

FALL 2015

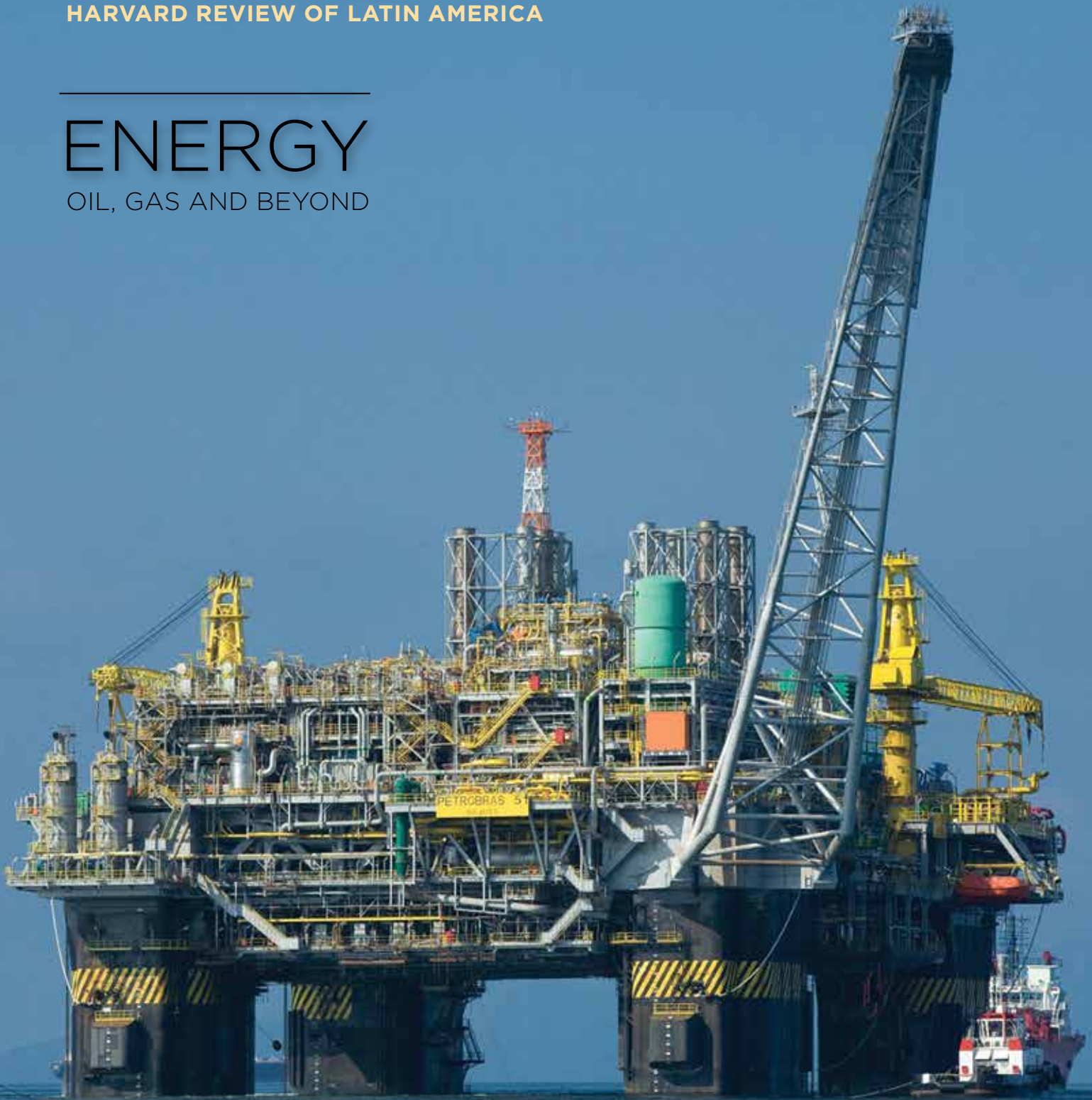
# ReVista

HARVARD REVIEW OF LATIN AMERICA

---

## ENERGY

OIL, GAS AND BEYOND



## Oil, Gas and Beyond

I was waiting for the ship to come in. In fact, so was everyone else in Nicaragua. Gas lines stretched around the block. The supermarket shelves were nearly bare. Lights went out again and again, plunging the country into frequent darkness. Telex machines couldn't work, and we reporters had to depend on the few places with generators to file our stories (for younger readers, this was pre-computer and smart phones). U.S. President Ronald Reagan had imposed a trade blockade on Nicaragua in May 1985. The Soviets were sending oil, dodging the blockade.

We reporters did what we always do: we reported on the ship's arrival. But we also breathed a collective sigh of relief. The arrival of the Soviet ship meant hot showers and light to read by.

Energy is intensely political. It shapes nations and trade and fuels wars and blockades. Energy, I discovered then, is also intensely personal. It shapes our lives on a daily basis. It's not only a matter of how we get around or whether we have enough food to eat; energy production affects the communities that receive it and those that produce it. It shapes attitudes toward gender and race and nationalism and identity. It pollutes the air and the rivers. It offers immense economic opportunities. Or it does both.

You might not think of Latin America and the Caribbean right away as a big energy producer or consumer. But Venezuela stands ninth in global oil production with gas reserves almost triple those of Canada. Three countries—Venezuela, Brazil, and Mexico—account for about 90 percent of the region's oil production. And Latin America and the Caribbean also have the capability to provide abundant alternative and renewable energy sources: wind, solar, geothermal and biomass, among others.

Perhaps because of my experience in Nicaragua, I started to conceive this issue in terms of meta-politics. And there is certainly a lot of politics related to energy in the region: the political upheaval of Brazil as a result of corruption scandals in the national oil company; the turmoil in oil-rich Venezuela; the impact of the semi-privatization of Mexico's oil industry; the targeting of Colombia's energy installations by guerrilla forces in a show of strength in the context of the ongoing peace process.

But then I thought back on how the arrival of oil had been experienced on a very local and personal level. I began to hear stories about the production of energy: what it felt like to grow up in an oil camp, how energy production affects indigenous women in one particular region, how local communities involve themselves in deciding what is done with oil.

And just recently Alvaro Jiménez, Nieman Affiliate at Harvard '09, happened to mention to me that he was starting a website "Crudo Transparente," a site that monitors the Colombian oil industry. Out of curiosity—and as a quick break from proofreading this issue—I took a peek. The site focuses on five areas: local economy, contracts and royalties, environment, security and human rights and ethnic conflicts. I was pleased to see how much overlap there was with the themes I had chosen for this issue of ReVista.

Although the website deals with only one country—Colombia—it felt like an affirmation of the focus I had chosen for this wide-ranging topic. Energy is political. Energy is personal. Energy matters.

*June C. Erlick*

**VOLUME XV NO. 1**  
David Rockefeller Center  
for Latin American Studies

**Director**  
Brian Farrell

**Executive Director**  
Ned Strong  
ReVista

**Editor-in-Chief**  
June Carolyn Erlick

**Copy Editor**  
Anita Safran

**Publication Interns**  
Isabel Espinosa  
Gabriela Farrell  
Diego Lasarte

**Design**  
Jane Simon Design

**Printer**  
P+R Publications

**Contact Us**  
1730 Cambridge Street  
Cambridge, MA 02138  
Telephone: 617-495-5428

**Subscriptions, Back Copies and Comments**  
jerlick@fas.harvard.edu

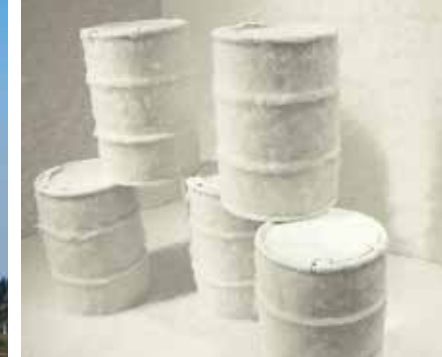
**Website**  
revista.drclas.harvard.edu

**Facebook**  
ReVista, the Harvard Review of Latin America

Copyright © 2015 by the President and  
Fellows of Harvard College.  
ISSN 1541-1443  
ReVista is printed on recycled stock.

This issue of ReVista is made possible  
through generous support of  
**Santander Universities Global Division.**

Sovereign



## ENERGY

### OIL, GAS AND BEYOND

#### FIRST TAKE

Latin America's Oil and Gas *by Francisco J. Monaldi* **2**

#### THE POLITICS OF OIL

Brazil's Oil Scandal *by Simon Romero* **8**  
Energy and Politics in Brazil *by Lisa Viscidi* **13**  
Mexico's Energy Reform *by Myrna Santiago* **16**  
China in Latin America *by Rebecca Ray* **20**

#### THE ECONOMICS OF ENERGY

What Powers Latin America *by Ramón Espinosa and Carlos G. Sucre* **24**  
The Impact of Falling Gas Prices *by Luisa Palacios* **28**  
Peruvian Oil Production *by Eleodoro Mayorga Alba* **32**

#### ALTERNATIVE ENERGY

Wind Energy in Latin America *by Carlos Rufin* **36**  
The Power of the Brazilian Wind *by Mauricio B. C. Salles* **38**  
Solar Energy in Chile *by Claudio A. Agostini*  
*Carlos Silva and Shahriyar Nasirov* **40**  
Geothermal Energy in Central America *by Jacques E. C. Hymans* **42**

#### LIVING WITH OIL

Life in a Venezuelan Oil Camp *by Miguel Tinker Salas* **46**  
Behind the Corporate Veil *by Kody Jackson* **50**  
Añelo and Vaca Muerta *by Mariana Barrera* **52**

#### FOCUS ON THE AMAZONS

Beyond Dinosaurs and Oil Spills *by Theodore Macdonald* **56**  
Forests for Energy? *by Juan Luis Dammert B.* **62**  
Oil and Indigenous Communities *by Barbara Fraser* **66**  
In the Shadows of the Extractive Industry *by Nelly Luna Amancio* **70**

#### PREVIOUS REVISTA ARTICLES ON ENERGY

**77**

# ReVista

HARVARD REVIEW OF LATIN AMERICA

FALL 2015  
VOLUME XV NO. 1

Published by the David Rockefeller Center  
for Latin American Studies  
Harvard University

## IN EVERY ISSUE

#### BOOK TALK

Transforming U.S.-Latin American Relations  
*by Michael Shifter* **78**  
Human Rights, Human Woes  
*by Daniel Gonzalez* **80**  
Musical Creation and Hardship  
*by Pedro Reina-Pérez* **82**

#### BUILDING BRIDGES

Building Bridges with Cuban Libraries  
*by Lynn M. Shirey* **84**

#### ONLINE

Look for more content online at  
[revista.drclas.harvard.edu](http://revista.drclas.harvard.edu)



#### ON THE COVER

Petrobras Oil Platform  
Photo By Ricardo Stuckert/PR  
(Agência Brasil [1]) [CC BY 3.0  
br (<http://creativecommons.org/licenses/by/3.0/br/deed.en>), via Wikimedia Commons

# Wind Energy in Latin America

Realizing the Potential **BY CARLOS RUFÍN**

**WIND ENERGY HAS ENORMOUS POTENTIAL IN Latin America.** With its relatively low population density, vast distances and energy needs in remote places, Latin America offers an ideal setting to harness wind energy.

Energy needs in windy, but isolated or remote places, such as the Caribbean islands, the mountains and plateaus of the Andes and the Mesoamerican ranges, as well as the region's vast savannahs (*llanos, cerrado*, Chaco and pampas), can be met more efficiently by wind turbines than any other alternative. Wind energy is more easily adapted to scale than solar energy: compared to solar panels or solar concentrators, wind turbines generate more electricity relative to the area that they take up, and this difference is growing as wind turbines increase in size and efficiency. Thus, wind energy can be a more appropriate technology in isolated areas with significant energy needs. If planned with care, wind turbine facilities have little adverse effect on ecosystems, and in the region's vast uninhabited spaces, they can have few or no aesthetic and sound impacts either. Wind energy complements very well the region's hydro-dominated electricity grids, because hydroelectric generation can easily respond to the intermittence of winds, in contrast to thermal generation, which is far less flexible in general; and, at least in some parts of the region, the winds are strongest during the dry season, precisely when hydroelectric generation is most limited. Lastly, the relatively accessible nature of wind power technology means that it can be manufactured in the region, unlike other types of energy technologies. Brazil, for example, is requiring local raw materials and manufacturing in wind power installations, and one of the region's key players is an Argentine company, IMPSA.



Wind energy in Marcona, Peru.

**Nevertheless, wind energy is still a relatively underexploited resource across the region, particularly in relation to its vast potential.**

Several areas in the region are increasingly using wind power. The Caribbean, in fact, has a long history of use of wind energy; many sugarcane mills in the islands were powered by windmills before the advent of highly efficient steam engines burning bagasse (sugarcane fiber). But with the Caribbean sugar industry being displaced in recent decades by highly competitive producers in Brazil and elsewhere, the area confronts high costs of energy as the islands (with the exception of Trinidad) lack traditional energy resources. Not surprisingly, exploiting the powerful and constant trade winds has become once again a highly attractive proposition for the islands, with strong growth in Jamaica, the Dominican Republic and Aruba.

Mexico is, after Brazil (discussed at length elsewhere in this issue of *ReVista*), the second largest market for wind energy in Latin America, particu-

larly in the southern part of the country, where wind conditions are most favorable. Costa Rica, with a strong commitment to renewable energy, has installed the largest number of wind power turbines in Central America, followed closely by Honduras. In the Southern Cone, Chile and Argentina are aggressively investing in wind power, and both countries are expected to overtake Mexico in terms of total installed capacity over the next ten years. Lastly, new projects are also taking shape in Peru and Uruguay.

Nevertheless, wind energy is still a relatively underexploited resource across the region, particularly in relation to its vast potential. For this potential to be realized, energy policy needs to overcome the mindset that has dominated the sector throughout its history in Latin America and the Caribbean: the obsession with hydroelectric generation. Despite the increasing costs of building large dams in more and more distant locations, more protests by indigenous communities affected by dam construction, and growing awareness of the environmental costs of such facilities, many governments in the region remain convinced that tapping the remaining hydroelectric potential is the best way forward, and are spending vast sums of money on projects like the Madeira River complex in Brazil. The old mindset also permeates the operation of the region's national grids, accustomed to the predictability of generation based on dams with large reservoirs of water, as opposed to the greater short-term intermittence of individual wind power installations—despite the reality of climate change, which is altering hydrological patterns and making hydro generation less predictable too.

Many Latin American countries, having restructured their electricity sectors to give a more prominent role to private



Discharge side of a hydroelectric plant, Péligre Dam in Haiti: in the background, the dam with the spillways for discharging excess water; in the foreground, the powerhouse, where the turbines and generators are located.

ownership of generation facilities, also face the challenges of attracting private investment in wind power. Wind energy facilities face a different kind of risk than those of technologies with a longer track record. Instead of hydrological risks or the volatility of fuel prices, wind power depends on a resource—wind—that is less well known throughout the region, and that follows its own patterns. Such uncertainty deters private investors. Innovative policies, perhaps modeled on those successfully employed in Europe, offering a fixed price for every unit of energy generated, must be put in place to overcome investors' reticence.

Although environmental and social impacts are less severe than those for large dams, the best locations for wind farms may be in indigenous lands; transmission lines may need to cross such lands or other environmentally sensitive areas. Wind projects in Mexico and elsewhere have already experienced setbacks due to local opposition. These projects are no different from other kinds of resource extraction, and as such they require consultation and prior consent of affected communities, which in turn may entail sharing some of the benefits with these communities. Policy makers, private developers and lenders must be

aware of this broader context and develop appropriate protocols and standards to engage these stakeholders to everyone's satisfaction.

To sum up, wind power can and should play a major role in the future of energy in Latin America. It is up to policy makers and the private sector for the potential to be realized.

*Carlos Rufín is Associate Professor of International Business at the Suffolk University's Sawyer Business School, and a consultant on energy matters to the World Bank and the Inter-American Development Bank.*