Energy and Development in South America: Conflict and Cooperation

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With Jessica Varat

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Front Row L-R- Colombian President Álvaro Uribe, Chilean President Michelle Bachelet,
Bolivian President Evo Morales, Venezuelan President Hugo Chávez,
Brazilian President Luiz Inácio Lula da Silva

Back Row L-R- Uruguayan Vice-President Rodolfo Nin Novoa,
Ecuadorian President Rafael Correa, Guyanan Prime Minister Samuel Hinds

Oil Rig in Stormy Sea © Steve Bloom/Getty

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Contents

Energy, Development, and Regional Integration

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This paper provides an overview of three general themes: 1) the relationship among energy, development and institutions; 2) the history of energy cooperation and integration in Latin America; and 3) the major obstacles to further energy cooperation and integration in the region. A key variable that emerges in each of these subject areas is the institutional context within which energy policy is made. This institutional context is a key determinant of whether or not energy policy contributes to development and promotes stable regional integration.

ENERGY, DEVELOPMENT, AND INSTITUTIONS

Abundant and competitively priced energy is a key infrastructural element which attracts industry and a modern service sector and facilitates further natural resource extraction. While promoting economic development, the energy sector itself is very capital intensive and not a major generator of employment. Energy is a fundamental component for any improvement in social welfare and health. Energy promotes education by facilitating studying after dark and making it possible for children to attend school rather than gather water or wood for fuel. The contributions of energy to health are multiple: cooking indoors with cleaner burning LPG or natural gas produces fewer respiratory diseases than traditional fuels and makes it more likely that water will be boiled, thus reducing water borne illnesses; electricity permits health clinics and hospitals to function around the clock and access the internet to expand the diagnostic capabilities of local doctors; public health information for disease prevention and treatment can be disseminated more broadly through radio and television.

Table I, indicating access to electricity in 2005, demonstrates that the level of access to electricity shows quite a bit of variation among Latin American populations, closely coinciding with social and economic situations. In Argentina, 95 percent of the population has access to electricity, but in Bolivia, only 64 per-

TABLE 1. ELECTRICITY ACCESS IN 2005: LATIN AMERICA
At end of 2006 (billion barrels)

	Electrification Rate	Population without electricity million	Population with electricity million	Source
Argentina	95.4%	1.8	37.1	GNESD (2004), ECLAC (2002)
Boliva	64.4%	3.3	5.9	ECLAC (2003), OLADE (2002)
Brazil	96.5%	6.5	179.7	ECLAC (2003)
Chile	98.6%	0.2	16.1	APERC, ECLAC (2003)
Colombia	86.1%	6.3	39.2	ECLAC (2003)
Costa Rica	98.5%	0.1	4.2	ECLAC (2002)
Cuba	95.8%	0.5	10.9	OLADE (2002)
Dominican Republic	92.5%	0.7	8.2	DHS (2002), OLADE (2002)
Ecuador	90.3%	1.3	11.9	ECLAC (2002)
El Salvador	79.5%	1.4	5.5	GNESD (2004), ECLAC (2004)
Guatemala	78.6%	2.7	9.8	ESMAP (1988/1999), DHS, OLADE (2002)
Haiti	36.0%	5.5	3.1	DHS (2000), Engineers Without Borders (2004)
Honduras	61.9%	2.7	4.4	ECLAC (2003)
Jamaica	87.3%	0.3	2.3	OLADE (2002)
Netherlands Antilles	99.6%	0.0	0.2	IEA estimate
Nicaragua	69.3%	1.7	3.8	ECLAC (2002), DHS (2001), Global Environment Facility (2001)
Panama	85.2%	0.5	2.7	OLADE (2000)
Paraguay	85.8%	0.9	5.2	OLADE (2002)
Peru	72.3%	7.7	20.2	ECLAC (2004)
Trinidad and Tobago	99.1%	0.0	1.3	OLADE (1997)
Uruguay	95.4%	0.2	3.3	US Commercial Service (2005)
Venezuela	98.6%	0.4	26.1	ECLAC (2003)
Other Latin America	87.3%	0.4	2.9	IEA estimate
Lantin America	90.0%	44.9	404.3	

cent and in Honduras, 62 percent have access. The rates drop as one moves further down the development ladder. In Haiti, the poorest country in the hemisphere, a mere 36 percent of the population has electricity.

Institutions affect the broader societal and governmental context within which oil and gas markets function. For producing countries, the most prominent development issues revolve around the "resource curse." This term describes a country that is richly endowed with valuable natural resources and still remains a poor country. Why? The abundance of valuable natural resources creates incentives for rent-seeking behavior and corruption on the part of government, the private sector, and even consumers, thereby disrupting the ability of a government to function efficiently and effectively. But—as the experiences of Norway, Great Britain and the United States demonstrate—the resource curse is not inevitable. What determines whether or not a country falls victim to the "resource curse" is institutional. Transparent and accountable institutions of government minimize both rent-seeking behavior and corruption.

The politics of developing useful institutions must be analyzed at the domestic, regional, and global levels. The institutional context within which energy is developed nationally and traded regionally is a fundamental determinant of the relative prices of distinct energy sources; the institutional context therefore affects demand for and investment in specific sources of energy. It is important to keep in mind that oil and gas have competitors in the market place. One of the factors that affects the use of natural gas—even though it is a cleaner fuel than its chief competitors for power generation (diesel and coal) or for home heating (wood)—is its ability to compete in terms of price with those alternative sources of energy. In a country like Brazil, the availability of hydroelectric power is a major determinant of the demand for natural gas, because the consumer price of electricity generated from hydroelectric power is so cheap. If nuclear power plant construction proceeds in Brazil, Argentina, and Chile, and if the energy produced does not reflect the real cost of construction and disposal, then the demand for natural gas and petroleum in the Southern Cone will also be affected.

REGIONAL ENERGY COOPERATION AND INTEGRATION

The issue of energy integration in the region arises because there are geological and economic factors that should lead to greater integration of Latin America's energy sectors. Geology and nature have given different parts of the region an abundance of natural endowments that can be used to produce energy: rivers for hydroelectric power, petroleum and natural gas deposits, biomass, and even

coal. Coal is not often part of the discussion, even though coal is in the background as a major energy source for the region. Colombia is a world power in terms of coal and there is technological development in the area of 'clean coal'. When Chile became concerned about the cutoff of gas supply from Argentina, one of the alternatives was to turn its power plants into coal-fired plants.

The major economic factor stimulating efforts to promote energy integration is not efficiency (as it might be in the case of the United States and Canada) but rather, disparities in levels of economic development. Many of the largest and fastest growing economies in the region (Brazil, Chile, and now Argentina) have lacked domestic sources of energy to fuel continued growth. However, many of the countries with high levels of poverty (Bolivia, Ecuador, Peru and Venezuela) have a surplus of easily accessible energy resources. It seems natural to expect that it would be to the mutual advantage of all parties to develop a regional energy market. Perhaps once these economic development drivers create a regional market, efficiency considerations may modify the way that market functions, but the current driver is definitely the search for economic growth.

Despite the availability of resources, however, the region is unlikely to be self-sufficient in energy. The trajectory for economic and population growth indicates that the regional demand for energy will continue to grow. But the disparities in access to energy and the domestic institutional context within which energy policy is made suggest that regional production will not be sufficient to meet that demand.

Because there has been energy cooperation across the region, integration does not start from ground zero. Venezuela has made concessionary sales of petroleum to the Caribbean and Central America, as has Mexico to Central America. There are cross-border investments in the energy industry as well, as reflected, for example, in Venezuela's investment in an oil refinery in Nicaragua. Countries are also cooperating in developing the infrastructure to deliver energy. The *Plan Pueblo-Panama* from Mexico to Panama is a treaty with some component parts that have already been implemented. An initial phase linking the Guatemalan and Mexican electrical grids is already under construction, with the Mexican side completed and the Guatemalan scheduled to come on line in late 2008.

Table II presents data on power imports and exports, revealing that some energy integration has already taken place. In 2002, Argentina was already exporting power to Brazil, Chile, and Uruguay; Colombia to Ecuador and Venezuela; Paraguay to Argentina and Brazil; Uruguay to Argentina; Venezuela to Brazil. Power is a very important component of energy integration because energy is useful to the extent that it is turned into power that can be used. If a country can export power, it is generating value-added to its primary resource.

TABLE 2. SOUTH AMERICAN POWER IMPORTS AND EXPORTS 2002 (GWh)

FROM / TO	Argentina	Boliva	Brazil	Chile	Colombia	Ecuador	Paraguay	Peru	Uruguay	Venezuela	Total Imports
Argentina							6143		1908		8015
Boliva											0
Brazil	751						35443			416	36609
Chile	1768										1768
Colombia											8
Ecuador					56						56
Paraguay											0
Peru											0
Uruguay	559										559
Venezuela					549						556
Total Exports	5299	0	0	0	618	74	42336	0	1909	423	

Source: Business News Americas, "Energy Integration in Latin America"
Note: Differences between totals and individual figures are from rounding figures off.

Integrating electricity markets is much more challenging than integrating raw materials. Consider, for example, the case of Chile. When Argentina began reducing its natural gas exports to Chile in 2004, the Chileans had an adjustment problem: they had to figure out how to run their power plants without natural gas from Argentina. More expensive and more contaminating options existed; diesel, coal, etc. But consider what would have happened in Chile if, rather than importing gas from Argentina via pipeline to run power plants in Chile, the power plants themselves were located in Argentina and the transmission lines came from Argentina into Chile. If, because of domestic considerations and priorities, the Argentines decided not to fuel the power plants that sent electricity to Chile, Chile would have had a much more difficult time substituting for imported power. Consequently, power integration is a much more delicate, intimate, and deeper level of integration. It is thus more problematic, particularly when countries have a variety of options at their disposal.

South America is crisscrossed by natural gas pipelines. The first transnational pipeline was from Bolivia to Argentina in the early 1970s, a point at which Bolivia sold large volumes of natural gas to Argentina. In the 1980s, however, Argentina deregulated its domestic market, attracted capital into the sector, and discovered that it had significant amounts of natural gas. Consequently, Argentina did not need any natural gas from Bolivia. Partly as a result of countries' search for self-sufficiency, and partly as a result of the political instability of exporters of energy, markets have been experiencing a great deal of fluctuation.

The new situation in the 1980s created tensions between Bolivia and Argentina. First came price revisions, as the Argentines insisted that Bolivia lower its prices to levels prevailing in the deregulated Argentine market. Disputes then erupted over volume when Argentine production not only supplied the domestic market but also produced a surplus for export. Rather than understanding that the market for natural gas had undergone a dramatic shift, Bolivians felt exploited by their neighbor.

The progress of regional energy integration has slowed since 2004. Amid great fanfare, the *Gran Gasoducto del Sur* linking Venezuela with Argentina, with touted benefits for all countries in between, was proclaimed to be a major step forward in energy integration. The project was never economically viable, and in 2007 Venezuelan President Hugo Chávez, the principal force behind the project, announced that he understood that it would not go forward.

The failure to move ahead on the Gran Gasoducto is illustrative of the on-and-off energy relationship between Brazil and Venezuela. There has been a great deal of discussion about the two countries working together, spurred on

by President Chávez and Brazilian President Lula da Silva. Initially, the two countries were going to collaborate on a re-gasification plant and a refinery in Brazil, and Brazil was going to invest in the Mariscal Sucre gas field in Venezuela. But Brazil has commenced work on the re-gasification plant and refinery without Venezuelan participation, and Petrobrás has announced that it will not be investing in the Venezuelan gas field.

Bolivia and Brazil have also experienced a great deal of uncertainty in their energy relationship. In 2006, Bolivia nationalized its natural gas fields and dramatically increased its share of the royalties from non-Bolivian companies operating in Bolivia—both national oil companies (NOCs) and private international oil companies (IOC's). State-owned NOCs are thus not immune from the effects of changing contracts, and have many of the same kinds of concerns as IOCs do with respect to foreign investments.

Brazil's developing gas market at home, some deregulation of its energy sector, and Bolivian nationalization of the oil and gas fields and refineries stimulated new investments in Brazil's oil and gas sector. The result is that Brazilian hydrocarbon discoveries have been constant and large, investment in alternative fuels has grown, and the country is developing a capacity to import liquefied natural gas (LNG) from other countries in the region (Trinidad and Tobago, possibly Venezuela) and beyond (West Africa, the Middle East, and Southern Asia). This evolving energy picture affects the Bolivian-Brazilian energy relationship: Petrobras has gone from being a major investor in Bolivia, to freezing investments, to re-entering the Bolivian market in order to relieve short-term supply problems.

Two more problematic energy relationships are those of Argentina-Chile and Bolivia-Argentina. In the end, Argentina was unable to meet its contractual obligations to Chile and violated a state-to-state treaty between the two countries that guaranteed the Chilean market national treatment (that is, the Chilean market would be treated as if it were the Argentine market). Bolivia also is unable to meet its contractual obligations to supply gas to Argentina. Bolivia does not produce enough gas to honor its contractual obligations with both Argentina and Brazil. And despite the fact that Argentina pays a higher price for Bolivian gas, Bolivian authorities opted to drastically cut exports to Argentina in order to fulfill the entire volume stipulated in the contract with Brazil. These Argentine and Bolivian decisions send one more signal to the marketplace that the credibility of contracts in the region is very low. The questions today for the governments and private investors of consuming countries are not whether the resources are in the ground, or not even whether price will direct the flows, but whether those resources will get into the market according to contractual obligations.

CHALLENGES TO CONTINUED COOPERATION AND GREATER INTEGRATION

The chief challenges to expanded regional energy cooperation arise in the areas of investment, the distribution of economic rents, the relationship between the export and domestic markets, regulatory regimes, and the use of energy as a foreign policy tool.

Investment capital today, both public and private, is available and interested in the region's natural resources, but that availability and interest are unlikely to persist in the medium to long term. As the U.S. economy begins to decline, it will have a negative impact on the global economy, which in turn will have a negative impact on the availability of capital for developing countries. A U.S. recession will also drive down energy prices, thereby reducing the ability of energy producing countries to invest at home, including in their own energy sectors.

In the short term, there is a window of opportunity in terms of the availability of capital for expanding energy resources. The question concerns the mobilization of that capital for the sustainable long term development of the region's resources and development.

What is the fair *distribution of the economic rents* associated with the production of energy? Analysts, governments, and citizens in the region used to ask whether those rents would go to a Latin American government or to an international company. In the current context of increased regional trade, the distribution question affects not only IOCs and privately owned Latin American companies but also internationally active NOCs, that is, Latin American governments buying and selling to each other. The issue of rent distribution also affects the vulnerability of supply: if a country is demanding a distribution of rents that is out of sync with what the markets suggest is an appropriate distribution, then that country is not going to attract the investment necessary for exploration, production, and transportation of that energy. If a country is not able to attract investment, it ends up not being able to supply its contracts (e.g., Argentina and Bolivia).

A related export issue is whether natural gas rich countries will export the raw material (the gas itself) or value-added products. This is an important question in Bolivia. For decades, Bolivians have been talking about "industrializing" the gas (turning it into petrochemicals, electricity, etc). The problem is that other Latin American countries do not want to pay Bolivia the price of value-added products. They would rather add that value in their own countries. In addition and as highlighted earlier, the vulnerabilities are greater if a country imports a value-added product such as electricity rather than the resource, such as gas, itself.

The relationship between the export and domestic markets is another key issue for regional integration. Energy exporters seek to use their energy to generate revenues in order to develop their economies. However, energy exporting countries frequently find themselves debating whether it is better to export the resource and then use the resulting income, or to guarantee a particular level of supply for domestic use and only export the surplus. Giving the domestic market priority over exports creates a situation in which Latin American importers become vulnerable to the domestic energy policy decisions of Latin American exporters. Price can be the driver of giving priority to domestic supply. In Argentina, low domestic prices have decreased exploration and production, producing supply shortages. The Argentine government has thus cut supplies to Chile in order to mitigate the impact of shortages at home.

An undeveloped market at home can also be a factor behind giving priority to domestic consumption. Bolivia's *altiplano*, where the majority of the indigenous population lives, receives little natural gas. To remedy this situation, the government has sought to build a gas infrastructure, offsetting costs by guaranteeing a flow of gas supplies. But in the current context of inadequate exploration and production investment, political decisions to develop the domestic market clash with Bolivia's commitments to supply energy to its Latin American neighbors. As noted above, Bolivia is behind in meeting its contractual obligations to Argentina, even though Argentina pays the highest prices for gas.

Emphasizing domestic priorities over regional markets is rooted in an historical sense of exploitation. For example, Venezuela was an energy giant in the 1970s and '80s, but most of the Venezuelan population failed to benefit. Whether due to the "resource curse" or not, the reality is that there are enormous numbers of very poor people in Bolivia, Ecuador, and Venezuela. It is thus understandable that in new periods of democracy, citizens say that they want these resources to be used for domestic development first. That, then, raises a challenge: how can resource nationalism be harnessed in support of regional energy cooperation?

A key issue for regional integration and cooperation concerns the reliability of supply. If a supplier decides to emphasize and give priority to the domestic market, the importing country loses control over how much energy will be available for purchase. Suddenly, the importing country is faced with a situation in which it gets what is leftover. If nothing is leftover, the importer gets nothing, regardless of any contract that might exist.

Regulatory regimes affect investment; therefore they affect the security and volume of supply. Appropriate regulatory regimes give the regulator a degree of auton-

omy from the demands of vested interests and governments. That independence provides confidence to all parties that the basic supply and price terms of the energy contracts will be respected. Unfortunately, in many producing countries of the region the regulatory function is underdeveloped and often in the hands of Ministries of Energy or Finance and thus subject to political pressures and manipulation. The consequent uncertainty discourages investors, thereby slowing the development of a regional market.

Regulatory regimes also affect contracts directly, often by unilaterally altering the terms under which private investments were permitted. The concern for investors is not whether the contracts will be subject to renegotiation: when there is a dramatic fluctuation—either an increase or a decline—in price, companies (whether they are NOCs, international oil companies, or local private companies) know that the old contracts are not sustainable. What NOCs and international oil companies do not want is to renegotiate a contract and then thirty days later have to renegotiate it again, and six months later have to renegotiate yet again. That is simply too much uncertainty around investments that are, after all, enormous. It is also too much uncertainty for governments, whether they are exporters depending on the generation of income, or importers needing to generate power. Massive uncertainty is deeply corrosive to the energy trade. Regional energy integration thus requires the development of better and stronger regulatory regimes.

Using energy as a foreign policy tool constitutes another obstacle to regional energy integration. This issue relates not only to the non-market terms on which energy may be sold, but also to the non-market terms for gaining access to supply an energy market. When access to energy exports and energy markets are linked to specific behavior by governments, governments are forced to consider not only the cost of that specific energy resource but also the cost of changing the country's foreign policy. If we assume that governments adopt foreign policies that best meet the needs of the political coalitions supporting the government, then any changes to those policies will require costly political adjustments at home. This added political cost could make imported energy less competitive with alternative sources and thus slow regional integration.

CONCLUSION

Whither energy cooperation and integration in Latin America? Security of supply is not an issue only affecting the United States. Latin American countries also have concerns about the security of their imported supply, and have turned increasingly

to domestic exploration, extra-regional LNG imports, and potentially, nuclear energy. Assuring energy security in Latin America means that energy integration will be global, not just regional in scope.

Latin American energy importers are unlikely to pay more for energy imports simply because they come from a poor neighbor. It is desirable to make concessionary sales an element of the regional dynamic, but an energy integration scheme cannot be built around the idea that through energy, governments and consumers will be providing aid. A central question concerns whether or not Latin American energy exporters will be competitive in an increasingly globally integrated energy market. Bolivia, for example, may actually lose some of the great advantages it had five years ago in the region.

The global integration of energy markets also raises challenges to countries like Ecuador and Venezuela. They will be competing for regional energy markets with international suppliers who offer more stability. When energy security is a concern, stability is something for which consumers are willing to pay.

The fundamental energy question confronting the region today is whether regional energy integration in Latin America will be driven primarily by political agreements or by market relationships. Each of these drivers generates its own problems. If energy integration is driven by political agreement, then the challenge for both investors and importing countries is the credibility of those political agreements in a context of economic or political volatility. For example, in 2001–2002, the problem in Argentina regarding the security of exports was not initially one of political will, but rather the collapse of the Argentine economy. That set into motion a number of political and economic reactions that neither Chile nor Argentina had foreseen when they signed the treaties in the 1990s that ostensibly provided Chile with guaranteed access to Argentine gas. In cases such as Ecuador and Bolivia, where over the last decade multiple presidents have been forced out of office by demonstrations in the streets, the credibility of political agreements will be low. How can an importing country confidently develop its energy policies based on the promised future behavior of the Bolivian and Ecuadoran governments? Energy integration affects the entire energy matrix and energy infrastructure, all of which entail large investments and big gambles. The reliability of political agreements is thus crucial.

Market relationships generate their own challenges. If energy integration is based on a regional market, the implication is that countries will not give priority to their domestic market. The market of a neighboring country will have the same priority as the domestic market because both countries are part of a regional market and energy flows across national borders.

But the marketplace does not meet demand; it meets *effective* demand,[1] and many people in Latin America do not have effective demand for energy. Thanks to democracy in its various forms across the region, those without effective market demand have effective political demand. Thus, it comes as no surprise that the region's energy exporters are seeking to rapidly and dramatically increase access to the benefits of energy (power, employment, social welfare, and wealth). Market relationships as a result need to adjust.

Who will pay the cost of delivering access to the benefits of energy to disadvantaged social sectors? Do consumers in Latin America's importing countries foot the bill via ever higher prices? This increases the likelihood that importing countries will substitute energy sources and diversify their energy matrix, thereby diminishing the long-term wealth to be generated from the exporting country's energy supplies. Or do the resources for improving access come from a reassessment of the budget priorities of the exporting country, which in turn means that some domestic programs and sectors will see their relative share of the budget decline? Put simply, the question is whether the resources to expand market access to disadvantaged sectors will come from selling energy to neighboring countries at a higher price, or whether the resources will come from the national government using money from its own treasury—wealth that has been earned through energy exports—for domestic investment. The answers are neither easy nor self-evident.

NOTES

1. Effective demand refers to the idea that one must have money or other assets (purchasing power) or some product to sell in order to make demand *effective*. [Ed.]