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## Energy-Strapped Nicaragua Leans Green in Effort to Power-up

By Benjamin Witte-Lebhar

After long lagging behind its Central American neighbors in both electricity production and connectivity, Nicaragua, the largest country in the isthmus, is counting on ambitious--and green-oriented--expansion plans to leapfrog into a position of regional leadership.

As of 2009, Nicaragua's total installed electricity capacity was approximately 970 megawatts (MW), less than half the size of the power grid in neighboring Costa Rica (2,500 MW), Central America's electricity leader, according to a recent report by the UN's Economic Commission for Latin America and the Caribbean (ECLAC). Even El Salvador, which has roughly the same population size but just one-sixth Nicaragua's land area, has a significantly larger installed capacity (approximately 1,500 MW). Guatemala, Panama, and Honduras have generating capacities of roughly 2,370 MW, 1,700 MW, and 1,600 MW, respectively.

ECLAC's "Central America: Statistics of the electricity sub-sector, 2009" report concluded, furthermore, that Nicaragua relies on thermoelectric--fossil fuel-burning--generators for roughly 76% of its total capacity, well above the Central American regional average of 54%. In Costa Rica, which boasts by far the isthmus' greenest grid, thermoelectricity accounts for just 28% of total installed capacity.

Coverage is a major problem in Nicaragua as well. Electricity penetration has gradually increased through the years but, as of 2009, was still just 65%, making it one of the least connected countries in all of Latin America, the Inter-American Development Bank (IDB) recently reported.

Other sources such as the International Energy Agency (IEA) and the UN Development Programme (UNDP) estimate the percentage of Nicaraguans with electricity access to be somewhat higher: 72% and 69%, respectively. That is still far lower than the penetration rates in Costa Rica (99%), Panama (88%), El Salvador (86%), and even Guatemala (80%), the IEA calculates. In Central America, only Honduras (62%, according to the UNDP) appears to have a weaker electrification rate.

Nicaraguan authorities, however, insist all of that is about to change. Thanks to a series of ambitious production goals and a flurry of international loans and investments, Nicaragua--rather than just catching up to its neighbors--could soon take a regional leadership role, particularly in renewable-energy sources. By prioritizing green-energy projects, the impoverished country hopes to solve not only its production problems but its connectivity and fossil-fuel dependency issues as well.

Starting in August 2010, the government of President Daniel Ortega began touting what it calls a Plan de Expansión de la Generación Eléctrica 2010-2017, a seven-year scheme that looks to increase Nicaragua's total installed capacity by more than 70%. Under the plan, Nicaragua will not only substantially reduce its dependence on fossil fuels, but, by 2017, it could very well be in a position to export electricity through the Sistema de Interconexión Eléctrica de los Países de América Central (SIEPAC), a US\$400 million regionwide transmission project currently in the works.

The Ministerio de Energía y Minas (MEM) predicts that, within seven years, Nicaragua will generate more than 90% of its energy from renewables. "During the period 2017-2025, this percentage will increase to almost 100%," MEM head Emilio Rappaccioli pledged during the Organización Latinoamericana de Energía (OLADE) meeting held last November in Nicaragua's capital city.

The Ortega administration is also busy implementing a four-year initiative called the Programa Nacional de Electrificación Sostenible y para la Energía Renovable (PNESER). Like the Plan de Expansión, the PNESER initiative focuses on renewable-energy projects. It also emphasizes electricity penetration, promising specifically to expand rural electrification to 117,000 new households (702,000 persons) in 3,666 communities through the installation of new transmission lines and small-scale generation projects. More generally, the plan--which enjoys backing from the IDB, European Union (EU), and other donors--looks to expand electricity coverage from 65% to 85% of Nicaragua's population by 2014.

"PNESER is a huge program for the size of Nicaragua. Just the concept of it is drowning the IDB, World Bank, and government officials in massive paperwork and negotiations," Lâl Marandin, co-founder of blueEnergy, a Managua-based NGO, told NotiEn.

### **The winds of change**

Between them, the two plans set out what are certainly lofty goals. No doubt meeting them will be easier said than done, particularly for an impoverished country (after Haiti, Nicaragua has the hemisphere's lowest per capita GDP) in the midst of an ongoing political crisis.

President Ortega is under increasing international scrutiny for his plans to participate in this year's election despite constitutional term limits that prevent presidents from serving consecutive periods and cut off at two the total number of times a person can hold the office. Ortega, who served a first term as president from 1985-1990, is legally disqualified on both counts. He plans to run again anyway. Elections are scheduled for November.

"The 'country risk' is the elephant in the room," said Marandin. "As national interest rates remain very high (about 8% for these kinds of projects), massive foreign investments are required and the 2011 presidential elections will probably prevent a whole lot of new investors from taking any risk before the situation stabilizes."

Still, a number of factors suggest that Nicaragua--even if it fails to fulfill all of its energy promises--is nevertheless in a good position to make serious headway in addressing its particular energy shortcomings.

For starters, loans and investments earmarked for energy projects have already begun pouring in. The IDB, EU, and the World Bank's International Finance Corporation (IFC) have all opened their pocketbooks of late in the form of loans and donations. Several private companies have also been investing in recent years in renewable-energy projects.

One of the more iconic ventures is the Amayo wind park, a 40-MW project in Rivas that went into operation in early 2009. Last year the wind farm--already Central America's largest--added even more turbines, expanding its capacity by an additional 23 MW. Several other wind-farm projects are in the works. Last year Nicaraguan authorities granted operating licenses to the companies Blue Power & Energy and Eolo de Nicaragua S.A., which each plan to build wind farms of approximately 40 MW.

Other firms are investing in geothermal plants, for which Nicaragua--thanks to its volcanic Marrubios range--is particularly well suited. Geothermal electricity production is nothing new in Nicaragua, whose experience with the technology dates back to the early 1980s. Initial enthusiasm in the renewable-energy source resulted in the pioneering 35-MW Momotombo facility, which opened in 1983. The facility was later expanded, but, starting in the 1990s, mismanagement and overproduction saw the plant's output drop significantly.

Nowadays, however, the technology appears to be enjoying a real renaissance. Efforts have been made to upgrade the Momotombo site. Near the city of Leon, meanwhile, private developers are busy expanding another geothermal plant, the 10-MW San Jacinto-Tizate facility, which during the next year and a half is expected to increase its generating capacity first to 46 MW and--by mid 2012--to 76 MW. Four additional geothermal projects totaling 100 MW are also being planned along the Marrubios range: the El Hoyo-Monte Galán (20 MW); Managua-Chiltepe (20 MW); Volcán Casita-San Cristóbal (30 MW), and Volcán Telica--El Najo (30 MW).

### **Hydro, the other "renewable"**

The bulk of Nicaragua's future generation capacity, however, is likely to come from large-scale hydroelectric dams, starting with the US\$700 million Tumarín project, which the Ministerio del Ambiente y Recursos Naturales (MARENA) approved for construction last March. The 220-MW hydroelectric plant is a joint effort between the huge Brazilian state utility Centrais Elétricas Brasileiras (Eletrobrás) and Centrales Hidroeléctricas de Centroamérica (CHC), also Brazilian owned. Slated for eastern Nicaragua's Río Grande de Matagalpa, the Tumarín project is expected to get underway within the next few months and begin operations in approximately four years.

Plans are also underway to build an even larger hydroelectric complex with dams along the southern San Juan and Brito rivers. The Brito project, which has an estimated price tag of US\$600 million, would boast an installed capacity of 250 MW, making it the country's largest single source of electricity. Backers of the plan say that, together with the Tumarín facility, the Brito project would essentially free Nicaragua from its dependence on expensive and polluting petroleum derivatives.

"Given that the national demand is about 700 MW right now and should expand to perhaps 800 MW in 2017, these new hydro plants could offset the 'clean energy' to more than 70% easily, maybe even reaching 80%," said Marandin. "Nicaragua has the potential to go almost 100% renewable, but for that to happen, they'll need to secure more foreign investments than currently announced."

In trumpeting their renewable-energy goals, Nicaraguan authorities make no distinction between large-scale hydroelectric projects like Tumarín and Brito and nonconventional renewable energy (NCRE) sources, like wind and geothermal. The stance reflects what was

once a fairly standard assessment of hydroelectric dams: that they are clean (carbon free), reliable sources of energy based on a renewable fuel--water.

In more recent years, however, environmental groups the world over have taken a far more critical view of large-scale hydroelectric dams, which they say alter both upstream ecosystems, by flooding river basins, and downstream environments, by cutting the natural flow of water. Big dams and their accompanying reservoirs can have a steep social cost as well, as they often displace local communities.

The Tumarín project is a case in point. Press reports suggest more than 1,000 people are being forced to move to make way for the facility's 50 sq km reservoir. CHC admitted recently that negotiations with local property owners delayed the start of construction, originally scheduled for mid-2010. CHC president Marcelo Conde told reporters last November, however, that the Brazilian firm finally struck a "very positive" deal with owners of the soon-to-be-flooded land.

"It's difficult to offer a precise [starting] date, but we believe in the first months of [2011] we'll be ready to go," said Conde. "As far as the settlements are concerned, it's all negotiated. There aren't any problems. Agreements have already been signed with the owners of some 300 farms. We reached a very positive understanding. We got delayed a few months, but everything's very favorable for the families, who are happy with the fair and really good settlements."

The CHC president refused to go into details about the exact amounts of the settlements, other than to say "a few good millions of dollars." He added, "This money will be injected into the country's economy somehow."

Unlike the HidroAysén project in far southern Chile or the Belo Monte project in Amazonian Brazil, to name just two, the Tumarín plan has not attracted much local opposition--maybe because of its relative isolation in Nicaragua's extremely underdeveloped Región Autónoma del Atlántico Sur (RAAS).

Some critical voices have, however, begun to surface against the Brito plan. In an interview last September with *El Nuevo Diario*, scientist Salvador Montenegro of the Centro para la Investigación en Recursos Acuáticos de Nicaragua (CIRA/UNAN) described the two-dam project as a grave threat to the Brito and San Juan rivers.

"They sell this project as a pretty package, as the panacea that will free the country from its dependence on thermoelectricity or fossil fuels like oil," said Montenegro. "But behind this magic that they offer us is the destruction of the whole ecosystem of the Río San Juan and thousands of other impacts on [Lake Nicaragua] and its river ways."

"You who have the opportunity to reach all over: tell the country that we're facing an unprecedented disaster for which there's no turning back," Montenegro told his interviewers. "Once it all begins, everything will be lost forever."