

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

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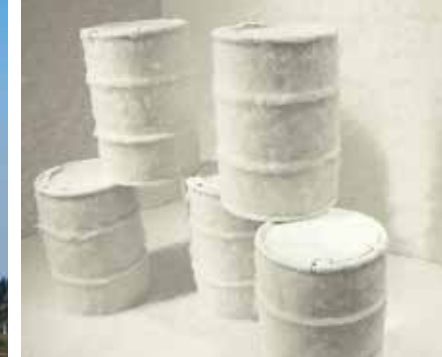
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ON THE COVER

Petrobras Oil Platform
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Although solar power's most obvious benefit is the environmental advantage from producing less CO₂ emissions than fossil-fuel-burning technologies, the use of solar energy has a potentially large social value that is missed by traditional cost-benefit analysis.

nificant technological advances. The costs, therefore, are becoming increasingly competitive with respect to other technologies. If pollution caused by the use of fossil fuels such as coal and diesel were figured into the costs through the implementation of corrective taxes, solar energy cost would become even more competitive.

Although solar power's most obvious benefit is the environmental advantage from producing less CO₂ emissions than fossil-fuel-burning technologies, the use of solar energy has a potentially large social value that is missed by traditional cost-benefit analysis. Solar energy can strengthen the economy in rural areas because network extension of traditional energy systems is typically not a viable economic option for these communities. In isolated rural areas with lack of access to electricity, grid extensions are often not cost effective. Therefore, isolated, or off-grid, small solar energy systems can provide a sustainable and cost-effective alternative to the diesel based solutions that are typically deployed in such areas. Chile has more than 3,500 isolated rural communities with no access to energy networks, many of them lacking access

to roads and infrastructure to maintain the flow of fossil fuels.

Solar energy has now started to play a greater role in the energy matrix of the country. There are still some problems that need to be overcome to allow the full deployment of its large potential, but a future with cleaner energy and sustainable development is becoming increasingly feasible.

Achieving the ambitious renewable energy goals and overcoming existing barriers require strong, consistent and balanced policy support by the government. Unless the Chilean government takes a leadership role establishing prioritized areas of policy interventions to address challenges rapidly and properly, it could miss a chance to materialize large-scale solar development and to recoup the benefits of solar energy investments for the development of its communities and regions' economic growth. Establishing a policy framework to accelerate market competitiveness, supporting the needed confidence for investments in local technology advancement and manufacturing capacity, facilitating large-scale solar grid integration, implementing new financing and business models, expanding international collaboration to provide accelerated learning and knowledge transfer to Chile, and improving training, education and awareness for solar energy technologies are among the priority policy actions to be taken shortly.

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Geothermal Energy in Central America

Under the Volcano

BY JACQUES E. C. HYMANS

WHEN WE THINK ABOUT GLOBAL TECHNOLOGY leaders, Central America does not typically come to mind. But Central American countries have indeed been in the vanguard in their use of geothermal energy: an abundant, constant, efficient, renewable and low-carbon source of electric power.

Twenty-four percent of El Salvador's electricity comes from geothermal. That figure places it second out of all countries in the world in its level of reliance on this power source. (Iceland is tops.) Meanwhile, fifteen percent of Costa Rica's electricity comes from geothermal, as does ten percent of Nicaragua's and five percent of Guatemala's. Compare those numbers with the worldwide figure of 0.3 percent. The basic reason for Central America's geothermal energy riches can be summed up in one word: volcanoes.

Even more impressive is the amount of geothermal energy that Central Americans have under foot, but so far failed to exploit. World Bank reports indicate that the countries of the region may have up to 25 times more geothermal energy than they are currently using, and that geothermal power alone could cost-effectively satisfy their entire electricity demand.

Yet the Central Americans have added only a relatively small amount of additional geothermal plant capacity since returning to peace and democratic governance after the end of the Cold War. The region's geothermal production did increase approximately fivefold between 1990 and 2012—from 747 to 3,542 giga-





Above: Volcanos in Guatemala; Opposite page: women walk past Caripito Refinery.

watt-hours per year (GWh/y). But during the same time span, electricity generated from imported diesel fuel exploded from a mere 16 to 12,345 GWh/y. Overall, imported fossil fuels accounted for only ten percent of the region's electricity generation in 1990, but today they account for over forty percent. The region's marked shift away from renewables such as geothermal and hydroelectric power since the 1990s is highly problematic from both environmental and economic viewpoints. When oil prices spiked in the mid-2000s, the newly fuel import-dependent Central American countries faced financial shortfalls as high as three percent of GDP.

The 1990s Washington Consensus liberalization of energy markets was a main cause of Central America's increased dependence on fossil fuels, to the detriment of domestic renewables such as geothermal. In the Central American context, geothermal energy is very economically competitive in the long run, but

profit-seeking companies are deterred by its high up-front costs and long lead times before any return on investment. Therefore they prefer to build standard thermal power plants instead.

The Central American countries certainly did not forget about their geothermal riches after the 1990s. Guatemala, Honduras and Nicaragua tried to use exploration concessions to entice foreign companies to develop the geothermal sector, but this proved insufficient to promote significant new investment. El Salvador pursued a public-private geothermal partnership with the Italian multinational ENEL Green Power, but the company showed a strong preference for generating sure profits from existing plants over investing in green-field development, and the two sides ended up in an epic, eight-year-long legal and political battle that is only now coming to an end with ENEL's decision to sell out and depart from the country. The only truly bright spot for geothermal—

and for renewables more generally—has been Costa Rica, whose decision to defy the Washington Consensus and keep the Instituto Costarricense de Electricidad in government hands paved the way for longer-term thinking about how best to satisfy the country's energy requirements.

Nevertheless, there is considerable momentum today for further development of the geothermal sector in Central America. The main impetus is coming from a country that sits on the other side of the "ring of fire": Japan. Japanese companies have dominated the global geothermal plant equipment market for decades, in part thanks to strategically placed foreign aid offered by the Japanese government. Now Japan is redoubling its efforts to promote the sector worldwide. In August 2014, the Japan International Cooperation Agency extended a \$550 million low-interest loan to Costa Rica to support the construction of three new geothermal power plants, which are expected to nearly double the country's geothermal production when they go into operation around 2020. The Japanese are also providing major support for a Latin America-wide geothermal development initiative that was initially proposed by climate-conscious Germany.

The irony is that Japan has been slow to exploit its own massive domestic geothermal potential and has barely added any plant capacity since the 1990s. Stymied at home, Japanese geothermal plant builders convinced the government to support them abroad. But today, with Japan facing persistent energy woes following the Fukushima nuclear disaster, many industry analysts are expecting a geothermal renaissance inside Japan. If that renaissance does indeed come to pass, will the Japanese still remember their plans for Central America?

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LIVING WITH OIL



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