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Central America's Energy Challenges

Cristina Eguizábal

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Energy Challenges in the Americas

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Cover Image:

Ribeirao das Lajes dike with its forest bordering the reservoir, an example of Light S.A.'s reforestation program. Light, a subsidiary in Brazil of the French company EDF (Électricité de France), distributes electricity to 80% of the State of Rio de Janeiro and implements environmental protection programs. ANTONIO SCORZA/AFP/Getty Images.

Central America's Energy Challenges

By Cristina Eguizábal

Of the three poorest countries in the Americas, two are in Central America. With the exception of Costa Rica and Panama, poverty rates are high and inequality is profound. Central American countries spend much of their resources on imported hydrocarbons despite the fact that the region's main source of energy for household use remains firewood. This is even true of Belize and Guatemala, the region's only oil producers. As a result, the seven small economies of the region suffer when oil prices are high, as was the case in 2008.

Hydroelectricity, administered by the state through public utilities and transmission companies, has dominated electricity generation in the region. In the 1990s, economic liberalization and privatization reached the energy markets and attracted foreign investors to develop new power plants. Investors preferred thermal (diesel-powered) plants as they were less costly and faster to build than hydropower plants, let alone river dams. In the 1980s, approximately 75% of the region's energy came from hydroelectric dams; that percentage has since dropped to less than 50%. In 2009, according to ECLAC, 47.5% of electricity in Central America was generated by hydraulic power, 37.3% came from oil, 7.9% was geothermal, 4.4% was generated by sugar cane,



Guatemalan woman carrying a load of firewood from the slopes of the mountain to her home. In the Quiche region, more than 90 percent of families rely on firewood for cooking.

1.8% came from coal and 1% was wind-powered. Of that total, 60.8% of electricity was generated from renewable sources. As a result, the region's energy matrix looks

fairly diversified, although much work remains to be done for the countries to reach energy output levels capable of maintaining economic growth and lifting their



Windmill farm on the shores of Lake Nicaragua. The Concepción Volcano on Ometepe Island dominates the background.

populations up from poverty while reducing the proportion of hydrocarbon-generated electricity.

Energy profiles vary among Central American countries: 95% of Costa Rica's energy production comes from renewable sources (mostly river dams), while in Nicaragua the figure is 26.6%. In El Salvador, Guatemala, Panama and Honduras the proportion of renewable energy is around 50%. All of the countries in the region need to expand their power-generating capacity quickly to extend the electrical grid to rural areas and complete the electrification of their territory. Out of a total of 40 million people living in Central America, approximately 10 million do not have electricity in their homes and almost 20 million still use firewood for cooking. The challenge confronting Central American countries is their need to reduce reliance on traditional biomass sources of energy—e.g., firewood—which are not only big polluters but also contribute to the region's rapid deforestation. It is imperative to build renewable energy-generating capacity while reducing emissions of greenhouse-effect gases.

Central America's hydroelectric potential is far from exhausted. Big dams are not only costly in financial terms, however; by dramatically changing the social and ecological systems of an entire region, they can also become costly politically. The Brazilian conglomerate Quieroz-Galvão-Electrobras is building a new dam, Tumarín, in Nicaragua's South Atlantic Autonomous region. The dam will revert to public property after 30 years, but the communities that surround Tumarín—which claim they were not consulted about the project—and environmentalist groups allege that it will negatively impact the

entire Río Grande de Matagalpa watershed.

The Chalillo hydropower project in Belize provides another example. Since 2005, Belize Sugar Industries (BSI) has been working on a plant that runs on both oil and sugar cane bagasse (92% renewable). It will produce 30 megawatts of power, of which 25 megawatts, representing 20% of Belize's national grid, are to be sold directly to the state-owned Belize Electricity Limited. The remaining five will be for use at the BSI factory.

Other renewable public-private partnerships in energy projects include wind parks in Costa Rica (Plantas Eólicas de Costa Rica) and Nicaragua (Amayo I and II), which are already operational, and Cerro de Hula in Honduras, still under construction. El Salvador is Central America's larger producer of geothermal energy. Two plants in Ahuachapán and Berlín generate approximately one-quarter of the country's total output.

At the other end of the continuum are small-scale renewable energy initiatives that allow poor rural populations to avoid the need for fixed lines. There are no reliable data on the spread of off-grid renewable energy on a small scale, but a large number of these systems are being installed. Small solar projects, underground biogas chambers and "mini" hydroelectric dams deliver electricity at a price that even the poor can afford and are sufficient to power cell phones, fans and high-efficiency light bulbs. These initiatives will not replace the need for the more reliable electricity delivery systems necessary to power major appliances such as refrigerators, but until that happens, they will make life easier for millions of people, particularly poor women and children.

The most ambitious energy initiative involves not power

generation but power efficiency, by linking the power grids of Panama, Costa Rica, Nicaragua, Honduras, El Salvador and Guatemala. After 20 years of discussion, Central American governments finally began construction of the Central American Interconnection System (SIEPAC) in 2006; the interconnection of Panama and Costa Rica became operational on October 25, 2010. As part of the Puebla Panama development initiative (which includes Colombia as well), the Regional Electrical Market plans to complement SIEPAC with electrical interconnections between Guatemala and Mexico, Guatemala and Belize, and Panama and Colombia. Supporters of the project argue that the interconnection of the nations' electrical transmission grids will optimize shared use of hydroelectricity, reduce operating costs and create a large enough market to attract foreign investment in power generation and transmission systems. Some critics fear that SIEPAC will facilitate electricity exports to Mexico and Colombia but not expand access in Central America, and others voice concerns about the associated environmental and social costs of large hydropower facilities. Supporters and critics alike stress the weakness of the region's regulatory environment at all levels, national and regional.

Central American countries must expand their electricity generation considerably in the coming years. To do so responsibly, they need to establish a truly diverse energy pattern based on financial and environmental sustainability. ■

Cristina Eguizábal is a professor of international relations and the director of the Latin American and Caribbean Center at Florida International University.