

# Energy Magazine



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## OLADE's Forums start up their activities



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## ACTIONS FOR PEACE

The terrorist attacks that took place in the United States on September 11 were aimed at mankind. When we heard about these attacks, although still dazed by the tragedy, we realized immediately that our lives had changed forever.

The natural tendency of human beings to find an explanation for events and actions whether personal or far removed has come up against the impossible.

With the disappearance of a bipolar world, symbolized by the fall of the Berlin Wall, mankind hoped that the Cold War and the threat of a nuclear war had been left behind. It thought the world had embarked upon an era of peace. The only conflicts to expect would come from clashing business interests between different zones of the planet, which could be resolved in international negotiation institutions.

Terrorism, however, has undermined these hopes for enduring peace. Fanaticism has gone beyond what mankind's history has ever seen before, because the attacks were made without any declaration of war, their main target was the civilian population, and the instruments used were the children, women, and men who were the passengers on the airplanes chosen for this heinous action.

We have all been overcome by a feeling that peace has almost vanished. We are not at war, with the warring camps wearing different uniforms, emblems or flags or representing different territories. Terrorism has declared war on humanity itself; it has demonstrated

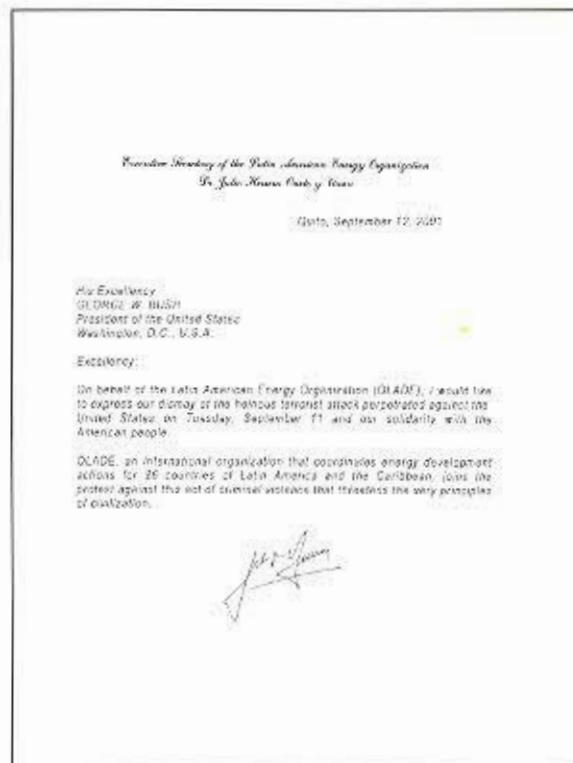
that its attacks can be aimed at anyone, anyplace and under any circumstance.

But hope and the will to live in peace have not died. As I write these words, exactly three weeks have elapsed since the attacks. The widespread condemnation of the attacks, as well as the international community's solidarity with the victims, confirms our conviction that peace is the only alternative for the people of the world.

response has not been limited to mere rhetorical statements condemning the attacks, in the naïve hope that the scope of the tragedy might discourage its perpetrators from committing similar acts in the future.

These past weeks, the international community has started taking actions to identify those who were responsible, as well as those harboring them. It has agreed that the terrorists have to be punished, that the funding sources that enable these actions to be carried out and facilitate the subsequent concealment of their intellectual and material authors have to be blocked. These actions and those that are being announced are aimed at ensuring peace.

OLADE is a forum comprised of 26 countries of Latin America and the Caribbean, noteworthy for the coexistence of many countries, different political opinions, cultural traditions, and religious beliefs. Respect for this pluralism and the differences stemming from it is typical of its history and will no doubt be a part of its future. I would therefore like to reiterate the Organization's commitment to work, within the scope of its activities, for the welfare of the people who belong to it, and thus contribute to consolidating peace.



The United States, the direct victim of these acts of terror, and the international community have reacted prudently, with caution and in conformity with the principles of international humanitarian law. In the eagerness to punish the perpetrators, there have been no hurried cries for war leading to immediate and indiscriminate actions that could have converted other innocent people into victims. Nevertheless, the

Dr. JULIO HERRERA  
Executive Secretary

# OLADE's Forums start up their activities



*The Minister of Energy and Mines of Ecuador, Pablo Terán-Ribadeneira, presented an overview of the reforms and future of Ecuador's energy sector at the inauguration of the International Seminar that was held to start up the activities of OLADE's Forums*

In the framework of an International Seminar held in Quito, Ecuador on September 9-11, 2001, the activities of the three forums that were created by OLADE's XXXI Meeting of Ministers in order to involve new players in the energy development of Latin America and the Caribbean started up.

The Seminar, which was attended by 132 representatives from 107 entities, organizations, companies, and regulatory agencies of the region's energy sector, was inaugurated by the Minister of Energy and Mines of Ecuador, Mr. Pablo Terán-Ribadeneira, who presented on this occasion an overview of the reforms the Ecuadorian

government has been promoting in Ecuador's energy sector and the prospects for this sector.

The Seminar included the following speakers: Sebastián Bernstein, international consultant and Chilean national, who addressed the topic "Energy Sector Outlook for Latin America and the Caribbean"; Pierre Thouin, Consul-

tant of the firm Gestion Pierre Thouin Inc. of Canada, who spoke about the "Perspective for Energy Integration and Development from the Vantage Point of the Private Sector;" and William Massey, Commissioner of the U.S. Federal Energy Regulatory Commission, who dealt with the subject "To Regulate or Not To Regulate."



*William Massey, Pierre Thouin y Sebastián Bernstein, speakers at the Seminar*



## ENERGY SECTOR BUSINESS FORUM

The Energy Sector Business Forum is aimed at facilitating the analysis and discussion of business opportunities, the identification of obstacles to investment, as well as the exchange of experiences among business associations, chambers of production, and private enterprise involved in energy development in Latin America and the Caribbean. Thus, this Forum shall be called upon to become a channel for a permanent dialogue between the public and private sectors and, as a result, to foster the integration,

**GENERAL TOPIC:** Regional integration in Latin America and the Caribbean

**SCOPE:** Natural gas, electricity, oil, and coal

**SPECIFIC TOPICS:** Harmonization of technical and legal norms, conditions for promoting investments, enlargement of energy markets (import/export of energy sources), regional/international treaties, environmental aspects, trade aspects.

Among the resolutions approved by the Energy Sector Business Forum, the

OLADE's Permanent Secretariat. Four members will be representing the oil and gas sector, and four the electric power sector.

The first Board will be composed as follows:

- Chairman: Jorge Amilcar Boueri da Rocha, ELETROBRAS, Brazil
- First Vice-Chairman: Manuel Osuna y Fernández, PEMEX, Mexico
- Second Vice-Chairman: Armando Lenguitti, TRANSBA S.A., Argentina
- Advisor: Gerardo Rudín, RECOPE, Costa Rica



*Many companies involved in the energy development of Latin America and the Caribbean expressed their interest in promoting the actions of the Energy Sector Business Forum*

impetus, modernization, and transformation of the region's energy sector.

At its initial meeting, the Energy Sector Business Forum approved its bylaws and agreed upon the principal topics it would focus on and the activities it would carry out:

one that provides that the agreements adopted by the Forum will be viewed as recommendations to OLADE's Meeting of Ministers is noteworthy.

The Business Forum decided to set up a Board to conduct its activities. It is comprised of nine members, who will be elected by the Assembly of Participants, except for the representative of

- Advisor: Jorge Berrio Sánchez, Unión Eléctrica, Cuba
- Advisor: René Ortiz, international consultant, CONSIDA, Ecuador
- Advisor: Flavio Santos Tojal de Araújo, PETROBRAS, Brazil
- Advisor: ISA S.A., Colombia (representative to be designated)
- Secretary: Oscar Arrieta, OLADE



## FORUM OF SUPERVISORY ENTITIES AND REGULATORY AGENCIES FOR OIL AND GAS ACTIVITIES

The Forum of Supervisory Entities and Regulatory Agencies for Hydrocarbons Activities is aimed at creating in Latin America and the Caribbean, and consolidating within the framework of OLADE, a space where existing regulations for the oil and natural gas sector can be reviewed, discussed and improved, as well as promoting the exchange of experiences in order to optimize the work of these institutions and support the establishment of agen-

- Chairman: Carlos Mirando Pacheco, Superintendent of Hydrocarbons, Bolivia
- First Vice-Chairman: Ricardo Ramírez, Expert Commissioner, Energy and Gas Regulation Commission, Colombia
- Second Vice-Chairman: José Cesario Cecchi, Superintendent of Marketing and Transport, National Petroleum Agency, Brazil
- The third Vice-Chairman will be elected later.

The Board of Directors that was appointed will be acting ad hoc until the next meeting, at which time the Forum's definitive officers will be elected.

Among the principal items on the next meeting's agenda, there are the ratification of the bylaws, the election of the Board of Directors, the establishment of a quota payment for the participating members, and a working plan for the Forum.



*Members of the ad hoc Board of Directors that will be carrying out the first activities of the Forum of Supervisory Entities and Regulatory Agencies for Oil and Gas Activities, along with the Board's advisors*

cies in the countries of Latin America and the Caribbean that require them, in order to contribute to the development of the subsector in the region.

At its first meeting, the Forum approved a Final Report, which established the Forum, and started by electing the presiding officers for the session:

Regarding the draft bylaws for the Forum, it was agreed that the entities would individually review the bylaws and would submit them for discussion at the next meeting for their approval. The observations of each entity must be received by OLADE's Permanent Secretariat by December 2001. The Board of Directors shall prepare a new proposal for the document to present it at the Forum's next meeting, which will take place in January 2002.

It was determined that mechanisms to ensure communication between the Forum's members would be through a web site and e-mail, to be designed by OLADE.

The Forum will be informing OLADE's Meeting of Ministers about its establishment and any other specific topic suggested by its members to the Forum's Board of Directors prior to this Meeting.



## FORUM OF SUPERVISORY ENTITIES AND REGULATORY AGENCIES FOR ELECTRIC POWER ACTIVITIES



*Members of the Board that will be conducting the activities of the Forum of Supervisory Entities and Regulatory Agencies for Electric Power Activities*

The Forum of Supervisory Entities and Regulatory Agencies for Electric Power Activities is aimed at creating in Latin America and the Caribbean, and consolidating within the framework of OLADE, a space where existing regulations for the region's electric power sector can be reviewed, discussed and improved, thus promoting the exchange of experiences in order to optimize the work of existing institutions and support the establishment of others in the region's countries that require them, in order to contribute to the development of the electric power subsector.

At its first meeting, held on September 11, 2001, the Forum designated Mr. Juan Legisa, President of the National Electric Power Regulatory Entity (ENRE) of Argentina, as

chairman of the meeting, approved the Forum's bylaws, and decided to establish an Executive Board, comprised of five members: the Chairman, three Vice-Chairmen, and a representative from OLADE's Permanent Secretariat.

The Board was composed as follows:

- Chairman: Luis María Fernández Basualdo, Regulator of the Republic of Argentina and member of the Board of Directors of ADERE
- First Vice-Chairman: Diego Pérez-Pallares, Chairman of the Board of Directors of the National Electrification Council (CONELEC), Ecuador
- Second Vice-Chairman: J. Paul Morgan, Deputy Director, Office of Utilities Regulation, Jamaica

- Third Vice-Chairman: Roberto González-Vale, Ministry of Basic Industry (MINBAS), Cuba

The Forum agreed that its next meeting would take place at the same time as the other Forums, albeit not simultaneously but consecutively.

OLADE was requested to set up an e-mail address for the Forum to serve as a means of communication between its members.

Furthermore, it should be emphasized that, at the meeting, it was agreed that all the Forum's members, especially the Executive Board, would take steps to invite the other regulatory agencies of Latin America and the Caribbean to become members.

# Thoughts on the Energy Sector Reform Process in Latin America and the Caribbean\*



## By Sebastián Bernstein International Consultant

What characterizes the reforms undertaken in Latin America and the Caribbean in electricity, oil and gas, coal, and other forms of energy?

Essentially the substitution of central planning and state monopolies for competitive markets, efficient regulation of monopolistic segments, and the opening up to private capital, with the total or partial withdrawal of the State from business activities.

At bottom, reforms are carried out because there is the confidence that demand can be met more efficiently and automatically in a market environment, with the participation of the private sector.

**Origin of the reform:** It should be observed, first of all, that the reform took place in those countries that had already liberalized their economy, or were in the process of liberalizing it and opening it up to the outside world. A change in energy policy is really not possible unless the same change takes place at the macroeconomic level. What gave rise to the changes in the energy sector? Basically:

- In the majority of the countries, reform was primarily used as a tool to tackle the inefficient and critical situation of the companies, espe-

cially the power utilities, but also some oil companies (Argentina). This critical situation was the final outcome of having the State act as owner, regulator, and manager of the companies and of using state companies to achieve political objectives or social development objectives, which ended up by being contrary to their basic business objectives. This situation was apparent in countries like Argentina, Peru, Colombia, and the Dominican Republic, among others.

- In other countries, the reform was more "ideological": although the financial situation of the state

\* Presentation made at the International Seminar that was held to start up the activities of OLADE's Forums. Sebastián Bernstein was Executive Director of the National Energy Commission of Chile from 1984 to 1990 and was involved in reforming and privatizing the electric power sector and deregulating the oil and gas sector in Chile.

- The presentations by William Massey and Pierre Thouin will be published in the next issue of OLADE's Energy Magazine.



enterprises was reasonably sound, it was recognized that a competitive market would always allocate resources better than centralized regulation and that decentralization would permit reaching higher levels of efficiency than the pretense of regulating national monopolies.

- In addition, the intention was to have the State perform a subsidiary role in the economy, because it was considered that its active participation, especially in state monopolies, could jeopardize the sound development of the industry. The substitution of state capital for private capital was thus transformed into an objective.

This situation prevailed in countries such as Chile, at the start of the eighties, and in El Salvador at the start of the nineties.

**What do we mean by the subsidiarity of the State?** That the State should not carry out activities that intermediate individuals and organizations, that is, companies, local collectivities, can do for themselves. In the economy, this means that the State should not be involved in activities that the private sector can take care of. It also means that the State should be concerned about ensuring that the neediest sectors of the population gain access to goods and services such as housing, education, health, etc.

**Who promoted the reform?** The leaders of the reform were the economic authorities, normally the Ministers of Finance or the Economy, sometimes the Minister of Mining and Energy, or their direct representatives, with full support from the executive branch. These authorities urgently sought to resolve the economic and financial problems of the sector's companies. Although as a rule they ignored the detailed operation of the industry, they had a sense of what instruments could be used to

break up monopolies and to establish market mechanisms in given segments of the industry.

At the start of the nineties, the World Bank and IDB began playing a major role in fostering reforms, when they realized that their traditional policy of promoting loans to state monopolies, on condition they led to sound rates of profitability, was not yielding any results. Thus loans such as those for structural adjustment were granted on condition reforms were implemented to promote free markets, private-sector participation, and the efficient regulation of monopolistic activities.

### **The reform process faced what difficulties?**

**Oil:** In the oil sector, the reform process was and will continue to be technically and economically simple. Indeed, the industry has almost always involved private-sector participation (the large world oil companies), where both crude oil and oil products have been handled as tradable commodities. This makes it easy to decentralize this industry and facilitates open-market competition not only in production but also in refining and imports and distribution. Prices can be efficiently set by the market, using as a reference the import or export parity price of these products. Decentralization and private-sector participation can therefore occur at all levels, with greater potential for the world's large oil companies.

Nevertheless, reform in the oil sector came up—and continues to come

up—against political and institutional difficulties. Thus, in many small countries, the existence of one or two refineries belonging to large companies that operate under an exclusive supply scheme and with contracts at prices that guarantee a profit margin, prevents open competition with imported oil products. This oftentimes means that the prices end up by being set by the authorities. This was the case in the majority of the countries of Central America and the Caribbean, although pressure coming from the economy's liberalization has led many of them to liberalize the market for oil products completely.

In addition, in countries where domestic prices were subsidized with respect to their true economic value, political authorities avoided liberalizing prices and privatizing the area's state enterprises. This situation was apparent principally in the region's oil exporting countries, such as Mexico, Ecuador, and Venezuela. Over the last few years, this situation has reversed.

There are countries like Chile, where the markets for crude oil and oil products have been liberalized, but where



the state company is preponderant, mainly in refining and wholesale supply. Although state refineries apply parity prices, that is, efficient prices, to compete with eventual imports, in practice their presence inhibits third-party competition. The privatization of refineries in Chile, although partial, has been heavily opposed by state executives and workers and has become a political issue.

Finally, there is a group of countries, among which Argentina, where market liberalization and privatization were carried out to the very end. That is how YPF was privatized and then taken over by REPSOL.

**Electricity:** The central element of the electric power industry's reform is vertical and horizontal breakup of state electric power monopolies, separating power generation, transmission, and distribution activities into different companies and the establishment of an open competitive market for power generation. Free access to the transmission and distribution system is being envisaged for supply to large end-users. Power transmission and distribution prices are regulated in line with the subrogated market concept, in other words, the simulation of prices that would exist if there were open competition for the supply of these services. In later stages, all or part of the utilities are privatized.

The first scheme of this type was implemented in Chile between 1982 and 1985, followed by Argentina and Peru in 1992 and afterwards by a large number of Latin American countries, between 1994 and 1998.

As a rule, resistance to reforms in the

electric power industry come from four fronts:

- Opposition from workers to the breakup of the state monopoly for fear of losing their jobs when private companies take over.
- Resistance to putting prices, including regulated tariffs, on par with economic costs.
- Political opposition to the privatization of state enterprises.
- Fear that private enterprises, especially power generation utilities, will not expand, which means keeping the State in the industry.

The application of reforms requires total commitment by the executive



branch and approval of the corresponding legislation by Parliament.

Even when it is assumed that the market is capable of resolving all power generation operation and development problems, the reform requires that the regulations that are to be applied, mainly regarding supply conditions to distributors, spot market operations, and payment obligations between the agents of this market, should be well designed. Further on, we will see that this problem and the situations that have been tackled have never been well resolved.

**Natural gas:** Because natural gas is an energy source that had an explosive

development from the start of the nineties (the exception is Argentina), the progressive liberalization of its markets was not traumatic as was the reform for the electric power sector, which affected companies that had a long history.

In the countries where this resource is abundant, the natural gas market has been characterized by decentralized production, generally through exploration and production contracts with private oil companies.

Although there has been major progress in liberalizing gas prices, in some countries there continue to be direct or indirect regulations on these prices. Thus, in some cases, the final price to medium-sized and small consumers is regulated, which leads to a netback price at the well head which is set in accordance with transport costs from the field to the consumption center.

In other countries, a peak price has been established for existing fields up to a given date and open prices have been set for new fields that are discovered. In the case of countries that have large production surpluses in terms of domestic and foreign demand, prices are difficult to forecast, thus, for example, exports from Bolivia to Brazil are set on the basis of the fuel oil substitution netback in Sao Paulo. As for the non-exportable volumes, to the extent they are significant, they tend to show prices that are lower than those for the fuel they can substitute. If exports materialize through the LNG plant, the price of gas used will probably be established on the basis of the price of gas on the west coast of the United States.

Gas transport is regulated in some countries and deregulated in others not only for the access to existing gas lines but also transport fees. In Peru, electric power consumers subsidize, through charges for capacity, that part of gas transport costs that is not covered by the regulated tariff for this service.

Furthermore, natural gas distribution normally has regulated prices, except for Chile, where the various phases of import, transport and distribution are deregulated. The underlying concept is that there is no evidence of monopolistic revenues in distribution because of the existence of substitutes such as liquefied gas, kerosene, diesel and fuel oil, and firewood.

#### **Distinctions regarding regulatory and institutional frameworks currently in force in the region**

In the majority of the countries of Latin America and the Caribbean, the market for crude oil and oil products is deregulated or is tending toward deregulation. The price system is therefore very simple: in the oil importing countries, the tendency is toward import parity prices, whereas in the oil exporting countries, the tendency is toward export parity prices. There are no significant distinctions between the countries. There are distinctions, however, regarding the existence or nonexistence of state enterprises, the effective freedom of agents to import fuels and the levying of taxes on given products in order to increase the State's budget. This is the case for gasoline, which is normally affected by extremely high specific tax rates.

As indicated, the wholesale price of natural gas tends toward open market prices but in various countries it is subject to indirect regulations. Transport fees are sometimes subject to regulation and, in other cases, stem from open season processes. Regarding

natural gas distribution, the fees are normally regulated on the basis of efficient costs, except for Chile.

Because electricity is a non-tradable commodity, in the electric power sector there are more or less important distinctions between the countries that have reformed the industry. To begin with, we could highlight the following essential aspects:

*In the majority of the countries of Latin America and the Caribbean, the market for crude oil and oil products is deregulated or is tending toward deregulation. The price system is therefore very simple: in the oil importing countries, the tendency is toward import parity prices, whereas in the oil exporting countries, the tendency is toward export parity prices*

#### **Generation:**

- Spot prices based on marginal costs versus bid prices (exchange).
- Explicit capacity component versus absence of this component.
- Pass-through of the purchasing price of distributors to their end-users versus the tariff to the public based on a referential purchasing price.

- Management in outage conditions: compensations
- Operation of interconnections

#### **Transmission:**

- The countries apply various concepts, but all agree with the shared use of the transmission system. The differences are not very relevant owing to the incidence of transmission in end-user prices.

#### **Distribution:**

- Development of competition in the development of retail supply (end-users that are not subject to price regulation and can choose their supplier).
- Way of regulating distribution fee: on the basis of the annual payment of the new replacement value plus operating and maintenance cost versus profitability on the depreciated asset.

We will be focusing on aspects concerning generation, because they are the most critical in an industry that has to duplicate its capacity every 9 to 14 years. In addition, power generation prices determine 70% of the price for larger users and 40-50% of prices for end-users.

#### **Spot prices based on marginal costs versus prices offered on the exchange**

Spot prices are applied each hour to the differences between production from a generator and its contracts for that hour. If its production exceeds the energy supplied in contracts, it sells the surplus to the spot market and buys the missing amount if the opposite occurs.

In principle, generators compete for freely established contracts and the contracts are the driving force behind the development of generation. With a

long-term perspective, this type of competition can be developed, even with a limited number of generation utilities.

Nevertheless, in medium-sized or small countries, new generators do not manage to contract their entire capacity until various years later. This makes them operate like a merchant plant, selling their entire production at the spot price. For them, the sound functioning of this market is a necessity, not only from the economic standpoint but also in terms of financing. If the number of power generation utilities is low, which is actually the case in a large part of the countries, the spot market can be manipulated because it is based on bids.

In addition, the spot price based on bids can reach very high values, leading to uncertainty for agents that turn out to be buyers on this market. This can prevent payments from being made.

Therefore, the conclusion is that, in systems with a small number of producers, it is advisable to have spot

prices based on marginal costs with some flexibility. In larger countries that have a high number of generators, such as Colombia and Argentina, a spot market based on bids can operate perfectly.

### **Capacity component?**

The capacity component, expressed as a price per kW of guaranteed power capacity, can be seen as an “insurance” for the guaranteed availability of energy when the electric power systems requires it. All generation units have some level of guaranteed or “firm” availability, and the payment for this is made regardless of the real dispatch of the units.

This scheme has the advantage of sustaining the existence of reserve units, although they are not contracted.

If there are no payments for capacity, the reserve units that are not contracted will only be remunerated on the rare occasions they are dispatched. Therefore, the only way to receive remuneration is bidding very high prices on the spot market, on the few

occasions they are invited. This can lead to very high prices, as was evident in the recent crisis in California, where during several hours, the spot price amounted to 120 times the “normal” price of electricity. Generally, these situations lead to payment crises and to a stoppage of the spot market.

The existence of capacity payments for the firm power capacity of power generation units avoids situations of spot price instability and provides powerful signals for the installation of reserve units when they are useful for the security of the electric power system.

### **Pass-through of supply prices to distributors versus reference prices**

The current trend is that the sale prices of generators to distributors are established by supply bidding processes and that the prices obtained are passed on to small regulated users.

Nevertheless, in some countries such as Peru, Bolivia, Chile, and Ecuador, the pass-through prices is a reference price based on spot price forecasting. This price can turn out to be unaccept-



able for generators owing to its absolute level and volatility. Under these conditions, there will be no supply contracts and the distributors will have to buy on the spot market, which involves a risk because they might be buying energy in bulk at very high prices only to sell it afterwards at a lower price. This can bring the system to a standstill. In Peru and Chile, the probability that events of this nature might occur is low because the forecasting of spot prices must be adjusted to open-market prices. But even so, this situation is occurring right now in Chile.

The solution for all these countries would be to eliminate reference prices completely.

#### How has the reform worked?

For **oil and oil products**, market liberalization has worked perfectly. The question that should be asked is quite different: why shouldn't an industry where the consumers are willing to pay the economic cost of the fuels they require and where it is always possible to import these products at their market value function efficiently? Problems of functioning can only be conceived when there is an embargo on supply or a temporary shutdown of facilities (for example, unloading and storage facilities, which can be resolved over the short term).

Precisely because of the high share of oil and products in the region's energy matrix (60% according to OLADE) and their growth rate, which requires duplicating demand every 12-15 years, it is very important to emphasize the liberalization of this market.

As for **natural gas**, the explosive growth of this energy source in the area and its cross-border marketing have been driven mainly by the liberalization and privatization of the electric power industry and its attribute as a clean fuel.

The speed of the penetration of gas in power generation has occurred owing to the introduction of combined cycles that can be installed at a low cost and are highly efficient. The use of gas for electric power generation is reflected in countries like Colombia, Argentina, Brazil, Bolivia, Mexico, Chile, and Venezuela.

Furthermore, natural gas has become an important vector for international trade. This is true for the Bolivia-Brazil gas pipeline and the five gas lines supplying Chile from Argentina, among other cases. The upcoming development of gas from Camisea in Peru and liquefaction facilities that will be developed with Venezuelan and Bolivia gas are also examples of the importance that this energy source has been acquiring.

In the **electric power sector**, experience shows that the impetus for liberalization and privatization of the industry has been disentangling the bottlenecks that prevailed at the start of the nineties in many countries and that led to power rationing and low-quality service, inefficiency, economic losses, and zero growth capacity.

Furthermore, prices have been declining in the majority of the countries that reformed their electric power industry.

The scheme for liberalizing electric power markets ended by prevailing over the two alternative models that were competing:

- The first is the vertically integrated state enterprise model, where the utility signs supply contracts with IPP, which supposedly compete for the initial contract but then do not run any market risk. I say supposedly because in many cases this competition never occurs.
- The second, associated to the previous one, is a single-buyer model

that plans the expansion of the entire system and then invites bids for supply contracts for transfer to distributors. This model, which was about to be implemented in Panama, was later transformed into a classical model of open-market competition.

*For oil and oil products, market liberalization has worked perfectly. The question that should be asked is quite different: why shouldn't an industry where the consumers are willing to pay the economic cost of the fuels they require and where it is always possible to import these products at their market value function efficiently?*

Power generation market liberalization in the countries where reform had been carried out earlier and where it was possible to introduce natural gas has yielded spectacular results: thus, real

prices in dollars fell by between 30% and 50%- In Argentina, prices were around US\$27 per MWh, in Chile US\$34 per MWh, and in Colombia under US\$30 per MWh.

Gas has thus become the principal competitor of hydropower, with the advantage of shorter installation periods, less uncertainty, and lower environmental impact.

Nevertheless, in Central America, in the countries that reformed their electric power industry, power generation prices have remained high, in the range of the US\$60-80 per MWh. This is because in some countries the power industry inherited contracts with IPP at very high prices, often-times drawn up to tackle rationing problems urgently and without any bidding process.

### Supply outages

The subject of tools to tackle critical supply problems is as yet unresolved. In the past decade, Chile experienced shortages because of a situation that combined the worst hydrological conditions in the past 50 years and the prolonged shutdown of a new combined cycle unit. This led to a supply deficit on the order of 10% over the last three months. The situation in Brazil, because it is still in the process of evolving, is another example of the need to have suitable tools to resolve shortage problems.

In Chile, the electric power law provided that, in the event of outages due to drought or prolonged shutdown of thermoelectric units, generators should pay to those distributors with which

they had drawn up contracts a compensation for each kWh that is not supplied. This compensation is equal to the outage cost prevailing on the wholesale market under these conditions.

Theoretically, the scheme works because the appearance of the outage cost of about US\$150 per MWh is an incentive for consumers to voluntarily reduce their consumption, because they are paid for this reduction. At the same time, payment of the outage cost to self-generators and independent producers is an incentive to deliver energy to the market.



This what airlines do when they overbook their flights: they offer to pay passengers to get off the flight and look for a price that gets rid of the overbooking.

The mechanism seems quite simple, but partially failed in Chile, because the law provided that, if the drought was more severe than what was recorded in the statistics, no compensation should be paid. Since this was the case, it was not possible to introduce the price mechanism. It should be recognized, however, that to avoid buying spot energy at the outage cost, the generators that had a deficit rushed to buy diesel gas turbines to limit the outage. Thus, close to 600 MW were introduced over a period of less than six months.

To resolve the problem of compensations, a law was passed providing that

compensations be paid in all circumstances, without any limit because of drought or its continuation over time.

The result of this extreme legislation in a country with high hydrological fluctuations is that generators are recalcitrant to sign contracts with distributors because of the risk involved. Because of this some distributors whose contracts were expiring have remained without any new contracts.

The regulations in this field are extremely sensitive and should be carefully evaluated before they are implemented. Possibly the solution, in the case of Chile, is to set a limit on the risk by establishing a ceiling on the payment of compensations that have to be made, for example, a fraction of the annual amount of each supply contract.

### Vertical integration

A subject that is constantly surfacing is that of the vertical integration of generation and distribution, which could constrain competitiveness, especially in small systems. To completely forbid integration goes against the grain of good business practices, so that the challenge is to find a reasonable balance.

Energy regulation and deregulation is a fascinating topic. There is no doubt that OLADE is an exceptional forum where specialists in this field and the energy authorities of our countries can exchange experiences. This is absolutely necessary in view of the growing levels of integration between our countries in gas, electricity, and oil.

# Sun Power



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# ALGERIA: First Participating Country of OLADE



*In Algiers: The Agreement whereby Algeria became the first Participating Country in OLADE was signed. After the ceremony for the Agreement's signature on July 9, 2001, the Minister of Energy and Mines of Algeria, Dr. Chakib Khelil (right), and OLADE's Executive Secretary, Dr. Julio Herrera, along with Algerian government officials, exchange copies of the Agreement.*

The Minister of Energy and Mines of Algeria, Dr. Chakib Khelil, and OLADE's Executive Secretary, Dr. Julio Herrera, signed an agreement whereby Algeria has become the first Participating Country of the Latin American Energy Organization (OLADE).

The ceremony for signing this agreement took place in Algiers on July 9, 2001.

The status of Participating Country in OLADE was established by the XXXI Meeting of Ministers of the Organization for those countries located outside the geographical area of Latin America and the Caribbean.

This ministerial decision was taken in the framework of the challenge of OLADE, as a regional energy policy integration, cooperation, and coordination forum, to address the demands of its Member States, owing to the trans-



formations they have experienced, to promote the region's adequate insertion in a globalized world and thus tackle the challenges and better take advantage of the opportunities stemming from the economic and social development of Latin America and the Caribbean.

In this context, in the agreement drawn up by the Ministry of Energy and Mines of Algeria and OLADE, through its legal representatives, the parties recognize that each one of them has information, know-how, experiences, training programs, and technological development

they are interested in sharing and developing jointly to achieve energy development and ensure the well-being of their people. Thus, they pledge to work together continuously, permanently, and smoothly.

The agreement provides that, for the previously mentioned purposes, the parties will meet periodically in order to identify areas they might be interested in developing jointly and to designate individual experts or working groups who will be in charge of doing so. They also agree to develop training programs, as well as evaluate their

development and propose new areas every time they meet.

Algeria is an oil and natural gas producer, with large export volumes. Suffice it to say that, at present, gas from Algeria meets 60% of Spain's gas consumption needs.

Algeria is a member of the Organization of the Petroleum Exporting Countries (OPEC) and is leading efforts to establish an African Energy Commission.

*The press was interested in the instatement of Algeria as a Participating Country of OLADE. In the picture, OLADE's Executive Secretary, Dr. Julio Herrera, spoke to Algerian television.*



# Energy sector development in Cuba



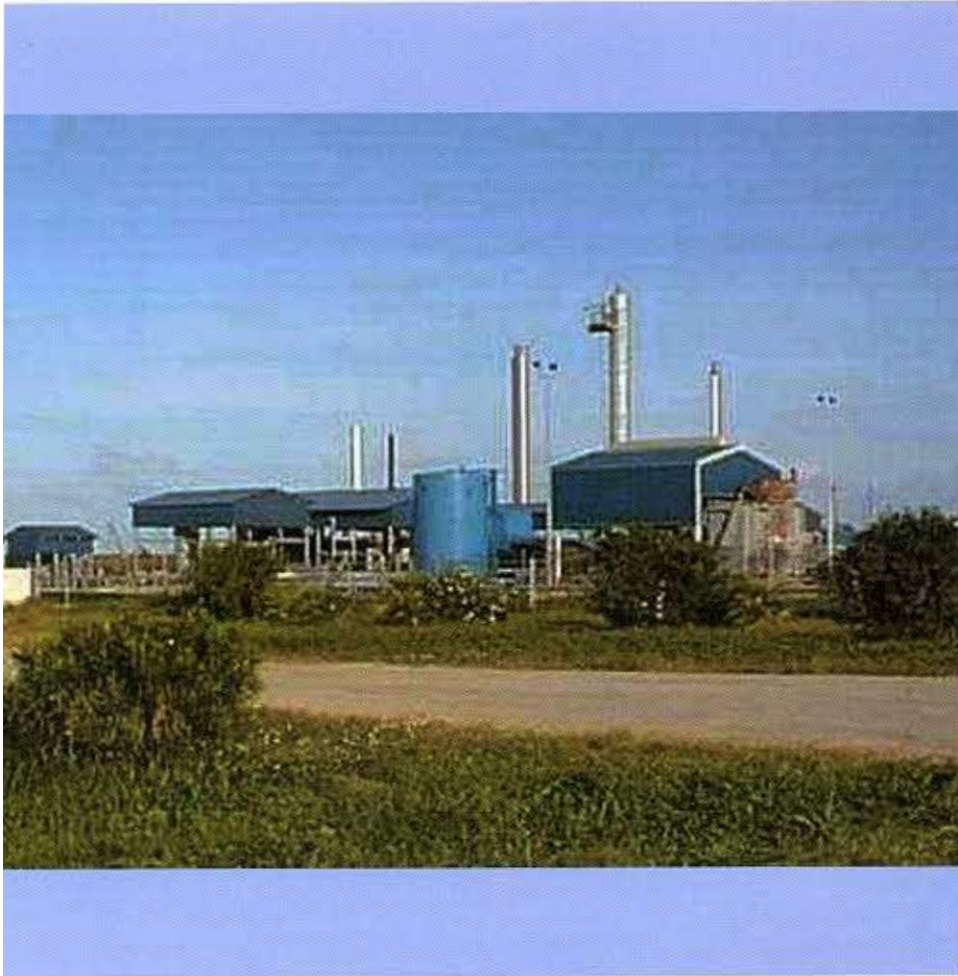
**José González-Frances**  
Vice-Minister of Economy and  
Planning of Cuba



Over the last 10-12 years, Cuba has had to face the disappearance of the Soviet Union and the world socialist system, in addition to the continued and worsening economic embargo by the U.S. Government, which have substantially affected the national economy.

Specifically with respect to the energy sector, the breakup of the Soviet Union and disappearance of the special economic and commercial relations that were maintained with it have implied the elimination of the imports of crude oil and oil products from the Soviet Union and the halt of preferential loans for investments in thermoelectric plants, oil refineries, and other projects.

In order to prepare itself as best as possible to address the crisis, the Government, as early as 1993, approved the Program for the Development of National Energy Sources, which essentially emphasizes an increase in the use



(PAEC), over the last three years, it has been possible to reduce by about 100 MW the growth of peak demand, which reduces the need for investment in new plants.

In oil production (it includes associated gas in equivalent terms), there has been a substantial rise in production, since from a production of 750 physical Mt in 1989, there will be a production of about 44 MMt this year and efforts are being made so that total production will amount to 6 MMt by 2005.

To reach this goal, foreign companies have participated by contributing capital and technology. Soon exploration will begin in our Exclusive Economic Zone of the Gulf of Mexico. If the forecasts of our geologists turn out to be valid, over the next five years, the country's availability of oil will rise even more, with expectations of even higher figures to meet our needs to a greater extent.

The ratio between the import of energy sources and GDP over the last 10 years has declined by somewhat more than 40%, as a result of the steady growth of national energy sources, basically oil and gas.

During the early nineties, for the reasons explained at the start of the present article, a substantial decline of public service electric power generation capacity was recorded and major service outages occurred in 1993 and 1994. This negative past has been virtually overcome in the history of these heroic years.

Two units of 250 MW each one (from the Czech Republic) were finished and are now operating in the province of Oriente. New capacity for 160 MW (plus 115 MW in the process of being finished) has been assembled to use associated gas, in a joint venture with a foreign company. Power generation units from the Soviet Union and the Czech Republic (a total of 1500 MW) are being modernized. One 11-MW unit is already available on the Isla de la Juventud, functioning with a BOOT scheme with a foreign firm.

Today, the country's installed capacity is 4460 MW, of which 880 MW are from self-producers (mainly the sugar cane industry). Of this total, 4236 MW are interconnected, comprised of one single national power grid with a double circuit

of the country's own energy sources and the saving and rational use of all energy sources.

Despite difficult economic conditions during these years and although our country did not have access to funding from multilateral organizations (for example, World Bank, IMF, and IDB), implementation of the strategy designed by the Revolution has enabled economic recovery to begin as of 1994. In energy, major progress has been made.

Let us examine some data that confirm this favorable evolution of the energy sector:

- In 1989, 33% of total energy supply was from national sources, whereas by 2001 this share is now slightly over 50%.
- In 1989, oil and natural gas extracted from the country accounted for 4% of total energy supply, whereas by 2001 they accounted for more than 30%. In 2001, 40% of total supply of oil products come from national sources.
- In the first semester of 2001, 55% of the country's power generation was produced from national sources, whereas in 1989, this share amounted to 10%.
- In 1989, the imports of oil and products amounted to 11.6 M physical Mt, whereas in 2000, they amounted to only 6.0 MMt, although all needs are still not met.
- In 1990, energy intensity amounted to 4.26 BOE per US\$1000 of GDP and, in 1999, it amounted to 3.47 (19% decline in nine years). This reduction is due not only to higher efficiency (more efficient technologies, financial and organizational measures), but also to changes in the country's economic structure, with the development of tourism and the pharmaceutical and biotechnology industry, which entail low energy consumption.
- With the application of an electricity saving program in the population



of 220 kV. It is noteworthy that more than 95% of Cuba's population benefits from electricity.

The remaining 5% are located in remote areas, basically in the mountains. Nevertheless, there is a program for gradually providing electricity to these areas using stand-alone systems with solar energy, micro hydropower plants, stand-alone diesel plants, wind energy, etc., since it is impossible for the National Energy System to reach these places because of the high financial cost involved. This will ensure that all schools in these areas will have television and will be able to receive computers in the near future.

A substantial part of installed public service capacity is prepared to use the country's crude oil and, in the near future, the others will also be adapted to national crude. Therefore, before the end of this five-year period, virtually all electricity will be generated by national energy sources (oil, associated gas and sugarcane bagasse, as well as a small proportion of hydraulic energy).

Our forecasting for the future envisages the development of electric power generation using bagasse and sugarcane straw (RAC), for which external financing is needed. The collaboration of the UNDP is already available for a first plant.

Although immediate development is based on oil and also on the use of RAC, we are not neglecting other renewable sources of energy. Regarding this:

- A program to build small hydropower stations is under way (at present, there are 176 plants with an installed capacity of 57 MW) to use our water resources and to meet the needs of remote places that the National Electric Power System cannot reach.
- A program to install photovoltaic cells in remote places for family medical consultations and schools is underway. This program is part of one of the most ambitious programs for the

mass dissemination of culture, which is oriented and directed personally by our Commander-in-Chief, Fidel Castro Ruz.

- Work continues to be done on other sources, mainly wind energy and biogas.

Cuba's energy sector is open to foreign investment, as provided for by Law No. 77. At present, the bill for the New Electric Power Law is being worked on. It will also include the participation of foreign investors, when necessary.

Finally, it should be pointed out that, by the end of this year, the corresponding organizations must submit to the Government a proposal for a Strategy Energy Development Plan, which envisages a horizon up to 2010, which will be the guideline for the near future once it is approved.

We would like to thank OLADE for the opportunity to present, in its Energy Magazine, these modest achievements by Cuba's energy sector, which are only the outcome of the dedicated work of our revolutionary people.

## PRINCIPAL INSTITUTIONS INVOLVED IN THE ENERGY SECTOR

### MINISTRY OF ECONOMY AND PLANNING

It proposes the country's energy policy to the Government; it prepares the Material





Balances of Energy Sources; it conducts energy inspections through the National State Inspection Office; it takes, processes, and publishes energy statistics through its National Statistics Office; it carries out various research efforts through the National Economic Research Institute.

#### **MINISTRY OF BASIC INDUSTRY**

The Electric Power Union belongs to the Ministry. It accounts for most of the country's electric power generation and administers the National Electric Power System, as well as the CUBAPETROLEO Union, which is in charge of essential activities in hydrocarbons.

This organization orients and directs the Electricity Saving Program (PAEC).

#### **MINISTRY OF SUGAR**

Principal cogenerator of the country's electricity, using RAC (bagasse and sugarcane straw).

#### **NATIONAL INSTITUTE OF HYDRAULIC RESOURCES**

It is in charge of hydropower plants (except for the plant of Hanabanilla) and the program for developing this national source of energy.

#### **MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT**

It directs the country's scientific and technical research policy, including energy-related matters.

It holds various events during the year regarding this matter, among which the TECNOURE event, related to technologies for energy saving and the rational use of energy.

#### **MINISTRY OF FOREIGN TRADE**

Through the company CUBAMETALES, imports of fuel oil and diesel were made; other imports were made by the PETROMAX company of CUPET.

#### **MINISTRY OF FOREIGN INVESTMENT AND COLLABORATION**

It represents Cuba in OLADE and in other world and regional multilateral organizations. It is in charge of managing international collaboration.

#### **MINISTRY OF INFORMATICS AND COMMUNICATIONS**

The company ECOSOL-SOLAR, which produces equipment for the use of renewable sources of energy, belongs to the electronics group of this institution.

#### **MINISTRY OF HIGHER EDUCATION**

This institution is in charge of the country's universities, where engineers, economists, and other professionals involved in energy activities are trained. It also conducts energy-related research through agencies such as CETER and others.

#### **MINISTRY OF EDUCATION**

It is implementing a program for primary school, secondary school, and pre-university teaching to promote the suitable use of energy among students.

#### **MINISTRY OF FISHING INDUSTRY**

It operates the fleet of fuel coasting vessels and some ships for importing crude oil and oil products.

#### **MINISTRY OF TRANSPORTATION**

It operates the railway, one of the means of transportation used to carry fuel.

#### **MINISTRY OF DOMESTIC TRADE**

It takes care of distribution of kerosene as a household fuel to the population.

#### **CUBASOLAR**

A Cuban nongovernmental organization to promote the development and use of renewable sources of energy.

# *The California Deregulation Experience*



*a model  
of managerial  
failure*

intend to offer comments today on the State of California's attempts to deregulate its electricity systems and the ultimate failure of such attempts.

I believe this subject is relevant for two reasons. First, deregulation or privatization of electricity systems is a worldwide issue and what has occurred in California impacts the decision-making process of nearly every state or nation. Secondly, the true story behind the failure addresses larger, human issues such as management and leadership theory, as well as the study of man as a species and all of his accompanying weaknesses.

### **California's Electricity System**

It may be helpful to briefly discuss California as a political and economic entity and the rationale for the original decision to deregulate.

California is a large and populous State. Its 2000 population is listed as 34 million, meaning that nearly 1 out of 8 United States' residents calls him or herself a Californian. The State's Gross Domestic Product is \$1.35 trillion, making it the fifth largest economy in the world behind United States, Japan, Germany and the United Kingdom, and greater than France, China, Brazil, Canada and Spain. It is also the home of such icons as the Golden Gate Bridge, Yosemite National Park, Hollywood and Disneyland.

California's electricity growth had been fairly constant over the years growing at an annual rate of approximately 2 percent. This has been true up through the mid-90s when growth

increased due to an unusually strong economy. As an example, our peak load (or demand) increased from 47,000 MW to 51,000 MW between 1996 and 1999, a singular megawatt serving approximately 1,000 persons.

Our transmission grid system is a western regional system, one of five in the United States, ranging from southwest Canada through the entire western United States and into northern Baja California in Mexico.

Our electricity fuel sources have been diversified with a fairly good mix between hydroelectric, coal, natural gas and nuclear plus renewable sources such as geothermal, solar, wind, small hydro and biomass. Because we are no longer building plants fueled by coal or oil, or hydroelectric or nuclear, all because of environmental challenges, California, like much of the United States is quickly becoming dependent upon natural gas, which itself is in abundant supply, but its delivery systems are constrained.

Nevertheless, by the early 90s, California's electricity system was relatively healthy but for the fact our rates were high due to a combination of nuclear plant costs and high-priced contracts with small independent producers as mandated by federal law.

### **The Move to Deregulation**

So why deregulation? By 1991, California's economy joined the worldwide recession, which was prompted by the downgrading of Asian economies. Looking to cut costs, California's manufacturers, who also happened to be

**ROBERT A. LAURIE  
COMMISSIONER  
CALIFORNIA ENERGY  
COMMISSION**

the larger energy users, began relocating to adjacent states where the cost of doing business was less.

In response to the threat of the loss of California's manufacturing base, Governor Wilson ordered studies as to how to keep California competitive. On the list of recommendations was to seek to lower electricity rates to large consumers by allowing direct access between the consumer and the supplier without the necessity of buying from the utility. Accordingly, after studying the subject for a number of years, the California Public Utilities Commission (PUC) submitted a final report to the Legislature in 1996, recommending deregulation of the generation market. The Legislature quickly adopted the necessary laws, which were signed by the Governor in September, 1996.

The deregulation law passed both houses of the Legislature unanimously, a goal desired by legislative leaders and supported strongly by the utilities. However, this could not be done without some compromises, among which was a temporary retail rate cap, the price charged to the residential consumer, set at 10 percent below 1996 rates. This was done for the purpose of satisfying consumer advocates who originally opposed the law. The deci-

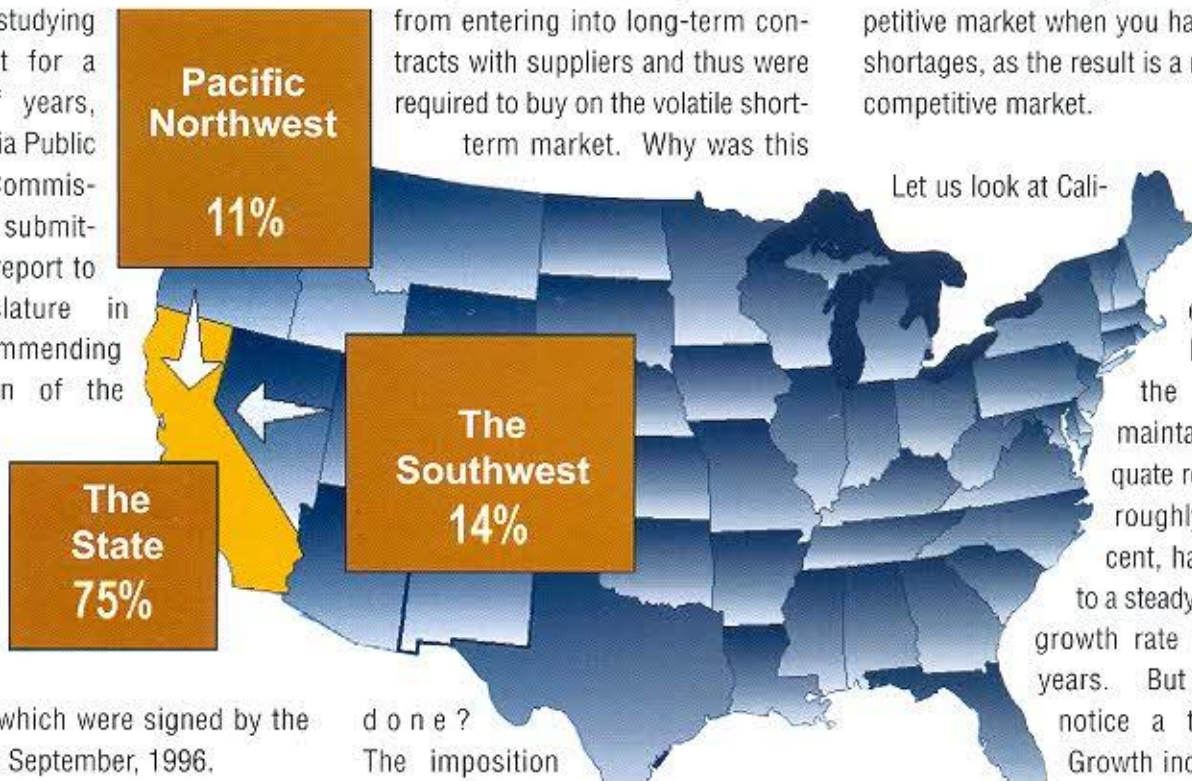
sion to impose the retail rate cap would return to haunt the Legislature and the utilities, but it was not opposed at the time in light of the fact that the utilities fully expected that the wholesale costs would fall below the retail rate cap price.

Rules were also created to help run the new competitive market. For example, the utilities were directed to divest half of their fossil-fueled power plants and sell such to independent producers. Also, the utilities were prohibited from entering into long-term contracts with suppliers and thus were required to buy on the volatile short-term market. Why was this

done? The imposition of these rules was the result of years of mistrust between the utilities and their regulating agency, the Public Utilities Commission. The PUC was primarily concerned that the utilities would use their market position to control the market (or obtain "market power") through their unregulated subsidiaries and ensure high prices to consumers. No strong consideration was given to the likelihood that the new independent producers would be able to do the same.

## Supply Shortages

When the "crisis" became public in May of 2000, the mantra recited by all politicians was, "we need more generation. It takes too long to build power plants. The environmentalists are at fault". This was all a gross oversimplification, but it was a political response preferred to the complex discussion of market dysfunction. The issue of supply is necessary to discuss as it is now an understood rule that you do not transition from a regulated to a competitive market when you have supply shortages, as the result is a non-freely competitive market.





large numbers until the end of 1998 and those are just now beginning to come on-line. Thus, by the year 2000, we had lost a good portion of our reserves, but there were additional factors. I should note at this point that since deregulation, the Energy Commission has licensed over 12,000 MW, much of which is being constructed today.

California has historically obtained 25 percent of its power from imports from other states. During the course of the last year, much of this power has been curtailed because of a drought in the Northwest, which is dependent upon hydroelectric power and population growth throughout the West. In addition, on an average day, we have nearly 3,000 MW off-line due to planned and unplanned maintenance. Over the last year, these numbers have increased to 10, 12, even up to 17,000 MW. The cause is debatable, but the repercussions were threatened blackouts. Now that the market has stabilized, these missing megawatts have suddenly reappeared.

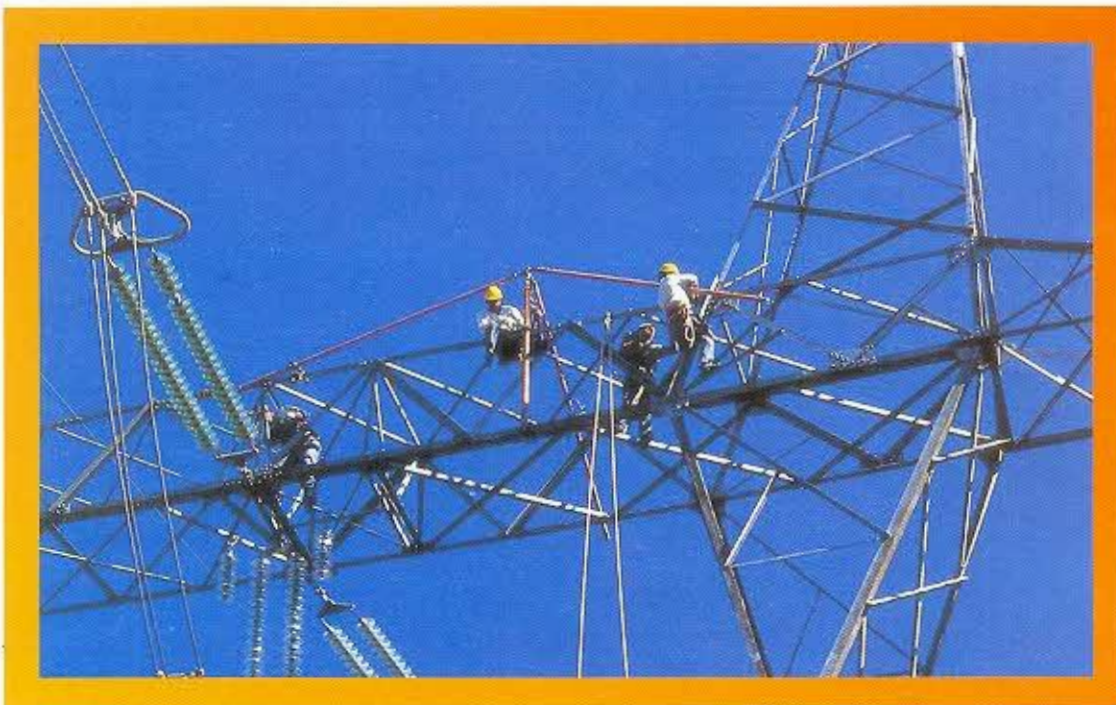
The problem with all this is that the supply shortages, if real at all, were and are temporary, yet the solutions are dramatically very long-term and very expensive. We will talk about that later.

In light of all the above, those who are analytical of mind, cite a flawed deregulatory law, flawed regulations, and supply shortages as the cause of failure. I respectfully disagree, as the true cause is much more basic and much more human.

### **Response to Market Dysfunction**

The deregulation law provided a mechanism to monitor the market by mandating professionally trained market experts for both the Independent System Operator and Power Exchange. Recall that the market officially began on April 1, 1998. By the fall of 1998, the market monitoring committees began communicating their concerns about potential market dysfunctions. The Public Utilities Commission, the

Electricity Oversight Board, and the Federal Energy Regulatory Commission (FERC) all received early warnings of potential threats to a freely competitive market system. Such warnings increased in intensity throughout 1999. In late 1999 and through the spring of 2000, market professionals, the utilities, even the generators were issuing dire warnings of market failures. The warnings were focused on auction rules where the market clearing price was set at the highest price or the last price bid, allowing great rewards for the generators, the reliance on the spot market, and temporary supply shortages. Finally, in May of 2000, the public became aware of the issue when retail caps were removed in Southern California and prices doubled, tripled or more. The Legislature and regulators responded with panic. The Legislature immediately reimposed retail rate caps and the Governor's new Chairperson of the Public Utilities Commission, issued a statement calling deregulation totally flawed and a failure and immediately put an end to



expansion of deregulation into distribution services. Over the next many months, wholesale prices rose to extraordinary levels, while retail rates remained capped driving the utilities into a state of bankruptcy. Finally, the utilities ran out of borrowing capacity and the State took over the function of power purchases. Total State and utility debt at this point exceeds \$20 billion.

It was not until February and March, 2001, that the State began entering into long-term contracts, auction rules were changed and finally in June, FERC placed conditional limits on wholesale prices.

The market has now stabilized, current wholesale prices are running at \$40 per MWH about the same as pre-deregulation. Long-term contracts have been entered into totaling \$80 billion for prices as high as \$236 per MWH. There has been substantial new power added to the system and the State has now even begun selling power back at a very substantial loss.

The energy crisis may very well be over, but it has been replaced by a future financial crisis, as the citizens of the State prepare to pay the long-term debt incurred by the State and the utilities. The State is seeking to sell \$13 billion worth of bonds to pay itself back for its current energy debt. The question will remain as to what to do with the utility debt. The Governor wants to buy the transmission lines from the utilities. The Legislature is hesitant to have a state-owned transmission system.

So what was the true cause of the crisis? I suggest to you it was the inexcusable failure to respond with necessary regulatory action.

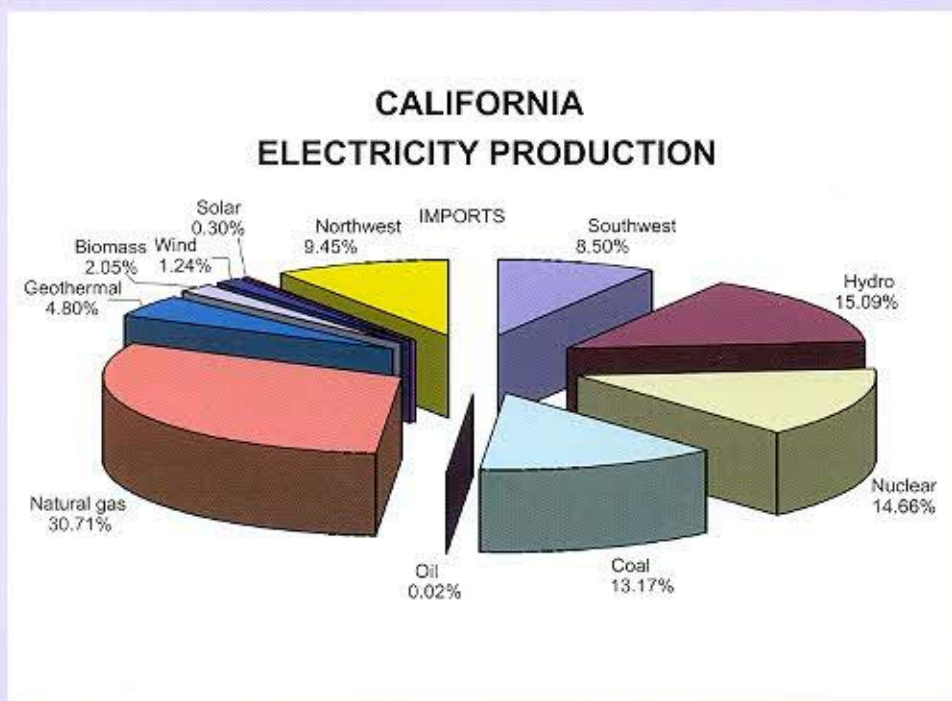
Why did that occur? In January, 1999, within months of the opening of the market, a new governor took office and brought a new Administration with him. The Governor is a slow and cautious man. He did not make his needed appointments to the Public Utilities Commission and the Electricity Oversight Board during his whole

first year in office. Thus, quite literally, through the critical year of 1999, the regulatory bodies with oversight and market responsibilities were frozen. The Governor had and continues to let it be known that no decisions are made without his consent. All through 1999, the Governor was solely focused on education issues and despite clear warnings to the contrary, engaged in no review of energy issues. Even after the May 2000 pricing issues, while experts watched, the Governor refused to address the issue until the spring of 2001. It was only then that the obvious remedies were initiated.

**Lack of Independent Regulatory Authority**

Compounding the lack of personal reaction by the Governor was the fact that he has consolidated all regulatory authority under his direct control.

Prior to deregulation there were two energy regulatory agencies in California: the Public Utilities Commission, which regulated electricity retail prices, and the California Energy Commission (CEC). The California Energy Commission is a newer agency than the Public Utilities Commission, having been created in 1975, as a result of the mid-70s energy crisis sparked by the OPEC oil embargo. The Energy Commission is charged with developing the State's energy plan, doing all forecasting, administering research and development, renewable and energy efficiency programs and is responsible for licensing all thermal power plants exceeding 50 MW.




The PUC was an independent commission created by the California Constitution, and the CEC was an independent commission created by statute. All of the Commissioners, five on each Commission are appointed by the Governor for a six and five-year term, respectively.


With deregulation came a number of new agencies. The Independent System Operator, a nonprofit corporation with a 17 member Board of Directors, the Power Exchange, also a nonprofit corporation with its own Board of Directors, and the Electricity Oversight Board with oversight responsibility over the ISO and PX with a Board of Directors appointed by the Governor were all created by the deregulation law.

Since the new Governor has taken office, a number of changes have been made to this regulatory structure. First, the law relating to the PUC has changed giving the Governor the power to designate the Chairman and giving the Chairman greater day-to-day control over the agency. Also the Governor has designation authority over the Executive Director and the advisors to the PUC Commissioners, effectively making the PUC an executive department.

My Energy Commission has historically reported directly to both the Governor and Legislature. We now report through the Governor's Resources Agency Secretary and executive consent is required for all actions, effectively making the Energy Commission a department of the Executive.



*“In California, the short-term political outcome or goal was to push the costs of the market dysfunction beyond the 2002 general election. So rather than a small rate increase that would have solved the problem in the spring of 2000, we have incurred a \$20 billion debt that will cost us dearly over many years.”*



The independent ISO Board of Directors has been disbanded and replaced by a Board of Executive officials and chaired by the Governor's appointee, effectively making the ISO an executive department. The Power Exchange has been dissolved. New legislation has created an organization called the Green Team whose purpose is to assist in licensing power plants not under Energy Commission jurisdiction. Its Board of Directors is, for the most part, the Governor's department heads reportable directly to the Governor. Finally, a new law has created the California Power Authority whose purpose is to build and operate power plants in competition with the independent producers. The Chairman of the Board is a Governor's appointee, effectively making the Power Authority a department of the Executive.

Now, why is this such a bad idea? Energy policy, energy pricing has broad economic and political implications for a nation or state. Correct economic decisions are often in conflict with short-term political decisions. Short-term political decisions often lead to detrimental longer-term economic conditions. Accordingly, a high degree of independence and autonomy must be provided to decision-makers to avoid decisions based primarily on short-term political outcomes. In California, the short-term political outcome or goal was to push the costs of the market dysfunction beyond the 2002 general election. So rather than a small rate increase that would have solved the problem in the spring of 2000, we have incurred a \$20 billion debt that will cost us dearly over many years.



Most nations that have enacted deregulatory schemes have recognized this and have set up independent regulatory bodies, which have the clear power to act outside of the Executive. California has ignored what every other governmental jurisdiction seems to understand by placing all regulatory authority in the hands of the Executive.

By creating an independent reviewing authority, this does not mean that you have a governmental system not accountable to the people or Congress or the Executive. I cite for example the United States Federal Reserve Board and its Chairman Alan Greenspan. Although Mr. Greenspan is appointed by the President and confirmed by the Senate, the actions of the Reserve Board are able to be undertaken with a fair degree of insulation, thus allowing sometimes

unpopular political decisions, but proper economic decisions to be made. This serves the interests of both the public and the politicians who become insulated from unpopular but necessary decision-making.

I have always considered an unaccountable bureaucracy to be the greatest danger to a mature democracy. I am thus sensitive to the positions I have just stated. I believe, however, that certain circumstances require a degree of independence of decision-making subject, of course, to the ultimate control of the people's representatives.

### **Conclusion**

California will probably avoid major blackouts this summer, but at a grievous cost. The cause of our circumstance is not a poorly drafted deregulatory

law or regulations, which they were; or short-term supply problems, which we had; or obscene profits by generators, which we probably allowed by the rules; but rather our failure is the result of human negligence, arrogance, ambition and lack of effective leadership.

I recently saw the old classic movie *Ft. Apache* with John Wayne and Henry Fonda, both playing military officers on the western frontier. Contrary to expert advice, Henry Fonda's character orders a dashing cavalry charge into the camp of hostile members of the warrior Apache tribe led by the famous Chief Geronimo. Needless to say, the soldiers are slaughtered, but their leader is remembered as a courageous hero. This is a very high price to pay for one man's glory.

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# Central America: Energy efficiency a mainstay for the development of the electric power sector



## Introduction

The interest of the Latin American Energy Organization (OLADE) in developing energy efficiency in the region was welcomed by the European Commission. As a result, funding for a project focusing on all of Central America was secured.

The project, which is called Demand-Side Management in the Central American Isthmus, was implemented in three phases, involving six countries: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. In each one of these countries, one city, as a rule the country's capital, was chosen for the focus of the study.

The project's fundamental objective consisted of preparing, for each one of the participating countries, a plan of action to develop energy efficiency, based on the specific conditions of each country and adjusted to each country's prevailing reality. In order to achieve the objective that was proposed, it was necessary to conduct load characterization studies to determine the share of the major end-uses in consumption and in the load curve of each city's electric power system. The development of this information

base enabled sound measures and programs to be proposed, and afterwards they would be integrated into a plan of action with a clearly defined potential.

Finally, demonstrative applications of the programs proposed in the plan of action were made, with the intention of starting up some of the activities that are part of the plan.

The first phase basically conducted a regional assessment, which served as the basis for selecting the first three countries to receive technical assistance. The cities that were chosen were San José in Costa Rica, San Salvador in El Salvador, and Managua in Nicaragua. In Phase II, the project's objectives were achieved in these cities. The results in these countries were analyzed in previous issues of the *Energy Magazine*.

Achievement of the objectives with the results of Phase II led the European Commission to fund the project's continuation, with Phase III, in the three other countries of Central America. It is the completion of this last phase that is the subject of the present article.

## Area of activities of the final phase

Phase III of the project, in order to cover all six countries of Central America, focused on Guatemala City in Guatemala, San Pedro Sula in Honduras, and Panama City in Panama. The activities of this phase, which served to complete coverage for all six countries, ended in December 2000.

Below, there is a brief description of the cities that are part of the study and what they represent in the context of their own country.

**Guatemala City:** The metropolitan area of Guatemala City, which includes the capital and neighboring urban settlements, has a surface area of 6,208 square kilometers, where 27% of the country's population lives. Nevertheless, available information has obliged the study to consider the concession area of the power utility of Guatemala, the Empresa Eléctrica de Guatemala S.A. (EEGSA), comprised of the departments of Guatemala (which includes the capital's metropolitan area), Escuintla and Sacatepequez.

Guatemala has a surface area of 108,900 square kilometers and, in 1999, a population of close to 11.9

million. The annual demographic growth rate that has been forecast for the period 2000-2010 is 2.2%. During 1990-1999, gross domestic product (GDP) grew at a yearly average rate of 4%, and in 1999 per capita GDP amounted to US\$927 (at prices of 1990).

In 1999, the country's total installed capacity amounted to 1,359 MW, with hydropower accounting for 38% of this total. In 1999, 47% of total net production of electricity was from hydroenergy. Electric power service is provided to 49% of the population. In 1999, annual per capita consumption of electricity amounted to 436 kWh.

**San Pedro Sula:** In contrast to the other Central American countries, the major economic activities and highest electric power demand in Honduras is not located in the capital but rather in the northern region, which is the country's principal industrial and commercial center. The city of San Pedro Sula, which is the district's capital city and the major commercial and industrial center of the country's northern seacoast area, owes its economic impetus to its proximity to the Atlantic seaboard and banana plantations, which are the primary source of exports for Honduras. The urban area of San Pedro Sula has close to one million inhabitants, which account for 12% of the total population, and a surface area of 10,000 square kilometers, equivalent to 8.9% of the country's entire surface area.

Honduras has a surface area of 112,492 square kilometers and, in 1999, a population of close to 6.3 million. The annual demographic growth rate forecast for 2000-2010 is 2.8%. During 1990-1999, gross domestic product (GDP) grew at a yearly average rate of 3%, and in 1999 per capita GDP amounted to US\$698 (at prices of 1990).

In 1999, the country's total installed capacity amounted to 858 MW, with hydroenergy accounting for 45% of this total. Hydroenergy provides 62%

of total electric power production. It is estimated that, for the period 2000-2010, 52% of the population had electric power service. In 1999, per capita consumption of electricity amounted to 542 kWh.

**Panama City:** The area of study, which includes part of the Metropolitan Area of Panama City, is comprised of the concession area for the distribution utility UNION FENOSA EDEMET-EDECHI, which has a population of 1.6 million and a surface area of 467 square kilometers. The city's out-

*“The project’s fundamental objective consisted of preparing, for each one of the participating countries, a plan of action to develop energy efficiency, based on the specific conditions of each country and adjusted to each country’s prevailing reality.”*

skirts, with a low load density, accounts for 88% of this area. The capital itself, with medium and high load densities, accounts for the remaining surface area. The principal activities in the metropolitan area are commercial and governmental.

Panama has a surface area of 75,517 square kilometers and, in 1999, a population of close to 2.8 million. The yearly demographic growth rate for the period 2000-2010 is expected to be 1.6%. From 1990 to 1999, gross domestic product (GDP) grew a yearly

average of 4.5%, and in 1999 per capita GDP amounted to US\$2,829 (at prices of 1990).

In 1999, total installed capacity in the country amounted to 1,206 MW, with hydroenergy accounting for 56% of this total. In 1999, 76% of total net electric power production came from hydroenergy. It is estimated that, for the period 2000-2010, the yearly average rate of growth for net energy production will be 4.5%. The main hydropower stations are Fortuna (300 MW) and Bayano (150 MW). 68% of the population has electric power service. In 1991, per capita electric power consumption amounted to 1,656 kWh.

### Load characterization study

Load characterization helps to determine the contribution of each end-user and each sector to peak demand and electric power consumption. Load characterization study provides a very sound basis for identifying demand-side management measures and the efficient use of electricity and its subsequent selection.

The point of departure for the load study is the distribution of billed energy by consumption sector. On the basis of this study, the strata of analyses are defined to establish in each one of them a sample for the survey and, afterwards, for measurements. The survey provides data on the ownership of equipment among customers, whereas the metering campaign permits the incorporation of the load curve by customer group, equipment, and large user, to support the estimates of their share of demand.

The energy received by the power utilities is recorded for billing purposes, incorporating the information of active and reactive power capacity, busbar voltage, and load curves. The statistical data come mainly from billing and generation, classified by consumption sectors, number of customers, and purchased energy.

The surveys consider samples selected randomly. In the residential sector, customers were stratified in consumption groups, taking a sample from each stratum. The commercial and industrial consumption sectors were grouped under one stratum called "Nonresidential". The questionnaires try to identify equipment and appliances owned by the customer, with their power capacity and time of use,

On the basis of the metering, load consumption and curves for the most frequently used equipment among the customers of the sample by consumption sector were obtained. The same information was obtained for customers and customer groups. As a result, it was possible to estimate the load curves by consumption sector and obtain a breakdown by end-uses not only for energy but also for peak

power capacity, as indicated below.

The measured load curves were typified and classified by working day and by Saturday and Sunday. Afterwards they were compared with the energy obtained from expanding the sample of the survey in

being considered, that is, the city as a whole, which appears in Figure 1.

How the ownership of equipment differs in the three cities, despite similar climate conditions in two of them, must be highlighted. Panama City and San Pedro Sula are similar, as indicated in Figure 2.

The differences in equipment ownership lead to different shares in consumption and in the demands that each end-use has in each city, as illustrated in Figure 3. In other words, for the same end-use, its contribution to consumption of the sector and to the load curve is different for each one of the cities considered in Central America. This is understandable when one takes into account the customs of each population, as well as the different income levels in each case.

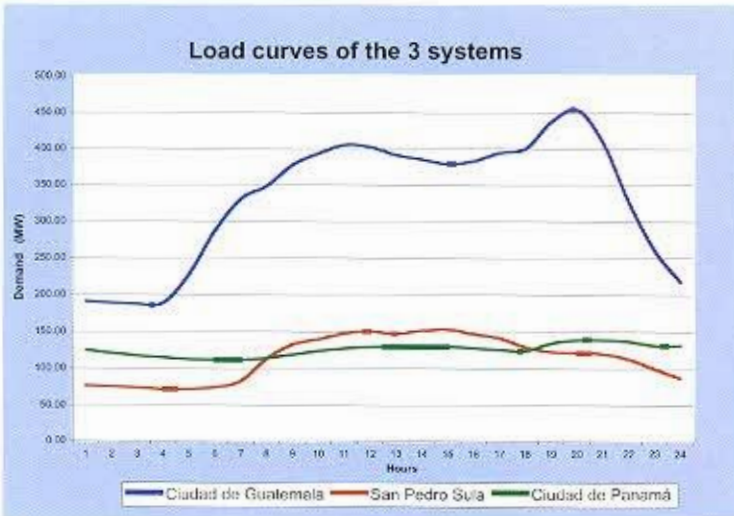


Figure 1. Load curves of the three cities participating in the project

in order to associated them to use periods and obtain average energy for each type. The sample was expanded on the basis of the percentage shares found for each equipment, its average power capacity, and its probable time of use. By weighting working days, Saturdays, and Sundays, the corresponding annual energy was estimated.

order to define the curve corresponding to each one. Afterwards, the curves were extrapolated, first at the consumption stratum level and afterwards at the subsector level. The final adjustment is made in function of the sector's energy and the load curve of each city's power system.

The point of departure of the study is the load curve of the entire system

If differences in the contribution of end-uses to consumption are confirmed, the logical consequence is the difference there is in their share of peak demand of the electric power system in each one of the cities, as indicated in Figure 4.

Finally, the share of end-uses in the Nonresidential sector in consumption is shown in Figure 5.

The global estimate for each one of the cities concludes with the estimated load curve for each consumption sector and its contribution to the entire city's system, as indicated in the curves of Figures 6, 7, and 8.

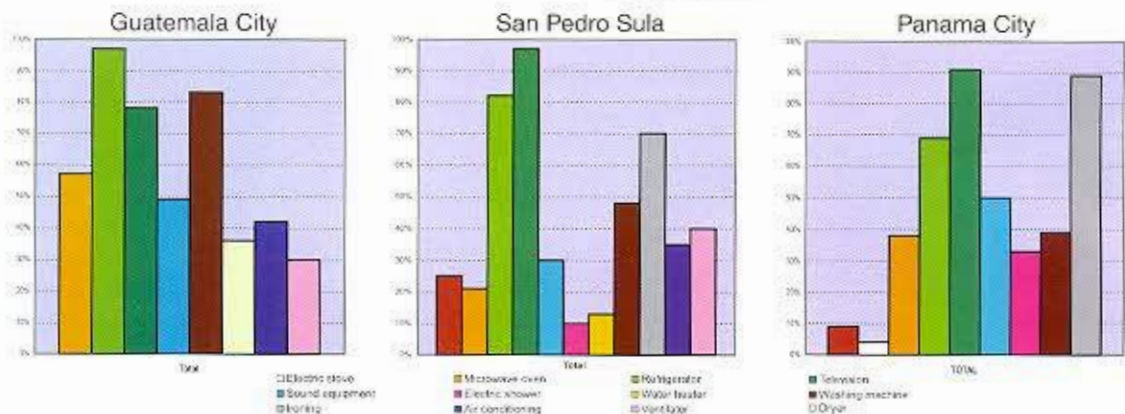


Figure 2. Ownership of equipment in the residential sector of the three cities in the study



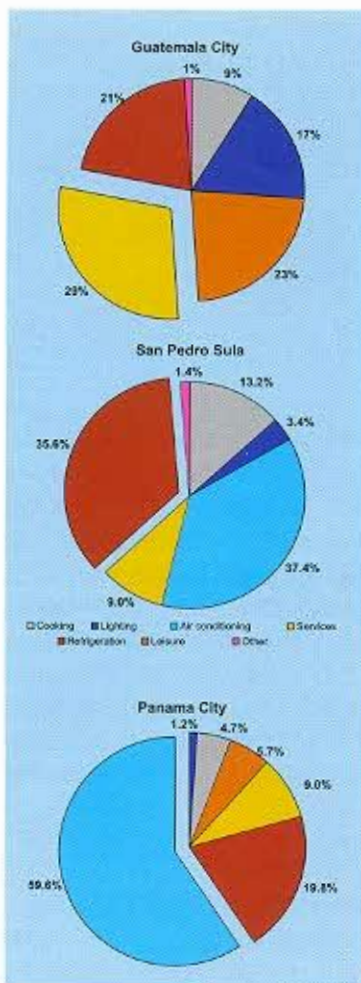


Figure 3. Share of end-uses in residential consumption in each city

### Plan of Action

In view of the diverse conditions in terms of share of end-uses in the three cities, the plans developed for each one are specific to each case. Nevertheless, as a rule, the programs can be summarized as follows:

- Residential Sector: lighting, refrigeration and air conditioning
- Commercial Sector: lighting (including street lighting) and air conditioning
- Industrial Sector: lighting, refrigeration, air conditioning, and motive power, as well as small cogeneration (if any)

**Street lighting:** In the residential sector, the lighting program involves substituting incandescent lamps for compact fluorescent lamps when the daily

average use per lamp is over four hours. That is why the proposal is to substitute light bulbs in the most widely used areas of the household (dining room, kitchen, yard light). In the commercial sector, however, the proposal is to substitute standard fluorescent luminaires for luminaires with highly reflective reflectors, electronic ballasts and T8-type fluorescent tubes. As for street lighting, the progressive substitution of mercury lamps for sodium lamps is proposed. For the industrial sector, two cases were considered, one where fluorescent lighting is used

with the same luminaires as those for the commercial sector, and the other where high-intensity discharge lamps are required and where metallic halogenated lamps are used instead of mercury steam lamps that have completed their useful life.

**Refrigeration:** Improvements in the operation of refrigerators (location of appliance, internal and external cleaning, and elimination of frost at sufficiently frequent intervals, conservation of the lining in good conditions, adjustment of the thermostat at 4°C for refrigerators and -12°C for freezers). Substitution at the end of their useful life for more efficient refrigerators (good insulation, efficient compressors, and better power capacity factor), especially in the upper strata of the customers.

**Air conditioning:** It is felt that the program should give incentives for the substitution of existing appliances for units that have a higher efficiency. Air-conditioned premises should be upgraded by installing insulation and eliminating seepage so as to control all the factors that have an impact on the efficiency of the installation as a whole. In other words, insulating curtains should be installed in cold rooms. Double doors should be used for commercial and industrial premises. Maintenance programs that include periodical adjustments to the functioning and cleaning of filters of cold groups should be incorporated.

**Motive power:** The substitution of excessively large motors is being proposed (possible establishment of a bank of motors for their

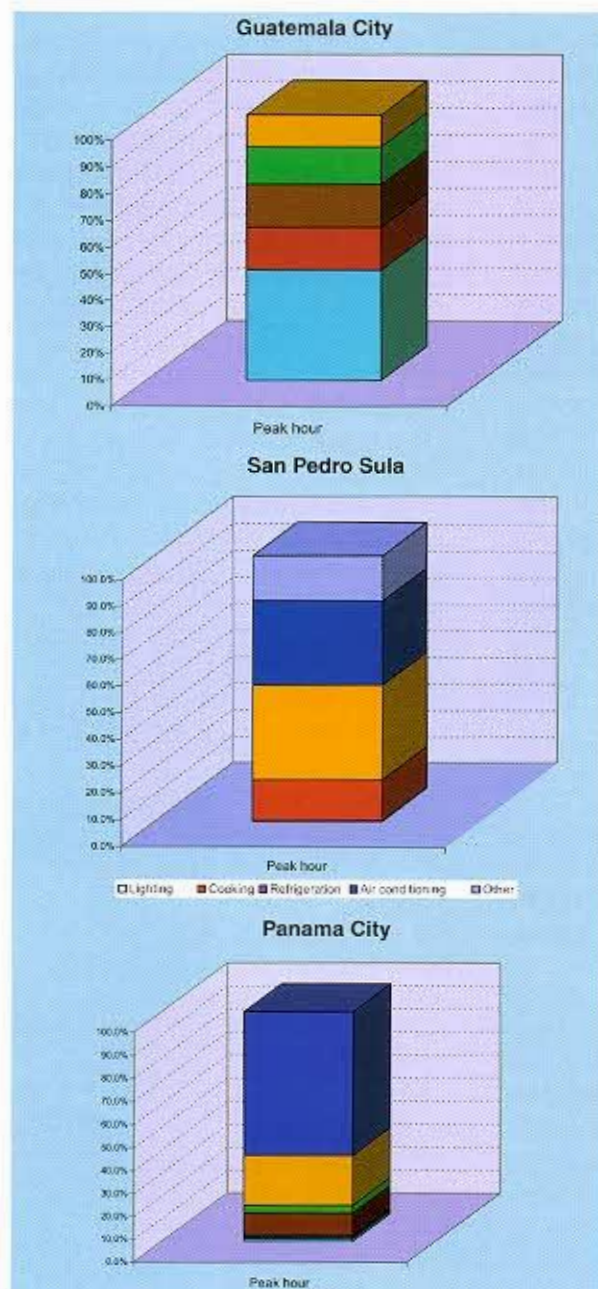
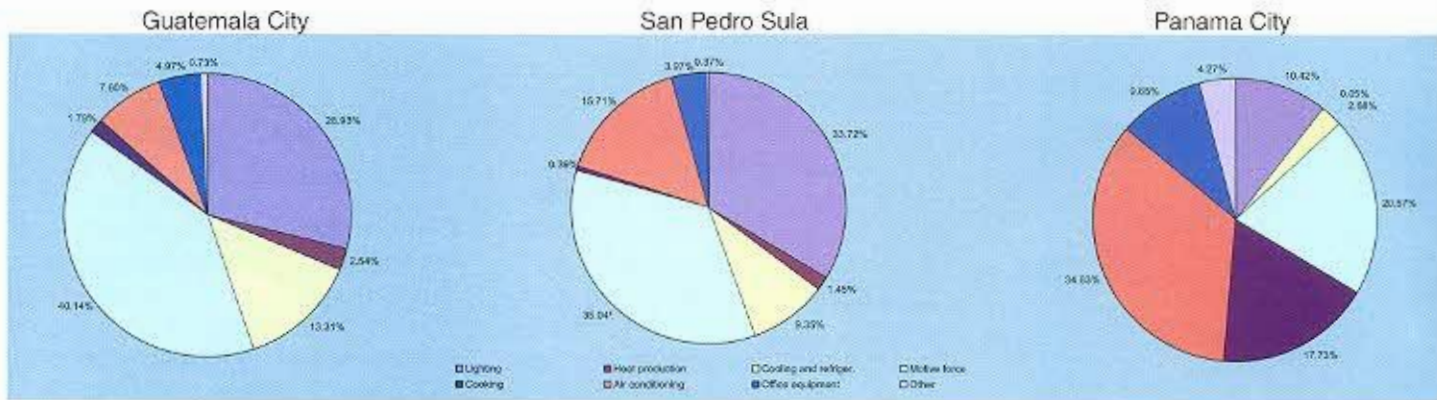


Figure 4. Contribution of end-uses to the system's peak demand

Figure 5. Share of end-uses in the consumption of the nonresidential sector



exchange between companies). The promotion of controls to vary the speed of the motors. The promotion of the application of electric motors with new technologies (the so-called efficient motors).

**Cogeneration:** Cogeneration was recommended for some specific cases in Guatemala and Honduras, where it turns out to be economically attractive. A 2,500 kW cogeneration system for the simultaneous production of steam and electricity (which is the minimum size required for motors operating on bunker) consumes between 60% and 70% less energy, compared with a conventional motor, and produces up to 15 million kWh per year (on the basis of 16 hours per day of use), with an investment cost on the order of US\$800 per kW, that is, US\$2 million for an available power capacity of 2.5 MW.

**General measures:** There is a set of measures that can be classified as general, as in the case of mass media measures to promote practices for the more efficient use of electric power, programs for raising the awareness of users to enhance their chance of purchasing equipment with better technology when it is time to buy a new household appliance; training programs for technicians which must be the basis for a long-term plan like the one that is being proposed; and labeling programs that help buyers to choose efficient appliances once the public has been informed of the advisability of looking for higher efficiency.

It should be indicated that the plans that have been developed assume that appliances will be replaced as their useful life comes to an end, that is, when the customer of the electric power system has to consider replacing the appliance and where, as a result of an economic analysis, the incremental cost of the technological improvement is fully financed by the saving generated by the incorporation of an improved technology.

### Conclusions

The programs that were proposed led to interesting results for the electric power systems of the cities that were the study's target. Thus, in Guatemala City, energy savings are expected to amount to 402 GWh per year up to 2010, which is about 11% of the consumption forecast for the distribution area of EEGSA. As for the reduction in power capacity at peak hours, it will amount to 61 MW by 2010, that is between 7% and 8% of the city's peak demand. In San Pedro Sula, energy saving will amount to 141 GWh per year up to 2010, that is, 10% of the consumption forecast in the city's urban area, and the reduction of peak power capacity will be 25 MW by

2010, that is, between 9% and 10% of peak demand. In Panama City, energy saving will be amounting to 291 GWh per year up to 2010, which accounts for 18% of consumption forecast for the city's urban area, and the reduction of power capacity at peak hours is expected to be 31 MW by 2010, that is, 10-11% of the grid's peak demand.

To reach the results that are expected, not only is the application of the proposed programs necessary but also current conditions in which the power sector is evolving must be taken into account.

In the sector's new structure, which is aimed at ensuring an open and competitive market, with a vertical and horizontal separation of the businesses that comprise the electric power system, the responsibilities to develop energy efficiency are too divided,

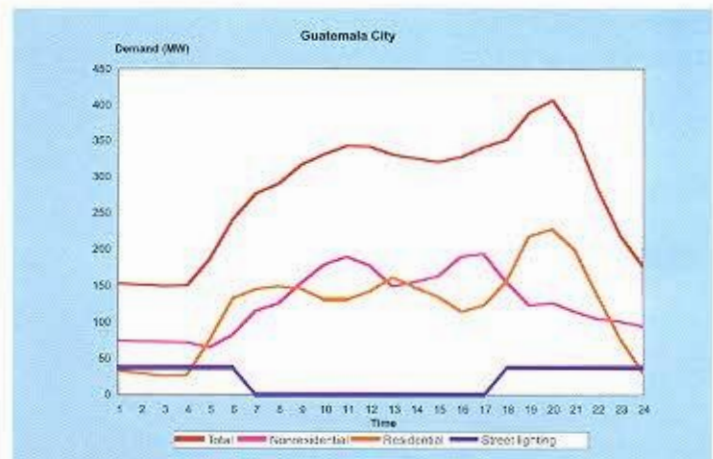


Figure 6. Share of consumption sectors in the load curve of Guatemala City

owing to the participation of many players, which include at least the following: power generation utilities, transmission utilities, and distribution utilities, to which must be added another kind of company because of the trend of incorporating a new player, the marketing companies.

Furthermore, the benefits that efficiency brings to a vertically integrated power utility are not clear for some of the new players. For example, the evaluation of efficiency programs in an integrated company permitted the quantification of direct benefits for generation by calculating the decline in operating costs and the possible postponement of new investment. In the electric power market's new structure, improved efficiency for the group of stations that comprise the entire supply is not the same as that for an individual generator.

Likewise, distribution utilities, whose remuneration depends on the amount of energy that is taken to their users, only look at the possible decline of their income, because of reduced sales as a result of the operation of an electric power efficiency program. There are few executives from these utilities who envisage the possibility of improving their marketing efforts on the basis of the added value stemming from efficiency programs and, over the longer term, of keeping more efficient customers. This means not only keep-

ing the users as their customers but also ensuring the permanence of their distribution utilities on the power grid, thanks to their higher competitiveness.

On the other hand, the State can no longer be relied upon to carry out actions stemming from an energy efficiency policy since, in all the countries, the State is gradually withdrawing from implementation activities.

In addition, it is necessary for someone with an *overall vision* for all energy subsectors and all players of the chain to update the evaluation of the results of any energy efficiency program. It should not be forgotten that this evaluation is critical because of the difficulty of drawing comparisons with a situation that never existed before. This is because efficiency programs exert an impact on demand, reducing its growth. That is, the evaluation of results is always carried out with respect to a forecast demand (without DSM). The more thoroughly the reference base for the analysis is established, the better is the follow-up of the evolution of demand and, as a result, the evaluation will be more reliable.

The above-mentioned conditions can only be reached with a *specialized group* that permanently carries out previous work for the implementation of efficiency programs, to act as a catalyst for the orchestration and drafting of bills or regulations with a global

vision for the energy sector to reach the suitable decision-making levels of each State and thus ensure ratification.

In addition, the labeling of technical standards of equipment requires a long process of coordination between politicians, technicians, standard-setting organizations, producers, distributors, and, to the extent possible, consumer and user associations. To ensure a broad-based participation in this process, there must be a group capable of undertaking the tasks that are required, such as: preparing proposals with sufficient technical bases, the logistic organization of meetings, the documentation and follow-up of results, and the resulting follow-up on resolutions, the publicity of standards proposed among all Central American countries.

The definition itself of an energy efficiency policy requires the elaboration of a proposal based on a careful analysis of the conditions and needs of each country so that it can contribute to supporting a favorable environment for the development of energy efficiency.

All of the above leads to the proposal of following the example of the majority of the industrialized countries, which have an *institution specializing in energy efficiency*, which in the case of Central America could be region-wide in order to save resources and avoid the duplication of efforts.

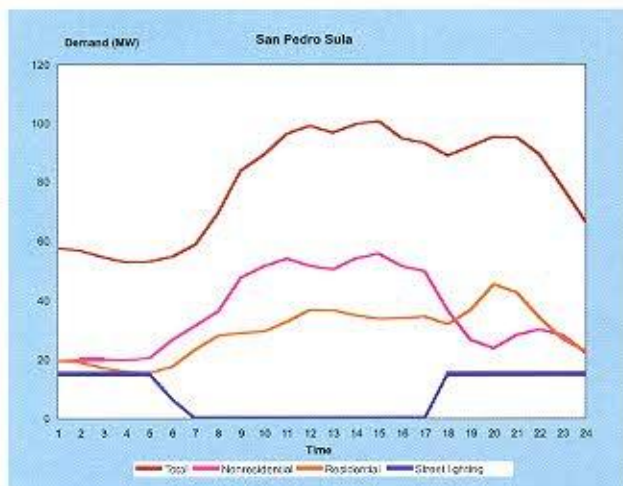


Figure 7. Share of consumption sectors in the load curve of San Pedro Sula



Figure 8. Share of consumption sectors in the load curve of Panama City

# FIRST MEETING OF THE CARIBBEAN HYDROCARBONS COOPERATION COMMISSION

The first meeting of the Caribbean Hydrocarbons Cooperation Commission was held in Trinidad and Tobago on Thursday, August 9, 2001, at which the following countries were represented: Trinidad and Tobago (Chair), Belize, Cuba, Haiti, Jamaica, St. Kitts/Nevis and Suriname.

In order to promote subregional cooperation in oil and gas, the Meeting agreed on the following:

- That the study on the possibilities of setting up re-gasification plants in the Caribbean countries to facilitate the increased utilization of natural gas in the Caribbean energy matrix be taken to the feasibility level and that a proposal be submitted to the U.S. Department of Energy to provide funding for the study.
- That, within the context of the study proposed at 1. above, a prefeasibility study on the specific case of Jamaica be carried out, given the immediate needs of that country for relevant information to take decisions in the near future with regard to options for electricity generation. The Petroleum Corporation of Jamaica is committed to facilitating this study in conjunction with other entities, including the National Gas Company of Trinidad and Tobago.
- To accept the idea of receiving crude oil under the Caracas Accord and having it refined in Trinidad and Tobago in order to receive petroleum derivatives, subject to the approval of the Venezuelan government.
- The trans-Caribbean natural gas pipeline should not be considered as an option for analysis at the feasibility level at this juncture, but noted that the issue will not go away and should be kept in mind for the long term.
- In view of the fact that the trans-Caribbean pipeline is a long-term project, the Haitian government should discuss with the government of the Dominican Republic the possibility of extending a pipeline to Haiti from the LNG facility being built in the Dominican Republic.
- Express appreciation to the Petroleum Corporation of Jamaica for its offer to receive personnel on short-term attachments as a bilateral cooperation arrangement to provide institutional strengthening support to the Haitian Petroleum Committee.
- That public awareness programmes be embarked upon in the countries to sensitize policy makers on the rationale for using natural gas, including environmental considerations.
- Quality standards for petroleum products should be standardized in the Caribbean. In this regard, it was noted that OLADE has a project aimed at the harmonization of legislation and product standards in Latin America and the Caribbean.
- Energy efficiency is a priority area in terms of sustainable energy development in the region. The meeting supported fully the energy efficiency project being implemented under the Caribbean Energy Action Programme (CEAP) and accepted the offer by Cuba to share its experience in this area.
- That ECLAC-Port of Spain, as part of its continued collaboration with the CEAP, will provide, for circulation to the countries, the list of projects previously submitted to the World Solar Summit (WSS) with a view to incorporating some or all of them, to the extent that this is feasible, within the CEAP.
- To thank the Ministry of Energy and Energy Industries of Trinidad and Tobago, as Secretariat of the Commission, for the excellent and efficient manner in which the meeting was arranged and conducted.
- To reiterate to OLADE appreciation for its efforts in support of the establishment of the Caribbean Hydrocarbons Cooperation Commission.

# SUBREGIONAL SEMINAR ON ENERGY POLICYMAKING IN THE CARIBBEAN IS HELD IN CUBA

The Subregional Seminar-Workshop on Energy Policymaking in the Caribbean, organized in the framework of the OLADE-ECLAC-GTZ Project on Energy and Sustainable Development and with support from Cuba's Ministry of Basic Industry, was held in Havana, Cuba, on July 11-13, 2001.

The Seminar, which was attended by delegates from Barbados, Cuba, Haiti, Jamaica, Suriname, and Trinidad and Tobago had two fundamental objectives: the first was to present the theoretical and practical contents of the Guide for Energy Policymaking and some elements to help assess the subregion; the second was to develop a practical exercise to apply and handle the proposed methodology.

The participants emphasized some aspects that may become the components that must be taken into consideration when formulating a subregional energy policy:

- An important element is the marked diversity of the socioeconomic and energy situations among the subregion's countries, especially Cuba's highly different socioeconomic and institutional organization compared to the other countries.
- In terms of energy, it is clear that Trinidad and Tobago is different from the other countries, because of the resources it has available. It is the area's only fuel exporter. The characteristic that the other countries have in common is precisely their dependence on fuel imports for domestic supply.
- Another common characteristic is the limited endowment of renewable sources of energy.
- The slight attention being paid to the potential stemming from the rational use of energy emerged as one of the priority problems of common interest

for an energy policy aimed at promoting sustainable development in the area's countries. This fact has been decisive for selecting this problem to exemplify the obstacles to applying, in practical terms, the approach and methodology that the Guide proposes.

- Among the situations that the participants identified as energy policy problems, those involving the electric power sector were highlighted as another matter of common concern. These problems involve not only supply security and quality, but also the high cost of generation and power distribution losses.

The objectives of the Seminar-Workshop were fully reached. This was apparent in the interest in the approach and methodology that were presented, as well as the active participation of the attendees, who

showed a wide-range of knowledge about the problems that were tackled. Compliance with the objectives was also evident in the interest expressed by the countries in holding further more in-depth seminar-workshops of this kind on energy policymaking in the countries that were represented. The brief presentation of the results of previous national workshop in Jamaica and Barbados, including the subsequent attendance of the former country, also contributed to the event's success.

At the closing ceremony, OLADE's Executive Secretary, Dr. Julio Herrera, expressed his appreciation for the event's excellent organization by the host, that is, Cuba's Ministry of Basic Industry through its Advanced School. He also thanked the representatives of the countries attending the event. Finally, he highlighted the importance of having energy policies in Latin America and the Caribbean that incorporate sustainable development.



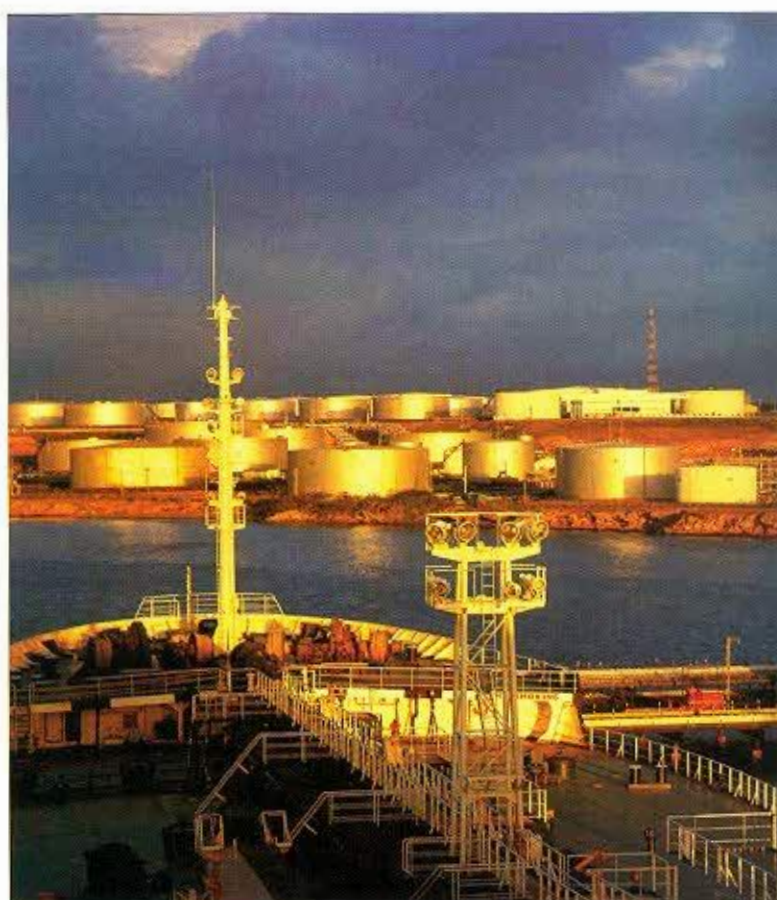
**In Havana**, after the closing ceremony of the Subregional Seminar-Workshop on Energy Policymaking in the Caribbean, on July 13, 2001, along with the Minister for Foreign Investment and Economic Collaboration, Marta Lomas Morales, from left to right, the Vice-Minister for Foreign Investment and Economic Collaboration, Raúl Taladrí, OLADE's Executive Secretary, Dr. Julio Herrera, and the Director of International Economic Organizations, Pedro Morales Carballo.

# OLADE'S VISION AT THE REPSOL YPF-HARVARD SEMINAR

OLADE's Executive Secretary, Dr. Julio Herrera, made a presentation on "The Outlook of International Organizations" at the session on Liberalization and Regulation: The Road to Take, in the framework of the XII Repsol YPF-Harvard Seminar on Energy Policy, held in Palma de Mallorca, Spain, on July 6-7, 2001.

During this session, which he shared with Mr. Robert Priddle, Executive Director of the International Energy Agency (IEA), and Mr. Don Jordan, President of the World Energy Council (WEC), OLADE's Executive Secretary referred to aspects of energy globalization, energy integration of Latin America and the Caribbean, sector reforms, market liberalization and new market regulations, as well as the results of reforms, their impacts on investments, and the trade of energy sources and sector coverage.

"The nineties," said Dr. Julio Herrera, "were the energy decade for the region. Latin America and the Caribbean is no



longer what it was before the reforms. The region has been renewing itself, in line with the challenges posed by international political demands, which have changed substantially since the end of the cold war, with the fall of the Berlin

wall. The imminent advent of a new world economic and political order, which is being identified by the term 'globalization', where international trade is a major component, has converted Latin America and the Caribbean

into an area of unique importance. There are many countries in the region that have taken the political decision to become part of a 'globalized world' in order to participate in this world, benefit from its positive aspects and mitigate any adverse impacts."

"In this environment," he added, "to a large extent it will be the development of markets that will determine the future development of the people. The region is aware that their markets are emerging markets and, as a result, they are an inexhaustible source of trade for goods and services, as well as targets for foreign investment, which indeed is what has occurred."

After presenting an overview of what the energy sector transformation process in Latin America and the Caribbean means, OLADE's Executive Secretary asserted that there is yet much to be done, to be developed, to be tapped, especially with respect to the consolidation of reforms. The consolidation of reforms will provide the groundwork to ensure a return of foreign investments, not only to safeguard those that have already been made but also to attract those that can be made in the future.

"International cooperation, whether multilateral or bilateral, cannot be omitted from everything that is achieved in the future in terms of energy in the region. International cooperation will be the foundation on which the region's development will rely to reach its objec-



*"...International cooperation, whether multilateral or bilateral, cannot be omitted from everything that is achieved in the future in terms of energy in the region. International cooperation will be the foundation on which the region's development will rely to reach its objectives, objectives that are shared by international cooperation, private investment (new private business with a dominant social role) and the beneficiaries of both.*



tives, objectives that are shared by international cooperation, private investment (new private business with a dominant social role) and the beneficiaries of both. Cooperation sows the seed for the results of subsequent investment, especially private but specifically foreign investment."

"This reality requires a revision of the foundations on which cooperation is based. At present it is not considered as a priority, but new cooperation schemes, based on solidarity and social responsibility, now referred to as strategic cooperation for the region's countries, must be redesigned."

"Energy, with its traditional or new, clean, and renewable sources of energy, economic growth, sustainable development, 'globalization' and so many other concepts that have dominated the international stage and forums, make no sense whatsoever if we end up by having an underdeveloped and depressed person, living in poverty, still using firewood or dung as a primary source of energy, and without a decent destiny in which to raise a family inside society, unable to develop the most elementary human values."

"This means," he said, "that we who focus on energy activities must adopt a stance aimed at giving a human dimension to energy, so that energy can pave the way for the growth of mankind and society."

## CD-ROM for the Project on Energy and Sustainable Development in Latin America and the Caribbean implemented from 1993 to 2001

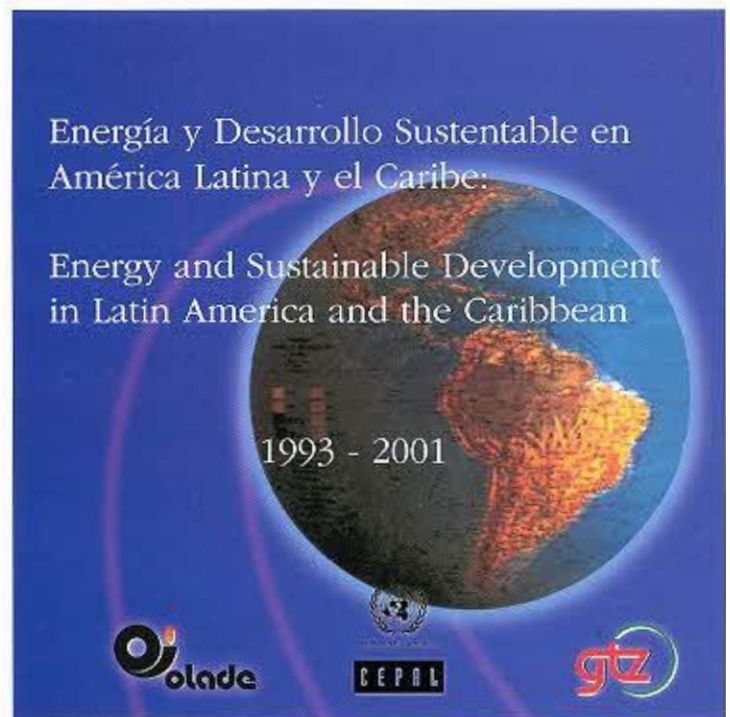
The Project on Energy and Sustainable Development in Latin America and the Caribbean that was carried out with financial support from the Federal Ministry for Cooperation and Development of Germany (BMZ) and jointly implemented by the Latin American Energy Organization (OLADE), the Economic Commission for Latin America and the Caribbean (ECLAC), and the German Technical Cooperation Agency (GTZ), concluded at the end of September 2001. The project started up at the end of 1993 and involved three consecutive phases.

For Phase I of the Project case studies on energy and development were conducted in Chile, Colombia, and El Salvador, which were the countries selected for their diversity of approaches to State restructuring, availability of energy resources, market sizes, and degree of openness to the outside. The studies facilitated the preliminary identification of relevant aspects for the linkage between energy and development and enabled the Project to collaborate with these countries in formulating energy policies that favor sustainable development.

During Phase II, case studies of Brazil and Bolivia were conducted, using the previous experiences as a reference. The results were summarized in a book entitled *Energy and Sustainable Development in Latin America and the Caribbean: Approaches to Energy Pol-*

*icy*, which was published in 1997. With these studies, the experiences in energy policymaking for the region were broadened as a result of the in-depth study of the problems with respect to the sustainability of development that were detected. To disseminate these experiences, national seminars were held in various countries, and subregional workshops were organized for the Southern Cone, the Andean Community, Mexico and Central America, and the Caribbean. Energy integration projects were identified by conducting prefeasibility studies for gas pipeline infrastructure in Central America, based on the *Prefeasibility Study of the Gas Interconnection between Mexico and the Central American Isthmus*, published in 1998.

During Phase III, the case studies of Colombia and Chile were updated, and technical assistance was provided to the countries of Central America and the Caribbean. Further work was carried out to identify integration projects between countries, including the *Prefeasibility Study for the Gas Interconnection of Colombia and Venezuela with the Central American Isthmus* and papers that explore the natural gas market integration potential between the countries of the Andean Community. The previous experiences were summarized in the book entitled *Ener-*



*gy and Sustainable Development: Guide for Energy Policymaking*, published in 2000. National workshops were organized in Jamaica, Nicaragua, Honduras, Peru, and Barbados, and subregional workshops in Quito, Santiago de Chile, Panama City, Honduras, and Havana.

In their final report, OLADE and ECLAC deem that the Project's results in Phase I reflect a sound framework of reference for designing the region's energy policy. Phase II contributed to fine-tuning this instrument, on the basis of the work carried out at various levels, and to consolidating it. Phase III applied a more operational approach to applying concepts and promoting technical assistance to help governments implement sustainable development proposals in the energy policy of the region's respective countries.

The most important work done in the framework of this Project has been brought together in a CD-ROM, which also includes a complete list of other papers that have been the groundwork for the conclusions that were reached.



## STUDY FOR NATURAL GAS MARKET INTEGRATION IN SOUTH AMERICA HAS BEEN PUBLISHED ON CD-ROM



tance of OLADE's Member States.

responding financing requirements can be obtained from this analysis.

The report provides the following:

The study's results provide a consistent overview of least-cost gas trade in South America in line with various scenarios for

- Information about the energy and gas sector for the region's countries as the basis to establish supply/demand forecasting.
- Natural gas supply and demand scenarios generated by the model and applied to all the countries. The results have been consolidated for the entire region.
- The methodology used to assess the gas interconnection scenarios and the principal conclusions drawn from the selected scenarios.

The *Study for Natural Gas Market Integration in South America* that was published on CD-ROM was carried out by OLADE with the participation of ARPEL and Beicip-Franlab as consultant, in addition to support from the European Commission and the assis-

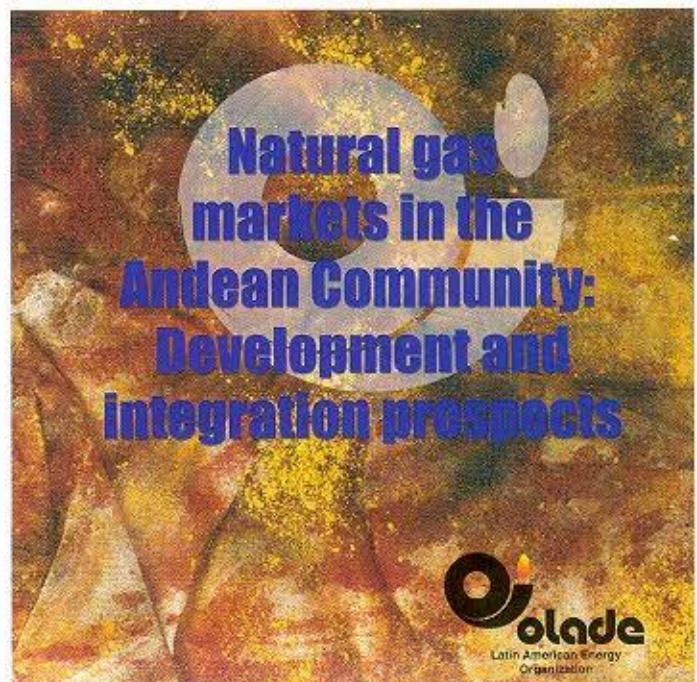
gas demand and gas reserves production. Some interconnection projects will be competing among each other, and therefore only an integrated analysis of future gas flows in the region will be able to provide a least-cost solution. The most feasible projects and the cor-

## CD-ROM ON NATURAL GAS MARKETS IN THE ANDEAN COMMUNITY: DEVELOPMENT AND INTEGRATION PROSPECTS

The papers that were compiled by OLADE's Permanent Secretariat between mid-1999 and June 2001 on natural gas markets and their outlook in the countries of the Andean Community were published on a CD-ROM. Although some of the data that are provided could be updated, this deficiency does not in any way alter the validity of the description of the structural characteristics of these markets, or the conclusions on their prospects.

With this publication, OLADE is offering a new and wide-ranging overview of opportunities for investment to promote the long-term supply of a cleaner energy source, which has the possibility of providing high amounts of feedstock for electric power generation. With investments in natural gas, the installed capacity of hydropower can be complemented and a more flexible scheme for electric power supply can be ensured especially when climate conditions adversely affect the rainfall regimes of watersheds.

The papers presented on the CD-ROM provide suggestions and may lead to new studies that validate or contradict the assertions made by these papers. Nevertheless, there is no doubt they will constitute the groundwork for comparing hypotheses and obtaining further knowledge about this subject in the subregion.



# Opinion and debate

Panama City, August 24, 2001

Dr. JULIO HERRERA  
Executive Secretary  
Latin American Energy Organization (OLADE)  
Quito, Ecuador

Dear Dr. Herrera:

It is with great pleasure that I receive OLADE's *Energy Magazine*, which keeps us informed about all that is occurring in the region's energy sector.

I would like to take this opportunity to congratulate you for your excellent work, and I would like to reiterate our willingness to having our country also become an active player in regional projects being implemented in the energy sector.

Cordially,

Temístocles Rosas R.  
Interior Vice-Minister of Commerce and Industry  
Republic of Panama

The present section is reserved to print the statements and opinions of our readers regarding articles and information published in our journal, as well as their viewpoints about noteworthy aspects of the region's current energy topics.

The ideas or possible debates that might arise as a result of this page will no doubt contribute to promoting the development of the energy sector in Latin America and the Caribbean.

In the present issues, we are publishing the letters sent to us by Dr. Temístocles Rosas R., Interior Vice-Minister of Commerce and Industry of Panama, and José Luis Rodríguez Vásquez, a Peruvian graduate.

Lima, July 29, 2001

Dr. JULIO HERRERA  
Executive Secretary  
OLADE  
Ecuador

Dear Dr. Herrera:

I would like to inform you that I have received OLADE's *Energy Magazine* for the first time. It was given to me by the former Vice-Minister of Energy of the Ministry of Energy and Mines of Peru, Mr. Sergio Ugarte-Rentería. When I started looking at it, the first thing that caught my attention was the phrase "Giving a Human Dimension to Energy," in the Magazine's editorial. It made me reflect on the importance for those professionals like myself who focus on energy activities to adopt a position aimed at ensuring that mankind be granted a decent destiny, where persons can evolve along with their families in a society that enables them to develop the most elementary human values.

I am very happy and satisfied to have found a magazine with these high technological, political, economic, and social standards.

Cordially,

José Luis Rodríguez-Vásquez  
B.S. in electrical engineering  
President of the class of 2000 II



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# BUSINESS AND INVESTMENT OPPORTUNITIES IN THE ENERGY SECTOR OF LATIN AMERICA AND THE CARIBBEAN

## **BOLIVIA**

### **Bidding process to build household gas networks**

On August 30, 2001, the Ministry of Foreign Trade and Investment issued a national and international public invitation to a bidding process to award to the private sector the contract for installing primary and secondary natural gas networks in Bolivia. The bids of the companies that are interested in participating will be accepted until November 8, 2001. The bidding process includes the provision of primary networks owned by the Bolivian state oil company Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) and secondary networks that reach households.

## **BOLIVIA-PERU**

### **Construction of binational gas pipeline is being studied**

The possibility of building a gas pipeline between Bolivia and Peru to facilitate the export of Bolivian liquefied natural gas to the United States will be one of the items on the agenda of the interview that will be held between President Jorge Quiroga of Bolivia and President Alejandro Toledo of Peru before the end of year, informed Bolivia's Minister of Foreign Affairs, Gustavo Fernández.

The idea is to promote a private-sector project, for an estimated value of US\$5 billion, to liquefy natural gas and export it to North America, using part of Bolivia's proven gas reserves, which amount to 46 trillion cubic feet.

## **BRAZIL**

### **PETROBRAS invests in exploration**

Between September and December 2001, Brazil's state oil company Petróleo Brasileiro S.A. (Petrobras) will be investing US\$2.6 billion to boost activities aimed at finding new reserves, as part of a general investment program amounting to US\$4.78 billion projected for 2001 for the purpose of expanding exploration and production in oil areas.

With this high volume of investment, Petrobras intends to reach an average daily crude oil production of 1.4 million barrels.

It should be emphasized, however, that in July 2001, Petrobras achieved a new record for processing in refineries in Brazil, that is, a daily average load of 1,700,654 barrels.

## **COLOMBIA-VENEZUELA**

### **Gas pipeline for integration**

Colombia's oil state company Empresa Colombiana de Petróleos (ECOPETROL) and Venezuela's state oil company Petróleos de Venezuela S.A. (PDVSA), through its subsidiary Gas de Venezuela, are studying the construction of a 200-km long gas pipeline that will be connecting the platforms of Ecopetrol and Texaco on Colombia's northeastern coast with Lake Maracaibo in Venezuela.

Regarding this, the President of PDVSA, General Guacaipuro Lameda, reported that a technical study will define the conditions for his country to import natural gas from Colombia.

In addition, ECOPEPETROL's President, Dr. Alberto Calderón, stated that the company is interested in this interconnection and will explore economically viable conditions to install it.

## **CUBA**

### **Private-sector participation in oil exploration**

Cuba's state oil company (CUPET), by entering into partnerships with private-sector enterprises, will be promoting, as of the second semester of 2001, a project to explore for oil in its territorial waters in the Gulf of Mexico. About 10,000 square kilometers of the 112,000 square kilometers of its northeastern seaboard will be explored. CUPET informed that Cuba has increased its oil production fourfold over the last decade, on the basis of its wells from the mid-northern seaboard of the province of Matanzas. These wells produce about 70% of the oil used for electric power generation.

Six of the seven power generation plants on the island will be upgraded so they can use this crude oil as feedstock. As a result, 90% of power generation will be based on domestic crude oil.

## **ECUADOR**

### **Private-sector enterprise will take over electricity distribution for 30 years**

In Ecuador, awarding electric power distribution to private enterprise for 30 years will be decided on October 28, 2001.

The public service distribution and marketing concession contract that has been proposed to companies interested in buying 51% of the shares of the Solidarity Fund in 17 power utilities establishes clear rules to promote confidence among the investors who will be participating in this bidding process.

## **PETROECUADOR seeks investment for oil development**

Private-sector investment required to develop the oil block of Ishpingo-Tambacochoa-Tiputini is estimated at US\$2.5 billion. To obtain this investment, the state oil company Petroecuador will be looking for a partner in the first quarter of 2002.

## **MEXICO**

### **Private sector will participate in the gas industry**

The Director General of Mexico's state oil company Petróleos Mexicanos (PEMEX), Raúl Muñoz-Leos, reported that mechanisms are being sought to facilitate greater participation of the private sector by broadening service contracts in the area of natural gas.

The Director of PEMEX reiterated the need to make heavy investments rapidly in the country's gas exploration efforts, since the price of natural gas could rise in coming years. Regarding this, sources from Mexico's state oil company mentioned that strategic partners interested in making these investments are being sought.

## **TRINIDAD AND TOBAGO**

### **Investments for the petrochemical industry**

An investment of US\$400 million will require the construction of a methanol production plant in Trinidad and Tobago, whose production capacity has been calculated at 1.7 million tons per year.

Financing for this oil transformation project is being negotiated. The Canadian company Methanex, which is interested in building the plant and marketing its product, has earmarked US\$100 million for shares and equity participation in this company.

# Energy Magazine

The Energy Magazine, in full color with a print run of 5,000, is issued quarterly in Spanish and English.

It is distributed throughout Latin America, the Caribbean, North America, and Europe to executives of public and private energy sectors, financiers, industrialists, consultants, and technical experts involved in the region's development.

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