
SYMPOSIUM: ENERGY POLICY IN LATIN AMERICA

INTRODUCTION*

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*Background: The Energy Crisis and Development*¹

The "energy crisis" has often been advanced as the most important explanation of many Latin American nations' economic and political behavior during the 1960s and 1970s. Low oil prices led Venezuela to join in founding OPEC in 1960 and to take an active role in reaching its decisions. The fear of an oil embargo in 1973–74 forced Brazil to shift to a pro-Arab foreign policy. The increased oil prices of the past decade permitted, but did not ensure, rapid growth of Latin American oil producers, and are associated with massive increases in foreign borrowing and the search for new energy sources by both oil consuming and producing nations. The expenditure of increasing shares of national income on energy production and distribution influences life styles by leaving fewer resources for other activities, and will continue to do so at least until substitutes for current energy sources become available at attractive prices.

The concept of an "energy crisis" is part of a broader pessimism exemplified by the widely read Club of Rome books, which predicted that as world population and living standards increase, we will have insufficient global resources to provide everyone with an adequate level of living. Worse, pollution, the greenhouse effect, and nuclear accidents are foreseen as likely results of a search for higher incomes. Recent

*I wish to thank Daniel Gross and Susan Lees for extensive comments.

policy initiatives in Latin America to reach higher incomes without these side effects include population planning and limitation; international borrowing for pollution control; and, to some extent, reduction of the potential for a nuclear disaster by an increase in production of other sources of energy.

Almost all policymakers predict that we will run out of oil before other sources of energy. They indicate that the "energy crisis" refers to two separate items: current oil prices sharply higher than the 1960s average, and increasing oil prices in the future. This reflects the prediction that Latin America probably will have insufficient oil at low real prices soon after the turn of the century. For this reason, analyses of the "energy crisis" and energy policy often are limited to oil and related hydrocarbons.

Although the best-known analyses focus on the questions of the potential supplies of oil and the structure of demand for energy and for oil, little attention has been given to conditions that determine the supply of Latin American oil to markets. Many analysts claim that regardless of what Latin American leaders say, oil production is not subject to broad government policy; instead, oil is produced in new fields as fast as possible, in hopes of gaining access to the United States market. The speed of production often appears to result from the characteristics of the geological structures which are opened up; government policy apparently accommodates to the necessarily unforeseen changes in supply as new wells are brought into production.²

Implications of Energy Policy for Social Development

The uneven oil supply results in variable government revenues and expenditures, and ad hoc policies. The likelihood of oil discoveries strongly influences domestic and foreign relations. At home, increased oil production brings boom towns, with their inflation and social dislocation, as well as adjustment problems in declining areas. The fight for jobs in oil-rich areas influences labor movements and union-government relations. The social transformations brought about by oil intermittently make headlines in Latin America. Public outcry forces the government to cope with some oil related problems in new areas, such as too few schools or cultural activities, alcoholism, pollution, destruction of existing economic activities, and inadequate compensation for property taken over for oil development. Yet, because we have limited knowledge of how oil or energy boom towns differ from others, there has been little advance planning or policy to cope with the social and welfare aspects of oil development. Similarly, we know little about how social and cultural factors shape consumer response to energy availability and prices; they do not strongly influence energy policy.

Energy Policy

“Energy policy” is a new concept. It covers all phases of the energy industry and includes the supply of fuels and their transformation into energy; the distribution and end use of fuels and of electricity; and research into and development of each of these activities. Energy policy is nonetheless difficult to understand, create, and implement because the demand for energy is not directly determined by consumers or by the government as something desired in itself. Rather, energy is demanded because it is needed to produce goods, run machines, and supply transportation. Similarly, on the supply side, material that can be used as fuel has alternate uses: oil can be transformed into petrochemicals, coal into synthetic fibers, natural gas becomes ammonia and fertilizer, and fissionable material can be used for medical treatment and agricultural research. The supply of each material for fuel narrowly depends upon whether the material is best used as fuel or as a different product. Moreover, each fuel source and fuel use has environmental costs, which should be included in setting energy policy.

Broadly, funds should be invested in supplying fuel and energy only if this is more desirable than other activities on which the funds can be spent, such as building hospitals or factories. In addition, energy policy is influenced by political questions regarding foreign sources of fuel and technology and by the more complex problem of nuclear non-proliferation. A nation’s energy policy therefore is derived from its broader economic and political goals and is not an independent entity.

These goals vary among Latin American nations; therefore, their energy policies differ. Although a number of Latin American subregional energy policies and agreements exist, a unified “Latin American energy policy” has not emerged. To some extent this reflects the fact that Latin American nations’ energy policies are often formed in reaction to the actions of stronger nations, and that their policies are often set on an ad hoc basis as new opportunities emerge.

United States Actions and Latin American Energy Policy

United States’ energy policy is of great importance to Latin American nations because of the United States’ dominant position as a purchaser of petroleum and as a supplier of technology. Some believe that the United States has no consistent energy policy; others argue that the United States has both wanted to increase its oil imports and to restrict nuclear energy development, leaving lukewarm backing of solar research as the major bilateral venture in which the United States is willing to assist developing nations, although aid for development of other energy sources is given through multilateral organizations.

The United States' anxiety over fuel supplies gives Latin American nations the option of tying delivery of fuel to concessions in other areas; it also feeds fears that the United States will force Latin American nations to supply it with oil, in amounts and at times set by the United States, regardless of the producing nations' preferences or needs. In this view, Latin American nations are forced to undertake rapid development of oil for the United States, and of non-oil fuels for themselves. And, since United States energy policy shifts rapidly, making purchase of natural gas and delivery of enriched uranium uncertain, Latin American nations have tried to diversify their partners in fuel and energy trade.³ They are also considering the strategy of using several nuclear technologies, supplied by different nations, rather than that of obtaining the savings attendant on using one technology throughout the nuclear industry, for fear of the disruption that could be caused if the only source of nuclear fuel were to be cut off. Mexico is currently evaluating several different nuclear reactor proposals.

Reactions to United States Policy: Mexican Leadership

The anxiety over United States' actions in energy policy are part of the larger concern of how world income is to be divided. In the case of income from energy, Venezuela and Ecuador have joined the OPEC cartel of petroleum suppliers, while Mexico has followed its lead in pricing oil. It is now realized that OPEC has not always been a successful cartel: the price of goods bought by oil producers has risen more rapidly than the price of oil, leading to world-wide inflation.

In order to achieve peaceful and noninflationary distribution of world energy supplies and incomes, Mexico has suggested the appointment of a working group, composed of representatives of petroleum producing, industrialized, and developing countries, to prepare documents on specific proposals. These would be designed to guarantee the sovereignty of each nation's natural resources; rationalize the exploration, production, distribution and consumption of present energy sources; ensure the systematic exploitation of potential resources of all types; and enable all nations to draft energy plans compatible with world policy. They also would devise measures in developing countries for the promotion of auxiliary industries; guarantee current oil supplies in developing countries; set up financing and development funds to meet long-term and urgent needs of developing and importing countries; institute a system for disseminating technologies; and support the establishment of an international energy institute.

The Mexican proposals have been nominally accepted rather than practically implemented. Despite their excellence, they are unlikely to

gain many adherents because rich oil-consuming nations dislike the prospect that poor nations will insist that the rich consume less, in order to save resources for the poor; and because oil producers will not cede current income for uncertain future benefit until cartel actions consistently fail. Moreover, most United States politicians act as if they believe that they will lose fewer votes if reductions in energy consumption result from either price changes or national policy than if they result from concessions made at international bargaining tables.

The Mexican proposals are interesting as evidence that Latin American energy proposals are launched not only on their own merits, but also as tactics in jockeying for leadership of Third World nations. Mexico's leadership in keeping Latin America free of atomic weapons and in using natural gas for an aluminum smelter which will help Jamaica's troubled bauxite economy are other energy policies that are based more strongly on political than on economic considerations.

Responses to the Energy Crisis

The Mexican example underscores the many different ways in which the energy crisis is perceived, met, and used as a weapon in Latin America. This theme is the focus of "Coping with Energy Shocks in Latin America: Three Responses" by James Street, who believes that the shock of the 1973 oil crisis was as important for Latin American development as that of the Great Depression. He says that "the brunt of the energy shock has been borne by the poor and the working classes" and has called forth distinct political responses. The first effect of the oil crisis was a fall in the real growth rate and a decline in the per capita output of non-oil exporting Latin American nations. Inflation, balance-of-payments deficits, and large increases in foreign public debt characterized these countries. The energy crisis had its effects not so much through "brown outs" or "black outs," which would have occurred if there were major shortages in the physical supply of fuel and electricity, as through the shortage of foreign exchange to pay for goods other than oil. Thus, Brazil reduced many programs to free funds for exploration for oil and for development of alternative sources of energy. In late 1979, she renewed her efforts to improve the nation's economic structure and considered ways of aiding poor workers.

Venezuela, on the other hand, initially benefitted from the oil price rises of 1973 and 1974 and used its oil income both to finance internal development and education projects and to assist some Central American and Caribbean nations. The oil boom led to domestic inflation and increased food imports. Venezuela did not use its oil wealth to improve its economic structure or income distribution and now faces a

continuing balance-of-payments deficit. Its ability to export oil in the future may be limited because oil reserves from easily exploited fields are expected to run out within a generation.

The Mexican response to the oil crisis is especially interesting as Mexico was recently transformed from an oil importer to an exporter, with possibly giant reserves. Mexico at first experienced the economic dislocation typical of Latin American oil importers; consequently, migration to the United States increased and the peso was devalued. Under President López Portillo (1976–), Mexico exported oil to alleviate the recession and planned to use oil revenues to finance the National Development Plan, which focuses on creating renewable sources of wealth to supplement nonrenewable oil. Continuing efforts are needed to increase agricultural productivity and employment, as is emphasis on science and technology to provide the “human capital” needed to supply the skills called for by the National Development Plan.

Energy Planning

The implementation of national energy policies requires careful management of each country’s energy sector. Nations attempt to reduce the effects of uncertainty surrounding the price and availability of energy through planning. In “Energy Planning in Latin America: A Brief Review of Selected Countries,” T. Owen Carroll, Romir Chatterjee, and Vinod Mubayi survey patterns of energy use of commercial and non-commercial fuels and provide an overview of institutional arrangements both for the energy sector in Brazil, Costa Rica, Peru, Jamaica, and Colombia, and for regional energy planning in the Organización Latinoamericana de Energía (OLADE) and the Caribbean Regional Economic Community (CARICOM). They present the advantages of integrated energy planning by examining Peruvian plans for the energy sector, which are evaluated in the context of Peru’s development objectives and trends.

Carroll et al. analyze the bases for and the implementation of energy policies and state that an evaluation of alternative energy strategies can be carried out using a Reference Energy System, which examines future energy resource requirements in relation to alternative patterns of sectoral demands. This evaluation is necessary because of the ten to fifteen years required to develop new sources of energy, during which time it is essential to understand the interdependence of energy and economic development. The authors describe currently available training programs for energy management which will increase a nation’s abilities to carry out energy planning and evaluation.

*Regional Development, Institutional Information, and Energy Data Sources**

Carroll et al. mention that regional energy agreements are not carried out by regional organizations such as OLADE. Instead, they are made by the nations immediately concerned. J. Eliseo da Rosa (Indiana State University, Evansville) analyzes the economics of a regional 22.6 million KW hydroelectric project to develop the Paraná River Basin in "The Economic Determinants of Hydroelectric Power Development on the Paraná River by Argentina, Brazil, and Paraguay." He focuses on the solutions to the problems of optimality in production and fairness in the distribution of the gains that have been reached in the bilateral negotiations between Brazil and Paraguay for the hydroelectric plant at Itaipu, and between Argentina and Paraguay for the plants at Yacyretá and Corpus. He explores the nature of water as a "common pool" resource and of the rent that should be paid for water as a guide to evaluating the treaties governing the hydroelectric development of the Paraná.

Binational agreements are only one of the many forms of regional cooperation in energy development. Herman House prepared an "Estudio preliminar sobre el establecimiento de una red de información de energías no convencionales en América Latina," available from CEPAL, in which he indicates that nonconventional energy is of particular importance for rural dwellers who cannot be supplied from national energy grids. It can be provided from biomass and by the development of hydrogen electricity systems, which facilitate the use of electric vehicles. Isolated efforts to develop these sources have been undertaken in a number of nations, and should be supplemented by an information network for nonconventional energy sources which should provide documentation and include the exchange of information and experience, as well as subsystems for each technological field and energy in general. The formation of this network should make it possible to determine which tasks in the development of nonconventional energy sources are best undertaken within a nation, and which should be undertaken on a regional or international basis.

The development of energy policy in Latin America is influenced by many international agencies. In "The Role of International and Regional Organizations in Latin American Energy Development," Margarette K. Luddemann (Georgetown University) and Laura Randall (Hunter College, CUNY) survey the activities of the agencies which have the largest energy programs: the World Bank; the Inter American Development Bank; UNESCO, FAO and ECLA; the Organization of American States; OLADE; the Energy Project of the Central American

*The papers by da Rosa, House, Luddemann and Randall, and Doernberg and Garcia were written as part of this Symposium but could not be published due to space constraints. Copies of the papers may be secured from their respective authors.—Ed.

Isthmus; the Organization for Economic Cooperation and Development; the European Economic Community; the OPEC Special Fund; and the Latin American Economic System.

Many national and international organizations provide energy data for Latin America. "Energy Data Sources for Latin America," by Andres B. Doernberg (SUNY at Stony Brook) and Elisa Garcia C. (SUNY at Stony Brook), is an annotated bibliography of the publications of these organizations. The authors also survey several energy publications and provide a bibliography for the energy situation of Mexico, Peru, Argentina, Costa Rica, and the Dominican Republic. They discuss the kinds of data needed for analysis of energy demand and resources and indicate the ways in which energy data in Latin America need to be improved. Readers interested in Central American energy perspectives should consult the "Lista de Documentos del Subcomite Centroamericano de Electrificación y Recursos Hidráulicos" and the "Lista de Documentos Cepal/Mex"; Latin American coverage is provided by the publications of CEPAL on Latin American energy, which will help to provide continuing insights into Latin American energy policy.

Conclusions

Although a unified Latin American energy policy has not yet been formed, there is a Latin American concern with energy issues that has changed the ways in which specialists in development perceive Latin America. During World War II, shortages of energy limited the growth of Argentina and Brazil. These shortages were viewed as temporary bottlenecks, rather than as a central issue of national development. Further, energy was considered important for industrializing nations, and much of Latin America was thought to be essentially rural. In the United States, land reform, the desire for nominally democratic anti-Communist regimes, the need to limit the government's role in the economy and to limit inflation were thought to be key Latin American issues. In Latin America, the need to change economic structure at home and to improve the terms Latin America obtained abroad was thought to be the key to economic progress. In time, the technical analysis became increasingly complex. And oil was mainly the concern of nations who found their export revenues slipping as oil prices fell.

All of this dramatically changed when oil prices rose. This time, however, much of Latin America was industrializing and affected, and so were industrial nations. The greater importance of energy to Latin America and more complex analysis of the domestic and international consequences of fuel and energy availability, price, and conditions of exchange have created a new focus for the analysis of key issues. This focus is energy policy.

NOTES

1. Studies of national energy policy for individual Latin American nations are not included here, since several have recently been published. See, for example, Kenneth Paul Erickson, "Brazil," and Laura Regina Rosenbaum Randall, "Mexico," in Kenneth R. Stunkel, ed., *National Energy Profiles* (New York: Praeger, 1981); Jerry R. Ladman, Deborah J. Baldwin, Elihu Bergman, eds., *U.S.-Mexican Energy Relationships* (Lexington, Mass.: D.C. Heath and Co., 1981); Luis Claudio de Almeida, "El modelo energético de Brasil," Bruno Philippi, "Síntesis de la situación energética de Chile," and Raúl Espinosa, "El rol de la empresa privada en el desarrollo energético de Chile," in Heraldo Muñoz, *Desarrollo energético en América Latina y la economía mundial* (Santiago de Chile: Editorial Universitaria, 1980).
2. See Laura Randall, "Determinants of Oil Production in Latin America, 1960-1975," forthcoming. Preliminary results indicate a significant (.01) relationship between crude oil output, changes in profit by sector, and international reserve levels, which explains well over 90 percent of output when appropriate international prices are used to construct oil profit estimates.
3. A recent example is Brazil's sale of fuel alcohol for gasohol to a United States firm. The sale was needed because of delays in the production of Brazilian vehicles which burn gasohol. This left Brazil with a surplus of fuel alcohol. According to Stuart Miehler, the result was American protests that the imports put the United States "in the awkward position of substituting our national dependence on petroleum for a dependence on foreign fuel alcohol." The United States Department of Energy issued a preliminary order barring the United States firm from mixing a new allocation of gasoline with Brazilian alcohol (*Wall Street Journal*, 18 June, 1980, page 15).

Another observer, however, attributes the U.S.D.O.E. move to the allegation that the Brazilian export price of fuel alcohol was below the price at which that product sells in Brazil, so that imports of the product to the United States would constitute "unfair competition." In this case, fuel imports depend upon trade rather than energy policy.

the industrial connection

achievement & the family in developing societies

bernard c. rosen

The family will survive the industrial age, but in what form? Drawing on a quarter century of research on the impact of industrialization upon developing societies, Rosen presents a controversial argument that extends into such matters as productivity, fertility, the status of women, the goals of education, and other social issues. The new individual achiever is modifying the world we live in, but his orientation to success may prove to be a strong underpinning for the survival of social institutions and the family amid social change.

Rosen bases his theories on data accumulated over the past twenty-five years from an ongoing research project in Brazil, which he finds to be a paradigmatic industrializing giant. The result is a history of the "modern" family, surveying "The Great Transformation" caused by industrialization and urbanization, but focusing on more recent changes in kinship groups, marital interaction, sex roles, childbearing and rearing patterns, and human development. The impact of migration and the new competitiveness on the young family is revealed to be part of a complex network of pressures and rewards as important to the formation of new values as to the metamorphosis or destruction of the old.

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