



# CERTIFICATION AND FINANCING PROPOSAL

## VENTIKA & VENTIKA II WIND ENERGY PROJECTS IN GENERAL BRAVO, NUEVO LEÓN

*Submitted: January 22, 2014*

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### INDEX

<b>EXECUTIVE SUMMARY</b> .....	2
<b>1. ELIGIBILITY</b> .....	4
<b>2. CERTIFICATION CRITERIA</b>	
2.1 Technical Criteria	
2.1.1. Project Description .....	4
2.1.2. Technical Feasibility .....	10
2.1.3. Land Acquisition and Right-of-way Requirements .....	12
2.1.4. Management and Operations .....	13
2.2 Environmental Criteria	
2.2.1. Compliance with Applicable Environmental Laws and Regulations .....	14
2.2.2. Environmental Effects / Impacts .....	16
2.3 Financial Criteria .....	21
<b>3. PUBLIC ACCESS TO INFORMATION</b>	
3.1 Public Consultation .....	21
3.2 Outreach Activities .....	22

## EXECUTIVE SUMMARY

### VENTIKA & VENTIKA II WIND ENERGY PROJECTS IN GENERAL BRAVO, NUEVO LEÓN

- Projects:** This certification and financing proposal covers two adjacent wind energy projects :
- Ventika Wind Project in General Bravo, NL:** Design, construction and operation of a 126-MW wind farm located in General Bravo, Nuevo León (“Ventika”).
- Ventika II Wind Project in General Bravo, NL:** Design, construction and operation of a 126-MW wind farm located in General Bravo, Nuevo León (“Ventika II”).

The energy generated will be purchased by private companies pursuant to independent long-term power purchase agreements (PPAs) signed with the project companies.

- Projects Objective:** The projects will increase the installed capacity of renewable energy resources, which will reduce the demand on traditional fossil-fuel-based energy production and contribute to the displacement of greenhouse gas emissions and other pollutants from power generated by fossil fuels.

- Expected Projects Outcomes:** The environmental and human health outcomes resulting from the installation of new renewable energy Projects are:

Ventika

- a) Generation of approximately 512.7GWh of electricity during the first year of operation,<sup>1</sup> and
- b) An expected displacement of approximately 303,518 metric tons/year of carbon dioxide, 1 metric ton/year of sulfur dioxide, and 751 metric tons/year of nitrogen oxides.<sup>2</sup>

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<sup>1</sup> Information provided by the Sponsor and based on the Independent Engineering Review for the Ventika and Ventika II Projects performed by AWS Truepower, December 2013.

<sup>2</sup> SO<sub>2</sub> and NO<sub>x</sub> calculations based on emission displacement from wind energy generation equivalent to a 512.7 GWh of electricity generation from natural gas, which is the predominant fuel source near the Project area. CO<sub>2</sub> reduction based on the energy generation equivalent to a 512.7 GWh, and the emission factor considered in the Ventika Project Design Document and the Validation Report submitted for consideration in the Clean Development Mechanism.

Ventika II

- a) Generation of approximately 521.0 GWh of electricity during the first year of operation,<sup>3</sup> and
- b) An expected displacement of approximately 308,431 metric tons/year of carbon dioxide, 1 metric ton/year of sulfur dioxide, and 763 metric tons/year of nitrogen oxides.<sup>4</sup>

**Sponsor:** TEG Energía, S.A. de C.V. (TEG).

**Borrowers:** Ventika, S.A.P.I. de C.V. (Ventika SAPI).  
Ventika II, S.A.P.I. de C.V. (Ventika II SAPI).

**Loan Amount:** Ventika: Up to US\$70.0 million.  
Ventika II: Up to US\$70.0 million.

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<sup>3</sup> Information provided by the Sponsor based on AWS Truepower, Independent Engineering Review for the Ventika and Ventika II Projects, December 2013.

<sup>4</sup> SO<sub>2</sub> and NO<sub>x</sub> calculations based on emission displacement from wind energy generation equivalent to a 521.0 GWh electricity generation from natural gas, which is the predominant fuel source near the Project area. CO<sub>2</sub> reduction based on the energy generation equivalent to a 521.0 GWh, and the emission factor considered in the Ventika Project Design Document and the Validation Report submitted for consideration in the Clean Development Mechanism.

# CERTIFICATION AND FINANCING PROPOSAL

## VENTIKA & VENTIKA II WIND ENERGY PROJECTS IN GENERAL BRAVO, NUEVO LEÓN

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### 1. ELIGIBILITY

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#### ***Project Type***

The Projects fall in the category of clean and efficient energy.

#### ***Project Location***

The Projects are located in the municipality of General Bravo, Nuevo León, approximately 48 km (30 miles) south of the U.S.-Mexico border.

#### ***Project Sponsor and Legal Authority***

The **private-sector Sponsor** is TEG Energía, S.A. de C.V. (TEG or the "Sponsor") a subsidiary of Cemex, S.A. de C.V. TEG will use special purpose companies named Ventika, S.A.P.I. de C.V. ("Ventika SAPI") and Ventika II, S.A.P.I. de C.V. ("Ventika II SAPI") for the implementation of the Projects. Ventika SAPI and Ventika II SAPI are Mexican-based companies incorporated on June 28, 2011. Their contact representative is Patricio Gonzalez-Villarreal.

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### 2. CERTIFICATION CRITERIA

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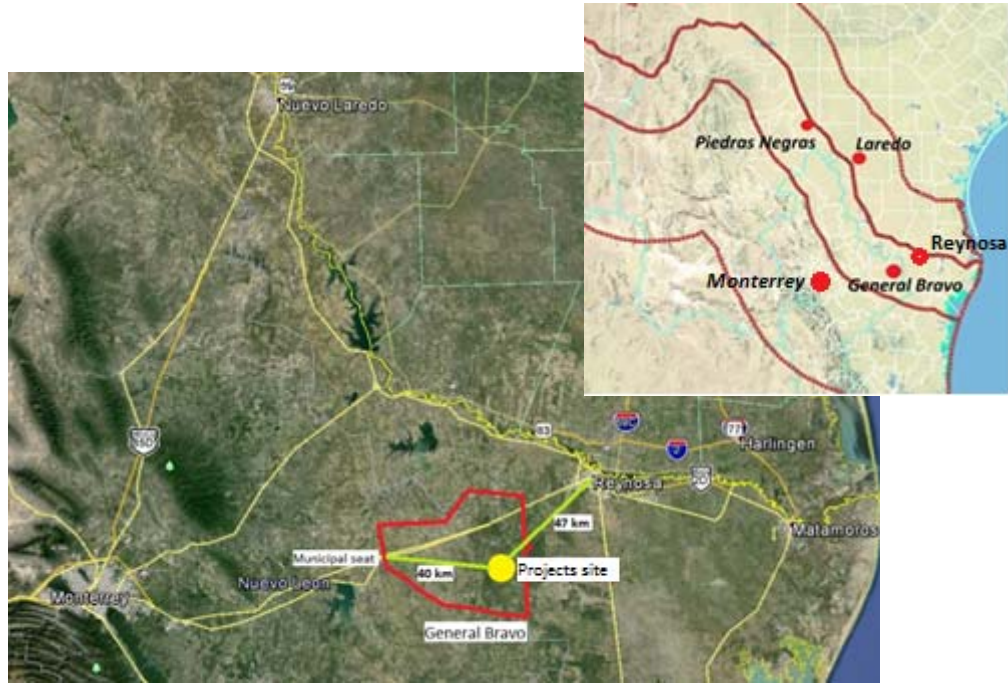
#### 2.1 TECHNICAL CRITERIA

##### 2.1.1. Project Description

#### ***Geographic Location***

The Projects are located in the municipality of General Bravo, Nuevo León, approximately 40 km (24.9 miles) east of the municipal seat of General Bravo, 160 km (100 miles) east of Monterrey and 47 km (29 miles) southwest of Reynosa, Tamaulipas. Ventika will be developed in an area of approximately 3,728 hectares (9,213 acres), and Ventika II in an area of approximately 3,587 hectares (8,864 acres). Figure 1 below shows the approximate geographic location of the Projects.

**Figure 1**  
**PROJECTS VICINITY MAP**



**General Community Profile**

The Projects are expected to benefit several municipalities within 300 km (187.5 miles) of the Nuevo León border region, including the Monterrey metropolitan area.<sup>5</sup> The expected benefits from the Projects include the generation of electricity equivalent to the annual consumption of 65,725 and 66,880 households for Ventika and Ventika II, respectively.<sup>6</sup> The Projects will also benefit local communities by creating employment opportunities and additional taxes through the construction of the Projects.

According to the Mexico 2010 Population Census, the population of Nuevo León was 4,653,458, which represents 4.1% of the total population of Mexico. Between the years 2000 and 2010, Nuevo León experienced an average growth rate of 1.79% annually, similar to the national rate (1.8%).<sup>7</sup>

According to the most current economic activity information from INEGI, the State of Nuevo León contributed 7.48% to the Mexico gross domestic product (GDP) in 2011. The main activities contributing to the state GDP are: manufacturing sector (27.59%), trading activities (16.94%),

<sup>5</sup> BECC estimates more than 130,000 households located within the 300 km border region of the state of Nuevo León will consume the electricity generated.

<sup>6</sup> Estimation based on 1,997.442 kWh electricity consumption per capita in 2012 from Mexico's Energy Information System <http://sie.energia.gob.mx/> and 3.9 persons per household in the state of Nuevo Leon as indicated per the Mexican National Statistics Institute (INEGI), <http://www3.inegi.org.mx/sistemas/mexicocifras/default.aspx?e=19>

<sup>7</sup> Source: INEGI, 2010 general population and housing census <http://www3.inegi.org.mx/>

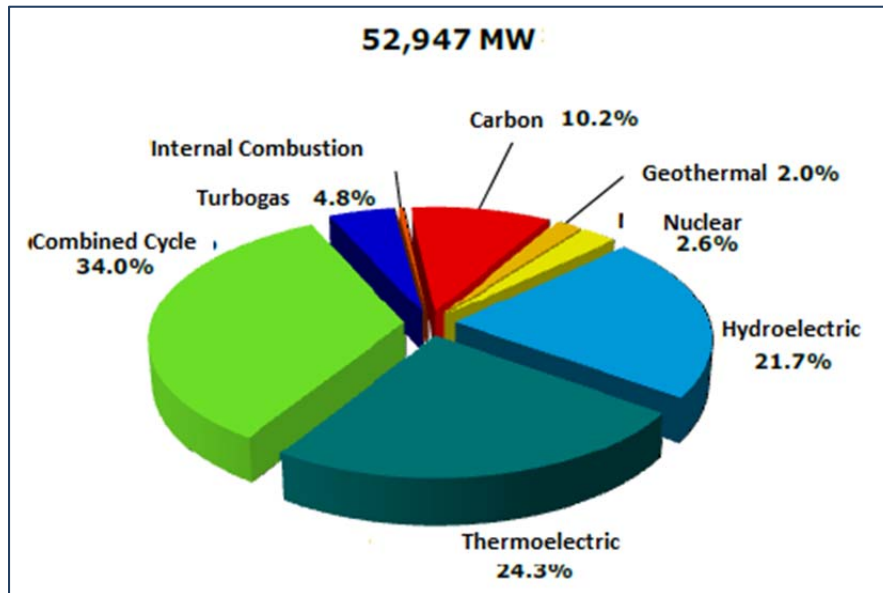


CFE generates electric power using various technologies and energy sources. To better support an opportunity to increase and diversify the energy portfolio, in 1992, the Power Sector Law in Mexico was amended to allow the participation of private capital in energy generation activities under the following schemes: a) cogeneration or small power production, b) self-supply, c) independent power production d) exports, e) imports for self-consumption.

Additionally, in 1995, the Mexican Energy Regulatory Commission (CRE) was created to regulate activities related to the participation of private investment in the power and natural gas sector (NG). The CRE is responsible for issuing the permits for electricity generation and NG transportation to private parties.

Mexico's current energy portfolio includes thermoelectric, hydroelectric, coal-fired, geothermal and wind powered plants and facilities, as well as one nuclear power plant. Although the use of solar, wind, and biomass resources has a large potential, geothermal energy is the only renewable source (excluding hydropower) with a significant contribution to the energy mix (2% of total generation capacity). Figure 3 shows the technologies used by the CFE, which owns roughly 85% of Mexico's power producing capacity, for electricity generation in Mexico.

**Figure 3**  
**CFE ENERGY PORTFOLIO OF TECHNOLOGIES, 2010**



Source: POISE

In 2008, Mexico enacted the Law for the Renewable Energy Use and Energy Transition Financing (LAERFTE). The law specifies, among other provisions, the obligation of the Ministry of Energy (SENER) to develop a Special Program for Renewable Energy Use, as well as a National Energy Transition and Sustainable Use Strategy. The law also sets a goal to increase the participation of non-fossil technologies in power generation to at least 35% by 2024.



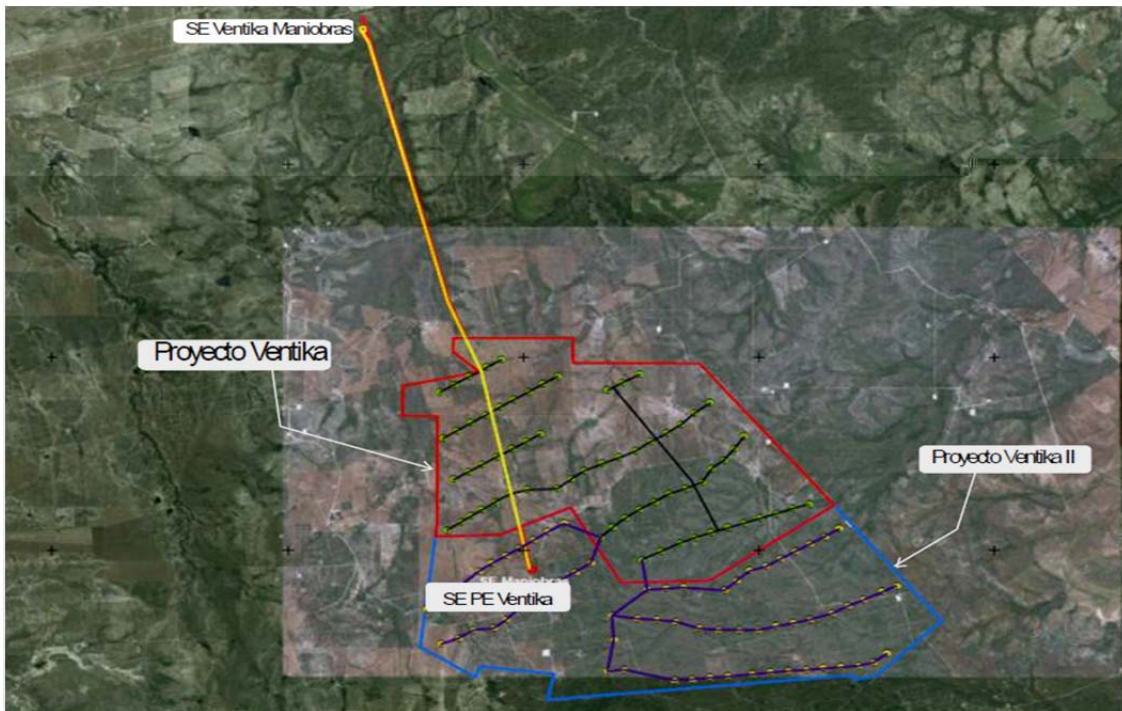
There are areas in Mexico with high potential for wind energy. Since 1994 CFE started to operate the Mexico Areas Areas Areas

Aiming to diversify the technology portfolio and promoting the use of renewable energy for power generation to reduce greenhouse gas and other air pollutant emissions, the government of Nuevo León included actions to develop renewable-energy based systems for the electricity sector in the State Development Plan 2010-2015 and the State Climate Action Plan 2010-2015.

**Project Scope and Design**

The scope of the Projects is to design, build, and operate two wind farms, Ventika and Ventika II, with a capacity of 126 MW each. Ventika will be built on an area of approximately 3,728 hectares (9,213 acres) and Ventika II on an area of 3,587 hectares (8,864 acres). Two substations and one transmission line will also be constructed to collect the energy generated by both Projects. Figure 5 shows the Project sites.

**Figure 5  
PROJECT SITES  
VENTIKA AND VENTIKA II**



Construction of the Projects began in December 2013, and the Projects are expected to reach COD no later than April 2016.<sup>10</sup> Table 1 presents the status of key tasks for the implementation of both Projects.

<sup>10</sup> Information provided by the Sponsor.

**Table 1**  
**PROJECT MILESTONES**

Key Milestones	Status
CRE authorizations for energy generation	Completed (July 2012)
Land lease agreement and right of way	Completed (September 2012)
CFE Interconnection Agreements	Completed (September 2012)
CFE Transmission Agreements	Completed (September 2012)
SEMARNAT MIA resolutions	Completed (October 2012)
Land use change authorization issued by SEMARNAT (for transmission line, roads and substations)	Completed (December 2012)
Engineering, Procurement, and Construction (EPC) Agreements	Completed (June 2013)
Operation and Maintenance Agreements	Completed (June 2013)
Land use change authorizations issued by SEMARNAT for installation of the turbines	Completed (November 2013)
Land Use and Construction Permits issued by the municipality	Completed (December 2013)
Power Purchase Agreements	Pending Execution
Commercial Operation Date	April 2016

NADB will ensure that its procurement policies are followed by the borrowers, by using appropriate procurement methods in the selection of goods, works and services at fair market prices while ensuring that their capital investments are made in a cost-effective manner.

## 2.1.2. Technical Feasibility

### Selected Technology

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 blade size and improved blade designs. The Sponsor evaluated several different models of wind turbines from various providers and selected the equipment that was considered most suitable to the characteristic of both Projects sites to obtain the best performance (long-term energy output) according to wind resources. The evaluation considered the guarantee and warranty terms, operation and maintenance (O&M) pricing, commercial/financial terms, EPC execution plan, safety and security and turbine suitability.<sup>11</sup>

According to the preliminary results of the Independent Engineering Review<sup>12</sup> and the environmental studies provided by the Sponsor, the main components of the Projects are:

- Wind turbines. Each Project will include 42 wind turbines with 3.0 MW of nominal power each. Wind turbine transformers will step up the voltage of generated power to 34.5 kV for transmission through an insulated underground cable. A concrete design will be used for the 120-meter towers.

<sup>11</sup> Project Sponsor selection process.

<sup>12</sup> Independent Engineering Review for the Ventika and Ventika II Projects, AWS Truepower, December 2013.

- *Electrical substations and transmission line.* Two substations named “PE Ventika” and “Ventika Maniobras” will be constructed to provide service to both Projects. “PE Ventika” will receive the energy generated from both Projects and will be used to step up the voltage from 34.5 kV to 230 kV. The energy collected will be conveyed through a new 14.1 km (8.7 miles) transmission line to the “Ventika Maniobras” substation which will interconnect to an existing CFE transmission line.
- *Monitoring and control systems.* The SCADA system will allow for the control and monitor of the operation of each turbine, as well as each Project as a whole, from a central computer or a remote PC. In case of problems, the SCADA system can alert the operations staff. The control system will always be in operation to ensure that the machines run in an efficient and safe manner. Additionally, the system will be able to monitor and record the atmospheric measurements of multiple meteorological towers. Both Projects will be controlled and monitored by this system.
- *Roads.* The Projects will include the construction of approximately 54 km (34 miles) of newly built roads to provide access to and within each Project site. Roads will be 6 meters wide and will have a 0.2 meter soil layer with a 0.4 meter compacted layer on top. Side slopes will be covered with fertile soil to promote growth of vegetation and prevent the erosion of roads.
- *Operation and maintenance facilities.* An O&M facility will be built at the Project site. The facility will include a permanent administrative, maintenance and storage building structure.

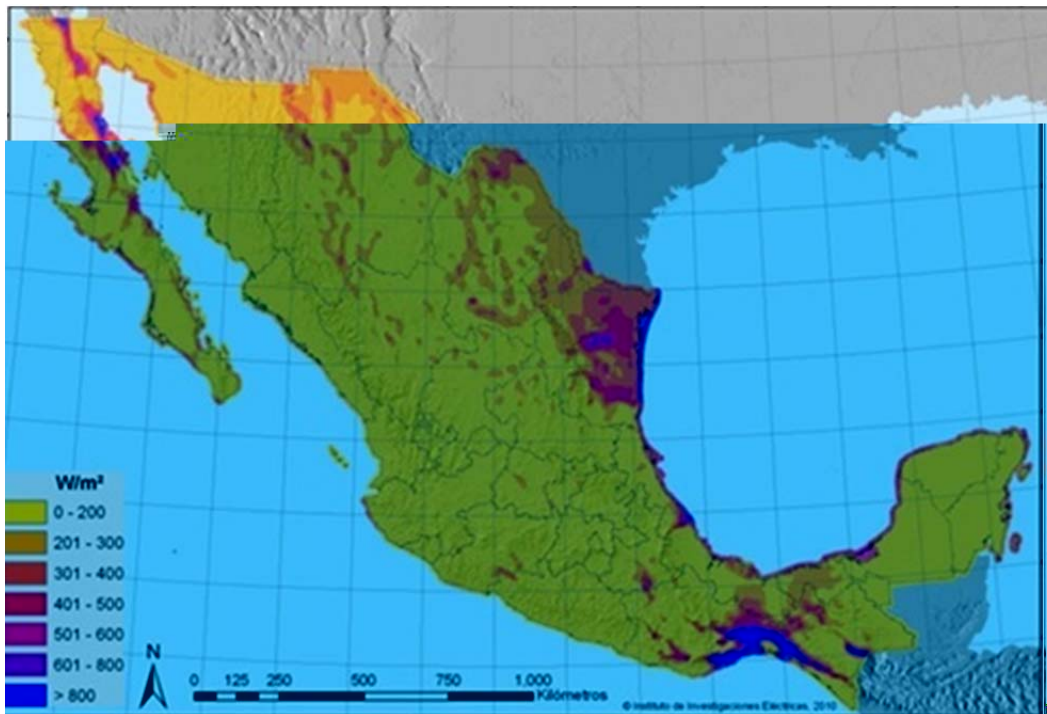
### **Wind Resource Assessment**

The Projects are located in the state of Nuevo León, where mid-level wind power density has been reported. According to the Mexican Power Research Institute (IIE), wind resources in the State range from 201 to 400 W/m<sup>2</sup> (see Figure 6).<sup>13</sup>

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<sup>13</sup> [www.iie.org.mx/](http://www.iie.org.mx/)

**Figure 6**  
**MEXICO WIND POWER DENSITY**



Source: Mexican Power Research Institute

In order to assess the wind resources available in the Project areas, four meteorological towers were installed to collect data, including wind speeds and direction. Measuring instruments were installed at 100 meters above ground level to gather information, beginning in September 2011. Available data from the meteorological towers were compiled, validated, and incorporated into the wind resource analysis. Based on the preliminary results, it is estimated that Ventika will generate an average of 512.7 GWh, and Ventika II will generate an average of 521.0 GWh of electricity in the first year of operation.<sup>14</sup> The results are being vetted for accuracy and related risks by an independent engineer.

### **2.1.3 Land Acquisition and Right-of-way Requirements**

The sites for each Project include various properties that together encompass a total area of 3,728 hectares (9,213 acres) for Ventika and 3,587 hectares (8,864 acres) for Ventika II. The sites for each Project are located in rural areas where livestock farming is the main activity. The Sponsor has secured the land and rights of way for both Projects. Documentation related to rights of way, land purchases, and lease agreements with private parties have been provided for both Projects.

<sup>14</sup> Independent Engineering Review for the Ventika and Ventika II Projects, AWS Truepower, December 2013.

The Projects required an authorization from SEMARNAT for Forested Land Use Change and in December 10, 2012, SEMARNAT issued the authorization no. 139.04.1.-1287(12) exclusively for the construction on the areas dedicated to the transmission line, roads and substations. SEMARNAT issued a land use change authorization for each Project site on November 13, 2013.

The Projects also required permits from the municipality for land use and construction. The municipality issued the permits for land use and construction on December 12, 2013, for the installation of the entire Projects' components including wind turbines, substations, O&M facilities, transmission line and roads.<sup>15</sup>

#### **2.1.4. Management and Operations**

The Sponsor, TEG Energía, S.A. de C.V., is a subsidiary of Cemex, one of the largest building material and cement producers in Mexico. The company, as a whole, has developed strategies to minimize environmental impacts, achieve energy savings, and implement the use of renewable energy and alternative fuels to reduce emissions. In 2011, Cemex, through TEG, developed the EURUS wind farm with 250 MW of installed capacity in the region of La Ventosa, Oaxaca, which helped to displace the emission of more than 489,000 metric tons of carbon dioxide.<sup>16</sup> TEG will develop and operate the proposed Projects.

The proposed Projects will be designed to operate automatically with minimal human intervention. 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. The Sponsor executed Operation and Maintenance Agreements (OMA) with the turbine manufacturer in June 2013. The OMA specifies tasks to perform for all turbines and balance of plant operation and maintenance during the term of the agreement. The scope of the OMA includes services such as industry standard O&M management tasks, reporting, remote monitoring and resets, and maintaining logs and records.

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<sup>15</sup> Ventika: Land use permit, Document No. 008-2013 and Construction permit No. 04-2013; Ventika II: Land use permit, Document No. 009-2013 and Construction permit No. 05-2013.

<sup>16</sup> Source: Cemex, 2011 Sustainable Development Report.

## 2.2 ENVIRONMENTAL CRITERIA

### 2.2.1. Compliance with Applicable Environmental Laws and Regulations

#### **Applicable Laws and Regulations**

The Projects are subject to federal environmental clearance authorizations in Mexico. Below are a list of the general laws and regulations applicable to the Projects, as provided in two Environmental Impact Assessments (MIAs) presented by the Sponsor in May 2012.<sup>17</sup>

- *General Law of Ecological Balance and Environmental Protection (LGEEPA)*, which establishes the environmental regulatory framework, expands the strategic vision, and conveys specific powers and duties to the states and municipalities, so that the environmental problems of each can be addressed directly.
- *General Law for Waste Prevention and Comprehensive Waste Management (LGPGIRS)*, which seeks to identify the criteria that should be considered by various levels of government in the generation and comprehensive management of solid waste, in order to prevent and control environmental pollution and ensure the protection of human health.
- *General Wildlife Law*, which establishes the concurrence of the federal, state and local governments regarding the conservation and sustainable use of wildlife and their habitats in Mexico.
- *General Law for Sustainable Forest Development (LGDFS)*, which regulates and promotes the conservation, protection, restoration, production, zoning, cultivation, management and use of the country's forest ecosystems and their resources.
- *NOM 080 SEMARNAT 1994*, which establishes the maximum levels of noise emissions from motor vehicles, motorcycles, and 3-wheel motor vehicles, as well as noise measuring methods.
- *NOM 081 SEMARNAT 1994*, which establishes the maximum levels of noise from stationary sources and noise measuring methods.
- *NOM 059 SEMARNAT 2010*, which identifies the species or endangered wildlife in Mexico by preparing the corresponding lists and establishing the criteria for inclusion, exclusion or change in risk status for different species, using a method for assessing the risk of extinction.

#### **Environmental Studies and Compliance Activities**

For each Project, the Sponsor developed independent Environmental Impact Assessments (MIAs) as a requirement of the Ministry of Environment and Natural Resources (SEMARNAT) for the sites where the Projects will be developed. The MIAs identify, describe and evaluate the

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<sup>17</sup> Manifestación de Impacto Ambiental, Modalidad Particular, Proyecto Eólico Ventika, mayo de 2012. Manifestación de Impacto Ambiental, Modalidad Particular, Proyecto Eólico Ventika II, mayo de 2012.

potential environmental effects associated with the proposed action and alternatives. The evaluated elements include the soil, geological, hydrological, flora and fauna and visual resources as well as socio-cultural aspects and migratory routes of birds, bats and monarch butterflies.

Based on the findings of the MIAs, and after a thorough analysis of potential impacts, the MIAs conclude that the execution of the Projects would not significantly affect the environment. The geographical location of the Projects ensure that there will be no significant adverse impacts in the population of monarch butterflies, since the Projects are located 150 km (93.2 miles) away from their main migratory route and 250 km (155.3 miles) away from the main migratory routes of birds. In order to mitigate possible impacts to these species, the MIAs include a series of mitigation measures including the installation of monitoring systems and registry of birds, bats and butterflies. SEMARNAT issued two distinct Resolutions of the MIAs in October 2012, where the development of the Projects was authorized.

As part of the studies, a noise study was conducted prior to the construction in order to establish a reference noise level. Subsequently, noise levels generated by the wind turbines will be analyzed during the operation phase.

Additionally, in order to comply with the requirement of other funding agencies, the Sponsor developed a Phase 1 Environmental Assessment for each Project in accordance with the minimum requirements of ASTM E 1527-05 "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" and followed the guidelines of the International Finance Corporation (IFC) and the Inter-American Development Bank.<sup>18</sup> The purpose of these studies was to identify Recognized Environmental Conditions (REC) which can include effects associated with past, present or future emissions of hazardous substances or petroleum products in soil, surface water or groundwater, but do not include *de minimis* conditions.<sup>19</sup> No evidence of asbestos, use of hydro-chlorofluorocarbons or industrial liquid waste was found at the Projects sites. As a condition of *de minimis*, it is expected that small amounts of hydrocarbons generated and stored according to the hazardous waste management program described in the MIAs.

In November 2011, the Projects were submitted to the United Nations Framework Convention on Climate Change (UNFCCC) to be reviewed and considered for participation in the Clean Development Mechanism (CDM).<sup>20</sup> The Sponsor indicated that the Projects have been approved by the CDM Executive Board.

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<sup>18</sup> American Society for Testing and Materials (ASTM).

<sup>19</sup> "*De minimis*" conditions refer to a level of risk that is too small to be of concern.

<sup>20</sup> The Clean Development Mechanism (CDM) is one of the mechanisms defined in the Kyoto Protocol that allows a country with an emission-reduction commitment to implement an emission-reduction project. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one metric ton of CO<sub>2</sub>, which can be counted towards meeting Kyoto targets.



Information about the Ventika projects related to the CDM process can be found in the following sites:

- Ventika
  - Registration: <http://cdm.unfccc.int/Projects/projsearch.html>
  - Documentation: <http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1356678953.67/view>
- Ventika II
  - Registration: <http://cdm.unfccc.int/Projects/projsearch.html>
  - Documentation: <Http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1356677506.62/view>

### **Pending Environmental Tasks and Authorizations**

No environmental authorizations for the Projects are pending.

### **Compliance Documentation**

The Sponsor has obtained the following federal and municipal environmental clearances required for the Projects:

- Ventika:
  - MIA Resolution No. S.G.P.A./D.G.I.R.A./D.G./8111 issued by SEMARNAT.
  - Resolution of the application for forest land use change authorization issued by SEMARNAT, Document No. 139.04.1.-1298(13).
  - Land use permit issued by the Municipality of General Bravo, Document No. 008-2013.
- Ventika II:
  - MIA Resolution No. S.G.P.A./D.G.I.R.A./D.G./8110 issued by SEMARNAT.
  - Resolution of the application for forest land use change authorization issued by SEMARNAT, Document No. 139.04.1.-1296(13).
  - Land use permit issued by the Municipality of General Bravo, Document No. 009-2013.
- Substations/transmission line: Resolution of the application for forest land use change authorization, issued by SEMARNAT, Document No. 139.04.1.-1287(12).

## **2.2.2. Environmental Effects / Impacts**

There is a need for affordable and environmentally beneficial alternatives to conventional hydrocarbon-based energy sources. Renewable energy projects create an opportunity to generate electricity without the atmospheric emissions generated by fossil-fuel-based plants. Wind is a renewable energy source, which means that it can be used continuously without depleting natural resources. Wind is a clean form of renewable energy and is currently used in many developed and developing nations to meet their demand for electricity. Wind energy does

not produce waste byproducts that require disposal, or gas emissions that contribute to air pollution. It does not consume or pollute water. The Projects do not anticipate the use of water for cooling the turbines during normal operations. The Projects provide an opportunity to displace greenhouse gases (GHG) and other pollutants produced by traditional hydrocarbon-based energy generation, while providing local residents with a safe and reliable energy alternative.

### **Existing Conditions and Project Impact – Environment**

Historically, Mexico has depended to a great extent on fossil fuels for the generation of energy. This conventional method of energy development can affect the natural environment due to harmful emissions related to the generation process, including GHG and other pollutants, such as sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>).

The Projects will help reduce the demand for electricity generated by fossil fuel-based power plants, and since wind-based power generation implies zero fuel costs and no emissions, they will displace related harmful emissions. The Sponsor does not expect to use any existing or new wells on-site; therefore, no additional permits are required. Although some water resources will be required for construction, the EPC contractor will use water transported to the site by water trucks.

The anticipated environmental outcomes from the installation of new renewable energy generation capacity of 126 MW for each Project (or more than 512.7 GWh for Ventika and 521.0 GWh for Ventika II in Year 1), is the expected total displacement by both Projects of 611,949 metric tons/year of carbon dioxide, 2 metric tons/year of sulfur dioxide, and 1,514 metric tons/year of nitrogen oxides.<sup>21</sup>

### **Mitigation of Risks**

Some environmental impacts are anticipated from the implementation of the Projects. The Sponsor has considered mitigation measures that are intended to reduce, mitigate and control the environmental effects resulting from Project development activities. To ensure that mitigation measures are implemented properly and in a timely manner, the Sponsor has also proposed plans and programs including an Environmental Monitoring Plan, a Wildlife Rescue Program, a Reforestation Program, a Flying Fauna Monitoring Program and a Noise Monitoring Plan.

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<sup>21</sup> SO<sub>2</sub> and NO<sub>x</sub> calculations based on emission displacement from wind energy generation equivalent to 1,034 GWh of energy production from natural gas electricity generation, which is the predominant fuel source near the Project area. CO<sub>2</sub> reduction based on the energy generation equivalent to 1,034 GWh, and the emission factor used in the Ventika and Ventika II Project Design Documents and the Validation Reports submitted for consideration in the Clean Development Mechanism.

Pursuant to the applicable provisions of the LGDFS and in compliance with the provisions of the LGEEPA regarding Environmental Impact Assessments, both MIAs consider the following activities to be carried out during the construction and operation of the Projects:

- Flora
  - A Wildlife Rescue Program will be implemented for the species identified in NOM-059-SEMARNAT-2010.
  - The proposed Reforestation Program will be implemented using a 2:1 reforestation ratio.
  - Land clearing, excavation, and leveling activities will be restricted only to the sites identified in the general Project layout.
  - Fertile soil removed during land stripping and clearing activities will be stockpiled within the Projects area and returned to the sites to be reforested once the construction phase is completed.
  
- Fauna
  - Establish a Wildlife Rescue Program focused on low-mobility species (rodents, snakes, lizards and turtles, primarily), relocating them to sites with environmental characteristics similar to their ecological requirements. This program must be implemented prior to land clearing by qualified wildlife management personnel.
  - Perform land clearing activities in a planned and gradual manner to allow the native wildlife to move to areas that will not be cleared for the implementation of Projects tasks.
  - Inspect the area for nests and burrows that could be in use, prior to starting the removal of vegetation, land clearing, excavation, and compaction activities. Once wildlife is identified, implementation of the aforementioned Wildlife Rescue Program must be carried out.
  - A Wildlife Monitoring Program will be implemented to monitor flying wildlife such as birds, bats and monarch butterflies.
  - Visual and acoustic deterrents will be installed to avoid bird and bat collisions.
  - Wildlife hunting and poaching will be officially banned.
  
- Solid Waste
  - Waste will be stored temporarily in a designated site equipped for this purpose, in compliance with applicable environmental regulations. Waste transportation will require the use of licensed companies. Waste will be disposed of at authorized facilities only.
  - All unused areas after construction will be restored to their original condition by replacing the soil excavated during land stripping and clearing activities in order to restore vegetation to the area.

- Containers will be installed at strategic locations throughout the work sites for the collection, separation, characterization, transfer, and final disposal of solid waste. The containers will remain closed and away from areas at risk of fires, chemical reactions, and/or air dispersion.
- Where feasible, the Projects will support the recycling of some wastes before transferring them to authorized disposal sites, thus preventing or reducing pollution and negative visual impacts.
- Properly labeled containers will be used for the temporary storage of hazardous waste.
- Noise
  - Establish a speed limit of 10 km/h (6 mph) for machinery and motor vehicles within the Projects construction and operations areas.
  - Maintain machinery in optimal conditions to reduce noise and vibration issues.
- Air Quality
  - Water and soil conservation will be achieved by installing vegetation covers and controlling runoffs to mitigate particle emissions.
  - Main access roads will be watered (using water drawn from sites authorized by the applicable authorities) and vehicle speeds will be restricted to 10 km/h by placing traffic signs at different locations to minimize dust emissions caused by vehicular traffic during the site construction and preparation phases.
- Soil
  - Control measures will be implemented to prevent fuel, oil, and grease spills caused by the use of machinery during the construction phase. In case of accidental spills, contaminated soils will be removed and handled as hazardous waste.
  - Containers must be placed on impervious surfaces for fuel handling and to avoid leaks or spills thus preventing soil contamination.

#### Natural Resource Conservation

The Projects will support natural resource conservation by reducing the demand on fossil fuels for energy production and associated improvements to air quality. The Ventika and Ventika II Projects are anticipated to produce approximately 512.7 GWh and 521.0 GWh, respectively, of zero-carbon electricity in the first year of operation, equivalent to the annual energy consumption of 65,725 and 66,880 households respectively. In addition, clean technologies such as wind energy require no water for electricity production, whereas fossil-fuel-fired generation is typically water intensive.

According to the Resolution of the MIAs, and as previously explained, the Projects will not have significant impacts on monarch butterfly populations, migration routes of birds or bats, since the Projects are located 150 km away from the main migration route of the monarch butterfly, 250

km away from major bird migration routes and 20 km (12.4 miles) away from a bat secondary migratory route. The Projects will not be developed within a fragile ecosystem, protected area, biosphere reserve or area designated with some cultural, scenic or archaeological value.

### No Action Alternative

The “no action” alternative to the development of renewable energy sources would result in greater demand for conventional fossil-fuel-based energy production, further depleting natural resources for the purpose of meeting an ever-growing demand for energy, as well as a lost opportunity to generate emission-free energy, such as that derived from wind sources.

Additionally, the Projects will help meet the goals established by LAERFTE and comply with emissions regulations, while satisfying increased demand for electricity. Should the Projects not be implemented, the mix of renewables in Mexico will be delayed.

### Existing Conditions and Project Impact – Health

Epidemiological research has shown that both chronic and acute exposure to harmful emissions associated with fossil fuel-based energy production can lead to serious respiratory problems. It is estimated that, at the very least, prolonged exposure to excessive levels of pollutants can deteriorate the respiratory capacity of human beings and greatly contribute to the increased incidence of cardiopulmonary diseases, such as asthma, heart ailments, and lung cancer.

By using clean renewable resources instead of conventional fossil fuel sources in power generation, the Projects will positively impact the region by reducing pollutants and thus help to contain the severity of respiratory problems and other diseases aggravated or caused by air pollution. In addition, the reduction of GHG emissions is expected to mitigate climate effects that create more vulnerable conditions for human health.

### Transboundary Effects

No negative transboundary impacts are anticipated as a result of the development of the wind energy Projects; on the contrary, a beneficial effect is anticipated on air quality due to the decreased demand on fossil-fuel-fired electrical plants in the region. Furthermore, the Projects will aid in addressing the larger environmental concerns related to greenhouse gases and global warming targeted by international agendas. The Mexican Section of the International Boundary and Water Commission (IBWC) sent a concurrence letter to BECC on January 8, 2014, indicating that no negative transboundary impacts related to the implementation of the Projects were identified.

### Other Local Benefits

During construction, the Projects are expected to generate more than 1,000 jobs, and 20 permanent jobs are expected to be created during operation. The Projects will also promote social and economic development of the municipality of General Bravo. Employment of construction personnel would provide a temporary beneficial impact on local businesses and the regional economy through increased expenditure of wages for goods and services. Personnel for construction would be drawn from local populations to the extent feasible.

### 2.3. FINANCIAL CRITERIA

The Projects Sponsor has requested a loan from the North American Development Bank (NADB) to complete the financing of each of the Projects. The proposed payment mechanism is consistent with the project structure normally seen in the renewable energy industry. The source of payment will be the revenue generated by the Projects in accordance with the pricing established under the PPAs to be signed by the Projects Companies. NADB loan will have no recourse beyond the Projects Companies, Ventika and Ventika II.

The Projects' expected revenue from the sale of electricity is estimated to be sufficient to: a) cover scheduled O&M expenses, b) fund any debt service reserve, c) pay the debt service on the senior loans, and d) comply with debt service coverage requirements.

In addition, NADB's analysis verified that Ventika and Ventika II have the legal authority to contract financing and pledge their revenue for the payment of financial obligations. Ventika and Ventika II also have the legal and financial capacity to operate and maintain the Projects based on the experience provided by their development team. Ventika and Ventika II will contract the Projects' O&M services with a firm with ample experience and expertise in the industry. NADB will verify that the projected O&M costs and contract warranties are in accordance with industry standards.

Considering the Projects' characteristics and based on the financial and risk analyses performed, the proposed Projects are considered to be financially feasible and present an acceptable level of risk. Therefore, NADB proposes providing a market-rate loan for up to US\$70 million to Ventika, S.A.P.I. de C.V. and a market-rate loan for up to US\$70 million to Ventika II, S.A.P.I. de C.V., respectively, for the construction of the projects described herein.

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## 3. PUBLIC ACCESS TO INFORMATION

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### 3.1. PUBLIC CONSULTATION

BECC released the Draft Project Certification and Financing Proposal for a 30-day public comment period beginning December 11, 2013. The following documentation was made available, upon request, for the Projects:

- Ventika.
  - MIA for the project.
  - MIA Resolution No. S.G.P.A./D.G.I.R.A./D.G./8111 issued by SEMARNAT.
  - Resolution of the application for forest land use change authorization, issued by SEMARNAT, Document No. 139.04.1.-1298(13).
  - Project Design Document "Ventika" for the United Nations Framework Convention on Climate Change.

- Ventika II.
  - MIA for the project.
  - MIA Resolution No. S.G.P.A./D.G.I.R.A./D.G./8110 issued by SEMARNAT.
  - Resolution of the application for forest land use change authorization, issued by SEMARNAT, Document No. 139.04.1.-1296(13)
  - Project Design Document “Ventika II” for the United Nations Framework Convention on Climate Change
- Substations/transmission line: Resolution of the application for forest land use change authorization, issued by SEMARNAT, Document No. 139.04.1.-1287(12).

The public comment period ended on January 10, 2014, with no comments received.

### **3.2. OUTREACH ACTIVITIES**

In November 2011, the Sponsor submitted the Projects and held a meeting with the Designated National Authority represented by the Ministry of Environment and Natural Resources (SEMARNAT), for the possibility to consider the Projects under the Clean Development Mechanism (CDM). SEMARNAT communicated its concurrence with the Projects in a letter sent to the Sponsor. Additionally, the Inter-ministerial Commission on Climate Change “*Comisión Intersecretarial de Cambio Climático, CICC*” issued a Letter of Approval of the Projects.<sup>22</sup> The letter supports the development of the Projects while they contribute to Mexico’s sustainable development.

In November 2011, the Sponsor conducted a public consultation in “Rancho Las Adjuntas”, a farm located inside the Project site. A total of 12 participants, including property owners and some neighbors, attended the meeting. The participants expressed their support for the implementation of the Projects which will bring benefits to their community. Other comments during the meeting were related to promoting this kind of projects in the whole country to create employment in local communities and improve environment by generating electricity through clean technologies such as wind farms. No negative comments were received during the meeting. The process is documented in the Project Design Documents as part of the CDM outreach activities for the Projects.

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<sup>22</sup> The CICC, launched in 2005, is an inter-ministerial body responsible of coordinating the formulation of policies on climate action. For more information, see the following link:  
[http://www.ordenjuridico.gob.mx/Federal/PE/APF/CI/CICC/25042005\(1\).pdf](http://www.ordenjuridico.gob.mx/Federal/PE/APF/CI/CICC/25042005(1).pdf)

Additional documents provided to BECC describe the activities conducted by the Sponsor in order to present the Projects among the authorities and the community:

- During the fourth quarter of 2011, the Sponsor informed the local government of the intent to develop the Projects.
- On February 13, 2012, the Mayor of the General Bravo municipality sent the Sponsor a letter expressing his support of the development of the Projects.
- On May 31, 2012, the Projects were published in the federal Environmental Gazette number DGIRA/026/12.
- On June 1, 2012, the Projects were presented to the community in an article in the El Norte newspaper.
- On January 30, 2013, during the Mexico Wind Power Congress, Cemex presented its strategy to reduce CO<sub>2</sub> emissions through the development of renewable energy projects including Ventika and Ventika II.

Finally, BECC conducted a media search to identify potential public opinion about the Projects. References to the Projects were found on the Sponsor's website<sup>23</sup> and several Internet sites, including the *REVE* magazine, *Sexenio Nuevo León*, and *BN Americas*. Some of the information highlights the interest of Cemex S.A. de C.V. in developing the Projects in the municipality of General Bravo, Nuevo León, which would represent the largest wind farms in the country with an annual generation of 660 GWh. No opposition to the Projects was detected in the media search.

Examples of these articles can be found at the following links:

- *REVE Wind Magazine* (December 27, 2011) – “Eólica en Mexico: Cemex entra en el sector eólico” (Wind in Mexico: Cemex enters the wind energy sector)  
<http://www.evwind.com/2011/12/27/eolica-en-mexico-cemex-entra-en-el-sector-eolico/>
- *Sexenio Nuevo León* (August 2, 2012) – “NL tendrá los parques eólicos más grandes del país” (Nuevo León will have the largest wind farms in the country)  
<http://www.sexenio.com.mx/nuevoleon/articulo.php?id=8128>
- *BN Americas* – “Ventika Wind Farm” <http://www.bnamericas.com/project-profile/es/parque-eolico-ventika-ventika>
- *BN Americas* – “Ventika II Wind Farm” <http://www.bnamericas.com/project-profile/es/parque-eolico-ventika-ii-ventika-ii>

The Project sponsor has followed all public consultation requirements in order to comply with applicable environmental clearance and permitting processes.

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<sup>23</sup> <http://www.ventika.com.mx/>