# *Peru*
# *Reform and Privatization in the Hydrocarbon Sector*

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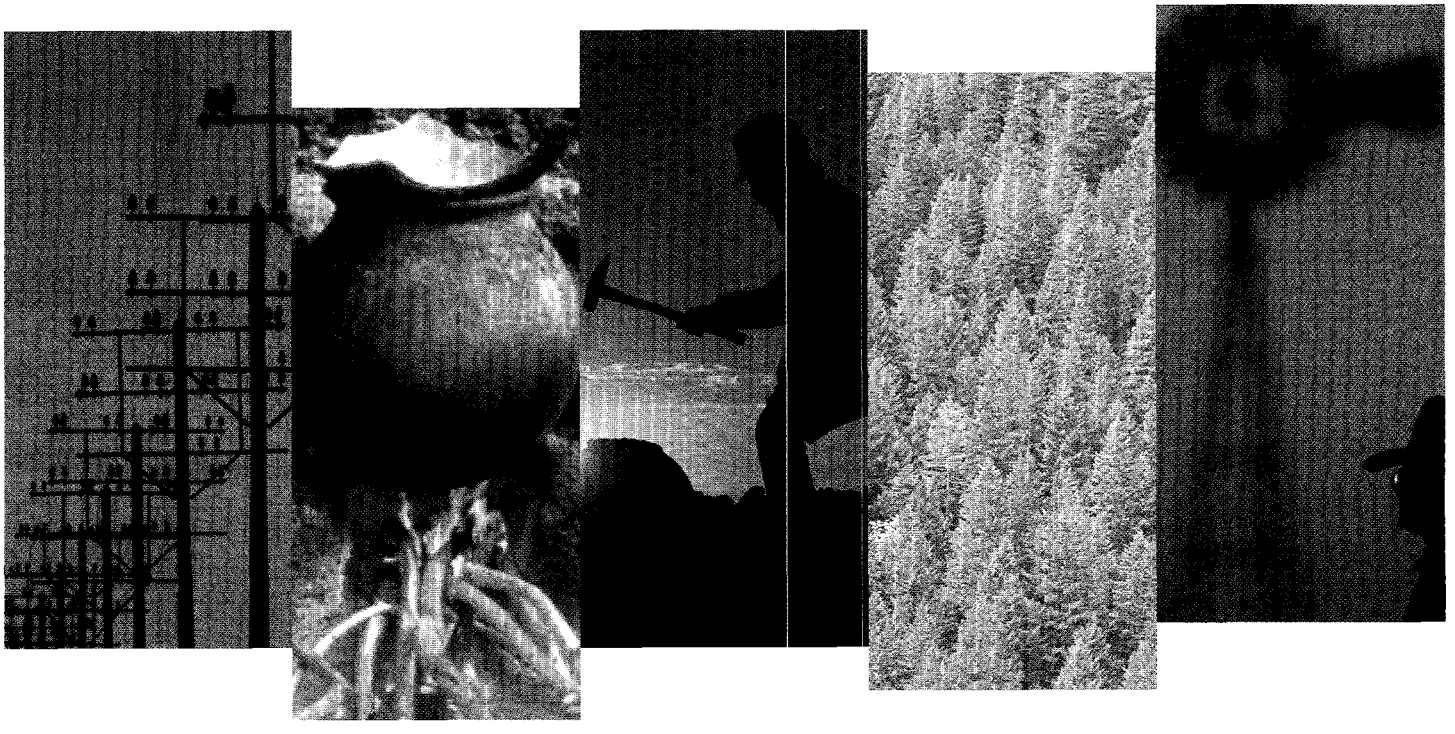

Energy

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JOINT UNDP / WORLD BANK

# ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAMME (ESMAP)

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# Peru: Reform and Privatization in the Hydrocarbon Sector

## July 1999

Joint UNDP/World Bank Energy Sector Management Programme
(ESMAP)

(Documento Disponible en Español, Ref. N° 216/99SP)

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# Foreword

This study on the Reform and Privatization process in the hydrocarbon sector in Peru was conducted by Eleodoro Mayorga Alba, Senior Petroleum Economist with the Oil and Gas Division of the Energy, Mining and Telecommunications Department of the World Bank and Pedro Touzet Gianello, General Director for Hydrocarbons of the Ministry of Energy and Mines of Peru.

Although this study was not formally conducted as part of the work program of ESMAP, the topics it focuses on are of direct relevance to ESMAP's mandate and might be useful to policy makers and practitioners in both developing and developed countries. This is why this study is published as part of the ESMAP series of reports as we thought it may usefully contribute to the debate on energy sector reform and the privatization process.

# Introduction

The transformation of the Peruvian hydrocarbon sector, including the privatization of Petroperu, is one of the most radical reform processes that have taken place in the Latin American transition towards open market economies. The change from a monopolistic, state-controlled industry to a dynamic, competitive, and private sector driven industry, deserves a careful analysis. This note provides a review of the Peruvian experience, aiming at extracting practical lessons that could be useful to other countries willing to enter a similar reform process, for evaluating options and preparing policy decisions in a more efficient and comprehensive manner.

The first part (Chapters 1 and 2) presents the global, regional and local settings upon which the sector reform was started in 1990, and discusses the overall macro economic policy put in place by the Fujimori administration.

The second part (Chapter 3, 4, 5 and 6) deals with the efforts made to create an enabling environment, in particular the implementation of a new legal, contractual and regulatory framework, the introduction of a viable pricing and taxation regime, and the establishment of a new institutional set up for the hydrocarbon sector. It presents the analysis of possible industry structures and of critical policy decisions required to create a competitive market conditions for each activity of the oil and gas industry.

The third part (Chapter 7 and 10) reviews the privatization methods that were chosen for passing the different upstream and downstream assets of Petroperu to private operation, paying special attention to measures decided upon to manage the process in a transparent, efficient and politically acceptable manner.

Specific chapters are dedicated to the implementation of environmental and social regulations (Chapter 9), the negotiation of the Camisea project, intended to develop the larger hydrocarbon resources of the country (Chapter 8), and the resulting medium term sector outlook (Chapter 11). Finally, an attempt is made to derive conclusions and recommendations and to single out the pending steps (Chapter 12). Although the Peruvian Government can proudly show the initial results of the sector reform, there are still critical decisions that need to be made to ensure its long-term sustainability.

This note has been prepared within the framework of activities undertaken by the Oil and Gas Thematic Group of the World Bank. Few theoretical documents were consulted. Most of the material consulted were documents prepared for policy decisions and direct interviews from key actors in the process. The key purpose is to illustrate actual situations, available options and the final considerations applied.

The main authors are: Eleodoro Mayorga Alba (EMTOG) and Pedro Touzett (currently Director General de Hidrocarburos). Chakib Khelil, Robert Bacon, Oscar

Arrieta, Masami Kojima and Charles McPherson provided valuable insights and comments to improve earlier drafts.

# 1

# The Setting

## Global

1.1 The last twenty years have brought significant changes to the global economy. The end of cold war tensions and the expansion of liberal macro-economic models have together allowed a rapid development of international trade. The resulting "globalization" has force the developing countries to modernize their economies and enter into competition for attracting a larger share of a growing flow of private capital which has been substituting for multilateral credit to the public sector as the key financial resources for the required capital investments.

1.2 Another important change is the growing environmental awareness. Currently, it is no longer acceptable to obtain profits from the exploitation of natural resources without considering the medium and long-term environmental costs. The rapid urbanization and the growth of transport needs have created a serious environmental challenge in the congested cities of the developing countries. The evidence that relates the global warming with the emissions of carbon dioxide and other greenhouse gases has prompted the need for a concerted international action.

1.3 At the same time, the oil market has experienced an important evolution. The projected long-term scarcity, which dominated the debates of the early 70's, has disappeared. Supply capacity is nowadays expected to remain more abundant than current and projected consumption. Consequently, prices are no longer controlled by the OPEC cartel, but the outcome of sophisticated open market transactions. In general, technological progress has brought lower exploration and production costs, facilitated rapid communications and allowed access to more environmentally sensible frontier areas. It is also helping to respond effectively to the need for better quality fuels.

## Regional

1.4 In the face of a changing world economy, the majority of Latin American countries have been able to emerge from the depressed "lost" decade of the 80's and enter a new cycle of economic growth during the early 90's. The end of import-substitution macro-economic strategies and of state planning has given birth to rather open market economies. The vulnerability of the regional economies and the lack of institutional stability which were serious deterrents of private investments have evolved, prompting the emergence of more transparent market environments, conducive to greater private sector participation. Although some difficulties have appeared during the late 90's, the slow down in growth has not changed the basic macroeconomic policies, which continue oriented towards liberal models.

1.5 In the majority of Latin American countries, there is now the strong belief that the state is no longer an efficient supplier of good and services, which should be mostly entrusted to the private sector. There is also significant progress on regional economic integration, based on free trade. The economic success of Chile and the stabilization of the Argentinean economy were among the factors that help the majority of Latin American governments to adopt liberal economic models and to begin attracting larger amounts of private capital.

## Local

1.6 Peru was among the last countries in the region to adapt to global and regional changes. After the military regime of the 60's and 70's, the Peruvian economy remained, for a very significant part, controlled by the state. A good number of public enterprises maintained monopolistic positions, and many local private enterprises operated under a protected regime. With the exception of the early 1980's when crude oil from the Amazonian Jungle started to be exported at favorable prices, economic growth was slow, lower than population growth. Signs of a strong recession had already emerged by 1983-84 at the end of the populist regime of President Belaunde.

1.7 During the Garcia Government (1985–1990) the economic situation deteriorated further; real wages dropped by nearly 50 percent because of erroneous expansive policies, overwhelming state intervention, price controls and lack of productive investments. Such policies left the Peruvian economy in a difficult situation; there was a process of hyperinflation with a 7400% index for 1990 and a significant accumulated drop in GDP/per capita. Due to the Government's refusal to comply with the foreign debt service, Peru was outside the international monetary system. Moreover, its legal framework and economic and financial policies, together with terrorism, were strong deterrents to private investors.

1.8 The negative impact of such economic policies was felt particularly in the hydrocarbon sector. Petroperu, the state monopoly responsible for the supply of the domestic market accumulated losses during the late 80's that reached US$ 2.5 billion, including long and short term debts, deferred equipment maintenance and lost its credit rating and the confidence of the public. Investments in the sector were at historically low levels. Consequently, oil reserves diminished, causing a rapid decline of production and a corresponding increase of crude oil and products imports (mainly diesel). Similarly, a large electricity deficit was projected to last several years because of lack of investments. With the failure of the 1987 initial negotiations for the development of the Camisea gas-condensate fields Peru ended the 1980's without a defined energy future.

## Petroperu Operations in 1990

1.9 In 1990, Petroperu was still a large integrated corporation. Its direct operations and four subsidiaries included the following items:

- Crude oil owned production from the old Talara Basin (onshore: 6,882,000 bbls; and offshore 7,783,000 bbls. carried out by a subsidiary Petromar) and in the Amazonian Jungle (Block #8 = 7,626,000 bbls and Block # 31 Central = 961,000 bbls). Petroperu produced approximately 49% of the national crude output.
- Other producers were private companies: Occidental, in Block 1-AB in the Amazonian Jungle (21,857,000 bbls), and the Consorcio OXY–Bridas, in the old onshore Talara Basin (2,183,000 bbls).
- Serpetro, a subsidiary in charge of contracting personal for the operation of the offshore platforms of Petromar.
- The Transandean pipeline that brings the production from Occidental Block 1-AB and Petroperu Block #8 to the Bayovar Terminal at the Pacific Coast. The main line has a length of 856 km (306 km of 24" diameter and 550 km of 36" diameter) and the north branch has a length of 253 km (16"). Storage capacity at Bayovar is 6 million barrels.
- Transoceanica, a subsidiary which was in charge of transporting crude oil and products between terminals in the Pacific coast.
- Six refineries with a total capacity of about 189 MBD; the two large ones with some conversion capacity (Talara and La Pampilla); Conchan dedicated mainly to the production of bitumen and asphalt; and three others (Iquitos, Pucallpa and Marsella, non operative) with small hydroskimming schemes serving local markets in the Jungle.
- A fertilizer, a solvent and carbon black plants of uneconomic size located in Talara and integrated to the Northwest Company operations.

- A lubricant plant and marketing operations of a local lubricant brand: Petrolube.
- Solgas, subsidiary responsible for bottling and distribution of LPG and for selling gas appliances.
- 23 distribution plants of different sizes, operated in an integrated way to ensure petroleum products supply to all parts of the country at the same price.
- Retail distribution: 85 gasoline stations operated directly by the company and 20 by private concessionaires.

1.10 In spite the financial crisis, Petroperu's personnel was confident on its capacity to rebuild the company, provided a reduction of Government controls and intervention and, in particular, provided an appropriate pricing policy. The technical capacity of the personnel was proven by the fact that it was able to continue delivering petroleum products throughout the country without any supply disruption, or significant industry accident, with extremely restricted financial resources. The management was convinced of the urgency of the reform, including the privatization of the company, after its necessary downsizing.

# 2

# The New Macro-Economic Policy: The Fuji-Shock and Its Follow-Up

## The Macro-Economic Adjustment

2.1 The new Administration, which took office in 1990, decided to undertake a "one-shock" adjustment, instead of a gradual approach, to change the difficult economic situation they had taken over. The election results had proved the complete mistrust that the Peruvians had in the traditional political parties. The Fujimori Government, without any significant political ties, was able to initiate a drastic structural adjustment.

2.2 Very rapidly key economic measures were decided. For instance, subsidies were abolished and all state-controlled prices, including food, energy and services were increased to economically viable levels: the gasoline price was multiplied in nominal values by 30 times. A strict monetary and fiscal discipline was implemented, including no exchange rate controls and an obligation among public institutions to pay each other for consumed goods and services. These measures balanced the government budget, and inflation was halted, at the cost of an immediate economic recession that has been difficult to overcome. Some attempts to mitigate the social impact were made but unemployment was a high cost, in particular for the low and middle class population strata.

2.3 The fiscal austerity, the recession, and the package of economic measures, allowed the public corporations, including Petroperu, to return to a precarious financial viability and gave time for them to plan their much needed reengineering. It was a common thought among managers of the large public corporations, seriously affected by the erroneous previous policies, that in spite of the recovery, *"The Mammoths they have administered might not survive the year 2000"*.

2.4 On the political front, Fujimori confirmed his holding of power: first, in April 1992, he closed Congress and via new elections, in spite of the recessive impact of the macro-economic shock, he obtained a new favorable Parliament. He also developed a sort of alliance with the military that has proved effective to combat terrorism. Fujimori's high popularity was demonstrated at his 1995 re-election.

2.5 Under these circumstances, the Peruvian political thinking evolved and conformed to the ideas of structural reform and a redefinition of the role of the State. The State was requested to remain the provider of social services: health, education, security; whereas all productive and commercial activities were to be transferred to the private sector. Market competition started to be seen as a better and more reliable way to set prices than any state entity.

2.6 Policy decisions to reform the hydrocarbon sector were planned as part of the overall economic policy in place. Oil was no longer considered "strategic" but a simple tradable commodity. Also, there was no need to keep a large public company entrusted with the petroleum supply of the nation. Private operators, competing in an open market, were considered able to achieve better results.

## The Short Term Restructuring of Petroperu

2.7 Under these circumstances, a short-term sectoral plan was implemented to start reducing Petroperu's monopoly, including measures such as:

- Correcting price distortions, while keeping the fiscal equilibrium, and achieving a minimal corporation financial viability;
- Reducing the political intervention on company matters, allowing for a more technical and economical decision making process;
- Closing financially loss making operations: fertilizers and petrochemicals;
- Reducing excess personnel: from more than 10,000 employees, Petroperu and its subsidiaries had only 6,000 employees in 1994;
- Doing minimal rehabilitation and delayed maintenance works;
- Delivering good signals to private investors, including:
  - the privatization of retail stations,
  - the negotiation of a small development project for investments up to US$ 250 million based on the known reserves of Aguaytia,
  - providing consistent solutions to inherited problems that contributed to the negative image of Peru, such as the difficult dispute case resulting from - *de facto* - expropriation of Belco Pertroleum Co., which was derived to AIG, and the remaining Japanese debt used for the financing of the Transandean Pipeline,
  - return to the international financial community: the IMF and the World Bank returned as key advisors.

2.8 The execution of this short term plan took place during 1991–1992, while ideas started to be better defined in relation to the future structure of the sector and to the precise concepts to be included in the new petroleum law and regulations.

# 3

# The New Legal and Contractual Framework

## The Principles of the New Sector Policy

3.1 It is on the basis of modern liberal market concepts that the Government of Peru (GoP) undertook the task of restructuring the hydrocarbon sector. To shape the macro-economic context and to attract much the investors to all sectors of the economy, a series of new general laws were introduced in 1991-1992. They were designed to allow a free movement of capitals, a gradual deregulation of prices, full currency convertibility, equitable treatment of foreign investors, simplification of tax procedures, etc.

3.2 A new law for the hydrocarbons sector was passed in mid-1993 to confirm the basic policy choices decided for the sector. Its main principles were complete opposite to the existing legal framework put in place by the nationalistic military regime of the 1960's. It should be recalled that the nationalization of the petroleum concessions of the Northwest in 1968, and the discovery of new reserves in the Amazonian Jungle during following years were politically presented as events at the center of the exercise of Peru's sovereign rights. Petroperu was to be recognized as the "*Símbolo de la Peruanidad*". The new policy principles chosen to shape the reformed sector are the following:

- Hydrocarbon resources in the ground belong to the state, but once extracted, belong to the producer;
- Free disposal of the hydrocarbons produced, and free import/export of crude oil and products;
- Prices to be set by supply/demand forces;
- End of Petroperu monopoly and free entrance of private companies to any activity of the oil/gas chain (upstream and downstream);
- Fiscal / exchange rate stability, US dollars accounting;
- Possibility for international arbitration;

- Modern regulations for industry operations and protection of the environment.

## The New Institutional Set Up

3.3 In addition, the legal framework defined a new institutional set-up:

- The Ministry of Energy and Mines (MEM) through the *Dirección General de Hidrocarburos* (DGH) defines the policy and set regulations where markets are not capable to perform at an efficient allocation of resources and to protect the environment;
- DGH was in charge of the supervision of the industry operations; a task now shifted to the responsibility of the newly created institution: *Organismo Supervisor de la Inversión en Energía* (OSINERG);
- Perupetro[1] is the new institution in charge of the administration of the resources, with a private legal status, that will enter in agreements with public and private companies willing to explore and produce hydrocarbons. A specific law was passed to set its functions, organization, freedom for contracting personnel, as well as its economic and financial autonomy.

## Upstream - Exploration and Development of Crude Oil Production

3.4 Before 1990, the production from areas operated by private companies was 24,040,000 bbls, about 51% of total production. Occidental production from the Block 1AB in the Jungle accounted for 21,857,000 bbls and the production of the Consorcio Oxy-Bridas accounted for 2,183,000 bbls. Exploration investments to find new reserves were limited to efforts by Mobil in the Huallaga Basin and development investments to maintain or increase oil production were at a historic low level.

3.5 There was a long list of issues on dispute kept by Occidental regarding tax stability and currency conversion, as well as a significant lack of definition regarding the environmental liabilities, in both Oxy and Oxy-Bridas operations in block 1AB in the Jungle and in the Northwest respectively.

3.6 Petroperu management was conscious of the need to improve the contractual framework and enter the regional competition for private capital. The experience gained on the negotiation of the *Acuerdo de Bases* with Shell for the exploitation of Camisea in 1986-1987 and with Mobil for the exploration of the Huallaga Basin in 1988 was extremely useful to understand deficiencies in the prevailing legal framework and to prepare a new contract model.

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[1] The name "Perupetro" was chosen as close as possible to "Petroperu", the national oil company, to avoid early critics on the privatization while purposely maintains the low profile of the reform

3.7 The new law included terms to improve the Exploration & Production (E&P) contract model, allowing Peru to become an attractive place for investing in enhanced production schemes of old fields and to carry out frontier exploration ventures. The key concepts of this E&P contract model are:

- Longer contract terms: up to 7 years for exploration and up to 30 years for oil developments and 40 years for gas developments.
- The contract area has no specific maximum size; it depends on the prospective, geographic zone and agreed guarantee exploratory program.
- Contractor revenues are based on production valued at international prices estimated using a contractually agreed crude oils basket.

3.8 The Government-take includes:

a. A Profit based Royalty function of the "R" factor (ratio of accumulated income to accumulated expenses). Part of this Royalty (about 12.5%) is transferred to the regional government where the production is obtained; the rest is mostly (97%) transferred to the Treasury, after a deduction (3%) to cover most of the expenses of Perupetro, OSINERG and the MEM. The following table presents its minimal values of the R factor are the following:

**Table 3.1: The Government-Take and the R Factor**

| *R Factor* | *Minimal Royalty (% of production)* |
|---|---|
| From 0.0 to 1.0 | 15 |
| From 1.0 to 1.5 | 20 |
| From 1.5 to 2.0 | 25 |
| From 2.0 onwards | 35 |

*The final percentages are negotiated for each contract. The ratio has proven sufficiently flexible to cope with variations in production and international prices and E&P investments and operating costs.*

b. Income taxes in accordance with general tax rules (currently rate is 30%).

3.9 Based on these new terms, Peru became a competitive place in the Latin American context. Private companies became rapidly attracted by large poorly explored blocks especially in the Sub-Andean Basin. The Camisea findings reinforced that perception.

3.10 At the same time, for the producing and contracted areas: (i) Petroperu was obliged to enter as any other company into contracts with Perupetro for the old Northwest and Jungle blocks, under conditions that will later allow their privatization; and (ii) the rights of existing contractors were respected and further the law paved the way for renegotiating contracts (Oxy, Petrotech) under fair conditions using the terms of the new model.

## Downstream - Refining, Distribution and Marketing of Petroleum Products

3.11 The new law opened the possibility for deregulating the sector and for undertaking the privatization of Petroperu. The legal framework was complemented with regulations dealing with pipelines, storage facilities, refining and processing of hydrocarbons, transport, distribution and marketing, based on international security and safety standards and free trade and anti-trust principles.

3.12 For petroleum downstream activities, attracting private investors and introducing competition are not easy tasks. In particular, there was no market base mechanism in Peru for setting prices and margins. Petroperu control over the key downstream facilities restricted the reform options. Deregulation was therefore considered only possible via the privatization of Petroperu assets, a process that required careful preparation. In this respect, the key idea in Petroperu Management was to provide clear signals and start selling the small assets to local and foreign investors willing to enter the oil business in Peru; and for the larger assets depots and refineries, rehabilitation was essential *to "dress the fiancée for its marriage* with private partners".

3.13 The new legal framework also paved the way for re-negotiating the Camisea Project based as much as possible on "unbundling principles." Gas transport and distribution, typically considered natural monopolies, were hence to be carried out as separate activities from gas production, by concessionaires under non-discriminatory tariffs.

## The New Regulations

3.14 Developing the new regulatory framework was a good example of a World Bank technical assistance project. The regulations were prepared by a team of foreign and local experts, which were conducted by the same management and policy guidance to produce a coherent set of modern industry regulations, including:

- Environmental Protection of Hydrocarbon Activities
- Qualification of Petroleum Companies
- Royalties and Retribution in Petroleum Contracts
- Standards for Refineries and Hydrocarbons Processing
- Safety in Hydrocarbons Storage
- Commercialization of Hydrocarbons Liquid Fuels

- Safety in Retail Stations selling Hydrocarbons Liquid Fuels
- Hydrocarbon Exploration and Exploitation Activities
- Distribution of Natural Gas by Pipelines
- Use of Resources obtained from Contractors in Training
- Commercialization of LPG
- Transport of Hydrocarbons by Pipelines
- Tariffs for Pipelines transporting Liquid Fuels
- Safety in Hydrocarbons Transport
- Safety in LPG Installations and Transport Operations
- List of Goods and Materials Import Tax Exempted for Exploration Contracts
- Guarantee of Fiscal Stability and Taxation Norms

3.15 Although the oil industry in Peru has a long history, starting in 1863, effective industry regulations were scattered and mainly geared to oil exploration and production. There were no adequate regulations to enable the development of the gas industry. The technology transfer that took place during the preparation of the new regulatory framework has proven of great value, providing GoP with experts with different backgrounds who are still contributing to the sector achievements.

3.16 The task of preparing regulations is a continuos one. In the case of the Peruvian industry, the arrival of gas from the Aguaytia and Camisea Projects demand the review and upgrading of the regulations pertaining to the transport and distribution activities. The existing law provides only the basic principles and much remains to be done in the way of establishing tariffs, condition for entry, non-discriminatory practices, client service, safety, etc. Further, the growing awareness of the impact of the industry on the environment is prompting the preparation of additional regulations and the upgrading of existing ones.

# 4

# The New Industry Structure

4.1 The key concept that has directed the restructuring of the hydrocarbons sector has been the search for competitive markets for all industry activities as the best way to ensure transparency, cheap energy and efficiency in resource allocation.

## Upstream: E&P Investments and the Crude Oil Market

4.2 It was relatively easy to create a competitive situation upstream. Peru had still large unexplored basins. The government policy was confirmed by the decision to renegotiate the existing contracts with Occidental in fair manner, privatize the proven reserves of oil (controlled by Petromar) and contract the gas-condensate fields of Aguaytia, including giving in concession the exploitation of the old Aguas Calientes y Maquia central jungle fields together with the Pucallpa Refinery. With the new law, the number of companies involved in upstream operations increased substantially.

4.3 Moreover, Petroperu upstream operations started to be undertaken under the same contract model used to attract private operators. Block X in the Northwest and Block 8 in the Jungle were subject of contracts negotiated between Perupetro and Petroperu. Excess acreage, where Petroperu was unable to invest, was subsequently subdivided and proposed for privatization. Depending on the area size, prospective and estimated investment requirements, companies of all sizes were invited to participate in the privatization process. Special consideration was given to allow the participation of local entrepreneurs, willing to take a risk in exploration and development of small blocks. As a result, blocks have been assigned to companies of varying size, including a block to be operated by a company sponsored by the National University for Engineering. The table below summarizes the success of the upstream policy decisions.

**Table 4.1: Results Achieved Upstream**

| | | *1990* | *1997* |
|---|---|---|---|
| Number of contracted blocks | | 4 | 41 |
| Acreage under operation (million hectares) | | 1.10 | 23.01 |
| Investment committed (million US$) | | 19.95 | 4300 |
| Seismic lines (km) | - 2D | | 2430 |
| | - 3D | | 451 |
| Number of wells | - Exploratory | 4 | 10 |
| | - Development | 52 | 92 |

4.4 Notwithstanding the above, until end-1998, there was no successful large crude oil discovery in Peru. The last discovery was Chambira in 1989 with only 15 million barrels of reserves. To date, exploratory wells have been drilled mainly in the Northern Amazonian Basin, in geological structures identified by previous geological and geophysical campaigns and where a significant wildcatting density is already cumulated. However, potential for large discoveries is now confined to the new frontier areas, especially in the Southern Amazonian Basin where a few successful exploratory wells of the 70's indicated the existence of light hydrocarbons and where exploratory drilling agreed in the new contracts has not yet taken place.

4.5 As consequence of the poor results of the exploration activities over the last ten years, crude oil reserves have continued declining and production has had the same behavior. In July 1990, proven reserves were estimated at 400 million barrels, while these were estimated at only 320 million barrels in December 1997. Crude oil production declined during these years from 47 million barrels to 43.2 million barrels. For 1998, El Niño and the substantial decline of Occidental's output in Block 1AB have caused a further deterioration of the crude oil production: 113.8 thousand barrels per day for the first five months of 1998.

4.6 To reverse the declining trend, which is generating a large negative impact on the country's balance of payments, it is possible to count with the gas-condensate project of Aguaytia (55 mmcfd and 4.2 mbd of condensates – producing since mid 1998) and it will be necessary to await the execution of the Camisea Project (200 mmscfd of estimated initial gas production and approximately 100 mbd of condensate production - expected for the year 2003). For the longer run, it will be necessary an oil discovery in a basin accessible to markets, such as form the offshore or from blocks near the Transandean pipeline.

4.7 It is only since 1994 that the large majority of oil contracts have been signed and exploration has arrived at frontier areas in the offshore and the Central and Southern Blocks in the Amazonian Jungle. Given the typical minimally agreed exploratory programs for the original and the first extension period, wildcatting will intensify during 1997 to

2000. It is from the results of this huge private investment effort (estimated about US$ 1.5 billion) that the continuously declining trend of proven Peruvian reserves will finally be reversed.

4.8 The drop in the oil prices; many optimistic reserve estimates; and a poor consideration of costs involved in the mitigation of past environmental damages have put at stake the flexibility of Perupetro to handle specific renegotiations and decide ad-hoc contractual amendments. This is especially the case of the marginal projects negotiated in ex-blocks of the Petroperu Operaciones Nor Oust (ONO). Royalties have had to be modified to take into account the investments required by the Pam's (Planes de Adecuación y Manejo Ambiental) to be executed in these old oil fields. Perupetro will have to continue showing such flexibility to extend as long as possible the life of old depleted fields.

## Downstream: Refining and Distribution Operations and the Products Markets

4.9 Competition downstream is obviously more difficult to achieve. Peru is a small fragmented market and transport and storage infrastructures in many cases do not provide for achieving easily competitive structures. The starting point was a chain of supply entirely controlled by Petroperu. There was therefore the need to provide an immediate signal of the new policy intentions by allowing new operators entering the retail activities while measures and specific plans were prepared to open also the whole activity.

4.10 The sale of 78 Petroperu directly-owned gasoline stations and the subsequent investments in new service stations of larger companies, estimated to be over US$ 250 million, has created conditions for the beginning of market competition in this final step of the oil supply chain. It has taken more than three years to start seeing significant price differences among gasoline stations, in particular between retailers operating under franchise of a major oil company: Shell, Mobil, Texaco, Chevron, Repsol, YPF; and local smaller gasoline retailers.

4.11 Another interesting spot where market competition has started to emerge is the LPG business. With the privatization of Solgas, the construction of new larger reception facilities, one by Repsol (with an additional storage capacity of 130,000 barrels) and another by the Mexican company Zeta Gas (with a capacity of 140,000 barrels) and the change in the government taxation policy for household fuels – eliminating the kerosene subsidy and bringing to the same low level the LPG and kerosene excise taxes – the LPG business has nearly doubled since 1990. A large number of filling plants and the introduction of smaller 5 kg bottles, among other improvements in customer services, have complemented the emergence of a very dynamic LPG industry which seems to be getting ready for the arrival of large LPG supplies from the Aguaytia and Camisea Projects. Recently, the French company ELF, in association with 16 small bottling local companies, has decided to invest US$ 22 million in the construction of a new plant.

4.12 The privatization of the refineries and wholesale terminals has been more difficult to implement. There was the early failure that took place in the attempt to privatize the small Conchán Refinery. Although close to the Lima market, with autonomous marine lines, storage terminal and processing capacity to produce high quality bitumen, its privatization was not possible to achieve at an acceptable price. This privatization was proposed too early in the reform process, without sufficient practical evidence of continuation of the new pricing policy. Offers received were low reflecting the high risk estimated by investors due to competition by larger still Petroperu operated refineries. To be credible, the downstream privatization process needed to start with the larger unit such as La Pampilla Refinery.

4.13 As it is discussed in more detail below, deregulation downstream requires adequate industry facilities and, often, a change in the pricing policy. To attract new agents into a market, product prices - before taxes - have to be established in line with economic border prices, and taxation must not discriminate between local and foreign suppliers. To smooth the movement in places where subsidies are significant, a useful device is a transitory formula simulating import-export parity prices, including an automatic mechanism of adjustment. Thus, subsidies are eliminated, the state is no longer responsible for price fluctuations, and the private sector can invest in the infrastructure, if needed.

4.14 Oil demand in Peru has recovered since 1990, but per capita consumption is still low compared to the average for Latin America (2 barrels of oil products per capita compared to the regional average of 4.4 barrels per capita). Consumption stagnated during the period 1990 to 1992 but started to increase as the economy in general recovered. Between 1993 to 1997, GDP annual growth rate was 7.2%, the highest in Latin America, double the region's average of 3.6% per year. Oil consumption first diminished from 128 MBD to less than 110 MBD, as a reaction to the adjustment shock and later stagnated until 1992 at around 110-120 MBD, has experienced rapid growth since 1993. In 1997, sales of petroleum products reached 150.4 MBD. For 1998, the drop in the economic growth rate, caused by El Niño and the small business closures, will bring a temporary stop of the oil demand recovery.

**Table 4.2: Petroleum Products Consumption 1993 - 1997**

| *(MBD)* | *1993* | *1997* | *Yearly Increase (%)* |
|---|---|---|---|
| Gasoline 84 & 95 RON | 25.5 | 28.4 | 2.3 |
| Kerosene | 14.8 | 13.7 | - |
| Turbo Jet | 7.0 | 9.3 | 5.8 |
| Diesel No. 2 | 38.3 | 58.2 | 8.7 |
| Fuel Oil No. 6 | 19.4 | 31.7 | 10.2 |
| LPG | 5.0 | 9.1 | 12.7 |
| Total | 110.0 | 150.4 | 6.4 |

It is interesting to note that:

- Diesel No. 2 has experienced a dramatic increase due to the strong dieselization of the transport fleet and the development of thermal generation;
- Fuel oil No. 6 has been consumed in increasing amounts for electricity generation;
- Overall gasoline consumption has experienced a moderate growth; however the demand for regular leaded 84 RON has stagnated, covering now less than 75% of the total gasoline market because of the penetration of unleaded and higher octane gasoline driven by the modernization of the car fleet.
- Turbo jet demand increased as the number of internal flights increased with the aviation sector also demonopolisized;
- LPG has started to substitute for kerosene. Indeed, new private storage investment has improved the availability of this product.

## The New Industry Structure: The Integrated vs. The De-Integrated Options

4.15 The legal framework, the increase of the demand for petroleum products, a more rational pricing system and the improved general economic outlook started to make possible the privatization of the refining and distribution facilities. However, it was also necessary that the GoP defined the future industry structure. In this connection, a highly political debate took place in 1994 concerning the future of Petroperu, dividing opinions between two options:

a. *An integrated company*, keeping all Petroperu core activities following the model used for the privatization of YPF-Argentina, or

b. *A de-integrated company* whose different parts are privatized separately.

4.16 A privatization strategy study conducted by the consulting firm Booz, Allen and Hamilton helped defining these two options:

a. Petroperu would be privatized as a single integrated company keeping -after closing of non profitable business units and general downsizing- the following:

*Core Assets*

- Exploration and Production: Talara and Block # 8 in the Jungle
- Refining units: La Pampilla and Talara
- Storage and Distribution Facilities: The coastal terminals
- Transport: Transandean Pipeline

*Assets to be operated in "Joint Ventures"*

- Refining in the Jungle
- Lubricants

*Assets and Services to be privatized separately*

- Drilling and Well service units
- Maintenance
- Transport of Products
- Storage and Distribution plants inside the country

b. Petroperu would be divided into business units and, with certain restrictions on their operation, these business units would be privatized:

- *Refineries*: Talara and La Pampilla should be sold to different investors to allow a satisfactory level of competition, independently of volumes and conditions prevailing initially for direct products importation. As market competition increases and if importation grows and/or remain highly relevant, this condition could be put aside.
- *La Pampilla Refinery and the Terminal Callao*: both should be privatized to different investors to avoid a monopolistic position in the supply of Lima market and to allow some degree of import competition. (Comment: this restriction could be put aside if regulations allow for a non-discriminatory use of excess storage capacity by tiers at reasonable tariffs).
- *Other Terminals and Distribution Facilities*: adjacent terminals should have different owners or a certain ceiling market share should be established, such as a 25% maximum of the regional market. This is a pre-condition to allow import competition. Storage owners should be obliged to allow tiers access to excess capacity.

4.17 The Booz, Allen and Hamilton study analyzed other alternatives, which in one way or another lay between these two extreme options. The study provided a comparison of advantages and disadvantages among the two options, which were used in a political debate including the management and personnel of Petroperu, the opposition to the Fujimori Administration and other political forces, especially in the regions where the industry has a great social impact.

**Table 4.3: Options for Restructuring the Oil Sector**

| *Integrated Privatization Option* | *De-integrated Privatization Option* |
|---|---|
| ***Advantages*** | ***Advantages*** |
| - Less potential supply disruptions<br>- All assets will get a buyer<br>- Efficiency gains from refinery integration<br>- Possibly a higher overall selling revenue. | - Smaller independent companies could enter to certain industry operations<br>- Competition ensured by minimal restrictions<br>- Larger investors could rapidly achieve high efficiency |
| ***Disadvantages*** | ***Disadvantages*** |
| - Risk from lack of interest in buying all of Petroperu<br>- Strong market dominance, resulting in limited competition and possible continuation of Government interference<br>- Delays in large capital intensive projects<br>- Long implementation due to time required to complete company restructuring and due to limited local capital available to buy shares | - Few unattractive assets could remain unsold, requiring the use of less favorable privatization terms<br>- Possible disruptions in the supply chain, which requires the preparation of a good implementation strategy |

4.18 The second option was selected and, therefore, Petroperu is meant to disappear as market competition starts to develop. The "unbundling" option was also retained for the legal framework of the gas and electricity sectors. In particular, the sectorial laws separate the production or generation activities from the transport and distribution activities.

# 5

# Prices and Taxes

5.1 An essential concept of the reform is that "*markets are better than any government agency to decide on the right prices*". Its ultimate goal is a complete price deregulation. This requires careful preparation, allowing sufficient time for markets to start working. Prices usually have to be corrected first, subsidies and barriers to entry eliminated and minimal regulations on safety and environment enforced. Finally, a sufficient number of players should be in the market to ensure that conditions for competition are present and that deregulation can proceed.

5.2 In the case of Peru, the only feasible way to increase the number of downstream players was the privatization, among different independent companies, of Petroperu assets, in particular refineries and wholesale depots. It is therefore only by the time of a complete privatization of this company that full deregulation will possibly take place.

## The First Adjustment: Elimination of Subsidies and Increase of Taxes

5.3 The first adjustment of petroleum prices decided by the Fujimori Government, responding mainly to the critical fiscal situation of 1990, consisted of a significant increase aimed at eliminating subsidies and increasing taxes. The average consumer price of a gallon of petroleum products in US dollars increased by nearly four times between 1989 and 1992, while the nominal value in local currency increased by 30 times. This was perhaps the most visible sign of what will be remembered as the "Fuji-shock." The Petroperu share to cover all production, transport and distribution costs increased in real terms by nearly three times. At the same time, taxes and margins increased by five times.

**Table 5.1: Petroleum Product Prices and Taxes 1989 – 1992 (US$ per gallon)**

| | *1989* | | | *1992* | | |
|---|---|---|---|---|---|---|
| | *Petroperu Price* | *Taxes & Margins* | *Consumer Price* | *Petroperu Price* | *Taxes & Margins* | *Consumer Price* |
| Gasoline 84 RON | 0.21 | 0.36 | 0.57 | 0.65 | 1.32 | 1.97 |
| Kerosene | 0.19 | 0.03 | 0.22 | 0.51 | 0.53 | 1.04 |
| Diesel No. 2 | 0.27 | 0.06 | 0.33 | 0.58 | 0.63 | 1.21 |
| Fuel Oil No. 6 | 0.15 | 0.06 | 0.21 | 0.37 | 0.50 | 0.87 |
| LPG | 0.07 | 0.02 | 0.09 | 0.51 | 0.57 | 1.08 |
| Volume Weighted Average | 0.20 | 0.13 | 0.33 | 0.55 | 0.76 | 1.31 |

5.4 Although the increase was dramatic, the new level of prices for key products in constant terms (calculated using a GDP deflator) was similar to the one prevailing during the mid-eighties. In 1985, considering only the demand registered for the major products (i.e. 84 RON gasoline, kerosene, diesel No. 2, fuel oil No. 6 and LPG), the weighted average petroleum price was US$ 0.67 per gallon. In 1989, the average price dropped down to US$ 0.33 per gal. and recovered to US$ 1.31 per gal in 1992. Since then it has remained at practically the same level. In June 1998, the weighted average for the major petroleum products indicated above was US$ 1.27 per gallon.

## The Ex-Refinery Prices

5.5 In the table above the first component of the consumer price consists of the Petroperu share. This corresponds to the ex-refinery price received by Petroperu, which until 1992 was the only supplier in the market, for covering all industry costs. This price was received at the wholesale terminal level, whether the products were produced at the local refinery or were imported. Also, this price included all handling and transportation costs up to the gate of all depots in the country.

5.6 According to the sectorial law passed in 1993, Article 77 stated that "the activities and prices related with crude oil and petroleum products will be governed by the laws of supply and demand." The GoP aimed at establishing a level playing field to facilitate competition between exploration and production companies, between importers and refineries, between wholesalers and between retailers, and to ensure that demand is met at minimum cost.

5.7 Until the privatization of La Pampilla Refinery, given that Petroperu was the only market player, the GoP felt necessary to use some form of price formula to verify that

prices were set at the "appropriate level." This was achieved as the result of an understanding between the board of Petroperu and the Ministry of Economy and Finance (MEF). In a competitive market, the "appropriate level" is determined by the opportunity cost, which in the case of petroleum products is given by the price that would be paid in international markets, after allowing for the transaction costs involved. The closest international market that could be used as reference in the case of Peru is the US Gulf of Mexico. Based on this reference, the price charged by Petroperu for product "t" was set using the following formula:

$$[(Pt * Qlt) + FIt] (1+dt) + REFt$$

Where:

*Pt* is the average price of a product in the Gulf of Mexico over the last 3 months,

*Qlt* is a quality differential applicable in particular to the varieties of gasoline consumed in Peru that are not traded internationally,

*FIt* is a pre-determined freight and insurance cost,

*dt* is the rate of customs duties, in Peru in 1993 was 15%; and

*REFt* is a pre-determined cost for storage and handling.

5.8 The agreement between Petroperu and the MEF also included provisions for an automatic adjustment mechanism whereby prices would be updated monthly if a difference greater than 3% had taken place. However, this indexation mechanism was not applied. While prices in international markets were falling, the MEF introduced a 7.5% sales tax to Petroperu in addition to other taxes applied to the petroleum products. This 7.5% tax was applied until December 1996.

5.9 Looking backwards, at the time the privatization of Conchán was proposed, prices were not yet set by such agreed formula. It is quite possible that investors were reluctant still to take economic risks in Peru without an appropriate pricing policy.

**Table 5.2: Ex-Refinery Prices Charged by Petroperu - November 1993**
***(US$ per gallon)***

| *Product* | *Average International Price* | *Quality Adjustment (%)* | *Freight and Insurance* | *Price at Port* | *Custom duties* | *Handling cost* | *Petro-peru Price* |
|---|---|---|---|---|---|---|---|
| LPG | 0.30 | 100 | 0.13 | 0.423 | 0.064 | 0.02 | 0.51 |
| Gas. 97 | 0.54 | 100 | 0.06 | 0.596 | 0.089 | 0.02 | 0.71 |
| Gas. 95 | 0.54 | 98 | 0.06 | 0.588 | 0.088 | 0.02 | 0.70 |
| Gas. 90 | 0.50 | 98 | 0.06 | 0.544 | 0.082 | 0.02 | 0.65 |
| Gas. 84 | 0.50 | 90 | 0.06 | 0.504 | 0.076 | 0.02 | 0.60 |
| Gas. 80 | 0.50 | 87 | 0.05 | 0.484 | 0.073 | 0.02 | 0.58 |
| Kerosene | 0.53 | 100 | 0.06 | 0.596 | 0.089 | 0.02 | 0.71 |
| Diesel | 0.50 | 100 | 0.06 | 0.564 | 0.085 | 0.02 | 0.67 |
| Fuel Oil | 0.24 | 100 | 0.02 | 0.259 | 0.039 | 0.02 | 0.32 |

5.10 The above formula was used until the privatization of La Pampilla Refinery was implemented in 1996. The first important departure from the theoretical formula took place in relation to the application of an export-parity concept for the residual fuel oil, considered as the "right opportunity value" for this product, which indeed prevails largely in excess due to the limitations of the refineries conversion capacity to process the heavy crude from the Jungle.

5.11 With the privatization of La Pampilla Refinery, the new owners, the Consortium including Repsol, YPF, Mobil and, Graña y Montero, decided to stop processing the crude from the Amazonian Jungle but to import other crude from Ecuador and Colombia and further decided to start setting ex-refinery prices under their own marketing criteria. In particular, for the fuel oil consumed by the mining industry in southern Peru, the Consortium started asking a higher price, closer to the import parity, instead of the export parity value. In spite of complains the price set by Repsol, the company operating the Refinery, responding to market realities, had to be accepted by the mining companies consuming fuel oil. To obtain a similar low price, low quality fuel oil, the mining companies would have to proceed anyhow with its importation.

5.12 Acceptance of market realities is not easily achieved. The debate on the price of fuel oil under the import parity concept, requested in the local press by the Manager of La Pampilla Refinery created certain frictions that resulted in the departure of this Manager, although the concept has continued to be applied.

5.13 Another important market distortion has taken place recently, during the drop of oil prices in the international market started the last quarter of 1997. It appears that during the review of Petroperu's financial results for 1997 and its projections for 1998, the Board of Directors found forecasted a substantial unexpected profit. For 1998, Petroperu in

accordance with these projections would have achieved profits in excess of US$ 400 million, because ex-refinery prices were not properly adjusted following the crude price decrease. It is worth noting that Petroperu currently handles only about 50% of the total Peruvian consumption. The foreign companies operating in Peru considered that the drop in international prices provided them with a good opportunity to recover recent investment in downstream facilities and, hence, were not also ready to transfer the price decrease to consumers. Under the request of the MEF representatives, Petroperu's Board of Directors considered that there was no valid reason to keep such a price differential, which would take out of the consumers' pockets such an amount of money. It requested the management to envisage a practical way to transfer the drop in prices to the final consumer. Petroperu had to appeal to the local chain of retailers to provoke a decrease in consumer prices, responding to the international market situation.

## The Retail Margins

5.14 One of the initial steps of the reform was the privatization of the gasoline stations, which was made possible with the deregulation of the retail margins. Until then all petroleum products were sold throughout the country at the same official price. After the privatization of the retail stations, prices to the consumers, in particular that of gasoline, started to have small differences from one delivery point to another.

5.15 The margin received by the concessionaires of Petroperu before privatization was always a subject of discussion. In 1985, a formula was proposed to adjust rationally the retail margin in accordance with inflation, interest rates, operating and security costs and the prices of products, among other factors. It was never applied consistently but margins were typically in the order of US$ 0.06 per gallon. With the privatization and deregulation of this final segment of the supply chain, the owners, including those who constructed new stations and those who bought stations from Petroperu, started to apply a higher margin. Adding the distribution margin, final transport from depots to the retail points and retail margin, gasoline prices are increased up to US$ 0.5 per gallon.

5.16 The investment made in building new gasoline stations, following the deregulation of this activity including not only the freeing of margins but also the elimination of restrictions regarding the location and number of stations, has been estimated at about US$ 250 million. The dramatic improvement of the services and infrastructure at the gasoline stations probably has been perceived as an important signal of the entrance of new private capital in the economy. However, it has taken at least three years for industry competition to drive down the high retail margin. Consumers are now confronted with significant differences in the diesel and gasoline prices depending on the location and the retailer brand.

## The Wholesale Margins: Terminal Fees Plus Distributors Margins

5.17 Wholesale margins remained included in the Petroperu ex-refinery price until the privatization of the terminals and distribution depots, which, under the form of 15 year operating contracts, took place in December 1997. Petroperu operated 18 wholesale terminals around the country. For privatization purposes, the majority of Petroperu's terminals were subdivided into 3 lots covering the following sub-regions: North (Eten, Salaverry, Chimbote y Supe), South (Pisco, Mollendo, Ilo, Cuzco y Juliaca) and Central (Callao and Cerro de Pasco).

5.18 In addition, there are product terminals attached to the refineries. Already, the terminal adjacent to La Pampilla Refinery has been privatized and is operated by Repsol, and the Pucallpa Refinery has been given to The Mapple Gas Corporation to be operated under the Aguaytia Project, while the Talara, Conchan and Iquitos depots have remained as part of the Refineries operation in the hands of Petroperu. These terminals together with the respective refineries are expected to be privatized in 1999.

5.19 Wholesale margins should now have to be split between the "distributors margin" and the "fee paid to the depot operators"; the latter is now established in accordance with the concession agreements for the Coastal terminals, with a ceiling fee of US$ 0.60 per barrel of product stored per month and of US$ 0.58 per barrel of product delivered to consumers. According to the results of the bidding process:

(a) The Peruvian Consortium GMP Graña y Montero obtained the concession for the operation of the North and South terminals offering to Petroperu a set rent per dispatched barrel in the order of US$ 0.2784 and US$ 0.4567 respectively and committed rehabilitation investments to be undertaken in the next 4 years of minimum US$ 5.5 million in the case of the North terminals and of minimum US$ 6.7 million to be carried out in 5 years, in the case of the South terminals.

(b) The other Peruvian Consortium that obtained the concession of the Central terminals was Serlipsa Fuel Centre S.A. offering Petroperu a rent of US$ 0.4739 per dispatched barrel and an investment commitment for the next 5 years of US$ 6.3 million. This Peruvian company has recently entered an association with a Dutch group Van Ommeren Tank Terminals.

As part of the operating service contracts, the concessionaires paid a US$ 3 million Subscription Fee and will pass revenues to the State in the order of US$ 9 million per year.

5.20 Wholesale margins for the depot operating in the jungle are more difficult to set up. These are small markets and terminals are closely related to Refinery operations. In the case of Iquitos, Petroperu is undertaking a project to construct a product pipeline linking the refinery to the city depot. Given the high level of market protection these markets enjoy due to their distance to other suppliers, protection equivalent to about US$ 6 per barrel in the case of Iquitos, the privatization of these assets should have to include the required regulatory scheme.

5.21 In the current price situation, after having depots handling fees established, distribution margins are the price component that remains relatively open ended. Wholesale distributors, after paying the imported or local products and the depots and terminal handling fees, are free to add a margin. The only limit that could prevail is one coming from the market itself. An average price mark up of 8 to 10% over the import parity was taken during 1997. According to close observers of the Peruvian products supply chain the recent drops in international prices are not reaching the consumers. The entrance to the market of the gasoline produced from the Aguaytia Project has allowed to show that it is possible to lower prices. Although, it is difficult in general to assess the competitive behavior of a given market, it appears necessary in the consumers' interest to evaluate possible measures for improving the competitiveness of the wholesale distribution activities.

## The Taxation Policy

5.22 Setting taxes is a complex task, and several criteria have to be weighed, because the direction and magnitude of the impact exerted by each tax is not evident up-front. There are however largely proven facts: subsidies, for instance, end up benefiting the richer and are being paid, through the inflation tax, more by the poor.

5.23 A first consideration in setting petroleum product taxes is the required total level for avoiding fiscal deficits. The contribution of taxes to be collected from petroleum products, in the case of Peru, is still fairly significant. It is important to notice that since 1991, after the major price adjustment decided by the Fujimori Administration, taxes on petroleum products have provided resources in the order of US$ 1,000 million per year, making a significant share of the public sector budgetary resources.

5.24 There has been rapid recognition by the GoP of the key concepts of an appropriate taxation system for petroleum products and, for energy products, in general. These imply that taxation should:

- not discriminate among consumers or producers. Initially a 7.5% sales tax to be paid by Petroperu was considered, but had to be abandoned with the privatisation process.
- improve the industrial competitiveness, the environment and the income distribution, and consequently the economic growth;
- favor the use of more abundant and less pollutant local fuels, such as LPG and natural gas, the production of which will generate investment, employment, royalties and income taxes.

5.25 Currently, Peruvian consumers of petroleum products are paying the following taxes:

- an excise tax *–Impuesto Selectivo al Consumo (ISC)–* which has variable rates depending on specific fuels;
- a municipal road tax, applicable only to gasoline, of 8% of the ex-refinery price, and
- a general sales tax *–Impuesto General a las Ventas (IGV)–* of 18% of the ex-refinery price, plus ISC and Municipal Road Tax.

5.26 The IGV and the Municipal Road Tax are set by law and could not be changed to accomplish any energy-environmental specific goal, whereas the ISC can be modified by Decree. Initially the ISC was set as a percentage of the fuel's ex-refinery price, nowadays it is -in a more convenient manner- denominated in Soles per gallon.

5.27 In 1997, taxes collected from these concepts were of the order of US$ 1,072 million. The ISC allowed the collection of approximately US 706 million, the IGV of 342 million, and the municipal road tax only US$ 24 million.

**Table 5.3: Petroleum Taxes in 1997**

| | *Sectoral Consumption* | | *Taxes (US/bbl)* | | | *Tax Collection (MMUS$)* | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *(%)* | *MMBPD* | *ISC* | *IGV* | *Road* | *ISC* | *IGV* | *Road* | *TOTAL* |
| *Transport* | | | | | | | | | |
| Gas 84 RON | 100 | 18.0 | 24.9 | 11.8 | 2.2 | 164 | 78 | 14 | 256 |
| Other gasoline | 100 | 10.4 | 35.2 | 15.2 | 2.5 | 134 | 58 | 10 | 201 |
| Diesel | 65 | 38.1 | 16.0 | 10.3 | | 223 | 142 | | 365 |
| TOTAL | | 66.5 | | | | 520 | 278 | 24 | 822 |
| *Residential* | | | | | | | | | |
| LPG | 75 | 6.8 | 9.5 | 10.9 | | 24 | 27 | | 50 |
| Kerosene | 80 | 11.0 | 7.0 | 9.3 | | 28 | 38 | | 66 |
| TOTAL | | 17.8 | | | | 52 | 65 | | 116 |
| *Industrial* | | | | | | | | | |
| LPG | 25 | 2.3 | 9.5 | | | 8 | | | 8 |
| Kerosene | 20 | 2.7 | 7.0 | | | 7 | | | 7 |
| Diesel | 29 | 16.6 | 16.0 | | | 97 | | | 97 |
| Fuel Oil | 95 | 30.2 | 2.0 | | | 22 | | | 22 |
| TOTAL | | 51.7 | | | | 134 | | | 134 |
| *Electricity Generation* | | | | | | | | | |
| Diesel | 6 | 3.5 | | | | | | | |
| Fuel Oil | 5 | 1.5 | | | | | | | |
| TOTAL | | 5.0 | | | | | | | |
| Turbo-Jet | 100 | 9.3 | | | | | | | |
| TOTAL | | 150.4 | | | | 706 | 342 | 24 | 1,072 |

5.28 The table above shows that industrial consumers recover the IGV and that electricity generators do not pay ISC; an exemption that will last until December 1999. Turbo jet is sold to airlines also tax exempted.

5.29 Transport fuels are those supporting the larger taxes. The trend towards the elimination of taxes to industrial and residential consumers would have to be continued.

5.30 In relation to industrial fuels, the GoP by Supreme Decree (SD) No. 005-98-EF of January 30, 1998 has decided to eliminate the ISC to industrial fuels: coal, fuel oil and natural gas from the year 2000. The basic concept is to increase industry competitiveness and allow for rapid penetration of natural gas, which is expected to enter the market with the exploitation of the Camisea and Aguaytia resources. To compensate for the import tax exoneration benefiting coal, this Supreme Decree introduced an ISC of Soles 11 per ton of coal, equivalent to this exemption. More recently, Art. 2 of SD No. 072-98-EF has eliminated the ISC for fuel—oils local and imported- a measure that will help the local producers and industrial consumers.

5.31 The ISC charged to LPG consumers has been reduced and set at the same level as the ISC charged to kerosene consumers. According to the Ministerial Resolution No. 157–98-EF of July 8th, 1998, both kerosene and LPG consumers will support the same ISC, approximately US$ 0.06 per gallon.

5.32 The ISC charged to regular leaded gasoline of 84 RON has been slightly increased in comparison with the unleaded 90 RON. This is consistent with the government policy to gradually phase out leaded gasoline by the year 2004.

## Pending Taxation Issues

5.33 One of the important taxation changes still required is to introduce a difference between the price of diesel for industrial users, which could be exempted of ISC taxes, and the price of diesel for transport users, which should be taxed to eliminate its excessive advantage vis-à-vis gasoline. Environmental considerations have not yet been taking into account for taxation purposes. One of the costly mistakes in terms of air quality has been the unrestricted importation of diesel-powered vehicles of all size which now congest Peruvian cities. A proposal needs to be worked out to encompass an improvement in diesel specifications for transportation, such as the reduction of the sulfur content, with the issuing of vehicle emission standards that will restrict the entrance and operation of high pollutant diesel units, and a corresponding amendment of the level of ISC taxes to differentiate the better quality diesel from the lower quality diesel supplied to industry, in particular facilities located far from urban areas.

5.34 Another important tax amendment would be the introduction of an annual tax on owners of LPG vehicles, that will compensate the loss in tax revenues that could take place if gasoline vehicles are massively substituted by vehicles using LPG nearly exempted from ISC taxes. This could well be the case at the time of the commissioning of the Camisea Project.

## Current Petroleum Prices

5.35 The following table presents the petroleum product prices in Peru as of June 1997, and compares these prices with those prevailing in neighboring countries. For Peru, it includes as regular gasoline the leaded 84 RON grade, and as premium grade the

unleaded 97 RON. The quality of regular and premium gasoline grades varies in each country.

**Table 5.4: Petroleum Product Prices in Peru and in Neighboring Countries, Mid 1997 (US$/gallon)**

| | *Peru* | *Chile* | *Ecuador* | *Bolivia* | *Colombia* | *Brazil* |
|---|---|---|---|---|---|---|
| LPG | 0.81 | 0.55 | 0.37 | 0.26 | 0.24 | 0.56 |
| Gas Regular | 1.81 | 2.15 | 1.09 | 1.45 | 0.87 | 2.59 |
| Gas Premium | 2.66 | 2.22 | 1.27 | 2.17 | 0.92 | 2.94 |
| Kerosene | 1.14 | 1.16 | | 0.80 | 0.87 | 1.34 |
| Diesel | 1.34 | 1.35 | 0.76 | 1.45 | 0.87 | 1.39 |
| Fuel Oil | 0.65 | 0.92 | 0.80 | 0.93 | 0.38 | 0.56 |

5.36 Compared with other Latin American countries, with the exception of Chile and Brazil, petroleum product prices are high in Peru. However, it is important to note that Bolivia, Colombia and Ecuador are self-sufficient and have hydrocarbon export surpluses, although the latter has in 1998 undergone a major price revision. This notwithstanding, due to the appropriate taxation, this has not been a major obstacle to the achievement of high economic growth, although, to reduce the regressive impact, efforts should be made to improve tax collection from other sources.

5.37 Political interference in price setting has now disappeared, and private sector participation has been able to develop in a healthy and strong manner. The process of deregulation requires time for markets to start working. The case of Peru illustrates this well. It is expected that the privatization of the Talara and Iquitos refineries, as well as other remaining Petroperu assets, will be completed in 1999. It is only then that full deregulation could be envisaged.

5.38 Peru, as many other developing countries, has little background in surveying market behavior through autonomous authorities. INDECOPI is an attempt at this and it is expected that it will assume a more important role as Petroperu's influence in the petroleum market fades away.

5.39 Particular attention should be given to ensure that tax collection is obtained without any loss in fiscal revenue. The drop in international prices provides an excellent opportunity for improving taxation, in particular to incorporate environmental concerns and differentiate the price of diesel between transport and industrial users, in particular those located far from urban areas.

# 6

# The New Institutional Set-Up

6.1 As part of the sector reform, an important element has been the establishment of new institutions taking into account the limitations of the state budget and of available local skilled personnel. The reform required a minimum of new institutions and the strengthening of existing ones, in accordance with the new policies.

## Key Sectorial Institutions

6.2 The Ministry of Energy and Mines (MEM) has remained in charge of elaborating, approving and applying the sector policy decisions and of undertaking indicative sector planning. Moreover, under this Ministry, the Dirección General de Hidrocarburos (DGH) has become responsible for issuing regulations and licenses. The DGH has to issue the appropriate regulations that will permit a sector behavior under open market policies; and the concessions and licenses for the construction of pipelines, transport and distribution systems, and for processing, storage and marketing of hydrocarbons and derived products. According to current regulations, the DGH is responsible for receiving the Environmental Impact Studies, and, in coordination with the MEM Dirección General de Asuntos Ambientales (DGAA) and other state agencies- of verifying the adequacy of proposed Environmental Management Plans. The DGH has to obtain inputs from the public audiences and, will grant the final authorization for starting the execution of all hydrocarbon projects.

6.3 In general terms, the Government made a massive downsizing in the number of public sector institutions and personnel, using different mechanisms, including some kind of retirement incentives. In the case of the MEM, the number of permanent workers was reduced from 1100 to 300. This allowed the acquisition of better equipment and more working space and, at the same time, permitted the contracting of temporary experts and more qualified personnel to be attached to key projects and for specific tasks demanded by the sector reform.

## The Sector Supervision

6.4 As a response to improve the sector supervision, in particular the enforcement of the new regulatory framework, the GoP created in 1996 a new institution: *Organismo Supervisor de la Inversión en el Sector Energía* (OSINERG) which absorbed the old sectoral supervision directorates for hydrocarbons and electric power. This institution is a public sector body with functional autonomy from the technical, administrative, economic and financial perspective. OSINERG's responsibilities comprise the supervision of companies' operations regarding the fulfillment of all sector regulations, including those regulations pertaining to the protection of the environment.

6.5 Before 1996, auditing companies were contracted to carry out supervisory tasks (i.e. *fiscalización)* because of the personnel and resource constraints of the MEM. A large number of auditing companies without sufficient technical background were created, offering services beyond the sector demand. Lacking controls a series of cases of poor supervisory work and of improper behavior were detected. OSINERG was created to address this situation. As a relatively new institution, OSINERG has been preparing new rules for supervision, and determining the size and resources required for its own functioning.

6.6 OSINERG has been taken out of the control of the Ministry of Energy and Mines and has become, since mid-1998, part of the new nationwide regulatory system attached to the Ministry of Economy and Finance. This measure has been undertaken to ensure transparency and coherence, throughout the different economic sectors, of the supervision role of the state, outside of the respective sectoral bodies. In relation to the supervision of the oil and gas industries, OSINERG continues a close coordination with other MEM agencies.

## The Administration of the Natural Resources

6.7 Since 1993, *Perupetro* replaced Petroperu to be in charge of the administration of the Peruvian hydrocarbon resources, with no operational functions. Petroperu's privatization determined the need to create a new government body that will promote acreage, negotiate new contracts -directly or through bidding contexts- and subscribe and administer all new E&P contracts. Perupetro has been created as a state enterprise belonging to "private law"; in this way, the new contracts are subscribed within the umbrella of the private commercial law. Among other advantages, such contracts can therefore be the subject of international arbitration if so required, including procedures ratified by the GoP as part of the International Convention for the Settlement of Investment Disputes (ICSID), the Multilateral Investment Guarantee Agreement (MIGA), and the Overseas Private Investment Corporation (OPIC).

6.8 Perupetro was named similarly to Petroperu to maintain as low a profile as possible and to limit the confusion of the international oil community and the general public, still thinking that Petroperu will continue alive. The law that created Perupetro

defined its core organization and limited the number of its staff, but provided Perupetro management with resources to contract outside experts and consultants. The financial autonomy of Perupetro is key for the accomplishment of its objectives. It is extremely dangerous to pursue ideas for bringing Perupetro under the control of the public sector budget, as recently proposed during the debate of the law of the annual budget for 1999.

6.9 Perupetro management had the possibility of offering new investors a simplified administrative environment. According to the previous legal/regulatory regime, a draft contract, once negotiated with Petroperu, required approvals from 7 institutions, including bodies belonging to the Ministries of Economy, Energy and Mines, Defense and the Central Bank. To reduce such a long procedure, the new legal/regulatory regime requires approval from only 3 institutions: the Ministries of Economy, of Energy and Mines, and the Central Bank. Efforts have been made to improve communications between these institutions and contracts are negotiated as closely as possible to already approved draft models.

6.10 A policy of advocating that Perupetro is the unique window of communication with other public sector institutions, which deliveries licenses and permits, has been extremely effective in facilitating the daily operation of new investors.

## The Remaining Role of Petroperu

6.11 As part of the public sector there still exist a number of remaining Petroperu business units, awaiting privatization: the Transandean oil pipeline and the Refineries of Talara, Conchán, Iquitos and El Milagro. The number of Petroperu personnel continued to diminish to 1,700 at the end of 1997. It is expected that during the next year the Talara and the Iquitos Refineries will be privatized using operating contracts (renting of the assets and management with associated risk for new investments), whereas the Conchan Refinery will be sold to private operators.

6.12 The privatization of the Transandean pipeline and of the small El Milagro refinery, probably under a concession scheme, will be undertaken thereafter. The reduction of the crude oil output raised a delicate situation, demanding an increase of user tariffs unless new crude oil reserves are connected to the line. Petroperu is actively following the peace process with Ecuador, offering a potential solution to the Ecuadorian oil producers who are waiting for a pipeline connection to reach export markets.

6.13 Petroperu's refinery and wholesale operations have been an important factor in restricting the products price variations while an increasing number of operators entered and competition started to be more effective downstream. In addition, delaying the privatization of these assets and maintaining the operation of Petroperu, which controls nearly 50% of the market, has allowed the government to handle its electoral agenda and avoid market disruptions or excessive margins.

6.14 This was the case of the review by Petroperu's Board of Directors of the company's financial situation at the end of 1997. With the drop in international oil prices,

and considering no adjustment of internal consumer prices, Petroperu was able to project net benefits over 400 million US dollars. The Board considered this situation unacceptable, showing that Petroperu, as the other operators in the market, was not behaving in a competitive manner. This forced Petroperu management to search ways to transfer the drop in international prices to the consumers entering a market agreement with private local retailers ready to carry forward the price decrease. It was only after this that the other market operators were forced to reduce their selling prices.

6.15 There is no tradition in Peru of a regulatory state and INDECOPI (*Instituto de Defensa de la Competencia y de la Propiedad Intelectual*) is still too fragile to ensure a fair level of margins and competition. This is perhaps the most serious gap in the sector reform. INDECOPI has wide responsibilities, does not belong to the energy sector, but has a critical role to play. The problems observed for the transmission to consumer prices of the decrease of international prices oblige the GoP to think about the strengthening of INDECOPI.

6.16 The other remaining tasks to complete the reorganization of the sectoral bodies are:

- Improving the skills and salaries of personnel in the sector and reducing the short term externally funded consultants.
- Publication of statistics and required information to ensure transparency.
- Establishing a mechanism, including adequate institutions, to ensure an effective technology transfer.

6.17 Petroperu will probably end up as a holding company responsible for the administration of rights in other companies (La Pampilla refinery); its assets given under operational contracts (Terminals) and non productive or commercial operations which has not been possible to privatize. Petroperu existence will be conditioned to maintaining a state participation in these kinds of activities.

# 7

# Privatization Mechanisms

7.1 This chapter will attempt to explain the sequence and methodology used to privatize the different assets of Petroperu. Although the process was influenced, to a certain extent, by political considerations, linked with the Peruvian electoral calendar and the oscillations of the administration's popularity, economic efficiency and transparency remained constant factors in selecting the privatization mechanism.

## The Short Term Plan to Restructure Petroperu

7.2 The initial proposition to start up Petroperu's privatization process was to close loss making business units, such as fertilizers and small petrochemical plants, to eliminate excess personnel and to sub-contract service operations as much as possible. The urea-ammonia, the solvents and the carbon black plants were closed in 1991, and a first reduction of personnel, in the order of 20%, took place this same year. In 1990, the number of employees of Petroperu, excluding the subsidiaries was 9,300. After the initial reduction of 1991 and the elimination of business units considered non-essential activities, the number of employees was reduced to less than 6,000. The basic idea was *"to dress the fiancée and to make it look beautiful and slim for its future marriage with private capital"*.

7.3 An important issue has been the smooth conversion of personnel. With the exception of Talara's personnel, there have been no major difficulties in the recycling of Petroperu's personnel into the new private companies or into other sectors of the economy. Petroperu's management worked hard to transfer the drilling and well service activities to private hands, and, in general, for sub-contracting all services as much as possible. In the case of services requiring qualified manpower, Petroperu's management made a serious effort to pass them to the same company's operators, along with the related equipment.

7.4 Afterwards, another important decision was to proceed with the privatization or closing of the four Petroperu subsidiaries, for the following reasons:

- *Petromar,* because of the required solution to the indemnity due to ENRON, the owner of Belco Petroleum;

- *Serpetro,* because of difficult labor problems and poorly maintained offshore rigs inherited from the previous government;
- *Transoceanica,* because marine coastal transportation could be obtained easily under competitive conditions; and
- *Solgas,* because LPG bottling and marketing was considered a private downstream activity outside the core Petroperu business.

7.5 The next serious privatization attempt concerned upstream assets outside of what was considered proven crude oil reserves required for the core company business. These reserves are those of profitable fields in the Talara and Marañón Basins. The core business included the pipeline from the jungle to the Pacific Coast, the Pampilla and Talara Refinery and the wholesale distribution facilities. Other upstream and downstream assets, including smaller reserves or gas condensates, smaller refineries, lubricant plant and the retail outlets were set to be privatized as soon as possible.

7.6 Most of the business units, including the core upstream operations have been sold 100% to private operators. For those downstream core business units (e.g. La Pampilla Refinery), the state has either reserved some shares for itself, of the order of 40%, or is simply keeping 100% ownership, as in the case of the wholesale depots, and selecting a concessionaire. In both cases, the result was has been the transferring of operations to private companies.

## The Privatization of Retail Gasoline Stations

7.7 Selling the gasoline stations and permitting the entrance of majors into the retail business was perhaps the easiest privatization operation. Gasoline stations have real estate value, depend on commercial and financial operations using low skilled personnel and involve low risk capital. The privatization brought interesting lessons regarding the time required for markets to work and to have competition in place.

7.8 In July 1990, there were 1445 retail outlets in Peru; 105 were owned by Petroperu and the rest were in the hands of private owners. Approximately 1185 were gasoline stations and 260 kerosene selling points. In 1996, there were already 2810 retail outlets that with the exception of 7 still belonging to Petroperu, were all in private hands, including more than 500 operated under the names of recognized international companies such as Shell, Mobil, Texaco, Chevron, YPF and Repsol.

7.9 An important driving force behind the increase in the number of retail stations has been the rapid development of the car fleet. According to Ministry of Transportation (MTCVC) estimates, the number of cars has gone from about 500,000 in 1990 to more than 1,300,000 in 1996. The number of vans and buses has also increased dramatically from less than 40,000 in 1990 to more than 70,000 in 1996. The government policy of nearly unrestricted importation of second hand vehicles and low duties has been at the origin of this important change. In spite of higher prices, gasoline and, in particular,

diesel demand has grown at a substantial rate; air quality has deteriorated and traffic congestion in major cities has grown nearly out of control.

7.10 Petroperu's gasoline stations were mostly obtained at the time of the nationalization process of 1968. Out of the 105 retail stations, 85 were gasoline stations, mostly located on excellent city corners or at city gates corresponding to main road exits, and 20 kerosene selling points, located on municipal land that made difficult for them to be transferred to private hands. Only 7 out of the 85 gasoline stations, attached to the Conchán Refinery (2) or on municipal lands in Ica, Cañete, Chincha, Chimbote or at Centromín-Sierra (Central Mining Comp.) operations, were not privatized in the first privatization attempt.

7.11 The selling of these retail businesses has represented a net income of US$ 40 million. It has been the first result of an effective deregulation of retail margins that has opened the door for the entry of larger international companies into the most visible segment of the industry. The newcomers responding to the new policy and to a growing demand have invested an estimate of US$ 250 million in constructing state of the art outlets, improving significantly the infrastructure as well as consumer service. Such movements have prompted a parallel effort from many local independent retailers who have improved also their service, and have been forced to create a consortium to obtain better prices by pooling purchases, offering lower pump prices and, in this way, being able to compete with the large foreign firms.

7.12 Today, gasoline prices have been forgotten as a visible indicator of inflation. Gasoline prices differ from station to station depending on retail and distribution margins. In October 1997, according to price lists published in the local newspapers by the Ministry of Energy and Mines, prices in Lima for regular gasoline 84 RON ranged from 4.66 soles per gallon to 5.30 soles per gallon, and the prices for premium unleaded 97 RON gasoline from 6.80 to 7.49 soles per gallon. The table below indicates the typical motor fuels price range in June 1998.

**Table 7.1: Transport Fuels Prices - June 1998 (US$ per gallon)**

| *Product* | *Mobil* | *Shell* | *Texaco* | *Repsol* | *Independent Retailer* |
|---|---|---|---|---|---|
| Diesel No. 2 | | 1.40 | 1.40 | 1.37 | 1.35 |
| 84 RON Gas | 1.75 | 1.75 | 1.75 | 1.74 | 1.66 |
| 90 RON Gas | 2.14 | 2.14 | 2.12 | 2.09 | 2.02 |
| 95 RON Gas | 2.32 | 2.33 | 2.32 | | 2.12 |
| 97 RON Gas | 2.52 | 2.52 | 2.50 | 2.46 | 2.39 |

7.13 Retail margins have experienced an interesting evolution. In 1992, when the privatization of gas stations was initiated, the retail margin set at Petroperu's outlets was US$ 0.06 per gallon in the case of the regular leaded 84 RON gasoline. This margin, until 1994 when the new privately owned stations started to become visible, remained fairly high with an average of US$ 0.085 per gallon. Since then there has been a certain reorganization of the market based on the fact that Mobil, Repsol and YPF which own approximately 200 gasoline stations have a supply policy related to La Pampilla Refinery where they are co-owners and together with retailers associated with other international brands (Shell, Texaco, Chevron) have been maintaining higher margins. On the other hand, the local independent group has their supply from Petroperu refineries or direct importation and has been able to compete offering prices including lower distribution and retail margins.

## The Privatization of the LPG Business

7.14 The entrance of private investors into the LPG business could be considered a successful operation that responded effectively to a growing market needing a better quality household fuel. Peru has a very low LPG per capita consumption and, on the coast and sierra where most of the population lives, there are no biomass resources. By adjusting LPG taxes gradually towards those on kerosene, the LPG market was allowed to increase rapidly. This policy is in line with longer-term expectations for significant LPG production to be derived from the Aguaytia and Camisea gas condensate fields.

7.15 In 1988, the consumption of LPG amounted to 1.8 million barrels. This year the LPG ex- terminal price was US$ 0.23 per gallon, while the CIF price was US$ 0.58 per gallon. The kerosene was sold in 1988 at a consumer price of US$ 0.12 per gallon and imported at a CIF price of US$0.60 per gallon. This year the consumption of kerosene was 7.8 million barrels. Although both products were heavily subsidized, the LPG supported larger taxes and its supply was constrained by the small refinery production and the reduced capacity of its receiving facilities. Pressures for growth were evident and it was necessary to import LPG at a high cost in small size vessels.

7.16 The privatization of SOLGAS was decided early in the reform process. The 82.2% shares of this subsidiary which were part of Petroperu's patrimony were offered through the stock exchange, and the majority was bought by the Group Gasinter S.A. for an amount of US$ 7.6 million, with an investment projection of an additional US$ 5 million.

7.17 In 1997, the consumption of LPG amounted to 3.4 million barrels. This year the LPG ex- terminal price was US$ 1.01 per gallon, while the CIF price was US$ 0.63 per gallon. The kerosene was sold at a consumer price of US$ 1.04 per gallon and imported at a CIF price of US$ 0.72 per gallon. In 1997, the consumption of kerosene was only 5 million barrels. The growing LPG demand has attracted two other companies to invest in reception and storage facilities: Zeta Gas from Mexico, which has built new installations to handle 140,000 bbls of LPG with an investment of US$ 40 million, and Repsol which took over the ex-Solgas operations and increased La Pampilla Refinery LPG facilities to close to 130,000 bbls, with an investment of US$ 25 million.

7.18 If the LPG production already coming from Aguaytia in the amount of 2,200 b/d is added to the market, it is easy to conclude that competition will increase. A number of small local firms have entered the retail LPG distribution business. Several of them have associated with ELF to develop a new large LPG plant. A Decree facilitating the use of LPG in the transport sector has also been prepared, although the taxation aspects have not yet been considered. It is estimated that 6,000 vehicles are now using LPG.

7.19 These developments call for a review of the existing safety and security regulations to preserve a healthy growth of this business. In future with the Camisea Project and the proposed Santa Cruz - Ilo pipeline that could bring large amounts of Bolivian LPG, the Peruvian market will enjoy large supplies of this product.

## The Privatization of the Lubricants Business

7.20 This privatization followed the opening of the retail business. The lubricant sub-sector has always been a competitive business where private internationally recognized brands competed with the Petroperu oil brands commercialized under the name of Petrolube. In 1990, Petrolube had a 42 % share of the total market. Other important brands were Shell, Castrol, Texaco, Pennzoil and Mobil. The main asset in this business was the lubricant blending plant of a capacity of 1,170 bpd and marketing facilities at the plant located in Lima-Callao.

7.21 The privatization of the plant and of the Petrolube brand name was carried out in 1996. All assets were passed without any investment commitment to Mobil Oil who presented the best offer (US$ 18.89 million).

7.22 In 1997, the Petrolube share was only 22%. Mobil has kept the Petrolube brand in the market. However, it is gradually, as competition allows, trying to transfer Petrolube clients to its own lubricant brand. With the increased number of large private companies in the retail business, the competition in the lube-oil business has significantly increased.

## The Privatization of the Marine Product Transport Business

7.23 The privatization of Transoceanica was also an easy operation to carry out. This subsidiary of Petroperu was in charge of coastal tanker operations, either with its own vessels (4 tankers of 25,000 DWT, two small LPG vessels of 7,000 and 4,500 bbls and lube transporteur of 3,200 bbls) or using contracted vessels.

7.24 Transoceanica privatization was done in 1993 through a bidding contest won by a Peruvian Chilean consortium - Gleopoint Enterprise Inc. - with an offer of US$ 25.2 million.

## The Privatization of Petroperu Upstream Operations

7.25 The first decision made to privatize Petroperu upstream operations was the separation of the fields with proven reserves (offshore operations, Aguaytia field), the known marginal fields, mainly in the Northwest, and the blocks with certain geological prospective where Petroperu did not have enough resources to explore. All these areas were not included in what was considered the core company operation. In each case, a realistic negotiation and, whenever possible, a transparent bidding contest carried out by Petroperu itself, was used for their privatization. Once this first lot of upstream assets was passed to private hands, by mid 1995, the fields that Petroperu kept for its own operations - under fair negotiated contracts with Perupetro - also went into the privatization process, but under different conditions.

7.26 *In the case of the offshore field operated by Petromar Lote Z-2*, after the solution given to the AIG-ENRON-Belco dispute resulting from Alan Garcia's de facto expropriation, the government decided to call a bidding contest in 1993 for their operation. Petrotech S.A. obtained a lease arrangement including a price equivalent to 84% of a basket of international reference crude and accepted a minimum work commitment of 40 development and 3 exploratory wells and to pay a rent of US$ 10 million per year over 20 years for the field installations. One of the interesting issues the new owners had to confront was the elimination of excess personnel this subsidiary of Petroperu had accumulated during the Garcia Government. In 1985, the offshore field produced 27,550 bpd employing 594 workers, in 1988, the production was 23,460 and the number of workers 2,734. Resulting from years of low investments the production before privatization, at the end of 1992, was 15,430 bpd, and the workforce already had been reduced to 1567 employees. At the same time, SERPETRO, the oil service subsidiary of Petroperu, which provided services to Petromar, was closed.

7.27 Another interesting experience was the *privatization of the well service units* that Petroperu operated in the Northwest. Old well service units, including wiring and swabbing units with an average of more than 15 years of use, were transferred part to private local operators and part to the same Petroperu workers, along with a two-year exclusive service contract. Petroperu management played a key role in shaping the workers' initial proposals into a viable commercial venture. An evaluation, two years after of this privatization effort, showed savings for the state in the order of US$ 4 million, including the price paid for the units, the savings in operating costs and the gains in productivity, while the workers had obtained with the exploitation of these assets a return of over 30% of their financial commitment, and more important, continued keeping an industry related job.

7.28 *The operation of the Maquia and Aguas Calientes fields*, plus the gas condensate proven reserves of Aguaytia were contracted by Perupetro in 1994 for operation by The Mapple Gas Corporation, as part of an integrated project, which also included the construction and operation of a 155 MW generation plant with sufficient transmission lines to deliver power to the coast (until Paramonga), and a 20 year concession agreement for the

2,500 barrels per day Pucallpa Refinery, including the river terminal and distribution plant. The exploitation of the gas-condensate and the electricity components has demanded an investment of more than US$ 250 million that The Mapple Gas Corp. has been able to obtain by selling up to 99% of its initial rights to 5 other specialized companies, grouped under The Aguaytia Energy Comp. The Mapple Gas Corp. kept however the 100% rights on the Maquia and Aguas Calientes fields.

7.29 In May 1998, the Aguaytia project went on stream. . With the drilling of 5 wells and the 2 work-overs, required by the existing discovery wells, it has been able to prove reserves 50% in excess of initial reserve estimates and to start delivering 55 mmscfd of gas to the electricity generating plant, and about 2,200 barrels of LPG to be marketed in the region and in the Lima market, and 2,500 barrels of C5+ condensates that are being processed together with crude at the Pucallpa Refinery and marketed in the area. The Mapple Gas Corp, on the other hand, has been able to fulfill on its own its contractual work commitment to be applied in 31-B, 31-C and 31-D, equivalent to US$ 93 million. It now intends to develop an exploratory campaign for potential crude reserves in structures identified below the Aguas Calientes producing reservoirs. Two exploratory wells are planned for the coming months.

7.30 As concerns the negotiations of proven hydrocarbon reserves, Petroperu opened a bidding contest to pass *the exploitation of old onshore fields in the Northwest* to private hands. Five small Peruvian owned companies and SAPET, a subsidiary of the China National Oil Company, have obtained these blocks under a variety of work commitments and rent sharing arrangements. The most significant work commitment obtained for the old onshore blocks came from SAPET including the drilling of 60 wells in a block with a production of less than 1000 bpd. The following Table presents the commitments subscribed by the Peruvian Operators:

**Table 7.2: New Contractors for the Old Northwest Fields**

| *Company* | *Production (Bpd)* | *Work Commitment* | *Initial Company share of Reference Oil Price* |
|---|---|---|---|
| GMP block V, incl. ex-CAVELCAS block I | 900 | 17 wells | 45% to 78% |
| PROPETSA/VISISA/ SERPET block III | 400 | 15 wells | 45% |
| RIO BRAVO in block IV | 700 | 3 wells | 45% |
| UNIPETRO block IX, owned and operated by the University | 500 | 2 wells and 6 studies | 70% to 80% |
| VEGSA block II | 650 | 6 dev. and 2 expl. wells | 30% |

7.31 In addition to the exploitation contract activities in the Northwest outlined above, there have been interesting commitments for exploration in blocks previously owned by Petroperu. For instance, GMP (Graña y Montero Petrolera) took the Carpitas-Zorritos onshore Block for exploration and committed investments of US$ 1.1 million.

7.32 The majority of the small Peruvian contractors that entered in these marginal blocks have not been highly successful. Oil prices have fallen from the US$ 18-20 per bbl range to an average of US$ 15 per bbl and even lower. Moreover, the companies had to execute programs for the mitigation of environmental damage (PAMA) most of it resulting from irresponsible past operations. These companies have been requesting Perupetro an upgrading in their shares of the oil price agreed in their original contracts.

7.33 As concerns the fields with large production, in the Northwest, Petroperu kept the most prolific Block X, with proven reserves of 45 million barrels and a production in the order of 13,500 bpd of sweet crude with API density ranging from 28 to 36 degrees, an excellent quality, as most of the crude oils are in the Talara basin. The operation of this block was proposed in a bidding contest in 1995 that attracted numerous companies. It was Perez Companc, an Argentinean company, who was in the early eighties in charge of executing in the Northwest a World Bank funded service contract for the Laguna Zapotal project who obtained the Block with a bid of US$ 202 million. Production of Block X is now in the order of 15,000 barrels per day. However, Perez Compac has problems to continue operating in the area due to the significant drop of the international oil price.

7.34 Although it was clear to Petroperu management that pre-privatisation investments should be minimized and never involved major capital expenditures, *for the oil fields in the Jungle,* the management decided to develop the latest discovered reserves of the Chambira field, and to proceed with the development drilling of the Pavayacu extension, as a way of increasing proven reserves and obtain production to compensate the increasing importation. Using a credit obtain from the Andean Development Corporation, investments of the order of US$ 40 million were dedicated in 1994 to these activities, which produced an increase of production of more than 7,000 barrels per day.

7.35 In 1995, the GoP also decided to open the Block 8, with 2.2 million hectares, in the Amazonian Jungle for bid tenders. Estimated proven reserves of this block were of the order of 73 million barrels, delivering a production of 24 mbd of crude oils of an API density averaging lower than 25 degrees, in a contract area covering 2.2 million acres in the Marañón Basin. Similarly to Block X in the Northwest, the government offered this block to any qualified company that would assume its operation. An Argentinean/Korean consortium, including Pluspetrol / PEDCO / DAEWOO / YUKONG obtained this contract offering entrance payment of US$ 144.2 million.

7.36 Despite the above mentioned contracts, crude oil production for the entire country has not yet increased significantly. In 1990, the crude oil production was 47 million barrels while in 1997 it was 43.2 million barrels. Gas production was 38.1 mmmcf in 1990 and 35.3 mmmcf in 1996. Without significant additions to reserves, production

cannot be maintained. It will be necessary to wait until the exploitation of the Camisea reserves, expected in the year 2003, to reverse this situation.

7.37 The latest upstream operation that was privatized corresponds to Petroperu's gas plants (Pariñas y Verdún), gas gathering system, liquids storage and connections to customers, plus the electric power system of Talara, consisting of 54 MW Malacas and 12 MW Talara-Verdún generation units. This gas-power system has been sold to The Consorcio Eléctrico Cabo Blanco that paid US$19.7 million for 60% of the system and accepted an investment commitment to add reserves and generation capacity in the amount of US$ 40.0 million. Electroperu kept the remaining 40%.

## The Privatization of the Refineries

7.38 The privatization of key downstream facilities has progressed at a slower pace. The government authorities, based on the experiences in the functioning of markets, in particular of pricing mechanisms, have been cautious. So far, the main assets privatized are La Pampilla Refinery (60% sold), and the wholesale terminals (under operational contracts).

7.39 The privatization of La Pampilla was undertaken after July 1995, when the Fujimori administration was reconfirmed by a large majority of the population. The political debate that preceded the privatization of core assets was particularly strong in relation to refinery's key and their role as part of the country's defense mechanism. It is important to notice that Chile has started to envisage the privatization of the ENAP Refineries only in recent months. The border differences with Ecuador, and the difficult social situation in the Northwest, have further delayed the decision for the privatization of the Talara Refinery.

7.40 La Pampilla Refinery is the largest in the country with a primary distillation capacity of 102,000 bpd, and a small conversion capacity, mainly an 8,500 bpd FCC and a reformer of gasoline of 2,500 bpd. An important asset of this refinery is that it is close to the Lima market. The refinery has submarine lines to receive and export crude oil and black and white products, and has sufficient selling facilities to easily deliver products to this market.

7.41 Only sixty percent of La Pampilla shares were put up for bids. The winner was a Consortium, including Repsol - Spain (50%), YPF - Argentina (25%), Mobil - USA (10%) and local capital, distributed among the engineering/construction firm Graña y Montero S.A. (5%), Banco Wiese ( 5%) and a group called *Fondo de Privatización del Perú* (5%). The consortium paid US$ 180.5 million and committed investment of the order of US$ 50 million over the next five years. Among the conditions made is that the consortium participants had certain limitations on participating in the privatization of the Talara Refinery, and the main products terminal close to El Callao port facilities.

7.42 The privatization of this important refinery has already brought a certain degree of competition into the local crude oil market as well as the wholesale products

market. The integrated Petroperu operation retained most of the heavy crude produced in the Block 1-AB by Occidental for internal consumption. This crude produced a low yield of gasoline and mid-distillates and a large volume (about 70%) of fuel oil. With small conversion units, La Pampilla has started to import lighter crude improving its gasoline and mid-distillates production, and, on the other hand, Perupetro has been able to export the heavy block 1-AB crude at good prices.

7.43 The major investment undertaken by the Consortium has been the increase in the LPG storage facilities. To satisfy the growing demand for higher octane unleaded gasoline the Consortium has been importing MTBE, and is planning the construction of new cracking units as the next important investment. This program will probably exceed the US$ 150 million and take place in the next 3-4 years, allowing a complete phase out of leaded gasoline from the Peruvian market.

7.44 With the operation of La Pampilla by private hands, competition has developed between the Consortium led by Repsol, Petroperu and private importers of specific products. Under these circumstances, it has become possible to advance towards a more complete market deregulation, including the privatization of the wholesale terminals and the rest of refining facilities.

## The Privatization of the Wholesale Terminals and Depots

7.45 To privatize the operation of the terminals the Committee in charge of managing the privatization of Petroperu (CEPRI) has preferred to proceed with long term (15 year) operating contract scheme. It was understood that interested companies should accept the condition not to enter the importation-distribution business and to remain minority upstream, particularly in refining operations in the areas of their influence. The terminals owned by Petroperu were subdivided into three subgroups: the North (Eten, Salaverry, Chimbote y Supe); the Center (Callao and Cerro de Pasco) and the South (Pisco, Mollendo, Ilo, Cuzco y Juliaca).

7.46 For this privatization, a regulated tariff of US$ 0.60 per dispatched barrel was established. Given this regulated tariff, for each group of terminals, interested companies were requested to pay a subscription right of US$ 3 million and to bid the renting fee per dispatched barrel of product, which they will be ready to pay to Petroperu. Further minimum investment commitments were set, equivalent to US$ 5.5 million in the North terminals (in 4 years), to US$ 6.7 million for the South terminals (in 5 years) and to US$ 6.3 million for the Center terminals (in 5 years). As a result of the bidding contest, the state will receive an annual income of approximately US$ 9 million.

7.47 It is important to recognize that during and after the privatization of the key terminals there has not been any interruption in the supply of petroleum products.

7.48 It is important to recognize that a complete deregulation will take place only after the privatization of the Talara Refinery. This action has been deferred for several reasons, including the possible increase of unemployment in Talara and the political

opposition shown to the Fujimori Government by this region at the last elections, severely impacted by El Niño Phenomena

7.49 Petroperu CEPRI has been able to move ahead with important other adjustments in the Petroperu Northwest operations. This includes the passing to private hands the health care operations. The Petroperu hospital has been demolished and the clinic is in process of being transferred to the Ministry of Health, including the personnel. The houses in Punta Arenas - the staff residence quarters- are currently rented to other operators in the area. It is expected that these assets will be sold trough a process that will be managed but a CEPRI-Real Estate who will also take care of the Lima Petroperu's 22 floors headquarters building.

7.50 The following table presents a summary of the privatization methods and the results obtained.

**Table 7.3: Petroperu Privatization - Summary Table**

| *Asset* | *Privatization Method* | *Result* |
|---|---|---|
| ***Production Operations*** | | |
| - ***Northwest onshore*** | | |
| >Small blocks | >Petroperu signed service contracts | >stop production decline |
| >Block X | >Bidding organized by Petroperu, win by Argentinean Consorcio Perez Compac) | >US$ 202 million, and US$ 25 mill on work commitments |
| - ***Northwest offshore*** | | |
| >Petromar - Block Z-2 | >Petroperu contracted to Petrotech (mainly a US independent) | > equiv. to US$ 200 mill + work commitments for US$ 65 mill. |
| >Serpetro | >closed | |
| >Other offshore blocks (Ex. The Corvina Field) | >returned to Perupetro & passed to new contractors (Ex. to Perez Compac) | >exploration efforts, incl. seismic & 6 exploratory wells |
| - ***Northwest facilities*** | | |
| >Well Services | >privatised, some units passed to Workers | >US$ 4 million of cost savings per year |
| >Gas & Power Generation | >privatized 60% to Con. Eléctrico Cabo Blanco | >US$ 19.7 mill. and work commitments of US$ 40 mill |
| >Punta Arenas houses | >to be passed to CEPRI Real Estate | |
| >Medical facilities | >partially demolished and | |

| *Asset* | *Privatization Method* | *Result* |
|---|---|---|
| | others transferred to Health Min. | |
| - ***Jungle Operations*** | | |
| >Block 8 | >sold to Argentinean/Korean Consorcio (oper. Pluspetrol) | >US$ 144.2 mill. and work commitments for USS 25 mill. |
| >Maquía/Aguas Calientes and Aguaytia | >passed to The Mapple Corp as part of the Aguaytia Project | >investments of US$250 million plus exploration for deeper oil reservoirs |
| >Iquitos headquarters | >on sale | |
| ***Refineries & Processing facilities*** | | |
| >La Pampilla Refinery with products terminal | >60% shares sold to Consorcio (operator: Repsol) | >US$ 180.5 million and work commitment of US$ 50 million |
| >Pucallpa Refinery with products terminal | >given in concession to the Mapple Corp as part of the Aguaytia Project. | >upgrade to process condensates. |
| >Iquitos Refinery and products terminal | >to be given in operating contract | |
| >Conchán Refinery and products terminal | >to be privatized 100% | |
| >El Milagro Refinery | >not decided | |
| >Talara Refinery and distribution plant | >to be given in operating contract | |
| >Fertilizers, Solvent, and Negro de Humo Plants | >closed | |
| >Callao Lubricant plant and Petrolube brand | >100% sold to Mobil Oil | >US$ 18.9 million |
| ***Transport facilities*** | | |
| >Transoceanica | >100% sold to Geopoint Enterprise | >US$ 25.2 million |
| >Road trucks | >sold, except five turbo units used at Airport | |
| >Transandean Pipeline | >not decided | |
| ***Wholesale Depots*** | | |

| *Asset* | *Privatization Method* | *Result* |
|---|---|---|
| >Pucallpa | >given in Concession to The Mapple Corp. | |
| >Central Zone (Callao, Cerro de Pasco) | >given in operating contract to Serlipsa Fuel Centre | >US$ 3 mill Subscription, US$ 0.4739/bbl dispatched and US$ 6.3 mill. of invest. committed |
| >North Zone (Eten, Salaverry, Chimbote, Supe) | >given in operating contract to Graña y Montero | > US$ 3 mill Subscription, US$ 0.2784/bbl dispatched and US$ 5.5 mill. of invest. committed |
| >South Zone (Pisco, Mollendo, Ilo, Cuzco, Juliaca) | >given in operating contract to Graña y Montero | > US$ 3 mill Subscription, US$ 0.4567/bbl dispatched and US$ 6.7 mill of invest. committed |
| ***Other assets*** | | |
| >Gasoline Stations | >78 out of 85 have been sold to different retailers | >US$ 40 million |
| >Solgas LPG | >sold 82.2% shares owned by Petroperu to Group Gasinter SA | >US$ 7.6 million with investment commitments for US$ 5 million |
| >Lima headquarters | >to be privatized | |

# 8

# The Camisea Project

## The Project Features

8.1 The Camisea region, located 600 km out of Lima on the east side of the Andes, probably has the largest gas condensate reserves of South America. The volume of proven "in-situ" gas reserves has been estimated between 13.7 and 16.2 trillion cubic feet (TCF), with a liquids content (LPGs and C5+ condensates) estimated at 725 million barrels.

8.2 To obtain a maximum recovery of the liquid fractions, the exploitation of gas condensate fields requires the development of recycling operations, where large volumes of wet gas are produced, the liquids from the wet gas are stripped and the dry gas is compressed and re-injected into the formation. To develop the Camisea Project, investments have to cope with the high capital cost of this field operation and with the construction of pipelines for the gas and the liquids through the Andes Cordillera, down to the markets in the Pacific coast. Estimated investments range between US$ 2,500 million to 4,000 million, including facilities to produce up to 2,000 mscfd of gas, to extract up to 100 thousand barrels per day of liquids, to re-inject in average 1,200 mscfd of dry gas, to transport to and fractionate the liquids on the coast, and to deliver gas to cover the requirements of the initial local market, estimated to grow from 200 to 500 mscfd.

8.3 The Camisea project is critical for the medium and long term future of the Peruvian energy economy, in particular for phasing out the high cost of imported petroleum products, reducing the deficit of electricity, introducing cleaner fuels in urban areas and supporting a new cycle of industrialization based on key industries such as iron and steel and petrochemicals.

## The Negotiation Story

8.4 In July 1981, Petroperu signed with Shell E&P Peru subsidiary two Contracts for Petroleum Operations, considering in kind retribution, for Blocks 38 and 42 located geologically in the Ucayali Basin, in the Southern Amazon Jungle. In accordance with this contract, Shell will receive a share of the petroleum production, in case of commercial exploitation. The total area of the two blocks was nearly 2 million hectares.

8.5 Between 1983 and 1987, Shell executed the agreed work commitments, and drilled 6 exploratory wells discovering the gas condensate fields of San Martín, Cashiriari and Mipaya, in the Camisea region. Phillips was associated with Shell in the original contract but retired after the drilling of the first well, the only dry well of the exploratory campaign.

8.6 In March 1988, in accordance with the Clause 5.10 of the contract related to the discovery of natural gas, Shell and Petroperu signed a Heads of Agreement (*Acuerdo de Bases*). This agreement established the basic terms for the development of an appropriate gas contract, including a basic definition for the industry structure and a calendar of activities to ensure the project implementation and funding. In August 1988, the agreement was abandoned due to the impossibility of continuing the project because of lack of financial resources, especially those that would have to be obtained by the Peruvian side for the construction of the pipelines. At this time, Peru was in default with the IMF and practically had no access to international financial sources.

8.7 Some attempts to establish new contacts with Shell were made by the Fujimori Administration in 1991-1992. It was only in March 1994 and after nearly 6 years of having the area abandoned with Shell claiming rights over the discovered reserves that the GoP accepted the signature between Perupetro and Shell of an Agreement for Evaluating the Project with the duration of 21 months. According to this new agreement Shell Internationale Petroleum Maatdchappij B.V. will reevaluate the commercial viability of the exploitation of the San Martín, Cashiriari and Mipaya fields. Subsequently in May 1995, Shell presented a feasibility study and request Perupetro to start negotiations for a formal development contract. The GoP accepted the study and the negotiations were again opened.

## The New Deal Signed in 1996, and Its 3 Phases

8.8 A year later, in May 1996, a new License Contract for the exploitation of Blocks 88A and 88B was signed between Perupetro and the Consortium Shell (57.5%) and Mobil (42.5%). These Blocks comprised only the surface of the proven gas condensate fields ands a small security area. The main purpose of this contract was the production of natural gas, the processing "in-situ" and the separation of liquid hydrocarbon, the transportation of gas and liquids to the Central Coast through two lines over approximately 600 km and the fractionation of the liquids in this region. The contract term was set at 40 years divided into three phases.

- *First phase:* of two years for appraisal of reserves and markets, including guaranteed investment commitments of US$ 19.5 million to be dedicated to the drilling of 3 confirmatory wells, the reprocessing of 250 km of seismic lines, geological studies, health, environmental and logistic studies, and basic engineering studies. This phase was executed with a 60 days extension requested by the Consortium and granted based on the contract terms.

- *Second phase:* for four years for the construction of the project facilities, in particular the cycling installations in the Camisea region, the pipelines to the coast for the gas and liquids and the fractionating of condensates. This phase was expected to be implemented under a guaranteed deposit of US$ 79.5 million. Unexpectedly, the Consortium in July 1998 decided not to enter this second phase.
- *Third phase:* considered the commercial production of gas and liquids to be undertaken by the Consortium and the corresponding payment of a variable royalty, ranged between 17% to 47% of the realized price, after deduction of transport costs, depending on the "R factor", the ratio between accumulated income and expenses. The possibility of developing exports to Brazil was considered under separate unspecified conditions provided Perupetro acceptance. It was considered that this would be done taking advantage of the new Bolivia-Brazil gas pipeline.

8.9 In addition to short term repercussion, the Camisea Project is of critical importance for ensuring the country's energy economy in the medium and long term. It is therefore important, now that the Shell-Mobil Consortium has abandoned the contract, to reassess the project viability, starting by carrying out a detailed analysis of the reasons for such a decision. It seems that the Consortium was considering the impact of a lower international oil price scenario on the project profitability and requested certain decisions from the GoP to reduce project risks, beyond the agreed terms of the 1996 contract, in particular:

- the development under its control of the gas distribution business of Lima.
- a change in the electric tariff policy.
- definitions regarding the possibility of exporting gas to Brazil.

8.10 The Shell-Mobil Consortium had control of the gas production and transportation, in accordance with the signed contract, but the regulatory framework issued in 1993 does not allow it to enter the gas distribution business. This regulations is clear in restricting the possibility of having complete control over the supply chain and calls for granting to third parties concessions for the distribution of gas. The change of the electricity tariff system also required modifications in the regulatory framework of this sub-sector issued in 1992. The exportation to Brazil was considered in the contract as an issue to be decided during the third phase of the contract, at the time an export contract scheme will become a feasible project.

8.11 The failure in the implementation of this contract has left the GoP with a serious challenge to obtain urgent investments to confront the growing energy consumption. Currently, the hydrocarbon production is of 116 thousand barrels of crude oil and of 90 million cubic feet of gas. Such a declining production is insufficient to cover the demand.

The deficit of the hydrocarbons commercial balance was US$ 424 million in 1997. In the period January - May 1998, it was US$ 118 million, lower than expected due to the economic recession caused this semester by El Niño phenomena on the fishing and agriculture sectors.

8.12 One of the key objectives to be achieved with the development of Camisea is the reduction of the electricity cost. Peru has an electricity system based up to 85% on quite irregular hydro electricity supply. Much of the new power demand has started to be covered by the development of thermal generation, using more costly imported liquid fuels. About 8 to 10 thousand barrels per day of diesel are currently imported to generate electricity. The deficit of electricity, noticeable in the Central and Southern markets where the mining sector is receiving large foreign investments, will be cheaper and more efficient combined Cycle Generation Units.

8.13 Several issues have to be taken carefully considered for designing a new strategy to obtain the required investments. Among others, the following considerations appear to be of critical importance:

- the reduction of the transport cost, possible by obtaining long term financing in best possible terms for the pipelines;
- the potential state participation, if the project viability so requires;
- the consideration of environmental and social impacts of the project and the need to devise adequate regulations for its construction and operation;
- the preparation of a transparent international bidding contest, separating probably the project components: upstream, transport and gas distribution taking into account their different risks and expected capital returns;
- the consideration of export markets up-front;
- the redefinition of the rent sharing mechanism, in terms different than the "R factor" that will also simplify the supervision of the project construction and operation.

8.14 In the formulation of the new strategy for the development of this key energy project, there is a possible large role to be fulfilled by the multilateral agencies. Associated through most of the reform and privatization processes that have been taking place in Peru and in other countries of the region, these institutions have accumulated experience in providing technical assistance to governments in important issues to be addressed for the development of gas projects. Further they could fund the state participate for instance in the pipelines.

# 9

# Developing Environmental and Social Regulations

## The Legal and Regulatory Framework

9.1 In 1990, the Peruvian Government started a process of change related to environmental regulations. The new government role in the productive sectors where state enterprises were dismantled because of the privatization program, prompted the formulation and implementation of a new environmental regulatory framework. The first task was to prepare and issue realistic regulations and procedures for preparing and reviewing Environmental Impact Assessments (EIA) for new and old industry operations, and for the supervision of agreed implementation plans.

9.2 In September 1990, an Environmental and Natural Resources Code (DL No. 613) was issued which complements the Law for the Promotion of Private Investments (DL No. 757) in setting the basic state policy in relation to the protection of the environment and the exploitation of natural resources. The Code is essentially a statutory document based on the general principles of sustainable development. The Government has created the *Consejo Nacional de Medio Ambiente* (CONAM) to coordinate at the national level the environmental policy and its application in the different sectors.

9.3 The Law for practical purposes defines, however, as "competent authority" the Ministry of each sector who will be responsible for determining the activities which present an environmental risk and which could exceed tolerable levels, standards of pollution. In the case of the petroleum and gas industry, the competent authority is the *Dirección General de Asuntos Ambientales* (DGAA) who will also approve the Environmental Impact Assessments (EIA) of all sector projects. However, who has the contact and signs the approval of the EIA is the *Dirección General de Hidrocarburos* (DGH). The Article No. 87 of the Hydrocarbons Law (Law No. 26221), refers to a precise "regulation" applicable to the petroleum and gas activities. This basic industry regulation was issued in November 1993 by DS No. 046-93-EM.

## The Case of New Projects or New Operations

9.4 To undertake any significant project, companies are requested to present an EIA to the competent authority, carried out by a qualified registered company. The *Dirección General de Asuntos Ambientales* (DGAA) of the Ministry of Energy and Mines qualifies and registers the companies that could undertake EIA in the sector.

9.5 The EIA should include:

- an environmental baseline study;
- a description of the project;
- an evaluation of the direct and indirect impact on the physical and social environment over the short and long term;
- a detailed Environmental Management Plan which will ensure that the impact of the project execution is within acceptable limits;
- a plan for abandoning and/or decommissioning operations in the area.

9.6 The EIA should be approved by the DGH with a positive opinion of the DGAA within 45 days. During this period, the DGH will hold public hearings on the project EIA and will provide comments to the Environmental Management Plan, if so required. Such comments should be incorporated in the EIA of the project.

9.7 In order to enforce this new legal framework that the Government formulated the Law for Supervision *(Fiscalización)* and enforcement of regulations. The Law No. 25763 issued in October 1992 allowed the Ministry of Energy and Mines to supervise the industry operations through third parties, thus enhancing the capacity of the Ministry to effectively perform this task. Initially this task was entrusted to the DGH, but since 1997, the supervision responsibilities have been transferred to OSINERG.

## The Case of Existing Operations

9.8 The Supreme Decree No 046-93-EM included some transitory clauses according to which all companies who had on-going operations at the time this SD was issued - November 1993 - were obliged to present within the next 18 months a *Programa de Adecuación y Manejo Ambiental* (PAMA) for each one of its operations. The implementation of the PAMA (monitoring, calendar of investments etc.) required an agreement with the DGH that could not exceed 7 years. Both private operators and Petroperu had to prepare and implement PAMAs.

9.9 The key concept for the privatization of Petroperu assets was that new investors would have to take care of cleaning the environment and the required investments for the adaptation of facilities to the new environmental regulations. To this end, Petroperu, in accordance with the law, prepared the PAMAs for all its business units and started the execution of the agreed implementation plans. If privatization of a specific asset took place

in the meantime, responsibilities were transferred to the new owners. In practice, approved PAMAs become a protecting document for all parties involved in the privatization process. In particular, investors were assured that the execution of the PAMA allow them to meet the environmental regulations and required industry standards of the facilities they were purchasing.

9.10 As part of the privatization process, a study on the required investments to upgrade Petroperu facilities was undertaken. This study was contracted with Gulf Interstate Engineering Co. from Houston, USA and was delivered in June 1994, providing abundant information on the necessary environmental actions to comply with the new regulatory framework. Furthermore, Petroperu contracted four qualified local companies for the preparation of the PAMAs of all facilities involved in the privatization program. Finally, complying with a requirement of the regulations, the PAMAs were audited in September 1994 by an independent auditing company, Komex International Ltd. from Calgary, Canada, and were presented to the DGH for approval in December 1994.

9.11 The total number of PAMAs prepared by Petroperu Management has been 35. The table includes the initial amount of required investments estimated for clearly identified actions. PAMAs also considered the need for certain studies, which could lead to additional investments. Contingencies are not included in the table below.

**Table 9.1: Petroperu – "Programas de Adecuación y Manejo Ambiental" Estimated Budget (1 US$ = 2.19 S/.)**

| | *Thousand Soles* |
|---|---|
| Block X – Talara | 3,270 |
| Block 8 – Jungle | 6,558 |
| Natural Gas Plant ONO | 3,683 |
| Power Generation ONO | 893 |
| Oleoducto Nor Peruano | 1,950 |
| Refinery Talara | 7,983 |
| Refinery La Pampilla | 10,036 |
| Refinery Conchán | 970 |
| Refinery Iquitos | 538 |
| Terminal Salaverry | 657 |
| Terminal Callao | 643 |
| Terminal Mollendo | 594 |
| Other facilities | 3,675 |
| TOTAL | 41,450 |

9.12 According to the estimates presented in the above table, extracted from Petroperu reports of March 1995, the investments required to address the environmental damage and upgrade Petroperu facilities did not exceed US$ 20 million. The main components refer to the adaptation of operations in the jungle fields, where depleted high water ratio reservoirs continue producing; and from the old refineries, poorly maintained and in need of new investments to produce cleaner products for an open importation market.

## Emerging Social Issues

9.13 Article No 12 of the key environmental protection regulation (SD No. 046-93-EM) states that any project affecting native communities should include in its EIA the necessary measures to prevent, minimize or eliminate negative social, cultural, economic and health impacts. Following this article, companies have included social assessments and undertaken socio-economic development plans with a different emphasis, to compensate the native communities living in contract areas.

9.14 In recent years, indigenous peoples have experienced a growing awareness of their human and social rights. They have established better coordinated organizations to participate in consultations with new companies, negotiate fair compensation and ensure their participation in the monitoring mechanisms of environmental regulations. Moreover, companies and indigenous peoples are requesting the Government to provide an effective interpretation of ILO Convention 169 and its application to industry operations.

9.15 Following the success of the new petroleum law, exploration has moved to more environmentally and socially sensitive regions, especially in the central and southern Amazonian areas, around the Camisea discoveries and towards the border of Bolivia. The companies involved have made significant efforts to minimize damage to the fauna and flora and to enter acceptable relations with the native communities in this part of the territory. However, not all companies have followed the same behavior and no minimal standards are imposed. Rights and obligations of the parties -state, native communities, and oil companies- remain in this respect without precise definitions.

9.16 The experience of the 1984 initial entrance to the Camisea region has been a very costly lesson that has shaped the future industry behavior vis-à-vis indigenous peoples. This experience is derived from the first contact between the personnel of seismic crews and other "colonos" with the low-immunity not-contacted indigenous population that resulted in serious health damage. Consultation has became practically the rule, and certain companies that proceeded to enter indigenous peoples' lands without consultation have experienced problems (i.e. the case of Arco in a Block close to the border with Ecuador, where it is believed that the community was already predispose against the industry operations).

9.17 The problem therefore that the Peruvian Government is now facing is how to respond -in a systematic and flexible way: with regulations and institutions which will

allow companies to operate efficiently in lands of indigenous peoples, taking care of their cultural, social and economic interests. This is clearly an empty spot in the regulatory framework where there is a lack of very precise, minimal, practical rules acceptable to all.

9.18 The economic development of the native populations concerns all sectors of the economy, although in certain areas of the Amazonian Jungle, petroleum operations are the key economic activity. At the national level, the new Ministry for the Promotion of Women and Human Development (PROMUDEH) has opened a dialogue with all indigenous communities, aiming at preparing a national action plan and possibly a new indigenous law. It is within this overall framework that Perupetro and the DGH are ready to initiate a tripartite negotiation to develop a new regulation to deal with the oil and gas operations in the lands of indigenous peoples.

## Improving Fuels and Urban Air Quality

9.19 The economic recovery, which began in 1992, has brought rapid motorization, facilitated by the unrestricted importation of secondhand vehicles. This has resulted in greater traffic congestion and significant deterioration of urban air quality. The government's policy agenda, hitherto focused on ensuring the peace process and the economic growth, is starting to include new priorities, among them the environment in general, and the improvement of air quality in Lima and other major cities in particular.

9.20 With the participation of major stakeholders from the public and private sectors, a Steering Committee was established in May 1997 to prepare a Program for the Improvement of Air Quality and the Elimination of Lead from Gasoline. Currently there are no air quality standards in Peru, nor a program for controlling vehicle emissions.

9.21 There is no system in Peru for monitoring air quality in the major cities. Only since 1988 has the Environmental Health Direction from the Health Ministry (DIGESA - *Dirección General de Salud Ambiental*) been measuring total suspended particles (TSP), concentrations of carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen oxides ($NO_x$) and heavy metals in two specific locations in downtown Lima - CONACO and DIGESA - with the following results:

- CO measurements (average 8 hr.) in selected points with high traffic congestion have shown levels between 18 and 25 ppm; while maximum accepted levels according to the WHO should be lower than 9 ppm.
- Average measurements for TSP, recorded in the CONACO station in 1996, were between 249 and 342 microgram/$m^3$ while the maximum annual average should not exceed 100 microgram/$m^3$.
- $SO_2$ measurements in the CONACO station are closed to the permissible maximum limit: 0.061 ppm average for 24 hr. versus 0.06 ppm of recommended limit.

- $NO_x$ measurements have shown growing values, currently in the order of 116 microgram/$m^3$ (24 hr. average) while the accepted maximum yearly average should be 50 microgram/$m^3$.
- Lead content in the air has been measured in the two monitoring stations giving values for some months as high as 1.12 microgram/$m^3$, with an average in the order of 0.418 microgram/$m^3$ (24 hr. average); while in this case the recommended WHO limit should not exceed 0.5 microgram/$m^3$.

9.22 Gasoline and diesel cover practically all motor fuel requirements; LPG has still a limited use in this sector. The following table presents the consumption of gasoline. As it is shown, the gasoline that is consumed more is the regular leaded 84 RON, a gasoline that does not meet the octane and other specifications required to fuel modern cars.

**Table 9.2: Gasoline Demand from 1990 to 1997 - Shares of Leaded and Unleaded Grades**

| | *1990* | *1993* | *1995* | *1997* |
|---|---|---|---|---|
| 97 RON – Unleaded | 0 | 76 | 855 | 946 |
| 95 RON – Leaded | 1136 | 919 | 577 | 611 |
| 90 RON – Unleaded | 0 | 564 | 1189 | 2199 |
| 84 RON – Leaded | 8242 | 7629 | 7533 | 6402 |
| TOTAL | 9418 | 9188 | 9977 | 10158 |
| Share of leaded gasoline | 100% | 93% | 79% | 69% |
| Share of unleaded gasoline | 0% | 7% | 21% | 31% |
| Diesel No. 2 | 11367 | 14077 | 18986 | 19543 |

The table shows that the share of leaded gasoline has gradually diminished. It is expected that this trend will continue when the new measures -explained in the paragraphs below- are applied. Another interesting fact is that the considerable increase of the car fleet has not translated into a similar increase of gasoline consumption, due to the strong "dieselization" of the fleet.

9.23 The multisectorial Steering Committee, after consultation with major stakeholders, prepared a Supreme Decree that was issued on July 13, 1998, eliminating the use of the leaded 95 RON gasoline and phasing out the amount of lead added to the 84 RON: from current 1.16 to 0.84 gms of Pb per liter. Subsequently, the accepted lead content should be reduced to 0.14 gms of Pb per liter on 1 July 2003 and completely eliminated on 31 December 2004.

9.24 This Supreme Decree (SD) established a grace period of 90 days for the competent authorities to issue: (i) a new set of petroleum product specifications, (ii) a national air quality standard for the first time with precise limits on known pollutants, including the monitoring procedures; and (iii) limits on emissions from vehicles used in transportation. Another SD issued on July 1998 raised to the same level the ISC applied to new and second hand imported vehicles, eliminating the advantage of the latter.

9.25 Petroperu and later Repsol have decided to maintain a lead-free 95 RON gasoline, keeping the number of octane grades in the market up to 4. It is expected that the new set of petroleum products specifications will provide for a rationalization of the number of grades. A priori, two or maximum three grades seem sufficient. The rationalization effort should be also pursued in the elimination of second hand imported vehicles many of them entering the car fleet unable to satisfy appropriate emission standards.

9.26 All these regulations are essential to improve urban air quality. Moreover, the new petroleum product standards will be a critical input for the privatization process of the Talara and Conchán Refineries. Some gasoline specifications - RVP and aromatics content as well as octane grades - and some diesel specifications - in particular, sulfur content - need to be updated in line with regional trends. The DGH in collaboration with INDECOPI is considering to use a proposed set of specifications proposed for harmonizing the quality of petroleum products throughout Latin America.

## Creating Government Capacity to Enforce the New Regulations

9.27 The sector reform has demanded an important effort to create the basic regulatory framework. To enforce it and continue adapting it to the evolution of the fuel production and consumption pattern, and to more stringent environmental standards, the Peruvian Government will have to continue making substantial efforts to build institutional capacity. In particular, it will have to contract and train skilled personnel, and invest in keeping up with the path of technology improvements. The imminent addition of natural gas and significant amounts of LPG requires a continuous updating of industry standards and regulations.

9.28 The industry, now largely in the hands of the private sector, requires a state-of-the art regulatory system able to provide a level playing field that would make possible healthy market competition. The execution of more complicated projects and the follow-up of accumulated expenses required for the evaluation of royalties based on the R factor, will demand to improve the technical and economic knowledge on the side of the regulatory sectoral bodies.

9.29 Further, there is a need to rapidly improve standards to protect the environment and respond to social concerns of indigenous peoples. However, as this section of the report has described, most of the concerns are already well stated and processes to achieve adequate regulatory responses are underway.

9.30 To address these issues, specially the required gas technology, the GoP has given thought to the idea of establishing an independent National Institute for Petroleum and Natural Gas, as a way of creating a technology transfer center that will upgrade current university levels and at the same time could channel private sector support in larger amounts while becoming an autonomous institution. The idea is worth pursuing.

# 10

# Managing the Process of Reform

## The Institutions: COPRI and CEPRI

10.1 As it has taken place, the reform and privatization of the Peruvian petroleum sector could be seen as a transformation that has gone in several phases: starting with the downsizing of Petroperu operations, the setting of the new legal and regulatory framework, the decision on the industry restructuring, the corporatisation and commercialization of operation responding to the open market and price deregulation policy and finally the privatization of assets under different modalities.

10.2 To handle this process a team with a clear vision has been in place. The transformation has been managed by the Commission for Promotion of Private Investments (COPRI) set up in accordance with the Legislative Decree of September 1991 to design and oversee the sale of state companies. This Commission reported directly to the President. It in turn has set up several special committees, known as CEPRIs, to promote the sale of individual companies or groups. In May 22, 1992, the Petroperu CEPRI was established by Supreme Resolution N° 291-92-PCM. The Petroperu CEPRI has been advised on financial matters by Merrill Lynch and local investment bank Prisma Inversiones & Finanzas. Arthur Andersen and other firms have provided financial and management advice.

10.3 Together with the market studies and the consolidation of viable business units, privatization in the case of the petroleum sector has to evolve in parallel with favorable political conditions. It took nearly three years to get the sectorial law approved in Parliament and to complete the downsizing of Petroperu. The debate on the new industry structure overlapped with the electoral campaign for the July 1995 change of government. Hence, the Fujimori Administration, seeking re-election, slowed down the privatization process. Indeed, the first important assets, part of the core Petroperu operation, were privatized only in 1996.

10.4 One of the central concerns in managing the process has been transparency. According to the overall law on promotion of private investments, the sales of assets belonging to the State should be done by an open public process, either as a sale of shares in the stock exchange or through a public and, if required, international bidding process. A

sole exception exists in cases where part of these assets are sold with the approval of COPRI directly to workers, or users of public services, or clients of financial institutions, as a way of developing the local capital market. This modality was used for several well service units, and other smaller Petroperu assets.

10.5 It is interesting to note that the management of the process has changed hands several times. In the first step, the preparation of the Law was done by a team of policy advisers close to the Ministry while the operation of Petroperu, together with the downsizing of the company, including the privatisation of subsidiaries, was undertaken by another team. The team close to the Minister moved as the second step to form the core of Perupetro's management group. Subsequently, because of its opposition to the selected disintegration option for the restructuring of Petroperu, the team in charge of the operations of the company was replaced by a new group of sector outsiders made responsible for proceeding with the privatization. The Chairman of the Board of Petroperu became the President of Petroperu's CEPRI.

10.6 The process was open and widely announced in the press. Relations with potential investors were kept at different levels to mitigate fears of lack of buyers for specific assets, and to shape conditions and expectations to market realities. Learning from the failure of the privatization of the Conchán Refinery, reform was carried out up-front. Transition periods have proceeded without provoking any supply disruption.

## Performance Indicators

10.7 To evaluate the progress made with the sector reform, it is important to set performance indicators that will qualitatively and, if possible, quantitatively measure the progress in relation to the following concepts:

a. in generating an enabling environment and in reducing risk factors for private investors, so that the sector's demand and supply balance starts to achieve a favorable surplus;

b. in establishing the sector's financial viability, based on a larger number of new private companies entering upstream and downstream outside of public resource support, and generating enough taxes and royalties;

c. in delivering better quality products at lower consumer prices, resulting from increasing industry segments operating under open and competitive conditions;

d. in protecting the environment;

e. in building adequate skills and institutional capacity in the government agencies to perform their new roles.

10.8 The reform and privatization process conducted by the Petroperu's CEPRI has not been completed, but so far it is possible to see that significant progress has been accomplished in relation to most of the above indicated criteria. The process has reached

however a point of no-return, There is a large private presence exercising a strong pressure on the GoP to continue with the privatization of the remaining assets still under Petroperu's control. Once the privatization of the Talara Refinery is achieved, the possibilities for state intervention in the wholesale products market will completely disappear.

10.9 Compared with the situation in 1990, it is possible now to invest both upstream and downstream in the Peruvian oil industry. In spite of the low crude oil price scenario, important companies continue entering, under transparent negotiations or bidding processes, into exploration ventures. There are practically few areas available. Perupetro has successfully achieved a high level of investment commitments. In the downstream, the number of retail stations has doubled, as has the number of LPG suppliers, improving significantly the consumer service quality.

10.10 A basic issue in measuring the path of reform is the sector institutional responsibility in establishing a level playing field and in eliminating subsidies and price controls. This is certainly already the case in Peru. At the ex-refinery level, domestic prices compare with international prices and Petroperu although still controls nearly half of the wholesale market, there is no evidence of any special protection for its operations.

10.11 Regulated activities have been reduced to the minimum required: depots, jungle refineries or key pipelines. The same concepts are being pursued in the setting up of the gas industry. Gas prices are expected to be related to those of competing fuels without tax differences.

10.12 An issue that has started to gain importance is the protection of the environment, and the capacity of the government bodies to ensure supervision and control in the implementation of the sector laws and regulations. It is only recently that efforts are being undertaken to phase out lead from gasoline and review technical fuel specifications. Also, emerging social issues related with the operation of industry in indigenous people's lands are starting to receive government attention and, as a result, regulation is expected to be developed by stakeholders' consensus.

10.13 In general, to modernize the State and attract investments, a new legal labor regime was issued, eliminating those costly benefits, which precluded the creation of new jobs, such as labor stability obtained after 3 months of work for the same enterprise. With the development of the sector and the new laws, the number of jobs created are by far superior to the posts available in the sector before the reform. The new gasoline stations, LPG retailers and exploration companies have created a great number of jobs. Where problems remain is in the Talara area where production is declining and investments are delayed, especially with dropping oil prices.

# 11

# Medium Term Outlook

11.1 This section makes extensive use of information prepared by the *Dirección General de Hidrocarburos* for the indicative medium term plan for the oil and gas sector. It shows a conservative projection of the oil and gas demand from 1997 to the year 2007. It will examine the result of the current investment effort in terms of additional production to meet the estimated demand and to improve the contribution of the sector to the country's balance of payments. The scenario examined considers as the starting date for the Camisea Project the year 2003.

## The Demand Projection

11.2 The main assumptions used for the projection of the petroleum product demand are the following:

- Economic growth: GDP is expected to grow at an average annual rate of 5% until the year 2000 and then at a rate of 4% only.
- Population growth: The annual rate of growth will decline over the ten year period from 1.8% to 1.5%.
- Car fleet: The rate of growth of the car fleet is expected to fall substantially from 7-8% at the beginning of the period to 3% at the end.
- Inflation and product prices: The inflation rate is assumed to decline, responding to the continuation of the current economic policy. However, petroleum product prices are expected to remain at the same level in real terms.
- Product quality: With the exception of the phasing out of lead in the 84 RON gasoline, no major improvements are expected during the projection period.

11.3 With the exception of Camisea, whose impact will be analyzed below in more detail, the only important energy project that will be brought on stream during the period 1997 - 2007 is Aguaytia. This project will produce gas that will substitute diesel for

power generation in the beginning at a rate of 2.5 mbd while the Aguaytia Power Plant is operated in semi-base, and later at a rate of 5 mbd when it is operated in base. The replacement of diesel used for industry in Pucallpa will amount only to 0.2 mbd.

11.4 The following table presents the estimated demand for petroleum products for the years 1998, 2001, 2004 and 2007.

**Table 11.1: Petroleum Demand Projection – (without the Camisea Project) (mbd = thousand barrels per day)**

| | *1998* | *2001* | *2004* | *2007* |
|---|---|---|---|---|
| LPG | 11.09 | 13.36 | 15.39 | 17.46 |
| Gasoline | 28.67 | 33.52 | 37.74 | 41.95 |
| Diesel | 57.95 | 65.33 | 75.08 | 84.12 |
| Kerosene | 13.20 | 12.63 | 12.21 | 11.80 |
| Turbo | 10.57 | 13.19 | 15.65 | 18.22 |
| Fuel oil | 32.41 | 34.43 | 36.82 | 39.32 |
| Other Products | 4.26 | 4.89 | 5.45 | 6.00 |
| TOTAL | 158.16 | 177.35 | 198.34 | 218.86 |

11.5 It is interesting to note that:

- the structure of demand will continue showing a greater share of white products, in particular diesel and LPG;
- the demand for LPG will continue to grow in the household sector, while the consumption of kerosene is expected to diminish;
- the demand for diesel will experience a very strong growth, especially in transportation, due to the favorable taxation diesel transport users have with respect to gasoline transport users.

## The Impact of the Camisea Project

11.6 To evaluate the impact of the Camisea Project in the medium term projections of the energy sector, it will be considered that following an international bidding contest undertaken in 1999, the construction of the project is successfully launched in 2000, and the project comes on stream in the year 2003.

11.7 The Camisea project will produce LPGs and C5+ condensates that will increase the production of crude oil. On the other hand, it will produce natural gas that will be used in power generation, replacing first diesel and fuel oil in the existing thermal power generation units and then directly supply combined cycle generation units, as well as in industrial applications. The penetration of gas will be a gradual process. For the considered scenario the following assumptions have been made:

- *Power Sector* - Currently, the Thermal Power Plants of Ventanilla and Santa Rosa have a combined generation capacity of 782 MW and are expected to be operating in base at 70% of their efficiency consuming approximately 25 mbd of diesel, equivalent to 147 mscfd. Further, the demand of the interconnected North Central Power System is expected to increase requiring the construction of an additional unit of at least 300 MW that will operate in semi-base in its year of commissioning 2003, and in base from 2004, consuming natural gas in the amount of 37.5 mscfd in 2003 and of 57.8 mscfd from the year 2004. Another unit of 300 MW will be required by the year 2007.

- *Industrial and Residential Sector* - According to the configuration of the project proposed by the Shell-Mobil Consortium, gas will arrive at the coast at Pisco and will be initially transported to Lima. The volumes of petroleum products that could be substituted by gas in the industrial and residential sector are estimated as follows:

  (i) Fuel Oil: 6.6 mbd for 2003, increasing to 7.2 mbd the year 2007;

  (ii) Diesel: 2.5 mbd for 2003, increasing to 2.8 mbd the year 2007, and

  (iii)LPG and kerosene: 2.4 mbd for 2003, increasing to 2.6 mbd for the year 2007.

  (iv)In addition, coal used for the production of cement could be replaced by gas in the amounts of 13.5 mscfd in the year 2003, increasing to 15.4 mscfd the year 2007.

11.8 The total impact of the gas produced by Camisea Project, according to the above estimates, will gradually increase from 267.9 mscfd in the year 2003 to nearly 500 mscfd by the year 2007 (approximately 70% for power generation and 30% for industry and other uses). The following table presents the projection of demand for petroleum products considering the effect of having the Camisea Project on stream from the year 2003.

**Table 11.2: Petroleum Demand Projection, with the Camisea Project Onstream the Year 2003 (Mbd = thousand barrels per day)**

| | *1998* | *2001* | *2004* | *2007* |
|---|---|---|---|---|
| LPG | 11.09 | 13.36 | 13.97 | 15.86 |
| Gasoline | 28.67 | 33.52 | 37.74 | 41.95 |
| Diesel | 57.95 | 65.33 | 48.05 | 56.83 |
| Kerosene | 13.20 | 12.63 | 11.21 | 10.83 |
| Turbo | 10.57 | 13.19 | 15.65 | 18.22 |
| Fuel oil | 32.41 | 34.43 | 30.06 | 32.10 |
| Other Products | 4.26 | 4.89 | 5.45 | 6.00 |
| TOTAL | 158.16 | 177.35 | 162.13 | 181.78 |

## The Projected Crude Oil and Condensates Production

11.9 In December 1997, the proven crude oil reserves totaled 316.5 million barrels, including the Talara onshore and offshore production blocks and the Block 1AB (Marañon Basin) and Block 31 (Ucayali Basin) in production in the Jungle. The production of crude oil and the liquids extracted from the associated gas produced from these reserves are expected to continue declining from approximately 120 mbd to 70 mbd by the year 2007.

11.10 The LPG and condensates produced by the Aguaytia project will make a small contribution. In addition, we should have to consider the production of LPG and condensates from the Camisea project and the results of the exploration in new Blocks. According to the most conservative scenario of the possible liquid production from the Camisea fields, the volume of liquids will be 70,000 barrels per day; the average scenario considers a production of 100,000 barrels per day. For this projection, a conservative figure of 70,000 bpd will be used.

11.11 To estimate the ongoing exploratory efforts, the following assumptions are made:

- The total investment to be committed in exploration is expected to be nearly US$ 3.5 billion. The total kilometers of seismic lines that will be achieved during the next ten years is estimated at 61,440 and the number of exploratory wells to be drilled is estimated at 143 wells (112 wells in the Jungle, at 15 offshore and at 16 onshore in the Northwest).
- This assumption is based on the work commitments made by private contractors in their license agreements with Perupetro corrected by a significant contractor's early retirement factor. According to past experience

nearly 55% of the initially agreed exploratory wells are not executed because of negative results of the geophysics studies.

- No major discoveries of crude oil or natural gas are made. The success ratio applied is 15% and the size of the average discovery is estimated at only 40 million barrels.
- No enhanced oil recovery projects are considered to add reserves.
- The volume of proven reserves from old fields will decline as a result of daily production from 294 million barrels to 152 million barrels by the year 2007. The contribution of the new discoveries will reverse this trend. The new discoveries are estimated to prove 1120 million barrels.

**Table 11.3: Projected Exploratory Investments and Estimated Results**

| | *1998* | *1999* | *2000* | *2001* | *2002* | *2003* | *2004* | *2005* | *2006* | *2007* |
|---|---|---|---|---|---|---|---|---|---|---|
| Investments in Exploration *(mills US$)* | 382 | 311 | 308 | 586 | 613 | 450 | 290 | 250 | 145 | 140 |
| Sysmique lines *(thousand km)* | 8.2 | 11.14 | 10.80 | 8.55 | 5.25 | 5.00 | 5.00 | 5.00 | 2.50 | |
| Exploratory wells | 15 | 10 | 10 | 25 | 28 | 20 | 12 | 10 | 6 | |
| Additions to Reserves *(mill bbls)* | 80 | 80 | 80 | 160 | 240 | 160 | 80 | 80 | 80 | 80 |

11.12 Based on the volumes to be extracted from the available proven reserves and from the new discoveries, the projected production of crude oil and gas liquids (LGN) is expected to be as follows:

**Table 11.4: Projected Production of Crude Oil and Gas Liquids (LGN), with the Camisea Project Onstream the Year 2003 (Mbd = thousand barrels per day)**

| | *1998* | *2001* | *2004* | *2007* |
|---|---|---|---|---|
| Proven Developed Reserves | | | | |
| - Talara Basin | 40.2 | 43.6 | 41.1 | 37.6 |
| - Marañón Basin | 81.8 | 53.0 | 43.0 | 33.0 |
| - Ucayali Basin | 0.6 | 0.5 | 0.4 | 0.4 |
| - Aguaytia LGN | 1.9 | 3.8 | 3.8 | 3.8 |
| SUBTOTAL | 124.5 | 100.9 | 88.4 | 74.8 |
| Undeveloped Reserves | | | | |
| - Camisea LGN | | | 70.0 | 70.0 |
| -New Discoveries | | 15.0 | 80.0 | 120.0 |
| SUBTOTAL | | *15.0* | *150.0* | *190.0* |
| TOTAL | 124.5 | 115.9 | 238.4 | 264.8 |

11.13 The table shows the critical importance of developing the Camisea Project and of the expected results from the on-going exploration campaign. Without the development of these reserves, the oil production of Peru will decline from current 124.5 mbd to 74.8 mbd by the year 2007. Compared with the demand projection, the volume of net imported hydrocarbons would increase from 33.6 mbd to 144.1 mbd.

## The Projected Trade Balance

11.14 To determine the volumes of crude oil and of petroleum products that will be exported and imported in the future, the following conservative assumptions are made in relation with the refining industry:

- No significant investments in refinery expansion nor in new conversion units; even if there are clear opportunities for converting excess fuel oils into mid-distillates. Total refinery primary capacity is estimated constant at approximately 180 mbd.
- Preference for medium grade crude with greater yield of middle distillates; resulting in exports of heavy crude from the Jungle.
- The LPGs and products obtained from the C5+ condensates produced from Aguaytia and Camisea (gasoline, kerosene and diesel) are added to the production of the refineries.

- The production from the new discoveries will permit to offset the current crude oil imports required by the refineries

11.15 In 1998, the volume of exported crude, mainly from the production of Occidental from Block 1-AB, is estimated at 47 mbd while the importation of crude is estimated at 87 mbd. For the year 2001, exports of crude are expected to decline to 29 mbd while imports are expected to increase to 105 mbd in case of no additions to reserves. Under this hypothesis, exports of crude by the year 2004 will be 20 mbd while imports required to supply the refineries will be 118 mbd.

11.16 The deficit or surplus of petroleum products will vary in accordance with results of the exploration in new areas and the date the Camisea project comes on stream. Assuming that this happens the year 2003, and the conservative forecast of crude production from new reserves is realised, the current deficit (33.7 mbd for the year 1998, growing to 61.4 mbd by the year 2001 because of greater imports of diesel and crude oil) will turn into an exportable surplus (76.3 mbd by the year 2004, and 83 mbd for the year 2007).

11.17 To evaluate the impact of this projection on the countries trade balance it is necessary to make assumptions in relation to the evolution of the oil and product prices in the international market. In the case of Peru, a good reference crude oil is West Texas Intermediate (WTI). In the period December 1997 to June 1998, the price of the barrel of WTI dropped about 25%. On average, it was US$ 15.27/bbl. For the projection, it is assumed that the WTI price will remain constant at US$ 15.00 per barrel. If this is the case, the price of the exported heavy crude and fuel oil will be of approximately US$ 10.00 per barrel. On the other hand, the price of imported LPG will be also US$ 10.00/bbl and of imported diesel US$ 21.00/bbl.

11.18 For 1998, the trade balance for the sector will show a small improvement, due to the lower level of imports of diesel and the drop in international prices. It will probably be slightly less than US$ 400 million. By the year 2001, the sector trade deficit will probably exceed the US$ 600 million. Assuming that the current exploration efforts achieve commercial discoveries, the trade balance deficit of the sector could be reduced to US$ 500 million by the year 2002, and it could be in the order of US$ 375 million by the year 2007.

11.19 If in addition the Camisea Project is developed without major delays and starts producing by the year 2003, the trade balance deficit will revert into a surplus of US$ 160 million. The surplus will continue increasing due to significant exports of gasoline and fuel oil, and the reduction on the importation of crude oil and mid-distillates. By the year 2007, it will be in the order of US$ 300 million.

11.20 On the other hand, the sector trade deficit, in the case of poor results from the exploration and delays in the execution of the Camisea Project, could increase from US$ 600 million the year 2001 to over US$ 1400 million by the year 2007.

# 12

# Conclusions, Recommendations and Next Steps

## Lessons Learned

12.1 There are very important lessons that could be extracted from the reform and privatization process carried out in Peru since 1990. The most important ones are the following:

12.2 *Strong political support and leadership were vital for success.* The first lesson concerns the need for support from the highest political level to overcome inertia and the inevitable resistance from bureaucracy and special interest groups. Implementation should be entrusted to pragmatic individuals with political clout, no vested interest in the status quo, and those who have access to world-class technical competence. The privatization arm of government COPRI is chaired by a senior minister and reported directly to the President.

12.3 *Related structural reforms should keep abreast with privatization.* Privatization programs should be implemented in the framework of an overall package of mutually reinforcing economic reforms, such as macroeconomics stabilization, trade liberalization, financial sector reform, elimination of subsidies, a pro-competition policy and regulatory reform. The hydrocarbons sector, though with a significant contribution to the overall macro economic picture in Peru, could not have been reformed in isolation; a sector reform was essential for privatization to proceed. Privatization alone is unsustainable and unable to restructure the economy if other reforms are lagging.

12.4 *A competitive sectorial law, with appropriate regulations, was issued early in the process.* The regulatory environment, price controls, subsidies and other problem areas were cleaned up before the sale assets took place. To achieve this, the strong political support gained by the Fujimori Administration and the favorable new Congress facilitated this task. Moreover, the GoP limited the conditions attached to privatization to a minimum. All complex, elaborate undertakings and privatization ideas that would have detracted from the value and attractiveness of Petroperu's business units and may undermine the deals, were abandoned.

12.5 *Restructuring of the National Company should be limited, but effective.* Restructuring was limited to legal, financial (balance sheet) and organizational changes, including closures, reductions in labor or transfers of social services. Petroperu personnel who had suffered from the financial restrictions and government interference of previous administrations was very favorable to the new measures. Restructuring also included dealing effectively with past environmental liabilities. In fact, it was preferable to undertake the necessary labor cuts in the different business units of Petroperu prior to privatizing them. The company's budget was carefully formulated to limit investment to essential goals. Implementation of technology changes, investment of capital and major purchases should be left to the new owners.

12.6 *Tailor the privatization strategy to particular circumstances.* An important lesson to be learned from the privatization experience in other countries is the need to tailor the privatization strategy to the particular circumstances of the sector. Although there are a number of "best practices" and generally accepted privatization methods, only careful packaging, timing and sequencing can guarantee overall success. The decision to choose the de-integrated option for Petroperu was fundamental. Thereafter, to manage the process, the accent was made on pragmatism, flexibility and willingness to try new solutions and methods. It is clear that the privatization of marginal fields is not the same as the privatization of large reserves. The same applies to refineries and wholesale depots. Proper incentive structures can motivate domestic and international investors to buy equities.

12.7 *Maximizing sale proceeds must be balanced with other priorities, in particular with achieving a competitive environment.* Although the CEPRI has kept as a duty to ensure that assets were sold for their fair market value, maximization of individual sale proceeds was balanced with other priorities, such as achieving a competitive environment, broadening share ownership and promoting the levels of capital markets. It seems that even in the most difficult moments of the negotiation with the Consorcio Shell/Mobil for the exploitation of Camisea, the GoP kept in mind that a private monopoly was worse than a public monopoly. Privatization of so-called "natural" monopolies, such as terminals or the Transandean pipeline has been preceded by a pro competitive restructuring of the industry and accompanied by a clear regulatory regime.

12.8 *Transparency, fairness and level playing field are of utmost importance.* Another important lesson concerns the need for transparency in the case-by-case privatization process. Asset valuation procedures have to be carried out by third party experts and applied realistically, fairly and consistently, as are procedures for calling for bids and evaluating offers. The CEPRI always took the necessary time and effort to ensure that the privatization process was well thought out, planned and executed. Widespread publicity campaigns helped ensuring that the maximum number of potential investors were aware of the opportunities. The Petroperu CEPRI has carried out an award process that has been transparent and clear, avoiding successfully all kinds of controversies.

12.9 *Outside expertise was consistently sought.* There is a need to make full use of specialist consultants but also to train in parallel local professionals. There is a growing

body of specialist experience in petroleum privatization worldwide. Local experts formed by Petroperu operations were used, but the GoP did not hesitate to resort to services of foreign privatization experts. The World Bank's direct support and technical assistance credits were used to obtain best available investment banks, consulting firms, environmental experts, accountants and lawyers that have been taking part in the design of case-by-case privatizations. However, much remains to be done in relation to institutional capacity building. Institutional failure, including the inability of the government to manage the regulatory process because of lack of qualified staff, could slow or undermine the success of the reform and privatization programs.

12.10 *Privatization was proactive with strong incentives for foreign investors.* Very early in the process the GoP understood that competition for investors in privatized assets is fierce. Without a conscious, consistent and aggressive policy to attract foreign investors, privatization programs might have fallen short on the revenue side or have turn away investors who could provide access to capital markets, the latest technology and management expertise. It was critical to rapidly obtain investors for prospective and profitable exploration and development ventures, as well as for less risky but viable retail outlets. Being already in the country, oil companies were more ready to enter refining and other more exposed parts of the oil business chain. At the same time, the GoP has consistently shown that it will not use its political power or any residual share or "golden share" in such a way that will jeopardize the company's ability to maximize profits and efficiency.

12.11 *The privatization was not managed by an artificially fixed timetable or deadline.* It has been important to learn that local petroleum products markets need time to become competitive. However, there is a need to keep a constant pressure on the process. Sequencing several sales in a pipeline as part of the privatization program according to market conditions was always in the mind of the CEPRI. However, the final time line adapted to realistic circumstances.

12.12 In conclusion, it is fair to summarize the process of the privatization of a national corporation like Petroperu, by indicating that:

- It is possible if political determination is there;
- It requires time:
  - to gain investor confidence
  - to let markets work and to achieve a competitive market situation
  - to proceed gradually and not disrupt supplies
- It requires a dedicated local team plus expert advice;
- It is simpler to proceed upstream than downstream
- The best is to define the strategy and proceed pragmatically case-by-case.

## Next Steps

12.13 The critical situation of the medium term trade balance for the sector, as described in the previous section, calls for urgent actions. In particular:

- Complete the privatization process, and allow free markets to operate without any state interference.
- Eliminate remaining price distortions and complete the taxation reform
- Strengthen the sector institutions and develop better mechanisms for the transfer of technology;
  - to continue attracting private investors
  - to enforce better environmental and social regulations
  - to enhance competition possibilities
  - to preserve consumer interests
  - to produce statistics, indicative plans and better manage the sector
- Develop the gas industry, in particular obtain the investment required for the execution of the Camisea Project,
  - to improve the demand-supply balance and reduce its negative impact for the economy.
  - to develop a gas promotion plan and proper regulations for achieving a competitive gas industry.

Joint UNDP/World Bank

# ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAMME (ESMAP)

## LIST OF REPORTS ON COMPLETED ACTIVITIES

| *Region/Country* | *Activity/Report Title* | *Date* | *Number* |
|---|---|---|---|
| | **SUB-SAHARAN AFRICA (AFR)** | | |
| Africa Regional | Anglophone Africa Household Energy Workshop (English) | 07/88 | 085/88 |
| | Regional Power Seminar on Reducing Electric Power System Losses in Africa (English) | 08/88 | 087/88 |
| | Institutional Evaluation of EGL (English) | 02/89 | 098/89 |
| | Biomass Mapping Regional Workshops (English) | 05/89 | -- |
| | Francophone Household Energy Workshop (French) | 08/89 | -- |
| | Interafrican Electrical Engineering College: Proposals for Short- and Long-Term Development (English) | 03/90 | 112/90 |
| | Biomass Assessment and Mapping (English) | 03/90 | -- |
| | Symposium on Power Sector Reform and Efficiency Improvement in Sub-Saharan Africa (English) | 06/96 | 182/96 |
| | Commercialization of Marginal Gas Fields (English) | 12/97 | 201/97 |
| Angola | Energy Assessment (English and Portuguese) | 05/89 | 4708-ANG |
| | Power Rehabilitation and Technical Assistance (English) | 10/91 | 142/91 |
| Benin | Energy Assessment (English and French) | 06/85 | 5222-BEN |
| Botswana | Energy Assessment (English) | 09/84 | 4998-BT |
| | Pump Electrification Prefeasibility Study (English) | 01/86 | 047/86 |
| | Review of Electricity Service Connection Policy (English) | 07/87 | 071/87 |
| | Tuli Block Farms Electrification Study (English) | 07/87 | 072/87 |
| | Household Energy Issues Study (English) | 02/88 | -- |
| | Urban Household Energy Strategy Study (English) | 05/91 | 132/91 |
| Burkina Faso | Energy Assessment (English and French) | 01/86 | 5730-BUR |
| | Technical Assistance Program (English) | 03/86 | 052/86 |
| | Urban Household Energy Strategy Study (English and French) | 06/91 | 134/91 |
| Burundi | Energy Assessment (English) | 06/82 | 3778-BU |
| | Petroleum Supply Management (English) | 01/84 | 012/84 |
| | Status Report (English and French) | 02/84 | 011/84 |
| | Presentation of Energy Projects for the Fourth Five-Year Plan (1983-1987) (English and French) | 05/85 | 036/85 |
| | Improved Charcoal Cookstove Strategy (English and French) | 09/85 | 042/85 |
| | Peat Utilization Project (English) | 11/85 | 046/85 |
| | Energy Assessment (English and French) | 01/92 | 9215-BU |
| Cape Verde | Energy Assessment (English and Portuguese) | 08/84 | 5073-CV |
| | Household Energy Strategy Study (English) | 02/90 | 110/90 |
| Central African Republic | Energy Assessement (French) | 08/92 | 9898-CAR |
| Chad | Elements of Strategy for Urban Household Energy The Case of N'djamena (French) | 12/93 | 160/94 |
| Comoros | Energy Assessment (English and French) | 01/88 | 7104-COM |
| Congo | Energy Assessment (English) | 01/88 | 6420-COB |
| | Power Development Plan (English and French) | 03/90 | 106/90 |
| Côte d'Ivoire | Energy Assessment (English and French) | 04/85 | 5250-IVC |
| | Improved Biomass Utilization (English and French) | 04/87 | 069/87 |
| | Power System Efficiency Study (English) | 12/87 | -- |
| | Power Sector Efficiency Study (French) | 02/92 | 140/91 |
| | Project of Energy Efficiency in Buildings (English) | 09/95 | 175/95 |

| *Region/Country* | *Activity/Report Title* | *Date* | *Number* |
|---|---|---|---|
| Ethiopia | Energy Assessment (English) | 07/84 | 4741-ET |
| | Power System Efficiency Study (English) | 10/85 | 045/85 |
| | Agricultural Residue Briquetting Pilot Project (English) | 12/86 | 062/86 |
| | Bagasse Study (English) | 12/86 | 063/86 |
| | Cooking Efficiency Project (English) | 12/87 | -- |
| | Energy Assessment (English) | 02/96 | 179/96 |
| Gabon | Energy Assessment (English) | 07/88 | 6915-GA |
| The Gambia | Energy Assessment (English) | 11/83 | 4743-GM |
| | Solar Water Heating Retrofit Project (English) | 02/85 | 030/85 |
| | Solar Photovoltaic Applications (English) | 03/85 | 032/85 |
| | Petroleum Supply Management Assistance (English) | 04/85 | 035/85 |
| Ghana | Energy Assessment (English) | 11/86 | 6234-GH |
| | Energy Rationalization in the Industrial Sector (English) | 06/88 | 084/88 |
| | Sawmill Residues Utilization Study (English) | 11/88 | 074/87 |
| | Industrial Energy Efficiency (English) | 11/92 | 148/92 |
| Guinea | Energy Assessment (English) | 11/86 | 6137-GUI |
| | Household Energy Strategy (English and French) | 01/94 | 163/94 |
| Guinea-Bissau | Energy Assessment (English and Portuguese) | 08/84 | 5083-GUB |
| | Recommended Technical Assistance Projects (English & Portuguese) | 04/85 | 033/85 |
| | Management Options for the Electric Power and Water Supply Subsectors (English) | 02/90 | 100/90 |
| | Power and Water Institutional Restructuring (French) | 04/91 | 118/91 |
| Kenya | Energy Assessment (English) | 05/82 | 3800-KE |
| | Power System Efficiency Study (English) | 03/84 | 014/84 |
| | Status Report (English) | 05/84 | 016/84 |
| | Coal Conversion Action Plan (English) | 02/87 | -- |
| | Solar Water Heating Study (English) | 02/87 | 066/87 |
| | Peri-Urban Woodfuel Development (English) | 10/87 | 076/87 |
| | Power Master Plan (English) | 11/87 | -- |
| | Power Loss Reduction Study (English) | 09/96 | 186/96 |
| Lesotho | Energy Assessment (English) | 01/84 | 4676-LSO |
| Liberia | Energy Assessment (English) | 12/84 | 5279-LBR |
| | Recommended Technical Assistance Projects (English) | 06/85 | 038/85 |
| | Power System Efficiency Study (English) | 12/87 | 081/87 |
| Madagascar | Energy Assessment (English) | 01/87 | 5700-MAG |
| | Power System Efficiency Study (English and French) | 12/87 | 075/87 |
| | Environmental Impact of Woodfuels (French) | 10/95 | 176/95 |
| Malawi | Energy Assessment (English) | 08/82 | 3903-MAL |
| | Technical Assistance to Improve the Efficiency of Fuelwood Use in the Tobacco Industry (English) | 11/83 | 009/83 |
| | Status Report (English) | 01/84 | 013/84 |
| Mali | Energy Assessment (English and French) | 11/91 | 8423-MLI |
| | Household Energy Strategy (English and French) | 03/92 | 147/92 |
| Islamic Republic of Mauritania | Energy Assessment (English and French) | 04/85 | 5224-MAU |
| | Household Energy Strategy Study (English and French) | 07/90 | 123/90 |
| Mauritius | Energy Assessment (English) | 12/81 | 3510-MAS |
| | Status Report (English) | 10/83 | 008/83 |
| | Power System Efficiency Audit (English) | 05/87 | 070/87 |

| *Region/Country* | *Activity/Report Title* | *Date* | *Number* |
|---|---|---|---|
| Mauritius | Bagasse Power Potential (English) | 10/87 | 077/87 |
| | Energy Sector Review (English) | 12/94 | 3643-MAS |
| Mozambique | Energy Assessment (English) | 01/87 | 6128-MOZ |
| | Household Electricity Utilization Study (English) | 03/90 | 113/90 |
| | Electricity Tariffs Study (English) | 06/96 | 181/96 |
| | Sample Survey of Low Voltage Electricity Customers | 06/97 | 195/97 |
| Namibia | Energy Assessment (English) | 03/93 | 11320-NAM |
| Niger | Energy Assessment (French) | 05/84 | 4642-NIR |
| | Status Report (English and French) | 02/86 | 051/86 |
| | Improved Stoves Project (English and French) | 12/87 | 080/87 |
| | Household Energy Conservation and Substitution (English and French) | 01/88 | 082/88 |
| Nigeria | Energy Assessment (English) | 08/83 | 4440-UNI |
| | Energy Assessment (English) | 07/93 | 11672-UNI |
| Rwanda | Energy Assessment (English) | 06/82 | 3779-RW |
| | Status Report (English and French) | 05/84 | 017/84 |
| | Improved Charcoal Cookstove Strategy (English and French) | 08/86 | 059/86 |
| | Improved Charcoal Production Techniques (English and French) | 02/87 | 065/87 |
| | Energy Assessment (English and French) | 07/91 | 8017-RW |
| | Commercialization of Improved Charcoal Stoves and Carbonization Techniques Mid-Term Progress Report (English and French) | 12/91 | 141/91 |
| SADC | SADC Regional Power Interconnection Study, Vols. I-IV (English) | 12/93 | -- |
| SADCC | SADCC Regional Sector: Regional Capacity-Building Program for Energy Surveys and Policy Analysis (English) | 11/91 | -- |
| Sao Tome and Principe | Energy Assessment (English) | 10/85 | 5803-STP |
| Senegal | Energy Assessment (English) | 07/83 | 4182-SE |
| | Status Report (English and French) | 10/84 | 025/84 |
| | Industrial Energy Conservation Study (English) | 05/85 | 037/85 |
| | Preparatory Assistance for Donor Meeting (English and French) | 04/86 | 056/86 |
| | Urban Household Energy Strategy (English) | 02/89 | 096/89 |
| | Industrial Energy Conservation Program (English) | 05/94 | 165/94 |
| Seychelles | Energy Assessment (English) | 01/84 | 4693-SEY |
| | Electric Power System Efficiency Study (English) | 08/84 | 021/84 |
| Sierra Leone | Energy Assessment (English) | 10/87 | 6597-SL |
| Somalia | Energy Assessment (English) | 12/85 | 5796-SO |
| South Africa Republic of | Options for the Structure and Regulation of Natural Gas Industry (English) | 05/95 | 172/95 |
| Sudan | Management Assistance to the Ministry of Energy and Mining | 05/83 | 003/83 |
| | Energy Assessment (English) | 07/83 | 4511-SU |
| | Power System Efficiency Study (English) | 06/84 | 018/84 |
| | Status Report (English) | 11/84 | 026/84 |
| | Wood Energy/Forestry Feasibility (English) | 07/87 | 073/87 |
| Swaziland | Energy Assessment (English) | 02/87 | 6262-SW |
| | Household Energy Strategy Study | 10/97 | 198/97 |
| Tanzania | Energy Assessment (English) | 11/84 | 4969-TA |
| | Peri-Urban Woodfuels Feasibility Study (English) | 08/88 | 086/88 |
| | Tobacco Curing Efficiency Study (English) | 05/89 | 102/89 |
| | Remote Sensing and Mapping of Woodlands (English) | 06/90 | -- |
| | Industrial Energy Efficiency Technical Assistance (English) | 08/90 | 122/90 |

| *Region/Country* | *Activity/Report Title* | *Date* | *Number* |
|---|---|---|---|
| Tanzania | Power Loss Reduction Volume 1: Transmission and Distribution SystemTechnical Loss Reduction and Network Development (English) | 06/98 | 204A/98 |
| | Power Loss Reduction Volume 2: Reduction of Non-Technical Losses (English) | 06/98 | 204B/98 |
| Togo | Energy Assessment (English) | 06/85 | 5221-TO |
| | Wood Recovery in the Nangbeto Lake (English and French) | 04/86 | 055/86 |
| | Power Efficiency Improvement (English and French) | 12/87 | 078/87 |
| Uganda | Energy Assessment (English) | 07/83 | 4453-UG |
| | Status Report (English) | 08/84 | 020/84 |
| | Institutional Review of the Energy Sector (English) | 01/85 | 029/85 |
| | Energy Efficiency in Tobacco Curing Industry (English) | 02/86 | 049/86 |
| | Fuelwood/Forestry Feasibility Study (English) | 03/86 | 053/86 |
| | Power System Efficiency Study (English) | 12/88 | 092/88 |
| | Energy Efficiency Improvement in the Brick and Tile Industry (English) | 02/89 | 097/89 |
| | Tobacco Curing Pilot Project (English) | 03/89 | UNDP Terminal Report |
| | Energy Assessment (English) | 12/96 | 193/96 |
| Zaire | Energy Assessment (English) | 05/86 | 5837-ZR |
| Zambia | Energy Assessment (English) | 01/83 | 4110-ZA |
| | Status Report (English) | 08/85 | 039/85 |
| | Energy Sector Institutional Review (English) | 11/86 | 060/86 |
| | Power Subsector Efficiency Study (English) | 02/89 | 093/88 |
| | Energy Strategy Study (English) | 02/89 | 094/88 |
| | Urban Household Energy Strategy Study (English) | 08/90 | 121/90 |
| Zimbabwe | Energy Assessment (English) | 06/82 | 3765-ZIM |
| | Power System Efficiency Study (English) | 06/83 | 005/83 |
| | Status Report (English) | 08/84 | 019/84 |
| | Power Sector Management Assistance Project (English) | 04/85 | 034/85 |
| | Power Sector Management Institution Building (English) | 09/89 | -- |
| | Petroleum Management Assistance (English) | 12/89 | 109/89 |
| | Charcoal Utilization Prefeasibility Study (English) | 06/90 | 119/90 |
| | Integrated Energy Strategy Evaluation (English) | 01/92 | 8768-ZIM |
| | Energy Efficiency Technical Assistance Project: Strategic Framework for a National Energy Efficiency Improvement Program (English) | 04/94 | -- |
| | Capacity Building for the National Energy Efficiency Improvement Programme (NEEIP) (English) | 12/94 | -- |
| | **EAST ASIA AND PACIFIC (EAP)** | | |
| Asia Regional | Pacific Household and Rural Energy Seminar (English) | 11/90 | -- |
| China | County-Level Rural Energy Assessments (English) | 05/89 | 101/89 |
| | Fuelwood Forestry Preinvestment Study (English) | 12/89 | 105/89 |
| | Strategic Options for Power Sector Reform in China (English) | 07/93 | 156/93 |
| | Energy Efficiency and Pollution Control in Township and Village Enterprises (TVE) Industry (English) | 11/94 | 168/94 |
| | Energy for Rural Development in China: An Assessment Based on a Joint Chinese/ESMAP Study in Six Counties (English) | 06/96 | 183/96 |
| Fiji | Energy Assessment (English) | 06/83 | 4462-FIJ |

| *Region/Country* | *Activity/Report Title* | *Date* | *Number* |
|---|---|---|---|
| Indonesia | Energy Assessment (English) | 11/81 | 3543-IND |
| | Status Report (English) | 09/84 | 022/84 |
| | Power Generation Efficiency Study (English) | 02/86 | 050/86 |
| | Energy Efficiency in the Brick, Tile and Lime Industries (English) | 04/87 | 067/87 |
| | Diesel Generating Plant Efficiency Study (English) | 12/88 | 095/88 |
| | Urban Household Energy Strategy Study (English) | 02/90 | 107/90 |
| | Biomass Gasifier Preinvestment Study Vols. I & II (English) | 12/90 | 124/90 |
| | Prospects for Biomass Power Generation with Emphasis on Palm Oil, Sugar, Rubberwood and Plywood Residues (English) | 11/94 | 167/94 |
| Lao PDR | Urban Electricity Demand Assessment Study (English) | 03/93 | 154/93 |
| | Institutional Development for Off-Grid Electrification | 06/99 | 215/99 |
| Malaysia | Sabah Power System Efficiency Study (English) | 03/87 | 068/87 |
| | Gas Utilization Study (English) | 09/91 | 9645-MA |
| Myanmar | Energy Assessment (English) | 06/85 | 5416-BA |
| Papua New Guinea | Energy Assessment (English) | 06/82 | 3882-PNG |
| | Status Report (English) | 07/83 | 006/83 |
| | Energy Strategy Paper (English) | -- | -- |
| | Institutional Review in the Energy Sector (English) | 10/84 | 023/84 |
| | Power Tariff Study (English) | 10/84 | 024/84 |
| Philippines | Commercial Potential for Power Production from Agricultural Residues (English) | 12/93 | 157/93 |
| | Energy Conservation Study (English) | 08/94 | -- |
| Solomon Islands | Energy Assessment (English) | 06/83 | 4404-SOL |
| | Energy Assessment (English) | 01/92 | 979-SOL |
| South Pacific | Petroleum Transport in the South Pacific (English) | 05/86 | -- |
| Thailand | Energy Assessment (English) | 09/85 | 5793-TH |
| | Rural Energy Issues and Options (English) | 09/85 | 044/85 |
| | Accelerated Dissemination of Improved Stoves and Charcoal Kilns (English) | 09/87 | 079/87 |
| | Northeast Region Village Forestry and Woodfuels Preinvestment Study (English) | 02/88 | 083/88 |
| | Impact of Lower Oil Prices (English) | 08/88 | -- |
| | Coal Development and Utilization Study (English) | 10/89 | -- |
| Tonga | Energy Assessment (English) | 06/85 | 5498-TON |
| Vanuatu | Energy Assessment (English) | 06/85 | 5577-VA |
| Vietnam | Rural and Household Energy-Issues and Options (English) | 01/94 | 161/94 |
| | Power Sector Reform and Restructuring in Vietnam: Final Report to the Steering Committee (English and Vietnamese) | 09/95 | 174/95 |
| | Household Energy Technical Assistance: Improved Coal Briquetting and Commercialized Dissemination of Higher Efficiency Biomass and Coal Stoves (English) | 01/96 | 178/96 |
| Western Samoa | Energy Assessment (English) | 06/85 | 5497-WSO |
| | **SOUTH ASIA (SAS)** | | |
| Bangladesh | Energy Assessment (English) | 10/82 | 3873-BD |
| | Priority Investment Program (English) | 05/83 | 002/83 |
| | Status Report (English) | 04/84 | 015/84 |

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|---|---|---|---|
| Bangladesh | Power System Efficiency Study (English) | 02/85 | 031/85 |
| | Small Scale Uses of Gas Prefeasibility Study (English) | 12/88 | -- |
| India | Opportunities for Commercialization of Nonconventional Energy Systems (English) | 11/88 | 091/88 |
| | Maharashtra Bagasse Energy Efficiency Project (English) | 07/90 | 120/90 |
| | Mini-Hydro Development on Irrigation Dams and Canal Drops Vols. I, II and III (English) | 07/91 | 139/91 |
| | WindFarm Pre-Investment Study (English) | 12/92 | 150/92 |
| | Power Sector Reform Seminar (English) | 04/94 | 166/94 |
| | Environmental Issues in the Power Sector (English) | 06/98 | 205/98 |
| | Environmental Issues in the Power Sector: Manual for Environmental Decision Making (English) | 06/99 | 213/99 |
| | Household Energy Strategies for Urban India: The Case of Hyderabad | 06/99 | 214/99 |
| Nepal | Energy Assessment (English) | 08/83 | 4474-NEP |
| | Status Report (English) | 01/85 | 028/84 |
| | Energy Efficiency & Fuel Substitution in Industries (English) | 06/93 | 158/93 |
| Pakistan | Household Energy Assessment (English) | 05/88 | -- |
| | Assessment of Photovoltaic Programs, Applications, and Markets (English) | 10/89 | 103/89 |
| | National Household Energy Survey and Strategy Formulation Study: Project Terminal Report (English) | 03/94 | -- |
| | Managing the Energy Transition (English) | 10/94 | -- |
| | Lighting Efficiency Improvement Program Phase 1: Commercial Buildings Five Year Plan (English) | 10/94 | -- |
| Sri Lanka | Energy Assessment (English) | 05/82 | 3792-CE |
| | Power System Loss Reduction Study (English) | 07/83 | 007/83 |
| | Status Report (English) | 01/84 | 010/84 |
| | Industrial Energy Conservation Study (English) | 03/86 | 054/86 |

**EUROPE AND CENTRAL ASIA (ECA)**

| | | | |
|---|---|---|---|
| Bulgaria | Natural Gas Policies and Issues (English) | 10/96 | 188/96 |
| Central and Eastern Europe | Power Sector Reform in Selected Countries | 07/97 | 196/97 |
| Eastern Europe | The Future of Natural Gas in Eastern Europe (English) | 08/92 | 149/92 |
| Kazakhstan | Natural Gas Investment Study, Volumes 1, 2 & 3 | 12/97 | 199/97 |
| Kazakhstan & Kyrgyzstan | Opportunities for Renewable Energy Development | 11/97 | 16855-KAZ |
| Poland | Energy Sector Restructuring Program Vols. I-V (English) | 01/93 | 153/93 |
| | Natural Gas Upstream Pricing (English and Polish) | 08/98 | 206/98 |
| | Energy Sector Restructuring Program: Establishing the Energy Regulation Authority | 10/98 | 208/98 |
| Portugal | Energy Assessment (English) | 04/84 | 4824-PO |
| Romania | Natural Gas Development Strategy (English) | 12/96 | 192/96 |
| Slovenia | Workshop on Private Participation in the Power Sector (English) | 02/99 | 211/99 |
| Turkey | Energy Assessment (English) | 03/83 | 3877-TU |

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| | **MIDDLE EAST AND NORTH AFRICA (MNA)** | | |
| Arab Republic of Egypt | Energy Assessment (English) | 10/96 | 189/96 |
| Morocco | Energy Assessment (English and French) | 03/84 | 4157-MOR |
| | Status Report (English and French) | 01/86 | 048/86 |
| | Energy Sector Institutional Development Study (English and French) | 07/95 | 173/95 |
| | Natural Gas Pricing Study (French) | 10/98 | 209/98 |
| | Gas Development Plan Phase II (French) | 02/99 | 210/99 |
| Syria | Energy Assessment (English) | 05/86 | 5822-SYR |
| | Electric Power Efficiency Study (English) | 09/88 | 089/88 |
| | Energy Efficiency Improvement in the Cement Sector (English) | 04/89 | 099/89 |
| | Energy Efficiency Improvement in the Fertilizer Sector (English) | 06/90 | 115/90 |
| Tunisia | Fuel Substitution (English and French) | 03/90 | -- |
| | Power Efficiency Study (English and French) | 02/92 | 136/91 |
| | Energy Management Strategy in the Residential and Tertiary Sectors (English) | 04/92 | 146/92 |
| | Renewable Energy Strategy Study, Volume I (French) | 11/96 | 190A/96 |
| | Renewable Energy Strategy Study, Volume II (French) | 11/96 | 190B/96 |
| Yemen | Energy Assessment (English) | 12/84 | 4892-YAR |
| | Energy Investment Priorities (English) | 02/87 | 6376-YAR |
| | Household Energy Strategy Study Phase I (English) | 03/91 | 126/91 |
| | **LATIN AMERICA AND THE CARIBBEAN (LAC)** | | |
| LAC Regional | Regional Seminar on Electric Power System Loss Reduction in the Caribbean (English) | 07/89 | -- |
| | Elimination of Lead in Gasoline in Latin America and the Caribbean (English and Spanish) | 04/97 | 194/97 |
| | Elimination of Lead in Gasoline in Latin America and the Caribbean - Status Report (English and Spanish) | 12/97 | 200/97 |
| | Harmonization of Fuels Specifications in Latin America and the Caribbean (English and Spanish) | 06/98 | 203/98 |
| Bolivia | Energy Assessment (English) | 04/83 | 4213-BO |
| | National Energy Plan (English) | 12/87 | -- |
| | La Paz Private Power Technical Assistance (English) | 11/90 | 111/90 |
| | Prefeasibility Evaluation Rural Electrification and Demand Assessment (English and Spanish) | 04/91 | 129/91 |
| | National Energy Plan (Spanish) | 08/91 | 131/91 |
| | Private Power Generation and Transmission (English) | 01/92 | 137/91 |
| | Natural Gas Distribution: Economics and Regulation (English) | 03/92 | 125/92 |
| | Natural Gas Sector Policies and Issues (English and Spanish) | 12/93 | 164/93 |
| | Household Rural Energy Strategy (English and Spanish) | 01/94 | 162/94 |
| | Preparation of Capitalization of the Hydrocarbon Sector | 12/96 | 191/96 |
| Brazil | Energy Efficiency & Conservation: Strategic Partnership for Energy Efficiency in Brazil (English) | 01/95 | 170/95 |
| | Hydro and Thermal Power Sector Study | 09/97 | 197/97 |
| Chile | Energy Sector Review (English) | 08/88 | 7129-CH |

| *Region/Country* | *Activity/Report Title* | *Date* | *Number* |
|---|---|---|---|
| Colombia | Energy Strategy Paper (English) | 12/86 | -- |
| | Power Sector Restructuring (English) | 11/94 | 169/94 |
| | Energy Efficiency Report for the Commercial and Public Sector (English) | 06/96 | 184/96 |
| Costa Rica | Energy Assessment (English and Spanish) | 01/84 | 4655-CR |
| | Recommended Technical Assistance Projects (English) | 11/84 | 027/84 |
| | Forest Residues Utilization Study (English and Spanish) | 02/90 | 108/90 |
| Dominican Republic | Energy Assessment (English) | 05/91 | 8234-DO |
| Ecuador | Energy Assessment (Spanish) | 12/85 | 5865-EC |
| | Energy Strategy Phase I (Spanish) | 07/88 | -- |
| | Energy Strategy (English) | 04/91 | -- |
| | Private Minihydropower Development Study (English) | 11/92 | -- |
| | Energy Pricing Subsidies and Interfuel Substitution (English) | 08/94 | 11798-EC |
| | Energy Pricing, Poverty and Social Mitigation (English) | 08/94 | 12831-EC |
| Guatemala | Issues and Options in the Energy Sector (English) | 09/93 | 12160-GU |
| Haiti | Energy Assessment (English and French) | 06/82 | 3672-HA |
| | Status Report (English and French) | 08/85 | 041/85 |
| | Household Energy Strategy (English and French) | 12/91 | 143/91 |
| Honduras | Energy Assessment (English) | 08/87 | 6476-HO |
| | Petroleum Supply Management (English) | 03/91 | 128/91 |
| Jamaica | Energy Assessment (English) | 04/85 | 5466-JM |
| | Petroleum Procurement, Refining, and Distribution Study (English) | 11/86 | 061/86 |
| | Energy Efficiency Building Code Phase I (English) | 03/88 | -- |
| | Energy Efficiency Standards and Labels Phase I (English ) | 03/88 | -- |
| | Management Information System Phase I (English) | 03/88 | -- |
| | Charcoal Production Project (English) | 09/88 | 090/88 |
| | FIDCO Sawmill Residues Utilization Study (English) | 09/88 | 088/88 |
| | Energy Sector Strategy and Investment Planning Study (English) | 07/92 | 135/92 |
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| Paraguay | Energy Assessment (English) | 10/84 | 5145-PA |
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| Peru | Energy Assessment (English) | 01/84 | 4677-PE |
| | Status Report (English) | 08/85 | 040/85 |
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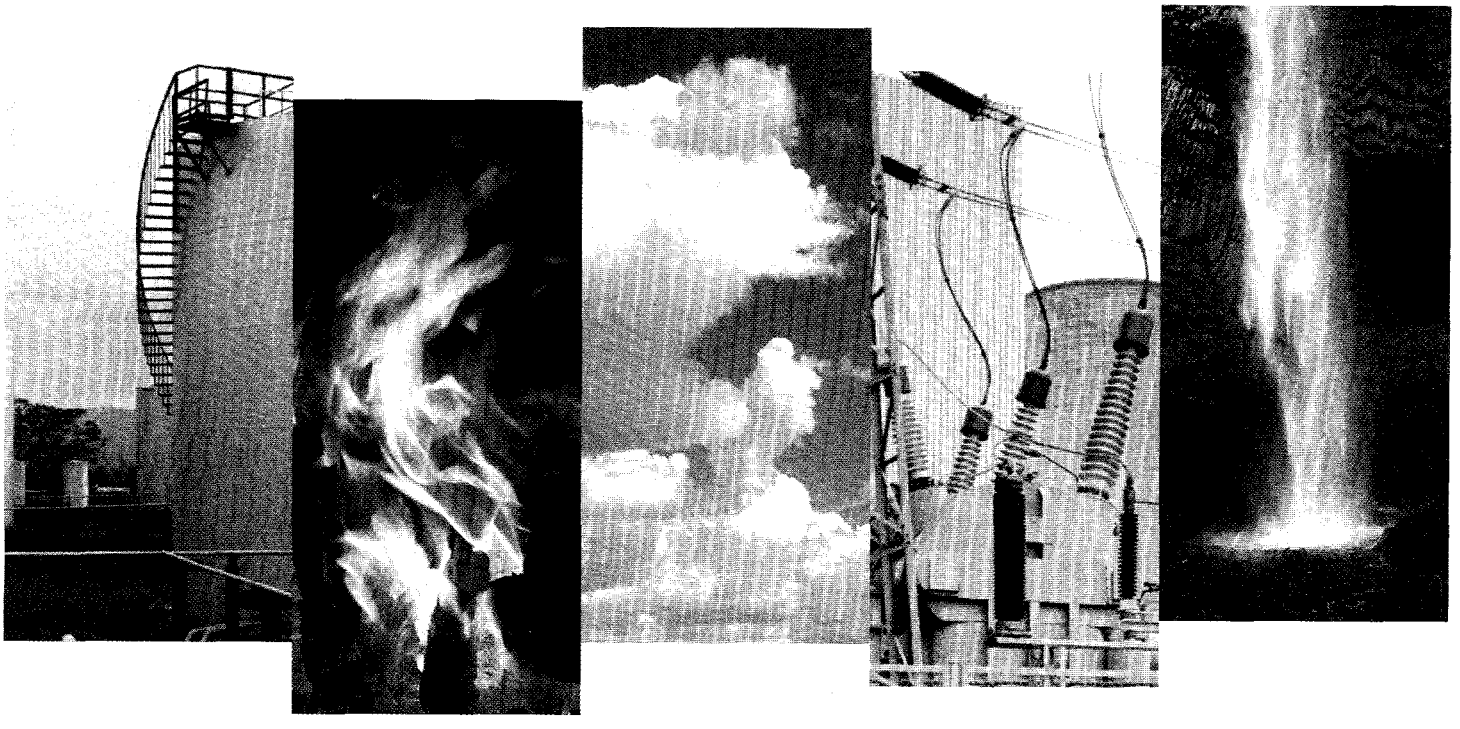

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