

Project Name Colombia-Jepirachi Carbon Off (@)...  
Set Project

Region Latin America and Caribbean Region

Sector Renewable energy (90%); Water supply (10%)

Project ID P074426

## Implementing Agency

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Environment Category B

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## 1. Country and Sector Background

2.1 Main Sector Issues Increased reliance on thermal-based generation capacity. After severe droughts, registered during the 1990s (i.e. 1992, 1997), that caused power shortages with associated forced rationing, the Country's power system has encouraged the development of more thermal generation capacity, specifically with the intention of increasing the share of firm capacity and enhancing the system's reliability of supply. The increase in thermal share of the sector has also been the indirect result of the withdrawal of the public sector in investments and the reluctance of private generators to enter the hydro electric generation with the associated environmental and social requirements. Therefore, future additions to the power mix to attend the projected growth in demand are anticipated to be thermal-based. While this responds to the need for flexibility and robustness of the system, the increase in thermal share contributes to the gradual increase of GHG emissions by the sector and the release of local criteria pollutants (such as NOx and, SOx particulates and volatile hydrocarbons, which have been linked to health of exposed populations). Lack of incentives to sustain a solid reserve margin. In the period 1993-1996 hydrologic conditions (i.e. wet years) allowed the base-load dispatching of hydroelectric plants with utilization as high as

50% Under these circumstances, thermal power plants were not necessarily dispatched. During dry seasons thermal power plants are then called to fulfill the demand. In highly critical events however, thermal power generators cannot supply 100% of the demand since there are no economic incentives to sustain a solid reserve margin (i.e. as in the majority of liberalized power systems around the world). High losses in the transmission and distribution system. Losses in the national transmission system represent approximately 1.8% of the total demand. Losses in the distribution systems are 18% on average and for the non-interconnected zones they approach 40%. However, in efforts to promote efficiency in distribution, the CREG does not recognize losses above 20%. This limit should decrease to 13% by 2003. Losses in the transmission system are exacerbated by the destruction of towers caused by guerrilla attacks. Lack of definition for treatment of renewable generation capacity. Wind parks are not specifically referred to in the current regulations. Any generation unit with an installed capacity of 20 MW or more are obliged to participate in the spot market on an equal footing with thermal and hydroelectric plants. If the capacity is less than 20 MW, however, the park qualifies as a "minor plant" (CREG Resolution No. 086 of 1996). A "minor plant" with a generating capacity of at least 10 MW has the right to participate in the pool and benefit from pool services under a preferential dispatching option (e.g. spinning reserve). In essence, small plants can access the electricity market by selling all their available output at the wholesale market price ("precio de bolsa"), which includes a "capacity payment" component (as a floor price for the bids), and are exempt from penalties on non-delivery of electricity. Precise rules for wind generation capacity when it exceeds the 20 MW limit are required to ensure that investments internalize the environmental and strategic benefits of renewable capacity in the country. For the project, it is anticipated that EEPPM will use preferential dispatching. Impacts of Climate Change on the endowment base for generation capacity. Colombia has ratified both the United Nations Framework Convention on Climate (UNFCCC) and the Kyoto Protocol. Recently, has completed its first communication to the , including an assessment of the anticipated impacts of climate change and its vulnerabilities to these impacts. The communication concludes, in the context of expected changes with potential impact for the energy sector, that a significant fraction of the territory will be affected by variations in the hydrological system and rainfall patterns. In particular, there is a likelihood of an increase in the rate of desertification in high mountain ecosystems (source of many of the head waters of the largest rivers of the nation). The process will be caused by reductions in rainfall patterns, higher rates of evapo-transpiration and the consequent drying of these ecosystems. The impact over the overall hydro generation capacity has yet to be estimated but is likely to reduce the flow of rivers fed by headwaters located in the Andes, in particular over the Western range of the Andes. The character of the Paramo ecosystem is also likely to be affected and the communication forecasts a 75-85% in the reduction of the area of Paramo. This change is of grave significance because of the role the Paramo plays in water regulation and storage in the Andes. 2.2 Government Strategy National Development Plan The National Development Plan of Colombia (PND), developed under the previous administration, proposes two strategies for the development of the national energy infrastructure: a) attract foreign direct investment and increase private participation, and b) strengthen the institutional structure for the planning, control and design of sectoral regulatory

frameworks. In particular, the PND emphasizes the importance of promoting sustainable development and internalizing key environmental and social variables into the design and implementation of sector public policies. As part of the national environmental policy, the PND promotes two priority programs: 1) "Clean Production" to promote the diffusion of new cleaner technologies and 2) "Green Markets" to enhance participation in markets that promote sustainable development (e.g. market based instruments, carbon market). With respect to international treaties, the PND establishes that the Colombian environmental action is aimed at consolidating alliances with other nations to promote sustainable development through cost-effective actions at the municipal, sub-national and regional levels.

**National Energy Plan** The National Energy Plan (PEN), was drafted in 1994 and updated in 1997. For the particular case of the electricity sector, the national strategy as stated by the PEN has focused on the following actions:

- Apply incentives to attract private investment
- Diversify sources of energy production
- Consolidate and develop the 500 kV national transmission network
- Reduce transmission restrictions and losses
- Improve the mechanisms and actions of the wholesale electricity market
- Develop flexible contracting mechanisms with regards to coal and natural gas supply
- Develop "futures market" and design new financing instruments for wholesale market activities
- Restructure institutional and financial structure of distribution companies

**National Electricity Sector Expansion Plan** The Colombian Energy and Mining Planning Unit (UPME) is in charge of designing the National Electricity Sector Expansion Plan which is a reference or indicative plan based on the criteria established in both the PND and the PEN. The national strategic elements related to the electricity sector are summarized below:

- Attend the electricity demand with a reliability higher than 95% in the long term
- Enhance the availability of firm capacity through the addition of thermal based capacity
- Improve system's efficiency through the installation of clean efficient technology
- Diversify the sources of electricity generation in the system

**Government's Policy on Climate Change.** Colombia is a party to the Framework Convention on Climate Change and has also signed and ratified the Kyoto Protocol (Law 629 enacted November 30, 2001). Colombia has been a leading participant in the discussions on the provisions and regulations of the Clean Development Mechanism in the context of the international negotiations under the auspices of the UNFCCC and has developed a detailed negotiations agenda on items leading to the definition of the rules for the CDM. As part of these activities, the Government has made a national assessment for the optimal use of the CDM (which was published in 2000). This assessment was undertaken by the Ministry of Environment in collaboration with other agencies in the energy, agriculture, industrial and forestry sectors. This study evaluated the country's potential for participation in CDM and the international carbon market, identified restrictions that could limit the development of CDM projects, and developed strategic lines to overcome these restrictions and maximize benefits for the country. Under the assessment, the Government has identified a portfolio of possible projects for submission to the CDM, which includes the proposed JPC. The Government has likewise taken steps leading to the further development of institutional capacity through among other actions: a) the organization of an inter-institutional committee under the aegis of the Vice-president's office to ensure full coordination on climate change issues; and b) the set up of a climate change office. On the basis of the studies sponsored as part of the National Strategic Studies (NSS), other inputs and the development of institutional capacity, the Government is in

the process of defining the main trusts of a National Climate Change Plan that considers the following goals: Strengthen the capacity to adapt to the anticipated impacts from climate change; Promote of reduction of emissions and increase in the sequestration capacity for greenhouse gases; Minimize the adverse impacts on the nation's exports of fossil fuels; Promote scientific capacity and the availability of information on the impacts of climate change on the nation's economy and ecosystems; Support awareness and dissemination of information, and Promote financial mechanisms for the adoption and funding of response actions. The plan, which is already drafted identifies and outlines the different benefits that could be gained through the CDM (Colombia as non-annex I party to the KP cannot participate in the other flexible mechanisms) and explicitly acknowledges the role that Carbon finance could play in promoting the goals of sustainable development in the country. The program proposed will be part of the goals, of the new administration, on climate change.

## 2. Objectives

The objective of the Jepirachi Carbon Offset Project (JCP or Jepirachi Project) is to reduce the greenhouse gas (GHG) emissions of the power sector in Colombia through the promotion of a 19.5 MW wind-based electricity generation facility. The project is expected to displace an estimated 1.168 million metric tons of carbon dioxide equivalent (mtCO<sub>2e</sub>) over a period of 21 years and will also support a social program that will contribute to improvements in the welfare of the local indigenous community. The JCP, will contribute to the development of the international carbon market in Colombia through the supply of Emission Reductions (ERs), developed under the Clean Development Mechanism (CDM) as set forth under Article 12 of the Kyoto Protocol. By linking the global issue with local development concerns the project truly reflects the spirit of the CDM. The ERs are classified as high quality because of the reliability of the project and the social additionality represented by the social plan for the indigenous people.

## 3. Rationale for Bank's Involvement

The PCF is a new product of the World Bank that aims to demonstrate how market-based emissions transactions can mitigate global climate change and pioneer emission reduction purchase transactions. The Bank's involvement helps to ensure quality of the first carbon projects, as well as institutionalizing experiences and ensuring replicability of the projects, while providing necessary project due diligence and other fiduciary responsibilities. The value-added of Bank support also includes the availability of in-house environmental economics and natural resources management expertise, ability to mobilize global experts with long experience in the field, technical support for project preparation, supervision capacity, and development of linkages with other sources of expertise and funding. Finally, the Bank brings to the proposed project the ability to serve as a catalyst for promoting environmental services throughout Latin America as well as knowledge of climate change mitigation programs both regionally and worldwide. Finally, Bank involvement links together the experience and lessons of its sector work (NSS), institutional development (support to the OCC) and the project. All this work comes together in the JCP as the result of the work done at the sector and institutional level.

## 4. Description

The project will support the development of a wind generation facility that is expected to generate about 68 Gwh/year during the next 21 years, in the process displacing at least 1.168 mtCO2e. The project includes a participatory program of institutional and community strengthening (social program). The social program is designed to benefit the indigenous population in the area of the project, effectively linking the global aspects with local development issues.

a) Development of Wind Energy Facility. The wind energy facility will have a nominal power capacity of 19.5 MW to be supplied by a series of aerogenerators to be linked to the national interconnected grid. The number and characteristics of the aerogenerators will depend on a bidding process to be finalized at the end of October 2002. The facility will deliver its energy under a preferential dispatching scheme. A grid connection to the site with a length of 8 km will also be installed. The facility is expected to start operations at the end of July 2003. The PCF will purchase the emission reductions caused by the operation of the JCP.

b) Social Program. The social program will include activities already defined in consultation with the local Wayúu community and will be put in place over the course of the first two years of construction and operation of the project. The program will not be restricted to the activities already outlined but will also establish the basis and provide the support for the development of additional community development activities to be implemented during the duration of the project, on a sustainable basis, focusing in the areas of health, education, economic and institutional development (see Social Program table ). The PCF will pay a premium on the value of the emission reductions based on the outputs of the social program.

Social Program Activity	Outputs	Impact
Water Desalination Design and construction of a water desalinization unit	The unit will be located in the neighborhood of the wind facility. Facility will be powered by wind-energy	Substantial increase in access to potable water
Volume Treated:	2 to 4 cubic meters per hour	Water Quality: Potable
Direct impact on health of local population	Water Storage	Construction of two water storage facilities (Juagueys) and rehabilitation of two existing facilities
Substantial increase in access to water	School rehabilitation	Expanded school facilities. Provision of equipment and refurbishing of school dorms
Direct impact on access to education	Health Center rehabilitation	Provision of equipment and facilities to the health center. Equipment will include solar-powered refrigeration.
Direct impact on access to health services	Rehabilitation of graveyard	Fencing and up-keeping of graveyard
Religious and cultural priority	Institutional Strengthening	To be defined as part of additional discussions with the Wayúu during the first two years of operation of the project.
Sustainability of social program	Additional community development projects	To be defined as part of additional discussions with the Wayúu during the first two years of operation of the project
Sustainability of social program and improvement of standards of living	Implementation Schedule	Location of the Project
The project will be located in Wayúu Indian Territory in the Northeastern region of the Atlantic Colombian coast, in the area between Cabo de la Vela and Puerto Bolivar, within the municipality of Uribia in the Department of La Guajira.	Project Costs and Funding Sources	Project Costs and Funding Sources
Component	Indicative Costs (US\$M)	EEPPM (US\$M)
Value of total ERs (US\$M)	A. Wind Facility	20.22
	B. Social Program	0.80
	Total	21.02

## 5. Financing

Total ( US\$m)  
BORROWER \$21.00  
IBRD  
IDA  
PROTOTYPE CARBON FUND \$0.00  
Total Project Cost \$21.00

## 6. Implementation

Prototype Carbon Fund (PCF) For purposes of the project, EEPPM will work in close coordination with the PCF, which was established for the purposes of (i) demonstrating how project-based transactions in greenhouse gas emission reductions can contribute to the sustainable development of developing countries and economies in transition; (ii) sharing the knowledge gained in the course of such transactions with all interested parties; and (iii) demonstrating how the World Bank can work in partnership with the public and private sectors to mobilize new resources for its member countries while addressing global environmental concerns. PCF enters into an Emissions Reduction Purchase Agreement (ERPA) and agrees on the accompanying Monitoring Plan (MP) with project sponsors, defining the quantity, price and other delivery conditions of ERs to be purchased by PCF, as well as accompanying institutional arrangements, including the monitoring and verification systems and methods. To increase the likelihood that the ERs will be recognized by the Parties to the UNFCCC, independent experts provide baseline validation and verification/certification procedures for ER that respond to UNFCCC rules as they develop. The ER estimates are based on the findings of a baseline study, validated by independent experts. The baseline study also certifies project's environmental additionality, as the Kyoto Protocol requires that reductions in emissions are additional to any that would occur in the absence of the certified project activity. In other words, the project is additional if the scenario with project generates fewer greenhouse gas emission than the baseline scenario. Both the Baseline Study and the Monitoring and Verification Protocol are available in the project files. Following each verification, the PCF will require that an independent third party contracted to perform the verification, issue a Verification and Certification Report that includes: (i) a statement of the amount of verified and certified ERs the subproject has generated in the relevant period, (ii) such other matters as may be required by the UNFCCC or Kyoto Protocol; (iii) verification of compliance with Bank Safeguard Policies, and (iv) compliance with the planned social program. The Jepirachi Project will be guided by annual reviews during the construction phase of Project, during which supervision missions would identify specific measures to: (i) address areas of implementation weaknesses, especially concerning the implementation of the Environmental Management Plans and social mitigation measures; (ii) accommodate changes in priorities; and (iii) ensure compliance with relevant policies and procedures. PCF involvement expires after emission credits for 800,000 mtCO<sub>2</sub>e are validated. The Jepirachi Project will be carried out by Empresas Públicas de Medellín (EEPPM). Apart from the PCF support, the project does not include any World Bank or IFC financing. MMA, UPME and CND. The principal Colombian institutions involved in the project include: (i) Ministry of Environment (MMA) and its Office of Climate Change (OCC); (ii) Energy and Mines Planning Unit (UPME), (iii) National Dispatch Commission (CND) (iv) Department of Indigenous Communities Affairs from the Ministry of Interior, and (v) Empresas Públicas de Medellín (EEPPM),

the project sponsor. Government institutions are described below: Ministerio de Medio Ambiente (MMA) and its Office of Climate Change. The Minister of Environment serves as the Designated National Authority for the CDM and therefore is the recipient of the sovereign credits created under the CDM. The MMA was the recipient of the NSS studies and has an interest in the development and promotion of a solid portfolio of projects for the Clean Development Mechanism. In particular, the MMA has created its Office of Climate Change (OCC) to deal with all aspects related to the Kyoto Protocol and its mechanisms and through it provides general assistance to sponsors submitting projects for carbon finance. The Ministry of Environment is in charge of issuing environmental, right of way and land use licenses (global license) on the basis of EEPPM's Environmental Impact Assessment. Energy and Mines Planning Unit (UPME). The UPME establishes the energy requirements of the different private and public economic agents operating in the nation considering demand projections based on most probable economic and demographic prospective. In addition, the UPME develops the National Energy Plan or Sector Strategy in consistency with the National Development Plan and has assisted in the modeling of the sector for purposes of establishing the baseline (or business as usual) GHG emissions. Centro Nacional de Despacho (CND). The National Dispatch Center (CND) is in charge of the planning, supervision and control of the integrated operation of generation, transmission and distribution that conform the national interconnected system. The CND also supervises and provides with instructions to the Regional Dispatch Centers (CRDs) in order to ensure system's coordination and reliability as established by the Operating Manual (Código de Operación) and considering the agreements reached the National Operating Council (CNO). ERPA The ERPA defines the minimum amount of ERs in metric tons of carbon dioxide equivalent that the JCP will deliver to the PCF. Generation and delivery of the ERs shall be carried out in accordance the ERPA and be completed on or prior to a date agreed upon between the PCF and the JCP. The PCF's total purchase of ERs from the JCP will not exceed US\$ 3.2 million. This total will include project preparation expenses such as those related to baseline assessment, validation, monitoring, verification and certification. At the time of the signing the ERPA, an anticipated schedule of payments based on the delivery of ERs will be prepared. The project sponsor shall make requests for payment to the PCF pursuant to the ERPA. The first payment from the PCF to the JCP will be agreed to in the ERPA and will occur upon declaration by the PCF that relevant conditions have been met. Thereafter, the PCF will only pay the JCP upon delivery of ERs. Direct Financial and Reporting Flow

## 7. Sustainability

The JCP has the technical, organizational and financial characteristics of a sustainable project. The financial strength and commitment of the sponsor provide assurances for the sustainability of the project. The social plan and the consultation process engages the local indigenous population and provides assurances of their support. The nature of the technology selected and its relatively low maintenance guarantee continuous operation for extended periods of time. The technical and economic feasibility studies, the environmental impact assessment, the financial analysis, and the baseline assessment have provided the necessary information to confirm the sustainability of the JCP.

#### 8. Lessons learned from past operations in the country/sector

The project has benefited from the emerging experience built in other PCF projects that are being conducted in different Latin American nations (e.g. Chacabuquito in Chile, Umbrella Project for Renewable Energy Sources in Costa Rica). In particular, on the basis of these experiences, the project emphasizes the local development linkages and seeks to ensure a strong partnership with the local population which have been found essential for long-term sustainability in similar operations.

#### 9. Environment Aspects (including any public consultation)

Issues : EEPPM carried out an EIA including the physical, biological, socioeconomic and cultural components. Local communities were consulted throughout the EIA process. In general terms, the EIA concluded that expected environmental impacts identified will be of medium, low or very low magnitude. A description of the impacts and the mitigation measures is included in Annex 6 of the PAD. The negative impacts however will be carefully mitigated or minimized through the programs and strategies established in the social management plan designed by EEPPM. Environmental Management Plan (EMP). The EMP includes programs to avoid, control, mitigate or compensate the negative impacts as well as to enhance the positive impacts during both construction and operation phases. The structure of the EMP for the physical and biological management impacts is shown in the following figure aimed at mitigating the identified potential impacts during both construction and implementation phases. The EMP adequately addresses all the impacts of the project. Consultation Process. The EIA was conducted under the requirements established in the Decree 1320 of 1998 relative to ethnic minorities and Agreement 169 of 1989 of the International Labor Organization (ILO) that calls for mandatory consultation processes and the participation of indigenous communities during the development of environmental assessments. EEPPM developed an extensive consultation process during the period 1999-2002. This consultation process included national, regional and local governmental institutions concerned with indigenous peoples, and traditional authorities and communities of Rancherías Kasiwolin, Arutkajui and Media Luna. The first consultation regarded the installation of the wind monitoring devices in 1999. The consultation process continued during all the phases of the EIA. The methodology and scope of the EIA was consulted as well as the identification of the impacts and the measures to manage them. EEPPM carried out a total of 23 formal consultation meetings with communities and several meetings with governmental institutions. All the consultation meetings with the communities were carried out with translators. The consultation process finalized in June 2002 with an agreement on the Environmental Management Plan, which includes the physical, biological, socioeconomic, and cultural programs described above. The Ministry of Interior, Department of Indigenous Communities Affairs, supervised the consultation process. Monitoring Plan. The Monitoring Plan establishes the procedures for the measurement, monitoring and follow up of all aspects included in the EMP and its programs. This plan is also aimed at analyzing and verifying the results derived from the implementation of the EMP's strategies and programs to ensure consistency and good practices and apply the corrective actions or adjustments as necessary.

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Note: This is information on an evolving project. Certain components may not be necessarily included in the final project.

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