



# **CERTIFICATION AND FINANCING PROPOSAL**

## **EXPANSION OF THE ENERGÍA SIERRA JUÁREZ WIND FARM IN TECATE, BAJA CALIFORNIA**

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## EXECUTIVE SUMMARY

### EXPANSION OF THE ENERGÍA SIERRA JUÁREZ WIND FARM IN TECATE, BAJA CALIFORNIA

<b>Project:</b>	The proposed project consists of the design, construction and operation of a 108-megawatt (MW) wind farm located in Tecate, Baja California (the “Project”), the second phase of a project certified by the NADB Board in November 2013. The electricity generated will be delivered to San Diego County through an existent transboundary 230-kV generator tie line and purchased by San Diego Gas & Electric (SDG&E), pursuant to a long-term Renewable Auction Mechanism Power Purchase Agreement (PPA).
<b>Objective:</b>	The Project will increase installed capacity of renewable energy resources, which will help supplying clean energy and reduce future demand on traditional fossil fuel-based energy production and thus help prevent the emission of greenhouse gases and other pollutants from power generation using fossil fuels.
<b>Expected Outcomes:</b>	<p>The estimated environmental and human health outcomes resulting from the installation of 108 MW of new renewable energy generation capacity are:</p> <ul style="list-style-type: none"><li>a) Generation of approximately 390 gigawatt-hour (GWh) of energy output on an annual basis.<sup>1</sup></li><li>b) Reduction of approximately 84,000 metric tons/year of carbon dioxide (CO<sub>2</sub>), 144 metric tons/year of nitrogen oxides (NOx) and 4 metric tons/year of sulfur dioxide (SO<sub>2</sub>).<sup>2</sup></li></ul>
<b>Sponsor:</b>	Infraestructura Energética Nova, S.A.B. de C.V. (IEnova) and Saavi Energía S. de R.L. de C.V. (collectively with IEnova, the “Sponsor”)
<b>Borrower:</b>	Energía Sierra Juárez, S. de R.L. de C.V. (ESJ).
<b>NADB Loan Amount:</b>	Up to US\$78.0 million.

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<sup>1</sup> Source: Information provided by the Sponsor based on the expected P50 electricity production.

<sup>2</sup> CO<sub>2</sub>, NOx and SO<sub>2</sub> calculations are based on the potential emissions avoided as a result of reducing future demand on fossil fuel-based electricity through the use of solar energy equivalent to 390 GWh/year and the emission factors for the state of California as reported by the U.S. Energy Information Administration. The emission factors are: 0.21520 metric tons/megawatt-hour (MWh) for CO<sub>2</sub>; 0.00037 metric tons/MWh for NOx and 0.00001 metric tons/MWh for SO<sub>2</sub>.

# **CERTIFICATION AND FINANCING PROPOSAL**

## **EXPANSION OF THE ENERGÍA SIERRA JUÁREZ WIND FARM**

### **IN TECATE, BAJA CALIFORNIA**

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#### **1. PROJECT OBJECTIVE AND EXPECTED OUTCOMES**

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The proposed project consists of the design, construction and operation of a nameplate 108-megawatt (MW) expansion of an existing wind energy farm located in the vicinity of La Rumorosa, Tecate, Baja California (the “Project”).<sup>3</sup> The electricity produced will be purchased by San Diego Gas & Electric (SDG&E) for use in the state of California, pursuant to a long-term Power Purchase Agreement (PPA). The Project will increase the installed capacity of renewable energy resources, those reducing both future demand on traditional fossil fuel-based energy production and the emission of greenhouse gases and other pollutants produced by such power generation. The Project is expected to generate approximately 390 gigawatt-hours per year (GWh/year) of energy output. As a result, it will help to prevent the emission of an estimated 84,000 metric tons/year of carbon dioxide (CO<sub>2</sub>), 144 metric tons/year of nitrogen oxides (NO<sub>x</sub>) and 4 metric tons/year of sulfur dioxide (SO<sub>2</sub>) from conventional fossil fuel-derived energy resources, which will support achievement of California state goals to reduce greenhouse gas emissions by using clean and renewable energy sources to meet the increasing demand for electricity.

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#### **2. ELIGIBILITY**

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##### **2.1. Project Type**

The Project falls into the category of clean and efficient energy.

##### **2.2. Project Location**

The Project will be constructed in the northern region of the state of Baja California, adjacent to the U.S.-Mexico border and to the original, existing and operating project certified by the NADB Board in November 2013. The Project site is located in the municipality of Tecate, approximately 29 miles east of the urban area of the city of Tecate and approximately 33 miles west of the urban area of the city of Mexicali at the following coordinates: latitude 32°34'29.37"N and longitude 116°05'31.15"W. The electricity generated by the Project will help meet the increasing demand for electricity in the southwestern region of the U.S. served by SDG&E, including the cities of San

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<sup>3</sup> The original 155-MW project was certified by the NADB Board in November 2013.

Diego, Imperial Beach, La Jolla and Oceanside, among others. Figure 1 illustrates the geographical location of the wind farm facilities.

**Figure 1**  
**PROJECT LOCATION MAP**



### 2.3. Project Sponsor and Legal Authority

The private-sector project sponsors are Infraestructura Energetica Nova, S.A.B. de C.V. (“IEnova”) and Saavi Energia S. de R.L. de C.V. (“Saavi”, and together with IEnova, the “Sponsor”), which will use the owner of the existing and operating 155-MW wind farm Energía Sierra Juárez, S. de R.L. de C.V. (“ESJ” or the “Borrower”) to implement the project and contract the financing. ESJ, a Mexican-based, limited-liability company, was incorporated on June 30, 2008, and successfully developed the first phase of the wind farm currently in commercial operation.

### 3. CERTIFICATION CRITERIA

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#### 3.1. Technical Criteria

##### 3.1.1. General Community Profile

The electricity generated by the Project is expected to benefit San Diego County and be sufficient to cover the annual consumption of approximately 37,500 households.<sup>4</sup>

According to the U.S. Census Bureau, the population of San Diego County in 2017 was 3,337,685, which represented 8.4% of the state population.<sup>5</sup> The main economic activities are: management, business and arts (39.7%); services (18.5%); sales (25.5%); natural resources and construction (8.2%); and production and transportation (8.0%).

The Project is also expected to benefit the municipality of Tecate by creating employment opportunities and additional income during its construction and operation. Approximately 300 jobs are expected to be generated during construction and up to 30 on-site jobs during operation, including various administrative positions.

According to the 2015 Mexican intercensal survey, the population of the municipality of Tecate was 102,406, which represented 3.06% of the population of the state of Baja California.<sup>6</sup> According to the 2014 Economic Census, the main activities contributing to the total gross production of the municipality are: manufacturing (78.0%), commerce (9.7%), services (6.6%) and other sectors (5.6%).<sup>7</sup>

##### **Local Energy Profile**

Although the energy will be generated in Mexico, the electricity will be delivered directly to San Diego County through an existing 230-kV generator tie line, which was certified by the NADB Board and constructed as part of ESJ first phase. The generator tie line is connected to the SDG&E East County (ECO) substation, which is connected to the Southwest Powerlink electric grid.

According to U.S. Energy Information Administration (EIA), a combination of lower technology costs and the implementation of policies that encourage the use of renewables at the state level (renewable portfolio standards) and at the federal level (production and investment tax credits) has driven down the cost of renewable energy facilities (wind and solar photovoltaic), supporting their expanded adoption.<sup>8</sup> In 2018, wind, solar and other non-hydropower renewables were expected to provide more than 10% of the U.S. energy generation.<sup>9</sup> Net renewable capacity and

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<sup>4</sup> The Estimation is based on 10,399 kilowatt-hours of electricity consumption per household in 2017 according to the U.S. Energy Information Administration (EIA), <https://www.eia.gov>

<sup>5</sup> Source: U.S. Census Bureau (<https://www.census.gov/en.html>).

<sup>6</sup> Source: Mexican national institute of statistics, *Instituto Nacional de Estadísticas y Geografía* (INEGI), 2015 Intercensal Survey (<http://www.beta.inegi.org.mx/temas/estructura/>).

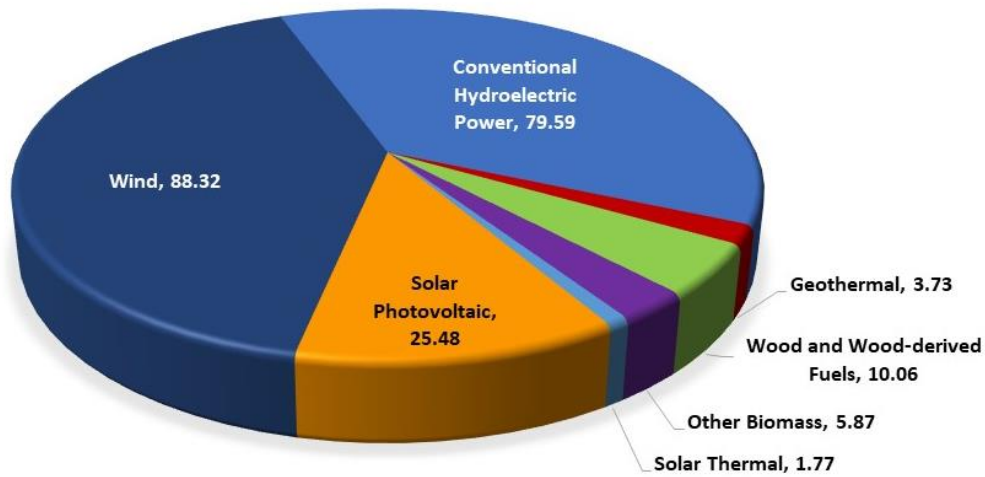
<sup>7</sup> Source: INEGI, Economic Census 2014 (<http://www.beta.inegi.org.mx/app/saic/>).

<sup>8</sup> Source: U.S. Energy Information Administration, Annual Energy Outlook 2018.

<sup>9</sup> Source: U.S. Energy Information Administration.

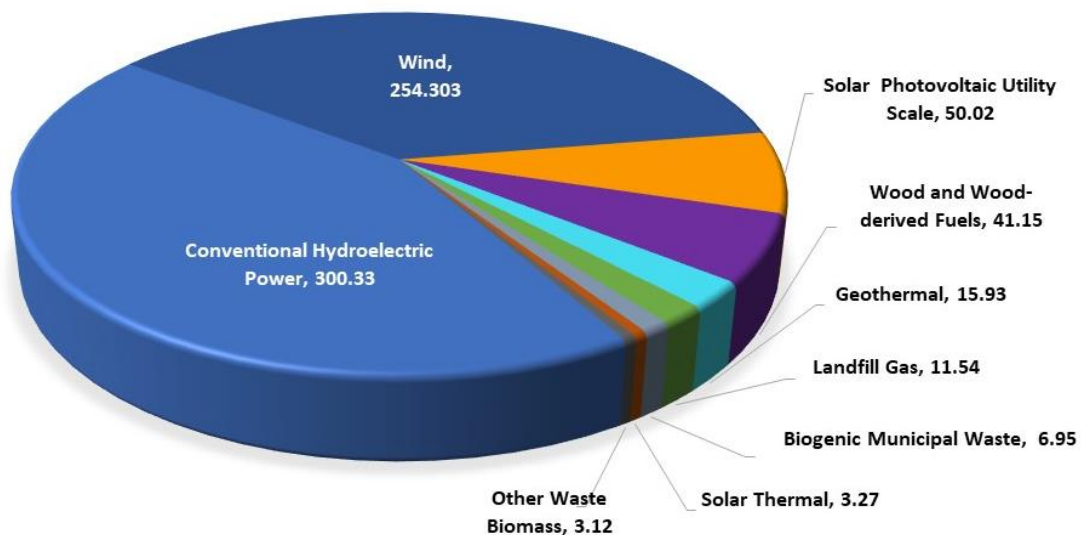
net generation from renewable energy sources in the U.S. during 2017 are shown in Figures 2 and 3, respectively.

**Figure 2**  
**U.S. NET RENEWABLE CAPACITY IN 2017**  
 (Gigawatts)



Other biomass includes municipal waste, landfill gas and municipal sewage sludge.  
 Source: Chart prepared by NADB based on the EIA Annual Energy Outlook 2018.

**Figure 3**  
**U.S. NET GENERATION FROM RENEWABLE SOURCES IN 2017**  
 (Billions of kilowatt-hours)



Source: Chart prepared by NADB based on the EIA Annual Energy Outlook 2018.

The U.S. Department of Energy (DOE), through the EIA, provides a state-by-state reference for information and data covering energy production and demand. In 2017, electricity generation in the state of California increased by 4% to 206,336 GWh compared to 198,227 GWh in 2016. California emitted 36.57 million metric tons of CO<sub>2</sub> from fossil fuel consumption in the electric power sector in 2016, representing 16% of the total CO<sub>2</sub> emissions of the state.<sup>10</sup> Current annual electricity generation in California relies on a mix of energy technologies as shown in Table 1.

**Table 1**  
**CALIFORNIA POWER GENERATION IN 2017**

Energy Source	Generation* (GWh)	Percentage (%)
Natural gas	89,564	43.40
Large hydroelectric	36,920	17.89
Solar	24,331	11.79
Nuclear	17,925	8.69
Wind	12,867	6.24
Geothermal	11,745	5.69
Small hydroelectric	6,413	3.11
Biomass	5,827	2.82
Coal	302	0.15
Oil	33	0.02
Other	409	0.20
<b>Total</b>	<b>206,336</b>	<b>100</b>

\* Source: California Energy Commission Energy Almanac, Electric Generation Capacity & Energy (2017).

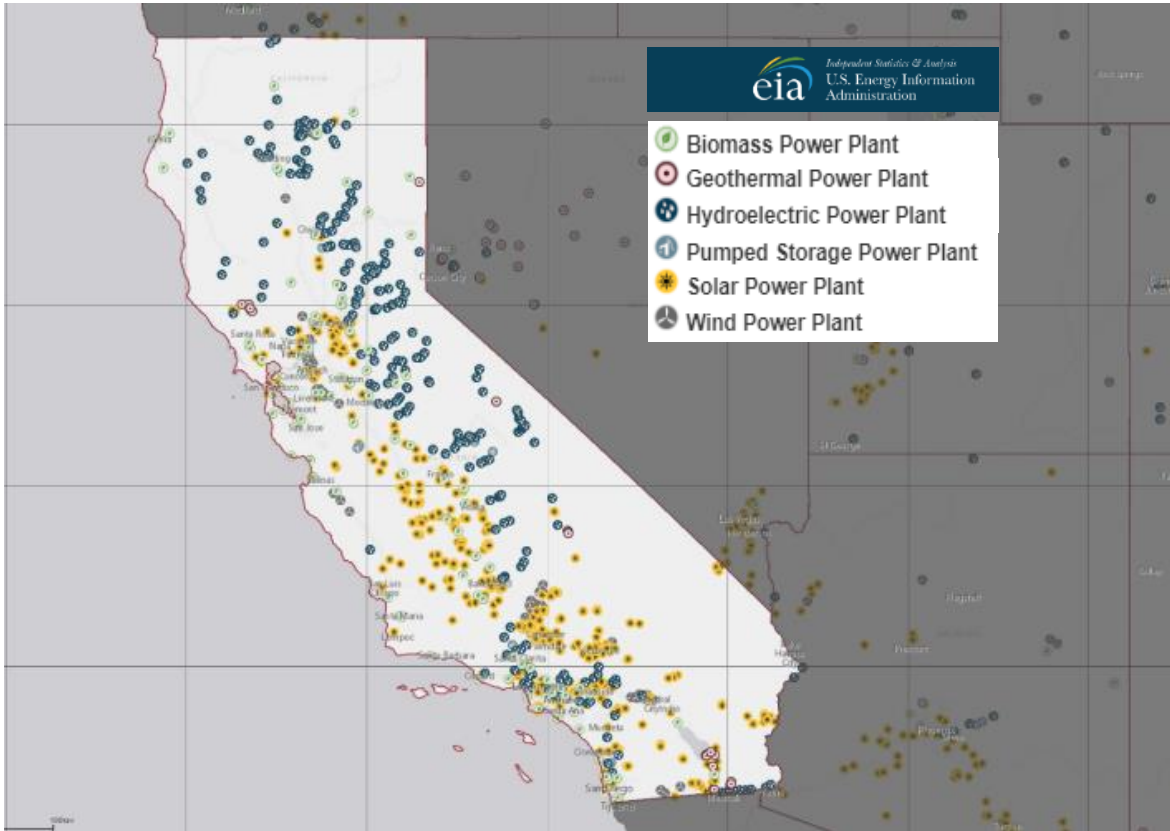
In the renewable sector, California was ranked third in the nation in 2016 in conventional hydroelectric generation, second in net electricity generation from all other renewable energy resources combined, and first as a producer of electricity from solar, geothermal and biomass resources.<sup>11</sup> California's renewable energy mix includes biomass, geothermal, hydroelectric, solar wind and pump storage power plants, as shown in Figure 4.

<sup>10</sup> Source: California Energy Commission (<https://www.eia.gov/environment/emissions/state/>).

<sup>11</sup> Source: U.S. Energy Information Administration, California State Overview.



**Figure 4**  
**CALIFORNIA RENEWABLE ENERGY POWER PLANTS**



Source: EIA.

In 2002, the State of California established a Renewable Portfolio Standard (RPS) with the goal of increasing the percentage of renewable sources in its power generation mix to 20% of retail sales by 2017. In 2003, the Integrated Energy Policy Report recommended accelerating the goal to 20% by 2010, and the 2004 Energy Report Update further recommended increasing the goal to 33% by 2020.<sup>12</sup>

In April 2011, California Senate Bill X1-2 was signed by Governor Edmund G. Brown, Jr. setting the RPS target at 33% by 2020. The RPS applies to all electricity retailers in California, including publicly-owned utilities, investors-owned utilities, electricity service providers and community choice aggregators and requires them to adopt the following goals for retail electricity sales from renewables: 20% by the end of 2013, 25% by the end of 2016 and 33% by 2020.<sup>13</sup>

Additionally, Governor Brown signed the Clean Energy and Pollution Reduction Act of 2015, which establishes targets to increase the RPS to 50% by 2030 for retail sales of renewable electricity.<sup>14</sup>

<sup>12</sup> Source: California Energy Commission (<https://www.energy.ca.gov/renewables/index.html>).

<sup>13</sup> Source: Ibid.

<sup>14</sup> Source: Ibid.

In 2017, renewable energy generation represented 29% of California's power mix (excluding large hydroelectric).

### 3.1.2. Project Scope

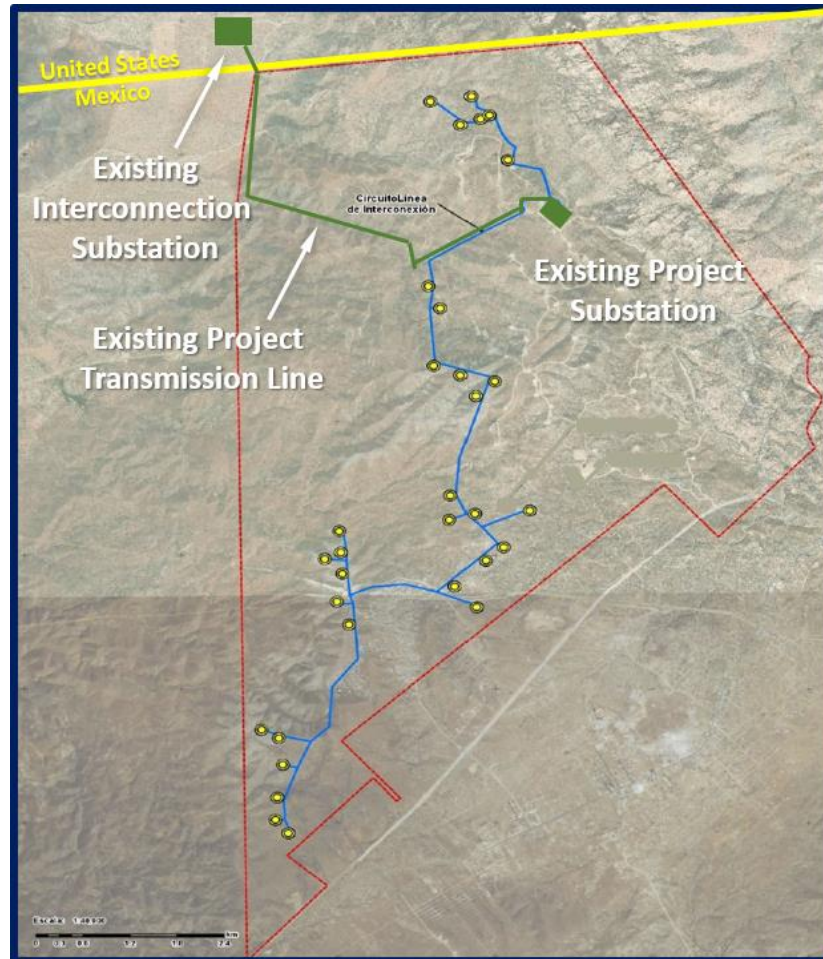
The Project consists of the design, construction and operation of a nameplate 108-megawatt (MW) expansion of the Borrower's existing wind energy farm located in the vicinity of La Rumorosa, Tecate, Baja California Norte (the "Project"). This is an expansion of the existing 155 MW initial phase of a project certified by the NADB Board in November 2013 and will be located on approximately 5,300 hectares (13,100 acres) secured on long term lease with the Ejido Jacume common land. The Project will be connected to the existing collection substation constructed for the first phase, which will step up the electricity voltage from 34.5 kV to 230 kV. From there, the electricity will be conveyed approximately 7.7 km (4.8 miles) through the 230-kV overhead generator tie line also built for the first phase of the Project to the existing SDG&E ECO substation located on the U.S. side of the border.

The Project includes the following components:

- Wind turbine generators (WTG). The latest layout currently includes the installation of 26 wind turbines, VESTAS model V150 to be mounted on steel towers 105 meters of hub height, each with a nominal capacity of 4.0 or 4.2 MW. Wind turbine transformers will step up the voltage of the power generated to 34.5 kV, which will be collected through an overhead collection system via different circuits that connect to the low side of the existing Project collection substation.
- Foundations. They will be designed for the estimated loads provided by the WTG supplier. The foundations will be composed of reinforced concrete.
- Monitoring and control system. Through the SCADA system the operation of each turbine, as well as the Project as a whole, can be controlled and monitored by a central dedicated plant server system with local displays and a remote computer. In case of problems, the SCADA system will alert the operations staff. The control system will always be in operation to ensure that the WTG are running in an efficient and safe manner.
- Roads. While the Project will use partially the network of roads and main entrance already constructed for the first phase of the Project for access to the site and step-up substation, additional internal roads will be constructed to access the new turbines and other infrastructure. All roads will allow the transportation of the WTG components, equipment and materials required for construction of the wind turbines and collection system line.
- Operation and maintenance (O&M) facilities. A temporary office and lunch area will be built for use during the construction phase. A permanent O&M facility with administrative space was built for the first phase of the Project and will be used for this expansion for O&M purposes, as well as for the maintenance and storage of equipment and spare parts during construction and operation. Potentially both offices and maintenance buildings may need to be expanded.

Figure 5 shows the location of the wind turbines within the project area, as well as the location of the existing project substation, generator tie line and interconnection substation.

**Figure 5**  
**PROJECT SITE**



The Project will require an Electricity Generation Permit from the Mexican Energy Regulatory Commission (CRE), which was obtained in February 2019. In addition, the Energy Import Authorization and the Energy Export Authorization for the electricity produced by the Project will have to be updated, which is expected to be completed by May 2019 and July 2019, respectively.

### **3.1.3 Technical Feasibility**

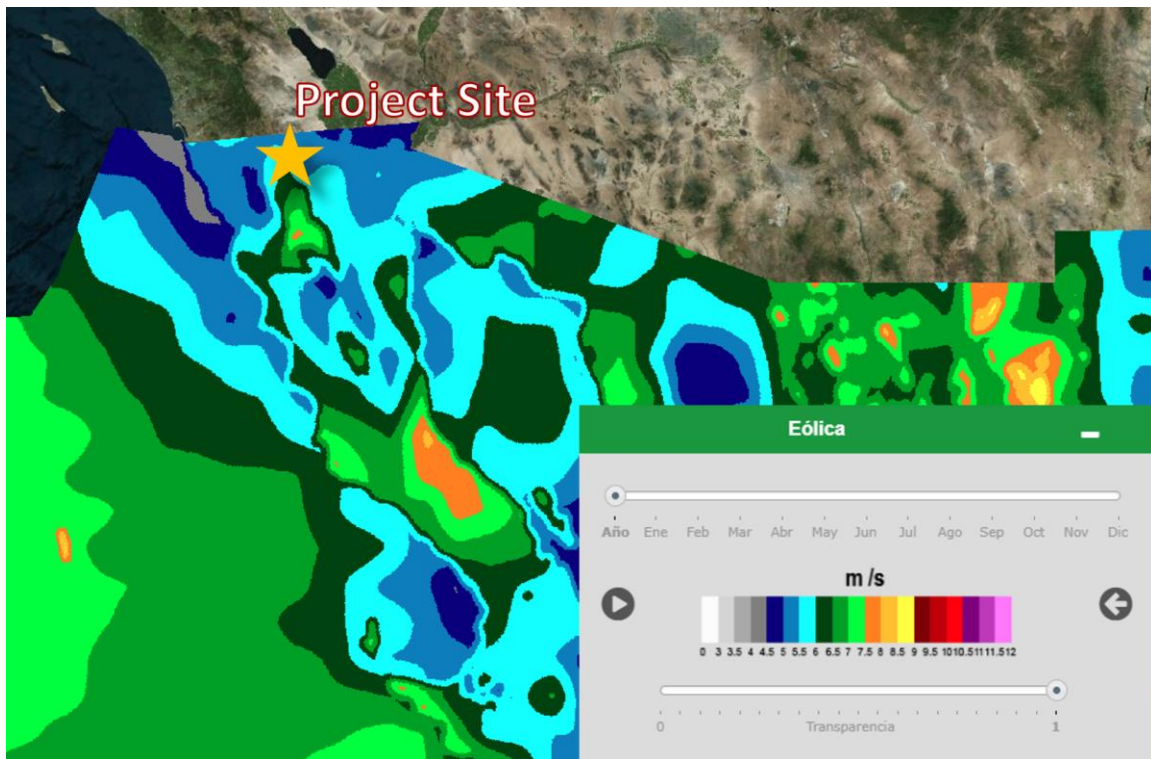
Current technologies allow for more efficient and reliable power generation, as well as greater production at average wind speeds, in part due to an increase in WTG rotor diameter size and improved blade profile designs. The Sponsor has selected VESTAS to supply the wind turbines, having determined that its equipment is best suited to the characteristics of the Project site and will perform best based on the wind resource (long-term energy output). The technology was also

evaluated based on such elements as cost-effectiveness, contractual terms, warranties and delivery times.

### **Wind Resource Assessment**

The Project is located in the state of Baja California. According to the Mexican Ministry of Energy (SENER), average annual wind speed in the state ranges from 5 to 6.5 meters/second (see Figure 6).<sup>15</sup>

**Figure 6**  
**WIND RESOURCE POTENTIAL**



Source: SENER, National Clean Energy Inventory

The Project benefits from wind resource data collected in connection with the existing and operating 155 MW wind farm. To assess available wind resources in the Project area, ten meteorological towers were installed to collect data, such as wind speed, wind direction and ambient temperature at different heights. Three towers were installed in March 2007, two in July 2007, four in April 2008 and the last one in June 2009. The data from the towers was validated and incorporated into a wind resource analysis. Other long-term measured data from monitoring stations, global data sets and modeling software were also used for the wind resource analysis.

<sup>15</sup> Source: SENER, National Renewable Energy Inventory, <https://dgel.energia.gob.mx/inel/mapa.html?lang=es>.



Based on the preliminary results, it is estimated that the Project will produce an average of 390 GWh/year of energy output at P50 exceedance probability. The analysis results and wind measurements will be vetted for accuracy and related risks by an independent engineer prior to financial closing.

The original 155-MW wind farm started commercial operations in June 2015 and has been in operation for over three years.

#### **3.1.4. Land Acquisition and Right-of-Way Requirements**

The entire wind farm (including the expansion envisaged by the Project) encompasses a total area of approximately 5,300 hectares (13,100 acres) of Ejido land, which was secured through a lease agreement on November 2006. The proposed Project will be developed on approximately 85.71 hectares (211.8 acres) of that area. The land is designating for livestock grazing. As part of the land use change, the environmental regulations establish that a fee must be paid to the Mexican Forest Fund as part of the authorization process.

Federal authorization for a land use change for the second phase of wind farm is required from the Ministry of Environment and Natural Resources (SEMARNAT). The technical study supporting the land use change requires the Sponsor to submit project information as close as possible to the final design. The Sponsor submitted a formal request for the wind farm land use change to SEMARNAT and is expecting to receive complete authorization by April 2019. A Municipal Land Use Change for the wind farm is also required and is expected to be obtained by May 2019. No land use change authorization for the generator tie line is required since the Project will be using the line constructed for the first phase of the Project.

Authorization from the Mexican Ministry of Communications and Transportation (SCT) to install the wind turbines is expected to be obtained by June 2019. Additionally, authorization for the installation of electrical collection lines that will cross, among others, aqueducts right-of-way is required from the Baja California State Water Commission (CEA). The permit is expected to be obtained by June 2019.

A construction license will be obtained from the Municipality of Tecate prior to initiating construction.

#### **3.1.5. Project Milestones**

Construction of the Project is scheduled to start in June-July 2019, and the Commercial Operation Date (COD) is expected to be no later than December 2020. Table 2 presents the status of key milestones for Project implementation.

**Table 2**  
**PROJECT MILESTONES**

Permits	Status
Land acquisition and/or lease agreements for the wind farm	Completed (November 2006) Updated (February 2019)
Electricity Generation Permit from the Energy Regulatory Commission (CRE)	Completed (February 2019)
CRE Import Authorization	Pending (expected May 2019)
CRE Export Authorization	Pending (expected July 2019)
Interconnection Agreement with SDG&E	Pending (expected May 2019)
Archeological clearance by the National Institute of Anthropology and History (INAH) (first segment)	In process (expected June 2019)
Environmental authorization from SEMARNAT (MIA resolution)	Completed (July 2010)
Environmental authorization amendment from SEMARNAT for the second phase of the wind farm (First MIA amendment resolution)	Completed (November 2018)
Environmental authorization amendment from SEMARNAT for the second phase of the wind farm (Second MIA amendment resolution)	Completed (March 2019)
Environmental authorization from the Baja California Ministry of Environmental Protection for the rehabilitation and construction of access roads for the second phase (State MIA amendment resolution)	Pending (expected June 2019)
Forestry Land Use Change authorization from SEMARNAT (First authorization)	Completed (February 2018)
Forestry Land Use Change authorization from SEMARNAT (Second authorization)	In process (expected May 2019)
Social Impact Study from the Ministry of Energy (SENER)	In process (expected April 2019)
Authorization to install wind turbines from the Ministry of Communication and Transportation (SCT-DGAC)	In process (expected June 2019)
Land Use Change authorization from the Municipality of Tecate	Pending (expected May 2019)
Authorization from the Baja California State Water Commission (CEA) to cross the aqueduct	In process (expected Jun 2019)

NADB's procurement policies require that private-sector borrowers use appropriate procurement methods to ensure a sound selection of goods, works and services at fair market prices and that their capital investments are made in a cost-effective manner. As part of its due-diligence process, NADB will review compliance with this policy.

### 3.1.6. Management and Operation

ENova has a portfolio and development pipeline of 1,416 MW in Mexico, consisting of wind, solar and combined cycle facilities, which includes 517 MW come from three wind farms, including this Project. ENova, with an office in Mexico City, will be the asset manager for the Project and will be responsible for overseeing and managing the O&M service provider.

The personnel currently operating phase one of the wind farm will also be responsible for operating the phase two facilities. The Sponsor will sign a long-term Service Maintenance Agreement (SMA) with the turbine manufacturer/supplier for maintenance of the turbines, which will include industry standard tasks. Operation and maintenance tasks will be performed to optimize the operating times of the turbines, reduce repair costs and extend the life of the equipment.

## 3.2. Environmental Criteria

### 3.2.1. Environmental and Health Effects/Impacts

#### A. Existing Conditions

Historically, the United States has depended to a great extent on fossil fuels for the generation of energy. This conventional method of energy generation can affect the natural environment due to harmful emissions related to the generation process, including greenhouse gases (GHG) and other pollutants, such as sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>). Consequently, there is a need for affordable and environmentally beneficial alternatives to conventional hydrocarbon-based energy sources.

The State of California has seen a declining trend in emissions since 2007. In 2016, emissions from statewide activities were approximately 13% lower than levels recorded in 2004. Emissions from the electric power sector accounted for 16% of statewide GHG emissions in 2016 and were 18% lower than 2015 levels. The overall decrease in carbon intensity in electricity generation in California has been driven primarily by the increase in renewable energy resources as a result of California's Renewable Portfolio Standard.<sup>16</sup>

In 2015, Governor Brown issued an executive order to further enhance California's greenhouse gas (GHG) reduction goals. The target of reducing GHG to 40% below 1990 levels by 2030 was established in order to ensure California meets its target of 80% below 1990 levels by 2050.<sup>17</sup>

#### B. Project Impacts

Renewable energy projects create an opportunity to generate electricity by using sources that do not produce the (GHG) and other pollutants that are released by fossil-fuel-based plants. Wind is

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<sup>16</sup> Source: California Air Resources Board, California Greenhouse Gas Emissions for 2000 to 2016; Trends of Emissions and Other Indicators, 2018.

<sup>17</sup> Source: Office of the Governor of California (<https://www.gov.ca.gov/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>).

a source of renewable energy, which means that it can be used continuously without depleting natural resources. It is a clean form of renewable energy as it does not produce waste byproducts that require disposal, nor gas emissions that contribute to air pollution and, therefore, provides an opportunity to prevent the emission of GHG and other pollutants produced by traditional hydrocarbon-based energy generation, while providing local residents with a safe and reliable energy alternative. Wind energy is currently used in many developed and developing nations to meet their demand for electricity. Moreover, in the case of this Project, water will not be used for cooling during operations.

The Project will reduce the demand for electricity generated by fossil fuel-based power plants, and since wind-based power generation implies zero emissions, it will displace related harmful emissions. The anticipated environmental outcomes from the installation of 108 MW of new renewable power generation capacity (or approximately 390 GWh annual energy output) include the displacement of 84,000 metric tons/year of carbon dioxide (CO<sub>2</sub>), 144 metric tons/year of nitrogen oxides (NO<sub>x</sub>) and 4 metric tons/year of sulfur dioxide (SO<sub>2</sub>).<sup>18</sup>

Additionally, the Project will help address larger environmental concerns related to greenhouse gases and global warming targeted by the state of California agenda and is consistent with California's 2017 Climate Change Scoping Plan published in November 2017 by the California Air Resources Board.

### **C. Transboundary Impacts**

No transboundary impacts are anticipated as a result of the development of the Project. The project will utilize the existing international Mexico – US cross-border generation tie line, which is already permitted pursuant to US Department of Energy's Presidential Permit (PP-334) and International Boundary and Water Commission approvals.

## **3.2.2. Compliance with Applicable Environmental Laws and Regulations**

### **A. Environmental Clearance**

In accordance with the environmental impact regulations established under the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) in Mexico, and the Environmental Protection Law in Baja California, the Sponsor prepared and submitted the following environmental documents:

- Environmental Impact Assessment (MIA) for the construction and operation of several phases of a wind farm with a capacity of up to 1,200 MW and the installation of up to 1,000 wind turbines and related infrastructure, including the transmission line and collection substation, submitted to SEMARNAT on September 15, 2009. The proposed Project is included in this MIA assessment.

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<sup>18</sup> CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub> calculations are based on the potential emissions avoided as a result of reducing future demand on fossil fuel-based electricity through the use of solar energy equivalent to 390 GWh/year and the emission factors for the state of California as reported by the U.S. Energy Information Administration. The emission factors are: 0.21520 metric tons/megawatt-hour (MWh) for CO<sub>2</sub>; 0.00037 metric tons/MWh for NO<sub>x</sub> and 0.00001 metric tons/MWh for SO<sub>2</sub>.



- First MIA amendment for the construction and operation of the 108-MW wind farm included within the scope of the original MIA, submitted to SEMARNAT on October 30, 2018.
- Second MIA amendment for the construction and operation of the 108-MW wind farm included within the scope of the original MIA, submitted to SEMARNAT on February 2019.
- Environmental Impact Assessment (MIA) presented to the Baja California Ministry of Environmental Protection for the rehabilitation and construction of access roads for the Project, submitted on December 7, 2011.
- First Forestry Land Use Change application for the 108-MW wind farm submitted to SEMARNAT on December 4, 2018.
- Second Forestry Land Use Change application for the 108-MW wind farm submitted to SEMARNAT on February 22, 2019.

The MIA identified, described and evaluated the potential environmental impacts associated with the Project—such as soil erosion and contamination, waste production, removal or loss of vegetation, site hydrology and impacts to wildlife—and included the proposed mitigation measures to prevent or minimize any negative effect or impacts.

On July 15, 2010, SEMARNAT issued MIA Resolution No. SGPA/DGIRA/DG/4751.10, authorizing the construction of a wind farm of up to 1,200 MW and associated infrastructure. In compliance with the MIA resolution, the Sponsor must implement the mitigation measures proposed in the MIA and obtain the required Forestry Land Use Change permit.

On November 21, 2018, SEMARNAT issued MIA Resolution No. SGPA/DGIRA/DG/8928.18, authorizing the first amendment to the MIA for the construction of a wind farm with a total capacity of 108 MW and associated infrastructure included within the scope of the original project. In compliance with the MIA resolution, the Sponsor must implement the mitigation measures proposed in the original MIA, which are described below in Section 3.2.2.B and obtain the required Forestry Land Use Change permit.

As part of the first MIA amendment, the Sponsor conducted a Bird Study that entailed one-year of monitoring activities from January to December 2017. The purpose of the study was to identify migratory birds designated as special status species, occurring within the Project site. A total of 22 bird species were detected, none of which were identified as belonging to a protected category under Mexican standard NOM-059-SEMARNAT-2010.<sup>19</sup> A 12-month Bat Study was also initiated by the Sponsor in January 2017. A total of nine bat species were identified, none of which were listed in Mexican standard NOM-059-SEMARNAT-2010.

On February 15, 2012, the Baja California Ministry of Environmental Protection issued State MIA Resolution No. SPA/TIJ/0500/12, authorizing the rehabilitation and construction of access roads for the first phase of the Project, many of which will be also used for the second phase. The

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<sup>19</sup> Mexican Federal Standard NOM-059-SEMARNAT-2010 identifies and lists endangered species or clusters of wildlife in Mexico and establishes the criteria for inclusion, exclusion or change in risk status for different species, based on a method for assessing the risk of extinction.

Sponsor submitted an amendment for the rehabilitation and construction of access roads for the second phase. The authorization is expected to be obtained by April 2019.

Additionally, the Sponsor is in the process of obtaining archeological clearance from the National Institute of Anthropology and History (INAH) for the Project. Because of the complexity of the terrain, INAH is developing the study by segments. The clearance for the first segment is expected to be issued in June 2019.

## **B. Mitigation Measures**

Some environmental impacts are anticipated from the implementation of the Project. The Sponsor has proposed mitigation measures that are intended to reduce, mitigate and control the environmental effects resulting from the Project activities. To ensure that mitigation measures are implemented properly and in a timely manner, the Sponsor will also develop the Environmental Monitoring Program described in the Project MIA. The first MIA amendment resolution required the Sponsor to implement the mitigation measures included in the original MIA.

Therefore, the following mitigation measures included in the original MIA and its resolution will be implemented:

- Flora
  - Land clearing activities will be restricted to designated Project areas to prevent the removal of additional vegetation.
  - A Reforestation Program will be implemented by establishing groves of native plants in a ratio of 3:1 within the Project impact area.
- Fauna
  - A monitoring program for birds and bats will be implemented before and after construction to analyze flight patterns and the potential for collisions. If necessary, additional mitigation measures will be applied.
  - Activities to identify, rescue and relocate wildlife will be carried out.
- Noise
  - The Sponsor will monitor noise levels in accordance with Mexican Standard NOM-081-SEMARNAT-1994.
  - The maximum noise level of the wind turbines will not exceed the limits established in Mexican Standard NOM-081-SEMARNAT-1994.<sup>20</sup>
  - To minimize noise, all vehicles and machinery will be properly maintained and receive regular tune-ups.

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<sup>20</sup> Mexican Federal Standard NOM-081-SEMARNAT-1994 establishes the maximum levels of noise from stationary sources and noise measuring methods.

- Air quality
  - Construction materials and waste transported by heavy vehicles will be covered.
  - Access roads will be watered to reduce dust.
- Water resources
  - A drainage system will be implemented to prevent flooding.
  - Portable toilets will be used to dispose of wastewater during the construction phase. A septic tank will be used to dispose of wastewater during the operation phase.
- Soil and Solid Waste
  - Oils, fuels, and other pollutants will be placed in closed containers in a secure area during all stages of Project construction and operation, and their disposal shall be in accordance with Mexican Federal Standard NOM-052-SEMARNAT-2005.<sup>21</sup>
  - Procedures will be implemented for the separation, storage, collection and use or disposal of the different types of waste generated during the different stages of the Project in accordance with applicable regulations.
  - Solid waste will be handled and transported to a final authorized site in accordance with the General Law for Comprehensive Waste Management and Prevention and its regulations.

### **C. Pending Environmental Tasks and Authorizations**

The following environmental authorizations are pending to be obtained for the Project:

- Second Forestry Land Use Change authorization from SEMARNAT for the 108-MW wind farm and its related infrastructure, including the collection line, which is expected to be issued by May 2019.
- Environmental authorization from Baja California Ministry of Environmental Protection for the rehabilitation and construction of access roads for the second phase, which is expected to be issued by April 2019.
- Archeological clearance from the National Institute of Anthropology and History (INAH) for the first segment of the Project, which is expected to be issued in June 2019.

### **3.3. Financial Criteria**

The Project Sponsor will finance the construction of the Project with a loan from NADB and other financial institutions. NADB's share in the loan will be for up to US\$78.0 million. The proposed payment mechanism is standard for similar renewable energy transactions in the U.S. and Mexico. The source of payment will be the revenue generated in accordance with the pricing established

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<sup>21</sup> Mexican Federal Standard NOM-052-SEMARNAT-2005 establishes the characteristics, identification procedures and classification of hazardous solid waste, as well as a list of such materials.

under the Power Purchase Agreement (PPA). San Diego Gas and Electric (“SDG&E”) is the buyer of the energy produced by the project under the PPA.

NADB performed a financial analysis of the source of payment (SDG&E), the proposed payment structure and the Project’s cash flow projections. SDG&E’s financial ratios support its investment grade ratings: A2 from Moody’s, A- from Fitch and BBB+ from Standard & Poor’s. The expected revenue from the sale of electricity is estimated to be sufficient to: a) cover scheduled O&M expenses, b) pay the debt service on the senior loan, c) fund any debt service and other reserves, and d) comply with debt service coverage requirements. IEnova will secure an O&M agreement for the project with an experienced provider.

Considering the Project’s characteristics and based on the financial and risk analyses performed, the proposed Project is considered to be financially feasible and presents an acceptable level of risk. Therefore, NADB has begun processing the loan request for up to US\$78.0 million that would be contracted by Energía Sierra Juárez, S. de R.L. de C.V., for the construction of the Project.

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## **4. PUBLIC ACCESS TO INFORMATION**

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### **4.1. Public Consultation**

NADB published the draft certification and financing proposal for a 30-day public comment period beginning on May 2, 2019. The following Project documentation is available upon request:

- Environmental Impact Assessment (MIA) for Energía Sierra Juarez Wind Farm, dated September 15, 2009;
- MIA Resolution No. SGPA/DGIRA/DG/4751.10 for the wind farm issued by SEMARNAT on July 15, 2010;
- First Environmental Impact Assessment (MIA) amendment for Energía Sierra Juárez Expansion Wind Farm, issued on October 30, 2018;
- First MIA Resolution Amendment No. SGPA/DGIRA/DG/8928.18 for the wind farm issued by SEMARNAT on November 21, 2018.
- Second MIA Resolution Amendment No. SGPA/DGIRA/DG/02505 for the wind farm issued by SEMARNAT on March 29, 2019.

### **4.2. Outreach Activities**

Under the Mexican Power Industry Law, anyone interested in obtaining a permit or authorization to develop projects in the energy sector must present a Social Impact Assessment (SIA) to SENER. In accordance with the guidelines and methodologies established by SENER, the study must identify the communities and towns in the area of influence of a project, as well as identify, characterize, predict and assess its possible consequences for the population, along with mitigation measures and plans for managing the social aspects of the project, including: a Social

Management Plan (SMP), Social Investment Plan (SIP), Monitoring and Evaluation Plan, Communication Strategy and Community Involvement Plan, social baseline, and stakeholder analysis. The evaluation also requires that indigenous communities or groups be identified in the area of influence of the project to determine if they need to be consulted. The Sponsor performed a SIA through a consulting firm and submitted it to SENER for review. SENER is expected to issue the SIA Resolution in March 2019.

As part of the environmental authorization process, on September 17, 2009, SEMARNAT published the request for environmental authorization of the Project in its weekly publication (*Gaceta Ecológica*), which provides information about the projects under evaluation. Additionally, on September 29, 2009, and October 13, 2009, the Sponsor published an extract of the MIA under review by SEMARNAT in the newspaper, *El Mexicano*.

Moreover, the regional and central offices of SEMARNAT made the MIA document available for public consultation and held a public meeting to present the Project in the city of Tecate on November 12, 2009. A total of 127 participants and 16 speakers attended the meeting. During the meeting, 13 speakers supported the Project, asserting that the wind farm will promote the use of renewable energy and will generate benefits to their community. Three additional speakers expressed concerns related to the environmental document, claiming that the study did not include a full description of the works and activities that would be required for the Project and thus the potential impacts were not fully anticipated. At the end of the meeting, SEMARNAT advised the attendees that the public comment period would conclude on November 20, 2009. After the comment period ended, the Sponsor was responsible for reviewing and responding to the public comments received. On November 27, 2009, the Sponsor submitted responses to SEMARNAT, which are included in the final MIA document. The MIA resolution indicates that, as a result of the public comments, additional information and mitigation measures were required from the Sponsor to identify the potential impacts of future phases.

NADB also conducted a media search to identify potential public opinion about the Project. References to the Project were found on the websites listed below:

- *Business Insider* (April 12, 2018) – “Harvesting energy where it's abundant and sending it where it's needed most,”  
(<https://www.businessinsider.com/renewable-energy-microgrids-wind-solar-2018-4>)
- *La Voz de la Frontera* (October 24, 2018) – “Parque eólico: se agota” (Wind farm: it's being exhausted),  
(<https://www.lavozdelafrontera.com.mx/local/parque-eolico-se-agota-2282722.html>).

In summary, these publications highlight the scope of the Project. Opposition to the Project was not detected from the available media coverage. The Project Sponsor has followed all public consultation requirements in order to comply with applicable environmental clearance and permitting processes.