CHALLENGES AND OPPORTUNITIES TO DELIVER RENEWABLE ENERGY FROM BAJA CALIFORNIA NORTE TO CALIFORNIA

CONSULTANT REPORT

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ABSTRACT

This report discusses opportunities and barriers to developing Mexican wind resources located in the La Rumorosa region of Baja California, which is adjacent to the California-Mexico border. The potential procurement of out-of-state renewable resources from this region could complement in-state renewable resources and help California meet its Renewables Portfolio Standard (RPS) goals. The report focuses on Mexican wind resources that could be developed for export to California in the near-term, but also considers longer-term opportunities. Particular emphasis is given to the electric transmission requirements for bringing those resources to the California energy markets, but also considers legal, regulatory, institutional, financial and competitive factors that bear on such development.

KEY WORDS – Electric infrastructure, renewable resources, wind power, electric transmission, generator tie-lines, trunklines, energy markets, energy imports, NAFTA, wheeling, congestion, transmission licensing, tax credits, Clean Development Mechanism (CDM), greenhouse gases, emission factors, border region, Baja California, Mèxico.

Executive Summary

This report focuses on the opportunities and barriers to developing Mexican wind resources located in the La Rumorosa region of Baja California, with particular emphasis on the transmission requirements for bringing those resources to the California energy markets.

The State of California has made a significant commitment to renewable energy and the reduction of greenhouse gas (GHG) emission levels. That commitment is evidenced by the mandate for California investor-owned electric utilities to achieve 20 percent of their resource portfolio from renewable energy by 2010, the Governor's 2005 executive order to reduce 2010 "business-as-usual" GHG emissions to the 2000 level, and the subsequent signing of Global Warming Solutions Act (AB 32) in September 2006. Specifically, AB 32 requires the California Air Resources Board (ARB) to develop regulations and market mechanisms that will ultimately reduce California's GHG emissions to 1990 levels (that is, by approximately 25 percent) by 2020. Mandatory caps will be phased in beginning in 2012 for significant greenhouse gas sources. California utilities are therefore seeking opportunities to develop new renewable energy resources.

Although California has a history of developing renewable resources, various planning and permitting impediments may limit the development of in-state resources. Because of this, the potential procurement of out-of-state renewable resources could complement in-state renewable resources to help California meet its Renewables Portfolio Standard (RPS) goals. Baja California, México, presents an inviting opportunity since it borders Southern California and has an abundant renewable resource potential. This potential is demonstrated by the current list of Baja renewable generation projects included in the California Independent System Operator (California ISO) interconnection queue, as shown in the following section, titled "México Resource Potential". In light of the 2010 RPS goals, this report looks at the Mexican renewable resources that could be developed for export to California in the near-term but also considers longer-term opportunities.

Method

In preparing this report, KEMA researched available information on the border area's transmission infrastructure and interviewed the pertinent California utilities, California ISO, renewable generation developers, and Mexican government officials. The scope of the interviews is described below:

San Diego Gas & Electric (SDG&E) and California ISO: To evaluate existing transmission and to determine if an opportunity exists in the near term (before 2010) and in the longer term (after 2010) to receive up to 500 megawatts (MW) of wind resources into the California ISO/SDG&E transmission system in the California-México border region. A list of participants is provided in Attachment A.

Imperial Irrigation District (IID) and Los Angeles Department of Water and Power (LADWP): To evaluate existing and planned transmission in the border region and potential interest in procuring power or renewable energy credits from up to 500 MW of wind resources at La Rumorosa in Baja California. A list of participants is provided in Attachment B.

Renewable Energy Developers: To determine the status and timeframe of ongoing efforts by wind power project developers in the La Rumorosa region. Specific questions covered the

projects' timetables, the status of land rights contracts, permit applications, power sales agreements, arrangements for interconnection and transmission, and other business requirements and constraints. KEMA interviewed Zemer Energía, EnXco, Fuerza Eólica, Sempra Generation, and Clipper Windpower.

This report also includes a review of México's legal and regulatory framework for renewable energy production and transmission which would affect the development of renewable energy for export into California. Additional interviews with key government officials at the Secretaría de Energía (SENER) and at the Comisión Reguladora de Energía (CRE) were used to confirm KEMA's findings and to explore whether the new Mexican administration's focus on climate change may raise statutory or institutional barriers to renewable exports. The officials interviewed by KEMA do not expect such barriers to develop.

CHAPTER 1:
México Resource Potential

Over the years, several studies have described the abundant renewable energy resources in Baja California. The region's climatology provides for abundant solar and wind energy but limited hydrological potential. While Baja solar and wind energy have seen limited development, geothermal generation resources have been aggressively developed in the past by Comisión Federal de Electricidad (CFE) to achieve the current 720 MW capacity at the Cerro Prieto fields near Mexicali. These geothermal resources are fully dedicated to serving CFE's native load. However, that was not always the case. In 1984, CFE signed contracts to supply SDG&E and Southern California Edison (SCE) with 220 MW of firm energy from its geothermal generation at Cerro Prieto. This arrangement lasted for more than 10 years, until native demand growth in Baja required CFE to retain this geothermal capacity for its own use.

While no definitive estimate of the overall potential for renewable energy production in the California-Baja California border region exists, several efforts have hinted that the potential magnitude could be in the thousands of megawatts.[1,2]

This assessment seeks to identify the amount, type and location of renewable energy in Baja California Norte, México, available for delivery to California before 2010.

Outside of the 100-MW Cierro Prieto V geothermal generating facility to be developed by CFE near Mexicali, Baja California, and a small solar thermoelectric component to CFE's Rosarito III combined-cycle gas turbine (CCGT) facility, the only Baja California Norte renewable resources with potential for export before 2010 are wind generation projects.

Figure 1 shows the geographic concentration of the wind resource in Baja California Norte. As shown in the figure, the wind resource is concentrated along the Juarez Mountains in the La Rumorosa region, starting from the U.S. border and extending south along the mountain range. A simple estimate of the available potential within a 30-km-by-30-km square centered on La Rumorosa reveals a high concentration of winds above 7 meters per second (m/s), characterizing a resource potential that ranges from good to superb as indicated in Figure 1. While there are no formal wind potential assessments for the region in the public domain, a rudimentary assessment based on visual inspection of the 30-km-by-30-km area shown in Figure 1 and the application of simple rules of thumb, indicate potential wind capacity of 550 MW to more than 1,800 MW.[3] A more thorough wind resource analysis recently carried out by a wind project developer shows a potential of more than 10,000 MW for Baja California, with several thousand MW found along the Juarez Mountains.[4]

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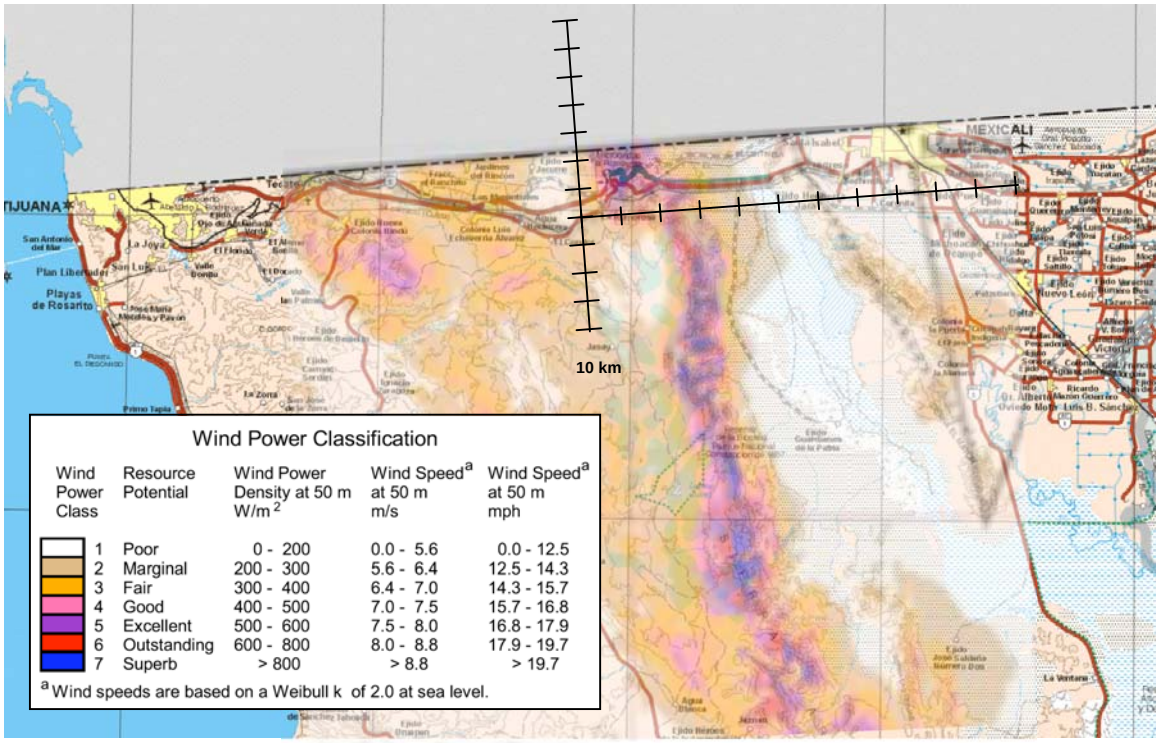
[1] *Energy Supply and Demand Assessment for the (California - México) Border Region*, Energy Commission-600-2005-023, May 6, 2005.

[2] *Potential for Renewable Energy in the San Diego Region* (Chapter 7), San Diego Regional Energy Study Group, August 2005.

[3] Assuming 10 to 30 percent of the land in the 30km by 30km square is used to erect wind machines and land requirement of 40 acres/megawatts.

[4] Personal communication with James Walker, EnXco, February 20, 2007.

Figure 1: Wind Resource Potential in Baja California Norte



Source: US DOE NREL Baja California Norte wind velocity map overlayed on INEGI Baja California map

In fact, California ISO reports approximately 5,000 MW of Mexican wind generator applications in its interconnection queue. All of these projects have applied for interconnection to the SDG&E grid as summarized in Table 1.

Each of these proposed interconnection points assumes construction of one or more generator tie line(s) from the respective Mexican wind project(s), across the international border into California. In fact, one or more trunk lines from Baja could handle power from a cluster of merchant-owned generation projects. Alternatively, wind developers may be able to connect into one of the existing merchant-owned generator tie lines that connect directly into the IV Substation (from the Termoelectrica de Mexicali (TDM) and Baja California Power (BCP) gas-fired generating plants in Baja) thus avoiding the need to build new transmission lines across the border. However, this would still require new line construction in Baja from the wind generator to the existing merchant line. Also, under Mexican law, it also may be necessary for the developer to take an equity position in the existing merchant line.

Table 1: Mexican Wind Renewable Interconnection Applications

Project Location	Proposed Pt. of Interconnection	Capacity (MW)	Proposed On-Line Date
La Rumorosa, Baja California	SDG&E IV-Miguel 500kV Line	400	June 2009
La Rumorosa, Baja California	SDG&E IV-Miguel 500kV Line	300	Nov. 2009

Mexicali/Ensenada/ Tecate, Baja California	SDG&E Miguel 230kV Bus	500	June 2010
Mexicali/Ensenada/ Tecate, Baja California	SDG&E IV 230kV Substation	1,000	June 2010
La Rumorosa, Baja California	SDG&E IV 230kV Substation	1,000	Oct. 2010
La Rumorosa, Baja California	New SDG&E 500/230kV Substation near IV-Miguel 500kV line	400	Dec. 2010
La Rumorosa, Baja California	SDG&E IV-Miguel 500kV Line	420	May 2011
La Rumorosa, Baja California	SDG&E IV 500kV Substation	1,000	Dec. 2011
	Total	5,020	

Source: California ISO Generator Interconnection Queue (Aug. 10, 2007)

Since it is not uncommon for generation developers to apply for different interconnection options as they proceed further in their planning and studies, some of the interconnection requests listed in Table 1 could be interconnection options for the same renewable generation project(s), which would mean the total potential capacity of these projects is less than the total of the individual applications. Also, the existence of an interconnection request does not in itself mean a project is economically viable or has a contract for sale of its energy. Even with those caveats, Table 1 clearly indicates that significant wind capacity could develop in the Northern Baja region over the coming years.

Status and Timeframe of Wind Projects in Baja California Norte

KEMA refines the estimate of Baja wind capacity currently under development by considering factors such as the status of permits and contracts. Among all the projects that have applied for California ISO interconnection, only two projects have obtained a permit from CRE. Both permitted projects are sponsored by Fuerza Eólica/Clipper Windpower.

KEMA interviewed sponsors of several projects on issues such as development timetables, status of land rights contracts, permit applications, power sales agreements, arrangements for interconnection and transmission, and other business requirements and constraints. The following sections summarize KEMA's interviews with the following entities:

- Unión Fenosa/Zemer Energía.
- Fuerza Eólica/Clipper Windpower.
- EnXco.
- Sempra Generation.

Unión Fenosa / Zemer Energía

Unión Fenosa/Zemer Energía, S.A. de C.V. (Zemer) reports having secured land rights to over 120,000 acres east and west of La Rumorosa as purportedly registered in the Tecate municipal

land registry and the federal national agrarian land registry.[5] The U.S. wind resource assessment firm Windots, LLC has carried out wind surveys for Zemer. These anemometric studies examined 10, 30 and 50 meters at eight sites since 2003. A more detailed resource assessment carried out by Zemer for the 37,800 acres with the most complete wind data shows average wind speeds between 6.5 and 7.7 m/s.

Zemer has initial plans to develop 400 MW of capacity for export to California and has been exploring sales to several California utilities and power marketing organizations. As of October 2007, no sales commitment has been made. Zemer has participated in the RPS procurement rounds of Pacific Gas and Electric and Southern California Edison (SCE), with an initial offer of 250 MW for delivery by 2010. Zemer expects to have a firm sales contract in place before the end of 2007. The 2010 energy delivery date assumes that turbines can be produced and delivered to the site by the end of 2009 and construction completed within eight months of the equipment delivery. This tentative schedule also assumes that the necessary cross-border transmission infrastructure is built in the interim. Zemer currently expects the organization contracting for the energy to build or arrange for the siting, licensing, and construction of the necessary transmission infrastructure.

Zemer has not yet applied for an export permit from CRE but has begun applying for other municipal, state and federal permits. In 2006 Zemer received approval from Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT) for the environmental impact statement for the initial 6 MW prototype phase of the project.

On June 7, 2007, Unión Fenosa announced the acquisition of a controlling share of Zemer Energía, with a planned investment of US$600 million to develop the La Rumorosa windpower project.

Fuerza Eólica/ Clipper Windpower

The Mexican wind developer Fuerza Eólica holds the only two CRE permits for wind power generation in Baja California. Its partnership with Clipper Windpower, a turbine manufacturer, could ultimately facilitate the acquisition of wind turbines and thus enable it to accelerate its plans. Although KEMA did not see a document, Clipper claims to have land rights for up to 750 MW of capacity. As described below, both of the CRE-permitted projects are located near the La Rumorosa area, west of Mexicali:

- Baja California 2000, S.A. de C.V.[6] obtained a self-supply permit from CRE in 1998. The project has a capacity of 10 MW and is intended to supply municipal lighting load. Clipper Windpower reports[7] that final negotiations with its offtakers are about to be finalized. The project is expected to complete by mid-2008.
- Fuerza Eólica de Baja California, S.A. de C.V.[8] obtained an export permit from CRE in

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[5] Land use rights contracts are registered with either the municipal Registro Público de la Propiedad – in this case for the Municipio of Tecate, BC, or in the case of communal arable land property, with the Registro Agrario Nacional in México City.

[6] Comisión Federal de Electricidad Self-Supply Permit E/71/AUT/98 issued to Baja California 2000, Unión Fenosa/Zemer Energía, January 14,1998.

[7] Personal communication with Mr. Michael Rucker, Western Development Leader, Clipper Windpower Development Company, Inc.

[8] Comisión Reguladora de Energía Export Permit E/214/EXP/2002 issued to Fuerza Eólica de Baja

2002. It has a planned capacity of 300 MW. Construction is expected to begin in 2009. The completion schedule of 2010-1011 is contingent upon signing of a Power Purchase Agreement.

EnXco

EnXco, the U.S. affiliate of EDF Energies Nouvelles, has been actively studying the wind resource in Baja California. The firm has acquired land rights in six of the largest ejidos (an area of farmland held in communal ownership but divided into separate family plots) surrounding La Rumorosa, and while anecdotal evidence points to rights held by EnXco for about 15,000 acres in Ejido Jacume, west of La Rumorosa, no further evidence of land rights was offered by EnXco at the time of the interview. EnXco does not appear to have commitments from potential buyers for its Baja California wind project. It has not applied for any of the necessary permits nor has it indicated it is in discussions with potential transmission service providers to carry the power to California.

Sempra Generation/Cannon Power

On June 29, 2007, Sempra Generation announced the acquisition of the land rights (lease) secured by Cannon Power to develop the 250 MW wind project on Ejido Jacume land near La Rumorosa. Subsequently (on July 2, 2007), Sempra Generation announced the sale of the project's output to Southern California Edison under a 20-year purchase power agreement under the 2007 RPS Program. Delivery will begin in late 2010. According to a source at Sempra, the point of interconnection with the California ISO grid is reflected in Table 1, but further details are proprietary.[9]

This project consists of 125 wind turbines to be installed along the eastern ridge lines of the Sierra Juarez Mountains in the Ejido Jacume, representing an investment of approximately $400 million. According to Sempra, the project remains subject to certain conditions, including regulatory approval of the contract and other conditions that preserve favorable project economics.[10]

California, Unión Fenosa/Zemer Energía, July 11, 2002.

[9] Personal communication, Sempra Generation, August 2007.

[10] Quote attributed to Sempra Chief Executive Officer and Chairman Don Felsinger by BNamericas, 29 June 2007.

CHAPTER 2:
Selling Renewables in México Versus to California

A wind developer in Baja California has the option of selling power in the Mexican market or in the U.S. market because of its proximity to the California-México border. In its selection of buyers, the developer will consider the contract price, duration and the risk to project revenue that each type of customer represents. Moreover, the developer will consider different incentive mechanisms for selling renewable energy in México versus to California. Since the clean attributes and emission displacement of renewable generation can only be counted once, developers in México have to weigh in the relative benefits from accruing the environmental benefits locally or selling them to California. If the environmental benefits from the renewable generation are accrued in México, developers can benefit from selling credits under the Clean Development Mechanism (CDM). If the renewable generation, along with its environmental benefit, is sold to California, the developer benefits from California's Renewables Portfolio Standard (RPS). It is also possible that a developer accrues the environmental benefits of renewable energy in México while selling the physical "non-renewable" power to California. The following sections discuss the relative benefits of a developer's selection of buyers.

Selling Power in México

A wind developer in México can take advantage of the CDM by selling its project output in México and its associated certified emission reductions (CERs) in the global carbon market. Also, given that large scale wind resource areas such as La Rumorosa are in close proximity to an existing transmission corridor, selling within México reduces the cost of transmission. However, negotiating power purchase agreements with potential electricity buyers in México could be challenging. The following sections discuss the benefits and drawbacks of selling wind power in México.

Clean Development Mechanism

The CDM is defined in Article 12 of the Kyoto Protocol as a mechanism to help developing countries attain sustainable development and industrialized countries (i.e., Annex 1 countries) to advance towards the GHG reduction objectives of the United Nations Framework Convention on Climate Change (UNFCCC). Annex I countries can implement projects that reduce emissions in non-Annex I countries in return for CERs. The CERs generated by such projects can be used by Annex I parties to help meet their emissions targets under the Kyoto Protocol. Article 12 also stresses that such project activities are to assist the developing country host parties in achieving sustainable development and in contributing to the ultimate objective of the UNFCCC.

The Mexican Senate ratified the Kyoto Protocol on April 29, 2000, but the requirements for project approval were not adopted officially by the Comisión Intersecretarial de Cambio Climático, the Designated National Authority (DNA), until 2005.[11] Thus, as of 2005, projects in

[11] The Intersecretarial Climate Change Committee in México is formed by representation of the following ministries: Energy, Environment, Communications And Transport, Social Development, Agrarian Development, Foreign Relations, and Economy.

México were eligible to pursue CERs under the CDM. As of March of 2007, there are eight wind electric projects registered as CDM projects, one of which is in the Baja California border area. The project output (< 10 MW) will be used in-country and delivered over the Mexican grid, thus making it eligible to use small-scale simplified CDM baseline and monitoring methodologies for certification.

The methodologies sanctioned by the DNA for the calculation of the emission reductions attributable to grid-connected wind electric projects are well established and based on the avoided emissions by CFE's fleet of generating plants. The first project certified under CDM was the Proyecto Eólico Eurus, located in Oaxaca, México, and estimated to have an emission factor of 610.3 tons of CO_2 per GWh. As CFE's generation becomes increasingly efficient, the emission factors used in CDM certification have come down. The latest project to apply for certification is CFE's La Venta. The emission factors used in the calculation of emission reductions in the CDM certification application are listed in Table 2.

Table 2: La Venta Emissions Factors

	2008	2009	2010	2011	2012	2013	2014
Emission factor [tCO_2/GWh]	560,15	547,89	535,64	523,38	511,13	498,87	486,62

Source: La Venta CDM Certification Application

Credits based on the equivalent emission reduction of a ton of carbon dioxide can be traded in the European Union Emissions Trading Scheme, where prices have reached €25-€30 level but recently have traded at a fraction of a Euro.[12]

The process for certification is involved and deliberate, and the ability of a project developer to capitalize on the trading value of CDM credits for project financing would require the use of hedging instruments to counteract the high volatility shown by the credits. Nevertheless, as the trading value of CDM credits recovers, developers are likely to continue to seek CDM certification, and lenders may find a way of incorporating the future sale value of the credits as a secure source of cash for debt service.

Since most wind projects are financed through a combination of debt and equity, the quality and risk of the project revenue stream must ultimately satisfy the lender and the equity holders (typically the project developer). The future value of carbon credits is particularly relevant since they represent a potential boon to the equity holder, but offer no upside to the lender, who will be focused on the quality of the project's sales revenue stream. From preliminary discussions with select lenders involved in financing wind projects in México, it appears that while the future value of carbon credits has been discussed as a potential source of cash collateral for debt service, the relative immaturity of the carbon markets and high volatility of the future value of the credits have so far prevented their consideration in debt service coverage ratio calculations. If the value of carbon credits was to be considered by the lenders, it would likely be in the form of a hedging instrument such as a collar to be exercised at a certain date in the life of the loan.[13] A collar is an investment strategy that uses options to limit the range of positive or negative returns on an investment in an underlying asset to a specific range. To do this, the developer would simultaneously buy a put option and write a call option on the value of the carbon credits. This hedging strategy would ensure that the value of the credits would be between the strike price on the call (potential profit), and the strike price on the put (potential loss), meaning the value of the credits would always be within a preset limit. Another alternative would be to sell the credits to one of several financial intermediary firms engaged in

[12] EUA prices week of February 18-24, 2007 as reported by PointCarbon.

[13] Personal communication, Calyon Corporate and Investment Bank, March 2007.

carbon trading.

Accelerated Depreciation of Renewables in México

While not eligible for U.S. tax credits, investments in renewable energy production in México can benefit from a generous accelerated depreciation schedule initially outlined in articles 21, 22 and 23b of the General Law for Ecological Equilibrium and Environmental Protection (Ley General de Equilibrio Ecológico y Protección al Ambiente – LGEEPA)[14] and specified in article 40 – part XII of the Income Tax Law (Ley del Impuesto Sobre la Renta – LISR).[15] The LISR currently allows 100 percent depreciation in the first fiscal year of equipment operation, as long as the equipment continues to operate for a minimum of 5 years.

The benefit of 100-percent accelerated depreciation on the first fiscal year of operations is particularly attractive to companies that already have substantial earnings in México. This may lead to increased participation by established energy companies seeking to partially acquire wind developers already active in the region.

Overcoming potential barriers to bringing México renewable generation across the border to California is discussed in the section titled "Overcoming Potential Barriers to Exporting México Renewable Resources."

Disadvantages of Selling in México

In México, the electricity consumers most interested in wind power are those subject to CFE's highest tariffs, that is, municipal governments billed at public lighting tariffs and commercial and industrial customers billed at medium-voltage industrial tariffs. For the developer, negotiating long-term power purchase agreements with these types of customers can be quite difficult, as municipal governments change every two years and industrial customers are typically unwilling to sign contracts long enough to satisfy the lenders.

In addition to municipal and commercial/industrial customers, the project developers have the option of selling power to the utility (CFE) at the statutory price of 85 to 90 percent of CFE's short-run marginal cost of electricity.[16] Clearly, this does not represent a very attractive option.

Selling Power to California

An alternative to incentivizing renewables projects with CDM certificates is to sell the generation to California investor-owned utilities for Renewables Portfolio Standard (RPS)

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[14] The Ley General de Equilibrio Ecológico y Protección al Ambiente (LGEEPA) was initially sponsored in 1998 and subsequently modified by the Secretariat of Natural Resources and the Environment (Secretaría de Medio Ambiente y Recursos Naturales - SEMARNAT).

[15] The Ley del Impuesto Sobre la Renta (LISR) is revised annually under the sponsorship of the Mexican Secretariat of Public Finance (Secretaría de Hacienda y Comisión Federal de Electricidaddito Publico - SHCP), which is also responsible for the collection of income taxes under the Ley del Impuesto Sobre la Renta.

[16] The short run marginal cost of electricity or Costo Total de Corto Plazo is projected forward by Comisión Federal de Electricidad every six months for specific nodes in the grid and communicated by Comisión Federal de Electricidad to participating generators.

Compliance. It is important to note that in the CDM scenario, even if the renewable generation is exported to California but the associated CDM credits are accrued in México, sold or traded, then the electricity would be considered as "null" electricity and would not be eligible for the California RPS compliance. The following section describes the eligibility and benefits of selling Mexican-generated renewable energy under California's RPS.

California Renewable Portfolio Standard

In 2002, Senate Bill 1078 established the California Renewables Portfolio Standard (RPS) requiring the three investor-owned utilities to purchase 20 percent of their energy from renewable energy sources by 2017. In 2003, the California Public Utilities Commission (CPUC) and California Energy Commission adopted the Energy Action Plan to accelerate the 20 percent goal to 2010. In California, electric utilities, still looking to fill their renewable energy portfolio commitments under the RPS program, represent an attractive market for Baja California wind project developers.

The 10-, 15-, or 20-year terms of power purchase agreements offered by the utilities coupled to the financial incentives provided under the RPS program, as well as their superior credit quality, make the option of selling power in California attractive.

However, a new project will necessitate a developer building new transmission infrastructure to reach a delivery point in California, or a Mexican point of delivery that connects to California. In order for a project to be certified as eligible to sell under the RPS program, the project would have to be certified under out-of-state and out-of-the-country requirements. However, if the first point of interconnection to the Western Electricity Coordinating Council (WECC) transmission system is located inside California, then the project is considered an in-state facility.

Renewable resources contracted by the Investor Owned Utilities (IOUs) under RPS solicitations must ultimately be delivered to a point within the California ISO control area, and, if they have their first point of interconnection outside of California, they must meet the out-of-state requirements and delivery requirements described in the *Renewables Portfolio Standard Eligibility Guidebook*. California Public Resources Code Section 25741(a) states that "electricity shall be deemed delivered if it is either generated at a location within the state, or is scheduled for consumption by California end-use retail customers. Subject to the criteria adopted by the Energy Commission, electricity generated by an eligible renewable energy resource may be considered delivered regardless of whether the electricity is generated at a different time from consumption by a California end-use customer."

According to CPUC and IOU requirements, as part of the solicitation process, wind projects located outside the California ISO control area must demonstrate adequate transmission capability. That is, each project participating in an RPS solicitation is responsible for including gen-tie costs in its offer as presently required by the Federal Energy Regulatory Commission (FERC). The utility is required to rank the offers through a least-cost, best-fit process considering all-in price (energy and capacity), including the cost of network upgrades associated with interconnection and delivery. In some cases the cost of the transmission from Baja California to the California ISO interconnection point (the gen-tie) may make these projects too expensive to be competitive in the California utilities' RPS solicitations. However, the recently announced Sempra/SCE contract proves that such projects can compete in a least-cost, best-fit evaluation.

Currently, the environmental attribute of renewable energy alone, known as Renewable Energy Credit (REC), does not qualify for California RPS if sold separately from its associated energy.

That means physical electrons from renewable projects must be delivered to an IOU in California for RPS compliance. With the launch of the Western Renewable Energy Generation Information System (WREGIS) in June 2007, the Energy Commission can now track renewable energy in the WECC region, including Baja California. This, and strong industry sentiments, are opening up the discussion of allowing RECs to be "unbundled" from its associated electricity for RPS compliance in California. The CPUC hosted a workshop in September 2007 on this topic. If and when unbundled tradable RECs are allowed in California, a trading platform and RECs market can be established. This will facilitate the selling of renewable attributes without the need to transfer the physical electrons to the utility under compliance.

CDM and Exported Power to California

Eligibility for CDM certification is limited to renewable facilities located in non-Annex 1 countries, including México. The project impact calculations are based on displacement of emissions by the generating fleet operating in that country. According to the DNA in México[17] and the UNFCCC,[18] renewable energy projects for export to the U.S. would be precluded from qualifying for CDM certification because the avoided emissions would accrue in the U.S. However, if renewable generation projects built for export to California were to displace CO_2 emitted by additional fossil-fired generation capacity built on Mexican soil for export to the U.S., these projects may be deemed eligible for CDM certification because the GHG emissions reduction would accrue in México. An additional requirement for exported renewable generation to be eligible for CDM certification is that both the renewable energy and the fossil-fired generation it displaces must be equally feasible for export.

Currently, there is a difference of opinion on the rules and processes for determining eligibility for CDM credits from renewable generating projects built for export to Annex I countries.[19] The CDM eligibility for renewable projects built for export to the U.S. will depend on the requirements imposed by the methodology selected to estimate the reduction in GHGs. Ultimately, the CDM certification of renewable export projects would give project developers in Baja California an additional source of cash without being forced to sell their output in México.

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[17] Personal communication, M. en C. Miguel Angel Cervantes Sánchez, Coordinador del Comité Mexicano para Proyectos de Reducción de Emisiones y Captura de Gases de Efecto Invernadero.

[18] Personal communication, Yolando Velasco, Head, Support to National Communications Unit, Secretariat – United Nations Framework Convention on Climate Change, Bonn, Germany.

[19] Personal communication, Daniele Violetti, Team Leader of the Clean Development Mechanism Registration and Issuance Unit, Secretariat – United Nations Framework Convention on Climate Change, Bonn, Germany.

CHAPTER 3:
Legal and Regulatory Framework of Cross Border Trading

KEMA reviewed México's legal and regulatory framework for renewable energy production and transmission to identify any barriers that would prevent the development of transmission lines to export renewable energy into California. Further, interviews with key government officials at the Secretaría de Energía (SENER) and at CRE were used to confirm the findings of our review and to explore whether the new Mexican administration's focus on climate change may raise statutory or institutional barriers to renewable exports.

The findings in both cases were consistent. No statutory barriers appear to exist, nor are expected to arise, that would limit the development and export of renewable energy to California.

International

North American Free Trade Agreement (NAFTA)[20]

Cross-border trade in electricity is not specifically addressed by the North American Free Trade Agreement (NAFTA), but covered under Chapter Six: Energy and Basic Petrochemicals. Whether electricity is considered as goods or as services, the scope and coverage of Chapter Six applies both to trade in energy goods and to "measures relating to investment and the cross-border trade in services associated with such goods."

When defined as a good in Chapter Six of NAFTA, electricity is subject to the provisions of NAFTA Chapter Three on national treatment and market access of goods. Article 301 of NAFTA requires that each party shall accord national treatment to the goods of another party in accordance with Article III of the General Agreement on Tariffs and Trade (GATT). Further, Article 603(1) of NAFTA adopts the GATT prohibitions on quantitative trade restrictions such as the imposition of maximum or minimum export or import-price requirements. Article 604 limits the application of export duties, taxes and other charges to those cases when the same charges are applied to the same goods when consumed domestically. The importation of electricity into the U.S. has been duty free since the establishment of NAFTA, as specified in the Harmonized System Classification 2716.00.00.

The maintenance of energy import and export licensing requirements is allowed under Article 603(5) of the NAFTA, provided that these are operated in a manner consistent with the Agreement. The Agreement also allows the establishment of restrictions of energy exports under certain conditions to relieve critical shortages of products essential to the exporting party. While under Article 607, the United States is allowed to place restrictions on exports for certain stated reasons of national security; the article imposes no obligations on and confers no rights to México.

Article 606 of NAFTA states that the energy regulatory measures of the parties are subject to

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[20] The review presented herein is based in its totality on: North American Free Trade Agreement Provisions and the Electricity Sector, Background Paper No. 4, North American Agreement on Environmental Cooperation, Gary Horlick and Christiane Schuchhardt and Howard Mann, June 2002.

the rules concerning national treatment, import and export restrictions, as well as to provisions on export taxes.

It is important to point out that there is no GATT/World Trade Organization case law on trade in electricity and that the only jurisprudence related to the energy sector deals with petroleum and gasoline.

México

Legal Framework

The current legal framework of México's electric power sector consists of a set of laws, regulations and other legal dispositions defining the role and jurisdiction of SENER, the regulatory authority of CRE; as well as the rights and obligations of the relevant government agencies (Comisión Federal de Electricidad – CFE y Compañía de Luz y Fuerza del Centro – LyFC) and the private participants in the sector. Of these two entities, only CFE operates in Baja California.

The responsibilities of the Mexican State and its agencies in the power sector are established by:

- The Mexican Constitution (articles: 25, 27 y 28)
- The Federal Law of Parastatal Entities (articles: 8, 10, 17, 18, 56 y 58)
- The Organic Law of Federal Public Administration (articles: 33, 48 y 49).

Article 25 of the Mexican Constitution defines the role of the State in coordinating national economic development with the participation of the public, private and social sectors, reserving for the state those strategic areas listed in Article 28.

Article 27 and 28 establish that only the Mexican State can generate, conduct, transform, distribute and supply electricity for the provision of a "public service."

Regulatory Framework

The structure and regulation of the electric power sector are defined by:

- The Law of Public Electric Service (Ley del Servicio Público de Energía Eléctrica or LSPEE).
- The Law of the Comisión Reguladora de Energía.
- The decree establishing the LyFC as a decentralized government entity.
- Rules Implementing the LSPEE (Reglamento de la LSPEE).
- Rules Implementing the LSPEE with regards to Contributions.
- Manual of Dispositions governing the Supply and Sale of Electric Energy for Public Service.
- Official Mexican Standards (Normas Oficiales Mexicanas).

The LSPEE, issued in December 22, 1975, was amended in 1983 to improve governance of CFE,

and amended again in 1992 to allow for private participation in areas that "do not constitute public service."

The areas in which the 1992 LSPEE allows private sector participation are:

- Generation of electric energy for self-supply, cogeneration or small-scale production (<30 MW) plus the sale of excess electric energy to CFE (≤20 MW).
- Generation of electric energy by independent producers for exclusive sale to the CFE or LyFC in specific geographic locations.
- Generation of electric energy for export, derived from cogeneration, independent production or small-scale production.
- Importation of electric energy by physical or moral persons exclusively for their own use.
- Generation of electric energy for emergencies arising from interruptions in the public electric service.

Further, the 1992 amendments to the LSPEE allow for "open" access to transmission, for users to build their own transmission and distribution lines, and for the sale of excess capacity by self-generation and/or cogeneration of up to 20 MW and/or unlimited quantities of non-firm energy to CFE or LyFC. The first four activities listed above are regulated by the CRE through the issuance of permits granted upon compliance with the applicable regulations. CFE's Independent Power Production Program is predicated upon the 1992 LSPEE and regulated by the rules implementing the LSPEE (Reglamento de la LSPEE).

Recently, the CRE has fostered the development of new regulatory schemes that encourage specific applications of renewable energy. On September 7, 2001, regulatory measures were published in the Diario Oficial de la Federación with the purpose of encouraging the development of generation projects based on renewable energy sources with intermittent availability, such as solar and wind. On February 26, 2004, a modification of the Interconnection Contract Model was published to include hydroelectric projects where the operator has no control of the rate of water extraction. On January 30, 2006, a modification was published to include the methodology for recognition of plant capacity. The main elements of this new regulatory scheme are the following:

- Generated renewable energy is dispatched whenever available.
- Excess energy generated at any given time may be "accumulated" within CFE and "withdrawn" when required, even in different time periods.
- Energy exchange will take place at tariff prices at the interconnection point.
- At the end of the year, excess energy accumulated in the system can be sold to CFE at 85 percent of the short-term generation cost.
- The monthly average of the energy generated during peak demand period on working days (1-hour period in case of wind and 3-hour period in case of small hydro) is recognized by CFE as plant capacity.
- The monthly combined peak demand is compared with this recognized capacity to determine CFE´s capacity charges.
- Ancillary services are paid in terms of the energy generated and not in terms of the installed capacity.
- Wheeling charges are paid in terms of the transmitted energy and not in terms of reserved capacity.
- CRE's renewable regulatory scheme does not apply to export as it is limited to renewable energy generation and transmission for self-supply within México.

Legal and Regulatory Basis for Exporting Renewable Energy

A wind or solar generating facility for export with capacity over 30 MW is specifically allowed under Article 108 of the LSPEE implementing rules and regulations (Reglamento), as an independent power producer (IPP). In order to be issued a permit to operate by the CRE, such an IPP must be a corporation duly constituted under the laws of México and domiciled within the national territory (Article 109 Reglamento LSPEE).

Article 117 of the Reglamento requires that an exporting-generating facility must present CRE with a duly executed and accredited power sales agreement or letter of intent to purchase the energy by a foreign buyer.

Article 118 of the Reglamento further requires that the energy must be exported unless the facility is authorized by SENER to change its output destination, or required to sell locally in case of emergency as defined in part a) of Article 37 of the LSPEE.

Article 36-III of the LSPEE and Articles 84 and 119 of the Reglamento require that the CRE, in deciding to issue a permit, consider the supply-demand balance at the local and national levels, as well as the fuel used by the proposed facility. [21] In fulfilling this requirement, the CRE must consult with CFE, requiring a statement from the latter as to the "convenience" of the operation of the proposed generating facility, its interconnection to the CFE grid, and of the construction of the transmission infrastructure to export its output. This requirement for consultation, may provide an avenue for CFE to object to licensing renewable export facilities if CFE's system impact analyses of the interconnection of the proposed facility to the WECC transmission system reveals conditions that negatively affect CFE's operations.

United States

The U.S. federal government regulates both the infrastructure and the commercial activities involved in cross-border trade in electricity.

Regulation of international transmission lines began in 1939 and was established by Executive Order (EO) rather than law. In 1953, EO 10485 established that no person shall construct, operate, maintain or connect an electric transmission line at the borders of United States without a permit from the Federal Power Commission. In 1978, EO 12038 transferred the authority to issue permits for new international transmission facilities to the Secretary of Energy. The Department of Energy's (DOE's) oversight authority extends to the construction, operation, maintenance, and connection of electric transmission facilities at the international border.

The permits for the construction and operation of electric transmission lines that cross the international border are called Presidential Permits. A permit is issued only if it is determined that the construction of the proposed infrastructure is consistent with the public interest. The two primary criteria that determine if a proposed project is consistent with the public interest are:

- DOE considers the impact the proposed project would have on the operating reliability of the U.S. electric power supply.
- DOE must comply with the National Environmental Policy Act of 1969 (NEPA) that

[21] As "freely available" renewable resources, wind and solar are not likely to be considered fuels in short supply.

requires DOE to consider the environmental consequences of proposed projects.

In addition, DOE must also obtain concurrence from the Secretary of State and the Secretary of Defense before issuing a permit.

The U.S. federal government does not regulate electricity imports. Furthermore, no federal permit is required to sell imported electricity if the sale at issue takes place outside of interstate commerce. "Interstate commerce" occurs where electricity in a state commingles with electricity that has been in another state.

If the cross-border line originates at the renewable generation facility and connects directly to the California grid without interconnection of any kind to the CFE system, there would be no commingling up to the interconnection point with the U.S. electric power grid. It is unlikely that FERC would have jurisdiction over the transmission rates or terms and conditions of renewable electricity over radial transmission lines unless the U.S. transmission provider seeks to own the U.S. portion of such generator tie lines and to include these costs into its rate base. In fact, this could occur pursuant to California ISO's new category of "trunk lines" for renewables.

Federal regulation of a sale for resale in interstate commerce of imported or domestic electricity will apply if title to the electricity changes hands within the United States. In this case, the seller must apply to FERC for approval of the rates, terms, and conditions of the sale. If approved, FERC will issue an order approving the rates and terms and conditions. There are two exceptions to FERC regulation of the sale: in the event the sale for resale in interstate commerce of imported or domestic electricity is conducted by a U.S. Government-owned, U.S. state-owned, or U.S. municipally owned utility; or is conducted by a U.S. Department of Agriculture Rural Utilities Service-financed rural electric cooperative.[22]

While this analysis is consistent with the current understanding of the Federal International Electricity Program, Office of Electricity Delivery and Energy Reliability, U.S. DOE,[23] the DOE program has submitted an informal clarification request to FERC.

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[22] *Guide to Federal Regulation of Sales of Imported Electricity in Canada, México, and the United States of America*, The North American Energy Working Group, January 2005.

[23] Personal communication with Ellen Russell, Federal International Electricity Program, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, March 7, 2007.

CHAPTER 4:
Overcoming Potential Barriers to Exporting México Renewable Resources

Given the significant potential to deliver renewable imports from México to California, it is important to understand potential barriers to such imports and explore ways to overcome such obstacles.

Regulatory Barriers

Constraints Imposed on Mexican Renewables by the RPS Process

The California Renewable Portfolio Standard (RPS) process for out-of-state and out-of-country renewable facilities could present barriers to developing wind projects in Baja California for export. The facility and delivery requirements are described in detail in the *Renewables Portfolio Standard Eligibility Guidebook* published by the California Energy Commission.[24] Some of requirements are listed below:

- The generation facility is or will be connected to the WECC transmission system.
- There must be a power purchase agreement between the generation facility and a retail seller, procurement entity or third party, and electricity must be delivered to an in-state market hub in California.
- The delivery must be made consistent with North American Electric Reliability Corporation (NERC) rules.
- The facility must participate in an Energy Commission-approved RPS tracking and verification system. A third-party participation in out-of-state transactions is contingent upon all parties to that transaction (third party, generator, load serving entity, and California ISO) participating in the tracking and verification system to verify RPS compliance.
- A facility located outside the United States that commenced or will commence commercial operations on or after January 1, 2005 (with exceptions for small hydro) must demonstrate that it does not cause or contribute to any violation of California environmental quality standard or requirement.

The current *Renewables Portfolio Standard Eligibility Guidebook* requirements may make it more difficult for Mexican developers to comply with the California RPS than for in-state developers. For example, if a Mexican developers' facilities are not or will not be in-state renewable facilities as defined by California statute, the developers must demonstrate that their facilities do not cause or contribute to a violation of a California environmental standard or regulation. To comply with this requirement, out of state developers must identify the applicable California environmental quality laws, ordinances, regulations, and standards (LORS) that may be violated by the facilities' development or operation, and demonstrate that these LORS will not

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[24] *Renewables Portfolio Standard Eligibility Guidebook*, California Energy Commission, January 2008, CEC-300-2007-006-ED3-CMF

be violated in the California region most likely to be affected by these activities. In addition, if the facilities are located out of the country, they must also explain how the developers will protect the environment to the same extent as would be provided by these LORS for a similar facility loacted in California, including any associated mitigation measures. Some non-California developers find it difficult to determine what the pertinent criteria are for demonstrating compliance with these environmental requirements. Clarifying the LORS requirements would serve to facilitate enhanced compliance of Mexican renewable projects to the RPS eligiblity requirements. These requirements may be clarified as more out-of-state and out-of-country developers apply for RPS certification.

The January 2008 RPS Eligibility Guidebook incorporates conforming changes from the passage of Senate Bill 1036 and Assembly Bill 809 in 2007. The 2008 RPS Eligibility Guidebook also includes clarifying language such as the flexibility allowed for banking and shaping, and provides a process for the Energy Commission to pre-approve the proposed delivery structure for out-of-state contracts that require CPUC approval.

CFE Not Allowed to Develop Transmission for Exporting

Currently, a developer KEMA interviewed is talking with a power marketing organization as a potential project partner and developer of the necessary infrastructure to connect the generating facilities from the La Rumorosa area directly to SDG&E's transmission facilities. The power marketer has approached CFE to develop the line from the generation site to the California-Baja California border.[25] CFE has indicated that this is not possible because CFE is limited by statute to develop facilities to provide public service and to finance its infrastructure through the Mexican federal budget process. Since the requested facilities would be a privately owned generating facility used strictly for export and would be isolated from the rest of the CFE public service system, it would be impossible for CFE to finance and build them. On the other hand, if the new facilities were electrically connected to the CFE system rather than to the California ISO system, CFE could perhaps justify the investment as network reinforcement.[26] However, this would require wheeling of the renewable energy through the CFE system to reach California markets.

Competitive Barriers

Ineligibility for U.S. Tax Credits

Since Mexican renewables are not eligible for U.S. tax credits (such as pursuant to Section 45 of the U.S. Internal Revenue Code), it results in a competitive disadvantage versus U.S. renewables amounting to about 3 cents/kWh levelized value (based on the 1.9 cent per kWh production tax credit).

Wheeling Costs

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[25] Personal communication with Mike Morgan, Vice President International Affairs, Sempra Energy.

[26] Personal communication with Alejandro Peraza, Director de Electricidad, Comisión Reguladora de Energía.

La Rumarosa wind developers that do not connect directly to the California grid may find it difficult to compete given the costs of wheeling through the CFE system. CFE typically computes a wheeling rate for each specific wheeling request that takes into account the distance the power is being wheeled and the embedded cost of the existing CFE transmission facilities. CFE may also assess a capital charge for any upgrades required within its system to accommodate a wheeling request. These costs will reduce the competitiveness of any Mexican renewable energy projects that plan to wheel to the California ISO system through CFE. The CFE annually posts a table of sample point-to-point wheeling rates on its website, but actual wheeling rates for each specific wheeling request are determined by CFE upon request. These wheeling costs could increase the overall cost of any renewable resources wheeled from México to California.

One option to avoid such wheeling costs is to construct a dedicated transmission trunk-line or generator-tie line from the renewable resource in México to the U.S. system. This option is discussed further in the section titled California-México Border Transmission Capacity.

Lower Capacity Factors

Previous bids that SDG&E has received from developers in México's La Rumorosa wind resource area have quoted capacity factors of 30 percent as compared to 35 to 40 percent quoted by wind developers in the U.S., making them less competitive. SDG&E assumes this is a function of less favorable wind resource characteristics in the La Rumorosa area compared to other options for wind resources in the U.S. In this context it would be valuable to know the capacity factor quoted in the recently announced Sempra-SCE wind renewable contract, but the information is not publicly available. The Energy Commission may want to pursue confidentiality agreements with Sempra and/or SCE to obtain these valuable data and other contract information that could be beneficial to developing the best regulatory strategy for the Border region.

Competitive Factors Common to U.S. and México Wind Projects

Competition for Wind Turbine Supply

Wind developers are currently facing a supplier backlog with wind turbines. Unless a developer has an existing near-term delivery commitment in a turbine suppliers queue, it is unlikely they could be on line in 2008 or 2009.

On-Peak and Off-Peak Congestion Constraints

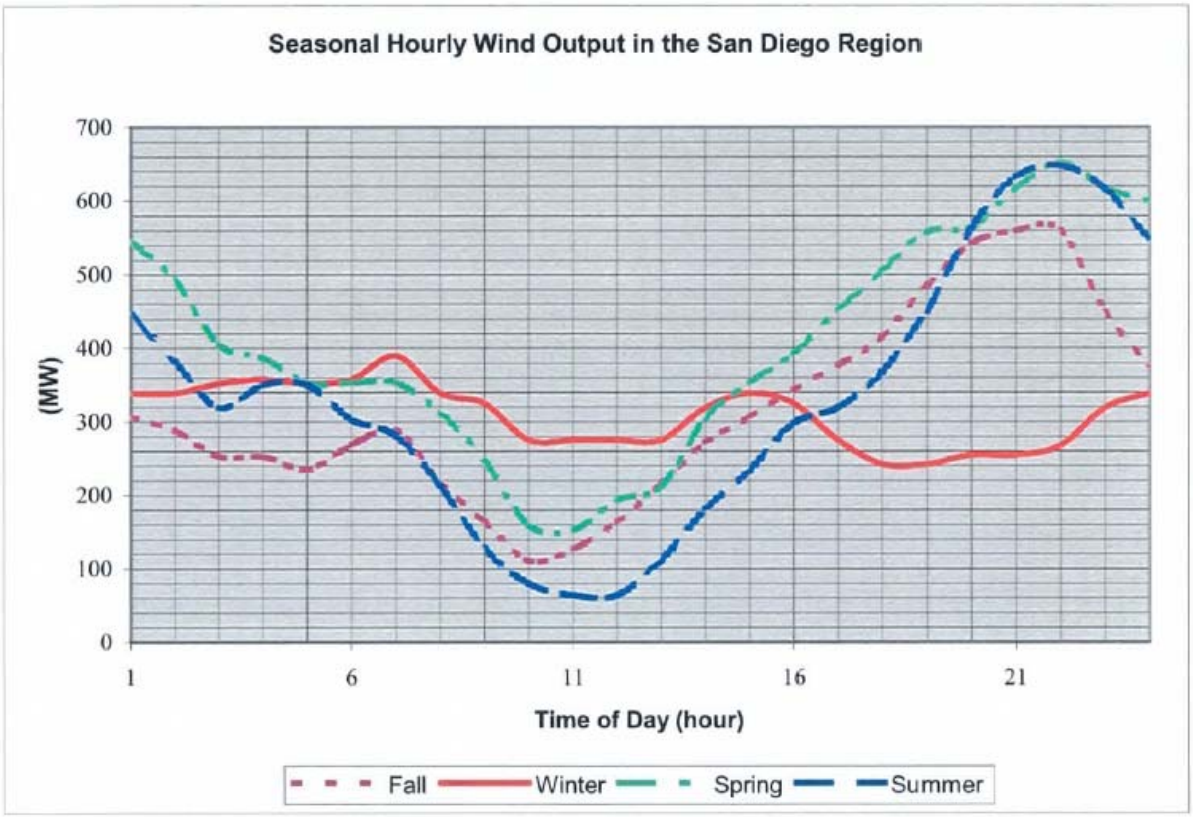
Wind resource sites in the Border region are remote from California ISO load centers and can experience delivery constraints due to California ISO transmission congestion. This can affect both the amount of energy that is delivered as well as the cost of delivery. The California ISO stated that congestion often occurs during on-peak conditions on SDG&E's transformer banks at Imperial Valley (from the 230 kV bus to the 500 kV bus) and at times during off-peak conditions on the Miguel 500/230 kV banks (from 500 kV to 230 kV). Depending on the point of interconnection of Mexican wind renewables, it could either aggravate or help to mitigate

these particular congestion constraints. Transformer upgrades at either substation should be possible and would cost in the tens of millions of dollars. However, such upgrades, combined with renewable additions, might cause congestion to occur at new points in the grid, which would have to be evaluated through detailed modeling of the transmission system.

Fortunately, there is a significant time-of-day diversity between wind and solar resource generation patterns in the Border region during most of the year. Solar energy output peaks during daylight hours and ramps to zero in the evening. On the other hand, wind generation along the border between SDG&E and Baja California typically peaks during the late evening, night time, and early morning hours as shown in Figure 2. The exception to this occurs in winter, but less wind capacity is expected at that time of year so the impact on congestion is reduced. Although the specific sites reflected in Figure 2 are on the U.S. side of the border, the La Rumorosa region is situated in identical terrain just to the south of the border and therefore similar wind patterns are expected.

As part of its least-cost, best-fit bid evaluation process for resource solicitations, SDG&E adds an upward adjustment to the bid price to account for expected congestion costs. These bid adders are computed for SDG&E using a propriety process developed by Asea Brown Boveri and take into account (among other factors) the specific connection point of the resources and the transmission paths available for delivery.

Figure 2: Output Characteristics of Border Area Wind Resources



Source: Potential for Renewable Energy in the San Diego Region, San Diego Regional Renewable Energy Study Group

Furthermore, SDG&E has testified in the Sunrise Powerlink proceeding that renewables may actually have an advantage over thermal generation in securing deliveries over constrained transmission paths as follows:

> …with respect to congestion it should be noted that energy from renewable energy sources has relatively low variable operating costs and is therefore unlikely to be physically curtailed in the event of congestion arises. Instead congestion will typically be managed by curtailing gas fired boiler and combined cycle generation with relatively higher variable operating costs.[27]

This statement appears to be based on the relative difference between typical "adjustment bids" from renewables vs. from thermal resources that are employed by California ISO in its congestion management process. If correct, this could mitigate congestion constraints as a barrier to export of Mexican renewables to California.

Finally, under the California ISO's pending market redesign, SDG&E anticipates that Available Transmission Capacity (ATC) and Congestion Revenue Rights (CRRs) on the California ISO controlled grid will be allocated to end-use customers located within the California ISO transmission grid. After conducting CRRs allocations on an annual and monthly basis, remaining CRRs will be auctioned and any qualified party may bid to buy CRRs. This will allow

[27] California Public Utilities Commission, A.06-08-010, Amended testimony of Jan Strack and Victor Kruger, V-36, December 2006.

parties to purchase CRRs as a financial hedge to smooth out hourly congestion charges they will be exposed to under the new market design. Thus, under anticipated future market redesign efforts, both U.S. and Mexican wind developers can bid in these auctions if they want to have a financial hedge against California ISO congestion costs.

Generator Tie-Line and Network Upgrade Costs

Another common factor is the cost associated with constructing the transmission interconnection facilities required to interconnect the wind project to the U.S. grid. Wind projects in México that desire to connect directly to the California ISO system are on an approximate equal footing with U.S. projects. Costs may vary, however, due to the increased distance from a wind project in México to the California ISO point of interconnection and the need for developers to obtain a Presidential Permit from the U.S. to build a generator tie-line across the border. Under current FERC regulations, the developers would normally be responsible for the full cost of the lines to get to the nearest California ISO substation, regardless of whether the generating plant is located inside or outside the U.S. However, FERC recently approved a California ISO tariff revision that authorizes up front rate base treatment for multi-user trunk lines that are built by transmission-owning utilities in order to interconnect renewable resources.[28] Each developer then refunds a pro rata portion of the trunk line cost when its generating projects become commercial. This tariff change could facilitate the construction of California ISO transmission infrastructure needed to interconnect and import renewable resources located in Baja California.

Regulation and Other Ancillary Service Requirements

As the control area operator, California ISO has the responsibility for maintaining adequate levels of "regulation" (rapidly dispatchable generation) within the control area, which California ISO acquires through ancillary service bids. California ISO has sole responsibility for arranging regulation and other ancillary services. As the aggregate capacity of wind generation increases statewide, California ISO will need to procure increased amounts of rapidly dispatchable generation for system regulation.

California ISO has a Participating Intermittent Renewable Program (PIRP) to help integrate renewables operationally into the California ISO control area. PIRP recognizes that intermittent resources have unique operating characteristics that significantly affect their ability to forecast and schedule energy. All renewable generation injected into the California ISO grid must be PIRP certified or they incur the same obligations as conventional resources to meet power delivery schedules and pay for imbalances in the settlement process. However, for PIRP-certified resources the MW deviations from a resource are netted across a calendar month and settled at a weighted-average price. PIRP resources also receive a Scheduling Coordinator exemption from negative deviation charges. PIRP certification would be required for Mexican renewables that connect directly to the California ISO grid. However, if they chose to connect to the Mexican grid and wheel through CFE to reach the California ISO, they would not be eligible for PIRP certification. In that case, California ISO could choose to implement either a "dynamic schedule" or "pseudo-tie" algorithm to manage control area imports in real time.

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[28] Federal Energy Regulatory Commission Declaratory Order on Multi-User Trunk Lines, April 19, 2007.

Contract Considerations

SDG&E stated that it requires all resource procurement agreements it makes with providers, in either the United States or México, be executed pursuant to the Western Systems Power Pool (WSPP) tariff and protocols, subject to U.S. law. However, it is unknown if this contract requirement could be viewed as a disincentive by renewable developers in México.

CHAPTER 5:
California-México Border Transmission Capacity

This section addresses the existing cross-border transmission capacity available for wind power imports from México.

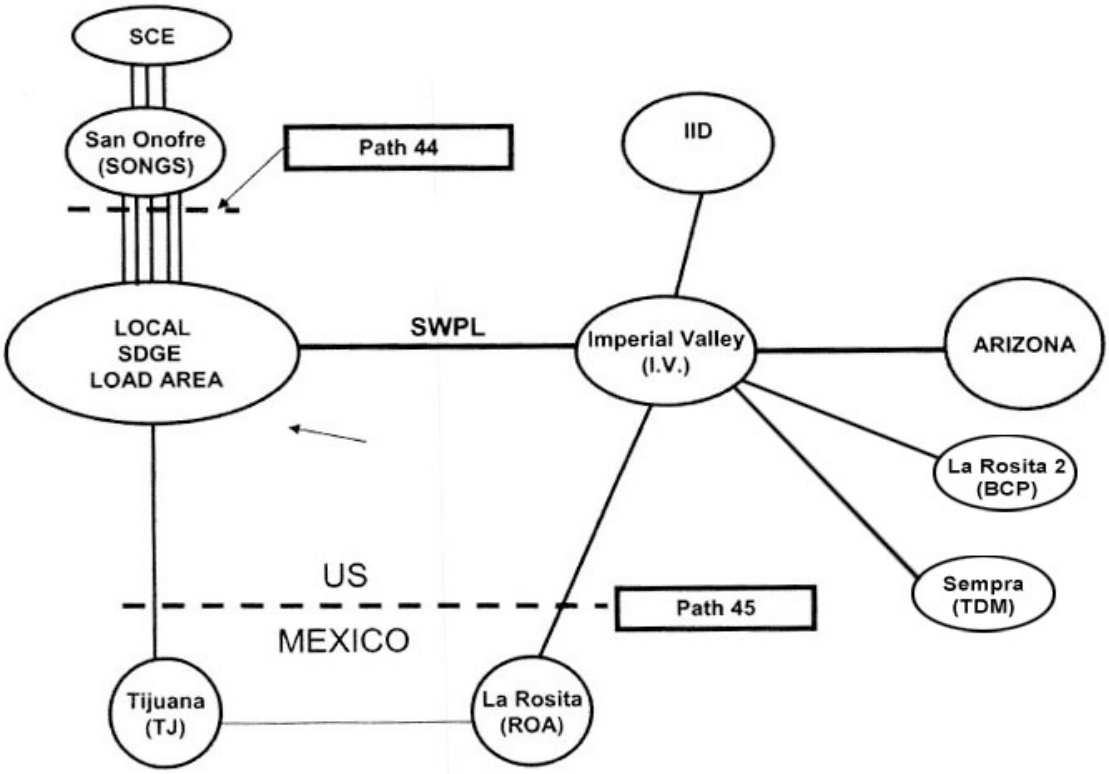
Cross-border transmission capacity can be in two forms:

1. Radial generation tie lines that connect a renewable resource directly into the California grid; or
2. Connection of the renewable project to the Mexican grid with wheeling through México to the existing points of interconnection between Baja California and California. The economic impact of this approach has already been discussed in the section titled Overcoming Potential Barriers to Exporting México Renewable Resources.

Existing Transmission

Figure 3 shows a simplified diagram of the existing SDG&E and CFE owned transmission in the California-México Border region.

Figure 3: Simplified Diagram of SDG&E and CFE Border Area Grid(s)



Source: R.06-02-013, 2007-2016 Long-Term Resource Procurement Plan, SDG&E Exhibits, Dec. 2006 (Edited)

The heavy black line in Figure 3 is SDG&E's 500 kilovolt (kV) Southwest Powerlink (SWPL), which runs both east and west of Imperial Valley Substation. The remaining lines on the diagram are 230 kV. The dashed line slightly to the north of Tijuana Substation and La Rosita Substation indicates the U.S.-México border. SDG&E owns the U.S. portion of the cross-border lines and CFE owns the portion of the Mexican portion of the cross-border lines. CFE's La Rosita-Tijuana 230 kV line crosses through the La Rumorosa wind development region.

WECC Path 45

Since the 1980s, SDG&E and Comision Federal de Electricidad (CFE) of México have jointly owned and operated 230 kV cross-border transmission interconnections. These have been upgraded over the years with the latest upgrade occurring in 2001. Path 45 is capable of delivering up to 800 MW of exports from Baja to California (subject to congestion and other operational constraints). One of the lines connects from CFE's Tijuana Uno Substation to SDG&E's Miguel Substation, and the other connects from CFE's La Rosita Substation to SDG&E Imperial Valley Substation. This pair of ties is referred to as Western Electricity Coordinating Council (WECC) Path 45.

CFE and Coral Energy often utilize Path 45 for short-term export transactions to the U.S., but most of the Path 45 export capacity is unused and would be available for export of renewables that originate in Baja California. For such transactions to be useful for RPS portfolio(s), the seller would need to execute long-term firm wheeling contracts through CFE's system to the point of interconnection with California ISO on Path 45. The execution of long-term wheeling contracts through CFE's system may result in increasing the overall cost of any renewable resources wheeled from México to California and therefore not be economical.

Cross-Border Generator Tie Lines

At this writing, there are no Mexican renewables facilities that connect directly into California. However, two merchant-owned gas-fired power plants in México— (BCP) located at "La Rosita 2" and (TDM)—connect directly into the California ISO grid at Imperial Valley Substation. The gen-tie lines for these plants run adjacent to the La Rosita-Imperial Valley 230kV corridor, but are not included in Path 45.

A similar delivery arrangement is contemplated in SCE's proposed long-term power purchase agreement with Sempra Generation for wind resources in the La Rumorosa area. Details of the transmission arrangements are confidential, but Sempra indicates that they plan to build a new gen-tie/trunk-line from Baja to one of the interconnection points identified in the California ISO interconnection queue (see Table 1).[29] The Energy Commission may be able to obtain details of the delivery arrangements by executing a confidentiality agreement with the parties. Sempra anticipates that other La Rumorosa area wind developers will contract for capacity in this line to deliver exports to California ISO .[30]

Another option for delivery of renewables from México would be to build a gen-tie from Baja to the Imperial Irrigation District (IID) north of Imperial Valley Substation. Such deliveries could

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[29] Personal communication with William Engelbrecht, Sempra Generation, August 2007.

[30] Presentation by Michael Morgan, Sempra International, at "Border Energy Forum", San Diego, California, October 19, 2007.

then be wheeled through IID to either SCE or LADWP. IID currently has an existing transmission interconnection (at the north end of its system) with SCE that is rated 600 MW. Over 80 percent of this capacity is currently subscribed by firm deliveries of existing geothermal resources from plants in the Imperial Valley. However, IID feels that limited delivery of wind renewable resources over the path might be possible.[31] IID doesn't currently have an interconnection with LADWP, but this is expected to change in 2010-2011 due to the addition of the Green Path North transmission project and associated upgrades, as shown in Figure 4. They are also willing to consider near-term upgrades of the IID to SCE Path that might allow a limited amount of firm wind renewable delivery from México prior to 2010 if there is a definite contract opportunity.

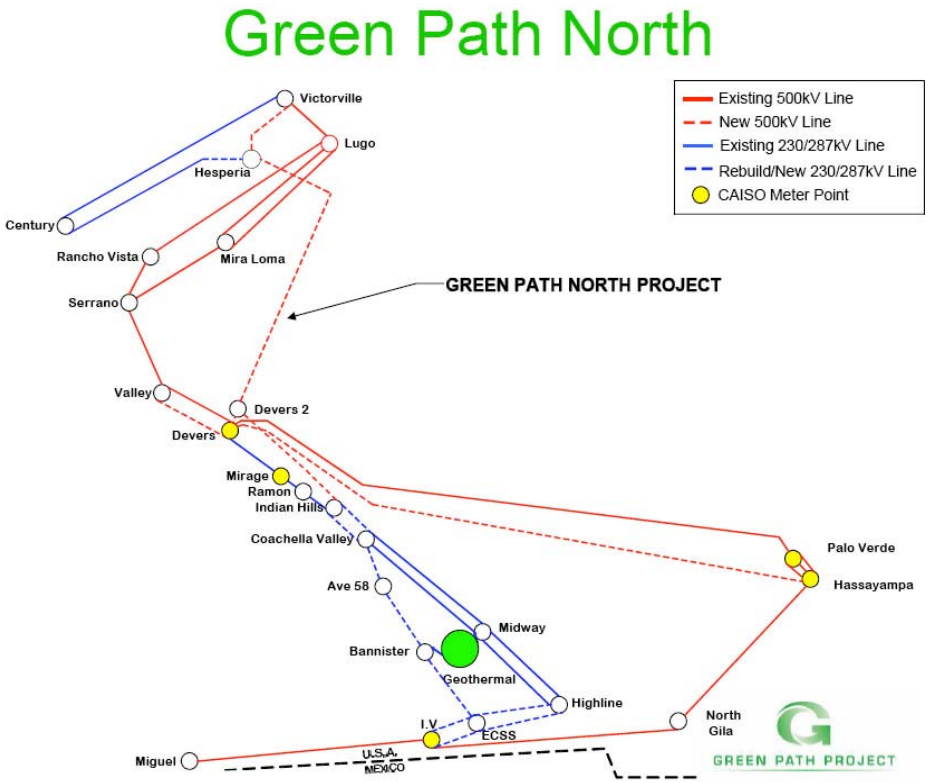
Planned Transmission Upgrades

The following section discusses additional transmission capacity that is currently being proposed in California to mitigate congestion or reliability issues in the border region, including the anticipated costs of added transmission and the source of funding for these capacity additions.

California ISO stated during KEMA's interview that the only transmission upgrades currently under serious consideration that are capable of significantly increasing renewable delivery capability out of the border region are: (a) the Sunrise Project, proposed for summer of 2010, and (b) the Green Path North project (along with associated upgrades in IID), proposed for completion by late 2010 or 2011. Both projects are expected to have about 1,200 MW of delivery capability.

[31] Interview with David Barajas, Imperial Irrigation District, February 23, 2007.

Figure 4: Green Path North Project and Associated IID Transmission Upgrades



Source: WECC Green Path North Report, July 2007.

Sunrise Project

The proposed SDG&E Sunrise Powerlink project involves construction of a new 500 kV line from Imperial Valley Substation into the SDG&E service territory, plus various 230 kV and lower voltage upgrades to the SDG&E system. The cost of the proposed project is projected to exceed $1 billion, with funding provided by increases in FERC-approved transmission rates for SDG&E and other participating transmission owners (PTOs) in California ISO. Allocation of these costs to PTOs would be done in accordance with California ISO's Transmission Access Charge (TAC) formulas. The CPUC and the Bureau of Land Management (BLM) issued a Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) in January 2008. Workshops and public participation hearings on the Draft EIR/EIS were held in the San Diego region in January and February 2008. A licensing decision is expected sometime during 2008.

Jacumba Area 500/230kV Substation

SDG&E plans to build a new 500/230kV substation in southeastern San Diego County to interconnect wind renewable resources.[32] This substation, which is independent of the Sunrise Powerlink proposal, will tie into SDG&E's existing Imperial Valley–Miguel 500kV line. Depending on the timing and licensing/Certificate of Public Convenience and Necessity (CPCN) application process for the substation, it may be possible to license the substation and have it built in the 2010 timeframe. It is important to note that the proximity of this substation to the La Rumorosa area of Baja California would make it an excellent point of interconnection for Mexican wind renewables in that region.

The cost of building this substation and possibly a 230kV or 500kV transmission line to the border with México could be recovered by SDG&E under the CPUC's backstop cost recovery mechanism,[33] or by rolling it under California ISO's TAC under the authority granted by FERC's ruling on multi-user resource trunk line declaratory order.

Green Path

The Green Path North project is sponsored by LADWP. The project would provide a new 500kV interconnection between SCE and LADWP in the Palm Springs area. Related IID expansion plans include a short 500kV link to Green Path North and numerous lower voltage upgrades. If completed, the project would create the first direct transmission interconnection between IID and LADWP. A diagram of the Green Path North project and related IID upgrades is shown in Figure 4. The delivery capability from LADWP's proposed Devers 2 Substation to SCE's Devers Sub is yet to be determined. It is also unknown how much power could be delivered over the 230kV upgrades between IV Sub and IID, which would be useful for wheeling power from México. However, a figure in the 250-500 MW range is feasible.

In recent public forums LADWP has quoted a preliminary cost estimate of $350 million for the portion of the Green Path North project from Devers 2 to Hesperia, but the components of this cost estimate are unclear. However, LADWP did confirm that the $350 million figure excludes costs for new facilities and upgrades south of Devers 2 that are shown in Figure 4, which are being planned by IID. The costs of the Green Path North project and associated IID upgrades would be borne by LADWP and IID, respectively. It is expected that the project costs would be recovered through increased customer rates, which could be offset to some degree by wheeling charges to any third parties that choose to schedule on the path. LADWP and IID also indicated a willingness to accept additional partners in these transmission project(s) if there is interest by other parties.

If the Green Path project is built, it would allow LADWP (as well as SCE) to procure renewable resources from the Imperial Valley as well as renewables from México by wheeling through the IID system to the southern terminus of the Green Path 500 kV line. It would also provide an additional delivery option to the existing path from México through the California ISO-controlled grid. While wheeling through IID might circumvent significant California ISO congestion constraints in the border region, such delivery through intermediate transmission owners would have added wheeling costs due to pancaking of wheeling charges.

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[32] California Public Utilities Commission, A.06-08-010, Sunrise Powerlink Transmission Project Hearing Transcript (Ali Yari, San Diego Gas & Electric) 893:4-896:11, July 2007.

[33] California Public Utilities Commission Decision No. D.0606034, June 15, 2006.

IID Indian Hills – Devers No. 2 500kV Line

In KEMA's opinion, the Green Path project will have no benefit for export of Baja California renewables to California unless IID completes additional transmission upgrades, including Indian Hills – Devers No. 2 500 kV line. The dashed lines shown in Figure 5 from Devers No. 2 to Indian Hills along with additional lower voltage upgrades further to the south have been proposed by IID, but are not definite projects at this time. According to IID, the earliest possible in-service date for its Indial Hills – Devers No. 2 500kV line is 2011. The specific design(s) and rating(s) of the IID upgrades to the south of Devers No. 2 are yet to be determined, and the transfer limit between Devers No. 2 and the existing Devers Substation is also undetermined at this time.

Licensing Uncertainty

It is important to note that while the Sunrise and Green Path projects offer clear potential for increasing transmission capacity that could help delivery of Mexican renewables into California, a lengthy permitting/licensing process is required and neither project is assured of approval. Other transmission options may be defined as a result of the permitting/licensing processes for these projects, or may need to be considered if either of the current proposals is denied. Even if approved, the eventual in-service date of the projects remains to be confirmed. Therefore much uncertainty still exists regarding the plans for transmission system expansion in the border area through 2010 and beyond.

CHAPTER 6:
Financing Options for Developing New Transmission

The various transmission options available to wind developers in Baja California Norte interested in exporting to California over existing transmission infrastructure were summarized in the previous chapters. This section discusses the options for financing the construction of new radial lines from the generating facilities to an interconnection point within California ISO or to the IID control area.

México

Paid by Generator

A generation developer in México that connects to California ISO would normally have to sponsor the construction of the interconnection facilities in México as well as the transmission line across the border to the CAISO interconnection point. The cost of these facilities would have to be rolled into the all-in price bid to the RPS purchasing utility. However, the portion of such gen-ties within California (north of the Border) may now be eligible for the multi-user trunk line financing option recently approved by FERC. In this approach a California utility builds and rate bases the trunk line and each developer that seeks to use capacity on the line only pays a pro rata share of the sunk cost. Under the California ISO tariff, developers may also sponsor upstream deliverability upgrades if they chose to do so.

Capacity Reservation by Generators on Gen-Ties to CFE

A possible approach for generation interconnection within México was used successfully by CFE in La Ventosa (Oaxaca), another promising wind resource area in Southern México. In this approach, CFE holds an "open season" for the wind developers in a given area to commit to capacity reservations in the new transmission facilities. Signed interconnection and wheeling agreements guaranteed with posted bonds would be agreeable to potential lenders, or in the case of CFE, to the Mexican Treasury, as a promise of repayment by the participating wind developers.

Co-Ownership with Mexican Company

Mexican law requires that private transmission facilities used for export be owned by a company incorporated under Mexican laws and domiciled in México. Several wind developers could jointly own the facilities up to the border under a regime of co-propiedad (co-property).

A precedent for this type of arrangement already exists in the export lines used by the Intergen and Sempra gas-fired generating facilities near Mexicali, Baja California.

Transfer of Transmission Assets to CFE

Some wind project developers that initially connect directly across the border to the California transmission system may at a later time seek to interconnect to CFE's transmission system as well. While there is currently no precedent for such an approach, conceptually it may be possible to transfer ownership of the associated transmission infrastructure within México to CFE for use in serving some portion of CFE's public service load, and/or for CFE to export power to the U.S.

Under current Mexican law (LSPEE), ownership of the cross-border transmission infrastructure thus interconnected would have to be transferred to CFE. The implementing rules and regulations of the LSPEE (Reglamento de la LSPEE) address compensation for the transfer of ownership of installations required for interconnection and provision of service by CFE but built by others.

More specifically, the special form of the CFE interconnection contract for backup service to Baja California businesses importing electricity from WECC already addresses the matter of ownership transfer (cesión) of the installations necessary to deliver the imported electricity to the business.[34]

Nevertheless, given the substantial uncertainties related to this concept, it is suggested that this matter be submitted to the consideration of the pertinent Mexican energy agencies for further consideration.

California

Paid by RPS Utility and Recovered through Retail Rates

The transmission facilities between the California-Baja California border and the interconnection point at the SDG&E system could be developed by SDG&E and the cost recovered under the California RPS statute 399.25, which per CPUC decision D.0606034 of June 15, 2006 provides a backstop cost recovery mechanism to recover through retail rates any transmission or interconnection costs not approved by FERC (including gen-ties).

This mechanism allows the utility to pay up front for the construction of transmission needed to access renewables, requiring generators to reimburse the utility for their pro rata share of the transmission costs.

The new CPUC interpretation of the applicability of Section 399.25, includes the following:

- The cost-recovery provisions are applicable to transmission facilities that are the subject of applications to the CPUC for a CPCN or Permit to Construct (PTC). The transmission projects also have to be deemed necessary for meeting state RPS goals.

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[34] The construction and transfer of installations required to import electricity are fomalized in an agreement based on articles 25, 26, 36, 39, 40, 41, 42 and the Second Transitory addendum to the implementing rules and regulations of the Ley del Servicio Publico de Energía Eléctrica (Reglamento de la Ley del Servicio Publico de Energía Eléctrica, en Materia de Aportaciones, Diario Oficial de la Federación, November 9, 1999.

- Some projects may not require a CPCN or PTC but would meet the standards for Sec. 399.25 cost recovery. If a utility determines there is a project necessary to meet RPS goals that meets the criteria for eligibility, the utility may file an application for authorization with the CPUC.
- While in earlier CPUC decisions, the CPUC ruled that backstop cost recovery would not apply to gen-tie facilities, new high-voltage gen-tie facilities needed to meet RPS targets are now eligible for backstop cost recovery.
- It is not necessary for the CPUC to evaluate network benefits in order to make a project be eligible for cost recovery.
- The following types of projects are eligible under the new interpretation of the statute: new high-voltage transmission lines designed to serve multiple RPS-eligible projects where added capacity will be utilized to meet the RPS targets; transmission upgrades or lines that are necessary to interconnect renewable energy generators that have power purchase agreements with CPUC-jurisdictional utilities; transmission upgrades or lines that are necessary to interconnect renewable energy generators that have PPAs with CPUC-jurisdictional utilities.

Multi-User Resource Trunkline

Another potential alternative for financing the construction of transmission between the border and the interconnection point with the California ISO controlled grid is use of the Multi-User Resource Trunkline concept, which was approved by FERC in April of 2007.[35] This established a new type of transmission rate treatment to facilitate the utility financing of California ISO interconnectionion facilities for for clusters of renewable projects in regions remote from load centers.

The California ISO will rely on the California Renewable Energy Transmission Initiative to prioritize California's renewable resource areas for trunkline eligibility. In addition, the criteria for trunkline eligibility requires that load-serving entities have demonstrated commercial interest in prospective renewable energy projects in the region.

The up-front cost for eligible trunklines will be financed by an existing or new PTO, which will be permitted to reflect the costs in its Transmission Revenue Requirement (TRR). If the trunkline facilities are 200 kV or higher, any portion not directly recovered from generation developers could be rolled into the California ISO's TAC for ratemaking purposes.

As new wind generators are constructed and interconnected to the trunkline, the costs of the capacity required by those resources will be directly recovered from the generators, thereby reducing the impact on transmission ratepayers by reducing the costs included in the PTO's TRR and the TAC. When all the capacity of the multi-user trunkline is utilized and paid for by the wind generators, transmission rate payers would no longer face any cost responsibility for those facilities.[36]

Financing by CPUC Non-Jurisdictional Utilities

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[35] Federal Energy Regulatory Commission Declaratory Order, EL07-33-000, April 19, 2007.

[36] California Independent System Operator Petition for Declaratory Order filed before the Federal Energy Regulatory Commission by the California Independent System Operator, January 25, 2007.

While the IID Imperial Valley substation would be another likely interconnection point for radial transmission lines from La Rumorosa, any necessary network reinforcements would have to be financed by the developer or recovered by IID through a new or modified transmission tariff filed with FERC. Alternatively, IID could amend its retail rates to recover the cost of the facilities from all ratepayers or design a new retail tariff for those willing to pay a surcharge for renewable energy.

CHAPTER 7:
Conclusions and Next Steps

This report opens the discussion of how to approach the exciting new potential for developing and exporting renewable energy from the Northern Baja region to California. While there is great opportunity in this area, the scope of the cross-border issues identified calls for even greater cooperation between those regulatory agencies and policy-makers involved at the U.S. federal level, the California utilities and regulatory organizations, and the CFE and the Mexican regulatory organizations.

KEMA has suggested some first steps for supporting the development of Baja renewables for export to California. They are grouped as educational/informational, identifying regulatory processes that should be examined or clarified, and infrastructure needs.

Education/Delivering the Information

- The developers need a better understanding of the transmission options available to them. Without clarity on these options, the developers have difficulty taking the lead on developing wind resources for export to California. Although potential buyers of the energy or marketers associated with the project may decide to undertake the development of the necessary transmission infrastructure, current and clear information would be most helpful in moving these projects forward. Therefore, the Energy Commission should publish information on this subject and promote discussion of this topic in binational forums.
- Preliminary studies have indicated the abundance of renewable energy resources in Baja California. However, no detailed study has been undertaken recently to quantify the resource potential in the area. In the past, private wind developers have contracted consulting firms to perform such studies. The Energy Commission should work with the developers so they understand that it is in their interest to make the results of these studies available. KEMA recommends that the Energy Commission conduct a wind resource potential assessment for Baja California.

Regulatory Processes Needing Clarification

- The Energy Commission should push for clarification of the process by which Mexican developers could demonstrate that their facilities and contract arrangements meet all of the applicable California environmental quality laws, ordinances, regulations, and standards as required under the RPS. This should include exploring the possibility of México adopting standards identical to the California standards for such export projects.

  Currently under SB 1078, renewable energy credits (RECs) are eligible for the California Renewables Portfolio Standard (RPS) only if they are bundled with their associated electricity. Although WREGIS was launched in June 2007 as the RPS tracking system, unbundled RECs are not uet allowed for RPS compliance. The CPUC is currently considering unbundling RECs for RPS compliance. The Energy Division held a 3-day workshop in September 2007 to develop a common understanding of what a tradable REC regime might entail. The workshop was followed by a ruling seeking comments and reply comments on a potential REC-trading regime. Under SB 107, the CPUC may not

authorize tradable RECs for RPS compliance until the Energy Commission and the CPUC make a determination that the tracking and verification system meets certain requirements. Both agencies have jointly drafted a report on the criteria, methodology and interim conclusions, and the Energy Commission held a workshop on March 17, 2008 to solicit stakeholder input. Both agencies are planning to adopt the final report in July 2008.

Even in an unbundled REC regime, out-of-state delivery requirements would still apply in the absence of a change in legislation. If in the future, RECs are not subject to out-of-state delivery requirements, developers could greatly benefit from being able to export RECs to California utilities for their RPS compliance while delivering the energy to another buyer.

- The possibility of a wind resource developer initially building an interconnection to the U.S., then later transferring ownership of its transmission facilities to CFE is without precedent. If any developers desire to pursue such a transfer of ownership, they would be wise to submit the concept for consideration to the pertinent Mexican governmental energy agency.

Infrastructure Needs

- The Energy Commission should promote continued expansion of border area transmission infrastructure including potential near term transmission upgrades that could mitigate congestion constraints in the Border region and facilitate renewable expansion, including:
  - Bulk power transformer bank additions at Imperial Valley and Miguel.
  - SDG&E's Sunrise Powerlink Project.
  - SDG&E's Jacumba Area 500/230kV Renewable Collector Substation.
  - LADWP's Green Path North Project.
  - IID's Indian Hills – Devers 2 500kV line (including associated lower voltage upgrades).
- Assuming a CPCN application will be filed for the Jacumba Area substation project, the CPUC should license the project in a timely manner.
- California ISO and the CPUC have identified several regions in the State, including the Imperial Valley, as renewable-energy-rich regions in need of transmission infrastructure. KEMA suggests that once the wind resource potential of the Northern Baja region is determined, it could be considered as another renewable-energy-rich region. This would facilitate the financing of transmission development through the CPUC and California ISO cost-recovery mechanisms, especially for out-of-state and out-of-country infrastructure.

Glossary

ARB	Air Resources Board
ATC	Available Transmission Capacity
BCP	Baja California Power
California ISO	California Independent System Operator
CCGT	combined-cycle gas turbine
CDM	Clean Development Mechanism
CER	certified emission reduction
CFE	Comisión Federal de Electricidad
CPCN	Certificate of Public Convenience and Necessity
CPUC	California Public Utilities Commission
CRE	Comisión Reguladora de Energía
CRRs	Congestion Revenue Rights
DNA	Designated National Authority
DOE	Department of Energy
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
EO	Executive Order
FERC	Federal Energy Regulatory Commission
GATT	General Agreement on Tariffs and Trade
GHG	greenhouse gas
IID	Imperial Irrigation District
IOUs	Investor Owned Utilities
IPP	independent power producer
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
LGEEPA	Ley General de Equilibrio Ecológico y Protección al Ambiente
LISR	Ley del Impuesto Sobre la Renta
LORS	laws, ordinances, regulations, and standards
LyFC	CFE y Compañía de Luz y Fuerza del Centro
m/s	meters per second
MW	megawatts
NAFTA	North American Free Trade Agreement
NEPA	National Environmental Policy Act of 1969
PIRP	Participating Intermittent Renewable Program
PTC	Permit to Construct

RECs	renewable energy credits
RPS	Renewables Portfolio Standard
RPS	Renewables Portfolio Standard
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales
SENER	Secretaría de Energía
SWPL	Southwest Powerlink
TAC	Transmission Access Charge
TDM	Termoelectrica de Mexicali
TRR	Transmission Revenue Requirement
UNFCCC	United Nations Framework Convention on Climate Change
WECC	Western Electricity Coordinating Council
WREGIS	Western Renewable Energy Generation Information System
WSPP	Western Systems Power Pool

ATTACHMENT A: KEMA/SDG&E/CALIFORNIA ISO INTERVIEW DATES AND PARTICIPANTS

KEMA met with San Diego Gas & Electric (SDG&E) and the California Independent System Operator (California ISO) as summarized in the table below to evaluate existing transmission and to determine if an opportunity exists in the near term (prior to 2010) and in the longer term (after 2010) to receive up to 500 Megawatt (MW) of wind resources into the California ISO/SDG&E transmission system in the California-México border region.

KEMA Interviews with SDG&E and CALIFORNIA ISO

Date	Location	Parties Interviewed	KEMA Participants
2-6-07	San Diego, CA	Linda Brown, SDG&E Director, Transmission Planning Mike Turner, SDG&E Manager, Interconnection Planning	David Korinek Richard Wakefield Johan Enslin
2-7-07	San Diego, CA	Mike McClenahan, SDG&E, Director, Procurement and Portfolio Design Stephen Yatsko, SDG&E, Senior Energy Administrator	David Korinek Johan Enslin Karin Corfee (by phone)
2-22-07	Folsom, CA	David Hawkins, California ISO, Lead Industry Relations Clyde Loutan, California ISO, Industry Relations Irena Green, California ISO, Transmission Planning Bruce Centurino, California ISO, Transmission Planning Ruhua You, California ISO, Transmission Planning	David Korinek Elena Schmid Karin Corfee

Due to the requirements of the Federal Energy Regulatory Commission's (FERC) standards of conduct, separate interviews were held with the transmission and procurement groups at

SDG&E. Although SDG&E owns and maintains the transmission facilities along the border, California ISO exercises operational control over the facilities. As part of their authority, California ISO administers the scheduling protocols that all wholesale power customers (including SDG&E's merchant function) use to schedule power flows on SDG&E's transmission facilities.

ATTACHMENT B: KEMA/IID/LADWP INTERVIEW DATES AND PARTICIPANTS

KEMA met with and interviewed representatives from Imperial Irrigation District (IID) and Los Angeles Department of Water and Power (LADWP) as summarized in table 2. Interviews were conducted to evaluate existing and planned transmission in the border region and potential interest in procuring power or renewable energy credits from up to 500 MW of wind resources at La Rumorosa in Baja California.

KEMA Interviews with IID and LADWP

Date	Location	Parties Interviewed	KEMA Participants
2-23-07	Telephone interviews	Chuan-Hsier Wu, LADWP Manager, Transmission Planning David Barajas, IID, General Superintendent, System Planning & Contracts	David Korinek
2-27-07	Telephone Interview	Brad Packer, LADWP, Integrated Resource Load Plan Manager	David Korinek
2-27-07 & 3-1-07	Telephone interview(s)	Ms. Belen Valenzuela, IID, Assistant Energy Manager	David Korinek

Due to the requirements of the FERC's standards of conduct, separate interviews were held with the transmission and procurement groups at both IID and LADWP. By their own choice, neither of the two utilities currently have PTO status in California ISO, and each owns and operates their respective transmission facilities separate and apart from California ISO.