

PROJECT INFORMATION DOCUMENT

Pre-Appraisal Stage

Report No.: TBD

Date Prepared/Updated: June 26, 2017

I. BASIC INFORMATION

A. Basic Project Data

Country:	Colombia	Project ID:	P161713
		Parent Project ID:	N/A
Project Name:	Colombia Clean Energy Development Project		
Region:	Latin America and the Caribbean		
Estimated Appraisal Date:	09/29/2017	Estimated Board Date:	10/31/2017
Practice Area (Lead):	Energy & Extractives	Lending Instrument:	IBRD Guarantee CTF Guarantee
Borrower(s)	Government of Colombia		
Implementing Agency	Ministerio de Hacienda y Crédito Publico / Ministerio de Minas y Energía / Financiera de Desarrollo Nacional (Implementing Agency)		
Is this project processed under OP 8.50 (Emergency Recovery) or OP 8.00 (Rapid Response to Crises and Emergencies)?		NO	
Financing (in USD Million)			
Capital Structure			
Estimated Project Cost		1,015	
Estimated Private Equity		268	
Estimated Debt		747	
<i>of which commercial borrowing</i>		487	
<i>of which Development Finance Institutions & Export Credit Agencies</i>		260	
Estimated Total Private Capital		755	
Guarantee Sizing			
FDN Capital Sizing (@ 1:4)		189	
IBRD-CTF Guarantee Amount		81	
Private Capital Mobilization Ratio (Private Capital / IBRD-CTF Guarantee Size) ¹		9.32	

¹ Based on total private investment, including commercial debt and equity.

Environmental Category	FI
Decision	Project in Pre-Appraisal after Quality Enhancement Review
Other Decision (as needed)	
Is this project processed under OP 8.50 (Emergency Recovery) or OP 8.00 (Rapid Response to Crises and Emergencies)?	No
Is this a Repeater project?	No
Is this a Transferred project? (Will not be disclosed)	No

B. Introduction and Context

Country Context

Colombia has exhibited a solid economic performance over the past several years. Growth rates were sustained at high levels in 2014 (4.6 percent) before moderating to a projected 2.9 percent in 2015, mainly resulting from the sharp drop of world oil prices and its impact on trade. The IMF recently commended the government for its policy response to oil price trends, which included strengthening fiscal policy, and tightening monetary policy while allowing the exchange rate to depreciate. Growth has been accompanied by a fall in unemployment reaching a record low of 9.1 percent in 2014 (lowest figure since 2000), predominantly led by the construction, social services, and financial sectors. In contrast, extractive activities remained stagnant following the sharp drop in international commodity prices and interruptions in production. Gross capital formation (backed by the government's large infrastructure investment program) and household and government consumption were the main drivers of growth, which compensated for the widening trade deficit.

Economic growth has been the main driver of poverty reduction and shared prosperity in the country. For the period 2002-2013, economic growth explains 73 percent of the reduction in extreme poverty and 84 percent of the reduction in total poverty. Similarly, income growth has been the main determinant of shared prosperity in recent years in Colombia. Labor income represents at least fifty percent of income growth for the poorest 10 percent of the population, and up to 70 percent for those in the fourth decile, in the period 2008-2013.

A historic event that took place in Colombia in 2016 was the signature and ratification by Congress of a peace accord between the government and the Revolutionary Armed Forces of Colombia (FARC), ending more than half a century of conflict that has killed over 260,000 people and displaced another 6.9 million, also causing enormous potential investment losses. The escalation of the armed conflict has greatly contributed to inequality in land distribution through the illegal dispossession of land, forced displacement, and re-concentration of ownership. There will be challenges in developing those rural areas, but the prospects of further economic development for the country are significant. In the energy sector, companies in the oil and mining industry, which have substantial operations in rural

Colombia, will be presented with new opportunities.

Sectoral and Institutional Context

Energy and Economic Growth

The energy and mining sectors in Colombia represent an important source of financing for development projects in the country. The two sectors made up 11.2 percent of GDP in the period 2010-2013 (about 52.3 percent came from the hydrocarbon sector). In 2013, the contributions of these two sectors (from taxes, benefits, and shares) represented 32 percent of the Government's current income. These resources have facilitated the implementation of development projects across the country (National Development Plan (NDP), 2014-2018). For instance, the electricity tariff includes a component that channels resources to a public fund that finances electrification efforts in rural non-interconnected zones (*Fondo de Apoyo Financiero para la Energización de Zonas No-Interconectadas*, FAZNI y el Fondo de Apoyo Financiero para la Energización de las Zonas Rurales Interconectadas FAER)

Colombia has gradually decoupled energy consumption from economic growth. In contrast to the regional trend, energy use in Colombia has exhibited gradual decoupling from economic growth. Colombia has a relatively low GDP per capita when compared to other countries of the region, but countries with higher levels of GDP per capita also exhibit higher levels of energy consumption (Brazil, Mexico, Chile), many of which have not been able to grow without consuming increasing volumes of energy on a per US\$ basis of GDP.

Electricity Sector

Colombia has a mature wholesale electricity market. The country reformed its power sector in 1994 and introduced a wholesale electricity market where competition is established across the value chain, including in transmission (with tenders for transmission expansion) and in retail (with free non-regulated consumers). Commercial transactions are made through spot (price based bidding and least cost dispatch) and contracts markets. Private sector participation is allowed in all segments of the value chain.

The Colombian electricity system is hydro-dominated and thus highly vulnerable to weather variability, specifically El Niño Southern Oscillation (ENSO) events. About two-thirds of the installed capacity is hydro-based and roughly 68 percent of Colombia's energy is produced from hydro resources. To ensure the availability of firm energy, the regulator introduced a capacity payment mechanism –whose design and procurement has gone through a series of restructurings – to create incentives for the provision of “firm energy services” during times of hydro scarcity. The original capacity payment has evolved into an auction for “firm energy” (reliability payment).

Recent assessments have identified a number of structural issues affecting the performance of the electricity market in Colombia. Including: i) high vulnerability to ENSO events, ii) limited availability of natural gas and high prices (closing of the border with Venezuela has created congestion in port, pipeline and storage infrastructure), iii) low scarcity prices (which is the price paid to generators for delivering firm energy; formula to calculate scarcity price is a function of the Platts US Gulf Coast

Residual Fuel Oil Price), iv) design of reliability payments challenged by extreme or long weather episodes, v) lack of incentives for renewable energy development, vi) certain degree of market concentration and suspected strategic behavior (50% of the market dominated by vertically integrated utilities, including EPM, EMGESA and CODENSA), and vii) potential conflicts of interest (XM owned by ISA, which is in turn owned by companies operating in the market such as EPM and Energia de Bogota). The convergence of all these factors have made evident that there exist structural issues in both the regulatory and institutional frameworks, and that the system, as it is organized now, is not delivering minimum levels of energy security (reliability measures). In addition, these problems are creating high uncertainty and deterring private sector participation.

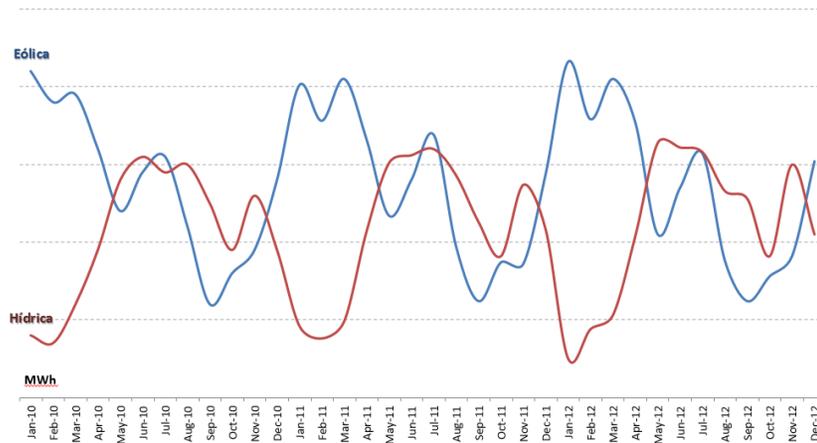
Structurally, the power system still lacks resource diversity and thus flexibility to cope with seasonal and weather shocks. The reliability payment had the merit of providing firm energy when it was needed, but at an extremely high cost, which also proved to be very uncertain. In practice, the existing regulation has not delivered the diversification of the energy mix necessary to cope with extreme episodes of climatic variability. Colombia needs to find other ways to diversify its energy mix and increase the resilience of the power sector.

The Government of Colombia (GoC) has launched a comprehensive evaluation of the performance of the electricity market. Various energy sector institutions, like the Ministry of Mines and Energy (MINMINAS), the Energy Planning Unit (UPME), as well as the National Planning Department (DNP), strongly recognize the need to diversify the energy matrix and develop renewable source-based generation as a resilience measure.

Colombia is endowed with abundant and diverse renewable energy resources, which could contribute to enhance the resilience of the sector. Both hydro and non-hydro renewable energy resources in Colombia are significant. The International Renewable Energy Agency (IRENA) estimates that Colombia has a “high” resource potential to develop wind, solar, hydro and geothermal generation (IRENA, 2012). Recent assessments suggest that Colombia has the potential to develop 30 GW of installed wind capacity, 1-2 GW of geothermal capacity, and regions such as the La Guajira and the Atlantic coast with very high solar irradiation (UPME, 2015). The world atlas of the International Journal of Hydropower and Dams places Colombia’s (economically feasible) hydropower potential at 140 TWh per year, which is significant considering average annual generation of 45 GWh.

Studies by UPME have shown that wind patterns in several locations in Colombia are countercyclical to rain patterns, in particular during ENSO events (Figure 1). This finding suggests that the development of wind (but also solar and geothermal) could aptly contribute to diversification. Wind production could help operate the reservoirs at higher levels, increasing their resilience to prolonged droughts. The insertion of non-conventional renewables to a hydro system is mutually beneficial. On one hand, the water stored in the reservoir is a large storage source, which can mitigate the generation volatility of wind and solar. On the other hand, the countercyclical feature of wind generation in Colombia enables a more reliable operation of the hydro system in times of scarcity.

Figure 1. Seasonal Complementarity of Wind and Hydro Resources in Colombia



Source: CREG presentation (June, 2016)

The country has introduced a legal framework as well as fiscal and financial incentives for the development of non-conventional renewable energy (NCRE), but there are still many barriers hindering expansion as well as private sector participation and investment. Law 1715 of 2015 (Renewable Energy Law) provides VAT exemptions as well as investment and production tax credits. However, there are a number of barriers still preventing renewable energy development: i) lack of specific market and procurement incentives that allow variable renewable energy generation (VRE) to compete on an equal footing with thermal and hydropower generation (these two sources receive a long-term reliability charge, but wind or solar energy are not eligible for this incentive); (ii) NCRE are not competitive in technology-neutral auctions in the absence of long-term contracts; (iii) the lack of transmission infrastructure to connect load centers with the Guajira area, where wind resources are located; (iii) a quasi-deep grid interconnection policy that imposes a high burden on project developers via financial guarantees to secure transmission investment (this barrier affects small and new project developers the most); and (iv) a lack of a grid code and rules for the scheduling and dispatching of variable renewable energy, among others (Annex 2 includes a risk matrix that describes these and other barriers in detail).

Demand-Side Management and Energy Efficiency

The GoC has built a solid institutional and policy framework to promote energy efficiency across sectors and it has gradually implemented various strategic actions. Colombia enacted Law 697 “Promotion of Rational and Efficient Use of Energy” in 2001, and since then has issued a number of key regulatory decrees, most notably: i) a resolution for the creation of an inter-secretarial commission that supports energy efficiency (*Comisión Intersectorial para el Uso Racional y Eficiente de la Energía y Fuentes no Convencionales*, CIURE) which reports to MINMINAS; ii) resolutions to introduce the Program for the Promotion of Rational and Efficient Use of Energy and Non-Conventional Energy (PROURE); and iii) Indicative Action Plans (PAI, 2010-2015 and subsequently PAI 2015-2020), which include specific targets by consumer segment. In the Regulatory Indicators for Sustainable Energy

(RISE) index that measures the extent to which a country has introduced the legal and regulatory instruments necessary to attract private sector participation in energy efficiency, Colombia shows a positive performance, and a score above the Organization for Economic Co-operation and Development (OECD) and regional measures. Yet, there is still considerable scope for reducing energy intensity in the industrial sector and developing renewable energy resources on the consumer side.

Demand-side management measures have the potential to considerably contribute to strengthening the resilience of the energy sector in times of hydropower scarcity. Due to the then-recent ENSO event, the Energy Regulatory Commission (CREG) introduced incentives for energy savings in March 2016 via Decree 388. Consumers were granted discounts, which were reflected in the electricity bill when consumption levels dropped below pre-established thresholds. The incentives, in tandem with an effective savings campaign led by the President Santos himself, achieved the desired energy savings of 5 percent, without the need for black-outs or brownouts. This market-based mechanism for energy efficiency has been used successfully in other countries, such as Brazil and South Africa.

Demand-side management can also contribute to lowering infrastructure investment needs. Activities that promote demand-side participation from end-users to ultimately lower consumption and improve energy intensity also result in reduced supply-side capacity and infrastructure investment needs across the value chain (generation, transmission, distribution). Although Colombia has launched adequate programs and has experienced real benefits from emergency energy efficiency campaigns during periods of water scarcity, there is still significant scope for the development of demand-side resources.

Both renewable energy and energy efficiency development can contribute to climate change mitigation, while at the same time contributing to strengthening the resilience of the sector to climate change and increased weather variability.

Infrastructure Financing

Colombia faces very large infrastructure financing requirements over the next few years that need to be met through diversified financing sources. Colombia has a limited project finance market with most of the infrastructure financing traditionally offered as corporate loans by a small set of commercial banks. Considering the significant infrastructure financing needs, there is a critical need to explore multiple financing sources such as sponsors equity, debt from local and international commercial banks, capital markets with participation of institutional investors, intermediary investment vehicles, including infrastructure funds, in a sustainable manner. The Government has undertaken a number of measures to address the financing needs through creation of appropriate regulatory frameworks and government agencies.²

Financiera de Desarrollo Nacional (FDN) is a development bank, established with contributions from the state as well as private capital, whose corporate purpose is to promote, finance, and support companies and investment projects in all sectors of the Colombian economy.³ FDN acts as a catalytic

² PPP Law (1508/2012), Infrastructure Law (1682/2013) and Standardized Contracts along with creation of specialized government agencies such as ANI and FDN.

³ The shareholding structure of FDN with majority ownership of GoC (MinHacienda) has the following composition: GoC (67.5 percent), CAF (8.18 percent), IFC (15.7 percent), and SMBC (8.18 percent).

public agency that mobilizes private investments through different financing sources by de-risking investment projects through innovative risk mitigation products and creating enabling financial conditions for long-term financing. With the support of the WBG, FDN is implementing a financial sector strategy for sustainable long-term financing in infrastructure.

Overall Energy Policy / Overarching Energy Strategy

The overarching policy framework of the energy sector in Colombia is articulated in both the NDP 2014-2018 and the National Energy Plan (PEN) of 2015. These two policy instruments establish a clear direction in the three areas of sustainable energy as well as in the area of resilient growth vis-à-vis climate variability.

*Under the Green Growth Strategic Line, the NDP supports various objectives that relate to the electricity sector: **Objective 1:** Progress towards sustainable and low-carbon development; **Objective 2:** Protect and ensure the sustainable use of natural capital and improve the quality of environmental governance; **Objective 3:** Achieve resilient growth and reduce vulnerability to climate change and disaster risks.* Under these three objectives, the GoC introduces measures to advance sustainable energy (through specific directions for promoting renewables and energy efficiency) and the creation of a more resilient electricity sector with an emphasis on modernizing planning.

PEN 2015 further details the strategic directions for the intended development of the energy industry and its subsectors. The table below summarizes the key objectives proposed in PEN 2015.

Specific objectives for the energy sector	1. Reliable supply and diversification of the energy basket
	2. Efficient energy demand
	3. Universal and affordable energy access
	4. Promote investment in international interconnections and infrastructure for the commercialization of strategic resources
	5. Maintain revenue and promote a viable productive transformation and value propositions
Cross-sectoral objectives	6. Link information to decision-making and create knowledge, innovation, and human capital for the development of the energy sector
	7. Consolidate the institutionalism of the sector and enhance public sector efficiency and regulation

Climate Commitments

Colombia submitted an Intended Nationally Determined Contribution (INDC) during COP21 (ratified on April 22, 2016 as NDC) to flag its climate mitigation and adaptation priorities, which will collectively cost an estimated US\$ 1.06 Billion annually, or 0.15 percent of GDP per year. A major innovation in the run-up to the Paris Agreement was the establishment of a voluntary process

whereby countries indicated their intended contribution towards global efforts to reduce the amount of greenhouse gases (GHG) entering the atmosphere. In its NDC, Colombia committed to reduce 20 percent of its carbon emissions level by 2030 when compared to a projected business as usual scenario.⁴ The sectors targeted for mitigation purposes are: energy, transport, agriculture, land use/land use change, and forestry (LULUCF), and industry. Colombia has outlined specific mitigation actions in its Strategy for Low Carbon Development (ECDBC), which includes actions to promote energy efficiency and renewable energy.

On the adaptation front, the country's NDC has committed to implementing measures in sectors with high exposure and degree of vulnerability to climate change, including energy, transport, water, agriculture, health, social development, environment, education, and tourism. Colombia has emphasized the implementation of adaptation and resilience measures in the NDC, the NDP, and the National Plan for Adaptation to Climate Change (PNACC) as a high priority.

In the energy sector, the PNACC establishes the considering climate change into the energy sector planning process as a priority.

C. Proposed Development Objective(s)

Development Objective(s)

The project development objective is to assist Colombia in increasing electricity generation capacity from non-conventional renewable energy sources and energy savings in the industrial sector with mobilization of private investment.

Key Results

The expected key results of the Project will be measured in terms of the following indicators:

- Avoided Greenhouse Gas Emissions (MtCO₂eq)
- Generation capacity of renewable energy constructed under the Project (MW) (Core)
- Increased energy efficiency, energy savings (GWh/year) (Core)
- Private capital mobilized (million US\$) – (Number) – (Core)

D. Project Description

The Project will support the development of clean energy projects, including both renewable energy and energy efficiency. The goal is to initiate an effort that will contribute to unlock Colombia's abundant clean energy resources through targeted technical assistance and credit enhancement and de-risking

⁴ This target could increase to 30 percent subject to the availability of international financial support. Colombia only contributes to 0.37 percent to global carbon emissions, however the amount of carbon emissions per unit of GDP is above the global average.

instruments. The proposed activity will support three categories of projects via technical assistance and financial instruments:⁵

Category 1. Large-scale renewable energy (wind, solar, > 20 MW).

Category 2. Small-scale renewable energy (<20 MW)

Category 3. Energy efficiency activities in the industrial sector.

Category 1. Large-scale renewable energy (NCRE) encompasses utility-scale Independent Power Producers (IPPs), primarily in wind and solar resources-(investments of about US\$ 736 Million).

The best wind resources in Colombia (and in LAC) are located in the La Guajira Peninsula. There are about 11 projects under study encompassing 1.4 GW and four large, reputable developers, which have already applied for the right to use transmission rights. NCRE is an area which is significantly underdeveloped in Colombia, in spite of the country's abundant resources and functional power sector. At a high level, the NDP 2014-2018 and the PEN2015 have clear objectives of achieving sustainable and low-carbon development and reducing vulnerability to climate change. For example, Colombia's electricity generation expansion plan estimates that a capital investment in the range of US\$ 14 Billion will be needed to scale-up non-conventional renewable energy.⁶ In spite of its abundant resources and organized power sector, the development of large-scale renewables in Colombia has been negligible, comparing to other countries in LAC, such as Brazil, Chile, Mexico, Peru, and Uruguay, which have implemented auctions, prices have been significantly reduced, and thousands of MW in wind and solar have been installed. In terms of readiness for implementation, large-scale NCRE will still need a few years before becoming operational, including the time to design and run the auctions, award PPAs, build generation and transmission line assets, and commission the wind and solar resources.

Category 2. Small-scale renewable energy (<20 MW) projects (investments of about US\$ 233 Million) include ground mount and rooftop solar photovoltaic operating as IPPs or as distributed generation schemes, and self-generation and co-generation activities in industry (mainly using biomass and, in limited cases, natural gas).⁷ This category was not originally itemized in the CTF Investment Plan in an explicit way, since some projects, such as co-generation and solar PV for large users, were classified under "energy efficiency." Furthermore, in this new version of the Project, the WBG included medium-sized, utility renewable projects to promote the scaling-up of non-conventional renewables even before large-scale wind and solar projects are ready to be bid-out and significant new transmission lines are built. Medium scale PV, co-generation, and self-generation projects have already been identified and some preliminary technical studies have been carried out. There is no need for those smaller projects to sell the produced energy via auction mechanisms, which expedites their implementation. Depending on the quality of the studies and on the developer's interest to implement them, those projects can be developed in a time horizon between 12 and 24 months.

⁵ These categories are established for the proposed project and do not correspond to regulatory thresholds.

⁶ Estimated amount based on the expected capacity of renewable energy projected in UPME's generation expansion plan (under scenario xx).

⁷ Co-generation and self-generation initiatives are mainly sourced with biomass, and to a limited extent with natural gas (only one project). In all cases, there will be a de-carbonization of the industrial activity.

Category 3. Energy efficiency (investments of about US\$ 46 Million). Those projects include energy efficiency per se, encompassing for example heat recovery, more efficient motors, HVAC systems, and lighting among large industrial customers. The inclusion of energy efficiency in this CTF program was a specific request from the GoC to help reduce and rationalize the use of energy in supply-constrained areas, such as the Mamonal industrial park adjacent to Cartagena. About 15-20 projects were identified and listed in the original CTF investment plan. However, under close examination, the WBG team noticed that those energy efficiency projects, albeit promising, are still at early stages of auditing and assessment. To enable a faster scale-up of energy efficiency resources, other projects that UPME and USAID had previously were included as potential candidates for the WB-CTF program. Given the readiness of those projects, the WBG team assumes that they can be implemented in a 6-12-month timeframe (Phase I), while projects in the Mamonal Region require additional time and resources for a detailed assessment, and if attractive can be implemented in a 12-24-month timeframe (Phase II).

The following table presents a breakdown of investments and project counts for Phases I and II of Categories 2 and 3 of the Project. The distribution between Phases I and II depends on the degree of readiness of the sub-projects in each category. Many subprojects in Categories 2 and 3 are in advanced preparation stages and could be supported in the first years of the WB-CTF Project implementation period. On the other hand, large-scale renewable energy projects (Category 1) depend on the launching of generation capacity auctions and other new regulatory provisions, as well as on the construction of a new transmission line (in the case of grid-connected wind projects located in that area).

Investments (US\$ MM) and Project Count (Units)										
	Category 3				Category 2				TOTAL	
	Energy Efficiency		Co-Generation		Self-Generation		Small Generation (<20MW)			
	Investments	Project Count	Investments	Project Count	Investments	Project Count	Investments	Project Count	Investments	Project Count
Phase I	6.7	5	15.2	4	54.1	10	105.8	5	181.8	24
Phase II	39.1	41	36.1	5	22.0	4	0	0	97.2	50
Total	45.8	46	51.3	9	76.1	14	105.8	5	279.0	74
Average Project Size (US\$ MM)		1.0		5.7		5.4		21.2		3.8

The WBG plans to contribute to the scale-up of renewable resources and energy efficiency efforts by offering a combination of technical assistance and provision of credit-enhancement products. On the technical assistance side, the GoC requested the WBG to support them in the design of auctions and in improving and modernizing market and commercial rules to create a competitive, level, playing field for renewable energy. Under the credit-enhancement provision, the WBG is planning to guarantee FDN for innovative credit enhancement and risk mitigation products so as to unlock significant private investments under the three project categories.

The rationale for providing these products includes the following:

- Due to the untested market for NCRE in Colombia, investors and lenders will initially require additional comfort in terms of risk mitigation.

- The uncertain regulatory framework for NCRE in Colombia poses significant investment risks due to the possibility of adverse impacts on expected tariffs over the life of the long-term (e.g., 15-20 years) power purchase agreements that project investors are expected to require.
- Lack of certainty about timely availability of transmission infrastructure to evacuate and distribute power from NCRE generation plants.

The power off-taker (XM) is primarily a system-clearing account and not a creditworthy utility with its own balance sheet. This poses a significant payment uncertainty to investors and lenders in relation to timeliness of payments and during termination scenarios.

A. *Project Components*

The proposed Project consists of the following two components:

Component 1. Technical assistance to support the preparation of the Project (*953k CTF Project Preparation Grant*)

Component 2. IBRD and CTF guarantee to backstop FDN guarantee obligations to enhance the creditworthiness of clean energy sub-projects (*US\$ 81 Million- CTF 40 million, IBRD 40 million*)

The two components are described below in more detail:

Component 1. Technical Assistance (US\$ 953 K)

The technical assistance component will support MINMINAs and FDN in developing the activities and assessments necessary to complete the preparation of the project, including: i) market sounding to create a robust pipeline of projects with identification and quantification of risks; ii) technical and prefeasibility studies of selected renewable energy and energy efficiency projects; iii) development of environmental and social management system/framework (ESMF); iv) advisory of financial structuring (design and development of appropriate credit enhancement and risk mitigation products); and v) project coordination with other Government agencies and structuring of a Project Implementation Unit (PIU) within FDN.

Other ongoing initiatives complement this technical assistance component by supporting the proposed project with parallel donor and trust fund resources, including:

1. **Program Design** (Global Infrastructure Fund, US\$ 400K FY18). *In processing stage*, the activity will contribute to the analyses necessary for detail project design during project preparation, including: i) legal, financial and economic analyses; ii) implementation and business models for energy efficiency projects; iii) definition of institutional and implementation arrangements; iv) *Assessment of optimal market intervention by FDN*, to support FDN in identifying and determining the optimal financial intervention to attract long-term finance to clean energy projects, and the creation of protocols for the oversight and supervision of social and environmental considerations.

2. **Regulatory Dimension** (*PPIAF, US\$ 690K, FY18*). *Approved and launched on April 2017*, this grant, aims to make market and regulatory frameworks for renewables and energy efficiency more conducive to private sector investments. The most important activity is the assessment and design of competitive mechanisms (auctions) to procure electricity in the Colombian power system, therefore creating a market for long-term contracts (PPAs). This activity includes: technical inputs for the design of auctions, , drafting of PPAs, and drafting of rules and procedures, with a focus on non-conventional renewable energy. In parallel, this activity will address some institutional and market design issues, such as intraday trading, nodal pricing, demand-side bidding, capacity payments, integration of distributed resources, governance of the power system under stress, and other critical issues, to make the market more efficient and conducive to long-term contracting (mainly for NCRE).

3. **Renewable Energy Integration** (*NDC Partnership Support Facility, US\$ 500K FY18*). *Approved and to be launched in June 2017*, the activity will support the following components: i) review of transmission and grid code amendment necessary to include VRE integration considerations; ii) evaluate the needs and suitable tools to implement advanced power system management, non-conventional generation forecasting, and automatic demand-response in scheduling and dispatching in Colombia. This activity will include an evaluation of the software and hardware used for dispatching and forecasting, gap analysis, recommendations, and potentially assistance with specifications of new tools to enable the adequate management of variable renewable energy (VRE) technologies and system flexibility options, and iii) targeted support for structuring of transmission lines to La Guajira, which will include a review of the effectiveness of the existing project structuring and procurement process.

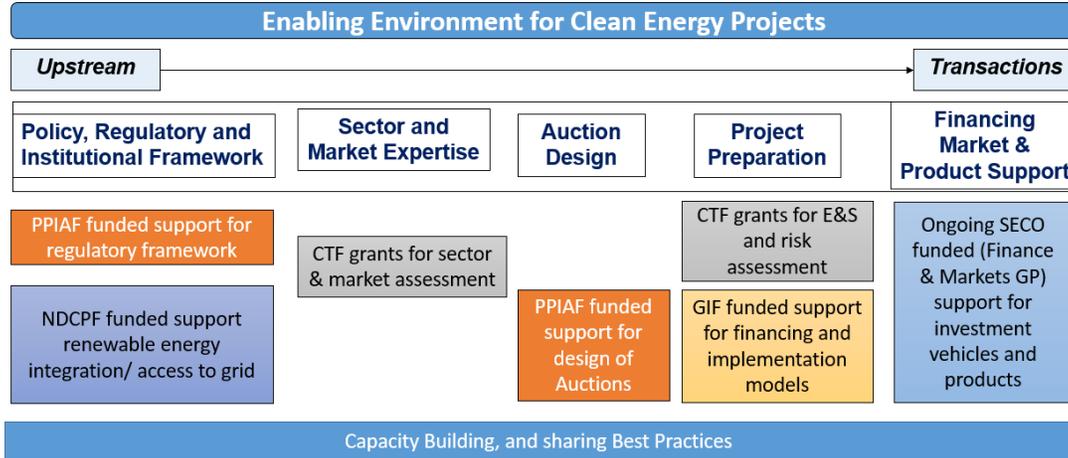
4. **Capital markets strengthening** (SECO, US\$ 2.2 Million FY18). *Approved and launched on December 2015*, the Switzerland State Secretary for Economic Affairs (SECO)-funded technical assistance of WBG Finance and Markets Global Practice has been developing a financial sector strategy, including developing an enabling environment for sustainable long-term financing. This financial sector strategy is being supported by a WBG technical assistance “Capital Markets Strengthening Facility Deep Dive” led by (FDN) in coordination with the DNP and the Ministry of Finance (Minhacienda). The WBG technical assistance started with the 4th Generation (4G) toll road program and is now expanding into other sectors, such as clean energy. This ongoing WBG technical assistance activity will primarily focus on developing suitable risk mitigation and credit enhancement products to strengthen long-term financing. Thus, it provides a strong linkage to the proposed IRD-CTF guarantee program and both operations will be fully coordinated, including in the identification and structuring of long-term institutional investors in financing the development of renewable energy and energy efficiency projects in Colombia.

WBG support provides strong value add. The WBG technical assistance will be geared towards creating an enabling environment by working with various government agencies involved in enhancing the regulatory framework, and creating an environment that is conducive to private sector participation. The WBG will provide technical training and knowledge-sharing by bringing lessons learned from other WBG

operations in renewable energy and energy efficiency.

Figure 2 below provides a schematic representation of how these different activities support the CTF Clean Energy Development Project on different fronts:

Figure 2. Additional Activities Supporting the Clean Energy Development Project



Component 2. IBRD and CTF Guarantees (US\$ 81 Million: CTF 40 million, IBRD 41 million)

The component will support FDN’s activities in the development of innovative credit enhancement products to de-risk projects and attract long-term investments in clean energy. IBRD and CTF guarantees will backstop FDN’s obligations associated with an initial set of projects to help FDN build a track record in the financing of clean energy projects. Under the proposed structure, FDN will create two windows to provide guarantees, one for renewable energy, and the other for energy efficiency sub-projects.

The use of IBRD, CTF, and FDN guarantees for clean energy development in Colombia is expected to support investments of about 716 MW in renewable energy capacity by mobilizing an estimated US\$ 969 Million and an additional US\$ 46 Million of energy efficiency investments, achieving a leverage ratio of approximately 1 to 9. FDN’s risk mitigation guarantees will help: (i) improve access to different sources of financing with competitive pricing; (ii) enhance investment recovery associated with renewables investments for long-term institutional investors; and (iii) enhance the risk profile of covered sub-projects to attract long-term institutional investors.

The innovative design of IBRD and CTF guarantees not only enhances the support that FDN is providing to sub-projects but it can also be understood as a last resort. The IBRD and CTF guarantees will provide contingent capital to the FER business account of FDN. If any of the guarantees issued by FDN under the FER is called by its beneficiary as a result of the occurrence of a covered risk, FDN will have to use its capital reserve base and, if necessary, raise additional capital from the financial market to meet its guarantee obligations. As a result of this, the call on IBRD–CTF guarantees will be treated as the last resort.

II. IMPLEMENTATION

Institutional and Implementation Arrangements

The implementing agency for the proposed project will be FDN with the specific function of catalyzing investments in Colombian clean energy infrastructure and addresses market failures that affects optimal infrastructure financing. FDN's mandate is to be the principal agent in developing the infrastructure finance market in Colombia. It offers products and services, at competitive market rates, that are critical to financing infrastructure—including long tenor loans, subordinated debt, and credit enhancements. On September 2, 2016, FDN entered into an inter-agency cooperation agreement (*Convenio Interadministrativo de Cooperación*)⁸ with the Ministry of Mines and Energy (MINMINAS) whereby FDN and MINMINAS agree to join forces to undertake the technical, financial and legal studies necessary to develop a new Renewable Energy Program (*Programa de Energías Renovables*, or PER).

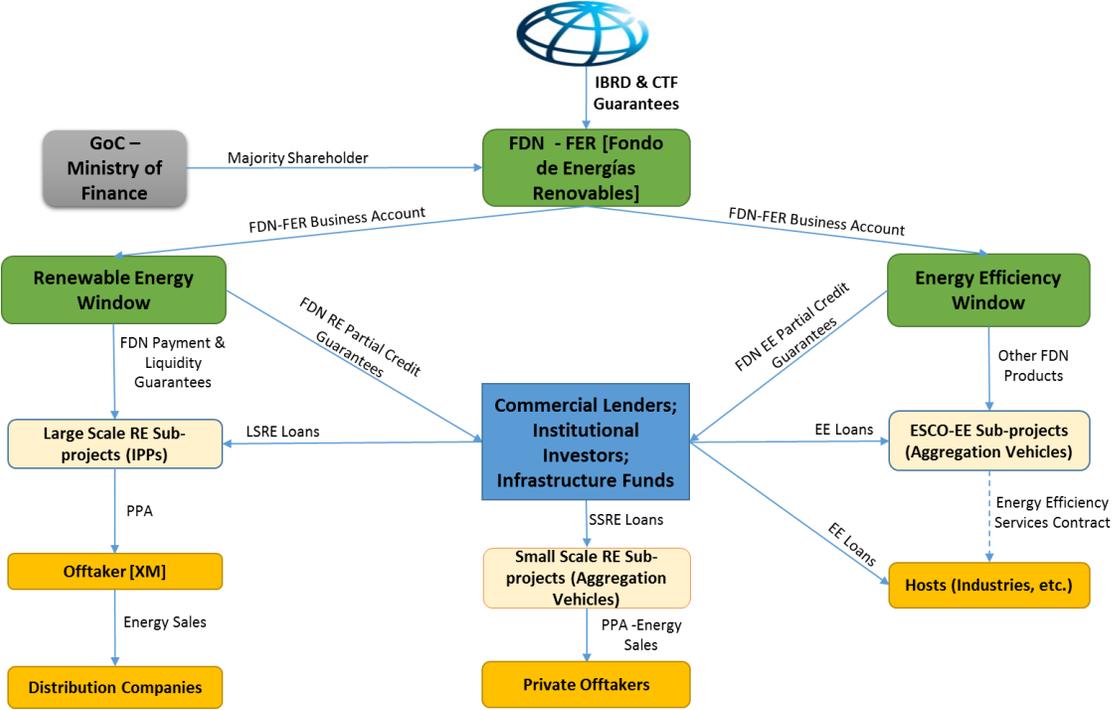
For the recent 4G transport program, FDN has committed \$66 million in credit enhancements through its liquidity facility, while mobilizing \$663 million⁹. This illustrates FDN's experience in offering credit enhancement products to the infrastructure sector. Notwithstanding this, FDN is yet to build a track record of its own in structuring and credit enhancing projects to support international private investments in energy sector, particularly renewable energy and energy efficiency projects. FDN is also currently strengthening its team to develop various aspects of the program, including structuring projects, designing new guarantee products for long-term institutional investors. The experiences brought by IBRD and CTF guarantees, from other clean energy operations, will also help improve the capacity of FDN to design and provide credit enhancement products.

The figure below illustrates the indicative structure and key features of the IBRD and CTF guarantees and related and guarantee claims processes. This structure will be further refined as further market assessments are conducted as to the need for suitable risk mitigation and credit enhancement products for potential lenders and investors.

⁸ Under Colombian law, “public entities” (which includes *sociedades anónimas de economía mixta* in which GoC has a greater than 50 percent participation) may enter into interagency cooperation agreements (*convenios interadministrativos de cooperación*) in furtherance of administrative functions or to jointly provide services under their responsibility.

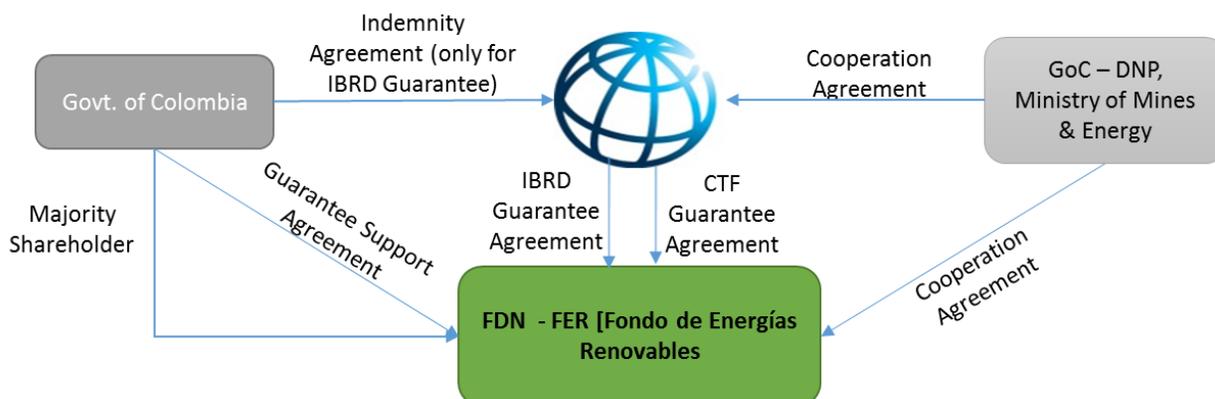
⁹ Critically, some 59 percent of mobilized funds will come from international capital markets and 28 percent from local financing.

Figure 3. Component 2 - Illustrative IBRD-CTF Guarantee Structure backstopping FDN Guarantees to Sub-projects



FDN will establish the FER (as defined above) to provide credit enhancement and other risk mitigation instruments to support the financing and development of renewable energy and energy efficiency projects. FDN will charge risk-based fees for each product that it offers to potential IPPs and aggregation vehicles under the FER, depending on the beneficiary of FDN’s guarantees. Sub-projects would need to comply with 4 main eligibility criteria to benefit from the IBRD and CTF guarantees: (a) be a private entity; (b) demonstrate capacity to handle environmental and social aspects compliant with World Bank Performance Standards; (c) not be sanctioned or debarred by the World Bank; and (d) meet industry standards for technical, economic viability, financial management and procurement. FDN will be the entity responsible for evaluating if sub-projects meet the eligibility criteria. (details on implementation arrangements regarding Environmental and Social (E&S) management will be added to Annex 3 before appraisal). In connection with the proposed guarantee structure, IBRD will enter into the contracts with FDN and GoC as illustrated below.

Figure 5: Component 2 - Illustrative Contractual Agreements between IBRD, FDN and/or the Government of Colombia



FDN will enter into two different guarantee agreements, one directly with IBRD with respect to the IBRD guarantee, and one with IBRD acting as implementing entity of the CTF with respect to the CTF guarantee.¹⁰

III. CONTACT POINTS

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¹⁰ Under applicable CTF policies, a counter-guarantee from the GoC will not be sought for the CTF allocation.

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