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Organización Latinoamericana de Energía

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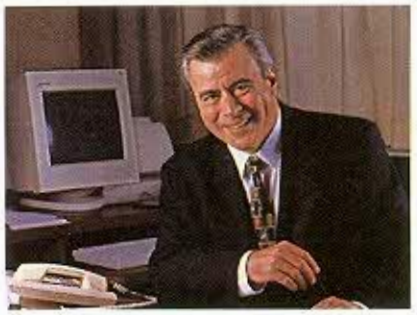
Editorial

THE ENERGY SECTOR AND THE INTEGRATION PROCESS OF THE ANDEAN COMMUNITY OF NATIONS



The five member countries of the Andean Community of Nations (Bolivia, Colombia, Ecuador, Peru, and Venezuela) have been tackling current challenges by fostering a major transformation of the mechanisms that permit the functioning of this subregional integration scheme, as has become evident over the last few years.

The periodical Andean presidential summits and other high-ranking political and technical decision-making forums have confirmed the will of the subregion's governments to consolidate the integration process, providing it with modern institutions to take up the challenges arising from the international scenario and globalization.

After 32 years, since its establishment in 1969, the Andean Community of Nations presents an image of a reactivated integration agreement, with promising prospects.

Regarding the energy sector, the Andean countries have clear advantages in terms of resource availability, which make this subregion self-sufficient in terms of energy. Its oil and natural gas reserves are the largest in Latin America and the Caribbean, with major exportable balances. The subregion accounts for 59% of the proven natural gas reserves in Latin America and the Caribbean and its reserves-production ratio, calculated to the year 2000, is 99 years.

The subregion's water resource potential for electric power production is very important but it has not been sufficiently tapped. Nevertheless, 76% of electric power generation comes from water, although it is expected that this share will decline as a result of the incorporation of natural gas into power generation processes. In addition, the Andean zone holds large amounts of resources for the production of renewable sources of energy.

Nevertheless, the Andean Community of Nations is a clear example of the fact that what makes countries and regions truly competitive in a global context is not merely the availability of energy resources but also their efficient and sustainable use and, especially, the structuring of an intra-regional trade scheme that promotes complementation, reduces production costs, facilitates trades, and promotes investment. It is precisely in this area that the subregion should join forces and deploy actions that would enable it to overcome existing barriers.

Although milestones and achievements in this field, such as the dynamic process under way between Colombia, Ecuador, and Peru, with the possible incorporation of Venezuela, for electric power interconnection, should be highlighted, there is as yet much to be done.

Regarding this, the Energy Ministers of the Andean countries, at their last meeting held in Quito on October 19, agreed to promote energy integration in the subregion. They decided to use OLADE's institutional mechanisms and support the coordination of the activities of this Organization and the Andean Community of Nations.

Greater impetus for, and consolidation of, international Andean trade will decisively contribute to strengthening the integration of the area's countries.

Dr. JULIO HERRERA
Executive Secretary

Quito hosts XXXII Meeting of Ministers of OLADE

"Contributions for a State Energy Policy in Latin America and the Caribbean" was the central topic for the ministerial debate at the XXXII Meeting of Ministers of OLADE, held in Quito, Ecuador on October 19-20, 2001.

The Meeting was inaugurated by the Vice-President of the Republic of Ecuador, Mr. Pedro Pinto-Rubianes, who highlighted the importance of energy in the development of the region's countries and the need to promote integration in Latin America and the Caribbean.

"The future of the energy sector of Latin America and the Caribbean requires a joint political strategy that promotes integration, development, conservation, and the rational use of its natural and energy resources. This is precisely OLADE's role and objective," said Vice-President Pinto.

The Mayor of the Metropolitan District of Quito, General Paco Moncayo, spoke at the opening ceremony of the Meeting and welcomed the participants. "We are watchful of how this Latin American international organization, OLADE, develops and evolves. We have closely followed its successful history, which has been important and useful for our countries."

OLADE's Executive Secretary, Dr. Julio Herrera, presented an overview of the region's energy situation and its prospects. "The energy sector of Latin America and the Caribbean, which played a leading role in the nineties, has the challenge of becoming a leader again in the early years of the 21st century," he said. "We believe we can do it. We believe there are material and human resources in the region that encourage us to be optimistic, especially under the difficult circumstances that the world is living since the unspeakable attacks on September 11, which are generating uncertainty and doubt about what will happen and how things will evolve."

The Minister of Energy and Mines of Ecuador, Mr. Pablo Terán-Ribadeneira, started up the discussion of the ministers by providing a political analysis of the paper prepared by OLADE's Permanent Secretariat on the above-mentioned topic.

"If we consider energy supply as the basis for the development of any country and, further yet, as the driving force behind improving social programs, because without safe, efficient and reliable electricity it is impossible to provide health, education or clean water, among other services, then we must find the way to transform these common objectives into reality," said Minister Terán. "Obviously this depends on the characteristics of each country, but I believe there are common features that we can analyze at this Meeting of Ministers."

"My colleagues the ministers," he added, "our nations have been listening to the call for integration for 30 years now and very little, if anything at

At the opening ceremony of the XXXII Meeting of Ministers of OLADE, from left to right: Mr. Pablo Terán, Minister of Energy and Mines of Ecuador; General Paco Moncayo, Mayor of the Metropolitan District of Quito; Mr. Pedro Pinto-Rubianes, Vice-President of the Republic of Ecuador; Mr. Luis Antonio Servín, Vice-Minister of Energy and Mines of Paraguay; and Dr. Julio Herrera, Executive Secretary of OLADE

all, has been achieved. Few countries are interconnected and many of those that are interconnected do not have any electricity trade. This matter has gone beyond mere concern to enter the realm of the absurd."

"The region is losing or has lost more than US$1 billion per year for not having promoted electric power integration. We also have to compare these figures with the indicators currently prevailing in the region: schooling rates of 8.5 years, whereas the Asian countries record rates of 12.5 years of schooling and developed countries record 13.3 years. US$1.1 billion of losses per year in a region that has more than 300 million poor."

The Ministers and Heads of Delegations participating in the Meeting, as part of this discussion, focused on various aspects involving the integration and development of the region's energy sector.

The Minister of Mines and Energy of Colombia, Dr. Ramiro Valencia-Cossio, asserted that political decisions had to be taken to ensure regional integration, as an obligation of the countries to the region's community. He emphasized the need to look for common problems to find common solutions. Regarding this, he said that OLADE is a forum that facilitates dialogue, which can be useful for the exchange of experiences with countries that have already gone through a process of this kind so that other countries can put them into practice. No country is self-sufficient. That is why integration is indispensable; it is not a conceptual matter, but rather a process that takes place out of a need for cooperation. He underscored that the electric power interconnection between Venezuela, Colombia, Ecuador, and Peru will become a reality in 2002 when a process that has already been started up by the four countries is completed.

The Minister of Energy and Mines of Peru, Mr. Jaime Quijandría, indicated that, since the State does not have enough resources, it is necessary to concretize reforms aimed at securing private investment from both domestic and foreign sources for the develop-

ment of oil, gas, and electric power projects. He stated that there is a promising future for the region's emerging markets that will permit greater competition. These markets should be set up with support from an institution such as OLADE and should be aimed at enhancing competition and efficiency. He noted that in Peru the services that have managed to reduce rates are in the hands of the private sector.

He said that the document of OLADE's Permanent Secretariat reflected the need to define a regional strategy for energy policy, which should begin with subregional linkages.

The Secretary of Natural Resources and Environment of Honduras, Ms. Xiomara Gómez de Caballero, referred to the progress made in integrating the Central American subregion. As an example of this integration she mentioned the Electric Power Interconnection System of Central America (SIEPAC) and highlighted OLADE's action to support coordination of an energy policy in the subregion.

She also pointed out that Honduras has created a legal framework to give incentives to generation using renewable sources of energy. Electric power generation permits have been granted for 18 power generation projects based on water and biomass resources, which will provide an additional 100 MW, apart from the projects already under construction, which will be generating 64 MW. All of these projects are to be implemented by private investors. She said the government is a facilitator of investments and provides regulatory and monitoring mechanisms, especially for legal and environmental aspects. To ensure favorable results, social issues have also been addressed.

The Executive Secretary of the National Energy Commission of Nicaragua, Mr. Luis Velásquez-Molieri, highlighted the integration efforts of Central America, especially, the SIEPAC Project and the project for developing the Mexico-Central America Gas Pipeline, with possibilities for interconnections with Colombia and Venezuela and afterwards with Ecuador and Peru. He indicated that, to promote this integration, the Energy Ministers of the subregion should hold periodical meetings, and he emphasized that OLADE has to continue with the initiative of consolidating subregional integration projects by acting as mediator and providing technical assistance.

He indicated some achievements made by the process of modernizing Nicaragua's energy sector, which started in April 1998 with the enactment of the electric power industry law that establishes the CNE, which is an entity for policymaking, growth plans, rural electrification development projects, and sector investment promotion.

As for the Minister of Energy and Mines of Guatemala, Mr. Raúl Archila, he emphasized the need to strengthen even further the region's integration processes and as part of these processes the implementation of signed agreements such as the San José Accord and the Energy Agreement of Caracas.

He said that specific projects can be developed in OLADE to promote energy cooperation and integration.

The XXXII Meeting of Ministers of OLADE adopted a Declaration, which reads as follows:

The XXXII Meeting of Ministers of OLADE approved the instatement of Algeria in the Organization as a Participating Country. Dr. Mohamed Khelladi, Algerian Ambassador to Venezuela and Ecuador, represented his country at the ministerial meeting

The XXXII Meeting of Ministers of the Latin American Energy Organization (OLADE), held in Quito, Ecuador on October 19-20, 2001

CONSIDERING

That the current international economic, political, and social environment requires greater and more active energy interaction between the region's countries, for the purpose of building up the capacity of our respective energy sectors, as well as increasing the coordination of regional actions to this end;

That there are differences between the subregions, the countries and their communities, which separately can constrain energy development but which together can contribute to the establishment of an integrated regional energy system;

That the process of modernizing and consolidating OLADE that started with the agreements reached at the Third Extraordinary Meeting of Ministers and the XXXI Meeting of Ministers of the Organization should contribute to increasing cooperation, exchange, and integration actions of the region's countries.

HEREBY DECLARES

The need for and advisability of:

1. Promoting complementation in the rational and environmentally sustainable development and use of energy resources, depending on the case, so that energy supply can be guaranteed to all peoples, on a timely basis, efficiently, permanently, and at a reasonable cost.

2. Promoting the exchange of experiences in order to tap the comparative advantages of each country for the benefit of the transformation processes that OLADE's Member States have started up or are interested in starting up.

3. Fostering favorable conditions that give incentives to investments in OLADE Member States, in keeping with national legislation currently in force.

4. Fostering the diversification of national, subregional, and regional energy matrices to contribute to energy supply and expand energy coverage for OLADE's Member States, on the basis of the rational use of their resources.

5. Promoting the development of regional energy markets that contribute to trade of the region's energy goods and resources.

6. Striving for regulatory and technical harmonization to facilitate energy integration.

7. Promoting the exchange of information and experiences among the Member States of OLADE, taking into account the importance of multilateral energy sector negotiations for the region, and coordinating to the extent possible their positions, in order to build up the negotiating capacity of the region and its countries.

8. Promoting studies and projects focusing on the use of renewable sources of energy, without detriment to the use of existing conventional energy sources and natural resources in each Member State of OLADE.

9. Ensuring that OLADE's structure, procedures, and activities be consistent with the Organization's mission to meet the energy needs of the Member States by promoting the sustainable development of various energy sources.

CONSOLIDATION OF SUBREGIONAL INTEGRATION IS THE PURPOSE OF THE CARIBBEAN ENERGY MINISTERS MEETING

OLADE's Executive Secretary, Dr. Julio Herrera, proposed that, on occasion of the XXXII Meeting of Ministers of OLADE, in Quito, Ecuador, a Caribbean Energy Ministers Meeting be held. This proposal was accepted, and this Meeting took place on October 18, 2001. It commenced with words of introduction from Dr. Herrera, who reiterated OLADE's commitment to the Caribbean Energy Action Program (CEAP) and highlighted the formation of the Caribbean Hydrocarbons Cooperation Commission.

The Honourable Mr. Robert Pickersgill, Minister of Mining and Energy of Jamaica, was elected chairman of the Meeting.

In compliance with the approved agenda, OLADE's Permanent Secretariat presented a Progress Report on the activities of the CEAP as at August 2001.

The report referred to the new CEAP Reporting Mechanism, Energy Policy-making for Sustainable Development, the Caribbean Hydrocarbons Cooperation Commission, Options to Increase the Share of Natural Gas in the Caribbean Energy Matrix, the Certificate Program, the Caribbean Renewable Energy Development Project, the Energy Efficiency Project, and National Energy Information Systems.

The delegate of Trinidad and Tobago congratulated OLADE for its work on the CEAP. He mentioned that the Ministry of Energy and Energy Industries and the National Energy Skills Centre hope to complete negotiations with OLADE to begin a Certificate Program during the first quarter of 2002.

The delegate of the Dominican Republic suggested that electricity should be an important subject of the CEAP. He mentioned particularly the issues of opening up electricity markets and how countries must deal with this. He said that, in his country, there was little information available on the market before the capitalization process started, and there was no legally approved regulatory framework. He felt that there should be ongoing monitoring by OLADE so that countries can share their experiences on this subject.

The Minister of Mining and Energy of Jamaica pointed out that, in his country, the regulatory body had been set up and had been functioning even before the partial divestment of the electric utility. A decision was also taken at that time that all new increments in capacity would be private. The state-owned electric utility was privatized this year. He also mentioned that the government had played an active role in the rural electrification program before the Jamaica Public Service Company was privatized. Under the new arrangements, the Rural Electrification Program remains in government ownership.

Regarding the CEAP's new activities, the Minister of Jamaica suggested that a public awareness program on energy conservation be developed in all countries, which would consist of elaborating audiovisual materials for the media. It was suggested that a public awareness project could be one of the areas recommended for the implementation phase of the Energy Efficiency Project sponsored by UNDP/GEF, since this is one of the main barriers.

Regarding this matter, OLADE's Executive Secretary mentioned the possibility that, based on the interest expressed at this meeting on this subject, a request could be made to include the Caribbean in the Project on Raising Awareness in the Rational Use of Energy presented to IDB for financing. As a result, the meeting requested that the respective steps be taken to include the Caribbean in the Program.

The report on follow-up activities of the Caribbean Hydrocarbons Cooperation Commission was presented by the delegate of Trinidad and Tobago, which is the host country of the Secretariat of the Commission, with the following comments:

- With respect to the possible extension of a pipeline from the natural gas facilities under construction in the Dominican Republic to Haiti, the delegate of the Dominican Republic noted the natural gas project is being carried out by a private company and therefore any negotiations should be carried out jointly with the Dominican Government and the private company.
- With respect to the idea of receiving crude under the Caracas Accord and having it refined in Trinidad and Tobago, it was reiterated that individual beneficiary countries under the Accord would have to make this request of the Venezuelan authorities. The delegate of Cuba noted that it would have to be a country-specific decision based on current needs and available facilities.
- The Cuban delegation reiterated its offer to share its experience in the area of energy efficiency with other countries.

At the end of the meeting, the delegate of Haiti made the meeting aware of his country's intention to discuss the issue of the natural gas pipeline with the authorities of the Dominican Republic, as well as to request assistance from Cuba in the area of petroleum exploration.

CENTRAL AMERICAN ENERGY MINISTERS MEETING REITERATES NEED TO HAVE AN INTEGRATED VISION OF ENERGY DEVELOPMENT

On occasion of the XXXII Meeting of Ministers of OLADE, the Energy Ministers and Heads of Delegation of Central America met in Quito, Ecuador on October 18, 2001.

OLADE's Permanent Secretariat presented to the Meeting for its consideration the document "Incorporation of Natural Gas into the Electric Power Interconnection in Central America" aimed at supporting the development of the SIEPAC Project.

The Meeting highlighted the need for the subregion to have an integrated vision of energy development and stated that OLADE is a suitable forum for subregional debates, which should serve as a framework to ensure the continuity of the integration process.

In addition, they mentioned that the project for the Electric Power Interconnection System for Central America (SIEPAC) needs to be integrated into the region's energy policy. For this purpose, they considered that it is indispensable to promote meetings of Energy Ministers to coordinate actions that require a joint energy vision.

On the basis of the above, it was agreed that OLADE would draft a proposal of guidelines to elaborate a subregional energy policy and a study on the optimization of the regional energy matrix, as well as submit a project profile aimed at promoting and raising awareness about the efficient use of energy.

It was also decided to hold the first Central American Isthmus Energy Ministers Meeting in the city of Tegucigalpa, Honduras, in order to be apprised of the document drafted by OLADE as specified in the preceding paragraph and other matters of common interest that could contribute to subregional energy integration.

This first meeting was held on December 11, 2001 and adopted the following declaration:

DECLARATION OF TEGUCIGALPA

The Energy Ministers of Central America, meeting in Tegucigalpa, Honduras on December 11, 2001, on occasion of the first Central American Isthmus Energy Ministers Meeting, hereby declare the countries' political will to integrate their energy resources and services in one single Central American system, similar to what has been under way for the electric power subsector.

Since the topics submitted by OLADE regarding the characterization and optimization of the Central American energy matrix and the proposal of guidelines for an energy policy of this subregion contain the necessary elements to set up an integrated system of energy resources and services.

DECIDE:

1. To set up the Central American Energy Ministers Meeting on a permanent basis.
2. To start elaborating a preliminary bill for a Framework Treaty for a Subregional Energy Policy, in conformity with the constitutional norms of each country.
3. To provide a follow-up of the "Proposal of Energy Policy Guidelines and Energy Matrix Optimization Study of Central America" and "Raising Awareness about the Importance of the Efficient Use of Energy" submitted by OLADE at this Meeting.
4. To instruct OLADE to prepare the terms of reference to take the necessary steps to obtain funding to facilitate the implementation of energy integration studies and activities.
5. To join efforts, among the Central American Governments and OLADE, to negotiate funding.
6. To accept Nicaragua's offer to hold the second Central American Energy Ministers Meeting in Managua in June 2002.

ENERGY MINISTERS OF ANDEAN COUNTRIES PROMOTE INTEGRATION

On occasion of the XXXII Meeting of Ministers of OLADE, the Energy Ministers and Heads of Delegation of Bolivia, Colombia, Ecuador, Peru, and Venezuela met in Quito, Ecuador on October 19, 2001, at the invitation of OLADE's Permanent Secretariat and the Secretariat General of the Andean Community of Nations (CAN).

OLADE's Executive Secretary, Dr. Julio Herrera, welcomed the Ministers and Delegates and talked about the need to give impetus to subregional integration, as the MERCOSUR, Central American, and Caribbean countries have been doing.

The Secretary General of the Andean Community of Nations (CAN), Ambassador Sebastián Alegrett, highlighted the advisability of setting up a Council of Energy and Mines Ministers for the Andean Subregion, as there are for other sectors, or of being inserted in the framework of OLADE. He also indicated the need for cooperation between the subregion's international organizations, so that they can join forces for the purpose of contributing to consolidating each other and complementing their skills. Likewise, he offered the institutional and legal framework of the Andean Community to examine the inter-relations involved in subregional, regional, and hemispheric integration.

The Minister of Energy and Mines of Peru, Mr. Jaime Quijandría, indicated that he agreed on the coordination of activities between CAN and OLADE in terms of integration and interconnection to avoid-duplicating efforts or resources and to take advantage of the progress already made, especially by the CIER and OLADE. In future meetings, concrete projects and funding possibilities by different multilateral organizations have to be evaluated.

The Minister of Mines and Energy of Colombia, Dr. Ramiro Valencia-Cossio, specified the fundamental role of OLADE in energy integration for the Andean countries and specified two practical aspects on which attention has to be focused: a) identification of the processes being lived by each country to determine their current situation in order to benefit from the experience of the countries that have already been through this process; and b) identification of projects that can link them together, with OLADE participating in each project either directly or via third parties.

In turn, the Minister of Energy and Mines of Ecuador, Mr. Pablo Terán, indicated that he agreed with what his Colombian and Peruvian colleagues stated and that a successful future is expected on the basis of the large capacities of the subregion's countries. He added that the decision to interconnect power systems will lead to lower emissions, which the developed countries will have to recognize economically as the subregion's contribution to a better environment.

The representative from Venezuela, Dr. Andrea Jiménez, stated that she agreed with what was said by the representatives of CAN and OLADE regarding the use of instruments and skills, as well as the existing forums already provided by the above-mentioned organizations, in order to achieve energy development with greater efficiency.

The representative from Bolivia, Ambassador Fernando Vargas, said that it was necessary to take advantage of our capacities and orient our efforts for the benefit of regional integration.

The Coordinator of CAN, Mr. Hernando Arciniegas, provided a wide-ranging explanation of the various instruments used by CAN as a supraregional international organization, emphasizing that the norms that are issued are mandatory for the member countries, which could facilitate progress in integrating the subregion's energy market.

The Ministers and delegates who were meeting agreed on the following:

1. To instruct OLADE to identify the processes being lived by each Andean country to determine their current situation, in order to benefit from the contribution and experience of the countries that have already been through these processes.

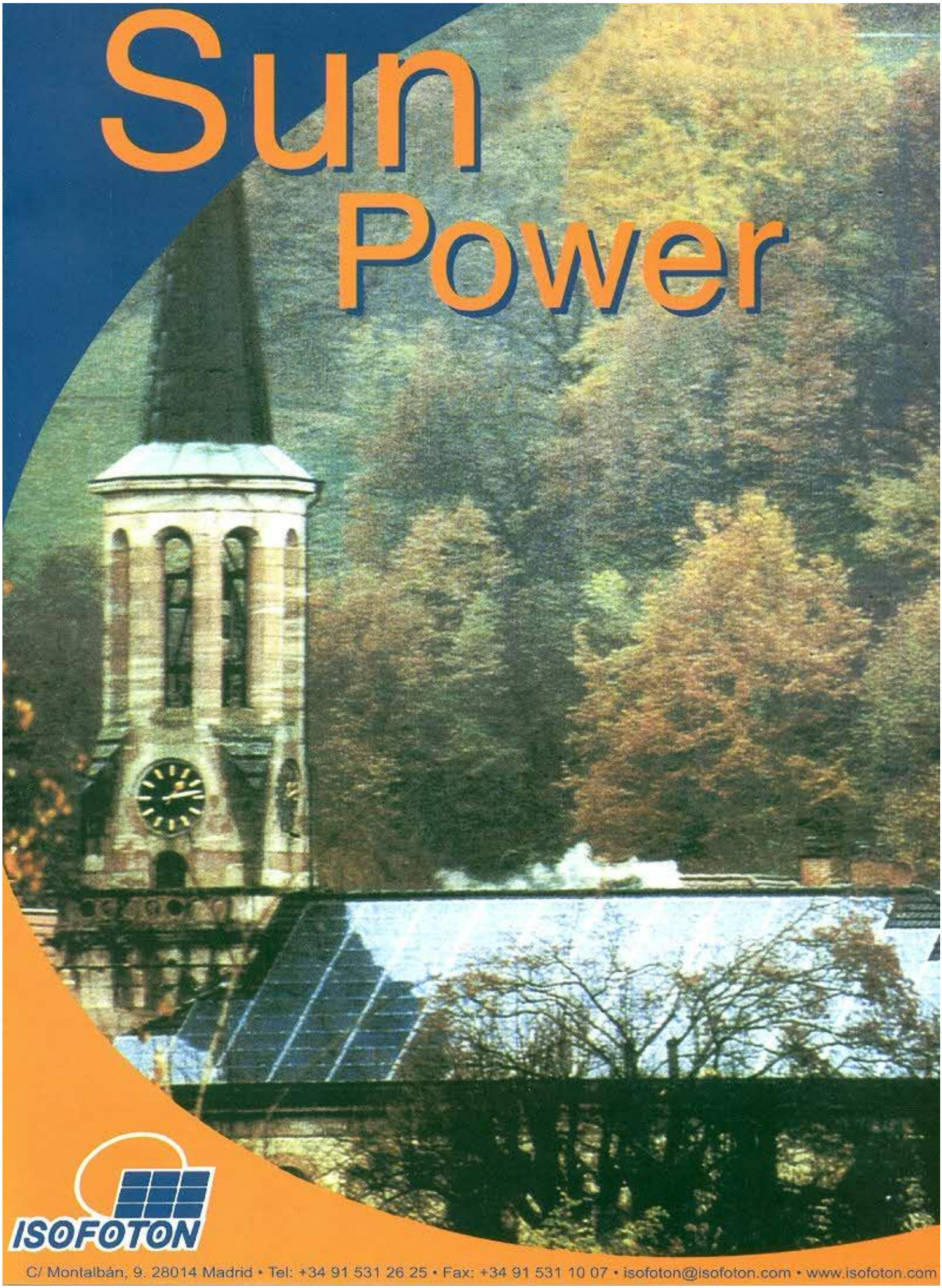
2. To instruct OLADE to identify projects that can link the Andean countries together, with OLADE participating in each one of them either directly or through third parties.

3. To instruct OLADE to evaluate the impacts of U.S. President George W. Bush's Energy Plan on the subregion.

4. To support the coordination of the activities of OLADE and CAN in order to avoid the duplication of efforts and to consolidate integration and interconnections between the Andean countries and third countries.

5. To use OLADE's institutional, political, and technical mechanisms to further energy sector coordination and development in the Andean subregion.

At the end of the meeting, OLADE's Executive Secretary invited the participating Ministers and Delegates to witness the signing of the CAN-OLADE Cooperation Agreement.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Address delivered by the President of Bolivia, Jorge Quiroga-Ramírez, to the General Assembly of the United Nations

I have come from the city of La Paz to add Bolivia's voice to the universal support that has been given to the United Nations for the Nobel Peace Prize it has been awarded.

This prize expresses better than any speech the world's recognition for the Organization and its Secretary General, Kofi Annan.

The UN's role as mediator, its call for orchestration, its courage to take up risks and its willingness to give up lives for a cause go far beyond strict compliance with its mandate and are an example for all our governments.

The Organization's active role has never been more necessary.

At a time when the menacing and evil shadow of terror has reared its head at the dawn of a new century.

The Berlin Wall was a symbol for the ideological divisions prevailing in the second half of the 21st century.

Since September 11, it is the wall of terrorism and intolerance erected by a handful of people who would like to divide world that has to be dismantled.

On one side of this new wall, there are those of us who are building, and believe in, democracy with pluralism.

On the other side, there are those who strive to impose their beliefs despotically in contempt of the rule of law.

On one side of this new wall, there are those of us who permit and foster the freedom of religion and expression.

On the other side, there are those who do not practice this freedom nor do they permit or tolerate it.

On one side of this wall, there are those of us who every day are making efforts to generate equality of opportunities for all women.

On the other side, there are those who are oppressing women and ruling over them tyrannically.

On one side of the wall, there are those of us who value freedom above all else.

On the other side, there are the terrorists who want to destroy and amputate it.

There is no doubt that Bolivia is always on the side of democracy, freedom and tolerance.

We want a life of peace and harmony.

Because of this, my administration has not hesitated to express, at all forums and with our full conviction, our total support for the actions undertaken by

the coalition led by the U.S. Government, after the attacks that killed thousands of innocent persons, the majority of them in this very city.

Terrorism, to a large extent, is sown and nurtured in the underground world of the drug trade.

"For these three reasons, we feel confident in requesting access to free trade markets, markets that are free in three ways: custom-free, subsidy-free, and free of parallel customs duties."

We should not allow terrorism to be disguised as a political statement, so that it can attack freedom.

We cannot allow drug trade to hide its true face under legitimate social demands so that it can undermine our democracies.

It is clear that terrorism and drug trade are Siamese twins and the twin enemies of open democracies. That is why we have to combat each one vigorously and with determination.

Bolivia, despite all of its limitations, is doing its part to combat the drug trade.

By the will of the majority of all Bolivians, as expressed through the National Dialogue, guided by our own interests, encouraged by our own public opinion, we are making irreversible progress in eradicating illegal coca crops aimed at elaborating cocaine, and we are reaching the final phase of our Plan for Dignity, whose objective is to remove Bolivia from the drug circuit.

But our work has not yet ended. International solidarity and support have never been more important.

To conclude its task, Bolivia needs two levels of support.

First, the international community has to be aware that steady support for alternative development programs is far more imperative for those countries that have eliminated a great deal of illegal coca and cocaine and where many people have been displaced.

Bolivia has reduced more than 90% of its coca leaf production.

However obvious it may appear to be, this linkage has to be repeated over and over again because many international bureaucracies allocate resources on the basis of the size of the problem, which is mistakenly defined as the volume of coca/cocaine production, when the real economic problem comes from the size of the reduction that has been achieved and the proportional decline of income generated by this activity.

Bolivia deserves and needs more support than ever, because it has made greater progress than ever.

Second, of even greater importance now, is the access to markets. The opportunity to fight for a place in the sun. The right to work, produce and sell.

And here, in this matter, the decision of the United States of America and the European Union to open up their markets for products coming from alternative development efforts is of crucial and definitive importance.

Bolivia is the nation with the lowest level of development in South America, the region's most open economy, and the only country that has been able to dramatically reduce a poisonous and damaging product such as cocaine over so short a period of time.

For these three reasons, we feel confident in requesting access to free trade markets, markets that are free in three ways: custom-free, subsidy-free, and free of parallel customs duties.

Free trade, that is, the triple-free trade, which is currently governing sectors such as telecommunications, banking, computers, or turbines, also has to be applied to agriculture, textiles, and leather. Unfortunately, these three sectors, which are labor-intensive, are controlled by 19th century rules in the third millennium.

In Bolivia, we are implementing decentralized and participatory health and education programs, but an educated and vaccinated citizen who has no access to markets is not a full citizen of the current world.

In Bolivia, we have put our economy in order and opened it up, but we have not seen full reciprocity in the developed world or among our neighbors.

In Bolivia, we have almost completed eliminated cocaine production. However pernicious cocaine may have been, it was an export product that did not have to bother with subsidies, trade barriers or customs duties.

Because of this we need to gain access to markets, to guarantee the completion of the Plan for Dignity and to prevent it from thwarting the will of the citizens, who are taking up the challenge of changing illegal activities for legitimate ones, but without access to markets.

Mr. President, at the threshold of the 21st century, in the midst of a severe economic and political crisis, which is affecting all the region's countries, Bolivia has to face another challenge, one which can decisively change our future.

As soon as South America's largest gas pipeline project was commissioned, Bolivia's natural gas reserves grew exponentially in a matter of a few years and my country acquired a high rank on the hemisphere's market.

Today we are meeting a growing share of Brazil's energy demand, and we are firmly intent on soon reaching the Pacific markets of Mexico and the United States.

The tragic events of September 11 mean that energy and gas integration have to be built on the basis of a long-term vision that takes into account three elements: large underground gas reserves, a reliable economy, and a sound democracy on the land's surface.

Bolivia already has these three elements:

The projects that are now being studied and negotiated will be transforming my country's production structure, multiplying growth rates, consolidating our role as an environmentally clean crossroads and heart of the continent, and will increase our power of attraction and presence in the Pacific Rim.

Thus, Bolivia will be taking yet another step in the march undertaken more than 120 years ago to return to the sea of our ancestors.

In this way Bolivia will be reasserting its ineluctable will to recover its maritime status with which it was born as an independent nation.

Mr. President, Bolivia supports the fight against terrorism and for freedom.

Bolivia, as no other country, is making giant efforts to fight against the allies of terrorism, namely, the drug trade. For this effort, for this dedication to openness, and for its need to combat poverty, my country asks for market access.

Bolivia will be playing a central role in reliable gas and energy integration in the 21st century.

Mr. President, we are aware that the long campaign for freedom and against terrorism is starting and will only end when all citizens of the world, men and women, enjoy the freedom to vote and elect, to express their opinions and profess their faith, to move about freely and, above all, to live free of the fear of terror.

And the United Nations should be the world's meeting place to travel this shared road.

And to build together the road to integration and peace.

As required by the times we are living.

New York, November 10, 2001

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Prospects for Natural Gas in South America

Pierre Thouin*

Figure 1

South America will be needing a large amount of energy for its economic development. Natural gas will become the fuel of choice for the next 40 years in this region. In a sustainable development context, natural gas is the best fossil fuel to stem the emission of pollutants in the air.

Reserves are not generally located near large consumption markets. As a result of the development of natural gas reserves, there will be major trade between the countries. Natural gas trade is already widespread in MERCOSUR and will extend to all countries of the region. The map of Figure 1 shows the principal known natural gas fields, the major gas pipelines being operated, and future

"...natural gas is the best fossil fuel to stem the emission of pollutants in the air"

gas interconnection projects in South America.

Canada and the United States only have 12 years of proven natural gas reserves; South America is in a much better position since its proven reserves are on the order of 288,000 billion cubic feet (BCF) and current consumption is on the order of 5,000 BCF per year, which means that proven reserves will last for more than 50 years. But these figures do not represent reality, because natural gas consumption will be rising significantly in coming years, mainly because of electric power generation. Furthermore, it makes no sense to use proven reserves either, because there is no doubt that new discoveries will be made. In the present article, we will be analyzing natural gas flows in South America on the basis of consumption forecasting and future discoveries.

The following table shows us the amounts of proven reserves and available reserves of natural gas in South America. Available reserves are calculated on the basis of the following formula: 100%*proven + 66%*probable + 33%*possible, which does brings us closer to reality.

We can observe that Brazil has a high development potential for the future, although Venezuela remains by far the main supplier of natural gas resources in South America.

This analysis of natural gas flows is based on an average price for one barrel of oil amounting to US$25 for the next 20 years, as estimated by the majority of experts. It is evident that a higher price will enable producers to increase exploration efforts, which will exert a direct impact on reserves and will permit the development of less profitable fields. A price that is too high, however, will lead to a drop in natural gas consumption.

Reserves (BCF)	Proven	Available
Argentina	26,180	49,362
Brazil	7,980	47,421
Bolivia	21,000	41,979
Chile	3,500	6,997
Colombia	8,400	15,358
Ecuador	1,443	2,877
Paraguay	0	0
Peru	9,500	33,521
Uruguay	0	0
Venezuela	147,000	216,930
Total	288,353	565,206

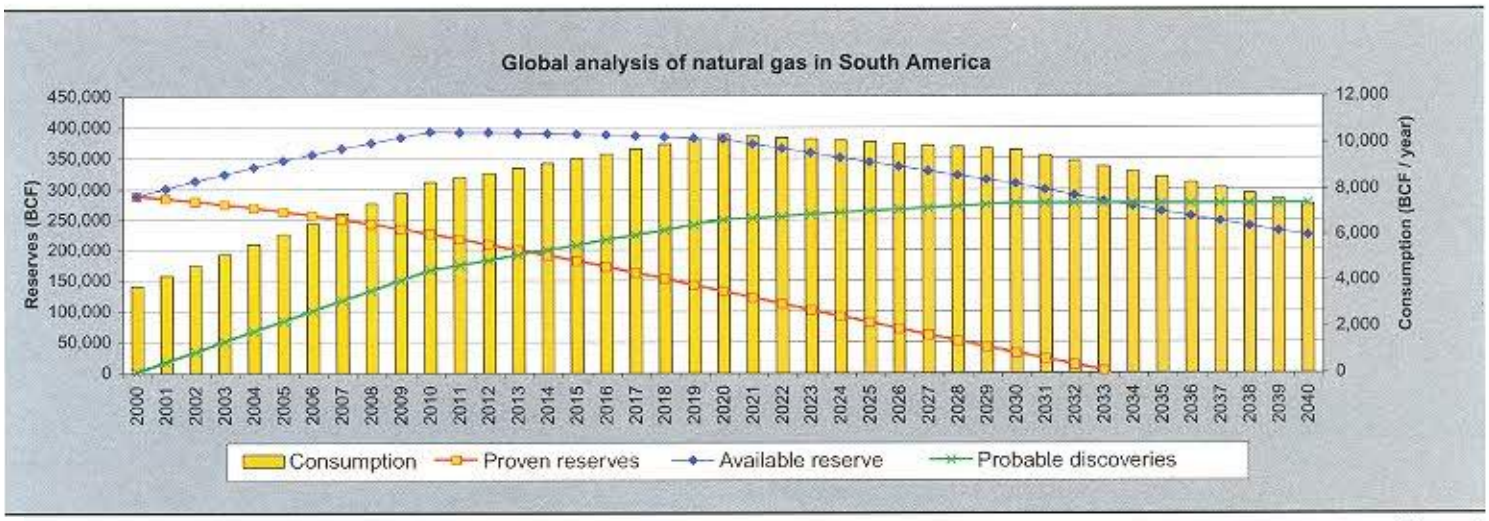


Figure 2

In a market economy, it is extremely difficult to predict short-term price fluctuations of natural gas and impacts on their flow. A good example is provided by the steep rise of natural gas prices in the United States last year, to a record price of US$8 per million BTU, which was not expected, although its subsequent rapid decline down to the current trading price of US$2 per million BTU was even more unexpected. It is sometimes easier to make very long-term forecasts, because energy is a basic need that has a relatively logical growth over the long term.

If a more realistic analysis of the situation in South America is conducted, using available forecasting for natural gas consumption and reserves, we will obtain the results indicated in Figure 2. This figure represents a probable consumption model based on proven reserves and probable discoveries.

When considering the growth of consumption, which will be very high in the coming decade, proven reserves (in red) decline rapidly. Probable cumulative discoveries (in green) will enable available reserves to rise. The probable discoveries will tend to stabilize around the year 2030, because the most profitable fields will have already been exploited or will be producing. Therefore, it will be increasingly costly to produce new natural gas fields to compete with other forms of energy.

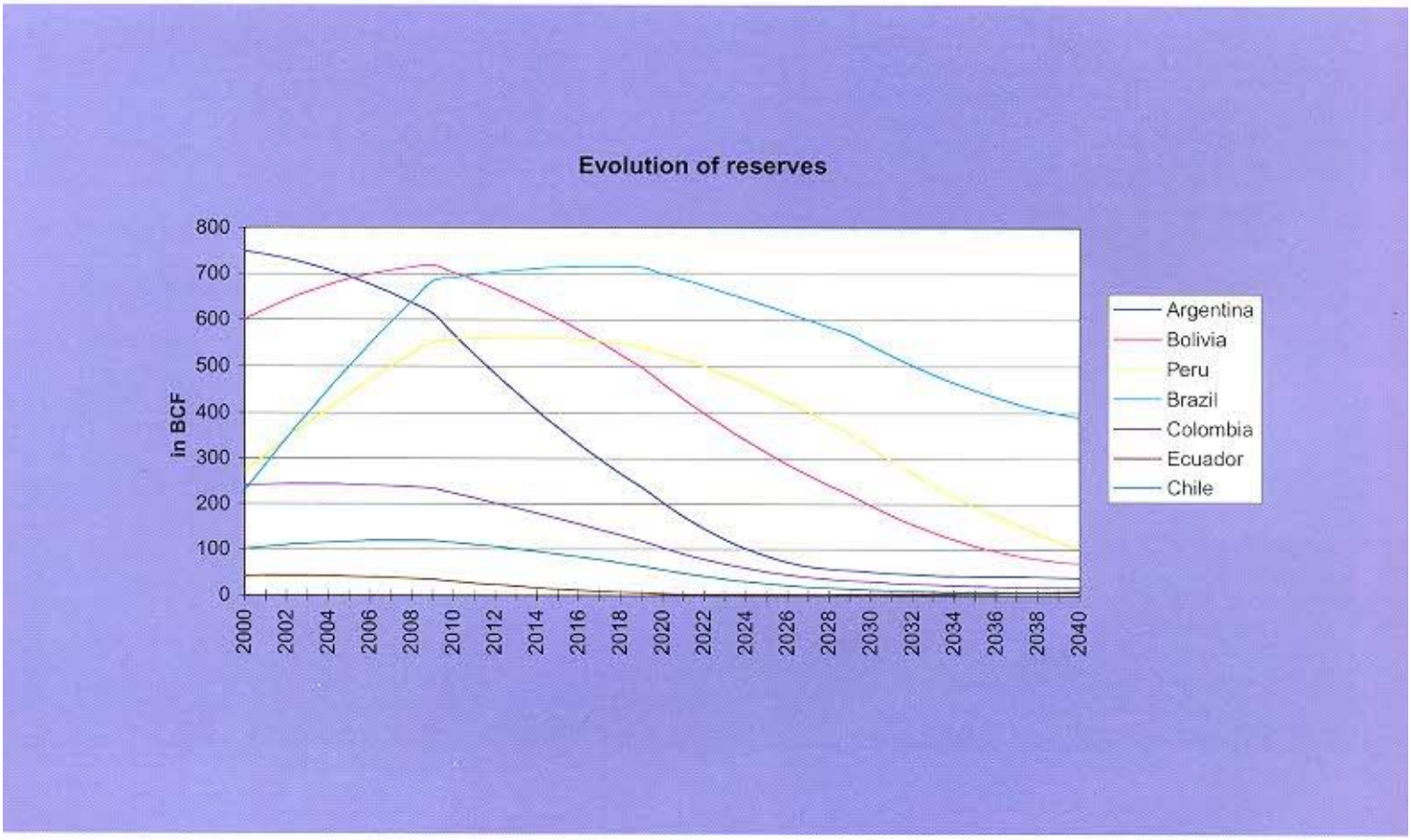
If annual consumption forecasts remain unchanged as expected by various administrations, it is very likely that the annual average of new discoveries will not end up by being any higher than annual consumption. Therefore, between 2010 and 2020, growth of available gas reserves will be constrained by high consumption.

Around 2020, available reserves will begin to decline and various countries will have heavily mortgaged their natural gas reserves, except for Venezuela. Indeed, by then the natural gas reserves of Argentina, Colombia, Ecuador and Chile will be declining.

The cost of developing new deposits in countries characterized by declining reserves could be higher than those of their competitors in Bolivia, Peru and Venezuela. The fact of receiving supplies from other countries and paying higher prices for natural gas because of extra transport costs (assuming these costs are lower than those of developing new deposits) would force certain South American markets to think of new energy sources. Because of this we are predicting market stabilization during the decade of 2020 and a downward trend for natural gas consumption after 2030, because by then a large part of the thermoelectric stations will have reached the end of their useful life.

The following tables and figures provide a potential scenario of the evolution of natural gas trade in South America for each producing country. We have taken into account the geographical location of producers and consumers, future interconnection projects, market forces and available reserves, in order to determine the potential trade of natural gas.

"...Around 2020, available reserves will begin to decline and various countries will have heavily mortgaged their natural gas reserves"



2000	BCF
Argentina to Brazil	35
Argentina to Uruguay	53
Argentina to Chile	273
Bolivia to Brazil	105

The figure to the right shows the current situation, in which Argentina is a pioneer for natural gas trade in MERCOSUR.

In 2030, Bolivia and Peru will be suppliers on the decline and Venezuela will begin to impose itself as a major supplier in South America.

2030	BCF
Bolivia to Argentina	350
Bolivia to Uruguay	86
Bolivia to Chile	105
Bolivia to Brazil	105
Bolivia to Paraguay	49
Peru to Argentina	175
Peru to Chile	140
Peru to Ecuador	238
Venezuela to Panama	109
Venezuela to Brazil	300
Venezuela to Argentina	984
Venezuela to Colombia	350
Venezuela to Caribbean	109

2040	BCF
Bolivia to Argentina	0
Bolivia to Chile	0
Peru to Argentina	0
Peru to Chile	0
Peru to Ecuador	194
Venezuela to Panama	109
Venezuela to Brazil	280
Venezuela to Argentina	473
Venezuela to Colombia	350
Venezuela to Paraguay	18
Venezuela to Uruguay	32
Venezuela to Caribbean	109

In 2040, Venezuela will be the indisputable leader of natural gas production in the region. The majority of the countries will continue to produce natural gas basically for their own domestic markets. Only Peru will be able to continue exporting to Ecuador because this market will be too small to justify a connection with Venezuela.

Argentina will always be an exporter, but Bolivia's large reserves and, above all, its strategic geographical location will convert it into the main natural gas exporter in South America around 2010. It is also highly probable that, in the decade of 2010 and afterwards, the Caribbean gas pipeline will come on stream from Venezuela in order to supply the United States, which will be requiring a segment going toward the southeast, in addition to their supply from Alaska and Canada, to consolidate and diversify their supply sources.

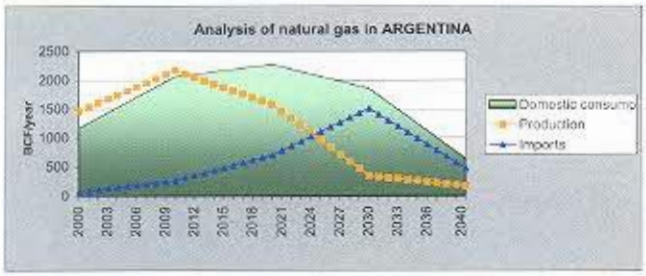
2010	BCF
Argentina to Brazil	105
Argentina to Uruguay	71
Argentina to Chile	140
Argentina to Paraguay	49
Colombia to Panama	74
Bolivia to Brazil	525
Venezuela to Caribbean	67

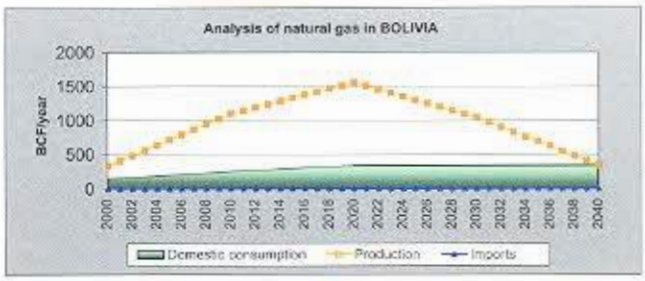
If Argentina's natural gas reserves decline, the Argentineans will keep their production to meet their own domestic needs and will probably stop exporting natural gas. They will have to import from Bolivia to meet their demand. Bolivia will continue to prevail as the main exporter of natural gas in South America. Venezuela, because of its large reserves and extremely low production costs, will be able to make a major thrust in Brazil. Natural gas from Peru will also find its first opportunities for export to Chile after Argentina withdraws its gas from the export market. In addition, on the basis of our studies, up until 2020, Ecuador will be able to use its own natural gas, but afterwards Peru will be in a better position than Colombia to supply this market.

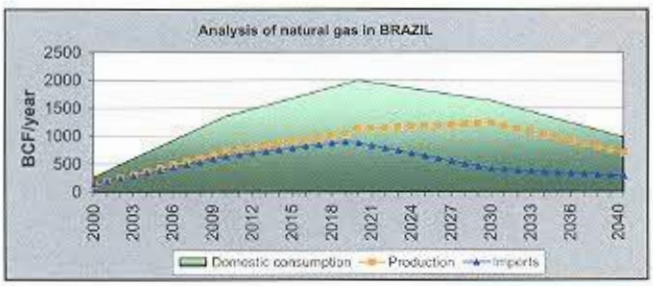
2020	BCF
Bolivia to Argentina	700
Bolivia to Uruguay	105
Bolivia to Chile	175
Bolivia to Brazil	175
Bolivia to Paraguay	60
Colombia to Panama	109
Peru to Argentina	0
Peru to Chile	105
Peru to Ecuador	154
Venezuela to Brazil	700
Venezuela to Caribbean	89

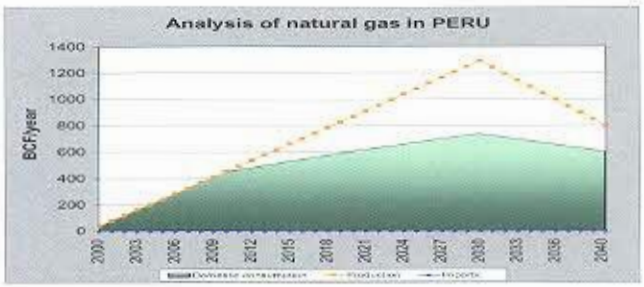
Finally, we are presenting the evolution of natural gas production on the basis of domestic consumption and imports, in order to give you a better idea of the evolution of the situation of each producing country.

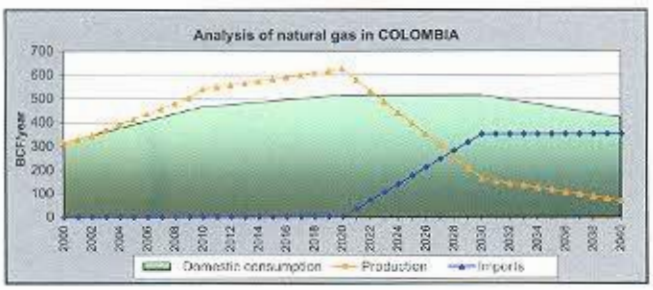
The area between the production line and the domestic consumption area in the charts represents the exports.

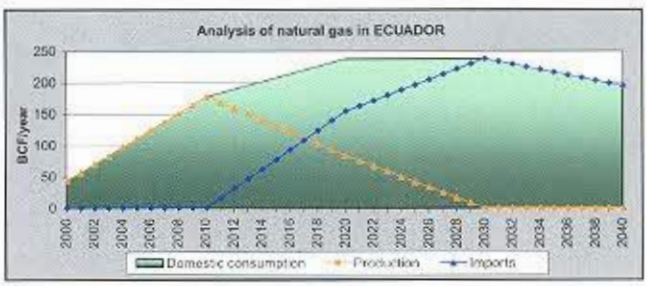


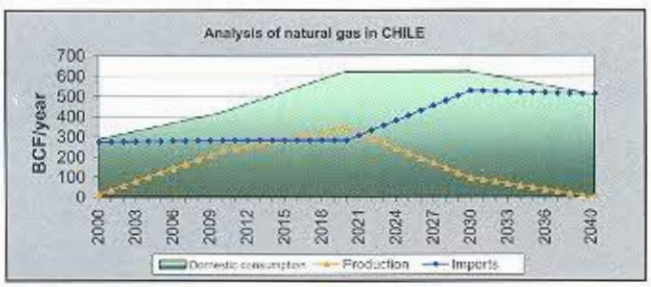


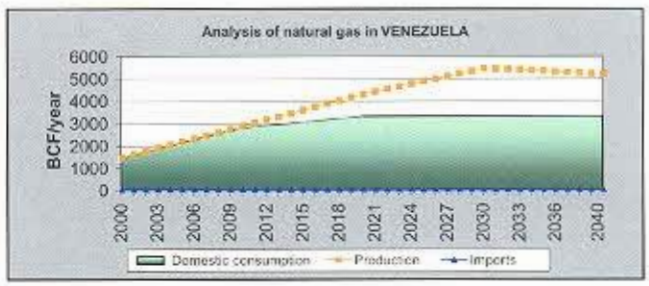












Conclusion

Over the next 20 years, natural gas will be the energy pivot of South America. In fact, for promoters thermoelectric stations are the choice option for electric power generation, mainly because of the short lead times and lower installation costs involved. Nevertheless, natural gas reserves, which are limited for certain countries, will force the countries to reappraise their strategic orientation for energy development. After 2020, it would not be surprising to see a forceful return of hydropower and wind energy in MERCOSUR, providing sound competition to oil and gas in terms of production costs and especially in terms of environmental impacts.

Acknowledgement

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* **Author:**

- Pierre Thouin has more than 27 years of experience in project management and as energy consultant, especially for the natural gas sector in Canada. He has a master's degree in project management and a wide range of experience in project planning, assessment and building, feasibility studies, and business development. Of the 20 years he has worked as an international consultant, the last 5 years have been as the expert in charge of analyzing natural gas investments for Hydro Quebec International and private investors. This work has enabled Mr. Thouin to conduct evaluations on strategic planning and emerging technologies, markets, regulatory aspects, and profitability of energy projects, especially in South America. This article was the basis for the presentation made by Mr. Thouin at the International Seminar to Start Up the Activities of OLADE's Forums, held in Quito, Ecuador on September 9-11, 2001.

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To Regulate or Deregulate: the U.S. Electricity Experience

William Massey*

Introduction

Energy market reform is an important effort around the globe, and its success or failure could well have global impacts. So policy makers must give serious and reasoned consideration to this effort.

I do not think the issue is that starkly delineated, whether to regulate or deregulate. I think of the transition to market solutions for energy in terms of "liberalization" of regulatory oversight, not deregulation. Recent events in electricity markets in the United States, especially in California, have demonstrated that regulators still have a significant role to play in the transition to markets as a way to discipline price and provide good service. Regulators cannot simply walk away and expect markets to perform well.

The Federal Energy Regulatory Commission (FERC) has jurisdiction over the rates, terms, and conditions of transmission service and wholesale sales of electricity in the Unites States. The recent California experience has brought home three important lessons for regulators. First, we need to be more insistent on good market design. Second, regional grid operation and planning in the hands of independent Regional Transmission Organizations is essential to good market operation. And, third, the regulators must have sharp regulatory intervention tools and use them quickly and decisively when markets are dysfunctional.

Before analyzing these three lessons, a little background on the FERC and the policy evolution toward market solutions for electricity have to be provided.

U.S. Regulatory Structure

The Federal Energy Regulatory Commission (FERC) is an independent regulatory agency of the U.S. government. Five Commissioners set policy and resolve disputes by majority vote.

For the natural gas industry, FERC regulates rates, terms and conditions of service for about 120 interstate natural gas pipelines. It also approves the siting and construction of pipeline facilities, including the environmental review. The gas commodity market is highly competitive and is not now regulated as to price.

For the electric industry, FERC has jurisdiction over wholesale bulk power sales by almost 1,000 sellers and over the high-voltage transmission wires of 174 utilities. However, unlike natural gas pipelines, FERC does not have the authority to approve the construction of electric transmission lines. This is a state matter. It also licenses over 1,700 hydroelectric facilities and regulates a number of oil pipelines.

In the United States, regulatory jurisdiction is split between the federal and state governments, and that makes it difficult–but not impossible–to develop a coherent and consistent regulatory policy. The FERC has jurisdiction over wholesale transactions and interstate transportation. Each of the 50 states has a regulatory commission with jurisdiction over local distribution and end-use transactions. Those transactions are not subject to FERC authority.

Electricity Policy Evolution

The road to restructuring electricity markets in the United States has been a bumpy one. Part of the difficulty is the very unique attributes of electricity and the complexities that they pose for restructuring. And part of the difficulty is due to the split in regulatory jurisdiction between the FERC and the states, the splintered control of the high-voltage transmission grid, poorly designed grid management, and questionable market structure rules. As a result, the design of most U.S. electric markets is not ideal. The FERC is working to correct these problems and remains committed to a market-based approach.

The commitment to markets varies by jurisdiction. The FERC is committed to furthering competitive wholesale markets, which are essential for retail competition to work. About half of the 50 states have either started retail choice or are committed to it.

What motivated the move to electricity competition in the United States? There are two reasons. One was perceived poor performance by regulated utilities in the 1980s. The economic events of the late 1970s and 1980s left many utilities with excess high-priced generation capacity. The costs of this capacity were rolled into consumer rates. The second reason for moving to competition was the same factor that has driven many formerly monopoly industries to competition: technological change. Scale economies in generation dramatically declined during the 1980s, and the new smaller plants could be brought on line for about half the cost of many of the existing plants. In addition, improvements in transmission technology allowed power to be moved over greater distances at higher voltages. These two factors meant that the generation sector was no longer a natural monopoly: customers could reach out to competing generators for service. The larger industrial customers in particular brought political pressure on the state governments to allow customers to shop for cheap power.

The FERC adopted two policies in the 1990s to promote competition in wholesale markets. It allowed "market-based pricing" for generation sales. Freed from the confines of cost of service regulation, generation developers could keep the trade gains that superior performance allows. And in 1996, the FERC also required transmission owners to provide non-discriminatory access to the grid. The principal problem it was trying to remedy was that most of the industry was vertically integrated. Thus, the owners of the transmission grid had every incentive to prevent competing generators from using the grid to take away their sales.

"...Scale economies in generation dramatically declined during the 1980s, and the new smaller plants could be brought on line for about half the cost of many of the existing plants"

So, in Order No. 888, adopted in 1996, all transmission owners were required to do the following. First, file a standard open-access transmission tariff. Second, provide transmission service separately from generation services, and require the utility's own generation sales to take service under the open access tariff just like all other grid users. This is known as "unbundling". And third, post all relevant transmission system information such as capacity available for service, and conduct all service requests, on an Internet-based electronic bulletin board that is available to everyone.

The thrust of our policy has been to lighten regulation of the supply, or commodity, sector of the industry but to tighten regulation of the wires sector to ensure open and efficient transportation services. Our open access policies provided the catalyst for sweeping changes in the U.S. electricity industry.

- Users of the grid have multiplied exponentially as new generators and electric marketers such as Enron have entered the market.

- Non-utility generation owned by companies such as Calpine, Dynergy and Duke Energy has more than doubled in the last ten years, and has contributed over half of the new investments in generation. Virtually all of this will be fueled by natural gas.

- A number of states such as Pennsylvania and Massachusetts have moved to adopt retail choice programs.

- A number of utilities are divesting generation in their traditional service territories, primarily because of state restructuring programs. This is significant, although the bulk of the industry remains vertically integrated.

- Utility merger activity in the United States has dramatically increased, driven in large part by the restructuring of the natural gas and electric industries. Utilities are obviously attempting to bulk up, to purchase competitive assets, in an effort to meet the demands of competition. Foreign companies are purchasing U.S. utilities, and natural gas pipelines are merging with electric utilities.

- Regionalization of the power grid has occurred in some areas of the country. In California and the northeastern part of the United States, Independent System Operators (ISOs) are now charged with operating the regional grid in a nondiscriminatory manner.

- Wholesale markets in many regions have produced reasonable prices and appear to be well structured. PJM is a good example.

The current state of market reform in the United States can be summarized as a work in progress. We are still learning.

Market design lessons

One of the things that we have learned is that regulators must insist on a good market structure if we are to have reasonable prices. A well-functioning wholesale market is also needed for a well-functioning retail market. Over the last year in the United States, we have become painfully aware of what works and what does not in terms of market structure and design. The market meltdown in California has provided many of these lessons. Some of those important elements of good market design are discussed below.

A. Appropriate hedging

The California electricity market was defined by a state policy that promoted an over-reliance on the volatile spot market. California state policy required suppliers to sell, and purchasers to buy, on the hourly markets. Yet, spot markets are almost by nature volatile. Imagine the chaos and high prices if the market for airline tickets was limited to purchasing your ticket at the gate as you board the plane. Substantial reliance on purchasing in advance, relying on long-term contracts, and using other hedging

instruments such as futures and forward contracts are key to good market structure. Regulators must insist that this market design element is in place. Purchasers must have the opportunity to assemble a balanced portfolio of supply instruments.

B. Assurance of adequate generating capacity

Another element of good market structure is an ex ante assurance of adequate generating capacity, including a reserve margin requirement. The California market design did not call for any capacity obligations. Presumably, it was expected that the invisible hand of the market would ensure that capacity would show up when needed. Yet, given that electricity cannot be stored, relying solely on market signals for capacity could mean significant fluctuations of price and capacity availability as supply and demand adjust. The fundamental role that electricity plays in the social, economic, health and public safety of society, however, argues that substantial fluctuations in availability and price should be minimized. One way of guarding against these fluctuations is to place an ex ante reserve requirement on the load-serving entities that they could meet however they see fit. This is the current practice in the Pennsylvania-New Jersey-Maryland Interconnection ISO market, PJM, and given the abundance of generation capacity additions planned there, suppliers seem to have confidence in that market design.

"...Instilling demand responsiveness into electricity markets requires two conditions: first, significant numbers of customers must be able to see prices before they consume, and second, they must have reasonable means to adjust consumption in response to those prices"

In the United States, each of the 50 states is responsible for the environmental siting approval of new generation. States must site necessary new generation in a timely manner, so that supply and demand stay in reasonable equilibrium.

C. Uniform interconnection standards

Market players must be able to respond to price signals, and increasing supply is a critical response that must be made as easy as possible. For that, uniform standards and processes across markets for connecting new generators to the grid are needed. New generators should make their location decisions based on market economics, not on which regions have the easiest interconnection process. In the United States, because of a patchwork of interconnection processes and standards, generators wanting interconnection face unnecessary obstacles. This problem must be solved, and the process must be sharply streamlined.

D. Congestion management

Recent events have also driven home both the reliability and price signal value of a good market-based congestion management regime. While the Commission does not require a specific congestion management method, the locational marginal pricing, or LMP, model is very valuable. By recognizing the incremental cost of generating power at various points on the grid, LMP sends the correct price signals needed for optimal use of existing generation and transmission resources and also encourages efficient siting of future generation and transmission expansion. We have a real-world success story of LMP implementation in the PJM ISO. There have been very few complaints about the PJM markets, and there are many new generation projects queued up to participate in that market. The PJM congestion methodology works. The FERC should aggressively promote this methodology across the United States.

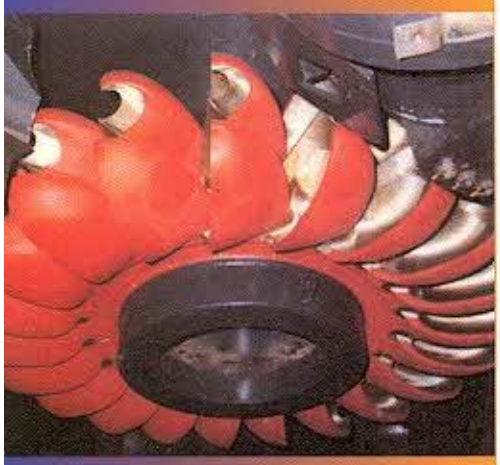
E. Demand responsiveness

So far, all of the market design elements that were mentioned have focused on the supply side of the market. But markets also need demand responsiveness to price. This is a standard means of moderating prices in well-functioning markets, but it is generally absent from electricity markets. When prices for other commodities get high, consumers can usually respond by buying less, thereby acting as a brake on price run-ups. If the price, say, for a head of cabbage spikes to $50, consumers simply do not purchase it. Without the ability of end-use electricity consumers to respond to price, there is virtually no limit on the price suppliers can fetch in shortage conditions. Consumers see the exorbitant bill only after the fact. This does not make for a well-functioning market.

Instilling demand responsiveness into electricity markets requires two conditions: first, significant numbers of customers must be able to see prices before they consume, and second, they

must have reasonable means to adjust consumption in response to those prices. Accomplishing both of these on a widespread scale will require technical innovation. A modest demand response, however, can make a significant difference in moderating price where the supply curve is steep.

And once there is a significant degree of demand responsiveness in a market, customers should be allowed to bid demand reductions, or so-called "negawatts," into organized markets along with the megawatts of the traditional suppliers. The principle here is that a one-MW reduction in demand is as valuable as a one-MW increase in supply, and should be compensated accordingly. This direct bidding would be the most efficient way to include the demand side in the market. But however it is accomplished, the important point is that market design simply cannot ignore the demand half of the market without suffering painful consequences, especially during shortage periods. There was virtually no demand responsiveness in the California market. Customers had no effective means to reduce demand when prices soared.



F. Ex ante price mitigation

California has shown us that electricity markets can be very volatile and prices can increase by orders of magnitude in the blink of an eye. There must be some mechanism in place to help prevent, or at least mitigate, such a price run-up especially those due to market power exercises. The most common type of mechanism in some U.S. markets is for bids to be mitigated to some pre-defined reference price if certain conditions exist. Those conditions can be structural, such as locational market power, or based on percentage increases in bids compared to a reference price, which is often based upon some average of past bids. But it is critical that some type of circuit breaker be in place before the fact. Such a device avoids almost completely unwieldy processes needed for after-the-fact price mitigation and refunds to customers, if necessary. I might point out that the Agency recently approved a mitigation device like this for the New York ISO market.

Grid management

There is one additional critical element needed for a well-functioning electricity market, and that is a reliable, efficiently managed transmission grid to which all players can gain access on a fair basis. The grid is the highway over which all electricity commerce must travel. Yet, in the United States, problems in the way the grid is organized and managed are presenting major impediments to good market performance. The U.S. industry remains mostly vertically integrated. The utilities that own the transmission grid also have their own merchant interests in generation facilities that they want to protect. As was mentioned earlier, those utilities have a conflict of interest in providing access to the grid, and there are constant allegations of market power and discriminatory conduct against those grid operators. A sharp separation of transmission from generation is necessary.

A second problem is the fractured nature of grid management. The operation and planning of the U.S. grid is splintered among well over a hundred operators. Yet, the grid is now being used to support broad regional markets and must accommodate an increase in the number and complexity of transactions. Reliability and efficiency suffer due to this fractured grid management, which also keeps wholesale power markets artificially small because traders must pay multiple transmission rates to move power over systems owned by separate corporations. These multiple rates make the

"The Commission must aggressively intervene when the markets are not producing reasonable prices. That is the law of the land in the United States"

power too expensive and deals become uneconomic.

The current grid management in the United States is not conducive to an adequate reliable supply of energy or to reasonable consumer prices. The FERC's strategy for addressing these grid inadequacies is Regional Transmission Organizations, or RTOs. The Commission's goal is to have a functioning RTO in every region of the United States by December 15 of this year.

An RTO is a grid manager for a large geographic region, operated independently of merchant generation interests, responsible for short-term reliability, regional planning and market monitoring. RTOs are absolutely essential for the smooth functioning of electricity markets. RTOs will eliminate the conflicting incentives vertically integrated firms now have in providing access. RTOs will streamline interconnection standards and help get new generation into the market. And RTOs will ensure access to regional power markets, improve transmission pricing, regional planning, and congestion management, and will produce consistent market rules across a region. Resources will trade into the market that is most favorable to them. Trade should be based on true economics, not the idiosyncrasies of differing market rules across the region.

One of the most critical RTO issues is scope and configuration. To realize their many potential benefits, RTOs must be truly regional in scope–large and well-shaped. Markets are regional in scope. This has been well demonstrated over the last year as prices over the entire 11 state Western Interconnection rose and fell with events in California.

Unfortunately, the voluntary RTO proposals made in the United States have been off the mark. While the proposal for RTO West is an excellent start, the remaining proposals are far too small in scope. Although these organizations promise to smooth the markets and operational seams between them in an effort to expand the markets, the fact remains that boundaries among RTOs are an unnecessary bump in the trading road. Thus, the larger the RTO the better.

In July, the Commission adopted as its goal four RTOs across the United States: one in the Northeast, one in the Southeast, one in the Midwest, and one in the West. This set of possible consolidated RTOs better represents trading realities than what has been proposed by the transmission owners. Better trading, and the improved means of planning and access, will greatly help the United States meet its current energy challenges successfully. But the FERC must take bold and decisive action soon if it is to realize the full RTO potential. We must insist upon well-designed RTOs.

There is one additional challenge to ensuring the grid facilities needed to support efficient and reliable electricity markets in the United States, and that is transferring the authority to site new transmission lines to the federal level. Siting authority is now splintered among many state and local authorities. An adequate transmission grid is essential to supporting the regional, interstate electricity markets, yet needed new facilities are often blocked or delayed due to parochial local interests. There are now proposals in the U.S. Congress to move transmission siting authority to the federal level. This change would make it much more likely that the transmission facilities necessary for large interstate power markets are actually built.

Regulatory intervention

Even with our best efforts to put in place well-structured electricity markets, there may be times when those markets fail to do their job. When markets fail, regulators must be aggressive in stepping in to ensure that market flaws are corrected and that consumers see reasonable prices. After all, the whole point of liberalization is to benefit electricity consumers.

The task of ensuring reasonable prices must be addressed far differently in liberalized markets than under the old regime. It is much harder now. The basic nature of our regulatory task is quickly moving from reviewing cost-based prices charged by individual

sellers to ensuring good performance by markets. Our focus is shifting, and our analytical tools must track this new responsibility. Our tools must also account for the unique complexities of electricity markets. Supply and demand must be balanced simultaneously, market conditions vary significantly over relatively short time intervals, and some aspects of supply can come only from generators with certain technical characteristics.

Market performance is heavily affected by these characteristics and must be measured using a sophisticated analysis. While we surely cannot expect electricity markets to attain the ideal of perfect competition, I believe that the concept of workable competition might prove useful to market analysis. Workable competition has been defined as competition that leads to a reasonable or socially acceptable performance in the circumstances of a particular industry. Thus, it is a pragmatic standard that takes into account the unique conditions of an industry. The kinds of things that might be appropriate to consider in deciding whether a market is workably competitive are indicated below.

First, one has to look at supplier concentration, but this must be defined accurately by considering energy prices, transmission capacity and transmission prices, all factors that con affect the scope of trade. We must also take account of the time dimension of supply and demand. By that, I mean analyzing horizontal slices of the supply curve at various load levels–such as peak, super peak, off peak and shoulder periods–to measure supplier concentration. Even more sophisticated approaches may be needed for assessing concentration in today's electricity markets.

While concentration is a very useful statistic, market power analysis should not be limited merely to supplier concentration issues. We should also determine if market rules create any perverse incentives or obstacles to competitive and efficient behavior by market participants. It has to be seen if the rules in the market promote the elements of a well-functioning market.

Computer simulation modeling is becoming essential to determining if markets are workably competitive. Such models can take into account the interaction of market structure, market rules and other markets conditions such as demand responsiveness, to estimate supplier and customer behavior and the result on consumer prices.

In addition to sophisticated market analyses, regulators need to develop clear standards of acceptable market behavior. We cannot expect players to follow rules that have not been posted. We must also ensure that markets are adequately monitored by entities that are independent of merchant interests, and that the monitoring and policing task is equipped with the right data, and with sufficient manpower, to do the job. And when market monitors tell us that market power is being exercised, we must not ignore their pleas for interconnection.

Indeed, the Commission must aggressively intervene when the markets are not producing reasonable prices. That is the law of the land in the United States. New electricity markets need a lot of attention. They are just emerging from almost a century of monopoly regulation. Moreover, the unique characteristics of electricity make the markets exceptionally vulnerable to market power and to the potential for breathtaking price run-ups when supply is short. Billions of consumer dollars are at stake, so we must conduct tough-minded investigations and correct market flaws. We have to be willing to impose a time-out on markets that are not functioning. All of the world's most sophisticated commodity markets have time-outs to prohibit market meltdowns.

Conclusion

The past year in the California electricity market has indeed been painfully instructive. We must heed the many lessons learned and apply them going forward. Electricity consumers will insist that market liberalization benefit them. Without such benefits, there is simply no point to it.

* William L. Massey is Commissioner of the U.S. Federal Energy Regulatory Commission (FERC). Over the last eight years, he has participated in all the decision making for restructuring the gas and electric power industries in the United States.

He earned a doctorate in law from the Law School of the University of Arkansas. He has played a key role in the evolution of U.S. energy policy, especially with respectto electric power markets. His current term as Commissioner extends to June 2003.

The text of this article is drawn from the lecture delivered by Mr. Massey at the International Seminar to Start Up OLADE's Forums (Quito, Ecuador, September 9-11, 2001).

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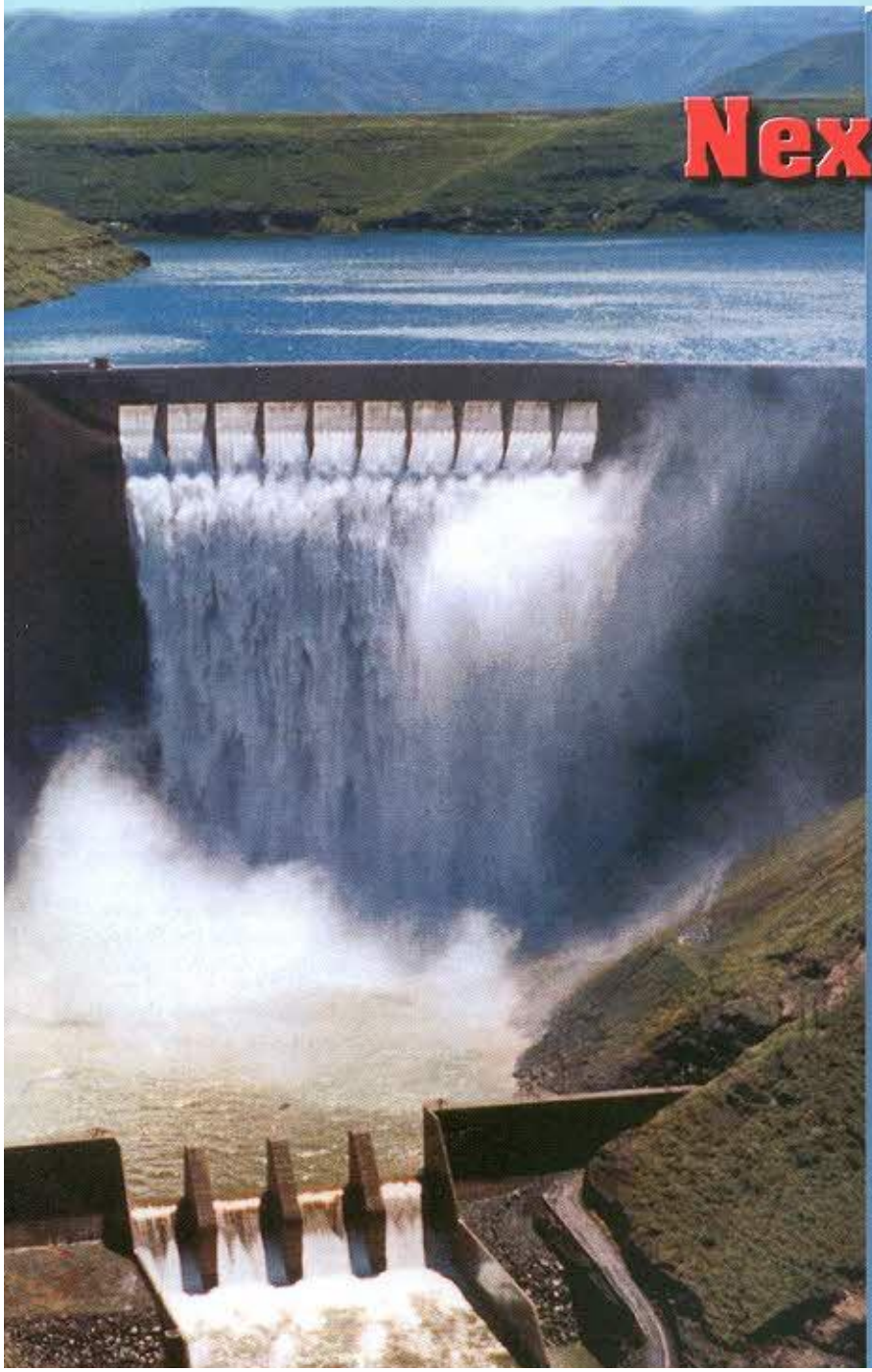

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September 11, 2001 and the Future

Dr. Chakib Khelil
Minister of Energy and Mines of Algeria
President of OPEC

After the fall of the Berlin wall, there was a rise in democracy and market economy in Eastern Europe, which spread to Latin America and other parts of the world (including Algeria).

The development of environmental and social concerns initially raised by non-governmental organizations (NGOs) later became an issue of political pressure groups, which demonstrated against the World Bank, the International Monetary Fund (IMF), and the Group of Seven (G7) meetings in Seattle, Washington, D.C., and Genoa. The development of economic blocs such as the Southern Common Market (MERCOSUR), the North American Free Trade Agreement (NAFTA), the European Union (EU), and the Asia-Pacific Economic Cooperation (APEC) have facilitated energy trade among their member countries.

Furthermore, the spectacular development of audiovisual communication technologies has led to the rapid globalization of activities. Nevertheless, among world leaders of developing countries, there is heavy criticism of globalization for the following reasons:

- Countries with a poor institutional, legal, and regulatory framework and poor enforcement capacity have no safeguard from global regulations.
- There are still 2 billion people who live on less than US$1 per day. These people are left out of the process of wealth creation stemming from globalization.
- AIDS, malnutrition and security are spreading.
- There is an increase in regional and internal conflicts in Africa, the Middle East, Asia, and Latin America.

While opinions diverge on whether or not globalization is primarily responsible for the worsening situation of a large share of the world's population, our concerns about globalization are here to stay with us for a long time and need to be addressed.

Turning to Algeria, my country, through the early part of the last decade, it suffered the effects of religious fundamentalism that took root in Afghanistan's conflict with the former Soviet Union.

Everybody knows that Algerian fundamentalists trained in that war in Afghanistan returned to Algeria and waged a campaign of terror that led to the death of more than 150,000 persons in the nineties, among whom doctors, journalists and the intelligentsia. These fundamentalists, just like other terrorist groups, received material support from their groups organized in Europe and the United States.

For several years, in the early nineties, Algeria suffered alone an airlines embargo and the closing of embassies in its country due to threats of terrorism, which made our isolation even worse.

The 11th of September disaster in New York finally brought to light the actions of these fundamentalists as they were finally listed as part of the terrorist organizations to be targeted by the coalition against terror. The U.S. and European governments started rounding up members of these organizations who operated on their soils. There was do doubt for us in the early nineties

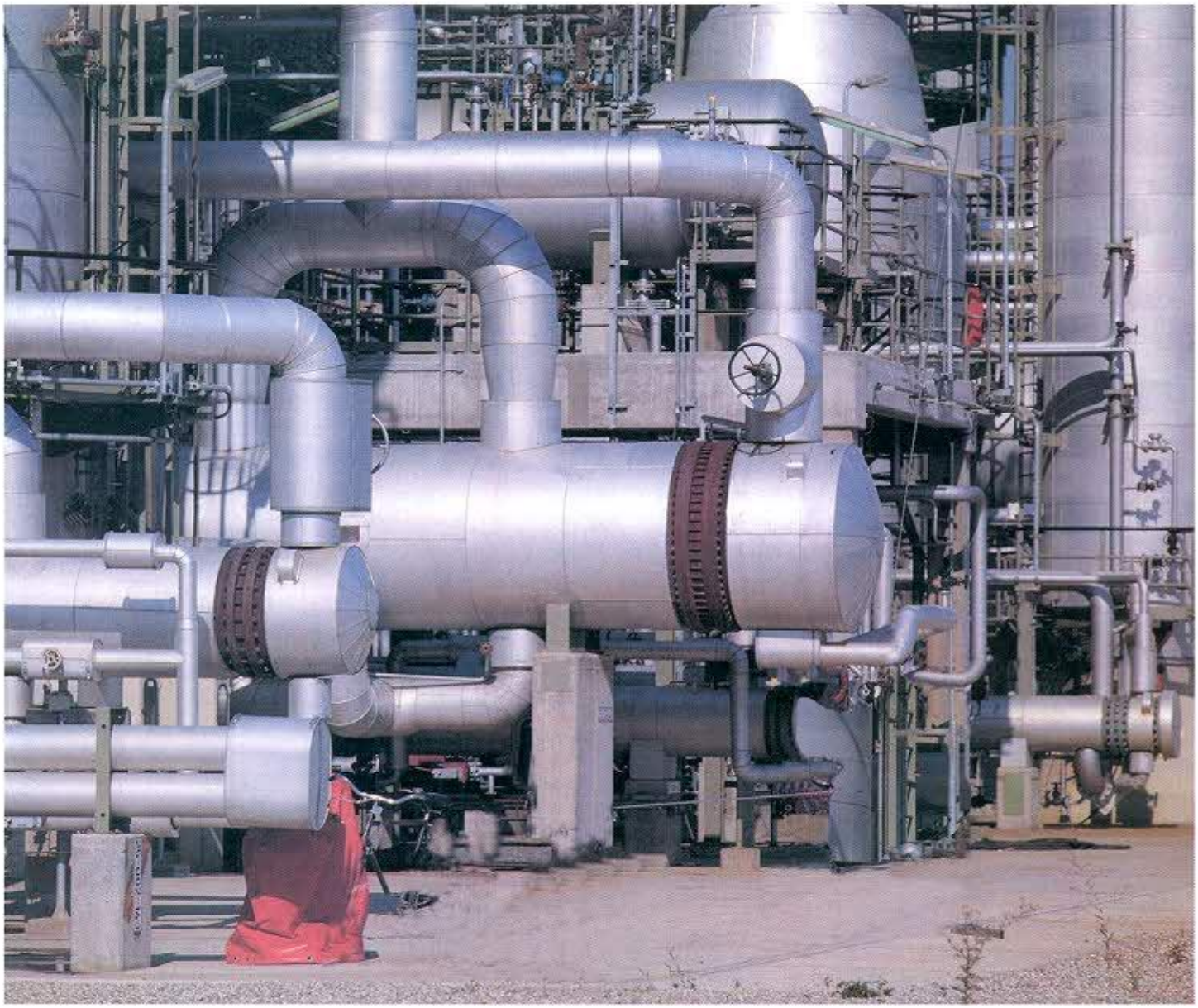
that security in Algeria was part and parcel of security in Europe and the United States.

The Civil Concord law offering a pardon to fundamentalists who did not commit crimes went into force two years ago in Algeria. While peace in Algeria returned progressively, huge resources estimated at US$25 billion have been required since to repair damages to the country's infrastructure and the repatriation of the population displaced by terrorism to their villages.

Fortunately, the oil and gas infrastructures in the desert areas and the north of the country were not at all affected. Towns and roads are safer now than some European capitals.

The government has initiated economic reforms to establish a working market economy. Algeria is a democratic republic based on a multi-party system with two chambers of parliament.

Reforms have focused on mines, electricity and hydrocarbons. While a new mining law has opened up the sector to private investments in June 2001, a new electricity law and a new hydrocarbons law are well on their way to being adopted this year, after two years of campaigns to explain them to civil society.



Over the last two years, we have offered areas for exploration and exploitation for diamonds and gold, signed several contracts for oil and gas exploration, and invited bids for a new electricity export project to Spain. Two undersea electric cables and gas pipelines to Spain and Italy are under joint study with partners. With Nigeria we are engaged in studying a geopolitically strategic gas pipeline between our two countries.

With these projects and Algeria's reforms and negotiations to become an associate member of the European Union, Algeria is now on its way to offering the best conditions for partners who seek access to Algeria's latest resources potential and the large nearby markets for electricity, natural gas and oil of the European Union.

What of OPEC?

The Organization of the Petroleum Exporting Countries (OPEC) has well-defined objectives for the current international scenario:

- To ensure satisfaction of demand for whatever reason.
- To maintain the stability of prices around US$25 per barrel on the basis of the mechanism that was put in place in October 2000, with a band of US$22-28 per barrel.

This target provides for reasonable return on invested capital and ensures long-term substitution for cleaner fuels. Nevertheless, there are other factors influencing prices:

- OPEC controls only 35% of world capacity.
- Although OPEC has spare capacity, it is used by consumers only when it is needed; unlike spare power capacity it is not paid for by consumers.

" Why do we need to stabilize oil prices? For producers, there are risk premiums paid on financing costs. For consuming countries, there are budget problems when prices drop and political pressure when prices rise "

- A 10% decrease in producer prices translates into about 5% decrease in prices to individual consumers because of the high taxation imposed on consumers (in the United Kingdom, taxes account for about 80% of the price).
- Although revenues for governments amount to about US$1 trillion from taxes on fuels, for the year 2000 OPEC producers received only US$250 billion. It should be noted that a decrease in taxes will go entirely and directly into the pockets of consumers, which in turn will encourage consumer spending, on which the industrialized economies rely for growth. A 10% decrease in taxes, for example, would represent an injection of US$100 billion into the pockets of consumers.
- Another influencing factor on oil prices is the Euro to U.S. dollar exchange rate.
- Important non-OPEC producers such as Russia, Norway, Angola, and Mexico also exert a major influence on prices.
- Why do we need to stabilize oil prices? For producers, there are risk premiums paid on financing costs. For consuming countries, there are budget problems when prices drop and political pressure when prices rise.
- Other factors affecting prices are refinery capacity and environmental regulations.

September 11 and the oil market

OPEC demonstrated that it is a responsible and responsive organization when it helped quiet the market immediately after the regrettable events of September 11.

The supply security concerns that are being raised are not founded, as demonstrated in the 1990 war against Iraq, and this is the orientation of our declarations to stabilize the market after the 11th of September disaster.

This is not to say, however, that facilities in either producing or consuming countries are immune to possible attacks.

It should be noted that insurance costs, in general, rose after the attacks and therefore, the cost of doing business is also higher.

It should also be mentioned that refining capacity is already tight and that the experience of the last two years has shown weakness in this link, which is a major factor in oil price volatility. Operators believe that more storage capacity might be a safeguard, but who is taking the initiative?

But risks also remain with the transport of crude, oil products and LNG.

The shifting of political alliances will be even more important for the future of the oil industry on the international stage. It is still not clear how these shifts will affect our industry and stability.

The future of the oil industry

There is no doubt that the oil industry has entered into a recession. The previous ones lasted between 6 and 24 months. The consensus on what will be done in the future will be shaped by this recession.
In this scenario, it is worth observing that Japan continues to underperform and that the European Central Bank appears more concerned about fighting inflation than promoting growth.

Therefore, it is important not to fall into the trap of protectionist policies, as in the 1929 recession, but to encourage more open economies and distribute better the windfalls stemming from globalization. One way is to help developing countries more aggressively in resolving their debt problems.

Another way is to promote two-way growth between industrialized and developing countries by promoting regional infrastructure projects, such as the gas and electric power interconnections between Algeria and Europe or the strategic gas pipeline project between Nigeria and Algeria. These projects will not only promote energy exports in one direction but also exports of goods and services in the other direction.

As for oil prices, they will tend to go back to their pre-September 11th levels, as activities become normal and demand grows to meet winter demand.

Of course, this is subject to the cooperation of non-OPEC producers to help stabilize prices, keeping in mind that, in the short term, only OPEC producers are capable of rapidly handling sudden increases in demand.

* *Summary of the presentation made by Dr. Chakib Khelil, Minister of Energy and Mines of Algeria and President of OPEC, at the World Energy Congress held in Buenos Aires, Argentina, on October 23, 2001.*

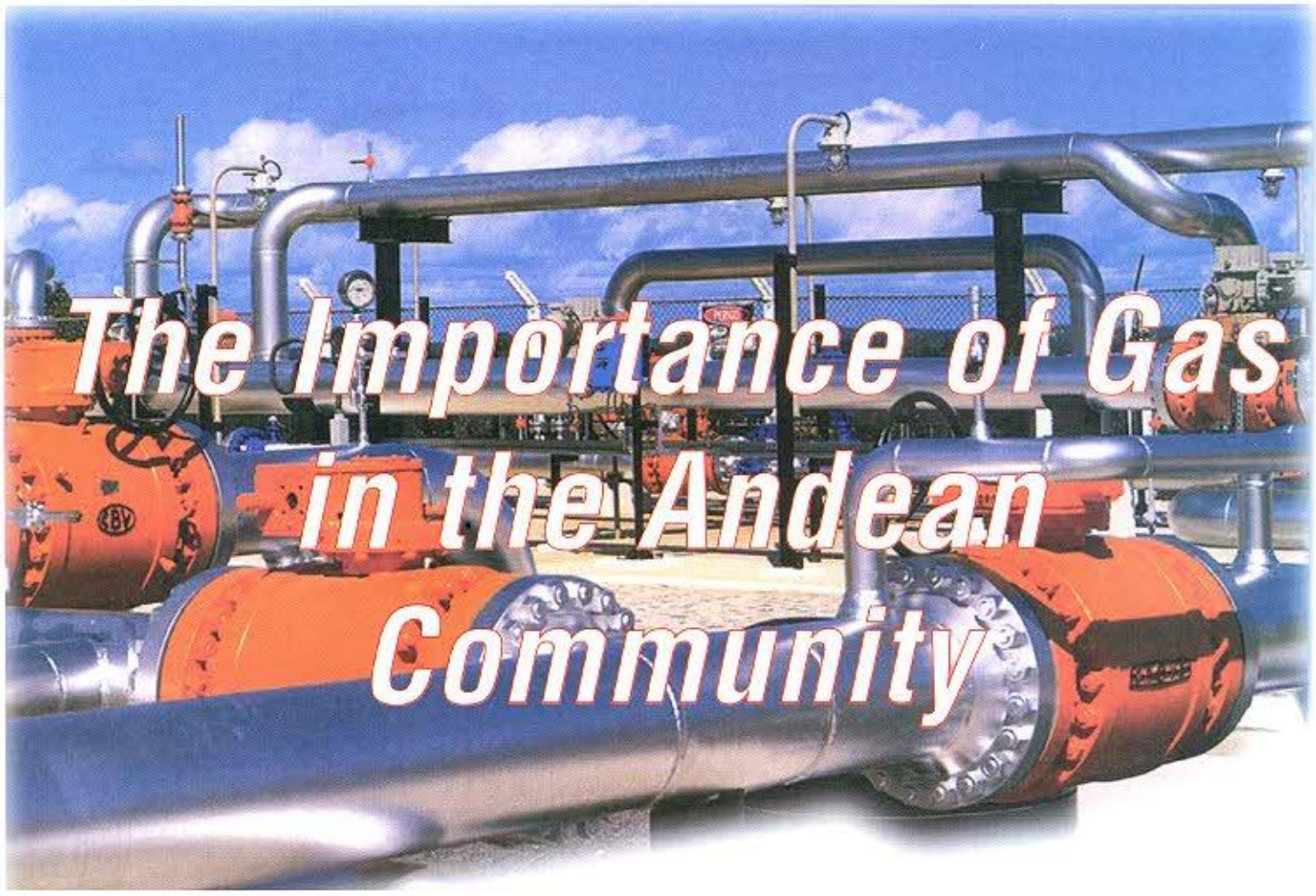
ENERGY AND THE ENVIRONMENT

Jeferson Nunes
Director of Cooperation and Training of OLADE

The relationship between the use of energy resources and the environment is increasingly important, since the countries have expressed their wish to implement a sustainable development approach in all of their current and future plans and projects, as a necessary tool to meet current needs without jeopardizing the possibility of future generations to also meet their own needs.

There is no doubt that energy project development based on environmentally friendly technologies, learning about the importance of new and renewable sources of energy and how to plan their development in the future, and becoming familiar with new environmental management systems and tools require high-level graduate training that can take advantage of the best experiences and latest know-how in this field. This training should be aimed at professionals involved, or wishing to carry out activities, in the energy-environmental sector and who strive to achieve excellence in the management of projects and resources of the organizations, institutions, or companies to which they belong.

This is the approach and nature of the OLADE-University of Calgary International Master's Degree Program in Energy and Environment, which combines the know-how of the northern hemisphere with those of the southern hemisphere to train professionals so that they can promote sustainable development in the countries of Latin America and the Caribbean.



The Importance of Gas in the Andean Community

"In the Andean Community of Nations there is evidence of future development of its abundant gas reserves, which will contribute to neutralize the volatility of oil prices on the international market," said OLADE's Executive Secretary, Dr. Julio Herrera, in the presentation he made at the International Conference on the Gas Industry: Strategy for its Development in the Andean Region, held in Bogotá, Colombia on November 6, 2001.

The Conference was organized by the British Government and was supported by the Ministry of Mines and Energy of Colombia, the Energy and Gas Regulatory Commission (CREG), ECOPETROL, ECOGAS, and the Colombian Petroleum Association.

Dr. Herrera highlighted the importance of the massive expansion of gas in Colombia and Venezuela's new gas policy, as well as the possible interconnections between both countries, with extensions to Central America and Ecuador. He also emphasized that Peru is in the process of developing it domestic gas market in order to enhance its future export prospects. Bolivia, which has considerably increased its natural gas reserves, is developing an export strategy that is broadening its export expectations to Brazil and other countries.

Regarding the production of this energy source, Dr. Herrera said that the principal producers of Latin America and the Caribbean are Venezuela, Bolivia, Trinidad and Tobago, Brazil, Colombia, Mexico, and Argentina.

In 2000, the Andean Community of Nations (CAN) accounted for 28% of the production of Latin America and the Caribbean; the main producers in the subregion are Venezuela, Colombia, and Bolivia.

It is expected that Bolivia will become the second-ranking producer of the CAN over the next few years, once its interconnection with Brazil has been completed.

Peru will also reach a major volume by 2003 or 2004, when the Camisea fields are connected to Lima.

In Latin America and the Caribbean, the largest consumer markets are Mexico, Argentina, and Venezuela, which are followed at a certain distance by Brazil, Trinidad and Tobago, Colombia, and Chile, then by Bolivia, Peru, and Uruguay. Chile and Uruguay have been interconnected with Argentina to substitute higher-cost liquid fuels for gas while Brazil has become interconnected to Bolivia and Argentina. Mexico has various interconnections

with the United States to cover the market that the U.S. transport network is unable to supply, owing to the high cost of reaching far-off border zones. At the same time, surpluses are exported.

The countries of the Andean Community of Nations consume what they produce. Colombia has managed to penetrate all socioeconomic sectors, and Venezuela's expansion of supply for residential and transportation sectors is in full swing. Peru's development of its gas industry is also under way. Although Bolivia has a small market, it has expanded its industry for exports. Ecuador is developing gas from the Gulf of Guayaquil and has a potential market for substituting liquid fuels.

The principal exporters of gas in Latin America and the Caribbean, during 2000, were Argentina, Trinidad and Tobago, and Bolivia.

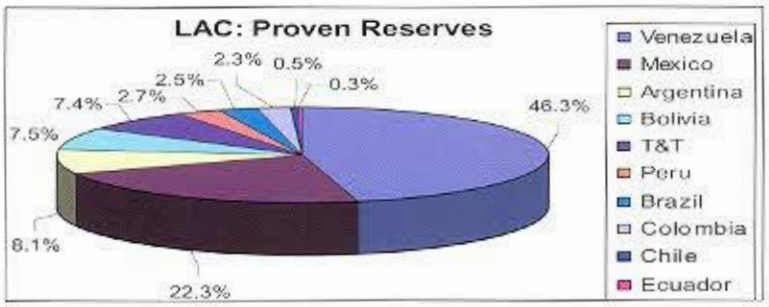
Among the countries of the Andean Community of Nations, only Bolivia is an exporter for 27 years, first to Argentina and now to Brazil. In the next few years, it will become the subregion's principal exporter.

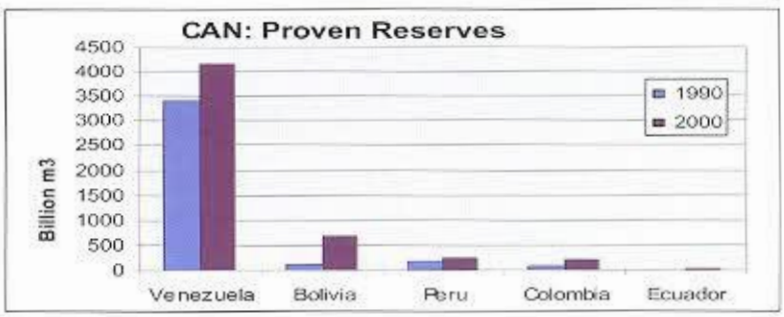
As for imports, during the year 2000, the principal importers of Latin America and the Caribbean were Chile, Mexico, and Brazil.

Prospects

OLADE's Executive Secretary finally presented a vision of the future of gas in the Andean Community of Nations, asserting that the subregion is sustainable on the basis of its own resources. That will make it possible for interconnections to be developed over the next few years between Colombia and Venezuela, Colombia and Ecuador, and possibly Peru and Ecuador.

The abundance of available resources (proven and probable reserves) in the

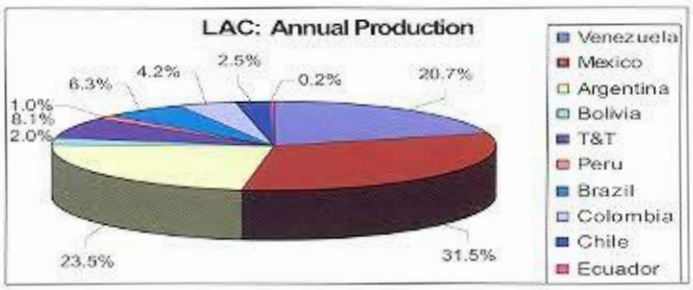


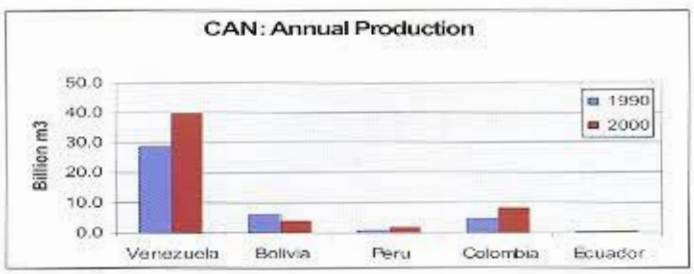


Source: OLADE

Andean Community of Nations suggests that, in the present decade, major exports will be made outside the region. Colombia and the Central American Isthmus could be interconnected and, later, could supply gas from Venezuela. Venezuela could export liquefied gas to the United States and Europe, without neglecting the potential market of Brazil, a country for which an interconnection could be built. Bolivia could expand its interconnection with Brazil, resume its supply to Argentina, and aim export volumes at Chile. Finally, the possible interconnection of Bolivia with Peru to export liquefied gas from the two countries along the Pacific coastline to the United States is considered to be a highly important project

Over the long term, the size of the markets of Argentina, Colombia, and Brazil may require large supplies from Venezuela, which is the country with the largest amount of resources in the region.





Source: OLADE

Energy Markets in Latin America and the Caribbean

In the framework of the Ecuador Oil and Power 2001 Conference held in Quito on September 26-30, 2001, the Executive Secretary of OLADE, Dr. Julio Herrera, made a presentation on the subject "Prospects of Energy Markets in Latin America and the Caribbean.".

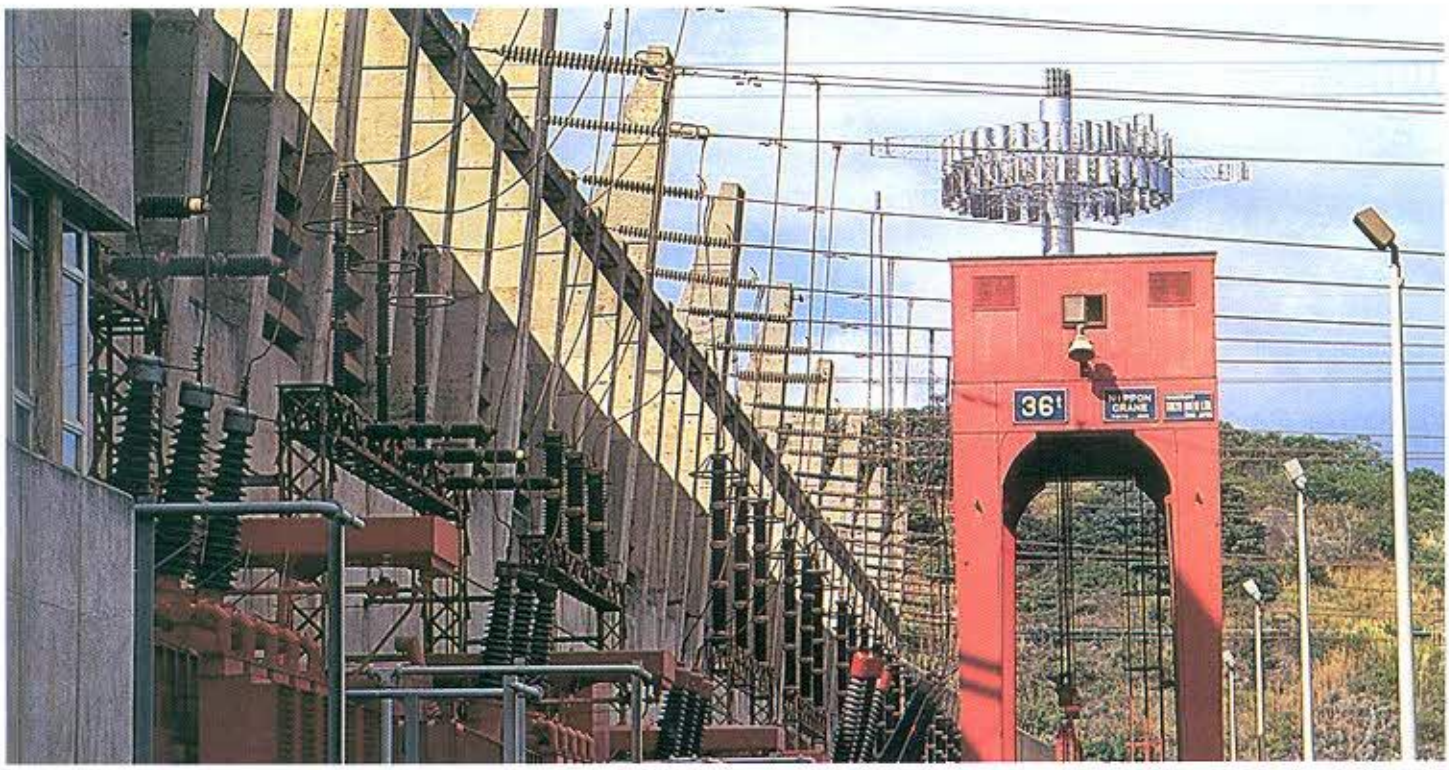
"Privatization, development, and expansion of energy markets, as well as new regulations, are part of the modernization process that is taking place in the region," said Dr. Herrera. "This process is under way and is being carried out in keeping with the political, economic, and sociocultural realities of the countries."

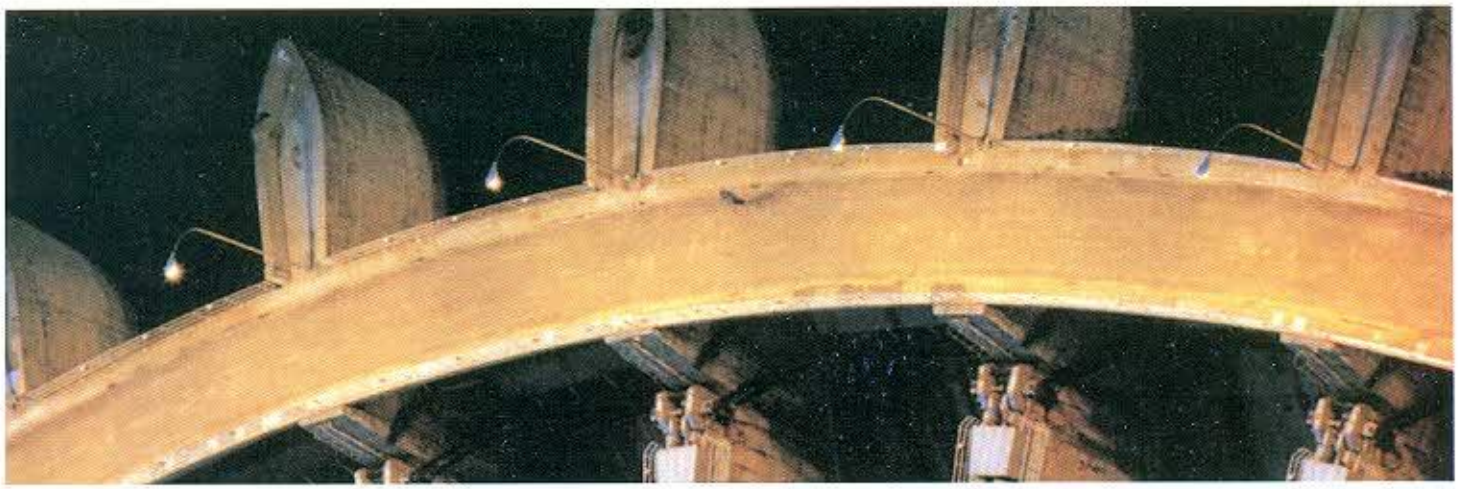
"An objective observation of the changes taking place because of the reforms can be summarized in two major approaches, on the one hand, the growing participation of privatized activities, and on the other hand, the transition of markets from traditional state monopolies to more competitive schemes."

As part of the reforms, he also identified two major changes compared to the past: the free availability or ownership of energy products and the ownership of energy company assets in the respective chains.

He indicated that, until the end of the eighties, the energy sector was had to play a strategic role in ensuring national security; as a result, the ownership of energy products and their production and transformation facilities were concentrated in the hands of the State. Over the last few years, the concept of national security and the ownership of energy products was changed and energy was viewed as an essential input for a competitive economy, in the understanding that high industrial productivity and quality of living of the population require safe and reliable energy supply over the long term at competitive prices.

The changes in ownership of products and assets have been accompanied by





the creation of energy markets regulated by legal frameworks that facilitate competition and free trade, striving to safeguard consumer rights.

"An objective observation of the changes taking place because of the reforms can be summarized in two major approaches, on the one hand, the growing participation of privatized activities, and on the other hand, the transition of markets from traditional state monopolies to more competitive schemes."

While describing the various characteristics of the ownership regimes of products, from state to private, with the energy markets of the region, from monopoly to open market, OLADE's Executive Secretary focused on the various trends recorded in the countries in this structural transformation process.

Regarding this, he referred to energy sector reforms and their linkage to regional energy integration processes.

What is to be done right now?

To expand markets and, at the same time, ensure energy supply in Latin America and the Caribbean, Dr. Herrera asserted that the following actions had to be carried out:

- Consolidate reforms and insertion in the markets of the rest of the world.
- Harmonize regional regulatory frameworks to facilitate energy integration.
- Avoid monopolies that hamper competitiveness and do not favor greater equity to expand markets.
- Protect and stimulate investments for the region's energy sector.
- Abate poverty and protect the environment.

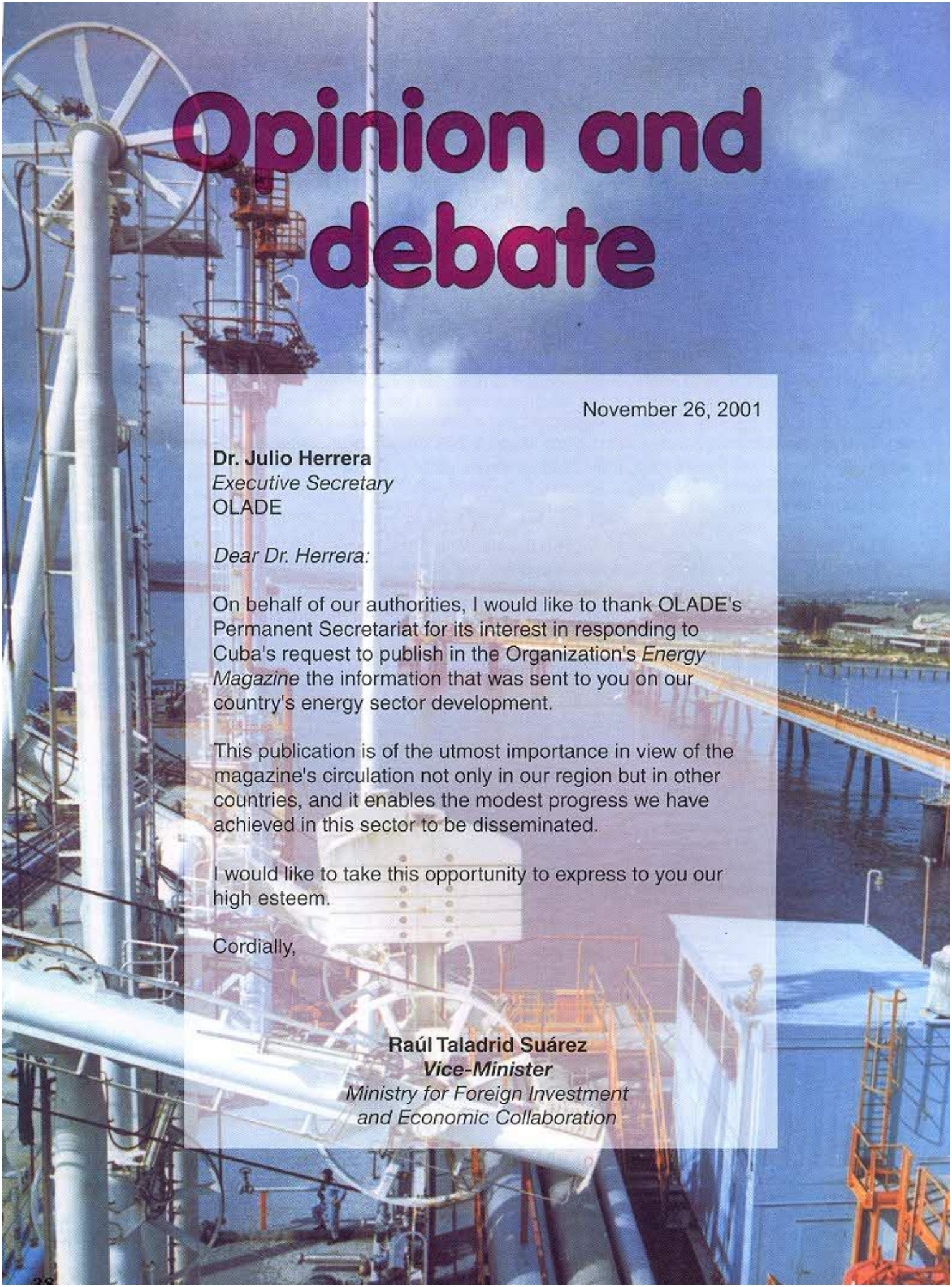
What is to be done in the future?

OLADE's Executive Secretary referred to the requirements for the future of the region's energy sector, saying that "it requires concrete actions over the long term that imply decisions in the present."

First of all, he emphasized the unavoidable responsibility of governments to formulate energy integration policies that open up new opportunities for business by promoting legal, regulatory, and supervisory frameworks that dismantle obstacles and facilitate the functioning of regional markets, free trade and consumer protection.

Second, he pointed out the need to tap regional energy resources, especially natural gas, to diversify the energy matrix, guarantee long-term energy supply, and expand coverage.

Finally, he said it was necessary to consolidate the conditions so that private investments could find in the region the suitable environment for business, with minimal risks, by means of an appropriate legal and tax framework.



Opinion and debate

November 26, 2001

Dr. Julio Herrera
Executive Secretary
OLADE

Dear Dr. Herrera:

On behalf of our authorities, I would like to thank OLADE's Permanent Secretariat for its interest in responding to Cuba's request to publish in the Organization's *Energy Magazine* the information that was sent to you on our country's energy sector development.

This publication is of the utmost importance in view of the magazine's circulation not only in our region but in other countries, and it enables the modest progress we have achieved in this sector to be disseminated.

I would like to take this opportunity to express to you our high esteem.

Cordially,

Raúl Taladrid Suárez
Vice-Minister
Ministry for Foreign Investment and Economic Collaboration

OLADE Report:

Natural Gas Markets and Potential in South America

"The Study for Natural Gas Market Integration in South America" was carried out by OLADE; ARPEL, and Beicip-Franlab as consultant, under the auspices of the European Commission and with the assistance of the Member States of OLADE.

The Study's main objectives were:

- *To analyze and update natural gas reserves, production, and consumption profiles for ten Latin American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela.*
- *To identify alternative routes for interconnection between the main production and consumption centers.*
- *To use a model capable of optimizing gas imports and exports between the countries, subject to already existing supply contracts in the region and to forecast and characterize gas pipelines in terms of diameter, pressure, and capacity.*
- *To estimate the investment that will have to be made in new transmission lines, dispatch centers, and other facilities for the principal alternative interconnection routes.*

Current trends in the gas sector in South America

The Study examines in detail the trends that can be expected in the gas sector in South America, among which, possible market developments, principal barriers to this development and gas integration in the context of market liberalization and openness, the growth potential for this source of energy, and the principal projects that are being promoted in the region as a result of the availability of gas.

- **Gas market development**

The future development of natural gas use and trade in Latin America over the next decade will be heavily influenced by Brazil, as it is South America's largest economy. At present, this country is elaborating an ambitious plan to increase electric power generation based on gas in coming years, to reduce the heavy dependence on hydropower generation, which is by far the largest source of electricity.

In the majority of Latin American countries, the same trend is expected to continue, with Brazil and Chile leading the process, which will mean that natural gas will be accounting for a larger share of the energy matrix. As in many other regions of the world, the initial development of electric power generation using gas fuels for feedstock will lead to higher consumption of this source of energy for industrial, commercial, and residential use.

Bolivia will clearly be the largest supplier of gas to Brazil, in view of the gas pipeline that is already operating and recent large discoveries. The most recent estimate of proven plus probable reserves amounts to 32.3 trillion cubic feet (TCF),* compared to 23 TCF a year ago.

Argentina is noteworthy for its relatively mature domestic market; it will be supplying gas to Brazil and Uruguay through new gas pipelines but will continue to export gas to Chile. There is uncertainty, however, with respect to the real potential of reserves in Argentina, on the basis of the 30 TCF of proven plus probable reserves.

Peru is well endowed, with a nonassociated gas reserve of 13.2 TCF in the Camisea field, although its development has been long delayed. An

upstream consortium has been selected, and downstream activities will soon be announced for bidding, so that effective field development is under way.

Venezuela is currently under pressure to increase its gas activities, with ambitious plans being elaborated by the state oil company PDVSA to open up the sector to private-sector investment. This means that Venezuela, with the seventh largest gas reserves in the world (185 TCF of proven plus probable reserves, including associated gas), will be playing a major role and will be expanding its activities considerably in the region over the next decade.

- **High growth potential**

It is important to promote gas market integration in the region, taking into consideration especially the level of growth that is expected for the use of this energy source, as well as the inevitable liberalization of markets. The current share of natural gas in the energy mix of the majority of the countries is still low and indicates that there is a high potential for growth. Each country, nevertheless, has a different profile and a different growth potential in various areas.

Gas consumption in Brazil in 1999 accounted for 3% of the primary energy mix (including renewables) and for Chile, it accounted for 11%. In these two countries, where gas is a very small component of the energy mix, considerable growth can be expected in all areas.

In Argentina and Venezuela, domestic markets are mature and gas consumption accounts for 47% and 50%, respectively, of the primary energy mix.

In South America, excluding Trinidad and Tobago, in 1998 natural gas consumption accounted for no more than 21% of the primary energy matrix. It can therefore be expected that natural gas consumption will duplicate in the region, from 192 million cubic meters per day (m3/day) in 2000 to about 422 million cubic meters per day in 2010.

It is expected that the same process will take place in all the countries: initial growth will occur in electric power generation, followed by industrial applications and finally by the residential sector. Another positive aspect for the development of gas is that it is forecast that demand for energy in the majority of the countries will be higher than economic growth with an elasticity in the range of 1.0 to 1.1. It is a rule in emerging economies that energy consumption growth should be higher than GDP growth. Thus, economic growth in the majority of Latin American countries will require a considerable increase in energy needs and therefore will offer high potential for the development of the natural gas market.

- **Principal natural gas interconnection projects**

Total proven reserves in the region amount to 214 TCF, including the wide participation of associated gas in Venezuela and Brazil. Proven plus probable reserves, but excluding associated gas, amount to only 111 TCF. In the current situation, Argentina, with proven reserves amounting to 24.6 TCF, and Bolivia, with 18.3 TCF, are exporting countries, whereas the importing countries are Brazil, Chile, Uruguay, and soon Paraguay. During the period from 2000 to 2015, regional gas demand, excluding Venezuela and Trinidad and Tobago, amounts to a total of 58.4 TCF, whereas expected production amounts to 51.2 TCF.

According to the study, the figures that were mentioned indicated that, over the medium and long terms, demand for gas, driven by large markets such as those of Brazil and Argentina, will reach such high levels that imports from Venezuela, Trinidad and Tobago, and possibly Peru will be required. The future optimal configuration of gas flows in the area with the participation of gas pipeline and LNG connections will depend on expectations of additional reserves, transport costs, and market structure.

At present, three gas interconnections are functioning:

- **From Bolivia to Argentina:** It is the oldest connection, from Santa Cruz, Bolivia to Yacuiba, Argentina, with a 500-km 24-inch pipeline and a capacity of 8 million cubic meters per day (m3/day).

- **From Argentina to Chile:** The Bandurria de San Sebastián Gas Pipeline in Tierra del Fuego, Argentina, to the Cullen methanol plant in Chile, which started up in 1996 with a 83-km 14-inch pipeline, with a capacity of 2 million m3/day. In 1997, the 463-km 24-inch Gasandes Gas Pipeline, with a maximum capacity of 20 million m3/day, started up; it takes gas from Neuquen, Argentina to Santiago de Chile. More recently, in May 1999, the 941-mile 20-inch Atacama gas pipeline, with a capacity of 8.5 million m3/day, started supplying the north of Chile (Mejillones) from the province of Salta in Argentina. The 1,180-km Norandino Gas Pipeline, with a capacity of 7.1 million m3/day, from Pichanal to Mejillones and Coloso, has also started up, as well as the 638-km Pacific Gas Pipeline, with a capacity of 9.7 million m3/day from Neuquen to Concepción.

- **From Bolivia to Brazil:** The Bolivia-Brazil gas pipeline is the most impressive and successful project in the region, with a length of 3,150 km, a diameter of 32 inches, and a maximum capacity of 30 million m3/day. It carries gas from Santa Cruz in Bolivia and supplies gas to São Paulo and the southern states of Brazil up to Porto Alegre. It started up in May 1999.

Construction of the following connections is under way:

- **From Argentina to Brazil:** The Uruguaiana Gas Pipeline carries gas to Entre Ríos to a power plant in Uruguaiana (440 km, 24 inches, capacity of 12 million m3/day). It is forecast that it will extend to Porto Alegre (615 km, 20 inches).

- **From Argentina to Uruguay:** The Cruz del Sur Gas Pipeline (208 km, 18 inches/24 inches, maximum capacity of 6.6 million m3/day) from Buenos Aires to Montevideo.

The study also identifies other candidate project for the new interconnections:

- **From Argentina to Brazil:** The Mercosur Gas Pipeline would connect the gas fields of northern Argentina (Salta) to São Paulo via Asunción in Paraguay (3,100 km, a diameter of 36 to 24 inches, a capacity of 25 million m3/day). The Austral Gas Pipeline would connect the gas fields of southern Argentina (Austral basin) to Montevideo (Uruguay) and afterwards Porto Alegre (Brazil) (3,700 km, 36 inches/30 inches, capacity of 31 million m3/day).

- **From Bolivia to Chile:** A gas pipeline from Villamontes to Tocopilla and Mejillones in northern Chile (850 km, 20 inches/16 inches, capacity of 6 million m3/day).

- **From Bolivia to Paraguay:** The Trans-Chaco Gas Pipeline of Vuelta Grande in Bolivia to Asunción in Paraguay (846 km, 22 inches, capacity of 6.9 million m3/day).

- **From Peru to Bolivia:** From the field of Camisea to Carraco in Bolivia (900 km, 36 inches, 40 million m3/day). Over the long term, this gas pipeline will take gas from Camisea to the largest market in Brazil.

- **From Peru to Brazil:** From Camisea to São Paulo by way of Port Belho (3,550 km, 32 inches, capacity of 30 million m3/day).

The study offers a consistent overview of the least-cost gas trade in the region, in keeping with various demand and reserve scenarios. On the basis of this analysis, the most feasible projects are highlighted and the corresponding investment program can be established.

* At January 1, 2001, the estimate for proven plus probable reserves in Bolivia amounted to 46.83 trillion cubic feet (TCF).

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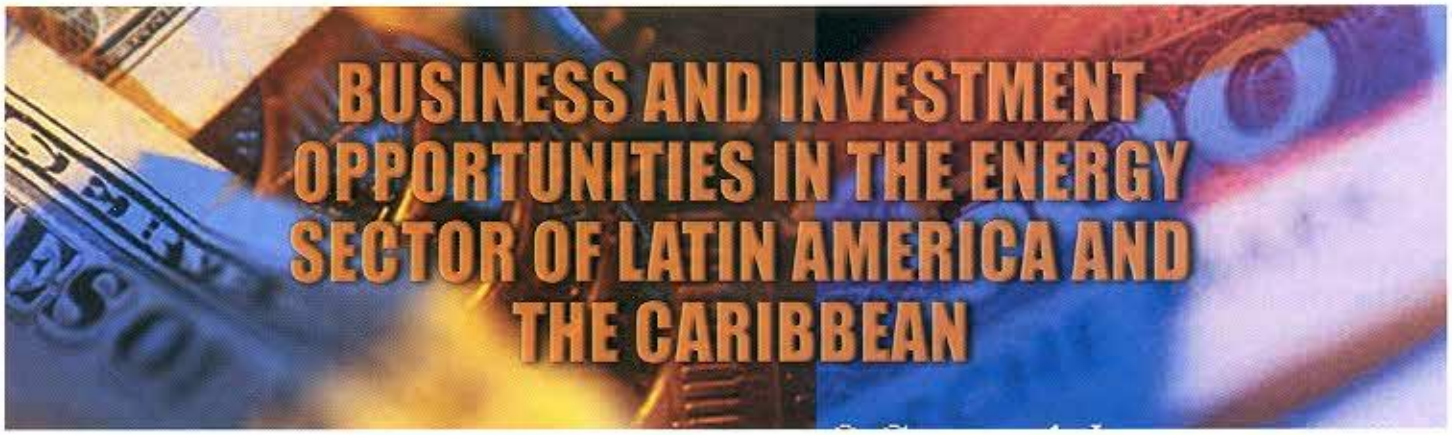

BUSINESS AND INVESTMENT OPPORTUNITIES IN THE ENERGY SECTOR OF LATIN AMERICA AND THE CARIBBEAN

CENTRAL AMERICA

Impetus for the SIEPAC Project

One of the world giants of the electric power industry, ENDESA, will be investing in Central America, as it is becoming part of the Project on the Electric Power Interconnection System for Central America (SIEPAC).

The Project, which benefits from financial backing from IDB, has added Spain through its multinational company ENDESA. The cost of SIEPAC will be US$320 million, and construction is expected to start by the first quarter of 2002, after the Presidents of the subregion's countries have signed the respective agreement.

BRAZIL

Production in the Campos Field

Petróleo Brasileiro S.A. (PETROBRAS) announced that it will be investing US$834 million in a new company, New Marlin, to raise money on the local market for new investments in the offshore Campos basin, which is currently producing 1.04 million barrels per day, although it is expected that by 2005 it will be producing 1.6 million barrels. To increase production from this basin, US$12.38 billion will be invested up to the above-mentioned year. Most of the investment will be made by PETROBRAS.

ECUADOR

Ninth Oil Bidding Round

The President of the state oil company Petroecuador, Rodolfo Barniol, reported that, in January 2002, he will be inviting bidders to the ninth round of oil bidding for the exploration and production of 13 oil and gas blocks not only in the Amazon region but also in the Gulf of Guayaquil. The structures have untapped reserves amounting to 348 millions barrels of heavy crude.

ECUADOR-PERU

Building an Oil Pipeline

Conversations are under way for building a 92-kilometer oil pipeline that would connect the oil deposits of southern Ecuador with the oil pipeline of northern Peru (Norperuano), with a carrying capacity of 200,000 barrels per day. The Minister of Energy and Mines of Peru, Jaime Quijandría, said that the pipeline would enable Ecuador to pump 31,000 barrels per day.

GUYANA-TRINIDAD AND TOBAGO

Cooperation to Build the Hydropower Project

The Trinidad-based company, Enman Services Limited, will lead a consortium that will most likely bring together major international companies for the development of a US$1 billion hydropower plant in Guyana that will be generating up to 1.100 megawatts.

Guyana's Prime Minister Samuel Hinds signed a Memorandum of Understanding with ENMAN providing a two-year period to evaluate the technical, financial, economic, social and environmental potential of developing the project.

Prime Minister Hinds stated that the project will enhance the further economic development of Guyana and

will fulfill one of "a number of dreams to develop our hydropower potential."

MEXICO

Possible Rise in PEMEX's Investment Activities

Mexico's budget for the year 2002 may entail a very high increase in investments for the oil state company PEMEX, because President Fox's administration wants a greater share of private-sector financing for state oil projects.

PEMEX, according to the draft budget, would be able to award contracts amounting to US$9.7 billion to private enterprises that offer financing for projects that will permit a return on their investment once they are commissioned. This mechanism, referred to as "Pidiregas," has already enabled PEMEX to award US$5 billion in contracts to private companies in 2000.

PERU

Hydropower Complex in Peru

The Ministry of Mines and Energy of Peru has granted a temporary permit for the building of the Tamboraque hydropower complex. Studies are being conducted to determine its power generation capacity, but it is expected that it will amount to 105 MW at a cost of US$122 million. The estimated lead time is three years.

Expansion of the Camisea Pipeline

The capacity of the gas pipeline stretching from Camisea to Lima will grow threefold to 1.2 billion cubic feet per day by 2004, when the above-mentioned segment has been completed.

The President of the Camisea Development Council, Luis Ortigas, said that he was carrying out feasibility studies to export liquid gas to the Pacific coast. It is expected that a new round of bidding will be announced for the blocks adjacent to Camisea, which are believed to hold natural gas. Likewise, the signing of contracts for gas distribution and marketing in Lima is being prepared.

VENEZUELA

PDVSA is Marketing its Gasoline in Argentina and Brazil

The state oil company Petróleos de Venezuela (PDVSA) will start marketing its fuels on the markets of Argentina and Brazil, as a first step to shipping fuel to the remaining countries of Latin America and the Caribbean, as reported by Vincenzo Paglione, Vice-President of the company. Angel Arciniegas, President of CITGO International Latin America, the subsidiary in charge of marketing the PDV and CITGO brands in the region, informed that the operation initially involves the installation of 400 service stations over four years. PDVSA, one of the principal oil suppliers in the United States, will be competing for a place on Argentina's market with the Spanish-Argentinean company REPSOL-YPF, with ESSO and with Shell.

INFORMATION: IT'S A MATTER NOT ONLY OF HAVING IT BUT ALSO OF USING IT

Mr. Gabriel Hernández
Director of Energy Information of OLADE

The notion of information management is closely linked to the development of information systems, which can be rated as reliable if they ensure easy access to data and documents that are required to administer our organizations and can be translated into knowledge for upgrading our capacity for intelligent decision making.

To achieve an adequate flow of information inside organizations and between them, large amounts of money have been invested and efforts made to develop information systems, a process that involves two types of components: on the one hand, the mechanisms and instruments for compiling, storing, and disseminating information, which have benefited from recent technological breakthroughs, and on the other hand, the resource we want to develop, that is, data, documents, knowledge, which are physically boundless, although in practical terms only a small part is interesting and useful for the users.

Specialists have focused their research on the establishment of an "information society," which in addition to providing communication and data transmission technology to all levels of society fosters an "information culture." Rather than just a concept, it is an optimal situation that is being sought, where organizations and persons know what information is needed, how and where to find it, but also, and this is even more important, its wide-ranging applicability for solving problems and defining development plans. Information systems and their evolution depend not only on their designers and managers but also on their users, who are the final beneficiaries of this effort.

The users must make commitments and take up responsibilities in this process: on the one hand, on the basis of the use of data and documents, they are generators of information with a higher added value that benefits organizations and society and enriches information systems; on the other hand by analyzing the quality of data critically and constructively they can provide feedback to system designers and administrators to orient the evolution of information systems adequately and fine-tune them.

OLADE's experience in information systems merits examination in the light of the previous proposals and objectives, since both the Member States and the Permanent Secretariat have participated in their design and are users of the information.

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Inside cover	20 x 28 cm	US$4000	
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