


INTER-AMERICAN DEVELOPMENT BANK

# MEMORANDUM

File Classification: INE/ENE/CO-T1059  
INE/322/2007

DATE: November 7, 2007

TO: Ms. Alicia S. Ritchie, General Manager CAN  
Mr. Roberto Vellutini, Manager INE


FROM: Leandro F. Alves   
Chief, INE/ENE

SUBJECT: COLOMBIA – CO-T1059. Expanding Innovation, Science and Technology in Bioenergy in Colombia. Technical Cooperation Project Profile.

Please find attached the Project Profile for the Technical Cooperation of the reference for your approval.

Christiaan Gischler, Team Leader (INE/ENE) [[ChristiaanG@iadb.org](mailto:ChristiaanG@iadb.org); xt. 3411] is available to answer any questions in reference to this operation.

Attachments:  
TC Project Profile  
Request Letter

Vo. Bo.   
Rodrigo Parot, CAN/CCO

cc: Rodrigo Parot (CAN/CCO)  
Marguerite S. Berger (VPC/GCM)  
Hyunghwan Joo (VPC/GCM)  
Juan Pablo Bonilla (INE/INE)  
Team Members

**INTER-AMERICAN DEVELOPMENT BANK**  
**TECHNICAL COOPERATION PROGRAM**  
**KNOWLEDGE PARTNERSHIP KOREA FUND FOR TECHNOLOGY AND INNOVATION**

**TC N°: CO-T1059**

**I. GENERAL INTRODUCTION**

- 1. Project name:** Expanding Innovation, Science and Technology in Bioenergy in Colombia.
- 2. Name of the Trust Fund:** Knowledge Partnership Korea Fund for Technology and Innovation (KFT) and the Sustainable Energy and Climate Change Initiative (SECCI)
- 3. Country team:** Team Leader: Christiaan Gischler (INE/ENE); Margaret Walsh (INE/ENE); Fernando Balcazar (RND/CCO); Jose Ramon Gomez (INE/ENE); Maria Jose Baptista (LEG/SGO) and Liliana Lopez (Project Assistant).
- 4. Executing agency:** Institute for the Development of Science and Technology- Francisco José de Caldas - (COLCIENCIAS, acronym in Spanish)
- 5. Beneficiary Institutions and Country:** COLCIENCIAS, the Ministry of Agriculture, and the Ministry of Mines and Energy of the Republic of Colombia
- 6. Financing plan:**
- |                                 |      |           |
|---------------------------------|------|-----------|
| IDB-KFT                         | US\$ | 500,000   |
| IDB-SECCI                       | US\$ | 330,000   |
| Local counterpart- COLCIENCIAS: | US\$ | 350,000   |
| Total:                          | US\$ | 1,180,000 |
- 7. Execution Period** 18 months
- 8. Disbursement period** 24 months

**II. BACKGROUND AND PROBLEM STATEMENT**

- 2.1 The Sustainable Energy and Climate Change Initiative (SECCI) launched by the Bank in March 2007 and the willingness to prepare a Rational and Efficient Use of Energy Program (PROURE, acronym in Spanish) by the Government of Colombia (GoC) are clear examples of the region's recent trends in searching means to achieve sustainable energy and reinforce the world's commitment to reduce green house gases and local pollution
- 2.2 The world production of bioenergy, and biofuels in particular, has been growing steadily over the past five (5) years. Production of bioenergy is projected to reach a level equivalent to 70 billion liters by 2010, a level of production approximately double the level reached in 2005. Driving forces behind the projected increase in production include high oil prices, a desire to diversify the energy matrix, energy security, and environmental concerns accompanied by a push to reduce carbon emissions.

- 2.3 Colombia is the second largest biofuel producer in Latin America after Brazil. Nevertheless, there exists an important technological gap that needs to be closed in order for Colombia to transform itself from a biofuel producer to a world bioenergy leader. The Government of Colombia (GoC) is aware of the tremendous potential of the country as a leader in biofuels: Colombia has more than 7 million hectares of land available for the cultivation of crops that may be used as feedstock for biofuel. In many instances, the available land is being used for illicit crop production and/or as a base of guerilla activity. The introduction of crops to be used as a basis for the production of biofuels would serve the dual purposes of permitting the GoC to decrease the production of illicit crops and to introduce an economically viable alternative for small agricultural entrepreneurs in rural areas. According to the GoC, cultivation of this land would result neither in deforestation nor the displacement of crops used for human or animal consumption. Nevertheless, the GoC and the Bank will work in concert to ensure that measures will be taken to avoid any adverse environmental or social impacts.
- 2.4 To realize its potential as an international leader in bioenergy, both the public and private sectors of Colombia require technical assistance. The Bank is actively working with the GoC through: (i) the provision of technical assistance related to support for the development of project proposals; (ii) financing strategies for investments in biofuels; and (iii) the development of national strategies for both sustainable energy and biofuels. In addition, the Ministry of Mines and Energy of Colombia (MME) has requested the Bank's support to develop a Rational and Efficient Use of Energy Program (PROURE, acronym in Spanish) that addresses sustainable energy, energy efficiency and biofuels (ethanol and biodiesel). The PROURE is a short-term, straightforward activity that is to be prepared within three months and financed with administrative funds.
- 2.5 The preparation of the PROURE will provide the foundation for a detailed long-term plan, the "Sustainable and Renewable Energy Strategy for Colombia (SREC)". The SREC is expected to be partnered with other initiatives such as a pilot program for efficient use of energy, a biofuel market study, a life cycle assessment of the production chain of biofuels, institutional strengthening of the GoC biofuel office and a workshop to present findings and conclusions. The GoC, through COLCIENCIAS, wants to support the innovation, research and development (R&D) of biofuels so as to create high quality know-how and a critical mass of scientific and technical capacity in the country. This effort would be focused upon areas in which the medium and long-term horizon for return on investment render it of a lower priority to the private sector.
- 2.6 The government of Colombia has appointed the National Coordinator for the Sustainable Development of Biofuels (NCB) to prepare the Colombian Council for Economic and Social Policies (CONPES) for biofuels. This report, in which R&D is considered one of the main pillars, will be submitted by the end of this year or the beginning of 2008 .
- 2.7 The GoC is fully engaged in its goal to become one of the biofuel leaders in the world. Towards this end, the GoC has approved blending mandates for ethanol, E10 (10% ethanol with 90% gasoline) and biodiesel and B5 (5% biodiesel and 95% diesel) for the main cities (Bogota, Medellin, Cali Bucaramanga, Cartagena) before 2008. The remainder of the country would follow this example. Although the referenced mandate has created an important local market for biofuels, the domestic demand has not yet been satisfied by with local production. More land will need to be cultivated and more processing plant will have to erected so as to achieve self-sustainability of bioenergy. Moreover, a complete analysis of the impacts (positive and negative) of this initiative as

well as the logistics, human resources, research and development requirements are yet to be determined.

- 2.8 The biofuel industry can produce important by-products or positive externalities such as: power (cogeneration with sugarcane bagasse), carbon credits (for fuel substitution, wastewater treatment and vinasse treatment), animal food (residues from soybean, sugar beat or yucca process), employment in rural areas and the creation of new opportunities to the regions that are currently beset by illicit crop production and guerilla activity. The realization of these positive externalities requires extensive R&D and technical analysis to chart the way forward for GoC. Technical assistance is required by the GoC so as to undertake the scientific research and analysis needed to advance from being a producer of biofuels to an international leader in bioenergy. This technical assistance will benefit the GoC, private sector companies, and individual entrepreneurs.

### **III. JUSTIFICATION**

- 3.1 The promotion of renewable energy, particularly biofuels, is one of the priorities of the GoC as set forth in the 2006-2010 National Development Plan. High energy prices, diversification of the energy matrix, energy security, reduction of greenhouse gases, a well established sugarcane and palm oil industry, availability of land and a huge potential to create employment in rural areas, are included among the driving forces to promote biofuels in Colombia.
- 3.2 With the recent announcements of 20% substitution of gasoline in the next 20 years in the US, and the Free Trade Agreement currently being discussed in the Congress of both Colombia and the US, new opportunities for the duty free export of biofuels from Colombia to the US may arise. These opportunities will be accompanied by major challenges for Colombia, therefore the country needs to prepare itself for these opportunities now. One of the areas in which Colombia needs to dedicate resources is the development of a competitive cadre of highly qualified researchers as well as modern, fully equipped laboratories. Colombia also needs to define and develop appropriate quality control standards and strong partnerships between universities and industries to promote applied scientific research in the biofuel production chain.
- 3.3 The importance of the bioenergy industry to Colombia is of such magnitude that a long-term strategy must be adopted so as to develop a continuum of measures that will enable Colombia to attain its goal of becoming an international bioenergy leader. Implementation of such a strategy will require investments in activities that yield tangible benefits only over the medium and long-term horizons as well as measures that have impacts in the short-term.
- 3.4 Colombia has identified challenges that it will face in its quest to become a leader in bioenergy as well as specific areas in which it needs to focus its attention. Among the areas identified as being along the critical path for the development of the industry are the following: (i) soil studies, assessment of land uses, and analysis of the impact of land use for biofuel production; (ii) the strengthening of the local engineering capacities to produce Colombian processing equipment for biofuel production; (iii) assessment of the logistics associated with biofuel production such as transportation from the remote areas of production to the urban centers and required investments in the logistics chain; (iv) analysis of the feasibility of alternative uses of the biofuels, such as energy generation for

remote regions; (v) studies and policies on the effects on the environment and the climatic change; (vi) analysis of the impact on the development of the industry on the water resources; (vi) required reforestation and conservation measures; (viii) reorientation of land use and impacts on biodiversity, rural employment and migration to/from urban centers; and (ix) the impact of the production of biofuels on the prices of commodities.

- 3.5 This technical cooperation will provide assistance to the GoC and will address the main market imperfections that discourage private sector investments in biofuels technology. Today in Colombia there are no incentives to create partnerships or joint ventures between private developers and universities or research centers. Additionally, there are no effective means to protect knowledge in relation to new technologies for biofuels. Finally, this TC will serve to capture positive externalities such as reduction of carbon emission due to improvement in energy efficiency in biofuel factories, methane recovery in biofuel wastewater treatment plants, price impact on other commodities due to the production of biofuels and power generation with sugar cane residue replacing fossil fuel power generation.
- 3.6 **Bank Strategy and Related Projects.** This TC is consistent with *Science and Technology for Development: an IDB Strategy* (2001) as it: i) focuses on areas that addresses current market failures; ii) supports the GoC in reducing the technological gap to achieve a competitive bioenergy industry and the commitment of the Colombian government to become a world biofuel leader; iii) acts as catalyst for sustainable development of the bioenergy sector; iv) will provide an important value added to the region, as Colombia will be able to transfer their technology to other countries in the region and; v) the TC is consistent with the new Bank strategy for Colombia, which identifies biofuels as one of main priorities for the country.

#### IV. OBJECTIVES AND DESCRIPTION

- 4.1 The main objective of this TC is to promote new technological development and transfer of technology in the area of biofuels. Only through the appropriate application and creation of knowledge would Colombia be able to strengthen the production chain of biofuels. Furthermore, this TC will finance the preparation of the design of a Research, Development and Innovation Fund for Biofuels (FIDIB, acronym in Spanish), with the following specific objectives: i) to identify the most important areas of research and innovation in the biofuels production chain so as to promote further expansion and investment in the sector; ii) to design and implement pilot projects for the FIDIB, with particular emphasis on promoting strategic partnerships among universities, industries and financial entities to develop lines of work and research in innovation in relation to biofuels; and iii) to promote technological transfer and capacity building within the production chain of biofuels.
- 4.2 This TC will also enable the Bank to engage in meaningful dialogue with the GoC to explore the possibility of a loan for the full-scale implementation of the FIDIB. The components to be financed in this TC are:

- 4.3 **Component 1 – Identification of the main areas of research (US \$150,000):** This component will identify the main areas of research and innovation relating to biofuels. The objective of this component is to identify and prioritize the areas where the main technological bottlenecks occur in the production chain of biofuels. Some of these areas were identified by the GoC (see paragraph 7.2 and 7.3): nevertheless, there exists a need to identify all the important technological barriers hindering the development of the sector and to develop next steps to address the effective removal of these barriers through interaction between and among international experts and domestic key stakeholders. In this context, this component will finance: i) Five (5) workshops to promote such dialogues among research entities, biofuel stakeholders (mainly private sector developers and biofuels entrepreneurs) and government. The first workshop will focus on launching this initiative; the next three workshops will be dedicated to identify key specific technological issues facing the industry in the development of ethanol, feedstock issues related to biodiesel, processing technology and value added of by- products (cogeneration with bagasse, methane recovery etc.) The final workshop will present the findings of the previous exchanges. These workshops are expected to produce a clear research agenda that prioritizes the main technical bottlenecks of the sector. This component will also finance travel costs to Colombia of highly qualified international researchers, developers, and manufacturers related to the bioenergy industry. These participants are located mainly in USA, Central America, Brazil, Korea, Thailand, Malaysia, Australia and Europe. The participation of international expert will help domestic stakeholders to (i) identify key technological issues, (ii) verify the validity of the identified issues and (iii) develop the necessary strategies and specific steps required to address them, taking into account relevant international best practices and experiences. In turn, the Colombian biofuel industry should be propelled to the next level through the broad-based expansion and consolidation of the domestic industry. Moreover, this component will be used to prepare a chapter on science, innovation and technology of biofuels in the upcoming Bank-financed SREC (CO-T1052). Finally, the identification of the key technological issues to be addressed will help to ascertain the level of demand for the FIDIB, as described below.
- 4.4 **Component 2 Design and Pilot Implementation of the FIDIB (US\$ 445,000):** The purpose of this component is to design the structure of the FIDIB and to launch it as a pilot operation.. The proposed fund will support the main research areas identified in the agenda through component 1 as well as the transfer of technology described in component 3 below. The first subcomponent will be the *design of the FIDIB*. This subcomponent will support the development of: the governance structure, the operating guidelines (eligible areas and entities), the selection criteria of projects, demand for resources for the FIDIB and the level of required funding, the identification of funding sources, appropriate methods to protect intellectual property rights (e.g., patents); sustainability of the fund; performance indicators; monitoring and evaluation procedures as related to the performance of the fund; and the design of tenders to address common problems for several regions of the country.
- 4.5 Although detailed design of the FIDIB will be based largely upon international best practices in this area, it is anticipated that a co-financing scheme, i.e., a matching grant scheme with the industry will be developed. Research required to develop new products or processes requires strong and proactive participation of industry. The fund will focus on developing specific applied technologies and related new patents to address key technological hurdles. It is also expected that the FIDIB would be governed by a steering committee (see Annex 1), whose membership include all related government ministries

as well as representatives from the industry and research community, with COLCIENCIAS as its chair. Additionally, the sustainability of the Fund, together with its funding sources and impacts (in terms of determining for every dollar invested in the fund, what would be the expected outcome for the GoC in terms of new jobs created, new patents, exports of biofuels, etc) will be thoroughly examined. This Fund would open new opportunities to develop relevant technology and human capacity in areas where the Colombian market is expected to further explore and expand. The eligible areas for funding include, among others: (i) development of new crops with higher resistance to plagues and droughts as well as yield; (ii) better use of by-products such as sugarcane bagasse for cogeneration, handling of glicerine, vinasse and fertirrigation; (iii) development of more efficient, cost-effective ethanol/biodiesel processing technologies; (iv) local development of equipments for biofuel factories; (v) development of cost-efficient irrigation techniques and harvesting methods; (vi) improvements in transportation of biofuels; and (vii) rural development projects for harnessing energy from biomass as well as promoting energy efficiency and methane recovery from wastewater treatment plants.

- 4.6 The second subcomponent is *the pilot implementation of the FIDIB*. In order to reduce the trial and error and more importantly, demonstrate its effectiveness through early success cases to garner more broad-based support, a pilot operation of the Fund is required. During the pilot implementation phase the FIDIB will operate as a revolving fund. The pilot operation will reduce the possible technical problems that may arise once the fund is fully operational. The fully operational fund is assumed to have estimated funding of USD 50 million/year. Additionally, the demonstration effect of the fund will serve to capture the interests of the private sector and to promote investments in bioenergy innovation and technology. To initiate the Fund and to create the required capacity to manage this facility, this component will fund some key lines of research to serve as pilot projects to show the benefits of investing in research and development. As an example of the demand for this kind of funding, in the 2007 COLCIENCIAS' call for research proposals, 29 projects were received in the area of biofuels for a total amount of US\$2 million: funding restrictions permitted the financing of only 30% of the funding needs. As a gesture of its commitment to this endeavor, the Government through the Ministry of Agriculture allocated an additional US\$6.8 million to the available funds. Through these additional resources, an additional 16 projects were short-listed and designated as eligible to obtain funding. The GoC plans to spend that budget completely and then support the biofuel sector through the proposed Bank loan for innovation science and technology for biofuels. The proposed loan together with recently approved resources for COLCIENCIAS by the GoC, would reduce significantly Colombia's deficit in investment in innovation science and technology. Currently such investment totals only 0.5 per cent of the Colombian GDP, a level that lags significantly behind the internationally recommended level of 2%.
- 4.7 Both the private sector and the government agree that the main areas that required the intervention of the government in terms of R&D dedicated to biofuels are long-term research and the type of research that has a less attractive profile for the private sector to invest because of protracted periods of return on investment. All such research will be focused upon areas that are essential on a strategic level for Colombia to become a world biofuel leader. The support of this type of research will be the primary value added that the Bank will contribute to the country.

- 4.8 **Component 3 – Technology Transfer (US\$ 175,000):** As described in 4.4, the FIDIB also has a component for facilitating the transfer of technology. The objective of component 3 is to prepare the design of this sub-component of FIDIB for building human capacity and to promote technology transfer. It is estimated that the size of this sub-component within the proposed FIDIB would be US\$ 5 million/year (10% of the total estimated funding of the fully operational FIDIB) and would also support specific programs proposed by the applicants, on a partial cost-recovery basis. In alignment with the concerns expressed by the private sector and the government as stated in 4.7 above, this sub-component will focus primarily on training and internship programs in areas identified as high priorities for R&D sustainability. Such training is expected to generate a critical mass of researchers, technicians, engineers, botanists, agronomists, equipment designers, etc. This component will also finance the pilot implementation of this activity, again with the expectation of a demonstration effect. Eligible expenses to be financed through this component include tuition, fees, and stipends for individuals or groups of researchers, technicians, operators, management, etc to attend programs at institutes/technical schools within Colombia or to the countries with state-of-the-art facilities and programs in bioenergy. The fund would be available to promote transfer of technology through the funding of internships, fellowships and scholarships at technical schools, universities, and industrial plants. This component would also sponsor exchange programs between domestic companies or universities to countries where the technology has reached a mature state of the art. The upper limit for funding of travel and accommodation costs, selection and evaluation criteria will be established as part of the design of the fund.
- 4.9 These three components will help Colombian technicians, researchers, biofuels project developers and energy planners to create local technology and know how related to the biofuels production chain.

## V. COST AND FINANCING

- 5.1 This TC total cost of is estimated at US\$1,180,000. It is estimated that the Knowledge Partnership Korea Fund for Technology and Innovation will finance US\$ 500,000 (42.37%), the Sustainable Energy and Climate Change Initiative (SECCI) will finance US\$ 330,000 (27.97%), and the local counterpart US\$ 350,000 (29.66%).

### 5.2 Summarized Estimated Budget:

Component/Activity	IDB- KFT Korean Fund	IDB- SECCI	COLCIENCIAS Local Counterpart	Total Estimated Cost (US\$)
<b>Component 1. Identification of the main areas</b>	<b>150,000</b>	<b>0</b>	<b>50,000</b>	<b>200,000</b>
Design of work methodology, workshops, preparation of guidelines for the technical committee, follow up of the workshops, definition of main research areas, and preparation of final reports	35,000			35,000
Preparation of the chapter of the SREC dedicated to science, innovation and technology in relation to sustainable energy and biofuels			20,000	20,000
5 Workshops (USD 25,000, 1-3 day duration, each)	75,000		30,000	105,000
Travel costs for international experts (4 experts per workshop, including per diem and honoraries)	40,000			40,000
<b>Component 2. Design of the FIDIB and piloting</b>	<b>175,000</b>	<b>270,000</b>	<b>195,000</b>	<b>640,000</b>
Design of the FIDIB including	45,000			45,000
Call for proposals			5,000	5,000



Evaluation of proposals			10,000	10,000
Funding of proposals	130,000	270,000	180,000	580,000
<b>Component 3. Technology transfer</b>	<b>175,000</b>	<b>0</b>	<b>105,000</b>	<b>280,000</b>
Design of the FIDIB-Technology transfer- Fund	15,000			15,000
Evaluation of proposals			5,000	5,000
Funding of proposals	160,000		70,000	230,000
Administration (logistics expenses for the coordination of workshops and offices expenses in relation to workshops, pilot administration of the fund)			30,000	30,000
<b>Auditing</b>		<b>20,000</b>		<b>20,000</b>
<b>Monitoring</b>		<b>20,000</b>		<b>20,000</b>
<b>Contingency</b>		<b>20,000</b>		<b>20,000</b>
<b>Total</b>	<b>500,000</b>	<b>330,000</b>	<b>350,000</b>	<b>1,180,000</b>
<b>Percentage (%)</b>	<b>42.37</b>	<b>27.97</b>	<b>29.66</b>	<b>100</b>

## VI. EXECUTING AGENCY AND EXECUTING MECHANISMS

- 6.1 **Executing Agency.** COLCIENCIAS, a public entity with more than 40 years of experience, has been identified as the most appropriate institution to represent the GoC in terms of research and innovation promotion, funding and policy-making. Colciencias will be the executing agency of this TC. The FIDIB will be managed by COLCIENCIAS, following the highest S&T international standards, including: quality, pertinence, efficiency of the proposals, as well as collaborative academic/private sector relationship, according to very high qualified national and international peer reviewers, and other well experimented practices used by the Colombian System for R&D&I, under the executive secretariat of COLCIENCIAS. The collaborative review process of COLCIENCIAS includes recommendations by the peer reviewers, assessment by technical committees and funding of research activities.
- 6.2 Colombia has some experience in biofuels and a solid reputation in science and technology. However, these facts are not enough to develop a fund for science and innovation for the development of biofuels. This TC would help in the transformation of Colombia from being a *biofuel producer* into a *world biofuel leader*. This initiative together with the technical and financial assistance of the Bank could be the first step in this great endeavor for Colombia.

## VII. MAJOR ISSUES

- 7.1 **Colombian capacity for R&D.** CENICAÑA (cane sugar research center) as well as CENIPALMA (African palm research center) are two of the main R&D centers for innovation and technological development for biofuels in the country. These institutions have proven track records with respect to improvements in crop productivity and high biomass performance, key for the development of the program. CORPOICA, the national agriculture research center, has also initiated important projects in this field. There are 14 R&D groups in public and private universities such as Universidad Nacional de Colombia, Universidad de Antioquia, Universidad de los Andes, Universidad Pontificia Bolivariana, Universidad Industrial de Santander as well as research centers such as: the Colombian Oil Institute (ICP acronym in Spanish) and CORPODIB. The aforementioned institutions have worked with technology related to gasification, distillation, transesterification, enzymatic and alkaline catalysis, combustion and fuel quality control.

In addition, the Country has universities with high-level programs covering more a more biofuel topics.

- 7.2 **Special issues for analysis.** There are some specific subjects that will need to be addressed. In the case of the agriculture sector, the main issues are: a) identification, characterization and improvement of germoplasm to optimize yield; b) location of biomass for biofuels; c) mapping to determine potentials to obtain biofuels from non traditional biomass, native or not; d) exploration of new tropical species for the production of biofuels; e) machinery and techniques of optimal harvests; f) environmental impact of the productive systems (sugar cane, African palm) in ecosystem aspects (ground and water conservation, biodiversity, pesticides contamination, plagues and diseases resistance; g) cultural aspects (public policy, economic effects, social participation); h) definition of minimum and optimal scales of production; h) use of by-products; and the i) development of sustainable agronomic packages for different kinds of crops.
- 7.3 For the manufacturing industry, issues that need to be addressed include: a) quality control standards required for export of biofuels; b) potential development of the sector; c) industrial development around by-products; d) environmental impact; e) improvement of production processes; f) production alternatives and g) production of equipment. Regarding the use of biofuels, the issues to be analyzed include: a) blending of biofuels with fossil fuels, b) solidification of palm biodiesel at low temperature; c) performance of biofuels in different engines according to Colombia automotive regulation; d) inventory of the national manufacturing capacity and; e) environmental aspects as related to air pollutants and green house emissions.
- 7.4 **Monitoring and Evaluation.** The execution of the Technical Cooperation will be supervised by COLCIENCIAS and the project team of the Bank. The action plan in chapter VIII show the expected deliverables.
- 7.5 **Sustainability.** COLCIENCIAS will assume the responsibility for the development of proposals in coordination with the Ministry of Mines and Energy, the Ministry of Agriculture, and the National Department of Planning. It is expected that the sustainability of the initiative will be provided through funding of the FIDIB. In addition, the GoC would obtain additional revenues (through taxes) and other benefits from the creation of new jobs, exports of biofuels, sales of carbon credits and eventually reduction of illicit crop cultivation and reduction of guerrilla activity

## VIII. ACTION PLAN

ACTIVITIES/DELIVERBALES	2007	2008				2009
	Q4	Q1	Q2	Q3	Q4	Q1
<b>Component 1. Identification of the main areas</b>						
Design of work methodology, workshops	X					
Workshops with national experts		X	X	X		
Definition of main research areas			X	X		
Preparation of Chapter for R&D to be included in SREC					X	
<b>Component 2. Design of the FIDIB and piloting</b>						
Design of the FIDIB		X	X			
Call for proposals		X	X			
Evaluation of proposals			X	X		
Support l of proposals				X	X	

<b>Component 3. Technology transfer</b>						
Design of the FIDIB –subcomponent of Technology transfer		X	X			
Evaluation of proposals			X	X		
Support of proposals				X	X	
Final report						X

## IX. ENVIROMENTAL AND SOCIAL STRATEGY

- 9.1 The plan conceived in this document would allow Colombia to generate knowledge and identify the environmental impacts related to the expansion of crops used as feedstock for biofuels. The initiatives to be financed through this TC are expected to mitigate any associated environmental problems such as methane recovery, effective wastewater treatment, vinasse control and to some extent organic control of plagues as well as reduction of erosion and recovery of degraded land. The research to be undertaken may also address issues such as protection of ecosystems and forests, and food security. Each of the financed initiatives will comply with the environmental and safeguards compliance (OP-703) of the Bank.
- 9.2 **Environmental and Social Impacts.** Considering its nature, this project is not expected to generate negative environmental or social impacts. It should be noted that the cultivation of the referenced 7 million hectares of land will not result in deforestation and these lands are not under cultivation for crops used for human or animal food. Furthermore, there is a recent Colombian Law guaranteeing protection of natural forestry.

## X. RESPONSIBILITY IN THE BANK

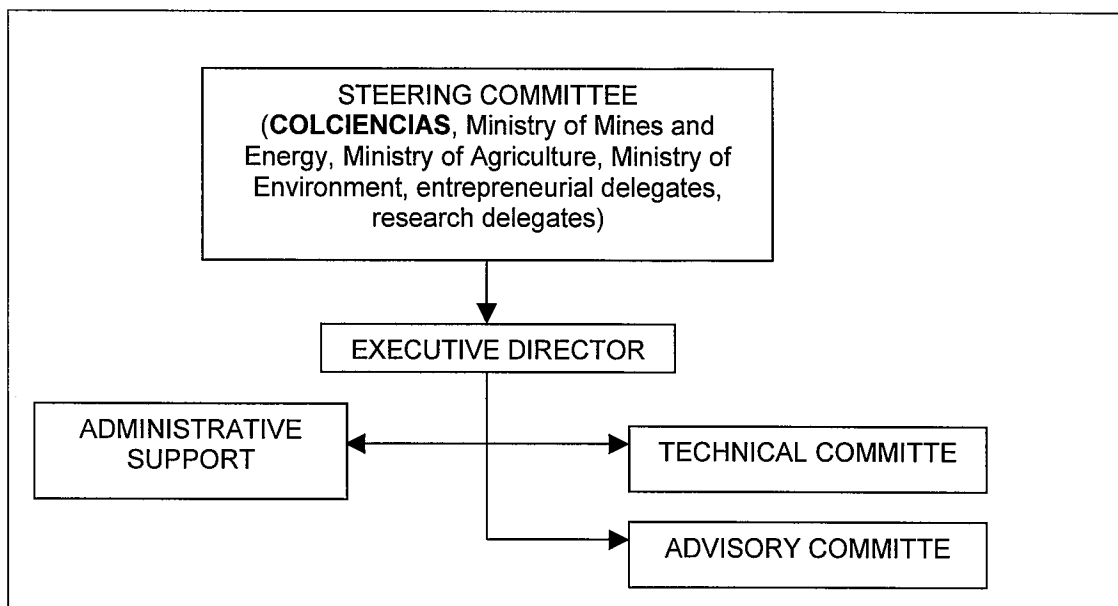
- 10.1 **Technical Responsibility:** The Energy Division of the Infrastructure Department (INE/ENE) will have the technical responsibility for the implementation aspects of the project.
- 10.2 The person responsible for this operation is Christiaan Gischler (INE/ENE). Contact information for Mr. Gischler follows: e-mail: [christiaan@iadb.org](mailto:christiaan@iadb.org) and telephone: (202) 623-3411.
- 10.3 **Responsibility for Disbursements:** The Energy Division of the Infrastructure Department (INE/ENE) of the Inter-American Development Bank will be responsible for the authorization of disbursements.

## XI. RECOMMENDATION

- 11.1 The Energy Division (INE/ENE) recommends the approval of this operation and the use of resources from the Knowledge Partnership Korea Fund for Technology and Innovation (US\$ 500,000) and the Sustainable Energy and Climate Change Initiative (SECCI) (US\$ 330,000), totaling up to US \$830,000 to finance the corresponding project.

## ANNEX I

### INDICATIVE GOVERNMENT STRUCTURE OF THE FIDIB



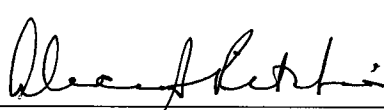
**Steering committee:** chaired by COLCIENCIAS and composed of representatives of high-level officials from the relevant government agencies and the main economic and academic institutions related with the subject. This committee will be in charge of the political and strategic orientation of the Fund.

**Executive Director:** Senior researcher with more than 15 years of experience on S&T management on subjects related with energy resources and applications, including cooperation between government, enterprises and universities. The director will be responsible for the management and administration of the fund, including the development of the activities, schedule and budget.

**Technical Committee:** Composed of by researchers and engineers from research groups and corporations involved with biofuels R&D. The technical committee will be in charge of the analysis and assessment of technical subjects related with different aspects of the fund, including designs, evaluation of proposals, etc.

**Advisory Committee:** A group of recognized entrepreneurs and academicians in charge of advices, planning and guidance for the attainment of the targets of the FIDIB.

Vo. Bo.   
Roberto Vellutini  
Manager, INE

Vo. Bo.   
Alicia S. Ritchie  
General Manager CAN



Al contestar por favor cite estos datos:

Radicado No.: 20072000116111

Fecha: 22/05/2007 04:06:17 p.m.

Bogotá, D.C., mayo 21 de 2008

Señor  
RODRIGO PAROT  
Representante en Bogotá  
Banco Interamericano de Desarrollo  
Cra. 7 No. 7-21 Torre B p. 19  
Ciudad

Asunto: Expanding Innovation, Science and Technology in Biofuels and Sustainable Energy in Colombia.

RECIBIDO  
2008 MAY 24 P 5:14

Estimado señor Parot:

Hemos recibido la iniciativa de la referencia, que ha sido puesta a consideración del Banco Interamericano de Desarrollo para optar por recursos de cooperación, por parte del Instituto por el Desarrollo de la Ciencia y la Tecnología – Conciencias.

La generación de combustibles alternativos ha venido tomando una especial importancia en el ámbito internacional y particularmente en Colombia quien ocupa el segundo lugar en producción de este tipo de combustibles, solamente después de Brasil.

La iniciativa propuesta no solamente se inserta en los propósitos del Plan Nacional de Desarrollo, sino también en la Estrategia de Cooperación Internacional para el periodo 2007 -2010 al coincidir con los Objetivos de Desarrollo del Milenio. En tal sentido, esta entidad no tiene objeción con que se continúe con el proceso tendiente a la obtención de cooperación por parte de ese Organismo.

Cordial saludo,

*Sandra Alzate Cifuentes*  
Sandra Alzate Cifuentes  
Directora

C.C. Claudia Jimena Cuervo. Asesora Dirección de Desarrollo Empresarial – Grupo Ciencia, Tecnología e Innovación – Departamento Nacional de Planeación.

8722



**Dirección de Cooperación Internacional**  
Consultador (57 1) 5960800 Ext.7200 - Fax ext. 7200 - Calle 7 No. 6-54 Piso 3  
Bogotá - Colombia - [www.accionessocial.gov.co](http://www.accionessocial.gov.co)





DDE - 20075000218351

Bogotá D.C., Miércoles, 06 de Junio de 2007

Señor  
**KURT FOCKE**  
Jefe de Infraestructura y finanzas Región 3  
Banco Interamericano de Desarrollo  
Washington

Ref: Plan nacional de ciencia, tecnología e innovación de Colombia

Estimados Señores:

La Dirección de Desarrollo Empresarial considera que la cooperación técnica solicitada por Colciencias al Fondo Coreano de Alianza para el Conocimiento en Tecnología e Innovación administrado por el BID (recursos no reembolsables), para el desarrollo de un Plan colombiano de ciencia, tecnología e innovación en biocombustibles y la constitución de un fondo para la implementación del plan permitirán sentar las bases para llevar a Colombia a ser un país productor y exportador de biocombustibles.

El país, a través de diversas instituciones tales como el Ministerio de Minas y Energía, de Agricultura y Desarrollo rural, de Hacienda y Crédito Público, y el Departamento Nacional de Planeación, está comprometido con el desarrollo de la industria nacional de biocombustibles con miras a convertir a Colombia en un país líder en esta área, y buscará dar sostenibilidad y viabilidad a esta iniciativa en el mediano plazo.

Con un cordial saludo,

  
**ORLANDO GRACIA**  
Director de Desarrollo Empresarial

Preparó: Claudia Cuservo



COLCIENCIAS 06-08-2007 02:47:19

Al Contestar Cite Este No. 2007EE4036 01 Folio Anex0

ORIGEN: Origen: Sd.336 - DIRECCION GENERAL MIRANDA MIRANDA JUAN FRANCISCO

DESTINO: Destino: BANCO INTERAMERICANO DE DESARROLLO KURT FOCKE

ASUNTO: Asunto: PLAN COLOMBIANO DE CIENCIA, TECNOLOGIA E INNOVACION

OBS: Obs:

D.G.

Señor  
KURT FOCKE  
Jefe Infraestructura y Finanzas  
Región 3  
Banco Interamericano de Desarrollo  
Washington, D.C.

Ref: Plan Colombiano de Ciencia, Tecnología e Innovación en Biocombustibles. Fase I, Diseño y Puesta en Marcha.

Estimado Señor Focke:

Es grato para COLCIENCIAS presentar la propuesta encaminada a adelantar la preparación y puesta en marcha del Plan de la referencia, el cual tiene como propósito fundamental consolidar la apropiación y generación de conocimiento científico y tecnológico, como factor esencial para garantizar el logro que se ha propuesto el País, de convertirse en productor y exportador de biocombustibles.

Esta iniciativa cuenta con el visto bueno de el Departamento de Planeación Nacional de Colombia y la manifestación expresa de no objeción por parte de la Agencia Presidencial para la Acción Social y la Cooperación Internacional. Todo esto, gracias a que el Plan de Ciencia, Tecnología e Innovación en Biocombustibles previsto, se inserta claramente en los propósitos del Plan Nacional de Desarrollo 2007-2010, lo mismo que en el Plan Estratégico "Visión Colombia II Centenario 2019" y en la Estrategia de Cooperación Internacional para el período 2007-2010.

Agradecemos la atención que nuestra propuesta les merezca y quedamos a entera disposición para cualquier información o aclaración adicional, que estimen pertinente.

Atentamente,

  
JUAN FRANCISCO MIRANDA MIRANDA  
Director General

/c.c./ Señor Christiaan Gischler, Especialista en Infraestructura, División de Finanzas e Infraestructura  
Básica 3  
Señor Rodrigo Parot, Representante BID - Colombia

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