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# **Editorial**

The new scenarios that have arisen in the countries of Latin America and the Caribbean as a result of changes in the region's development model, especially those taking place over the last few years owing to privatization and new forms of State participation in energy sector management, have led to new requirements for statistical information that both reflects these changes and can be used as a tool for decision making by those in charge of conducting the State. financing institutions, international organizations, development agencies and, in general, those involved in the region's energy development.

In this context, the Permanent Secretariat of OLADE, with financial support from the European Commission, will be implementing the National Energy Information Systems (SIEN) Project, in order to develop, in certain cases, or consolidate, in others, the tools for elaborating and administering energy statistics in the member countries of the Organization.

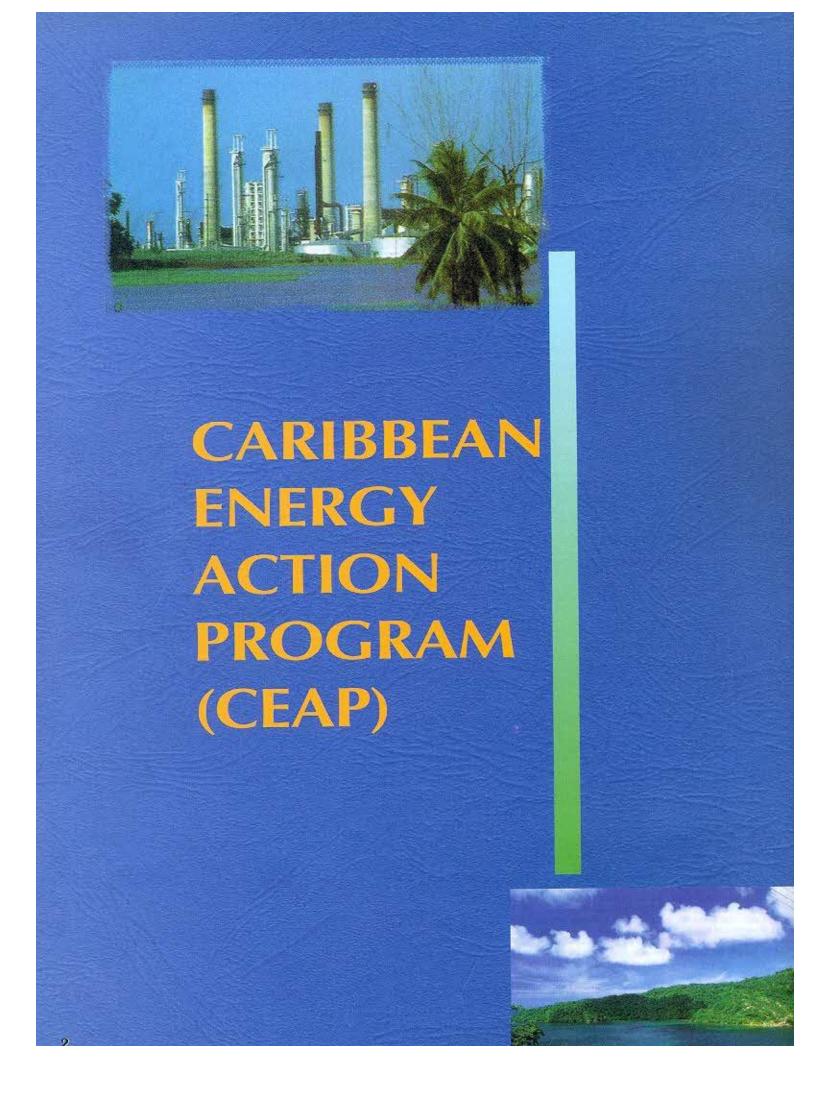
The present edition of the *Energy Magazine* includes an article on this project and its objectives, design, mechanisms, and implementation.

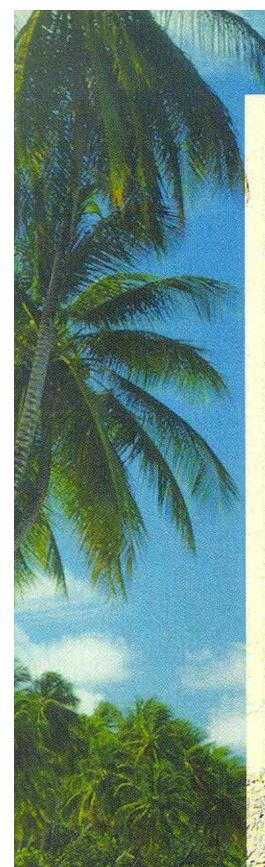
It also provides an overview of the Caribbean Energy Action Program (CEAP), established by the countries of the subregion with the coordination of OLADE and support from various international organizations and cooperation agencies in order to join efforts and coordinate actions that contribute to energy development and specifically promote the conditions that are needed to diversify energy supply so as to meet the requirements of the Caribbean countries, including those that are not members of OLADE.

The spotlight section for this issue focuses on the Republic of Peru and the major transformation of its energy sector over the last few years, in an analysis that examines the conceptual aspects of this transformation and provides a description of the most important projects that have been implemented or are planned for implementation up to the first years of the year 2000.

There is also an article on the fiscal impacts of the reforms in the region's electric power subsector, written by Dr. Hugo Altomonte, Regional Energy Expert at the Economic Commission for Latin America and the Caribbean (ECLAC).

Luiz A. M. da Fonseca Executive Secretary





#### BACKGROUND

Over the last few years, various international and national institutions have been implementing, separately, a series of energy projects in the Caribbean subregion, highlighting the need for this subregion to apply a more comprehensive approach to the energy sector.

As a result of this situation, in October 1998, in order to join efforts and coordinate actions, the Caribbean Energy Action Program (CEAP) was set up with the coordination of OLADE and the participation the Association Caribbean States (ACS), the Caribbean Community (CARI-COM), the United Nations Environment Program (UNEP), the Caribbean Energy Information System (CEIS), the Economic Commission for Latin America and the Caribbean (ECLAC/CCST), the United Nations Development Program (UNDP), the University of the West Indies (UWI/CER-MES), the UNEP Collaborating Centre, the European Commission, and the delegates of the majority of the Caribbean countries.

The general objective of the CEAP is to create the conditions reeded to diversify energy supply in order to meet the requirements of industry and the demand of the population of all the Caribbean countries, including those that are not members of OLADE.

The institutions sponsoring the implementation of CEAP actions are the German Technical Cooperation Agency (GTZ), the Canadian International Development Agency (CIDA), the Government of Quebec, the European Commission, the UNEP Collaborating Center, and the Global Environment Facility (GEF).

#### COORDINATION MECHA-NISM

In order to give impetus to the actions, a coordination mechanism has been set up. It involves the establishment of a Steering Committee that sets general policies and an Operating Committee to coordinate and monitoring the Program's components. The Steering Committee is comprised of the Ministers in charge of energy or their representatives. This Committee meets once a year at ACS headquarters to review progress achieved in the activities and define new actions for the following year. The ACS is now acting as Secretariat for the Steering Commit-

# New Impetus for the Subregion's Development

The Operating Committee is comprised of representatives from OLADE, ACS, CARICOM, ECLAC/CCST, UNEP, UNDP, and CEIS. Its duties include Program coordination and monitoring (while respecting the operating mechanisms of individual projects) and reporting to the Steering Committee.

#### PROGRAM ACTIVITIES

The CEAP's various activities are to be implemented in two phases, depending on the priority assigned to each activity and resource availability. The first phase will develop those projects that have already been identified and, in some cases, will secure the necessary funding, as indicated below:

In subsequent phases, additional projects of interest for the countries and other CEAP participants will be identified, and steps will be taken to obtain the respective funding for their implementation. If necessary, new modules will be incorporated into the Program.

#### **PROJECTS**

 The Electronic Information Network Project is aimed at meeting. countries' need to have a suitable channel for disseminating technical information on energy projects or initiatives, thus avoiding the duplication of actions and establishing contacts between the technical experts working in related areas. Thus, its objective is to facilitate the exchange of technical information on projects being implemented in the countries of the area, set up a data base, and offer an efficient consultation tool for technical experts and researchers.

The implementation unit for this project is OLADE, with support from the Caribbean Energy Information System (CEIS) and the University of West Indies Centre for Environment and Development (UWICED)/Centre for Resource Management and Environmental Studies (CERMES), which will be contributing resources for its funding.

At present, there is a preliminary version of the network on OLADE's web site and work is being done to set up the data bases and coordinate with other institutions.

The National Energy Information Systems Project was designed to build up the technical capacity of the countries by providing them with suitable tools to compile, store, administer, and evaluate energy sector information with the development of national energy information systems (SIEN), which would make available the energy statistics required for energy sector analysis, monitoring, follow-up, evaluation, and planning, as well as economic information, expansion projects, and indicators on management, environmental impact, and technological development.

The Project envisages activities on information assessment, definition of information flow mechanisms, SIEN design, and SIEN development, installation, and start-up.

OLADE will be implementing the respective activities, first in Haiti, with support of the CEIS and UWICED/CERMES.

 The Energy Policymaking for Sustainable Development Project is considered to be a project of special interest for the countries participating in the CEAP, because it intends to promote the adoption of policy guidelines to facilitate the implementation of projects aimed at achieving sustainable energy sector development (especially renewables and energy efficiency).

The project will take place in two stages. The first will prepare case studies (Jamaica and Dominican Republic), considering topics such as the analysis of current energy policy, the proposal for building up the institutional and human resource capacity of the

MODULE	PROJECT
Information systems	Electronic information network     National energy information systems (SIEN)
Energy policy	Energy policy making with the incorporation of sustainable development criteria     Energy supply optimization in the Caribbean Subregional Hydrocarbons Commission     Options to increase the share of natural gas in the Caribbean's energy matrix.
Training	- Certification program (specific short courses)
Legislation	- Energy sector environmental regulation
Energy efficiency	- Promoting demand-side management projects
Renewable energy	Transfer of small hydropower station technology     Promoting small and medium hydropower stations     Renewable energy development project for the Caribbean
Project formulation and funding	<ul> <li>Support to the Caribbean countries for formulating, developing, and marketing energy project proposals</li> </ul>

ministries, proposal of facilitating energy efficiency, renewable energy, and other clean technology initiatives. In addition, there will be a workshop on the approach and elements of sustainable development policies, based on the results of the case studies. The second stage will provide specific advisory services to the countries interested in applying these approaches.

This project is being implemented with funding from the OLADE-ECLAC-GTZ Project on Energy and Sustainable Development and the UNEP Collaborating Centre, which will be participating with support from the ACS, CARICOM, Organization of Eastern Caribbean States (OECS), UWICED/CERMES, UNEP, ECLAC/CCST, and the UNEP Collaborating Centre.

Its implementation has started with the preparation of an energy policymaking guide, to be applied in the case studies.

The Caribbean Energy Supply Optimization Project is aimed at transferring the successful experience of the Central American Hydrocarbons Coordination Committee (CCHAC) by establishing a Subregional Commission comprised of country delegates, which would become an appropriate forum to discuss aspects of priority interest, such as the formulation of alternatives to reduce energy supply costs (supply contracts, price setting, freight), rationalize the structure of energy balances, increase energy efficiency, intensify energy trade integration in the subregion, address environmental problems, etc.

The project will take place in two stages. The first will set up Subregional Caribbean Hydrocarbons Committee, which will be meeting at least once a year. The second will provide advisory services to those countries that are interested in applying the experience of some of the countries in some specific area and, if so, depending on the group's recommendation, a study would be conducted on energy supply optimization alternatives.

OLADE will coordinate project actions with support from ACS, CARICOM, OECS, UWICED/ CERMES, UNEP, and ECLAC/ CCST, as well as funding from the German Technical Cooperation Agency (GTZ), with which an administrative mechanism is being discussed prior to the first meeting for the establishment of the Subregional Hydrocarbons Commission, with support from ECLAC and some Central American countries.

 Options to Increase the Share of Natural Gas in the Energy Mix of the Caribbean is a project aimed at determining the subregion's natural gas potential and formulating alternatives for its development, considering for this purpose the complementary nature of gas from Venezuela.

The project will take place in two stages. The first will proceed with the elaboration of the contents of the study and the revision of existing information, with the participation of officials from Trinidad and Tobago, the country that has the largest gas reserves in the subregion. The second will study alternatives for submittal to the consideration of

The Electronic Information Network **Project** is aimed at meeting countries' need to have a suitable channel for disseminating technical information on energy projects or initiatives, thus avoiding the duplication of actions and establishing contacts between the technical experts working in related areas

the Caribbean Hydrocarbons Working Group.

The first coordination meeting was held with officials of the Ministry of Energy and Energy Industries of Trinidad and Tobago in order to define the study's scope, and progress has been made in compiling international information for the incorporation of LNG in the energy matrix of the Caribbean.

The project will be supported by ACS, CARICOM, OECS, UWI, UNEP, and ECLAC/CCST.

The Certification Program (Diploma), which is part of the CEAP, will be promoted to decentralize training activities aimed at meeting the specific needs of the subregion's countries. It is an extension of the Energy and Environment Project that OLADE and the University of Calgary are conducting together. The participant in this program who is attending one of the various short courses in training institutions of Latin America and the Caribbean will receive a diploma certifying the training that was given. Some of the courses will be granting credits for the Master's Degree Program in Energy and the Environment that is being delivered at OLADE headquarters. The program is planning additional courses using a distance teaching scheme. The first course will be for the Caribbean subregion and will focus on renewables.

This program is being funded by the Canadian International Development Agency (CIDA) and implemented by OLADE/ University of Calgary with support from UWICED and other Caribbean universities. The Program's first action, in May 1999, consisted of a planning meeting in Calgary, Canada, with the participation of UWICED, to define the program's structure and costs. At present, work is being done on the contents of the first course, which is scheduled for the first quarter of the year 2000.

The Environmental Regulation Workshop Project, which is to be organized as part of the CEAP, is aimed at compiling the regulatory schemes that are in force in the countries of Latin America and the Caribbean and that involve energy and environmental projects, as well as discussing the benefits and drawbacks of the regulatory schemes of each country to identify common problems and solutions.

OLADE and the University of Calgary defined the subjects of the agenda and will be holding this seminar with support from the UWI Caribbean Law Institute Center (CLIC), ACS, UNEP, CARI-COM, OECS, ECLAC/CCST, and the UNEP Collaborating Centre, on November 1-3, 1999, in Portof-Spain, Trinidad and Tobago. The governments of the subregion (ministries of energy and environment), NGOs, and representatives of the industrial sector (energy industries and large energy users) from all the countries of the Caribbean have been invited to participate in the seminar.

The Project Promoting Demand-Side Management Projects in the Electric Power Sector is aimed at promoting the start-up of DSM projects being jointly implemented by companies and investors from Quebec and Latin America and the Caribbean, with emphasis on the tourist sector of the Caribbean in order to involve the private sector in activities for the efficient management of energy and industrial facilities in the countries.

The project envisages the identification and evaluation of existing projects and the promotion of conditions favoring the countries and project implementation actions.

In order to start up actions in this project, an OLADE mission and the Government of Quebec visited Barbados, Cuba, Jamaica, St. Lucia, the Dominican Republic, and Trinidad and Tobago in order to determine the possibility for cooperation. In Cuba, the participation of companies from Quebec at the TECNOURE '99 Conference to be held in December 1999, as well as a seminar on ESCOs on October 5-7, 1999, was ensured. In Jamaica, advisory services to the Jamaica Public Service Company (JPSCo) were planned, and the establishment of an ESCO for an energy efficiency project for the University and a hospital is being evaluated. In Santa Lucia, a proposal for reducing technical losses in distribution, as well as conducting energy audits in government buildings, will be sent to the power utility (LUCELEC).

For its implementation, OLADE will be securing funding from the Government of Quebec and support from UWICED-CERMES and the Caribbean Electric Utilities Services Corporation (CARILEC).

 The Transfer of Small Hydropower Station Technology Project is aimed at consolidating the establishment of national teams with sufficient capacity to devel-



op projects for tapping the energy of small waterfalls, in their different stages.

The OLADE-ECLAC-GTZ project will fund and implement this project, with support from the OLADE-Quebec Program and the Cuban Government.

Between April and June 1999, a case study was conducted in Cuba, an alternative technology proposed for Cuba was prepared, and a subregional workshop was organized to present these alternatives. These results have been disseminated to all of the subregion's countries.

The Project for Promoting Medium and Small Hydropower Stations is geared to fostering the start-up of hydropower and electric power transmission projects with companies and investors of Quebec and Latin America and the Caribbean.

The Project includes phases to identify and evaluate existing projects, to promote favorable conditions in the countries, and foster project implementation actions to facilitate the start-up of hydropower and electric power transmission projects in the region, by means of partnerships technology transfers and between the companies of Quebec and interested countries, for which purpose specific meetings will be organized.

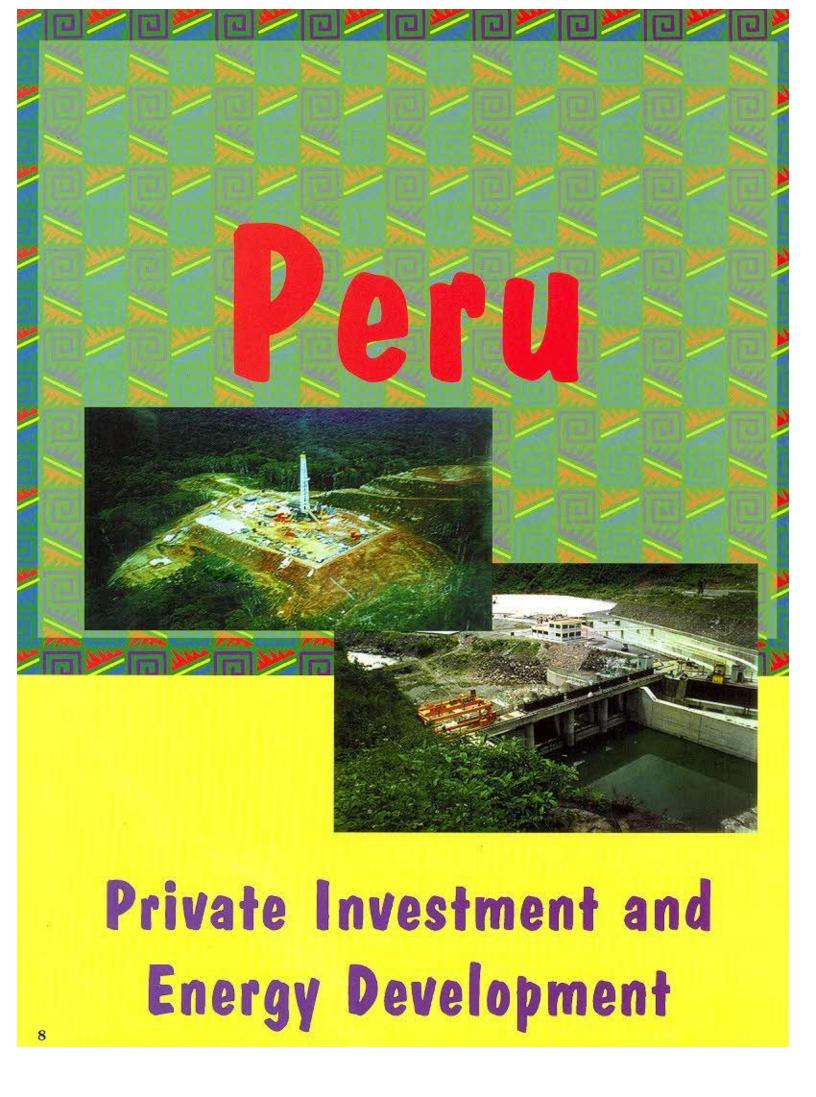
Project activities will be funded by the Government of Quebec and implementation will be in the hands of the OLADE-Government of Quebec Project, with support from the CEIS, UWICED/CERMES, UNEP, and ECLAC/CCST. To date, projects have been identified in Cuba and Guyana. In the former, a scheme for collaboration between the National Hydraulic Resources Institute and the company Microturbines Technologie, Inc. has been defined for the transfer of small hydropower station technology. In Guyana, negotiations are being held to build the 45-MW Tumatumari Station.

 The Renewable Energy Development for the Caribbean Project is aimed at facilitating the development of renewables in the member countries of CEIS.

The UWI initially thought of the project, which will be developed on the basis of crucial contributions from this institution. The project envisages the following activities: Evaluation of Renewable Energy and Component Design Policy, Evaluation of the Renewable Energy and Component Design Financing, Development of a Program to Build Up Renewables, Building Up the Renewable Energy Information Network, and Workshop on Project Design and Documentation.

The project is being implemented by CIES with support from OLADE, UWICED/CERMES, UNEP, and ECLAC/CCST and funding from UNDP/GEF.

After a year of the establishment of the Caribbean Energy Action Program (CEAP), it has become an element for the sector's development, with the active support and participation of the countries that are its members, which will enable its activities to expand in the future and new projects of interest for the subregion to be implemented.



he Republic of Peru is located in the midwestern part of South America, with Ecuador and Colombia to the north, Chile to the south, Brazil and Bolivia to the east, and the Pacific Ocean to the west.

Peru has a surface territory of 1,285,216 square kilometers. It has a population of 25 million and its demographic growth rate, according to 1993 census projections, is 1.8%. More than half the population (52.15%) lives on the Pacific seaboard, whereas 36.9% lives in the Andes and 11% lives in the Amazon river basin.

#### **OVERALL SITUATION**

Since the mid-1990, the Peruvian Government has been implementing a stabilization program aimed at reducing inflation, restoring macroeconomic equilibrium, and restructuring the economy in order to ensure long-term growth.

Alongside this, a set of structural reforms is being promoted to modernize the State, reduce its involvement in the economy, increase productivity, and enhance competitiveness. These reforms are part of world economic globalization and the prevalence of open market economies.

At present, private investment is being actively promoted in sectors that were previously the exclusive domain of the State, such as electricity, oil and gas, telecommunications, water, cement, mining, etc.

The stabilization that started in August 1990 put an end to the excessive growth of money. Pricing controls and subsidies were eliminated, thus permitting interest and exchange rates to float. As a

result, inflation declined from 7,000% in 1990 to one-digit figures in 1997. In 1998, inflation continued to decrease and was at 6.0%, the lowest rate since 1972.

Gross domestic product (GDP) between 1993 and 1998 recorded sustained annual growth of 6%, based mainly on the confidence in local and foreign investment and domestic savings. In 1998, the GDP growth rate amounted to only 0.3% because the Peruvian economy was severely affected the El Niño Phenomenon (alteration of Pacific ocean currents leading to flooding) and the international financial crisis.

#### ENERGY SECTOR

Peru has a variety of energy sources, among which oil and gas play a leading role, along with hydroenergy, coal, biomass, solar and wind energy, etc.

The Ministry of Energy and Mines is the institution governing energy and mining activities and therefore it is in charge of setting standards and promoting, supervising, and orienting the sector in order to contribute to the country's socioeconomic development in keeping with the Government's general policy to continue promoting private-sector investment in the country and conclude the program to privatize assets that are still in the hands of the State, a process that started many years ago.

This is in line with the implementation of actions to abate poverty, orienting investments towards those activities that ensure a greater generation of employment.

In this context, the essential actions inside Peru's energy sector are aimed at:

- Continuing with the privatization of the State's entrepreneurial activities in the energy sector, ensuring the viability of companies and promoting new investments in the companies that are being privatized, promoting productive employment and competition and improving efficiency in production to ensure quality and excellency of goods and services.
- Continuing with the promotion of private-sector investment in the development of power generation, transmission, and distribution activities in the country, creating the proper framework so that national capital can participate successfully in the privatization processes that are being implemented.
- Continuing with the expansion of the electricity frontier in rural and urban areas inside the country, whether through small stand-alone systems or by connecting these areas with large national interconnected grids. Alongside this, efforts will continue to integrate interconnected power systems into one single grid.
- Ensuring competition and permanently revising and complementing current standards in order to adapt them to the country's interests, as well as to the changes that are taking place in the global framework in which electric power activities are taking place.
- Continuing the promotion of exploratory activities in order to increase oil and gas reserves and to ensure self-supply over the medium term with a dynamic

Peruvian laws promote the participation of private-sector enterprises in the sector using a business approach for power generation, transmission, distribution, and marketing, governed by open market rules and without any constraint.

legislation that is always responsive to variations on the world fuel market.

- Supporting the creation of competitive markets to trade fuel in open market conditions.
- Supporting the privatization of oil and gas subsector assets that are still in the hands of the State.
- Intensifying the campaign to promote the rational use of energy and increase efforts to ensure the wider use of renewables.

#### ELECTRIC POWER SUBSECTOR

Peruvian laws promote the participation of private-sector enterprises in the sector using a business approach for power generation, transmission, distribution, and marketing, governed by open market rules and without any constraint. In the case of supplies for public electric power service, at present defined as any consumption with a peak demand under 1 MW, the Law has provided for a regulated pricing system based on marginal costs, the acknowledgment of efficient costs, and open market prices, recognizing a 12% real annual discount rate.

During 1990-1995, the electric power subsector was consolidated and restructured by upgrading existing facilities, establishing a suitable legal framework, restructuring the sector, and transferring a large part of the State's business activities to the private sector.

During 1996-1998, standard-setting, regulatory, and supervisory agencies were consolidated and/or created, and adjustments were made to current norms.

At present, the subsector is in the process of being consolidated, to ensure that service quality and customer attention will become truly important.

Despite the severity of the problems found at the start of the decade and the complications that have arisen naturally as a result of such a comprehensive transformation, major results have been achieved, among which the following are noteworthy:

- Recovery of the electric power balance, since there is now no deficit. The number of users has grown by 64% thanks to investments made in marginal urban areas and especially in rural areas.
- The national electrification coefficient, which in simple terms indicates the percentage share of the population that has access to electric power service, has risen from 50% to 70%, benefiting more than 4.2 million inhabitants. By the year 2000, it is expected that there will be a coverage of 75%.

Of the many projects that have been carried out in the country during this period, the following are noteworthy:

- High-performance thermoelectric plants addressing the permanent shortage of electricity in Iquitos, Pucallpa, Tarapoto, Tumbes, Puerto Maldonado, Mollendo, Tacna, among others.
- The Cachimayo-Abancay, Abancay-Andahuaylas, and Abancay-Chalhuanca-Chuquibambilla transmission lines, which helped to lay the groundwork for the comprehensive electrification of the Department of Apurimac.

- The Tintaya-Charcani transmission line, which permitted the integration of the electric power systems of the south, improving its reliability and which, in association with other projects such as the Arequipa-Mollendo line, has helped to overcome the negative impacts produced by the natural disasters that reduced supply.
- The Cajamarca-Cajabamba, Puno-llave-Pomata, Nasca-Puquio, and other transmission lines, which facilitated connection to the principal systems to important locations of the coun-

try's sierra, enlarging its integration and development possibilities.

 190 small electric power systems that carry energy to the most remote communities in the interior of the country, improving living quality and promoting their socioeconomic development.

During the period 1999-2000, an intense development program has been planned.

 In terms of supply side, it is expected that the Hydropower Station of San Gabán (110 MW), the Thermoelectric Station of Mollendo (70 MW), and one of the units of the Thermoelectric Station of Ilo 2 (125 MW) will start up. Building of the power stations of Chimay (111 MW), Yanango (38 MW), and Yuncán (126 MW), as well as the second unit of the Ilo Power Station (125 MW), will continue.

 As for transmission, it is expected that the Mantaro-Socabava

line, which will be integrating the Centro-Norte and Sur electric power systems, will start up and that the Talara-Zorritos transmission line, which will enable the principal system to extend up



to the northern border, will be completed.

The National Electrification Plan has also envisaged the following projects, among others:

 Completion of the Grand Amazon Axis, which will be connecting the cities of Tingo María, Aucayacu, Tocache, Bellavista, Tarapoto, Moyobamba, and

- Yurimaguas, permitting the incorporation of the San Martín Regional System into the Centro Norte Interconnected System.
- Construction of the 10-MW El Valor Thermoelectric Station, which will guarantee the supply required for the development of the northeastern area.
- Construction of the Campo Armiño-Pampas line associated to the Huancavelica small power system, which be able to provide energy for 40,000 inhabitants of extremely poor areas in this department.
- Construction of the Juliana-Puno, Ayacucho-Cangallo, Chiclayo-Tucumán-Cayaltí, and other lines.
- Construction of 50 small power systems, the main ones being Puquina-Omate-Ubinas, Bagua Stage I, Chachapoyas Stage II, Caballococha, Nauta, and Iberia.
- The start of a large program to install solar energy panels in the tropical rain forest and in border areas, which will facilitate social integration and improve the living conditions of a large number of inhabitants of remote areas and native communities.

#### OIL AND GAS SUBSECTOR

The Peruvian Government has taken up the task of restructuring the oil



and gas subsector by applying the modern concepts of a liberal market. A series of new laws were enacted between 1991 and 1992, permitting the free flow of capital, the gradual deregulation of prices, the free convertibility of the national currency, equal treatment for foreign and domestic investors, the simplification of tax procedures, etc., to set up the macroeconomic context that would help to promote the presence of investors in all sectors of the economy.

A new hydrocarbons law was approved in mid-1993, confirming the political bases that were defined and decided for the sector, among which the following are noteworthy:

- Hydrocarbons in the ground belong to the Peruvian State, but those on the surface belong to PERUPETRO, which is entitled to transfer ownership to the contractor in the licensing contracts.
- The free availability of hydrocarbons produced and the open market import/export of oil and products are provided for in exploration contracts.

- Prices are determined by supply and demand.
- Termination of PETROPERU's monopoly and the open access of private companies to all upstream and downstream oil and gas activities.
- Stable exchange rate regime. Accounting in U.S. dollars is permitted.
- Possibility of international arbitration.
- Modern regulations for oil industry activities and environmental protection.

The legal framework also defined the establishment of a new institutional configuration:

 The Ministry of Energy and Mines (MEM), through the General Department of Hydrocarbons (DGH), defines policies and establishes the regulations where the markets are not capable of efficiently distributing the resource and protecting the environment.

- The oversight function of industry activities remained in the hands of the DGH and then were transferred to a new institution called the Energy Investment Supervisory Agency (OSINERG).
- PERUPETRO is the new state agency with private legal status that is in charge of administering resources that promote, negotiate, subscribe, and supervise oil contracts with companies that wish to explore and produce hydrocarbons. It has a specific law defining its functions, organization, and autonomy for hiring staff, as well as economic and financial autonomy.

The key concept that has permitted sector restructuring has been the search for competitive markets for all industry activities as the best way to ensure transparency, low energy costs and efficiency in resource use.

In the hydrocarbons subsector, the subscription of 60 new contracts in the period from 1990 to 1998 is noteworthy. This has intensified exploration and production activi-



ties, which have led to the 1998 discovery of new natural gas reserves in the Pagoreni reservoir, with a volume calculated at more than 3 trillion cubic feet.

As an example of the changes in the oil and gas situation there is the natural gas reservoir of Aguaytía which, on the basis of an investment of US\$260 million, has increased natural gas production by 55 million cubic feet per day, yielded 1,500 barrels per day of LPG and 2,700 barrels per day of gasoline, and installed a 155-MW power generation plant.

In addition, the promotion of exploratory activities has been planned for the two-year period 1999-2000.

#### CAMISEA PROJECT

This Project considers tapping the San Martín and Cashiriari structures, located in the Camisea area, in whose reservoirs there is one of the largest non-associated natural gas reserves in Latin America. Its current potential is estimated to be about 13 trillion cubic feet of natural gas and 660 million barrels of natural gas liquids.

Camisea is located at about 500 km to the east of Lima, in a tropical wet

forest that is crossed by the Urubamba River.

Keeping in mind that the development of the natural gas of Camisea is viewed as the largest energy supply project for the country, the Peruvian Government has declared that it is a national priority and has decided to carry it out by promoting private-sector investment to be administered by the Commission to Promote Private-Sector Investment (COPRI) and by the Special Committee for the Camisea project specifically set up for this purpose.

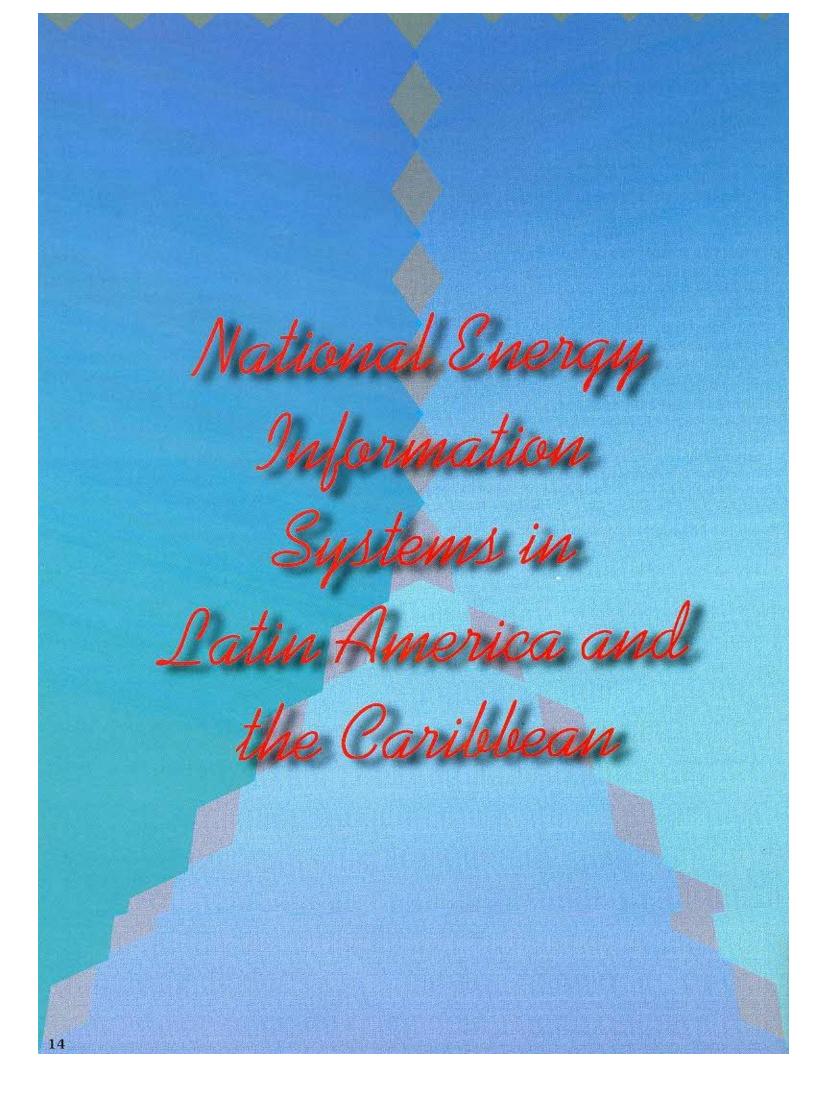
Since development of the Camisea project is an important element of the country's energy strategy and economic program, the goal of this process is the rapid, efficient, and transparent promotion of private-sector participation in the project, attracting the interest of the largest number of bidders with technical and economic solvency, so that in a competitive environment adequate economic conditions are defined to facilitate the fast and adequate development of the project.

The Plan to Promote Private-Sector Investment in the Camisea Project envisages the awarding of the respective contracts by means of international public bidding processes, which were announced on May 31, 1999. According to the base documents of the bidding processes, the project will be developed by means of a two-module scheme: one for the field, which involves natural gas production, the separation of dry gas and liquids, and cracking of liquid hydrocarbons; and the other for transport and distribution, involving oil and gas transport activities to the coast and natural gas distribution in Lima and Callao.

On the basis of the conditions of the bidding processes, it is estimated that the contracts will be awarded at the end of the present year and that, after starting production in the reserves, the gas will be reaching Lima by June 2003. As a rule, it is considered that field production, by means of a 40-year licensing contract, will involve an investment of about US\$1.5 billion, whereas oil and gas transport and distribution activities, by means of three concession contracts for a 33-year period, will involve investments of over US\$800 million.

Article prepared by the Technical Office for Energy of the Ministry of Energy and Mines of Peru





By means of the National Energy Information Systems (SIEN) Project, the member countries and the Permanent Secretariat of OLADE will be developing tools that will enable them to broaden their knowledge and details of energy statistics information and have available better tools for preparing short, medium-, and long-term forecasting.

The current conditions of the energy sector of the countries of Latin America and the Caribbean, where over the past few years privatization has taken place and there have been changes in the State's share in energy sector management, have led to new scenarios for the management of statistical information, which in the majority of countries had previously been handled by a centralized scheme because of the direct linkage of energy companies or institutions to energy ministries or secretariats.

Under this scheme, there was a reliable flow of information from the entities or areas of these ministries and secretariats to a centralized statistical clearinghouse whose job was facilitated by the fact that the most significant and important information was generated in the entities themselves, with which agreements were drawn up regarding the timetable and format for the delivery of the data and where the coverage, reliability, and quality of the information were clearly specified.

With the changes taking place in the majority of the countries, information sources that previously were centralized in one or two institutions are highly dispersed. State power utilities, for example, which used to manage all power sector activities and for which it was relatively easy to identify both users and coverage areas, have been split up into many utilities focusing on specific activities such as power generation, transmission, or distribution and, in some cases, to serve users in competitive markets, making it difficult to identify regional consumption.

From the standpoint of statistical consolidation, information must be compiled from a large number of institutions and companies, with which, in addition, methodological and conceptual aspects should be agreed upon to ensure standardization and consistency of the information. To this new situation, which is not exclusive to the power sector if one bears in mind the liberalization also taking place in the oil and gas sector and the entire energy sector as a whole, must be added, in some cases, the downsizing of human resources in charge of preparing energy statistics owing to the reduction in the size of official entities.

Despite the above, the State, planners, users, financing institutions, investors, sector entities, and international organizations are increasingly demanding high-quality information, sector energy because the data they use must be consistent, in line with reality, and with a coverage that considers the entire sector and the country as a whole. They also require periodical information so that data that vary continuously can be provided frequently. More detailed information is needed, because highly consolidated information can hamper the identification of problems that arise and their respective solution, and this information has to be broken down by subsector, region, or population group. As

for the timeliness of the information, this is essential for timely decision making. In addition, information must be easily accessible.

Bearing in mind these considerations, the member countries and OLADE's Permanent Secretariat, with financial support from the European Commission, will soon be implementing the project for promoting national energy information systems (SIEN) whereby the tools for elaborating and administering energy statistics in each will be developed or consolidated.

The first step in planning this project involved an inventory on the status of the development and characteristics of the SIENs in each one of the countries, which helped to determine whether they had a centralized information system that consolidated the statistical information of all the energy subsectors, whether these systems benefited from institutional recognition, whether sector institutions participate and were committed to supplying information, what tools were applied for this purpose, and what resources were allocated for compiling, processing, and disseminating data on information management technology.

As a result of this inventory, it was possible to observe that nine of the 26 member countries of the Organization had a SIEN, which incorporated mainly information on energy supply and demand required for the elaboration of national energy balances on a yearly basis. In some cases, there was another kind of energy-related data, such as energy prices, characteristics of infrastructure and equipment, and economic and demographic information,

being developed on different types of computer tools, principally on spreadsheets and exceptionally using data bases. It was also evident that the countries that have no information systems generally use non-system procedures for gathering and processing information, usually recorded on spreadsheets.

In the majority of the countries, there are various types of technical and logistic difficulties to ensure the adequate flow of data from entities or information sources toward the entity in charge of gathering statistics, such as differences in definitions and concepts on energy sources and energy sector activities, different periodicity in the generation of statistics, the lack of data, the incompatibility between information systems or the impossibility of data exchanges and transmission, etc., difficulties that are further complicated by current energy sector privatization and decentralization processes.

On the basis of this assessment, workshops and working groups were organized with information users, international organizations, and the SIEE® Advisors in the member countries, who are in charge of each country's energy statistics, to define the characteristics that each national energy information system required, as well their inter-institutional organization scheme, resources required, information to be included, structure, tools for development and operation features. On the basis of these elements, the project has been set up. This project is to be implemented as of the year 2000 and it will extend for three years with the participation of the energy ministries and secretariats, country experts, and OLADE consultants, as well as technical assistance from the European Commission.

On the basis of the successful experience of the Energy-Economic Information System (SIEE®), the following project objectives were established. OLADE will be in charge of the project's technical coordination and each country will be participating with specialists and technicians:

- Build up the analysis and planning capacity of the member countries of OLADE, providing them with appropriate tools for compiling, storing, administering, and evaluating energy sector information.
- Develop in the member countries of OLADE national energy information systems in order to make available the energy statistics required for energy sector analysis, monitoring, follow-up, evaluation, and planning, as well as economic information, expansion projects, indicators on management, environmental impact, and technological development and development forecasting and energy sector results.
- Establish methodologies for ongoing, timely, and consistent maintenance of energy sector information on the basis of information available in sector entities or other sectors.
- Provide the countries with suitable instruments to forecast energy sector outlook by means of tools that facilitate the formulation of alternative situations or scenarios for its development.
- Provide energy information systems with modules for assessing

energy-economic indicators whereby problems can be identified and timely solutions found.

In order to ensure the project's success and the continuity of national energy information systems, the commitment and continuous participation of energy sector authorities and all other entities involved in the sector, as well as information sources and users, are required, so that there can be a permanent interaction that will enable the SIEN to become an effective and useful tool.

For this purpose, the establishment of working groups where all the entities involved as information sources are represented is required. Their participation in the initial definition of SIEN characteristics, as well as the standardization of methodologies, concepts, and operating schemes, will be essential to ensure that the system will have reliable, timely, and complete information and that there will be a permanent flow of data.

As a rule, there are four types of activities that the project should carry out in order to ensure that a SIEN as described above will be installed:

#### 1. Assessment of information

 Energy sector characterization: In each one of the countries, in order to set up the entities participating in the different phases of production and development of different energy sources and to identify the primary sources of information, that is, oil companies, power utilities, coal trading companies, energy distributors, etc.

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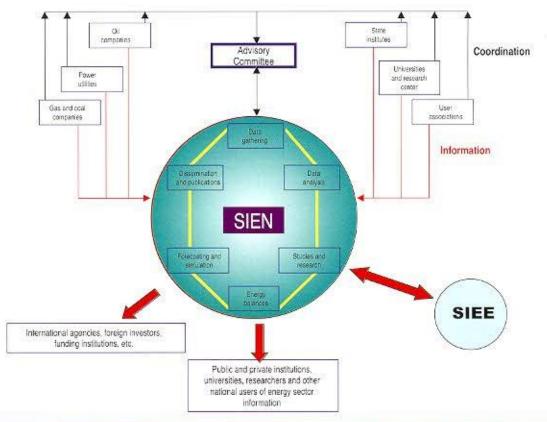
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- Complementary information: Identification of the principal public and private entities that can provide economic, demographic, or energy information required to consolidate energy sector information and the variables to elaborate management indicators, evaluation and monitoring information, and outlook on future evolution.
- Energy information evaluation:
   Evaluation of the status and availability of information in the different entities, existing information systems, environments used, technologies applied, quality of data, periodicity, and level of breakdown and, even more impor

- tant, determining the willingness to supply information to the SIEN.
- Definition of information flow mechanisms
  - Definition of mechanisms: Identify in each country the most suitable strategy to link on a permanent basis public and private institutions as SIEN information sources, by establishing a statistics committee or subsector working groups that provide information in a coordinated fashion to the SIEN and are institutionally committed to support the update of information.
- Development of mechanisms:
   Set up in each country a statistical group or committee sup-

- ported by sector authorities, with representatives of public and private entities and ensure their commitment for the permanent supply of information under conditions and characteristics mutually agreed upon, in accordance with the definition of the SIEN.
- Definition of interfaces: Analyze the information prepared by the different public and private entities in each country, the characteristics of their files, compilation methodology and calculation and define the interfaces between the entities and the SIEN so that data can be supplied to the system by means of schemes that are to the extent possible systematized through Internet or magnetic media, taking advantage of information that has already





been processed in other information systems.

#### 3. Design of the SIEN

- Characteristics of the information: Define the information that will be incorporated into the SIEN of each country, establishing the level of breakdown, periodicity, units of measure, etc., bearing in mind the results of the evaluation, the assessment, and the commitments achieved with entities in each country.
- Methodological definition: Identify information that is available and not available in the entities and, on the basis of previous studies and experiences that are applicable, recommend a statistical methodology for obtaining the data or estimating them, considering all sources, subsectors, and uses.
- Operating specifications of the SIEN: Definition of the SIEN's operating specifications whereby the methodology for data input, mathematical calculations, query validation and presentation processes are established, using as a reference the requirements of the users, whose needs must be met by the system, and the different means of system access such as printed publications, dissemination on magnetic media, and access to local networks and Internet.
- SIEN architecture: Design of SIEN areas and modules, ensuring that it will permit characterization of the energy sectors of the member countries with a wide range of statistical breakdown, so that it will be possible to register information by region, compa-

- nies, subsectors, energy sources, uses, periods of time less than one year, etc. Register of economic and demographic information, prices, rates, projects that are operating, that are being implemented and that are to be developed.
- SIEN data base: Design of the SIEN data bases, using relational type tools and standardizing criteria for the code tables.
- Energy balance: Design of the algorithms for the automatic elaboration of the national energy balance using different formats, units, and the level of useful energy.
- Indicators: Definition of the energy-economic indicators that permit an evaluation of energy sector management and determine the causes of problems and provide for possible solutions.
- Forecasting: Definition and design of tools to obtain energy sector forecasting under different economic and energy scenarios.
- Information query: Definition of outputs, queries, and forms of access to SIEN information, as well as procedures for their dissemination to all types of users and transfer of data to other systems such as OLADE's SIEE.
- Development, installation, and start-up of the SIEN
- Development of the SIEN:
   Development of information configuration, input, processing, and query programs, on the basis of the operational specifications obtained in all

- the countries, so as to meet the requirements—guaranteeing applicability, continuous operation, and reliability and consistency of the information.
- Installation: Installation of the SIEN in the member countries of OLADE, data input, operating tests, system adjustments, and definitive start-up.
- Training and dissemination: Training on SIEN management, update, and maintenance and broad dissemination at both the national and international level.

In short, the way the development of SIENs has been formulated should provide the countries with a tool that makes all energy sector statistical information available on a permanent, timely, and updated basis, with quality and consistency supported by the wide-ranging participation and commitment of authorities, entities, and persons involved in the sector. Likewise, its automation and standardization should mitigate the need to carry out repetitive work that at present is done manually, thus optimizing the application of resources for this work.

With the incorporation of modules of energy sector indicators and energy sector results, as well as the results of forecasting based on various economic scenarios, into the SIEN, there will be systems available that, in addition to acting as a data bank, will serve as suitable tools for sector assessment and planning, developed with advanced technologies that permit broad dissemination and easy access.



#### Introduction

Determining the fiscal impacts that can be attributed to the reforms in the electric power sector is complex, because in addition to the lack of sector information on this topic there must be a complete and comprehensive assessment to quantify these impacts over the short, medium and long terms. The complex fiscal impacts stemming from reforms in the electric power sector are related not only to the tax changes observed in the different restructuring processes taking place in the electric power industry (total liberalization or single buyer scheme) but also how this sale of a public enterprise to the private sector is carried out.

ECLAC<sup>1</sup> (1998) asserts that "although it might be difficult to quantify, in the case of privatization, there is a difference between the fiscal impact in the year in which the transfer was made and the total impact. Nevertheless, from the economic standpoint, there is a basic consensus regarding privatization: it is not an appropriate way to tackle public account imbalances over the short term; it usually leads to improvements in company management; the reduction of subsidies which goes along with the process builds up the financial sustainability of the corresponding sectors; it can be an effective mechanism to improve public finance over time if the income that is earned can be used to reduce public debt and, in particular, to buy debt

bonds at a discount on secondary markets."

Despite the importance granted by economic authorities of the majority of the countries of Latin America to the long-term strategic objectives of privatization, there is no doubt that the income from privatization and its contribution to short-term stabilization are the immediate results most looked forward to by fiscal authorities, because, it is usually said, it reduces public sector financing needs and because, if this income is used to reduce public debt, debt servicing is mitigated.

Nevertheless, these assertions cannot always be empirically verified for all the countries that have started and/or

extended the process of selling public assets. Indeed, for the countries where reform of the electric power industry consisted of total liberalization of networks and sector privatization or another scheme, such as partial liberalization or the single buyer system, it cannot be asserted that privatization has effectively contributed to reducing the fiscal deficit (measured by the results of the nonfinancial public sector) or much less led to any variation in gross debt or been related directly to its decline.

Explicitly or implicitly, the objectives being proposed by electric power sector reforms can be found at two levels: a macroeconomic level aimed at eliminating the deficit of state enterprises and balancing public sector accounts, and a sector level aimed at enhancing reliability and improving the sector's productive efficiency and obtaining financing through private-sector contributions. These objectives were combined with the principal guidelines of the above-mentioned structural economic reforms (macroeconomic stabilization, greater private-sector participation, new schemes for international ties, and renewed internal mechanisms for saving and investment2 and others), emphasizing the modification of company schemes aimed at ensuring that business interests, based on marginal cost tariffs, and competitiveness become the driving force behind higher operating results and levels of earning (market synonymous with efficiency).

There is no doubt that privatization was part of the set of structural reforms that involved, depending on the initial situation, political problems and the specific objectives of each country, which implied that the role effectively performed by privatization was not similar in all cases but rather respond-

Table 1: INCOME FROM PRIVATIZATION WORLDWIDE

	MILLION US\$				%	
	ELECTRICITY	OIL GAS	TOTAL	ELECTRICITY	OIL GAS	ENERGY/ TOTAL
1990	59	568	12658	0.47	4.49	4.95
1991	359	2085	24242	1.48	8.60	10.08
1992	4892	2760	26181	18.69	10.54	29.23
1993	1741	5162	23661	7.36	21.82	29.17
1994	2180	2115	21712	10.04	9,74	19.78
1995	4523	2781	21901	20.65	12,70	33.35
1996	6156	1687;	25399	24.24	6.64	30.88
1990-96	19910	17158	155754	12.78	11.02	23.80

Source: World Bank, Privatization Database in Global Development Finance, 1998, page 109

Table 2
INCOME FROM PRIVATIZATION (%) and MMUS\$

	LAC	ASIA (EAST & PACIF)	SOUTH ASIA +AFRICA+ME	EUROPE+ CENT, ASIA	TOTAL
1990	0.86	0,03	0.01	0.10	12658
1991	0.77	0.03	0.09	0.11	24242
1992	0.59	0,20	0.07	0.14	26181
1993	0.44	0.30	0.09	0.17	23661
1994	0.38	0.25	0.19	0.18	21712
1995	0.21	0.25	0.10	0.44	21901
1996	0.56	0.11	0.12	0.22	25399
1990-96	0.53	0.17	0.10	0.20	155753

Source: World Bank, Privatization Database in Clobal Development Finance, 1998, Appendix 4

Table 3
LATIN AMERICA AND THE CARIBBEAN
SECTOR INCOME FROM PRIVATIZATION IN 1997
(million USS)

	TELECOM.	IRON+STEEL MINING	ELECT.	BANKS	GAS	OTHERS	TOTAL
ARGENTINA			969				969
BRAZIL		3130	10775	641	596	2278	17420
COLOMBIA			2707		149	324	3180
JAMAICA						150	150
MEXICO				84			84
PANAMA	652						652
PARAGUAY		35					35
PERU		274				174	448
VENEZUELA		1200		126		141	1467
TOTAL	652	4639	14451	851	745	3067	24405

Source: Based on ECLAC Economic Study of LAC 1997-98, September 1998, pages 47-50

ed to the different needs of each national experience.

Income from Privatization: The Electric Power Sector in the World and Regional Context

According to statistics from the World Bank, the Inter-American Development Bank, and ECLAC,3 between 1990 and 1996, transactions for more than US\$155 billion have been recorded worldwide, of which the energy sector accounts for more than 23.8%. It should be noted that, in the case of the electric power sector, the share reached a peak over the last two years, accounting for 21% and 24%,

respectively. This same situation took place in 1993 for oil, since in that year oil accounted for 22% of the total amount of world privatization (see Table 1).

Latin America has been a leading region in terms of privatization in the world over the last seven years of the nineties. Of the cumulative income from privatization between 1990 and 1996, the region accounted for 53%, followed by Europe and Central Asia (20%), East Asia and the Pacific (17%), and finally the slight participation of three large regions, Africa, Middle East, and South Asia, which together accounted for only 10% (Table 2).

In Latin America and the Caribbean, this process continued in 1997, since according to ECLAC, the amounts reached more than US\$24.4 billion, of which more than 70% was accounted for by Brazil, followed to a lesser extent by Colombia (13%) and Argentina (less than 5%). But probably the most noteworthy fact is that the electric power sector was at the head of this process, taking more than US\$14.4 billion, followed by iron and steel and mining (US\$4.64 billion). This means that, in 1997, the electric power sector accounted for almost 60% of total income from privatization, essentially from the sale of public power utilities of Brazil (almost US\$11 billion) and, to a lesser extent, from Colombia (US\$2.7 billion). Another way of visualizing the importance of the privatization carried out in this subsector is that it accounted for 100% of Argentina's total, 80% of Colombia's, and 65% of Brazil's (Table 3).

In short, it can be asserted that it is not only the intensity of the privatization process in the Latin American countries that has been diverse. It also possible to distinguish in those countries that have already been involved in this transfer process for some time that there are stages of greater impetus followed by years where this drive starts losing momentum. Perhaps this is the result of the decline of the number of companies available for sale, the lower value of the remaining companies, the

public urgency of furthering the privatization process, or the fact that, in the new sectors that have a potential for privatization, regulatory institutions that have not as yet been established or that have just been developed are required.

# Fiscal Magnitude of the Privatization of Public Enterprises

The transfer of assets to the private sector exerts an impact not only on the results account because it increase government income and can reduce fiscal expenditures related to state enterprises (subsidies, debt servicing, and others), but also on the equity balance of the public sector due to the change in the composition and volume of assets and liabilities of the public sector. Unfortunately, the information

Nevertheless, it is important to emphasize that, despite the strategic importance of the above-mentioned considerations, it is certain that income stemming from privatization and its contribution to short-term stabilization are the outcome that is most looked forward to by fiscal authorities.

- First, because public sector financing needs (and therefore, pressures on interest rate and domestic prices) are reduced.
- Second, because if this income is used to reduce the public debt, debt servicing is mitigated.
- Third, because to the extent that foreign capital has access to the purchase of public assets, the inflow of foreign currency for this purpose reduces the external gap without leading to any potential volatility on the exchange rate markets.

available to assess the status of public finance is limited to the results account, but there is no information available on the equity status and its evolution, which undermines the transparency of public administration and makes it difficult to learn about the real financial situation of the government's enterprises, which is one of the principal challenges that have to be addressed in privatization.

There is a widespread consensus that the transfer of public assets or the increase in liabilities does not help the government resolve its fiscal problems (in other words, permanent deficit stemming from expenditure levels higher than income). In these cases, the fiscal problem can or should be resolved by a realignment of expenditures, income, or both.

Consolidating the goals of macroeconomic stabilization requires the search of greater resources for the national treasure. It is frequently expected that privatization will contribute to improving the status of public finance, traditionally viewed as the source of inflationary pressure and external account disruptions. The consolidation of government accounts, favored by privatization, should not be limited to achieving and keeping short-term macroeconomic equilibrium but rather should be the driving force behind long-term economic growth by ensuring a better allocation of resources and the corresponding stimulus for national savings. It is unanimously believed that "these long-term objectives have aroused the interest of the economic authorities in charge of the majority of privatization processes in Latin America."

These assertions cannot always be verified empirically for all the countries that have started and/or continued the process of transferring public assets. Indeed, when considering the countries with electric power sector privatization processes that are already mature and/or that were launched some time ago (Chile, Argentina, Peru, more recently Bolivia and Colombia) and other countries that are just starting this process (Brazil), there are no clear or consistent trends when compared with the type of reform proposed for the industry. In other words, for the above-mentioned countries where electric power industry reform consisted of total liberalization of networks or,

as in the case of Mexico, partial liberalization or the single-buyer system, it cannot be asserted that privatization has effectively contributed to reducing the fiscal deficit (measured by the results of the public nonfinancial sector) or much less led to a variation in gross debt or been directly linked to the reduction of gross debt.

It depends on how linkages are measured or what type of indicator is used. It can be asserted that the short-term fiscal impact of privatization can be quite substantial.4 Indeed, if income is compared to central government expenditures, it can be observed that, in the case of Argentina, for example, between 1990 and 1994, the income from privatization accounted for about 10% of central government expenditures, whereas in Mexico, between 1991 and 1993, it accounted for 15%. The case of Peru is noteworthy because, for 1994 and 1996, it was over 33%.

Nevertheless, when taking a broader indicator than the representativeness of income from privatization as a percentage of central government spending, such as the outcome (whether deficit or surplus) of nonfinancial public sector (NFPS) per GDP unit, for the period 1990-1997, one can see that there is no single or consistent linkage to the average income from privatization, measured also by GDP unit (see Chart 1). The cases of Chile and, to a lesser extent, Mexico are noteworthy, because there is a surplus of the NFPS. In the former case, although the majority of the income from privatization came before 1990, it is the country of Latin America that has been recording, throughout the decade, a surplus fiscal situation. In Mexico, although the average for 1990-1997 yielded a small NFPS surplus, it is necessary to specify that, since 1993 and thereafter, deficits are recorded, albeit not in the magnitude of the other countries, and, especially in 1997 and now in 1998, the decline of crude oil prices is negatively affecting fiscal income.

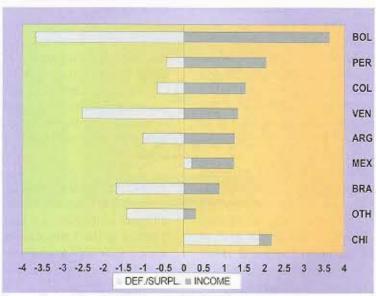
If the situation of some of the countries is specified in detail, the linkage

between the evolution of income from privatization and NFPS results does not show any clear or determining trend. Indeed, the following can be observed in Chart 2:

- In Colombia and Brazil, there was an inverse ratio between income evolution and NFPS results. It is assumed that a rise in income from privatization should go along with a decline in deficit (or increase in surplus) of NFPS, but this did not take place in the period 1990-1997 for these two countries. The most noteworthy is that, in these two countries, the deterioration of
- accounting for values of more than 13 GDP points, would not reflect an improvement proportional to the NFPS result (it was hardly 1%).
- Peru recorded the most evident correlation between income evolution and NFPS results.

It has also been asserted that privatization exerts a positive impact on external debt reduction. Here also we must proceed with some caution because for some countries that swapped capital, especially for the transfer of electric power assets, for debt bonds, they reduced only temporarily and partially

# Chart 1 INCOME FROM PRIVATIZATION AND NONFINANCIAL PUBLIC SECTOR RESULTS AS PERCENT OF GDP - AVERAGE FOR 1990/97



Source: Drawn from ECLAC, Economic Study of Latin America 1997-98. IDB: IPES, 1996, Chapter 5, World Bank, Data base on privatization up to 1994

the NFPS result becomes more considerable as of 1995, when there starts to be high income stemming from the transfer of public enterprises.

 In view of the singular process of capitalization recorded in Bolivia, where there was no "fresh income"s it was to be expected that income stemming from the capitalization process that took place essentially in 1995-1996, the total amount of gross debt. For example, in Argentina, in 1994, the privatization program had reduced the external debt by US\$18 billion, equivalent to slightly less than 25% of the total debt for that year.<sup>6</sup>

As for the linkage between debt variation and income from privatization, there is no single or consistent tendency (see Chart 2):

- In Table 4, one can see that, except for Venezuela, total debt disbursed in the period 1990-1997 grew for all the countries analyzed here, with substantial annual average increases in Argentina and Colombia (about 60%) and close to 40% in four countries: Peru (38%), Chile (40%), Mexico (41%), and Brazil (44%).
- Argentina and Peru constitute contrary examples. In the former, although income from privatization compared to GDP grew between 1990 and 1992, coinciding with a decline of total debt in the amount of US\$3 billion, as of this year the privatization program of Argentina did not manage to meet the needs of external financing and the debt-GDP ratio did not stop growing, from 25.8% to almost 44% in 1997. In Peru, however, in contrast to the high increases recorded in income for 1994 and 1996 (almost 6% and 5% of GDP, respectively), there is a steadily declining trend of the debt-GDP ratio from 68.3% in 1993 to 43.5% in 1997.
- In Colombia and Brazil, there are similar phenomena, contradicting the trend verified in the Peruvian case. It was already mentioned that both in Colombia and in Brazil, between 1995 and 1997, there was a spectacular growth in

- income with respect to GDP. Nevertheless, also during this period, there was a growing trend in the debt-GDP ratio (in Brazil it grew from 22.6% to 24.7%, whereas in Colombia it grew from 31.2% to 33.3%).
- Mexico recorded virtually no income from privatization since 1994. Nevertheless, as of the 1995 crisis, the debt-GDP ratio has been declining substantially by more than 20 points (from 57.3% in 1995 to 37.2% in 1997).

Therefore one should be extremely careful when drawing restrictive and determining conclusions on the fiscal impact of privatization. Oftentimes, the technical and political difficulties stemming from these processes do not coincide with the appropriate pace of income inflow to sustain stabilization programs. In many countries, usually the market value of fiscal assets is much lower than the amount of financial resources required by the stabilization programs, and this substantially restricts the effectiveness of privatization as an instrument that helps to achieve it.

For ECLAC,<sup>7</sup> "it is extremely difficult to measure the relative importance of the different objectives pursued by privatization in the Latin American countries, especially taking into account that their implications can be contradictory. Thus, for example, the attempt to maximize fiscal income can go against the incorporation of democratic criteria for the transfer of assets. At the same time, the latter objective will probably be contrary to the wish to attract the participation of foreign investors, as well as, in some circumstances, to a greater efficiency in the management of the company, once it is privatized (excessive dispersion of the principal prevents it from giving coherent signals to the agent). The objective of putting fiscal finance on a sound footing can also be contrary to other demands of the privatization process, especially the granting of guarantees to private-sector shareholders, such as the setting of a minimum rate of return (with the ensuing creation of contingent liabilities for the national treasury) and fiscal incentives by the tax administration (which assumes a reduction in tax collection)."

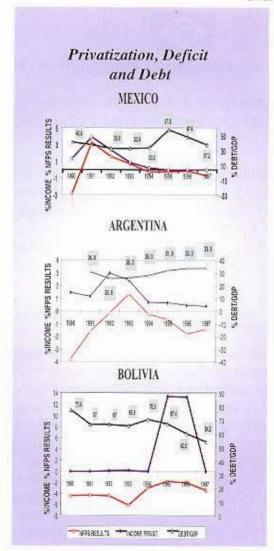
These fiscal privileges can generate, on the other hand, mistaken microeconomic incentives, contrary to the socially efficient management of the transferred companies. In addition, the objective of maximizing fiscal income can be contrary to the search for higher efficiency, because there is the possibility that the government will grant some monopolistic privilege to the privatized company by the erection of barriers to the entry of future competitors or the subregulation of the

Table 4
TOTAL FOREIGN DEBT DISBURSED

			(m	illion U	5\$)				GROWTH
	1990	1991	1992	1993	1994	1995	1996	1997	1990-97 (%)
Argentina	62233	58413	59123	70600	79455	89719	99077	108000	59,39
Bolivia	3768	3582	3784	3777	4216	4523	4366	4450	17.88
Brazil	123439	123910	135949	145726	148295	159256	178100	188200	43.95
Chile	18576	17319	18964	19665	21768	21736	22979	26900	39.76
Colombia	17993	17335	17277	18942	21954	25050	29202	31655	60.62
Mexico	106743	117817	116501	130524	139818	165837	160000	156000	41.00
Peru	19996	20787	21409	26370	30214	33443	33643	27685	38.27
Venezuela	35528	36000	38447	40836	41160	38460	35277	33250	-5.45

Source: ECLAC, Statistical Yearbook of Latin America and the Caribbean 1997 and Preliminary Balance 1997

#### Chart 2





area in which it evolves, as in the case of the capitalization of the power utilities in Bolivia.8

The many and complex motivations surrounding the privatization process involve at least four basic implications for its design:

- First, its objectives must be explicit and compliance must be closely monitored.
- Second, it should be used for structural reorganization purposes rather than as a short-term instrument for fiscal and macroeconomic rehabilitation instrument (see Inset 1).

- Third, it is essential to establish an appropriate regulatory framework to achieve expected long-term objectives.
- Finally, the parallel concession of fiscal or regulatory privileges that hamper the attainment of these objectives should be avoided.

#### Notes

- ECLAC, The Fiscal Pact: Strengths, Weaknesses, and Challenges, LC/G.1997, Santiago, April 1998.
- See Fernando Sánchez Albavera, "Globalization and Energy Restructuring in Latin America," ECLAC Magazine, No. 56, August 1995.
- See World Bank, Global Development Finance 1998, Washington, March 1998.

especially Annexes 4 and 5, pages 103-121; IDB, Economic and Social Progress Report, 1996 and 1997, especially the chapters on structural reforms and Chapter 5, "Privatization;" ECLAC, Economic Study of Latin America 1997-1998 and Fiscal Pact, op. cit.

See IDB, EPES 1996, Part Two, Chapter 5, "Privatization," pages 176-183.

See OLADE-ECLAC-GTZ Project, Case Study of Bolivia, ECLAC, LC/R 1830, July 1998.

See IDB, op. cit., page 177.

- ECLAC, Fiscal Pact, op. cit., page 240-241.
   See OLADE-ECLAC-GTZ, "Energy and Sustainable Development in Latin America: Case Study of Bolivia," ECLAC, LC/R 1830, July 1998.
- Hugo Altomonte, Regional Energy Expert, Economic Commission for Latin America and the Caribbean (ECLAC)



#### BRAZIL: AMBITIOUS INVESTMENT PLAN OF PETROBRAS

The Chairman of Petrobras, Dr. Henri Philippe Reichstul, reported that the company is proposing a major investment plan to increase crude oil production to ensure that the country will become self-sufficient by the year 2004.

The investment will involve US\$4 billion this year and US\$6 billion in the year 2000. Brazil is importing 600,000 barrels of oil per day. Daily average production amounts to 1.13 million barrels. It is expected that, by the year 2003, however, this production will have increased to 1.75 million to meet the country's total demand.



#### BRAZIL-BOLIVIA: STUDIES FOR A SECOND GAS PIPELINE

The Governments of Brazil and Bolivia announced that they will be studying the possibility of building a second gas pipeline between the two countries in view of Brazil's growing energy demand and Bolivia's gas potential, which in the past year increased its proven reserves threefold. The layout will be parallel to the pipeline joining the two countries and which started operating fully in July 1999. It will be exporting 9.1 TCF the first year of the contract and 30 TCF beginning in the fifth year.

Recent natural gas discoveries in Bolivia increased proven reserves from 8.6 TCF to 17 TCF, while Brazil is striving to increase the share of natural gas in its energy matrix from the present level of 2.8%, according to data drawn from the National Energy Balance for 1999, to 12% by the year 2010. For the year 2005, daily Brazilian demand for this energy product will be 65 MM m3.

The possibility of building this gas line will be discussed by authorities from both governments on October 28, 1999 in the city of Brasilia. The Vice-President of Bolivia, Jorge Quiroga, and the President of Brazil, Fernando Henrique Cardoso, will be attending this meeting.



#### NICARAGUA: NEW OIL EXPLORATION STAGE

After having interrupted oil activities for 20 years, the Nicaraguan Government announced that it will start up oil exploration once again in the country's territory.

The administration of President Arnoldo Alemán, through the Executive Secretary of its National Energy Commission, Mr. Luis Velásquez Molieri, announced the development of a new law that will permit exploration concessions to be granted as of the beginning of next year



#### PERU-BOLIVIA: MULTIPURPOSE PIPELINE CONSTRUCTION AGREEMENT

The energy authorities of Bolivia and Peru reported that they have drawn up the terms for an agreement that would enable Bolivia to build a multipurpose pipeline between La Paz and the Peruvian locality of Puerto IIo.

The pipeline, which will extend over about 400 kilometers, will be able to carry between 10,000 and 15,000 barrels per day of liquefied petroleum gas (LPG). Peru is currently importing 3,000 barrels per day of LPG, which is equivalent to half of its demand.

On the basis of the agreement, Bolivia will be contracting the building company for this project, whose cost is estimated at US\$200 million and which will require authorization from Peru with respect to environmental standards.



## TRINIDAD AND TOBAGO-SURINAME: SUBSCRIPTION OF OIL COOPERATION AGREEMENT

The state oil company of Trinidad and Tobago, Petrotrin, and that of Suriname, Staatsolie Maatschappij, signed a cooperation agreement to develop various joint business opportunities. The representatives of both companies said that they have agreed to work jointly to increase crude oil production, enlarge crude oil supply and sale schemes, share commercial and technical information, and train staff.

Specifically, the representative of Petrotrin, a company that currently buys crude oil from Suriname for refining, expressed interest in participating in Suriname's retail market.



# VENEZUELA: LAW TO PROMOTE PRIVATE SECTOR PARTICIPATION IN GAS DEVELOPMENT

A legal framework for the natural gas sector was approved in Venezuela, permitting that private companies participate in all areas of the gas industry, including production, without any minimum level set for state participation.

The law provides for a 20% royalty on natural gas production, which is greater than the current rate of 16.7%. Gas projects, nevertheless, are not subject to the current income tax for hydrocarbons projects. In addition, it explicitly permits the government to offer a complete or partial tax holiday for the royalties, which could be paid in cash or in kind at the discretion of the government.

This legal framework also created the Natural Gas Entity, in charge of promoting subsector development and regulating the industry.

# Statistics

## Energy Balance (10(3) boe)

#### 1998 - LATIN AMERICA AND THE CARIBBEAN

- Activity	Oil	Natural Gas	Coal	Hydroenergy	Geotherma	Nuclear	Firewood	Sugar Cane Products	Other Primary	Total Primary	Electricity	Liquid Gas	Gasoline/ Alcohol	Kerosene & Jet Fuel	Diesel Qil	Fuel Oil	Cake	Charcoal	Gas	Other Secondar	Non- energy	Total Secondary	Total
S PRODUCTION	3728868	1102519	272528	380326	10217	25304	407540	254206	58182	6239690	540870	160301	664250	125276	606970	553012	12998	40435	297546	31670	128957	3162285	6239690
() IMPORTS	414479	11375	99142			38288	26	0	0	563308	29185	62093	106587	16820	123754	92042	11406	65	15834	36	3411	461233	1024541
p EXPORTS	1948716	22218	175612			0	0	0	12550	2159096	30879	17998	126654	45733	121504	187307	461	60	4124	7581	21098	563197	2722293
p STOCK VARIATION	-11683	0	599	-110		-38429	0	-102	0	-49725	3 - 3	775	719	-289	1565	-556	794	10	-115	899	1252	5054	-44671
L UNDEVELOPED	- 0	115372	300	10011	1637	0	0	433	513	128266		0	0	0	0	. 0	0	0	579	0	0	579	128845
Y TOTAL SUPPLY	2182948	976304	196357	370205	8580	25161	407566	253671	45119	4465911	539376	205173	644902	96074	610785	457191	24737	40450	308562	25024	112522	3064796	4368422
T REFINERIES	-2151327	-15028				-			4025	-2162330		65281	586359	125276	606524	553012	1592		50827	21868	96769	2087508	-74822
R POWER STATIONS	-486	-127104	-80966	-364363	-8632	-25161	- 0	-35	-27	-606774	511134	70-007			-32429	-204238			-37210	0	0	511134	-369517
A SELF-PRODUCERS	-196	-18982	-1794	-5841			-3657	-14441	-6946	-51857	29736		- 2		-8472	-22311			-4534	-1023	0	29736	-58461
N GAS CENTER		-336272	100	3 3122			- 5551.0	A HEAVEN	3678	-332594		93912	49587		0			. 3	228325	0	30065	401889	69295
S COAL PLANTS			No.				-79475		0	-79475			Street					40435		0	0	40435	-39040
F COKING PLANTS/FURNACES			-76769	į.					-186	-76955					9		11406	-365	16610	-225	2123	30139	-47406
O DISTILLERIES		!		1,				-53676	0	-53576			48304							0	0	48304	-5372
R OTHER CENTERS	. 0	-7599	0	1			0	0	348	-7253	'	1108	-10616	0	446	0	-1549	0	1784	9802	0	13140	-6278
M TOTAL TRANSFORMATION	-2152009	-504985	-159529	-370204	-8632	-25161	-83132	-68152	890	-3370914	0	0	-10616	0	-40901	-226549	-1549	-365	-41744	-1248	0	-322972	-531601
. OWN CONSUMPTION	1237	161115	0	j u			0	54656	0	217008	18084	6632	6271	2717	17588	41410	1621		99555	2390	5190	201458	418466
. LOSSES	1372	8697	527	0	45	- 0	0	0	120	10761	84359	619	1730	10	2345	429	572	1030	863	0	113	92070	102831
. ADJUSTMENT	13348	2983	739	1	-97	- 0	-63	0	8065	24976	-1	-157	1222	-1388	1250	14	116	259	1252	772	1366	4705	29681
C TRANSPORTATION	.0	8926	5	9			52	li money	0	8983	1923	4883	548965	71359	402394	11748		000	10000	3	1445	1042720	1051703
O INDUSTRY	14526	193889	32636	0			58091	123943	33894	454979	202882	25184	2851	3478	54217	151137	19781	27108	137923	18361	8793	651715	1108894
N RESIDENTIAL	0	50287	1176				246490		2680	300633	133085	158868	1441	17345	1599	8303	1	10445	9307	0	13	340346	640979
S COMMERCIAL, SERV., PUBL.	50	18960	0				679		0	19689	74824	4147	1340	828	9528	5198	- 49	906	447	0	1836	99052	118741
U AGRO, FISHING, WINING	33	813	1745	Û	2	15	17653	4293	1100	25537	21836	415	817	985	79008	11529	180	146	2	469	126	115513	141050
M CONSTRUCTION, OTHER	373	18	.0				3632		149	4172	2384	255	2440	541	1954	874		134		447	4868	13897	18069
P CONSUMPTION	14982	272893	35562	0	0	0	324497	128236	37823	813993	436934	193692	557854	94534	548700	188789	19961	38739	147679	19280	17081	2263243	3077236
T NONENERGY		25631					0	2627	1	28259	0	4387	67209	201	1	0	918	57	17469	1334	88772	180348	208607
f END-USE	14982	298524	35562	0	0	0	324497	130863	37824	842252	436934	198079	625063	94735	548701	188789	20879	38796	165148	20614	105853	2443591	3285843

### Energy Balance (10(3) boe)

### 1998 - MERCOSUR, including CHILE

Activity	Oil	Natural Gas	Coal	Hydroenergy	Geothermal	Nuclear	Firewood	Sugar Cane Products	Other Primary	Total Primary	Dectricity	Liquid Gas	Gasoline' Alcohol	Kerosene & Jet Fuel	Diesel Oil	Fuel OI	Coke	Charcoal	Gas	Other Secondar	Non- energy	Total Secondary	Total
PRODUCTION	666538	312781	22276	263655	0	9979	207288	204053	38618	1725188	307581	55965	270184	40896	287313	141671	2590	37388	44430	31935	41176	1261128	172518
IMPORTS	297980	11375	86277	0	0	10396	- 4	- 0	0	406032	27070	33840	44016	10263	68288	9106	8730	73	0	37	2182	203406	60943
EXPORTS	119903	11094	0	0	. 0	. 0	0	- 0	0	130997	29712	5588	24260	8539	16607	29814	91	38	0	6148	2383	123179	2541
STOCK VARIATION	-2848	0	2061	0	0	-4517	0	0	0	-5304	0	-875	-6335	-1174	-6797	2921	399	0	-663	856	265	-11404	-167
UNDEVELOPED	0	29785	0	8804	0	0	0	. 0	469	39058	0	0	0	0	0	0	0	0	987	0	. 0	987	400
TOTAL SUPPLY	841767	283277	110614	254851	0	15858	207293	204053	38149	1955861	304939	83142	283604	41447	332197	123884	11629	37424	42780	26680	41240	1328965	20236
REFINERIES	-839073	0	0	0	0	0	0	- 0	4633	-834440	- 0	40013	211871	40896	287061	141671	0	0	28254	14728	36493	800987	-334
POWER STATIONS	. 0	-53038	-16423	-251344	. 0	-15858	0	0	0	-336662	289674	0	0	0	-9056	-9717	0	0	- 0	0	0	270900	-657
SELF-PRODUCERS	0	-11008	-13767	-3508	0	0	-3607	-6396	-6309	-44595	17907	0	0	0	-2228	-5636	0	-55	-3257	-1241	. 0	5490	-391
GAS CENTER	0	-25321	-24	0	0	0	0	0	3533	-21812	0	14595	1821	0	0	-76	- 0	0	952	3754	2590	23607	947
COAL PLANTS	0	0	0	0	. 0	0	-70605	0	0	-70605	0	- 0	0	0	- 0	0	0	37388	0	0	0	37388	-332
COXING PLANTS/FURNACES	- 0	0	-62544	0	0	0	0	- 0	0	-62544	0	-28	0	0	0	- 0	-3928	-365	15224	172	2123	13198	-49
DISTILLERIES	. 0	0	.0	0	0	0	0	-65403	0	-65403	0	0	58029	0	-0	0	0	0	0	0	0	56029	-90
OTHER CENTERS	0	-7190	0	- 0	- 0	0	0	0	852	-6338	0	1318	-12046	. 0	253	0	0	0	-174	11145	0	496	-5
TOTAL TRANSFORMATION	-839073	-96556	-92758	-254851	0	-15858	-74212	-71799	-6557	-1451664	0	-66	-12471	0	-11284	-15429	-6517	-420	-3431	-3377	0	-52996	-2343
OWN CONSUMPTION	0	44356	0	0	0	0	0	65680	0	110036	9631	177	888	341	2029	16185	1322	0	24130	355	0	55058	1650
LOSSES	2694	6825	284	- 0	0	0	0	.0	0	9804	46668	527	2014	6	1485	86	511	1171	1634	550	142	54795	645
ADJUSTMENT	0	0	492	0	0	0	5	0	0	497	0	7683	-219	0	0	9	0	203	589	0	0	8264	87
TRANSPORTATION	. 0	8307	0	0	0	0	52	0	0	8359	1181	82	206748	35156	245641	11147	0	- 0	0	0	0	499955	5083
INDUSTRY	0	67136	15027	0	0	0	45825	66574	31135	225697	115896	6079	53	681	10948	71628	3278	30438	10676	20346	1950	271975	4976
RESIDENTIAL	0	38805	106	- 0	0	. 0	73292	0	0	112203	69400	62045	0	5125	2314	363	0	4711	1114	0	0	145072	2572
COMMERCIAL, SERV., PUBL.	0	12976	0	0	0	0	708	0	0	13684	50929	2050	0	2	2424	4270	0	436	191	0	0	60302	739
AGRO, FISHING, MINING	0	1229	1946	- 0	0	0	13199	0	456	16829	11233	59	75	13	56070	4766	0	45	0	272	0	72534	893
CONSTRUCTION, OTHER	0	0	0	0	. 0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	19	L -0
CONSUMPTION	. 0	128452	17079	0	0	0	133076	66574	31591	376772	248639	70316	206895	40977	317397	92174	3278	35630	11981	20618	1950	1049857	14268
NONENERGY	0	7087	0	0	0	0	0	0	1	7088	0	4374	61555	122	1	0	0	0	1015	1780	39148	107995	1150
END-USE	0	135539	17079	0	0	o	133076	66574	31592	383860	248639	74690	268450	41100	317398	92174	3278	35630	12996	22398	41098	1157852	15417

Countries included in the table: ARGENTINA, BRAZIL, CHILE, PARAGUAY, and URUGUAY

#### Energy Balance (10(3) boe)

#### 1998 - MEXICO

Activity	Oil	Natural Gas	Coal	Hydroenergy	Goothermal	Nuclear	Firewood	Sugar Cane Products	Other	Total Primary	Bestricity	Liquid Gas	Gasoline/ Alcohol	Kerosene & Jet Fuel	Diesel Oil	Fuel Oil	Coke	Charcoal	Gas	Other Secondar	Non- energy	Total Secondary	Total
S PRODUCTION	1237423	291823	55994	22589	3600	15182	53713	17348	9	1697682	101155	62135	167718	21811	112085	186767	14688	0	236461	. 0	41895	944714	1697682
U IMPORTS	0	0	9984	0	0	- 0	0	0	0	9984	838	21348		- 0	7537	38167	2479	0	15834	0	- 0	133125	143108
P EXPORTS	692473	- 0	. 98	- 0	- 0	0	0	0	D	692571	778	1181	27023	1109	3169	545	0	0	4124	(10)	9016	46924	739495
p STOCK VARIATION	0	0	0	0	0	. 0	0	0	0	0	0	0	0	.0	0	0	0	0	0	.0	- 0	0	0
UNDEVELOPED	. 0	17511	0	0	0	0	0	112	0	17623	0	0	- 0	. 0	0	0	0	0	0	0	0	0	17623
Y TOTAL SUPPLY	544950	274312	65880	22589	3600	15182	53713	17235	9	997472	101216	82322	187618	20702	116453	224388	17167	0	248171	0	32879	1030915	1083673
† REFINERIES	-532052	0	0	0	0	0	0	0	0	-532052	0	13935	140361	21811	112085	186767	1513	0	13420	. 0	14442	504333	-27719
R POWER STATIONS	. 0	0	-50471	-22589	-3600	-15182	. 0	0	-9	-91851	101155	0	- 0	0	-2325	-138498	0	0	-37210	0	0	101155	-168730
A SELF-PRODUCERS	. 0	0	- 0	0	0	0	0	. 0	0	0	0	0	. 0	0	0	0	. 0	. 0	0	- 0	0	0	. 0
N GAS CENTER	0	-251975	0	0	0	-0	0	- 0	- 0	-251975	Û	48201	27356	0	0	0		0	223041	0	27453	326051	74076
S OGAL PLANTS	0	0	0	0	0	0	0	0	0	0	0	- 0	0	0	0	0	- 0	0	0	0	0	0	0
F COKING PLANTS/FURNACES	Û	. 0	-15409	0	- 0	0	0	3	0	-15409	- 6	0	.0	0	0	0	13174	0	0	- 0	0	13174	-2235
O DISTILLERES	- 0	0	0	0	0	0	0	- 3	- 0	0	6	Ö	0	80	0	0	0	0	0	0	0	0	0
R OTHER CENTERS	- 0	0	. 0	0	0	0	0	- 0	ő	0	0	0	0	0	0	0	0	0	0	0	0	- 0	0
M TOTAL TRANSFORMATION	-532052	-251975	-65880	-22589	-3600	-15182	0	0	-9	-891287	- 6	0	0	0	-2325	-138498	0	0	-37210	. 0	0	-178033	-124607
. OWN CONSUMPTION	0	6333	0	0	0	- 0	0	0	.0	6333	5133	5988	4335	2344	7221	20169	231	0	81215	0	1423	108036	114389
, LOSSES	0	0	0	0	-0	0	. 0	- 6	0	0	14658	Ö	0	- 0	- 0	0	0	0	0	0	D	14658	
ADJUSTMENT	12898	0	0	0	0	D	0	0	0	12898	0	0	0	0	0	0	0	0	0	0	0	0	12898
C TRANSPORTATION	0	. 0	0	0	0	0	0	ol	0	0	665	3857	174335	16841	77197	529	0	0	0	0	0	273224	273224
O INDUSTRY	0	14407	0	0	0	0	0	16780	0	31187	46962	3401	0	183	14786	57273	16019	0	126454	0	0	265078	295265
N RESIDENTIAL	- 0	1597	0	0	0	0	53713		0	55310	28746	69077	0	732		7919	0	0	6944	- 0	0	113818	
S COMMERCIAL, SERV., PUBL.	0	0	0	0	0	0	00	6	0	0	D	0	0	- 0	0	0	0	0	0	- 0	0	0	
U AGRO, FISHING, MINING	0	0	Ö	0	0	0	0	0	0	0	5052	220	0	585	14523	0	0	0	0	0	- 0	20381	20381
M CONSTRUCTION, OTHER	0	0	ä	Ô	0	Ö	0	Ö	0	0	0	0	0	0	0	O.	0	0	0	0	0	0	0
P CONSUMPTION	0	16004	0	0	0	0	53713	16780	0	86497	81425	76355	174335	18342	106907	65721	16019	0	133398	0	0	672501	758998
Y NOMENERGY	0	0	o o	0	0	0	0	456	0	456	0	0	8949	16	0	0	918	0	16349	- 0	31456	57686	58142
END-USE	ō	16004	0	Ö	0	0	53713	the state of the s	0	86953	81425	76355		18358	106907	65721	16936	0	149746	0	31456	730187	

#### Energy Balance (10(3) boe)

#### 1998 - CARIBBEAN

Activity	01	Natural Gas	Coal	Hydroenergy	Geothermal	Nuclear	Firewood	Sugar Cone Products	Other Printary	Total Primary	Bectricity	Liquid Gas	Gasstine/ Alcohol	& Jet Fuel	Diesel Oil	Fuel Oil	Coke	Ctarcoal	Gas	Other Secondar	Non- energy	Total Secondary	Total
PRODUCTION	58791	66368	0	2858	. 0	- 0	29110	23149	83	180359	23299	3211	14321	8849	15571	35387	75	4400	2452	1549	2115	111232	176486
IMPORTS	54749	0	981	0	0	0	. 0	- 0	0	55730	0	4253	6778	5165	23716	39821	132	10	.0	3	859	80737	136467
EXPORTS	26194	0	0	0	0	0	0	0	0	26194	0	1835	4255	4770	7189	17646		0 0	0	1549	283	37527	6372
STOCK VARIATION	1300	0	0	0	0	- 0	0	-102	0	1198	0	-15	46	.17	213	258	- (	10	0	0	0	529	172
UNDEVELOPED	0	6655	0	0	0	0	0	- 0	0	6655	0	- 0	0	0	. 0	0	6	0	0	.0	0	0	565
Y TOTAL SUPPLY	88646	59713	981	2858	0	0	29110	23047	83	204438	23299	5614	16890	9261	32311	57820	210	4420	2452	3	2691	154971	24817
REFINER ES	-79133	-3174	0	0	0	0	0	- 0	0	-82307	0	1163	12818	8849	15571	35387	78	0	1192	1549	2115	78722	-358
POWER STATIONS	-486	-11874	-411	-1911	0	0	. 0	-0	0	-14682	17708	0	0	0	-3289	-36122	(	0 (	0	0	0	-21703	-3638
A SELF-PRODUCERS	-70	-147	0	-947	.0	0	-5	4578	0	-5747	5591	. 0	0	0	-3482	-12860		X 0	0	0	0	-10751	-1549
GAS CENTER	0	-1404	0	0	0	0	0	- 0	. 0	-1404	0	2048	1226	0	0	0		0	- 0	.0	0)	3274	187
S COAL PLANTS	0	0	0	0	- 0	0	-9520	30	0	-9520	0	0	0	0	0	0	. (	4400	0	0	0	4400	-512
COKING PLANTS/FURNACES	0	0	0	0	0	0	9	. 0	0	0	0	. 0	- 0	0	0	0		0 0	0	0	- 0	0	Treat
DISTILLERIES	0	0	0	0	- 0	0	0	-578	- 0	-578	0	0	277	0	0	0	(	0	0	0	0	277	-30
OTHER CENTERS	0	0	- 0	. 0	0	- 0	8 0	0	0	0	0	C	- 0	0	0	0	-10	0 0	1260	. 0	0	1260	125
TOTAL TRANSFORMATION	-79689	-16599	-411	-2858	0	0	-9525	-5156	0	-114238	0	0	0	0	-6771	-48982	-10	0	0	0	0	-55763	-5876
. OWN CONSUMPTION	10	3152	0	0	0	C	0	.0	0	3162	907	101	12	36	152	36	68	0	717	0	0	2030	519
LOSSES	7	942	0	0	0	0	0	0	0	949	3553	1	4	. 4	46	. 0		0	294	.0	0	3902	485
ADJUSTMENT	0	3771	0	0	0	0	-67	0.	0	3704	- 1	0	431	-721	712	0	28	0	5	0	608	1064	476
TRANSPORTATION	.0	0	0		- 0	- 0	- 0	0	-0	0	- 2	716	13224	5073	11501	873	(	0	0	3	72	31464	3146
NOUSTRY	8644	16870	570	Ò	. 0	0	2195	17396	83	45758	9185	474	1017	274	8145	5892	103	30	290	-0.	947	26157	7191
RESIDENTIAL	0	12	- 0	0	- 0	0	13626	0	0	13538	6051	3904	619	4494	348	0	- (	3798	885	0	13	20112	3375
COMMERCIAL, SERV., PUBL.	0	24	0	0	0	0	10	0	0	34	2657	368	127	84	200	335	(	373	259	.0	0	4403	443
AGRO, FISHING, MINING	0	18	- 0	0		0	189	0	0	207	510	13	269	. 0		1764	. (	85	2	0	59	5756	596
CONSTRUCTION, OTHER	296	18	0	0	0	0	3632	0	0	3946	433	24	541	17	1382	138	. (	134	0	0	464	3133	707
CONSUMPTION	8940	16942	570	0	0	0	19652	17396	83	63583	18838	5499	15797	9942	24630	8802	103	4420	1436	3	1555	91025	15460
NONENERGY	0	18307	.0	0	. 0	0		495	0	18802	0	13	646	0	0	0	- (	0	0	0	528	1187	1998
END-USE	8940	the state of the s	570	0	0	0	19652	17891	83	82385	18838	5512	16443	9942	24630	8802	103	4420	1436	3	2083	92212	17459

Countries included in the table: BARBADOS, CUBA, GRENADA, GUYANA, HAITI, JAMAICA, DOMINICAN REPUBLIC, SURINAME, TRINIDAD AND TOBAGO

#### Energy Balance (10(3) boe)

#### 1998 ANDEAN COMMUNITY

Activity	Cii	Natural Gas	Cox	Hydroenergy	Geothermal	Nuclear	Firewood	Sugar Cane: Products	Other Primary	Total Primary	Electricity	Liquid Gas	Gasoline/ Alcohol	& Jot Fuel	Diesel Oil	Fuel Oil	Coke	Charcoal	Gas	Other Secondar	Non- energy	Total Secondary	Yorar
PRODUCTION	1754502	433801	197663	83366	0	0	70289	19499	17665	2576785	96328	42400	207438	51912	179646	156372	1332	1684	14687	3405	38939	794143	257678
IMPORTS	33628	. 0	. 1873	0	0	- 0	- 0	- 0		35501	57	4475	9883	101	15755	49	1017	0	- 0	0	48	31385	6688
EXPORTS	1102136	11124	175514	- 0	- 0	0	0	. 0	12550	1301324	42	8733	67612	28296	95330	125370	370	0	. 0	- 0	8259	334012	163533
STOCK VARIATION	-9500	0	2245	-186	0	- 0	0	0	6	-7440	0	638	-777	-336	880	184	. 0	0.0	0	0	0	589	-685
UNDEVELOPED	0	61554	300	- 0	- 0	0	0	0	0	61854	0	0	0	0	0	. 0	0	0	. 0	0	0	0	6185
TOTAL SUPPLY	676494	361123	25968	83180	0	0	70289	19499	5115	1241668	96343	38780	148932	23381	100951	31235	1979	1684	14587	3405	30728	492105	93963
REFINERIES	-668281	-8068	. 0	0	0	0	0	0	0	-676349	0	11300	189039	51912	179646	156372	- 6	0.0	9198	3405	38887	639759	-3659
POWER STATIONS	0	-62081	-3839	-82143		- 0	0	0	0	-147863	91742	. 0	- 0	0	-10110	-11151	- 0	0	0	0	0	91742	-7738
SELF-PRODUCERS	-126	-8320	-1124	-1037	- 0	0	0	-1241	-117	-11965	4599	0	.0	0	-2060	-1699	- 0	.0	-1103	(0)	0	4586	-1224
GAS CENTER	. 0	-60355	0	0	- 0	0	0	0	- 0	-60355	9	31100	18399	0	0	0	- 0	. 0	4321	0	52	53872	-648
COAL PLANTS	0	0	0	0	- 0	0	4099	0	0	-4099	0	0	0	0	0	0	- 0	1684	0	.0	0	1684	-241
COKING PLANTS/FURNACES	0	0	-4140	0	. 0	0	0	. 0	.0	-4140	0	0	- 0	0	- 0	0	1332	0	644	- 0	0	1976	-21
DISTLLERIES	0	0	0	0	. 0	0	0	- 0	0	D	3	. 0	0	0	0	0	0	0	0	Ö	0	. 0	1
OTHER CENTERS	- 9	0	- 0	0	0	0	0	0	0	0	3	0	0	.0	0	0	-1539	0	524	0	0	524	-101
TOTAL TRANSFORMATION	-668407	-138824	-8903	-83180	0	0	-4099	-1241	-117	-904771	0	0	. 0	0	-12170	-12850	+1539	0	-1103	. 0	. 0	-27662	-13829
CWN CONSUMPTION	1227	108578	0	D	0	0	0	0	0	109905	3077	371	634	90	7813	1915	- 0	.0	12020	2200	3767	31887	14179
LOSSES	818	42	244		- 0	0	- 0	0	120	1224	17385	99	532	3 90	5	0	114	0	47	0	0	18182	1940
ADJUSTMENT	0	0	351	0	- 0	0	0	0	0	352	0	-225	258	269	474	-1076	- 1	0	658	1205	108	1673	202
TRANSPORTATION	Ó	441	- 5	0	. 0	10	0	0	0	446	33	421	141871	12656	51764	2578	- 0	0	0	0	1373	210696	21114
INDUSTRY	5882	97278	15395	. 0	0	0	4118	12744	1405	136822	30216	14222	1629	1668	15689	8803	145	90	484	.0	5885	78831	21565
RESIDENTIAL	0	9860	1070	0	. 0	0	57381	0	2680	70971	24020	23051	821	7398	108	0	- 0	1537	375	0	0	57310	12828
COUNERCIAL SERV. PUBL.	50	5999	0	0	. 0	. 0	0	0	0	5049	15727	588	926	412	5621	258	- 0	0	0	0	1789	25321	3137
AGRO, FISHING, MINING	33	0	0	- 0	0	0	4711	4285	544	9673	3933	31	385	364	8808	5208	180	0	0	- 0	67	16976	2664
CONSTRUCTION, OTHER	77	0	.0	0	0	- 0	0	0	149	226	1951	222	1876	524	499	699	0	.0	. 0	0	4404	10175	1040
CONSUMPTION	6042	113578	16470	0	- 0	0	66190	17029	4878	224187	75880	38535	147508	23022	80489	17546	325	1626	859	0	13518	399309	62349
NONENERGY	0	0	0	0	0	0	0	1229	0	1229	D	- 0	- 0	0	0	0	0	. 57	. 0	0	13335	13392	1462
END-USE	6042	113578	16470	0	0	0	66190	18258	4878	225416	75880	38535	147508	23022	80489	17546	325	1684	859	0	26853	412701	63811

Countries included in this table: BOLIVIA, COLOMBIA, ECUADOR, PERU and VENEZUELA

#### Energy Balance (10(3) boe)

#### 1998 - CENTRAL AMERICA

Activity	06	Natural Ges	Cost	Hydroenergy	Geothermal	Nuclear	Firewood	Sugar Cana Products	Other Primary	Total Primary	Bestricity	Liquid Gas	Gasolinei Alpohol	Kerosene & Jet Fuel	Diesel Oil	Fuel OI	Coke	Chargoal	Gas	Other Secondar	Non- coorgy	Total Secondary	Youd
PRODUCTION	9238	66	0	11604	6617	- 0	52354	8181	238	88298	14807	457	5184	1814	9407	16434	0	558	682	0	753	50096	88298
UMPORTS	35387	0	310	0	- 0	- 0	- 0	0	0	35697	346	4277	12403	3609	22664	9043	65	0	0	0	282	52689	8838
EXPORTS	8010	0	0	0	0	- 0	0	0	0	8010	144	687	317	2054	1143	7431	0	. 0	0	-0	207	11983	1999
STOCK VARIATION	-1327	0	0	75	0	0	0	0	D	-1252	0	-8	-20	-173	139	357	0	- 0	0	0	0	295	-95
UNDEVELOPED	0	66	.0	1309	1637	0	0	321	44	3377	C	0	.0	. 0	0	- 0	- 0	- 0	.0	0	0	0	337
Y TOTAL SUPPLY	35288	0	310	10370	4980	0	52354	7860	194	111356	15009	4039	17250	3196	31057	18403	65	558	682	0	828	91097	15235
REFINERIES	-35288	0	0	0	0	.0	0	0	0	-35288	- 0	457	5117	1814	9407	16434	0	- 0	682	0	753	34664	-62
R POWER STATIONS	- 0	0	0	-10350	-5032	. 0	. 0	-35	-18	-15435	13787	0	0	. 0	-5765	-8559	0	0	0	0	0	13787	-1597
A SELF-PRODUCERS	0	- 0	0	-20	. 0	- 0	-3	-2652	0	-2675	1020	C	0	0	-402	-1824	- 0	0	0	0	0	1020	-388
GAS CENTER	0	0	0	0	- 0	- 0	. 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
COAL PLANTS	0	0	.0	0	.0	- 0	-1511	0	0	-1511	0	0	0	0	0	0	- 0	558	0	-0	0	558	-95
COKING PLANTS/FURNACES	- 0	0	0	0	0	- 0	0	0	0	0	C	C	0	0	0	0	0	-0	0	.0	Ü	0	
DISTILLERIES	0	.0	- 0	0	- 0	. 0	0	-20	.0	-20	C	0	67	0	.0	0	- 0	0	0	0	- 0	67	4
OTHER CENTERS	0	0	0	0	Û	- 0	0	0	0	0	£	0	0	. 0	. 0	0	0	0	0	0	0	0	- 3
TOTAL TRANSFORMATION	-35288	0	0	-10370	-5032	- 0	-1514	-2707	-18	-54929	0	0	0	0	-6167	-10383	0	0	0	0	0	-16550	-2138
OWN CONSUMPTION	0	- 0	Ū	0	0	- 0	0	0	0	0	177	17	3	. 0	112	805	0	0	682	0	0	1596	159
LOSSES	- 0	- 0	. 0	0	45	- 0	0	0	0	45	2773	0	0	0	1	1	0	0	0	0	0	2775	282
ADJUSTMENT	0	0	0	0	-97	0	0	0	16	-81	-1	-1	-30	0	-1	- 1	0	0	0	0	.0	-32	-11
TRANSPORTATION	- 0	. 0	0	0	0	- 0	0	0	0	0	59	7	16697	1906	18156	. 0	- 0	. 0	0	0	0	36825	3682
INDUSTRY	0	.0	310	0	0	. 0	3501	4698	160	8669	3309	616	160	98	4300	7202	66	0	.0	0	11	15761	2443
RESIDENTIAL	- 0	0	.0	0	0	0	47329	0	0	47329	4770	2824	1	849	48	21	0	427	.0	0	.0	8940	5625
COMMERCIAL, SERV., PUBL.	. 0	. 0		0	0	. 0	0	C	0	0	3631	548	288	328	1313	130	0	111	0	0	47	6396	639
AGRO, FISHING, MINING	.0	0	0	0	0	- 0	10	- 8	0	18	291	20	88	12	898	24	0	20	0	0	0	1353	137
CONSTRUCTION, OTHER	0	0	- 0	0	- 0	0	0	0	0	0	0	- 8	4	0	73	36	- 0	0	0	0	- 0	121	12
CONSUMPTION	0	0	310	0	0	0	50840	4706	160	56016	12060	4023	17238	3193	24788	7413	65	558	0	. 0	58	69396	12541
NONENERGY	0	0	0	0	.0	. 0	0	447	0	447	- 0	0)	39	3	- 0	0	0	0	0	0	770	812	125
END-USE	0	0	310	0	. 0	0	50840	5153	160	56463	12060	4023	17277	3196	24788	7413	65	558	0	0	828	70208	126671

Countries included in the table/EOSTA RICA, EL SALVADOR, GUATEMALA, HONDURAS, NICARAGUA, and PANAMA



#### Energy Report of Latin America and the Caribbean will be prepared annually by OLADE

As OLADE's contribution to further knowledge about energy sector activities and development in the region, the Permanent Secretariat of the Organization will be elaborating annually and distributing to the entire international energy community a publication entitled Energy Report of Latin America and the Caribbean.

The publication, which will be issued during the second quarter of each year, will analyze the evolution, results, and relevant events of the region's energy sector, incorporating regulatory, economic, and political aspects, in addition to statistics from different energy subsectors.

The Report will provide energy supply and demand growth indices in the countries of Latin America and the Caribbean. It will also analyze the evolution of different energy indicators with respect to sustainable development, especially those involving

social welfare, the adequate use of energy resources, and self-sufficiency. Tables and charts supporting these analyses will also be included.

The format and contents of the report for 1998, which was issued as No. 0, were approved by the XXX Meeting of Ministers, held in June 1999 in Rio de Janeiro. At present, the Report for 1999 is being prepared for distribution in the second quarter of the year 2000.

To this analytical publication on the region's energy development will be added another as of the year 2000, to be issued every two years jointly by OLADE and the Economic Commission for Latin America and the Caribbean (ECLAC) and entitled, Energy-Economic Prospects of Latin America and the Caribbean, on which both organizations are currently working.