

Promoting the Cross-Border Renewable Energy Market

Meeting report: “Creating a Regional Renewable Market in the Californias”
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Introduction

Several States in the US have made significant commitments to renewable energy (RE) and the reduction of greenhouse gas (GHG) emission levels. California alone has mandated that investor owned utilities (IOUs) obtain 20 percent of their resource portfolio from renewable sources this year and 33 percent by 2020. Procurement from neighboring states could potentially complement in-state resources to meet the Renewables Portfolio Standard (RPS). For this reason, California has been the focus of several studies and discussions on the RE export potential of Mexico.

Two main bottlenecks limit the growth of RE exports from Mexico to the United States: 1) lack of transmission capacity; 2) different subsidy and incentive schemes.² A January 25 roundtable discussion, convened by the Woodrow Wilson International Center for Scholars, brought together academics, private sector representatives and public sector officials from both countries to discuss the first two issues.

Bridging the transmission gap

Participants discussed three views on how to further expand cross-border projects. They focused on different project scales and transmission ownership arrangements.

1. Open transmission system. This arrangement could incorporate different developers and open the market to more competition (in Baja California it would particularly focus on large scale wind energy farms in the La Rumorosa region). The owner could be a public-private partnership (see below) or a private consortium. Many participants argued that the line operator would have to guarantee open access and transparency on fees. One limitation for such a project is timing, as the process necessary for building it would take from three to four years.
2. Producer-owned large-scale transmission. Under this arrangement a large company that produces RE would also finance the transmission infrastructure directly and would control all aspects of operations. One example of this approach is already being carried by Sempra. Some participants discussed the possibility that this transmission infrastructure could also be “open access,” with the line operator selling excess capacity on the open market to other producers.
3. Coupling cities: This approach would promote small-scale projects (less than 10 MW, including land-fill biogas and other energy sources) between border cities. This could be done by applying self-generation permits and inviting participants on the US side. This scenario would allow for rapid expansion with a large number of competitors across bordering states.

It is important to note that the first two examples of large-scale transmission could potentially face resistance from the Comisión Federal de Electricidad (CFE), as it would provide no direct benefit to Mexican consumers, while intermittency effects could disrupt local service.³ The potential for disruption is of particular concern in Baja California because the state uses a small, independent system.

¹ This report was prepared by the USAID/Mexico Competitiveness Program.

² A third bottleneck is the highly decentralized regulatory framework in the United States. While Mexico's Public Energy Service Law is clear, transparent and the same for every part of the country, the US has numerous municipal, state, regional and federal regulations that can be difficult to navigate

³ CFE is carrying a major project, scheduled for completion in 2013, that would interconnect the Baja California transmission network to the rest of the country. This infrastructure could allow connecting the renewable sources in Baja California to the rest of Mexico.

Transmission Financing

The discussion focused on options to finance transmission infrastructure. For small scale projects, the main option was a Public-Private Partnership that included participation from a Mexican and/or US company, as well as local or state governments. For large scale projects, several options were put on the table:

1. Built by a Baja California State Government Special Purpose Entity (SPE), financed through domestic capital markets, and operated by a private entity through a PPP.
2. Follow the experience of the *Temporada Abierta* in Oaxaca, where projects shared the costs of the infrastructure. This approach would lower the initial investment for developers, involve CFE and be open to more competition.
3. Private financing (Sempra example).
4. Co-financing by NADBANK (although there are no prior examples of binational infrastructure projects) or IDB (investment plan for Mexico still has 70 million USD available for RE projects, but could prove tricky as funding is intended for reducing emissions in Mexico).

Subsidies and Incentives

At present RE generation for sale to CFE is not competitive in Mexico. This is mainly due to CFE pricing, which is 85 to 90 percent of CFE's short-run marginal cost of electricity. Mexico has excess generation capacity, estimated at 40 percent. The consumers most interested in RE are those subject to CFE's highest rates, mainly municipal governments and industrial and commercial consumers.

RE developers in Mexico used to benefit from decelerated depreciation provision in the fiscal code. However, this incentive was neutralized with the latest fiscal reform. In the US a certain interpretation of the law would allow for tax credits for projects in Mexico (since savings are for end users). Current tax credits are for \$19/MWh, which is approximately 25 percent of the generation cost. Eligibility for CDM certification is limited to project impact calculations on displacement of emissions in Mexico (there are differing opinions on the eligibility of RE projects built for export). If certification is possible, this would allow developers to include CDM credits into project cost.

Some participants expressed concern on the focus of subsidies in Mexico, since the government subsidizes consumption rather than investment. The country's most subsidized city is Mexicali, Baja California, because of extreme temperatures and corresponding air conditioning use. The 2008 energy reform created an Energy Transition Fund (with 3 billion pesos) which has yet to materialize.

Creating a North American Renewable Energy Border Region

An integrated approach to creating an energy region must look beyond generating power to export. Linking RE generation to economic development in Mexico requires a focus on value chain creation for providers and services. Information needs to flow from developers to universities and authorities to develop training and certifications for technicians and engineers. Already local enterprises have responded to an expanding market but there is far greater potential. In this regard, the Global Environment Facility (GEF) and the Inter-American Development Bank (IDB) are supporting a project at the Instituto de Investigaciones Eléctricas (IEE) to develop the first Mexican-built wind turbine, to be deployed in Oaxaca, and develop a supply chain. The April 15-16 Ministerial meeting on Energy and Climate convened by Secretary Steven Chu seeks to address financing and the Department of Energy (DOE) is working with the IDB to develop a clean energy incubator.

On the transmission side, there is currently no coordination between the system operators (CAISO, in California, and CFE). For example, Mexican officials have expressed concern that the studies for the Sunrise Power Link project do not take into account the impact on the Mexican side. For CFE, a basic concern is the impact of a large amount of power on the very small system in Baja California (currently independent from the rest of Mexico and interconnected to California). Both federal governments can play an active role by creating a task force to address this and other concerns.

Finally, there is a need to carry out further resource evaluation (e.g., wind-mapping) as estimates widely vary. There are currently two efforts in place. Both the DOE and the Western Governments Association have been very active in this area.

Annex. Current state of binational transmission infrastructure

Along the border there are nine interconnection systems between the Mexican and US grids, of which only four operate regularly (the remaining five are reserved for emergency situations). The most important active connections are located in the State of Baja California Norte (combined capacity of 800 MW), which are connected to the WECC regional transmission system. The connection in Ciudad Juárez-EI Paso (200 MW) is exclusively used for emergency situations. The remaining interconnections are connected to the ERCOT regional transmission system and are mainly used for emergency situation (the only one that can have regular operations is located in Eagle Pass-Piedras Negras and has a capacity of 36 MW). (Figure 1).

Baja California Norte, the main potential supplier of wind energy to the United States, is isolated from the rest of CFE's network (although there is a plan to connect it by 2013). But it has the best available infrastructure for energy exports. Since the 1980s SDG&E and CFE have jointly owned and operated a pair of 230 kV cross-border transmission interconnections, which are capable of delivering up to 800 MW of exports from Baja California Norte to California. This pair of ties are mostly unused (except for short-term transactions by CFE), and in order for a developer on the Mexican side to utilize it to tap into the RPS portfolio, it would require a long-term wheeling contract through CFE's system which "may result in increasing the overall cost...and therefore not be economical."⁴ There is inadequate transmission in Southern California. The Sunrise Power Link (500 kV) project is the line that would be necessary to connect energy from Baja California. (Figure 2).

Privately owned transmission lines that connect generation facilities to the US do exist. Two gas-fired power plants in Mexico connect directly into the California ISO grid at Imperial Valley Substation (with a combined capacity of 1,510 MW). Additionally, Sempra Generation has a long term power purchase agreement (PPA) with Southern California Edison for wind resources in La Rumorosa and for this purpose is building a gen-tie/trunk-line to the California ISO interconnection queue. According to unofficial accounts, Sempra Generation is expecting that other wind developers may contract some of the capacity. Capacity information has not been made public. Information from DOE states that the Presidential Permit is going through the regulatory process.

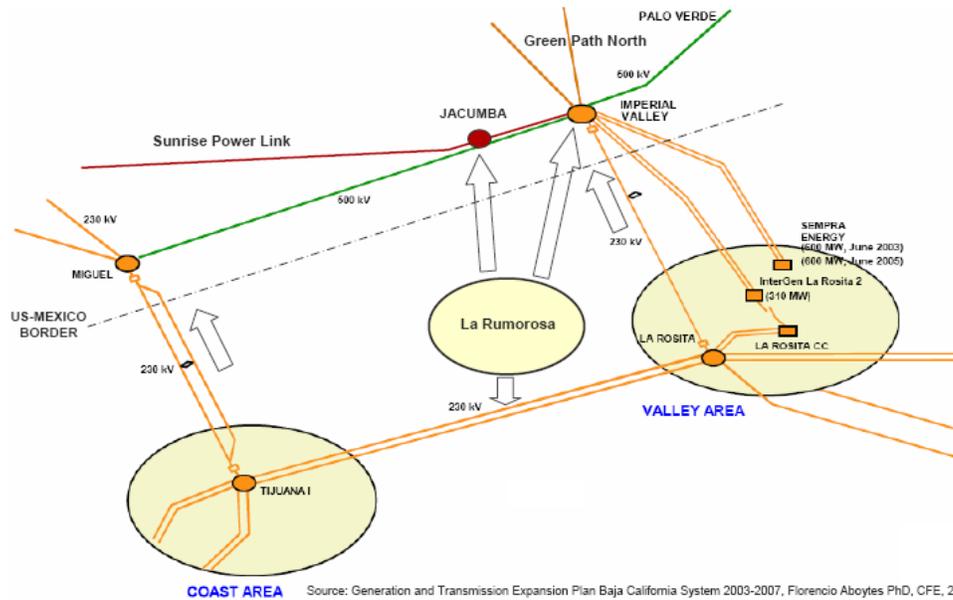
Figure 1. Current International Interconnections with Mexico



Source: SENER (2008) *Prospectiva del Sector Eléctrico 2008-2017*

⁴ Puga, N. (2008). *Challenges and Opportunities to Deliver Renewable Energy from Baja California Norte to California*, California Energy Commission.

Figure 2. Cross-Border Electricity Infrastructure in the Californias



Source: Luengo M. and Oven M. (2009). *Estudio del Potencial de Exportación de Energía Eólica de México a los Estados Unidos*, USAID.

Further Reading

Luengo M. and Oven M. (2009). *Estudio del Potencial de Exportación de Energía Eólica de México a los Estados Unidos*, USAID. [http://es.amdee.info/userfiles/Potencial-Exportacion-Eolica-VF\(1\).pdf](http://es.amdee.info/userfiles/Potencial-Exportacion-Eolica-VF(1).pdf)

Puga, N. (2008). *Challenges and Opportunities to Deliver Renewable Energy from Baja California Norte to California*, California Energy Commission. <http://www.energy.ca.gov/2008publications/CEC-600-2008-004/CEC-600-2008-004.PDF>

SENER (2008) *Prospectiva del Sector Eléctrico 2008-2017* http://www.energia.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf

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