

PROJECT IDEA NOTE**Mexico : LA VENTA II WIND POWER****A. Project description, type, location and schedule****Technical summary of the project**

Objective of the project	CFE has a pilot wind power plant in Oaxaca, with a capacity of 1,575 kW, operating since 1994 with excellent results, annual capacity factors over 40%. To introduce CFE in the commercial utilization of the wind, a project of 50 MW, La Venta II is now proposed.
Project description and proposed activities (including a technical description of the project)	La Venta II wind power plant will generate electricity harnessing the power of the wind, employing modern wind turbines, with possible individual capacities between 660 kW and 1500 kW. La Venta region has a very high energy-content wind , with an annual average wind speed over 9 m/s, which assures high levels of electricity production. Electricity generated in La Venta Wind Power Plant will substitute electricity produced by hydro and fossil thermal plants, avoiding CO ₂ gas emission (which will be confirmed by the dispatch model). La Venta II useful life is estimated in 20 years, it could be longer, but due to the accelerated steps in the technological development of wind turbines, it is better to consider 20 years, to avoid obsolescence in the installed wind turbines. The wind power plant will be located close to the town of La Venta, Oaxaca.
Technology to be employed	The kinetic energy of the wind is transformed into mechanical rotational energy by the horizontal axis rotor of the wind turbine, transmitting that movement to the generator to produce electricity. A number of individual wind turbines will be installed to complete a total capacity of 50 MW.

Project developer	
Name of the project developer	Comisión Federal de Electricidad (CFE)
Organizational category	Government agency: State-owned company. CFE is a decentralized enterprise of the federal government of Mexico, with legal personality and its own patrimony. CFE has been entrusted to deliver the public service of the electrical energy generation and supply and to plan the expansion of the Sector in conjunction with the Ministry of Energy.
Other function(s) of the project developer in the project	Sponsor and project entity
Summary of the relevant experience of the project developer	CFE has an installed power plant capacity over 34,000 MW, with an interconnected electrical network that cover practically all the continental territory of Mexico. Electrical lines up to 400 kV, transmits power from the power plants to the power substations, and from them, through distribution lines of lower voltage, to the

Address	final consumers. Practically all commercial technologies are covered by CFE power plants, including wind turbine technology. Alejandro Volta 655, Col. Electricistas, 58290, Morelia, Mich., México		
Contact person	Name of the Project Development Manager Gerardo Hiriart Le Bert		
Telephone / fax	44 3 322 7002		
E-mail and web address, if any	Gerardo.hiriart@cfе.gob.mx		
Project sponsors			
Name of the project sponsor	CFE		
Organizational category	Same as above		
Address (include web address, if any)	Same as above		
Main activities	Generation, transmission and distribution of electricity		
Summary of the financials	(Th. Pesos)	2001	2000
	Revenues	101,313,294	101,222,214
	Op. Profit/(Loss)	(599,040)	(1,165,625)
	Net Profits	6,150	5,982
	Current Assets	42,559,125	42,699,915
	Total Assets	519,694,341	521,649,530
	Current Liabilities	28,151,144	28,666,609
	Total Debt	137,398,657	136,276,928
	Equity + Reserves	382,295,684	385,372,602
Type of the project			
Greenhouse gases targeted	CO2		
Type of activities	Abatement		
Field of the activities			
a. Energy supply	Renewable (Wind) Energy		
b. Energy demand	Not Applicable		
c. Transport	Not Applicable		
d. Waste management	Not Applicable		
Location of the project			
Region	Latin America & the Caribbean		
Country	México		
City	La Venta Town		
Brief description of the location of the plant	La Venta II power plant will be located in the agricultural fields pertaining to the town of La Venta, Oaxaca, inside the southern region of the Istmo de Tehuantepec. That fields are a flat terrain with a small slope, descending toward the south.		
Expected schedule			
Earliest project start date	August 2004		
Estimate of time required before becoming operational	Time required for financial commitments: 6 months Time required for legal matters: 4 months Time required for negotiations: 4 months Time required for construction: 15 months		
Expected first year of CER delivery	August 2004		

Project lifetime	Number of years 20
Current status or phase of the project	CFE has already a feasibility study although it has not been validated by an external consultant. Terms of reference were sent to USAID, who offered to sponsor such procedure. KfW Bank is expecting an official request for financial support from the Mexican Government. CFE will proceed once the feasibility analysis is validated, which is expected to happen by June 2002. CFE will prepare the Environmental Impact Assessment study to meet with the legal requirements established by the Mexican laws. This document should be finalized within the next six months.
Current status of the acceptance of the Host Country	Letter of Approval is under discussion
The position of the Host Country with regard to the Kyoto Protocol	The Government of Mexico has signed the Kyoto Protocol in June 1998 and ratified it in September 2000. They support CDM activities in Mexico.

B. Expected environmental benefits

Estimate of Greenhouse Gases abated / CO₂ Sequestered (in metric tonnes of CO₂-equivalent)	Annual: Up to and including 2012: 0.68 million tCO ₂ -equivalent Up to a period of 10 years: 0.85 million tCO ₂ -equivalent Up to a period of 7 years: 0.6 million tCO ₂ -equivalent Up to a period of 14 years: 1.2 million of tCO ₂ -equivalent These values assume the displacement of gas at the margin. This assumption is considered as conservative but will be verified with project preparation and with the baseline study.
Baseline scenario	To evaluate the reduction in emissions, the baseline proposed will be the operation of the whole system without a wind power plant. Emissions under this scheme will be evaluated using software like WASP, MEXICO, PROLOG, LOG, SIPO; software used by CFE to model the expansion programs of the electrical sector and the plants dispatch, minimizing capital and operational costs. The real level of emissions reduction produced by La Venta II will be determined through the dispatch model. The power plant will be integrated in the National Interconnected System, where a number of different energy sources supply electricity (hydro, nuclear, gas, carbon, fuel oil and geothermal). Although the region is electrically supplied from hydro power plants, the dispatch algorithm assigns power stations based on a hydrothermal coordination and it can be expected that emissions reductions will take place by wind energy displacing hydro energy.
Specific global & local environmental benefits	Currently, the electricity distributed in the La Venta area comes from hydroelectric power plants in the vicinity. There is no other power plant in the area. Wind electricity produced at La Venta will reduce the loss of energy due to lines' transmission, improving the use of hydroelectric generation, which will traduce in displacement of fossil fuels, from another interconnected power plants, and hence, in emission reductions.
Which guidelines will be applied?	CFE will prepare the Environmental Impact Assessment study to meet with the legal requirements established by the Mexican laws.

	World Bank Environmental Safeguards Policy shall also apply. See: http://wbIn0011.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/9367A2A9D9DAEED38525672C007D0972?OpenDocument
Local benefits	There are no existing power plants in the area. La Venta II will provide clean energy locally.
Global benefits	La Venta II wind power plant will promote fuel diversification and globally reduce the emission of greenhouse gases.
Socio-economic aspects What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project?	The project is located in a rural area with high unemployment, its construction and operation will help economic and sustainable development, bringing new sources of jobs in the region.
Which guidelines will be applied?	World Bank Environmental Safeguards Policy: http://wbIn0011.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/9367A2A9D9DAEED38525672C007D0972?OpenDocument
What are the possible direct effects (e.g. employment creation, capital required, foreign exchange effects)?	During the construction period, the project will directly employ about 100 local people adding to the usual economic benefits of foreign and domestic direct investment in the area
What are the possible other effects?	La Venta I has brought the know-how of the wind technology for CFE. La Venta II will implement it on a larger scale.
Environmental strategy/ priorities of the Host Country	México has no special policy to promote renewable energy development; however, the Government has recently shown publicly its interest through the "Plan Sectorial de Energía", which is part of the "Plan Nacional de Desarrollo 2001-2006", saying "with the contributions of the public, social and private sectors the appropriate mechanisms for renewable energy development will be found". The document also establishes the goal of installing 1,000 MW of renewable energy during the present federal administration. The wind project La Venta II is part of that effort.

C. Finance

Total project cost estimate	
Development costs	1.5
Installed costs	53.9
Other costs	
Total project costs	55.4
Sources of finance to be sought or already identified	
Equity	CFE still to determine how much equity will be required by banks.
Debt – Long-term	Debt will be financed partly by a commercial bank, with a estimated annual rate of 8% and 8 years for payback (up to \$ US 12.3); and partly by the German Government and KfW Bank who are offering a \$ US 43.1 million credit at an annual rate of 4.3%, a grace period of 5 years and 12 years for payback.
Debt - Short term	
Not identified	

CDM contribution sought	EUR 4 million
CDM contribution in advance payments	Not applicable
Indicative CER Price (subject to negotiation and financial due diligence)	EUR 3.5/TCO _{2e}
Total ERPA Value	
A period until 2012 (end of the first budget period)	EUR 2.2 million
A period of 10 years	EUR 2.8 million
A period of 7 years	EUR 1.98 million
A period of 14 years (2 * 7 years)	EUR 4 million
If financial analysis is available for the proposed CDM activity, provide the forecast financial internal rate of return for the project with and without the CER revenues. Provide the financial rate of return at the expected CER price above and at EURO equiv. of 3/ tCO _{2e} .	See Tables 1 and 2 below

TABLE 1: LA VENTA II ERs ESTIMATES

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Net Generation (GWh) or Production Volume	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2	175.2
Total ER (thousand ton CO _{2e})	29.2	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	58.4					
PCF Purchase requested (thousand tons CO _{2e})	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6					
PCF Payment requested (US\$ million)	0.0876	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.2628	0.1752					

Project Idea Note

Mexico: La Venta II Wind Project
Date Submitted: May 17, 2002

TABLE 2 LA VENTA II INITIAL FINANCIALS

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Cash flow (before ER)	(385.25)	1,164.2	3,418.	3,751.	4,091.	4,437.	3,223.	1,458.1	1,985.	3,118.4	4,449.	4,884.	5,327.	5,788.	6,237.	6,704.	7,181.1	7,666.	9,726.	12,355	12,707	7,623.
Cash flow (after ER)	(385.25)	1,251.8	3,681.	4,014.	4,354.	4,699.	3,486.	1,720.	2,248.	3,381.	4,712.	5,147.	5,590.	6,041.	6,500.	6,880.	7,181.1	7,666.	9,726.	12,355	12,707	7,623.
Net Present Value NPV (before ER)	\$ 24,419.25 (thousand USD)																					
Net Present Value NPV (after ER)	\$ 25,760.94 (thousand USD)																					
Estimated financial internal rate of return FIRR (before ER)	14.89%																					
Estimated financial internal rate of return FIRR (after ER)	15.34%																					
Debt Service Coverage Ratio (before ER) *		1.74	1.81	1.91	2.02	2.14	1.60	1.20	1.3	1.50	1.86	2.0	2.10	2.3	2.39	2.55	2.7	2.91	5.2			
Debt Service Coverage Ratio (after ER) *		1.7	1.8	1.9	2.0	2.2	1.6	1.2	1.3	1.5	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.9	5.2			