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Statement

from

Javier A. Gutiérrez

Executive Director

**La Secretaría de Integración Económica Centroamericana
(SIECA)**

An integrated electricity market in Central America

Presentation

The Secretariat for Central American Economic Integration (SIECA) offers technical support to Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama, in their efforts to consolidate economic integration. Besides coordinating the work between the different secretariats and technical bodies of the Economic Subsystem, SIECA is clearly committed with regional electric interconnection.

One of its constitutive legal instruments, the Protocol of Guatemala, determines in its article 28, that the “Member states will promote the development of physical infrastructure and services, particularly energy, transportation, and telecommunications, to boost the productive sectors’ efficiency and competitiveness”. The Electric Interconnection System for the Countries of Central America (SIEPAC) turns this mandate into effective policy and opens up a regional market for electricity, in full operation since June 2013.

Additionally, the Protocol’s article 29 states that the “Member States commit to define a regional strategy for the private enterprise to participate in investments and service offering in the infrastructure sectors”. As we will see in greater detail, the creation of a private society that builds and maintains SIEPAC’s infrastructure also implements this mandate.

Let me begin by offering some background on SIEPAC.

SIEPAC is the regional initiative to support the consolidation of a Regional Electric Market (MER) by implementing the legal, institutional, and technical mechanisms that facilitate the private sector’s participation in developing the regional electric grid.

SIEPAC and MER help Central America optimize national electricity markets and facilitate generation projects at a larger, regional scale, which may be more conducive to securing investments.

As different demand profiles and generating supply structures exist in the region, the production of electricity will now be positioned where it is most efficient, leading to electricity production cost reductions.

It also increases the security of supply in the region given that the line permits countries to import energy if necessary.

SIEPAC’s key objective was to establish the infrastructure for electricity transmission that allows for participant countries to exchange energy. This infrastructure includes: transmission lines, substations and compensation equipment.

Empresa Propietaria de la Red (EPR) is a private society constituted in Panama and enabled by the governments in Central America to design, finance, build, and maintain SIEPAC's infrastructure. This entails almost 1800 km of transmission lines of 230 kV – they anticipate the possible expansion of a second circuit too. These lines connect 15 substations, through 28 bays of access. It also required installing reactive power compensation equipment. This initial infrastructure allows to maintain a reliable and secure energy transportation system of 300 MW. The anticipated second circuit will aim to duplicate this capacity.

The cost of this infrastructure was estimated at around US\$494 million dollars, including towers that anticipate the installment of a second circuit, a relatively low price for a network of 1800 km that affected around 8000 landowners in its layout.

Background and history

SIEPAC was originally conceived in 1987, with a series of feasibility studies conducted between then and 1995. That year, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama agreed an execution plan and garnered support from Spain and the IADB to execute its implementation.

The Framework Treaty of the Central American Electric Market was created to enable a mechanism that set a common set of rules for all six participating countries to implement the project. The Treaty came into force on June 18, 1998, while Panama ratified it on December 15 of that year (at the time it was not a member of the Economic Subsystem).

Among other dispositions, the Treaty bound countries to designate a public entity to participate in Empresa Propietaria de la Red (EPR), which would be charged with developing, designing, rounding up finance and maintaining the regional transmission system.

The participating agencies are:

INDE – Guatemala

CEL – El Salvador

ENEE – Honduras

ENATREL – Nicaragua

ICE – Costa Rica

ETESA – Panama

ENDESA – Spain

ISA – Colombia

CFE – México

An initial agreement to finance SIEPAC was struck in 1997. This provided the basis by which the Inter-American Development Bank offered funds to develop and approve the General Design of the Regional Electric Market (MER), which was approved in May 2000.

With this, MER was established as a seventh market, superimposed over the six national markets, in which agents engage in international energy transactions.

MER is governed by two entities: CRIE (Electricity Interconnection Commission) and EOR (Regional Operator Entity) that operate and regulate the market respectively, with support from national operators in each of the six countries.

The Rules of Procedure of MER were approved in December 2005 by CRIE and revised by EOR.

Extra regional Interconnections

Added to the SIEPAC main infrastructure, MER is further integrated with its neighbors through extra regional interconnections. Guatemala-Mexico is already operational, while Panama-Colombia is in its design phase.

Mexico-Guatemala

The Project was agreed in 2001, as part of the Tuxtla Dialogue Mechanism (where the governments of México, Belize and the Central American countries participating in SIEPAC gathered to discuss avenues for collaboration at the Mesoamerican level).

The interconnection aimed at creating a transmission line of 400 kV, of 98.6 km in length, of which 72% was on the Guatemalan side of the border. The structures were readied for a subsequent double circuit, as were the SIEPAC towers. This initiative also involved an expansion of two substations in Tapachula in Mexico, and Los Brillantes in Guatemala.

EOR authorized the interconnection's coming into full operation in February 2010, and started normal operations in April 2010.

Panama-Colombia

Stemming from the Tuxtla agreement, governments also agreed to implement a 614km interconnection line between Colombia and Panama, with a capacity for between 300 and 600 MW. The exchange would require habilitating agents from one country to participate in its counterpart. As such it requires harmonizing the existing legislation, and both countries are in the process of public consultation to analyze and discuss how this can come into full force to enable energy transmission from Mexico to Colombia in its entirety, via the Regional Electric Market (MER) of Central America.

Financing

The Electric Network had a total cost of US\$494 million, partly financed with a patrimonial contribution of US\$58.5 million.

The Inter-American Development Bank was the project's main sponsor, as it offered US\$253.5 million. Initially the IADB provided 12 loans for a total US\$240 million, with additional support to complete the tasks necessary for the project's implementation later on.

The Central American Bank for Economic Integration (CABEI) subscribed three lines of credit and three amendments that raise its contribution to US\$109 million. Of these, US\$40 million were a contribution from the European Investment Bank, which CABEI channeled into the region.

The Development Bank of Latin America - Andean Development Corporation offered US\$15 million and a liquidity reserve of US\$1.7 million, for a total of US\$16.7 million.

The liquidity reserve is a provision contractually required to cover the repayment installments and interest of one year.

The line, as previously mentioned is operated by Empresa Propietaria de la Red (EPR), where state energy companies participate as partners on equal grounds, added to three extra regional partners: ISA of Colombia, Endesa of Spain, and CFE of Mexico. Their participation was associated with providing a guarantee of US\$40 million each, added to the contribution of social capital to integrate the society.

In addition, guarantees from the members of the society helped procure additional funding for US\$40.5 million, a contribution of US\$4.5 million per shareholder. This came from direct credit lines from three shareholders (INDE, CEL y ETESA); credit extensions guaranteed by three shareholders (ENDESA, ISA y CFE); and transfers of AIDB credits backed by the remaining three partners (ICE, ENEE y ENATREL).

Operations

Injections of energy to MER doubled between 2013 and 2014, going from 688 GWh to 1445 GWh.

In 2015, injections accounted for 1.368 GWh and withdrawals for 1.358 GWh.

In June 2013, the regulatory framework of MER (RMER) came into force, as did the Procedure of Detail. In this new stage, injections into MER went from 688 GWh in 2013 to 1,368.4GWh in 2015. 2014 saw a peak in transactions because Honduras, Costa Rica and Panama had an energetic scarcity, which they covered by making significant purchases at MER.

An analysis of the economic benefits of participating in MER, conducted by CRIE, determined that the regional benefits in the year 2014 added to US\$271.5 million, 52% of which were due to

a reduction in the national oil bills, and 48% on savings from accessing a more efficient source of energy generation.

Besides overall savings, SIEPAC and MER also provide a mechanism to ensure sustained supply of energy even during crises periods. Shortly after it entered its full operation phase, Panama faced a drought and consequent energy scarcity, for which MER was instrumental in coping with the consequences.

Opportunities ahead

Some challenges, admittedly, remain in place:

The high cost of electricity remains an important issue. According to the IADB, estimates place the wholesale price in Central America at around \$150 per megawatt-hour compared to \$50 for other, comparable systems—making it three times as expensive.

We expect SIEPAC and MER will enable the development of larger and more efficient regional generation projects. The system also will allow countries to reduce their need to maintain reserve capacity, leading to additional savings.

INFRASTRUCTURE:

Central America still needs to install an increased capacity in its infrastructure, to raise it from 300 to 700 MV by decade-end. This will require from US\$10 to \$18 billion and an increased participation of the private sector in investments and energy services offering.

Some recent progress allows us to be relatively optimistic.

In May 2016, during the U.S.-Caribbean and Central American Energy Summit, the U.S.-Caribbean and Central American Energy Security Task Force [announced](#) an agreement to expand the regional market and transmission system, including initiating the feasibility study to double SIEPAC's capacity and explore market integration with Mexico, for which the State Department will seek to provide up to \$5 million in assistance for this purpose. This could help set the stage for future expansion of SIEPAC, through which cross-border electricity trade has quadrupled since 2013 and of launch the announced Mexico and America Central . and trade electricity expanding for opportunities explore to Commission Interconnection .integration

OTHER POLICY SOLUTIONS

There are other possibilities for furthering electric integration between the countries of Central America:

SIEPAC could benefit by creating an integrated energy planning system.

And there are still possible avenues for full harmonization of energy-sector regulations. While Guatemala, El Salvador, Nicaragua, and Panama's generation sectors are relatively competitive, for example, Costa Rica and Honduras provide electricity through a vertically-integrated monopoly.

By harmonizing their regulations, countries could reduce the barriers for new players to participate in the regional market. Currently, only electricity generators that are allowed to participate in the national wholesale markets of member countries are allowed to tie into the regional grid, possibly limiting the potential for increasing renewable energy in the regional grid. In Costa Rica and Honduras, only the state utility companies are allowed to participate, whereas in other Central American countries, where the electricity market is privatized, other energy generators are not expressly prohibited from participating in SIEPAC, although their participation can be limited by the need for a connection to the national high-voltage grid. Without a streamlined process guaranteeing grid connection for new generators, tying to the grid can be an expensive and lengthy process.

RENEWABLES

Improving the regulatory framework would also be helpful to facilitate investments and execution of renewable energy projects, contributing to a diversification of the regional energy matrix.

Of the total installed generation capacity of 12GW, there is a large share of renewables (56 per cent) and the most diverse mixture of renewable generation, composed of biomass, geothermal, wind, and hydro. Costa Rica, El Salvador, Honduras, and Nicaragua have developed some geothermal resources. Costa Rica, Honduras, and Nicaragua have about 350MW in wind farms, and Panama has 158MW of wind energy in the pipeline, [according to Norton rose Fulbright](#).

Historically, Central America has been powered mostly by hydropower, but in the mid-1990s hydro's share dropped as it began to be replaced by fossil fuels. In the mid-2000s, increasing shares of renewables, such as wind in Costa Rica, Honduras, and Nicaragua, decreased the region's dependence on oil. Encouragingly, despite the range of fossil fuel options now available, the region is continuing to expand its use of renewable energy, a trend that is in the global interest as well as the economic, social, and environmental interest of Central American countries.

Current efforts to strengthen electricity integration in Central America through SIEPAC and to streamline regional electricity regulation through the MER can benefit from international best practices for scaling up renewable energy through regional interconnection.

To do this, no single policy mechanism is the solution; rather, the right combination of policies depends on regional and national contexts. Feed-in tariffs and quota obligations—policies responsible for the majority of installed capacity around the world—are largely lacking in the region, but government-backed tendering schemes for renewables have had success in a

number of countries. If properly implemented, tendering programs can expand the development of renewables and serve the role that feed-in tariffs and quota obligations otherwise would.

Additionally, there is a challenge of linking the different economic integration initiatives in the region. SIECA has accumulated significant experience in supporting regional initiatives that aim to reduce the length, unpredictability, and complexity of administrative processes, which often hampers the full effectiveness like SIEPAC and the free flow of essential goods in general.

Articulating the efforts of different institutions in the Economic Subsystem will thus be crucial to support further integration of the energy markets and other broader sectors of industry and trade.

Some of the lessons learned from the effective implementation of SIEPAC are thus the following: The creation of the regional electricity market integration is a model for the process of integration of the region, which provides us with valuable experience in addressing the stages of executing a region-wide project: Studies, design, adapting to context, rights of way, execution, legislation, permits, authorizations, etc.

SIEPAC consolidated a network of regional transmission of electricity, and effectively raised the quality, continuity and reliability of the Central American electric system. It will allow for future expansion of the network as the infrastructure anticipated future increases in demand. And crucially, finance was optimized for the needs of Member States: resources gave priority to low cost, long terms for payment, and considerable leveraging, which resulted in the project being successful.