June 29, 2009

Clean Technology Fund

Project Proposal for Mexico: Private Sector Wind Development

(Current Information Document)

Proposed Trust Fund Committee Decision

The Trust Fund Committee reviewed and approved, on a contingent basis subject to availability of funds in the CTF, the requested CTF financing for the project, *Mexico: Private Sector Wind Development* (IDB/IFC), to be developed and implemented under the CTF Investment Plan for Mexico that was endorsed by the Trust Fund Committee at its meeting in January 2009. Specifically, the Trust Fund Committee approved the following allocation to IFC of CTF financing for the project:

(a) US$15 million investment
(b) US$500,000 implementation and supervision budget (see Annex 1)
(c) US$100,000 knowledge management

Name of Project or Program:	**Mexico Private Sector Wind Development**
CTF amount requested (US$):	US$15 million investment US$500,000 implementation and supervision budget US$100,000 knowledge management
Country targeted:	Mexico
Indicate if proposal is a Project or Program:	The development of Mexico's wind sector is being supported jointly by IFC and IDB through a programmatic approach which includes both private and public sector interventions. Each intervention will be submitted to the CTF Trust Fund Committee separately as the responsibility for seeking, structuring and supervising the CTF funds will vary between MDBs depending on project specifics, core competencies and CTF allocation of funds within the Mexico Country Investment Plan. This proposal outlines the programmatic approach being taken in Mexico's wind sector and seeks funding for the first project within the Program.

DETAILED DESCRIPTION OF PROJECT OR PROGRAM

Fit with Mexico's Country Investment Plan

1. On January 27, 2009, Mexico's Country Investment Plan (CIP) was endorsed by the CTF Trust Fund Committee. Mexico's CIP described the country's GHG emissions profile and indicated that the development of renewable energy sources was a key strategic area for CTF resources including through the private sector. An initial analysis determined that a CTF renewable program could result in around

1.8 million tons of carbon dioxide equivalent (Mt CO2e) /year at an abatement cost between US$31/t CO2e and US$38/t CO2e. Within this context Mexico's CIP targets the development of 500 MW of new installed wind capacity through CTF support (from a baseline of 85 MW of installed capacity in 2008). This project will be the first step in helping to meet this target and is the first initiative in a broader IFC and IDB strategy to develop the private wind market in Mexico. In addition to other direct private sector interventions, the overall strategy, which is described within this document, includes working with the Mexican energy sector regulator, *Comisión Reguladora de Energía* (CRE), to design the regulatory framework for the new Renewable Energy Law (*Ley para el Aprovechamiento de las Energías Renovables y el Financiamiento de la Transición Energética - LAERFTE*) enacted in November 2008 which calls for the development of a national strategy for promoting renewable energy.

Mexico's GHG profile

2. According to Mexico's Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), Mexico emitted 643 Mt CO2e in 2002 of which almost 400 Mt CO2e were from combustion of fossil fuels. Mexico ranks thirteenth in the world based on total GHG emissions and is the largest emitter in Latin America excluding land use sources. It accounts for 1.4% of global CO2 emissions from fossil fuels, excluding other GHGs and land-use change and forestry.

3. The sources of Mexico's GHG emissions are energy generation (24%), transport (18%), forests and land-use change (14%), waste management (10%), manufacturing and construction (8%), industrial processes (8%), agriculture (7%), fugitive emissions (6%), and other uses (5%). The oil and gas sector is responsible for about 12% of GHG emissions, about half of which is classified under energy generation.

4. Mexico has been very proactive in its efforts against climate change. In April 2005, Mexico established the Intersecretarial Commission on Climate Change (Comisión Intersecretarial de Cambio Climático – CICC). The CICC's key mandates include the formulation and coordination of national climate change strategies and their incorporation in sectoral programs. On May 25, 2007, President Calderón announced the National Climate Change Strategy (Estrategia Nacional de Cambio Climático – ENACC), thereby committing the country to place climate change at the heart of the country's national development policy. The ENACC sets the long-term climate change agenda, together with medium to long-term goals for adaptation and mitigation. In the Strategy, the country commits itself to reducing GHG emissions on a voluntary basis. In December 2008, the government committed to a 50% reduction of greenhouse gasses below 2002 levels by 2050.

Power Generation in Mexico

5. According to CRE, at the end of 2007, Mexico had around 62 GW of total installed electricity generation capacity. Of the total electricity generation, 42.6% was from natural gas, 22% was from fuel oil, 14% was from coal, 13.5% from hydro, 4.8% from nuclear, 3.0% from geothermal, and 0.15% was from wind. The demand for electric power in Mexico has been growing faster than GDP over the past several decades and this trend is likely to continue for the foreseeable future as electricity use continues to grow in the residential, commercial, and industrial sectors. To meet the increasing demand for power under a business as usual (BAU) scenario, total annual CO2 emissions from power generation are estimated to

increase by 230% between 2008 and 2030 – from 138 to 312 Mt CO2e. Based on their economic costs of production – excluding carbon and local externalities – both coal and gas-fired power generation would increase under the BAU, with coal accounting for 37% of the new capacity, and gas 25%. However, Mexico is experiencing a decrease in fossil fuel reserves and there is growing pressure to diversify the country's power sources. Assuming a cost of CO2e of as little as US$10/ton, low-carbon energy technologies – hydro, wind, biomass, geothermal, solar and efficient cogeneration – could replace much of the conventional fossil fuel based thermal power generation, principally coal, in the BAU scenario.

6. Mexico's electricity sector is dominated by the country's state owned integrated electric utility, Comisión Federal de Electricidad (CFE) which is required under the Constitution and various laws to purchase electricity at the lowest cost but sells electricity to consumers based on a matrix, with subsidized rates to residential consumers and premium rates to industrial consumers. Since the passage of legislation allowing private Independent Power Producers (IPPs), more than US$6 billion in private capital has been mobilized and today approximately 20% of Mexico's power generation is supplied by 12,557 MW of private IPPs using conventional thermal power generation. There is also 7% provided by 4,542 MW of privately financed autogeneration projects and 4.3% from 2,677 MW of "inside the fence" private cogeneration projects according to CRE.

Status of Renewable Energy in Mexico

7. Despite having world class renewable energy resources and the prospect of wind power and other sources achieving economic competitiveness in the short to medium term, the renewable energy sector of Mexico remains relatively untapped. Around 7% of Mexico's primary electricity output (in GWh) comes from renewable energy, which is largely accounted for by large-scale hydropower and unsustainable use of biomass associated with deforestation and forest degradation. According to studies used to develop the Economics of Climate Change Study, by 2030 renewable energy could result in as much as 72 Mt CO2e per year of abatement from five main sources: hydropower (both large and small), wind power, geothermal, energy from biomass, and solar. Combining such renewable energy investments with smart grids could result in a further 15 Mt CO2e abated by 2030. To date, Mexico has not accessed the carbon market at scale although the potential exists to do so.

Mexico's Wind Sector

8. Mexico is one of the most promising yet untapped areas for wind energy development in Latin America. Mexico has a tremendous wind energy potential conservatively estimated at more than 40 GW. However, its development has been extremely slow by global wind industry standards. This is due both to lack of adequate financial incentives for private developers and investors, as well as various issues with the existing regulatory framework and policies relating to wind energy.

9. The region of the Isthmus of Tehuantepec in the State of Oaxaca represents a world-class wind resource. This wind resource has elicited strong interest and support by the local and international wind development and investment community. Despite the fact that Oaxaca has more than 8,000 MW of wind potential and many sites with average wind speeds in the 8-12 m/s range, Mexico has only 85 MW of installed and operational wind projects at the end of 2008 (consisting of CFE's 2 MW La Venta I

project and the 83.3 MW La Venta II project in Oaxaca which became operational in January 2007). By comparison, at the end of 2008 the U.S. had more than 25,000 MW, China had more than 12,000 MW and India had more than 9,500 MW installed. In Latin America, Brazil is the market leader with more than 300 MW installed and operational and approximately 1,500 MW in advanced development.

10. Mexico has two parallel tracks for private sector participation in the wind sector:

    (i) CFE's IPP program which contemplates competitive tendering for up to 600 MW of new capacity in Oaxaca over the next 4 to 7 years, but, which despite support from the World Bank, has been slow to develop due to a number of failed bid processes and other administrative delays; and
    (ii) The autogeneration framework which allows private wind developers to sell power to some of the largest commercial and industrial groups in Mexico as off-takers, as long as the off-taker is also a shareholder in the project. Autogeneration projects are fully interconnected to Mexico's power grid and the electricity sold to the off-takers is transmitted and distributed via CFE or Luz y Fuerza del Centro (LFC, a Government-owned power distribution company serving Mexico City, the State of Mexico and neighboring regions in the center of the country) under Mexico's power sector interconnection regulations. These power generation projects typically are not "inside the fence," but rather are facilities that may be located at great distance from the ultimate off-taker with CFE "wheeling" the power via its transmission network. The power that the off-taker acquires from the autogeneration project offsets the power that they otherwise would have purchased directly from CFE or LFC representing the mix of other generation sources that supply the CFE national grid. Under the autogeneration regulations and to address the intermittent nature of wind power, CFE also acts as the backstop off-taker and will acquire any excess energy generated above autogeneration contractual obligations and the off-takers' demanded power at a tariff equivalent to 85% of the regional regulated short-term marginal cost of the power grid. Alternatively, under the regulations, an autogeneration wind power project may also elect to "bank" any excess generated energy for up to one-year to apply to future contractual off-take obligations.

11. The autogeneration framework for private wind power developers is effective because it allows private developers to earn tariffs which are higher than those paid to private wind power developers by CFE through the IPP process, but which are lower than what CFE would charge the industrial consumer directly. Under the autogeneration framework, private developers have identified and are currently developing 4,000-6,000 MW of wind power potential at sites located predominantly in Oaxaca and Baja California, much of which could be implemented by 2014 under ideal economic conditions and assuming timely construction of additional transmission capacity.

12. In 2008, no new wind generating capacity was interconnected to the Mexican grid. Nonetheless, the year was decisive, as the first three private autogeneration wind projects were erected and are now undergoing commissioning. This has laid the foundation for more private sector-led wind energy development in the future, and there are indications that both national and state governments are placing a stronger emphasis on development of wind energy. The wind development pipeline is impressive, and many projects are either in advanced stages of planning or ready to start construction. There is nevertheless concern about the adverse effects of the global financial crisis as commercial bank loans for projects in advanced stages of development have dried up.

Existing MDB operations in Mexico's wind market

13. The World Bank has been working for a number of years to support Mexico's renewable energy and wind power development. Through its "Large Scale Renewable Energy Development Project" the World Bank has: (i) provided technical assistance to various Government of Mexico agencies involved in the wind sector including the Ministry of Energy (SENER), CRE, the Ministry of Environment and Natural Resources (SEMARNAT), and CFE; (ii) mobilized carbon finance for CFE's 83.5 MW La Venta II wind power project; and (iii) secured US$25 million in Global Environment Facility (GEF) grant funding to support a higher tariff for La Venta III, the first CFE private wind IPP. In the Oaxaca region, the World Bank also pioneered a state-of-the-art monitoring system for the La Venta II wind project to mitigate potentially adverse avian collision risk as well as to engage in support for social and economic development policies to support the "ejido" landowners under Mexico's traditional system of land tenure that combines communal ownership with individual use. Through the GEF, the World Bank is also assisting the Government of Mexico to conduct a Strategic Environmental Assessment as a component of the "Large Scale Renewable Energy Development Project" to facilitate and optimize the planning and siting of future wind farm developments in the Isthmus of Tehuantepec in the State of Oaxaca.

Challenges for private sector wind development

14. Many private sector wind developers who are among the global wind industry's market leaders have autogeneration wind projects in advanced stages of development under Mexico's autogeneration scheme, but none have yet become fully operational. Approximately 143 MW of private wind autogeneration capacity was erected in Oaxaca at three separate wind farms during 2008 and are scheduled to start commercial operation during 2009. These will be the first autogeneration projects operational in Mexico.

15. A number of constraints have impeded these projects and private wind power participation in Mexico in general. Most notable is CFE's monopoly position in the Mexican power sector and a legal and regulatory framework that supports and protects this dominant position. Examples of the barriers and constraints that CFE has imposed on private wind power developers over the years include, among others:

    (i) recurrent changes in the regulations and requirements to obtain various wind project permits and licenses;

    (ii) significant difficulties and delays in obtaining interconnection and grid access permits from CFE including a relatively recent change which requires private wind developers to pay an incremental fee to CFE (in addition to their respective interconnection and wheeling fees) to finance a share of the construction costs of a new 290 km 400 kV transmission line which would enable power evacuation for future autogeneration wind projects in Oaxaca (the new line is expected to be completed by the fourth quarter of 2010); and

    (iii) various periodic adjustments by CFE to its complex commercial and industrial tariff framework which had a material impact on the margins and expected returns of wind power projects developed under the autogeneration framework. While to-date, Mexico has no fully-commissioned autogeneration wind power projects, by comparison, there are more than 4,500 MW of autogeneration power projects operating using conventional power technologies.

16. The current permitting, licensing and tariff framework reduces the attractiveness of Mexico's wind

sector. Several global wind power developers have elected to invest in other emerging market countries and take a "wait and see" approach regarding opportunities in Mexico as a result of the evolving regulatory barriers and constraints imposed by CFE. Nonetheless, important private investor interest continues, and even under such a framework, development of the sector could be expected to continue, albeit at a slow and cautious rate – well below Mexico's potential. The increased transmission fees, however, further amplify the high cost of being an early entrant into Mexico's wind market and pose an extra hurdle for developers who bear the full initial costs of the new transmission line construction. This makes the financial viability of these early projects significantly less attractive than future projects, and less attractive than developers originally anticipated.

17. In addition to high costs and regulatory challenges, new entrants to Mexico's wind sector are cautious given notable difficulties in deploying existing wind turbine technology to the strong wind conditions that are prevalent in Oaxaca. Newer multi-megawatt turbine technologies are now being deployed and a track record for these technologies will need to be developed over time; however the existing wind farms operated by CFE have provided some information and basic knowledge on how to deal with the strong prevailing wind conditions in this region.

18. The challenges outlined above are all exacerbated by the lack of an established track record of financially viable, well functioning wind projects in Mexico's private autogeneration market. There are currently 12 private autogeneration projects under development in Oaxaca representing more than 2,000 MW, which are subject to increased transmission fees but have transmission access permits and are ready to begin construction, if financing can be obtained. Unfortunately, the global financial crisis has stymied progress exactly at the time when Mexico's autogeneration sector is at a breakthrough moment and initial private autogeneration wind projects are reaching the construction stage and seeking financing for their projects. Commercial banks have withdrawn prior commitments even in cases where financing plans were complete, as liquidity became constrained, risk aversion grew, and a general flight to quality among foreign banks took place. Where financing is available, tenors have shortened and interest rates have increased to levels that make wind projects either only financially marginal or unfeasible. This situation has caused a significant slowdown in development of the sector. Currently, only a small number of wind project developers are willing or able to risk using 100% equity financing to get all, or at least part of their projects constructed so as to fulfill contractual obligations with turbine suppliers and off-takers, and to avoid voiding licenses and permits.As is typical for financing wind projects, these developers are expecting long-term debt to free up their paid-in equity and restructure their project financing plans as even "deep pocketed" developers only have the financial balance sheets to employ such a financing plan as a short-term solution. In cases where developers have the financial depth to construct their projects using equity, such actions severely impede the roll-out and scale-up of other projects they may have under development. The result of the financial crisis is that full development and construction of Mexico's initial projects is expected to be stalled at least until the crisis abates and commercial banks have both the liquidity and risk appetite to support Mexico's wind sector again. The delay in attracting back commercial financing to the sector and establishing the much needed track record for private wind autogeneration projects has negative, and possibly lasting, impacts for the sector. First, it runs the risks that the new Renewable Energy Law which was enacted in November 2008 would be designed with less than ideal incentives to attract and sustain further private investment (since the framework would be designed without real market information - both technical and commercial); and second, while some or most of the projects that are already under development in Mexico will likely be completed, new developers are likely to seek other markets that have reached a critical mass of wind projects and demonstrated their viability – possibly hurting the development of the sector even beyond the end of the financial crisis.

19. To further fuel the challenges of the sector, carbon prices remain low and uncertainty continues about the structure of the carbon market post 2012. To date, financiers heavily discount expected carbon revenues when analyzing the viability of any eligible project – including wind projects.

Risk of doing nothing

20. If no interventions are made, development of Mexico's wind sector can be expected to stall until the financial crisis passes and commercial bank lending returns to rates and tenors, which make the many projects currently under development financially viable. The rate at which commercial banks are likely to return to Mexico's wind sector is also expected to be slower under such a scenario versus one in which the projects that are ready for development are actually constructed and begin to develop an operational track record in the next few years. It can be expected that as the financial crisis wanes and banks become more liquid again, they will support projects in more proven and tested markets in order to mitigate their risks. Mexico would therefore be in a much stronger position to attract back private capital if there are private wind power projects implemented and fully operational. Under the do nothing scenario, it is expected that approximately 150 to 350 MW of the 500 MW required for Mexico's wind power sector to reach scale could be delayed as a result of the global financial crisis. Under such a scenario, the cost to Mexico (and globally) in terms of GHG abatement is estimated at 2.0 to 4.7 MtCO2e assuming 150 to 350 MW of wind capacity is delayed for three to five years.

The intervention within a transformational context

21. This project is part of an IFC and IDB programmatic approach to support the Government's objective of reducing its GHG emissions by 2050 by accelerating the growth rate of the wind power sector in Mexico. It consists of various components which will be submitted to the CTF Trust Fund Committee for approval as distinct projects depending on which MDB will be implementing and supervising the proposed project activities.

Public Sector Initiatives

22. On the public side, IDB is working with the Government to design the specifics of the new regulatory framework to the Renewable Energy Law (LAERFTE) which was approved in November, 2008. According to the law, CRE and SENER have been endowed with new powers to design and set up the relevant regulatory framework necessary to implement the new law. IDB will support CRE in removing existing barriers which impede the increased use of non-conventional forms of renewable energy which include wind. This will be achieved through a series of studies that will include a diagnostic of the existing generation/interconnection/transmission mechanisms and an assessment of the financial viability of renewable energy projects. The studies will also develop indicators and identify opportunities for increasing both public and private renewable energy projects.

23. The studies will address a wide variety of existing issues, including review and modification of dispatch and operation rules for renewable energy generators and establishment of the regulatory tools for setting up the maximum tariffs paid to renewable energy IPP generators by CFE. One of the main changes introduced by the new law is that CRE (and not CFE as in the former scheme) is in charge of developing

the tariff system for generators according to clear and transparent criteria which will be defined. On the autogeneration side, another study will be conducted to help CRE determine and define the electricity prices to be paid to generators who exceed the autogeneration capacity demanded by their off-taker and who sell such surplus to CFE as the backstop off-taker. The studies will address externalities derived from electricity generation and incorporate these externalities into the tariff system. This is expected to ease the integration of renewable energy to additional regions in México where excellent renewable energy potential promotes the competitiveness of renewable energy vis-à-vis less environmentally sound forms of energy generation.

24. The work outlined above is a key part of the overall strategic approach to the sector as the establishment of an attractive regulatory framework has the potential to significantly accelerate private wind development in Mexico once the financial crisis is over and transmission capacity constraints are addressed.

Private Sector Initiatives

25. On the private sector side, both IFC and IDB propose to use CTF funds to help attract private commercial banks to re-engage in Mexico's wind sector with debt financing in order to: (i) promote the immediate construction and implementation of the wind projects which already have transmission agreements with CFE and which are ready to move forward; and (ii) restructure and optimize the capital structure of projects in order to free-up capital that developers require to reinvest and progress additional wind projects. These initiatives seek to achieve the following objectives:

    (i) Fast-track the development of the private autogeneration wind sector and off-set up to 6.7 MtCO2e during the five-year period 2010 to 2014 (assuming 500 MW of incremental private autogeneration wind power capacity);

    (ii) Demonstrate the commercial viability of private autogeneration wind projects in Mexico and establish a track record in the near-term which would help reduce risks for financiers considering re-engagement with subsequent private wind projects and which may speed-up the return of large-scale commercial bank project finance to the sector;

    (iii) Develop a proven track record for multi-megawatt wind turbine technologies in the strong wind climate conditions that exist in the State of Oaxaca;

    (iv) Offset the additional costs for early entrants into the market who now face higher project development costs associated with additional up-front transmission costs, wind turbine contracts that were negotiated at the height of the supply-demand mismatch in the global turbine market, and high debt financing costs as a result of the global financial crisis (when appropriate long-term financing can be obtained); and,

    (v) Provide essential information to the Government and regulators who are designing the new renewable energy regulations and CFE who manages the IPP process about the terms and conditions necessary to rapidly scale private wind development in the country. Given the timing of the regulatory initiatives, it is even more important to establish a track record of accurate data from private sector projects in the near term to support the creation of effective laws that can further fast-track development of the wind sector.

26. It is anticipated that CTF funds of up to US$60 million may be needed to directly support an additional

three to five of the twelve private autogeneration projects in Oaxaca which are currently ready to begin construction but do not have access to long-term debt financing under current market conditions. This CTF funding would, in such a case, aim to help the country quickly scale-up and reach its 500 MW target of installed wind power by directly supporting an approximately 150 and 350 MW of incremental private wind power capacity that may otherwise be delayed for three to five years.

27. It is envisioned that once Mexico's wind market reaches a critical mass of over 500 MW installed and operational, that wind development is likely to continue to grow at a faster rate, without the need for further CTF support, as has been demonstrated in other, more mature emerging market wind sectors that have achieved rapid scaling, including India, China and, most recently, Turkey. Reaching such a level of wind project installations generally also results in lower costs for future developers allowing projects to become financially attractive within the current risk, financial and CDM environment. Enhanced financial attractiveness in the Mexican private wind power sector is expected to result from a combination of (i) the return of commercial bank debt financing at reasonable tenors and interest rates post-crisis, (ii) declining costs for key inputs such as turbines and locally procured "balance of plant" components and operations and maintenance (O&M) services, and (iii) lower market risks following the establishment of reasonable regulations, and a proven operational and off-take track record from the early movers.

28. If no interventions were made to promote the growth of private autogeneration wind power development in Mexico during the financial crisis, it is expected that no more than 250 to 400 MW of wind power (including the 143 MW already installed and partially commissioned) would become operational within the next five years. Given that the Oaxaca region has 8,000 MW of wind potential alone, and SENER's pre-financial crisis forecast predicted up to 1,924 MW of private autogeneration wind projects would be operational by 2012, this would be a significant negative impact for Mexico.

Market Initiatives

29. There are also a number of initiatives being pursued to further accelerate the development of Mexico's private wind power sector. These include:

(i) Establishing an effective feedback loop between the learning from these initial projects and the regulators and other project developers. Transparency, monitoring and evaluation, and knowledge management are all key elements of the CTF supported projects and a knowledge management program is being developed, possibly with *Centro Regional de Tecnología Eólica* (CERTE); *Asociación Mexicana de Energía Eolica* (AMDEE), Mexico's private sector wind power developer association; and/or other suitable institutions to ensure an effective feedback loop is created to capture and share information. The IDB public sector component will be responsible for incorporating the data obtained into the design of the new regulations; however, IFC would seek to work with AMDEE or another appropriate party to collect and aggregate data from the private autogeneration wind developers. A budget of US$100,000 is being sought to help AMDEE or such other party capture, document and share the learning from private autogeneration wind power development in the region (recognizing the boundaries of sensitive and proprietary commercial information of private sector developers). Additional CTF budget would be sourced by each of the subsequent CTF wind proposals to support this knowledge sharing component. Given the importance of the information sourced from private sector projects in the design of the new

regulations, a slow-down of private autogeneration wind development would have a further negative impact on the sector.

(ii) Developing knowledge and experience in the Mexican market for accessing carbon credits. To date, Mexico has not been able to access the carbon market at scale. The individual private sector wind power projects supported by CTF funds are expected to access the CDM carbon market, thereby having a demonstration effect for future renewable energy projects.

Project description

30. The transformation of Mexico's wind sector will come not from a single wind project but rather from the programmatic interventions set in motion by the program outlined above. The programmatic elements managed by the IDB will include a direct feedback loop with policymakers to incorporate lessons learned from the development of the wind sector in other countries as well as via the experience of private sector wind projects to be financed by IFC and IDB and incorporating CTF funds, including the project outlined below. This "fast-tracking" to accelerate wind's market penetration within Mexico's power sector will also generate important market information which has value to: (i) regulators; (ii) other wind developers and prospective investors; and (iii) commercial banks which should gradually re-engage in the sector over time.

31. The first project to be supported under the IFC and IDB private sector CTF strategy for developing Mexico's wind market is a wind farm located in the "La Ventosa" region of the Isthmus of Tehuantepec in the State of Oaxaca, which is being developed under Mexico's autogeneration framework. The wind farm will sell its energy to four local subsidiaries of an international retail chain under 15-year Power Purchase Agreements signed in 2006. The project is expected to sell 100% of its expected annual power generation of approximately 290 GWh to the off-takers at a mutually negotiated price. As required to qualify under the autogeneration framework, the off-takers also own *de minimis* shares in the wind farm.

32. The project is being developed by an experienced wind project developer (the "Sponsor") with over 1,500 MW of wind power projects in operation and close to 13,000 MW under development, mainly in Southern Europe and the U.S. The Sponsor has an excellent track record and relationship with both IFC and IDB, including positive experiences in past project finance transactions. The Sponsor also has additional wind sites under development in Oaxaca for a total of approximately 112.5 MW, subject to transmission constraints.

33. The off-taker is a large retailer with a global presence, influence in the market, and a well-publicized sustainability agenda including an objective of supplying 100% of its global energy needs through renewable energy sources. Successful demonstration of this goal would send a strong signal to other market players. The project represents one of the off-takers first renewable energy initiatives in an emerging market country and is likely to be scaled-up and replicated if it is successful.

34. The project also represents one of the Sponsor's early renewable energy investments outside of western Europe and the U.S. The project, as structured, would result in the transfer of technology as well as operational and maintenance know-how to the region and would also engage local talent and selected equipment throughout the development and construction stage which will promote capacity building within the region.

35. The Sponsor has persevered and remained committed to the project's development for much of the past decade. It has addressed and surmounted each of the regulatory and interconnection hurdles it has confronted while managing to secure a turbine supply agreement despite the global wind turbine supply-demand mismatch that existed over the past several years. The project has been unable to obtain debt financing for the construction of its wind farm, however with the hope of obtaining long-term debt financing the Sponsor has risked initiating construction in order not to risk violating its licensing and off-taker agreements. If the Sponsor is ultimately unable to obtain long-term financing for this project, it would prevent the reinvestment of its capital in the other renewable energy projects under development (including its wind power projects in Oaxaca once transmission capacity constraints are lifted). Such a failure would also send a strong negative market signal to other developers that may have the financial capacity to start development with equity capital but would not be willing to take the risk that they cannot ultimately find long-term debt financing. This is expected to impede the near-term development of other private autogeneration wind power projects in Oaxaca as other developers elect to wait out the financial crisis and further delay implementation of their projects. As noted previously, this could cost Mexico around 2.0 to 4.7 MtCO2e of foregone GHG abatement if the installation of 150 to 350 MW of additional wind power generation is delayed over a five-year period from 2010 to 2014.

Use of CTF funds within the project

36. Based on discussions with international commercial banks, it appears that the most significant lending constraint under current market conditions is risk aversion. This manifests itself in that only the safest, most creditworthy projects and sponsors in the strongest markets are receiving commercial bank funding (typically in the banks' home countries). Currently, available commercial bank financing is often at interest rates and tenors that make wind power project viability marginal and do not meet the long-term needs of wind projects.

37. As noted above, under current market conditions, the objectives of the IFC and IDB proposed CTF financing of the project are to: (i) structure a long-term project finance package that enhances the viability and long-term sustainability of the project; (ii) offset the relative high cost of obtaining long-term financing on commercial terms under current financial market conditions; and (iii) aim to attract potential commercial bank financing to the project. Under such a scenario, the CTF funding could be used to offset and mitigate some of the perceived risk of the project for commercial lenders. These objectives could be accomplished in a number of ways with the ultimate CTF structure for the project to be determined depending on the terms, conditions and features necessary to enhance the financing package and mitigate the risk of any commercial bank lenders that may consider financing for the project given the presence of such CTF support.

38. This project is among the first in the Oaxaca region to utilize multi-megawatt wind turbine technology in the unique wind regime in the region. As such, it will help to validate the operational results and establish a track record for such technology which will be valuable for commercial banks and other project lenders, other project developers and the Government to accelerate the scale-up of Mexico's private wind power development.

39. The Sponsor is in the process of completing the registration of the project under the CDM, in order to be eligible to receive Certified Emission Reductions (CERs). The company already received a non-objection letter from the Mexican *Comisión Intersecretarial de Cambio Climático* in May 2008, is currently finalizing the Project Design Document (PDD) and is preparing to have it reviewed and validated by an independent third-party firm. The Sponsor is targeting to have the validation process completed for registration with the CDM Executive Board by mid-year 2009. While the carbon revenue will help to support the future viability of the project, CER revenues have not been monetized to help offset up-front project development costs. The Sponsor expects to either acquire the CERs from the project to help meet its own EU compliance targets or to sell them through its global carbon trading operations. Given the uncertainties of the CDM market, lenders typically do not consider CER revenues when assessing project credit and making investment decisions unless CERs are committed for sale on a forward basis to a high creditworthy off-taker. Furthermore, the recent fall in carbon market prices has had a material impact on the level of future carbon revenue that the Sponsor can expect to receive from the project.

Terms of the CTF funds

40. If approved, the CTF funded tranche would be structured to meet the specific needs of the project and specifically to complement the project's senior debt financing by helping to achieve the long-term tenor and a blended cost needed to ensure the project's long-term financial viability and sustainability. The CTF tranche would reflect specific feedback from the senior lenders, including any commercial lenders that may be prepared to consider financing the project due to the risk mitigation and credit enhancement provided by CTF funding.

Risk for the CTF funds

41. Final agreement to provide funding for any project would be subject to: (i) a full due diligence by IFC and IDB, (ii) internal credit reviews by each institution which assesses Sponsor and project quality, and (iii) final Board approvals from each MDB. In addition, IFC mitigates real and perceived internal conflicts of interest and ensures the most effective use of donor funds by commissioning separate teams to manage the investment decision and structuring of an investment for its own account and investments with donor funds. All decisions regarding amount, structure, and terms of the CTF funds, in addition to CTF approvals, require the approval of an internal IFC investment review committee that is separate from the investment department's review committee. This internal IFC practice has been established to ensure that undue risks are not borne by donor funds and development objectives have a reasonable likelihood of success. The risk of loss is mitigated by the fact that the MDBs will not invest in a project that does not meet high credit and long-term sustainability standards, since failure of the project, at any level, would have an adverse impact on all financiers (including IFC and IDB) and would send negative market signals on the viability of private wind projects in Mexico.

Experience with donor funds in investment structures

42. IFC has a long history of using GEF funds in investment structures to test new market concepts and spur market development. While its total GEF portfolio exceeds $200 million, it should be noted that IFC has, through five transactions, applied approximately US$32 million of GEF funds under a variety of structures that have a higher risk than IFC's own-account financing to the same projects, and within this portfolio, only US$160,000 of the GEF funding has ever been lost.

FIT WITH INVESTMENT CRITERIA

Potential GHG Emissions Savings

43. The project is expected to offset approximately 0.9 MtCO2e over five years from 2010 to 2014.

44. Wind turbine technology is technically viable, commercially available, and is a zero emission electricity generation technology. As such the expected GHG mitigation potential is high.

Cost-Effectiveness

45. The cost effectiveness for the CTF funds in this project is estimated to be 0.9 MtCO2e abated per US$15 million CTF investment which is equivalent to approximately US$16.67 per tCO2e abated per CTF dollar invested.

46. As wind turbine technology is already a zero GHG technology, no further technological improvement is expected in this regard. However, as the sector reaches scale in the Oaxaca region, it is expected that locally-based component manufacturers, turbine assembly, as well as construction, operations and maintenance service providers will emerge and lead to lower costs for future private wind projects. If the Mexican wind power market reaches scale on a fast-track basis, this would result in a more rapid reduction in GHG emissions and the positive effects attributable to larger abatement of GHGs.

Demonstration Potential at Scale

47. The expected GHG emissions from the Mexican power sector under a business as usual case is estimated at approximately 850 MtCO2e for five years from 2010 to 2014. As noted above, the project is expected to result in a

reduction of an estimated 0.9 MtCO2e during this same time frame. Based on an estimated 150 to 350 MW of incremental private wind power projects that could be conservatively expected to be implemented over the same five year period, an additional estimated 2.0 to 4.7 MtCO2e would be abated over the five-year period from 2010 to 2014 (in addition to the GHG emissions abatement from the 143 MW of private autogeneration wind power projects that are currently installed and expected to be fully commissioned and operational during 2009).

Development Impact

48. The development of the project, as well as the scale-up of wind power in the Isthmus of Tehuantepec in the State of Oaxaca, is expected to promote sustainable economic development in one of Mexico's poorer regions. This is expected to be achieved in numerous ways:

(i) The project will provide an important monthly income source to the landowners on whose land the wind farm and the associated transmission interconnection facilities will be installed. The project company has entered into approximately 50 land-use right agreements to secure the land needed for the project. Under these land-use right agreements, the project company has already made payments. In addition, under the structure of the agreements with the individual and collective landowners, the company will make monthly payments following the start of operations of the project. Each of the landowners will continue to have access to and use of the land which can continue to be used for agricultural and ranching activities. Each of the other private sector wind power developers in the region has or will enter into similar land-use right arrangements for their respective project sites, further promoting the sustainable social and economic development of the region.

(ii) The project company is constructing a series of access roads and other infrastructure that is required for the construction, operation and maintenance of the facility, but which will also benefit the local communities. The project company has also indicated that, in partnership with local communities, it intends to implement a long-term community development program. In developing this plan the company is seeking the proactive assistance of the IFC and IDB in identifying, defining and implementing such activities following the construction and inauguration of the project. It is expected that the community development plan and IFC and IDB assistance will also incorporate a focus on specific initiatives linked to indigenous communities in the area.

(iii) The project is creating approximately 150 local jobs during construction under an initiative that the company has implemented to require its construction contractors and subcontractors to employ local community members for unskilled labor positions during the construction phase. This includes women construction workers. Selected construction equipment and materials such as gravel are also being sourced from the local community. Following its commissioning, the project is expected to directly employ approximately ten permanent full-time employees and generate a secondary economic multiplier effect on an ongoing basis during its operational life. With the scale-up of private wind power development in the region, additional local construction jobs would be created and the local community could be expected to attract and develop specialized local wind power operations and maintenance providers to support the industry.

(iv) The project is utilizing the local Port of Salina Cruz located on the Pacific coast of the State of Oaxaca, for the import of all towers, blades and turbine nacelles. The Port is currently primarily used by Mexico's Federal oil and gas company, *Petróleos Mexicanos* (Pemex), and the additional shipping volume and activity generated by the project is expected to boost its economic activity substantially during the project development. By comparison, to-date, all other wind power projects in the regions have instead used the Port of Veracruz, Mexico's most important seaport on the Gulf of Mexico, and have transported their imported turbine components more than 300 km to the respective project sites.

(v) Working with independent local ornithologists (including INECOL) IFC and IDB, with the project company's support, intend to coordinate with national authorities, GEF and other operators in defining cumulative avian impacts of existing and planned wind farms in the area. Through this effort, IFC and IDB also hope to indirectly support the Government of Mexico's GEF funded Strategic Environmental Assessment which is planned as a component of the "Large Scale Renewable Energy Development Project." This effort will contribute toward optimizing the planning and siting of future wind farm developments in the area.

(vi) The project and the scale-up of additional private sector wind power would also: (a) add to the country's energy security by increasing by about 30% Mexico's installed wind power generation capacity (including other projects currently in installation) and contributing approximately 290 GWh per year of clean, non fossil fuel dependent electricity generation; (b) demonstrate the viability of the private wind sector in Mexico through the first private Mexican wind power project under the autogeneration regulatory regime to obtain non-recourse project financing; (c) send a market signal to global wind power developers that the Mexican wind power market is viable and ready for scale-up, thereby helping to catalyze and accelerate development of the more than 8,000 MW of wind power potential in the State of Oaxaca; and (d) demonstrate to government officials who are defining new regulations, the terms under which private wind power can be viable and scalable.

Implementation Potential

49. See description above on Mexico's wind market for details on the market context and regulatory environment for wind power in Mexico. This project, along with other IDB and World Bank CTF related interventions is expected to help the Government define strong new regulations under the new Renewable Energy Law which took effect in November 2008.

50. The project is expected to mobilize US$60 million from IFC and IDB (US$30 million each) plus up to US$60 million from other sources including potential commercial banks, bilateral financiers, and/or export credit agency financing.

Additional Costs & Risk Premium

51. The CTF funds will be structured to help offset the high cost of being an early first-mover in Mexico's private wind power sector (including the increased development costs and fees imposed as a result of recurrent changes in regulations and requirements to obtain licenses, permits and transmission interconnection and grid access permits), and aim to help the project achieve long-term financial viability under current financial market conditions. It will also seek to address the specific obstacles identified by potential commercial bank financiers towards financing wind projects in Mexico at this time. In addition, the structure of the CTF funds will be tailored to achieve the necessary total tenor for the project and the level of subordination required by the senior lenders to the project. The CTF funding will be sized to offer the level of concessional financing that helps the project to remain financially viable when taking into consideration current commercial financing terms. The interest rate for the CTF funds will be set on a concessional basis in order to help offset the higher commercial market interest rates attributable to the financial crisis. As noted earlier, if the Sponsor is unable to appropriately leverage its equity in the project this can be expected to substantially reduce and retard the reinvestment of its capital in other renewable energy project under development in Mexico once transmission capacity constraints are lifted.

52. CTF financing will be complemented by IFC and IDB financing as well as potential financing from commercial bank financiers, bilaterals, export credit agency financing and revenues from sale or in-kind use of CERs.

Financial Sustainability

53. The project, along with other initial CTF direct interventions in the early stages of the scale-up of Mexico's private wind power market, is expected to promote sustainability by helping to establish a demonstrated track-record for the technical and financial viability of private sector wind projects, and thereby assisting to accelerate the development of the sector. Future project developers are expected to benefit from the development efforts, persistence and high costs encountered by the early movers in the sector, including the project company, which should ease the development and implementation process and lower the entry costs for future project developers. The lower risks which result from the establishment of such a track record, along with an improvement in the financial markets, will make Mexico's wind projects attractive on their own merits moving forward. Concessional funding was not needed to enable private sector autogeneration wind power projects under development in Mexico prior to the onset of the financial crisis, whereas the public sector and CFE's first two utility-scale wind projects (La Venta II turnkey & La Venta III IPP projects) have needed respectively, World Bank carbon finance mobilization and GEF grant funded concessional tariff support. It is expected that as commercial banks resume their lending practices and financial market loan pricing returns to pre-crisis levels, the private sector autogeneration projects will remain financially viable and commercially sustainable absent further CTF concessional finance support. Furthermore, as the sector reaches scale in the Oaxaca region, it is expected that the development of locally-based construction, operations and maintenance service providers as well as equipment suppliers will lead to lower project implementation costs for the private wind sector.

54. There are no institutional barriers preventing the commercial or technical viability of the project, however, the establishment of an attractive regulatory framework, which is part of the IDB's public sector work, has the potential to further scale-up and speed-up private sector participation in development of Mexico's wind sector.

Effective Utilization of Concessional Finance

55. As noted previously, CTF concessional finance in this specific project is being sought to help mitigate the impact that the financial crisis has had on expected commercial bank involvement in the project and to help secure a long-term financial plan that enhances the viability and sustainability of the project. The Sponsor is a global renewable energy developer with a strong global pipeline of wind, solar and other renewable energy projects. If the Sponsor is unable to secure an appropriate long-term project finance package to appropriately leverage its equity in the project, it could be expected to materially impair its future development activities and the timeframe over which additional clean, non fossil fuel dependent energy is commissioned with positive externalities including additional global GHG abatement.

56. The CTF funding will not only help to offset the high financing costs but also the other development costs incurred by the project company. As an early-mover in the sector the Sponsor was faced with higher regulatory and

transmission interconnection hurdles and costs than future entrants are expected to incur.

57. Furthermore, the successful implementation and commissioning of the project will demonstrate the commercial viability of private autogeneration wind power projects in Mexico and establish a track record in the near-term, thereby removing uncertainty and risks for commercial bank financiers of future private autogeneration wind power projects when the financial market rebounds following the crisis. The project will also help to develop a proven track record for the use of multi-megawatt turbine technology in the unique wind regime in the Isthmus of Tehauantepec in Oaxaca. This will provide important validation and feedback to commercial banks and future developers to reduce the risk profile and further promote the development of the private sector wind market.

58. The final structure of the proposed CTF tranche will be determined based on the specific needs of the project and the final senior debt package in order to complement the total project finance structure to help achieve the long-term tenor and blended interest rate cost needed to enhance the long-term viability and sustainability of the project. It will also seek to address any specific obstacles identified by potential commercial bank financiers involving wind project financing in Mexico at this time. The interest rate will be concessional to offset the higher commercial market interest rates attributable to the financial crisis. Final terms of the CTF funding will be subject to review and approval by an internal IFC investment review committee, which specifically assesses the use of donor funds within projects and is separate from IFC's normal investment review process. All projects will also be subject to Board approval per the CTF guidelines.

59. The project is also expected to generate approximately 0.5 million CERs through 2012 under the Kyoto Protocol's Clean Development Mechanism (CDM). However, the relatively low level of current carbon market prices has had a material impact on the expected future carbon revenues for the project. Assuming successful registration, validation and issuance of CERs, the company is anticipating carbon revenue of around US$7.1 million through 2012 based on current carbon prices and foreign exchange rates. This revenue will also be considered in the final structuring and terms of the CTF financing.

Mitigation of Market Distortions

60. This project would provide CTF funds to an individual project Sponsor; however, IFC and IDB have engaged in preliminary discussions and are open to consider working with all qualified private sector wind developers whose projects are close to project construction. IFC and IDB would use their CTF allocations, when necessary, to enable these projects to achieve debt financing and accelerate the scale-up of Mexico's wind power market. This CTF funds in this project will be sourced from IFC's allocation of CTF funding.

Risks

61. The main risks are:

Programmatic Risks:

(i) Approach to developing Mexico's wind market: There is a risk that despite the attractiveness of CTF incentives,

international commercial bank lenders remain too risk adverse or capital constrained to return to Mexico's wind sector in the immediate term. Should this happen, wind development is likely to stall until the financial crisis is over and the desired 500MW of additional wind power expected to be mobilized in the coming three to five years may not happen. IFC and IDB will aim to mitigate this risk by structuring CTF financing to specifically address the barriers preventing commercial bank lenders from entering the market;

(ii) Regulatory regime: There is a risk that the revisions to Mexico's Renewable Energy Law and modifications to sector regulations, including the autogeneration framework and CFE's future tariff regime, may make the internal rate of return of autogeneration wind power investments unattractive for private investors. The World Bank and IDB's CTF interventions aim to address this risk by working with the Government to design the regulations and by providing a feedback loop for project level information to be obtained by the Government, regulators and other sector participants;

Project Risks:

(iii) Turbine technology risk: There is a risk associated with using even modern and sophisticated wind turbine technology in the unique wind regime in the Isthmus of Tehuantepec in the State of Oaxaca which could produce increased wear and tear on the turbines, potentially leading to a shortened life span for certain wind turbine key components and increased major maintenance costs over the life of the project. To help mitigate this risk, IFC and IDB are exploring enhanced condition monitoring programs with the Sponsor in order to develop an appropriate preventative maintenance program for the project to ensure optimum performance of the technology over the full operational life of the project. These mitigation measures are being developed based on state of the art knowledge of preventative maintenance and wind farm operations and maintenance practices and are likely to include considerations such as appropriate spare part inventories and major maintenance reserves required for the project; and

(iv) Environmental and social impacts: The key environmental and social risks associated with the project include: (a) cumulative avian impacts; (b) land-use change; (c) economic impacts and benefits; and (d) indigenous peoples. The company has prepared an independent avian impact report which includes a collision risk assessment for key species. IFC and IDB will review this report and other avian assessment and monitoring data available from CFE and other wind farm operators and request the company to demonstrate that incremental avian impacts of the project are within acceptable ranges. Based on this assessment work and the requirements of the Government, the project company is expected to develop an integrated monitoring and wind farm management system to ensure potential avian impacts remain within acceptable ranges. With regard to community and socio-economic issues IFC's and IDB's review will encompass a detailed understanding and documentation of the consultations completed to date with individual and collective community members of the potentially affected "ejidos" and the consequent land-use right agreements and compensation arrangements that have been established. Based on this review, additional consultation and engagement with communities may be required to ensure all land lease/purchase arrangements have incorporated the views of all affected people in a transparent manner. The company's intention to establish a strong community development program will assist in addressing benefits to local communities, and working with IFC and IDB, particular attention will be paid to addressing the needs of indigenous groups affected by the project.

April 25, 2009

Review of CTF private sector proposal: Mexico Private Sector Wind Development

1. This review of the CTF private sector proposal for Mexico Private Sector Wind Development evaluates the usefulness of a CTF intervention, primarily with a view to overcoming the financing obstacles posed by the present international financial crisis.

2. The review does not deal with an evaluation of the details of the particular underlying wind farm autogeneration project as such, but focuses on the potential wider benefits of the proposal.

3. Based in this review, I support the CTF proposal. It appears likely to be essential to restoring momentum to private sector wind development in Mexico, and it may yield important external benefits to other projects in the area as well as at a more global scale.

4. With some of the best wind resources in the world, the region of Tehuantepec in the state of Oaxaca, Mexico is in many ways a uniquely promising area for large-scale wind energy development in Latin America. Only a few locations around the world (e.g. Egypt) have such large, contiguous high-wind areas in relative proximity to load centers in the electrical grid. Building up and maintaining a momentum for commercial wind power generation in these regions seems particularly important in order to achieve a demonstration effect to gather more interest from the wind industry and the financial sector in developing large-scale competitively priced wind energy in developing countries with a good wind resources.

5. The main qualities of this proposal are the following:

(a) The primary value of this proposal is overcoming the financing obstacles for renewable energy posed by the present financial crisis.

(b) In addition, this CTF private sector proposal as part of a programmatic approach undertaken in cooperation with IDB has special merit in focusing on overcoming "first-mover disadvantages", particularly in relation to

(i) Overcoming institutional / regulatory barriers to market entry, i.e. establishing a regulatory framework and practical procedures, which can ultimately benefit future developers and

(ii) Overcoming the problems associated with the "lumpiness" of large electrical transmission infrastructure projects.

6. The catalyst function of CTF can prove to be decisive in overcoming these barriers. It is commendable that the project in general will attempt to promote local capacity building and well as the

development of local employment. In addition, the project seems well focused on ensuring external benefits to further commercial wind development in this excellent area in terms of wind resources. In this context it is very valuable that the project will support the collection of experience (monitoring and evaluation) of autogeneration wind projects in the area through the cooperation of

CERTE and AMDEE.

Soren Krohn

Wind Energy Consultant

3601 Connecticut Avenue NW # 509

Washington, DC 20008