	0	2	3	4	4	4	4	14	32.0
Total	**120**	**118**	**116**	**106**	**99**	**97**	**97**	**91**	**94**	**100.0**

Source: Ministry of Energy and Mines.
Notes: (1) Until 2000, Block 1AB belonged to Occidental. (2) Until 1996, it belonged to PETROPERÚ.

Box 12
PLUSPETROL's Presence in Peru

The Argentinean PLUSPETROL arrived in Peru in 1996. Since then, it has become one of the main agents in the country's hydrocarbon exploration and exploitation sector (upstream).

In 1996, PLUSPETROL acquired Block 8 from PETROPERÚ (northern jungle) during the privatization process. In the consortium operating Block 8, PLUSPETROL acts as operator and holds a 33% share. The state-owned Chinese company Petroleum Corporation International Ltd. holds a 27% share, in addition to three Korean companies: Korea Petroleum Development Corporation with 20%, Daewoo Corporation with 11.67% and Yukong Limited with 8.33%.

In 2000, PLUSPETROL purchased from Occidental 100% of Block 1AB (also located in the northern jungle). In 2004, PLUSPETROL retained 55% of stock after having sold 45% to the Chinese Petroleum Corporation (CNPC) .International ANDES Ltd. PLUSPETROL operates Block 1AB.

These two blocks account for 59% and 41% of oil production and LNG production, respectively.

In February 2000, a consortium headed by PLUSPETROL won the bidding procedure for Block 88 (Camisea). Pluspetrol operates this block with a 27.2% share. Other members of the consortium are Hunt Oil (United States, 25.2%), SK (South Korea, 17.6%), Sonatrach (Algeria, 10%), Tecpetrol (Argentina, 10%) and Repsol (Spain, 10%).

Box 12 (*continued*)
PLUSPETROL's Presence in Peru

Block 88 accounts for 53% of natural gas production in Peru.

In 2005, a consortium was formed to exploit gas and LNG in Block 56 (adjacent to Camisea), to start up in 2007. This consortium, operated by PLUSPETROL, has the same shareholding structure as the consortium operating Block 88.

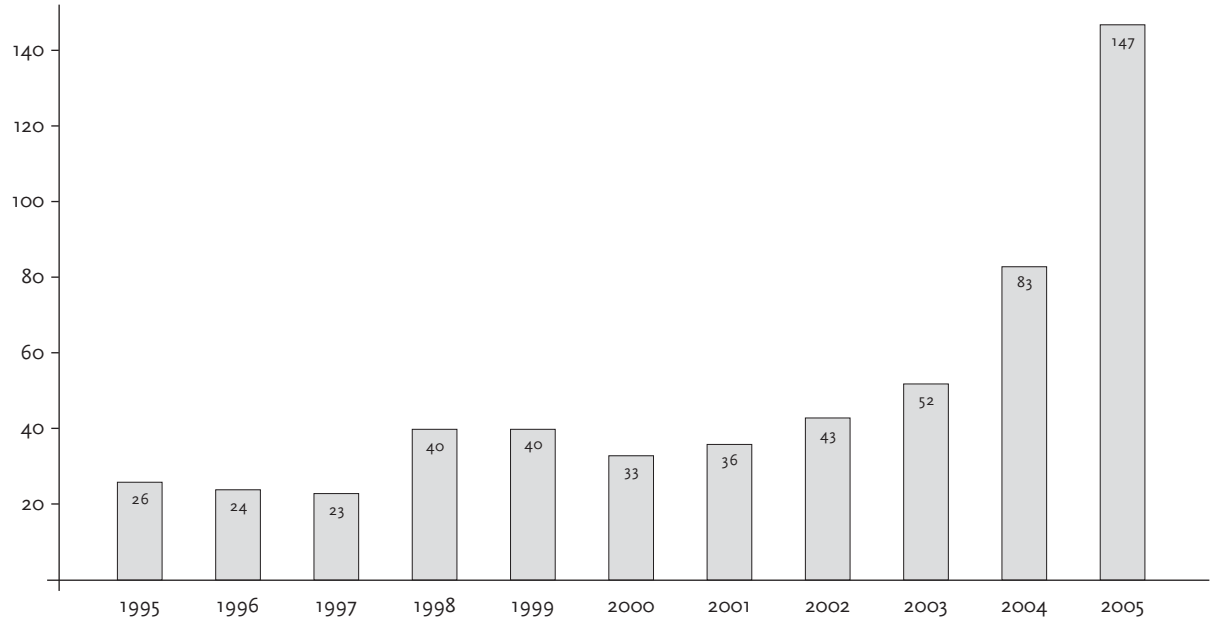
PLUSPETROL also participates in the consortium Transportadora de Gas del Perú (TGP), which built the natural gas and natural gas liquids pipelines from Camisea to the Peruvian coast. The Argentinean Tecgas operates these pipelines with a 23.6% share, followed by SONATRACH with 21.2%. Next are PLUSPETROL and Hunt Oil, with 12.4% shares each. Other participating companies are SK (11.2%), Repsol (10%), Tractebel (8%) and the Peruvian Graña y Montero with 1.2%.

Source: Ministry of Energy and Mines and several press articles.

Natural gas production has exhibited an exponential growth, particularly in the past two years (see Figure 26). From 1995 to 2005, the average annual growth rate was 23%. Nevertheless, when Camisea started its gas production (in August 2004), the growth rate increased to 67% in 2004 and 76% in 2005.

In 2005, production reached 147 MMCFPD, a record high for Peru.[39] Production levels are expected to rise in the future, since the domestic market is growing and export commitments from Block 56 have been signed with Mexico.

Figure 26
Peru: Natural Gas Production (Million Cubic Feet per Day)



Source: Ministry of Energy and Mines.

The largest natural gas production comes from Block 88, owned by the consortium led by PLUSPETROL (see Box 12). In 2005, its share in domestic natural gas production was 53.1%; higher increments are expected in the future.

The second largest producer is Aguaytia, located in the central jungle. It is followed by Petrotech, which produces 6.9% across the continental shelf in the North. PETROBRÁS ranks fourth with 6.8% along the northern coast.

Table 32
Peru: Natural Gas Production by Company (Million Cubic Feet per Day)

	2000	2001	2002	2003	2004	2005	Structure 2005
PLUSPETROL	0	0	0	0	19	78	53.1
Aguaytia	9	15	24	27	36	42	28.4
PETROTECH	14	9	8	10	11	10	6.9
PETROBRÁS	7	8	6	7	8	10	6.8
Sapet	3	3	3	4	4	3	2.2
GMP	0	0	0	1	2	3	1.8
Other	0	0	1	2	2	1	0.8
Total	**33**	**36**	**43**	**51**	**83**	**147**	**100.0**

Source: Ministry of Energy and Mines.

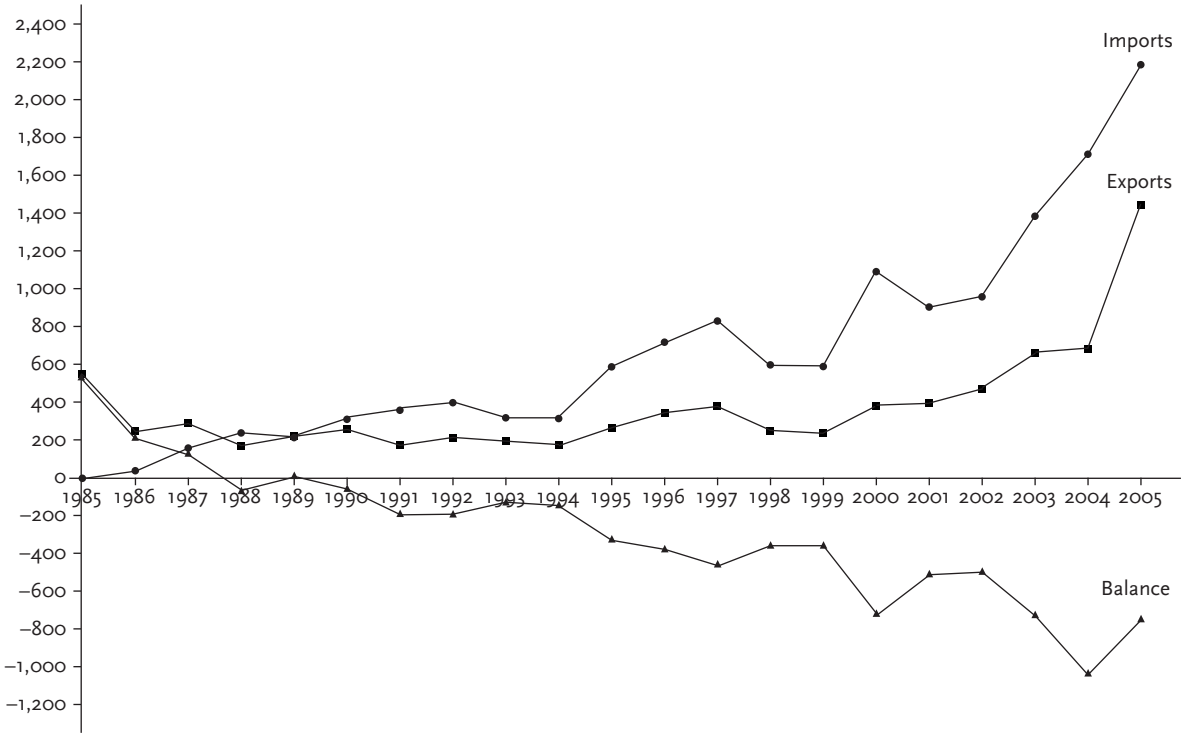
7. Oil Trade Balance

Peru has been a net oil importer since the end of the 1980s. This status was reinforced in recent years, since no new oil discoveries have taken place (see Figure 27). From 2000 to 2005, oil imports added up to US$8.253 billion.

In 2005, the oil trade balance deficit reached US$742 million. Subsequently, the economy suffered the negative impact of sharp rises in oil prices.

Main imports consist of light crude oil, diesel 2 and kerosene, highly priced in the international market. Heavy crude oil and industrial petroleum (residuals) are exported at low international prices. In 2005, imports' prices were 20% higher than exports'.

Figure 27
Peru: Oil Trade Balance (US$ Millions)



Source: Ministry of Energy and Mines.

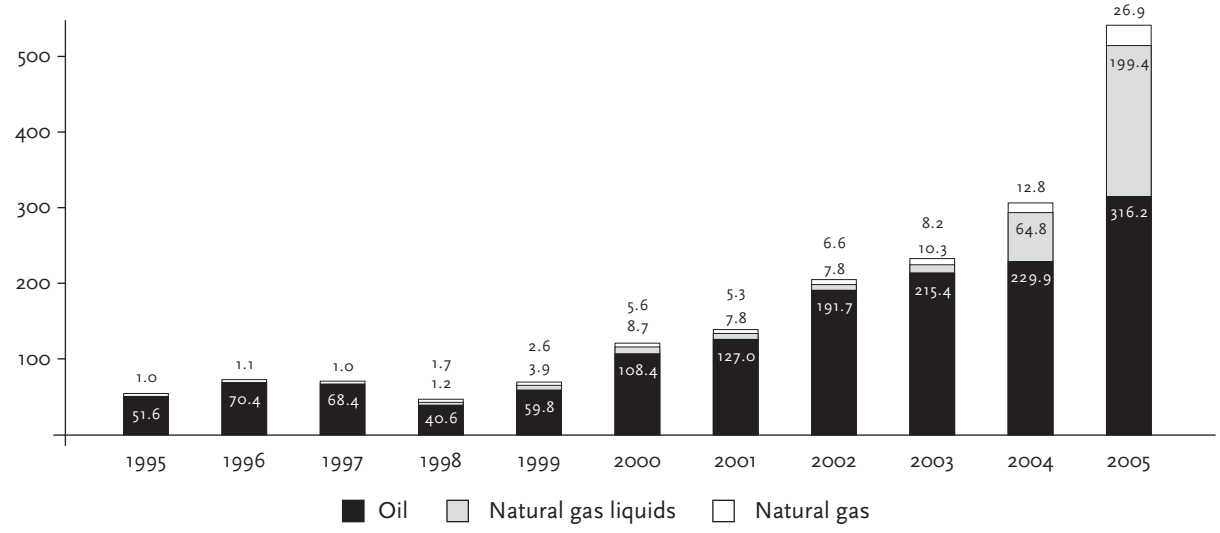
8. Royalties Collection

Peruvian legislation decrees that contractors must pay royalties to the state. The royalty is estimated based on the R Factor. Royalties are negotiated for each agreement. On average, royalties range from 20% to 25% of gross production value.

Despite reduced oil production, royalties collection has increased due to the rise in international oil prices and the new natural gas liquids production coming from Camisea's gas (Block 88). In 2005, total royalties for hydrocarbons amounted to US$543 million. Royalties on oil exploitation increased from US$52 million in 1995 to US$316 million in 2005, with a 25% average annual growth rate. However, the share of oil royalties in total collection fell from 98% in 1995 to 58% in 2005 due to the promotion of LNG and, to a lesser extent, natural gas.

Royalties on natural gas liquids amounted to US$199 million in 2005, a 208% increase with respect to 2004, when revenues totalled US$65 million. Its share went from 3% in 1998 to 37% in 2005. It is worth noting that most royalties come from Camisea's Block 88 (Cusco). A small portion corresponds to Block 31-C (Ucayali.)

Figure 28
Peru: Royalties Collection in the Hydrocarbon Sector (US$ Millions)



Source: Ministry of Energy and Mines.

Table 33
Peru: Royalties for Hydrocarbons (US$ Million)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2005 (%)
Oil	70	68	41	60	108	127	192	215	230	316	58
Natural Gas Liquids	0	0	1	4	9	8	8	10	65	199	37
Block 88	0	0	0	0	0	0	0	0	50	177	33
Natural Gas	1	1	2	3	6	5	7	8	13	27	5
Total Country	71	69	43	66	123	140	206	234	308	543	100

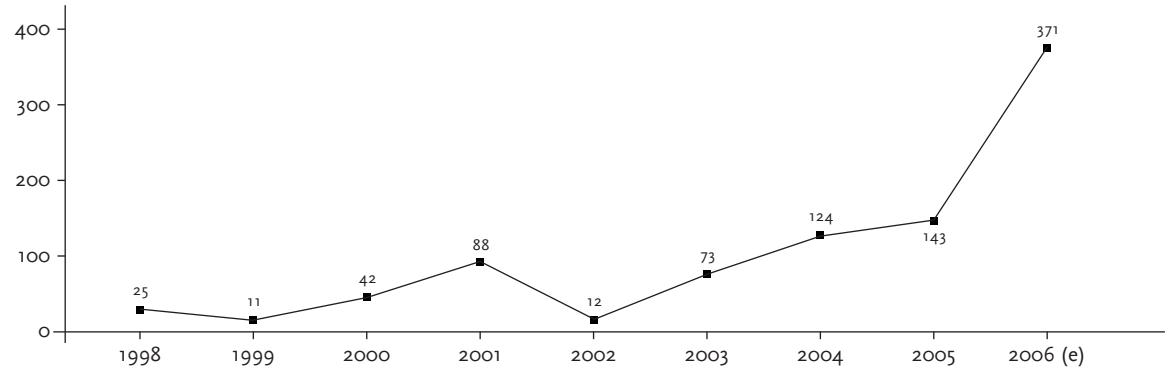
Source: Ministry of Energy and Mines.

Likewise, royalties were also paid on account of natural gas exploitation, although in smaller proportions than liquid hydrocarbons. The latter went from US$1 million in 1995 to US$27 million in 2005. Its share in total royalty payments is less than 5% for all years. Natural gas royalties come mainly from Block 88 and, to a lesser extent, from Block 31-C.

Tax Collection for Income Taxes

According to the official data provided by the *Superintendencia Nacional de Administración Tributaria* (SUNAT) or National Tax Superintendency, income tax payments for the hydrocarbon sector have increased from US$25 million in 1998 to an estimated US$371 million in 2006, which implies an annual average growth rate exceeding 100%. This increment is due to rising oil prices in the international market and to production start-up of Camisea's Block 88.

Figure 29
Peru: Income Tax and Oil Companies' Adjustment (US$ Millions)



Source: SUNAT—National Tax Superintendency.

It is worth noting that the largest amount of taxes collected comes from royalties, 74% on average with respect to total collection for the years 1998 to 2006, with the remaining 26% coming from income taxes.

With respect to total income tax collection, the hydrocarbon sector has a less than 6% share. However, within non-taxed fiscal revenues, the royalties for the hydrocarbon sector with respect to total non-taxed income have increased their share substantially, from 4% in 1998 to 43% in 2006.

Table 34
Income Tax and Royalties Collection for the Hydrocarbon Sector (US$ Billions)

	1998	1999	2000	2001	2002	2003	2004	2005	2006 (e)
Total Current Tax Revenues	9.032	7.495	7.915	8.245	8.202	8.990	10.463	12.418	16.032
1. Tax revenues	7.981	6.492	6.505	6.726	6.900	7.864	9.191	10.777	13.856
Income Tax (a)	2.021	1.492	1.466	1.609	1.717	2.278	2.655	3,390	5.774
Income Tax Hydrocarbons (b)	0.025	0.011	0.042	0.088	0.012	0.073	0.124	0.143	0.371
Hydrocarbon Share (%) (b/a)	1.0	1.0	3.0	5.0	1.0	3.0	5.0	4.0	6.0
2. Non-tax Revenues (c)	1.052	1.003	1.410	1.519	1.302	1.127	1.272	1.641	2.176
Hydrocarbon Royalties (d)	0.043	0.066	0.123	0.140	0.206	0.234	0.308	0.543	0.933
Hydrocarbon Share (%) (d/c)	4.0	7.0	9.0	9.0	16.0	21.0	24.0	33.0	43.0

Source: Ministry of Energy and Mines, Sunat, Mef and BCRP.

Endnotes

1 Even if the law did not envision specific contractual alterations, once D-L 2310 of 1974 had been revoked, it made any contract arrangement possible (including the concession abolished by D-L 2310).

2 Thus, after 52 years as a state-owned industrial and commercial enterprise, its organizational structure was altered in 2003, when it became a public limited company focused exclusively on the discovery, production, transport, storage and marketing of hydrocarbons.

3 "Similarly, we expect not only economic gains, but also greater transparency, fairness, stable policies, which are all positive signs for the sector's investors and for the state as well, since it implies higher efficiency for its companies. Thanks to these increasingly independent agreements, restrictions hindering the implementation of more aggressive exploration programs aimed at drilling wells would be mitigated." (World Bank, ESMAP, "Comparative study on the distribution of oil rents in Bolivia, Colombia, Ecuador and Peru", 2005.)

4 Nevertheless, when considering only the exploration and production investment categories, FDI was higher than ECOPETROL's investment, as analyzed later on.

5 Interview with PETROECUADOR's Chairman, Luis Román, Diario El Comercio, Quito (01/10/2006).

6 Data from the Ecuadorian Ministry of Mines and Energy.

7 This new contract arrangement is independent from the service provision contracts.

8 According to the World Bank (2002): Oil Policy Note. Most private investment in the exploration and promotion of new reserves takes place under joint venture agreements. This arrangement was introduced by the 1993 Hydrocarbons Law, allowing for contracts whereby the private company assumed all risks, investment and costs, sharing production with the state in 75% and 25%, respectively. In 1993, contracts for marginal fields were also adopted following the joint venture model though allowing private companies to access reserves discovered in small fields (less than 1% of domestic production.) In 1998, the previous administration tried to introduce joint venture agreements to allow partnerships between Petroproducción and private companies operating large fields. Although this initiative was supported by the National Congress, its initial economic conditions were altered, and it was later deemed partly unconstitutional and therefore non-applicable" (page 2).

9 The Law's main purpose was the dollarisation of Ecuadorian economy.

10 For a detailed analysis on the subject, see: "Reformas e Inversión en la industria de hidrocarburos de América Latina," Natural Resources and Infrastructure Series, No. 78, ECLAC, Santiago de Chile.

[11] FEIREP was created in June 2002. FEIREP receives 45% of the funds collected by FEP. An international markets trust operator is in charge of its management. The fund is mainly comprised of the following assets: a) state revenues originating in the crude oil transported via the crude oil pipeline (COP) and not resulting from a decreased use of light oil by SOTE; b) the central government's budgetary surpluses; c) 45% of funds collected by the Oil Stabilization Fund. On the other hand, FEIREP's allocations are as follows: a) 70% for foreign public debt buyback at market value and for debt write-off with the Ecuadorian Social Security Institute (*Instituto Ecuatoriano de Seguridad Social*, IESS); b) 20% to stabilize oil revenues until reaching 2.5% of the GDP and to tend to legally declared emergencies; c) 10% to promote human development through education and health.

[12] PETROECUADOR's main role is to "undertake the activities specified under the Hydrocarbons Law at all stages of the oil industry, always striving to optimize the use of hydrocarbons belonging to the state's inalienable and imprescriptible property and to promote the country's economic and social development" (PETROECUADOR's Foundational Law, Art. 2).

[13] PETROECUADOR's Financial Situation (2006): Ministry of Energy and Mines; PETROECUADOR.

[14] It should be added that investment by PETROECUADOR in operational partnerships amounts to 25 million dollars.

[15] Established under Executive Decree No. 1215.

[16] See *Reformas e Inversión*, op cit, pp. 64–65.

[17] These companies argued that they had invested substantial amounts of money in the exploration and development of oil blocks, their investment exceeding 2 billion dollars. For its part, the state was forced to reduce production in view of the insufficient transport capabilities, resulting in economic losses for oil investment and state revenues. According to these companies, the situation forced them to tone down or suspend their exploratory plans, since production to date was limited by the lack of a pipeline capable of evacuating their oil.

[18] This transaction did not receive the essential and unavoidable previous authorization by the Ministry of Energy, as specified in point 11, Article 74 of the Hydrocarbons Law: "The Ministry may declare the expiration of contracts whenever contractors:...11 transfer rights or hold private contracts or agreements aimed at leasing one or more rights without the Ministry's authorization."

[19] Full text of Article 2 reads as follows: Art. 2. "Following article 55, the present is added: State Participation in oil selling prices surpluses not agreed upon or foreseen. Contractors currently under partnership agreements for the exploration and exploitation of hydrocarbons with the Ecuadorian state and in compliance with this Law, notwithstanding their corresponding share in the volume of crude oil produced, whenever the average monthly effective FOB selling price of Ecuadorian oil exceeds the average monthly price prevailing on the date of signature of contracts, expressed in constant values for the settlement month, shall acknowledge at least a 50% share in extraordinary revenues generated by price differences on behalf of the Ecuadorian state. For the purposes of the present article, extraordinary revenues shall be defined as the price difference described above times the number of barrels produced."

[20] It is worth mentioning that the government has on several occasions infringed the agreed-upon "path of price." For instance, in 2006 compressed natural gas (CNG) prices were frozen. On the other hand,

legislation in force establishes that oil prices are free, though informal agreements exist with companies both in terms of wellhead prices and retail distribution.

21 "ENARSA is thus created, its purpose being to undertake, either on its own, through third parties or in partnership with third parties, the study, exploration and exploitation of solid, liquid and/or gaseous hydrocarbons; the transportation, storage, distribution, marketing and processing of these products and their direct or indirect by-products, as well as the provision of public transportation services and distribution of natural gas. It is therefore entitled to manufacture, process, refine, purchase, sell, exchange, import or export such products, and to perform any other operations complementary to its industrial or commercial activity or necessary to fulfill its purpose. Furthermore, the Company, either on its own, through third parties or in partnership with third parties, will generate, transport, distribute and trade electric power. The Company may perform all commercial activities linked to energy assets and promote any activities related to its purpose both in the country and abroad." (Law 25.943, Art.1)

22 According to its Annual Memoranda, Repsol recorded investment amounts in Argentina of €15,243 and €2,209 million in 1999 and 2000, respectively. The figures in euros have been converted to dollars at the average exchange rate for the corresponding years.

23 Concerning exploration, the company has reported 2004 and 2005 investment amounts totaling US$169 million. It plans to invest US$80 to 100 million per year in the following five years, Repsol, Press Release 12/14/2005. www.repsolypf.com/esp/todosobrerepsolypf/saladeprensa/noticias/ultimasnoticias/noticias.asp?PaginaID=117914.

24 See the Plan Argentina's web portal, http://energia.mecon.gov.ar/inversiones/planargentina.htm.

25 Newspaper *El Cronista*, Buenos Aires, 02/27/2006.

26 For a detailed analysis of Law 1689 of 1996 and its implications, see "Reformas e Inversión en la industria de hidrocarburos de América Latina," Natural Resources and Infrastructure Series No. 78, ECLAL, Santiago, 2004.

27 In March 1994, the government enacted the Law of Capitalization (*Ley de Capitalización*), which prescribes the transformation of state-owned companies, among them YPFB, into semi-public companies. Capitalization requires that strategic investors contribute 100% of the company's market value in the form of investment, thus obtaining new stock equivalent to 50% of the new company's total capital. The remaining 50% of shares belong to Bolivia's pension funds.

28 The decree's legal foundation is Article 4 of Bolivia's political constitution, as well as subsection a), paragraph 1, Article 23 of the San José de Costa Rica Agreement (*Pacto de San José de Costa Rica*), which establishes mechanisms for citizens' participation in government decisions.

29 The results were obtained from 2,678,518 votes representing 62.1% of the population entitled to vote.

30 This deadline was finally extended.

31 With respect to IDH distribution, 4% shall be designated for producing departments and 2% to non-producing departments; in addition, in those cases where a producing department receives less revenues than a non-producing one, the government shall compensate the former by transferring the funds necessary to equal the latter's revenues. The remaining IDH shall be assigned by the Executive Branch

on behalf of the TNG, indigenous peoples, rural communities, municipalities, universities, armed forces, national police corps and others (article 57 of Law 3058).

32 For the 1997–2000 no disaggregated data were available for companies' investment.

33 Repsol, Press Release, 10/29/2006 (www.repsolypf.com).

34 "PETROBRÁS fecha acordo para ficar na Bolivia", 10/29/2006, www1.folha.uol.com.br/folha/bbc/ult272u58157.shtml.

35 For a more detailed account on these reforms, see Campodónico, Humberto: "Privatización y conflictos regulatorios: en el caso de los mercados de electricidad y combustibles en el Perú," ECLAC, Natural Resources and Infrastructures Series No. 8, Santiago, 2000.

36 In the downstream sector, PETROPERÚ owned all oil refineries. PETROPERÚ and private companies participated in wholesale and retail marketing activities.

37 For a more detailed analysis of privatization in Peru, see Campodónico, Humberto (2004), Reformas e Inversión en la industria de hidrocarburos de América Latina, Natural Resources and Infrastructures Series No. 78, ECLAC, Santiago.

38 It is worth mentioning that Camisea's reserves come from two blocks: Block 88 (with the bulk of reserves and already in operation) and Block 56 (in the investment stage).

39 However, when compared to other countries in the region, production remains small.

40 See "Bonos Titulizados Hunt Oil," Apoyo y Asociados, Fitch Ratings, May 2006, pp. 7 and 12, www.aai.com.pe.

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Annex

1. Camisea's Block 88 Development

Exploitation, transport and distribution agreements for Camisea's Block 88 were signed at the end of the year 2000. Proven reserves for Block 88 amount to 8.12 TCF.

Its development was a key strategic option in energy policy, since it would allow for increasing significantly natural gas and condensate production, as well as modifying energy production and consumption patterns. The use of natural gas in thermal power stations, industry, transportation and residential consumption will have a replacement effect which in turn should aid in decreasing the deficit of the oil trade balance, thus reinforcing liquid production and export.

Block 88 consists of two fields, San Martín and Cashiriari (located in the Amazonian Jungle), discovered by Shell in 1984. In 1987–88, Shell negotiated an operating agreement with the government, which did not succeed due to a series of disagreements, some political in nature.

Eight years later, negotiations resumed and in May 1996 the Peruvian government entered a contract with the Shell/Mobil consortium to promote this field. In order to materialize investment, the Peruvian government granted Shell/Mobil a series of incentives through Decree 818, which facilitated an increase in the project's profitability (early refund of the General Tax on Sales, tariff payment by instalments, etc.)

The consortium operated proven natural gas reserves totalling 8.12 TCF and 600 MMB of liquids. However, in July 1998, the consortium announced it would not go ahead with the project, and subsequently the contract was terminated. This was due to several reasons: the absence of a natural gas market in Peru, which raised the need to create the conditions that would favor its development; differences between the government and the consortium over natural gas prices for electric power production; the project's vertical integration (exploitation, transport and distribution) advocated by the consortium and not envisioned by the project, and thus rejected by the government; and the consortium's proposal to export natural gas to Brazil, not contained in the project.

Therefore, the government once again had to call for tenders. In February 2000, the consortium formed by Pluspetrol (Argentina, 40%), Hunt Oil (United States, 40%) and SK Corporation (South Korea, 20%), was awarded the field's exploitation for a 40-year duration in exchange for an initial investment of US$400 million, plus an estimated total investment of US$1.6 billion.

FDI in development and exploitation of Camisea's Block 88 added up to US$1.72 billion. The investment may be disaggregated as follows: US$800 million for the field's development and exploitation (including the

fractionation plant at Paracas). Additionally, US$800 million will go to gas and liquid pipelines, and US$70 million to distribution in Lima.[40]

Pluspetrol executives estimate that the Peruvian state will receive approximately US$1.9 billion in taxes and US$3.5 billion in royalties.

In October 2000, natural gas and by-products transport and distribution was awarded to the Transportadora de Gas del Perú (TGP) consortium, headed by the Argentinean company TECHINT. Aside from TECHINT, which has a 30% share, SONATRACH (Algeria, 10%), Graña y Montero (Peru, 12%), SK Corporation (9.6%), Hunt Oil (19.2%) and Pluspetrol (19.2%) make up the consortium. TGP offered an investment amount of US$1.45 billion for a 33-year contract.

In May 2002, Tractebel (part of the French Grupo Suez), was awarded the project to manage natural gas distribution in the city of Lima. Subsequently, Gas Natural de Lima y Callao (GNLC) was constituted and renamed as Cálidda. Tractebel's investment amounts to US$200 million. Camisea's gas arrived in Lima in August 2004.

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