

## Technical Cooperation Abstract

### I. Basic project data

- Country/Region: Haiti
- TC Name: Sustainable Energy for Haiti
- TC Number: TBA
- Team Leader/Members: Christiaan Gischler (INE/ENE); Soo Hyun Lee (INE/ENE) Co-team leader; Natacha Marzolf (INE/ENE); Lumas Kendrick (ENE/CHA); Christopher Sewell (INE/ENE); Virginia Snyder (INE/ENE) under the supervision of Leandro Alves, Energy Division Chief (INE/ENE)
- Indicate if: Operational Support, Client Support, or Research & Dissemination: Client Support
- If Operational Support TC, give number and name of Operation Supported by the TC: N/A
- Reference to Request: (IDBDOCS #): TBD
- Date of TC Abstract: June 14<sup>th</sup> 2012
- Beneficiary: Government of Haiti (GoH)
- Executing Agency (EA): Inter-American Development Bank (IDB)
- IDB Funding Requested: US\$1,000,000
- Local counterpart funding, if any: US\$ 250,000
- Disbursement period (which includes execution period): TBD
- Required start date: September 1<sup>st</sup> 2012
- Types of consultants (firm or individual consultants): Consulting firm
- Prepared by Unit: INE/ENE
- Unit of Disbursement Responsibility: INE/ENE
- Included in Country Strategy (y/n); TC included in CPD (y/n): y
- GCI-9 Sector Priority: Climate change, Integration, and supporting development in small and vulnerable countries

### Objective and Justification

**General objective:** To perform Renewable Energy (RE) and Natural Gas (NG) feasibility studies for Haiti that will provide the GoH with comprehensive and concise information on what type of energy resources have potential in the country and how to incorporate them into the energy matrix to contribute to the improvement of Haiti's energy crisis.

**Specific objectives:** (i) To identify and assess the potential of RE and NG for Haiti by performing feasibility studies, creating legislation and; (ii) To foster and enable the development of pilot projects (based on the results of the feasibility studies) by proposing projects that combine the most efficient and effective energy options and technologies for Haiti.

**Main components:** (i) Natural gas feasibility studies; (ii) Renewable energy feasibility studies and pilot projects; (iii) Regulatory framework enhancement; and (iv) Capacity building and institutional strengthening of the sector.

**Justification:** Electricity access in Haiti is the lowest in the Latin American and Caribbean region. The electricity sector in Haiti has several weaknesses and it has been in crisis for decades. Haiti has a very limited availability and access to electricity, with significant technical and commercial energy losses. The main sources of energy generation are fossil fuels. There is basically no diversification in the energy matrix and the current power generation has a very low efficiency together with very poor energy resource management. Before the 2010 earthquake, Haiti had more than 88 percent of the country (7.5

million people) without access to electricity. The population that has access to electricity is between 12 and 20 percent and they only have an average of five to eight hours of service per day. In rural areas, just five percent has access to electricity.

The total installed generation capacity in 2010 in Haiti was about 150-MW, of which about 80 percent are diesel power plants. Besides the Péligre hydroelectric generation plant (54-Megawatts (MW) plant that feeds Port-au-Prince) there are six small hydroelectric plants with a total installed capacity of 7-MW serving the isolated systems. Approximately 75 percent of Haiti's total installed generation capacity was dedicated to the metropolitan area of Port-au-Prince in 2010.

With the assistance of the IDB, the GoH could continue working to reform, improve and transform the energy sector. This TC could: (i) achieve greater energy access for rural and urban households as well as businesses therefore improving the living standards of the population; (ii) improve the energy matrix in Haiti by promoting a sustainable mix of fuel sources; (iii) reduce Haiti's dependency on fossil fuels.

**This TC is aligned with IDB's institutional priorities** as outlined in the report on the Ninth General Capital Increase in Resources for the Inter-American Development Bank (GCI-9) (AB-2764). This TC contributes to the goals of (i) **“supporting development in small and vulnerable countries** “and; (ii) **“supporting climate change initiatives, renewable energy and the environment”**, which includes the ‘need to increase the knowledge base, strengthen frameworks and build capacity’. In addition, the TC is in line with the Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy (GN-2609-1). The TC is also in accordance to the Country Strategy.

## II. Description of activities and outputs

**Component I: Natural gas feasibility studies.** The approach of this feasibility study would be to analyze the potential of incorporating natural gas in Haiti's energy matrix in order to reduce the country's dependency on fossil fuels. This study will provide a better understanding of the available resources and potential of incorporating gas in the energy matrix. It will provide critical information to the GoH, national decision makers and private investors on the possibilities and opportunities to improve Haiti's critical energy situation. The approach and the specific objectives of the study are to: (i) analyze the scale of the demand, transportation, sources and applications for Haiti together with an (ii) prepare a pre-feasibility analysis of importing NG with the objective of substituting the generation of electricity with diesel for natural gas as well as including the cost of operations and converting the existing power plants (from diesel to NG).

**Component II: Renewable Energy feasibility studies and pilot projects (Rural and Urban Energy).** The government of Haiti has embarked upon an ambitious program to bring electrical service to the rural communities that are currently not served by the traditional electric grid. The goal is to provide electricity for 200,000 families. The feasibility studies<sup>1</sup> will analyze the potential of using RE to satisfy the aforementioned goal. This component will finance the following activities:

**Activity 1:** (i) solar public lighting; (ii) solar water heating systems; (iii) solar photovoltaic's using distributed generation; (iv) solar lanterns (which can provide a source of light in areas without distribution grid or electricity available in a very cost effective manner); and (v) solar cooking.

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<sup>1</sup> This feasibility study should first collect and analyze all existing studies and reports that have already been performed about the potential of solar energy in Haiti, including the review and inclusion of any international past and present experiences of solar energy in Haiti.

Activity 2: Design a sustainable rural electrification development model using RE or hybrid models (combination of fossil fuel and RE operated systems). This model should aim to achieve economic sustainability or at least cover the operation and maintenance cost, including the role of private entrepreneurs using micro-finance and other financial models for assuring the economic viability of the systems. The study shall also provide a selection methodology and detailed cost structure for potential and future pilot projects.

**Activity 3.** Cooking fuels. This component was chosen on the basis that rural electrification programs and clean cooking fuels programs are symbiotic in nature and put together will improve the financial sustainability of both programs<sup>2</sup>. Improving cooking fuels for the energy poor improves household air quality, directly improving health, and saves household resources such as time and income that would otherwise be spent collecting or purchasing firewood or charcoal<sup>3</sup>. Programs that provide clean modern cooking fuels save households money that they would otherwise have to spend each week for firewood and charcoal, where as electricity represents fixed cost that candles and kerosene for lighting did not (they could be purchased as income was available). The savings a household gains from the cooking fuels program can be applied toward the electricity service thus increasing the electricity project sustainability. The expected results of this activity would be to leverage existing cooking fuel programs in Haiti.

**Activity 4.** Pilot projects. The purpose of the pilot projects will be to demonstrate the applicability of the model to Haitian standards. The pilot projects shall do the following: (i) develop the selection criteria for determining the beneficiary location and targeted population for the pilots; (ii) design and install the pilots; and (iii) monitor and evaluate the results. The expected results of this activity would be to develop, design, install and monitor at least two pilot projects: (a) solar lanterns and (b) cooking fuel, including solar cooking applications.

**Component III. Regulatory framework to encourage the use of RE.** This component will support the preparation of draft policy and regulation documents required for the introduction of RE in Haiti including solar, wind and min-hydro among others. It is clear that the introduction of any of these technologies and energy resources need political support to improve their chances of entering into existing energy market. The RE support policies aim to reduce barriers for RE deployment, build up RE market capacities, make RE cost competitive and reduce Haiti's dependency on fossil fuels, and as a consequence contribute to mitigate climate change.

**Component IV. Capacity Building and Institutional strengthening.** This component will finance the preparation of recommendations for: (i) institutional strengthening and capacity building for key entities of the energy sector; and (ii) supporting public education and awareness to promote RE.

This TC should also finance and perform the following studies: Cost Effectiveness Analysis (CEA) comparing the different technologies among the different RE generation options (i.e., wind and mini-hydroelectricity); Cost Benefit Analysis (CBA) estimating the economic benefits, costs, and rate of return of the different technologies, including sensitivity analysis per IDB requirements; Monitoring and Evaluation (M&E) plan, risks assessment and environmental impact studies among others.

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<sup>2</sup> Liquid cooking fuels are already being sponsored by USAID and the World Bank to develop supply chains for these fuels as well as improve liquid cooking fuel regulation by strengthening Haiti's energy institutions.

<sup>3</sup> In Haiti, approximately 70% of total household energy consumption is for cooking, and most households meet this using firewood and charcoal.

III. **Budget:** The total amount of funding needed, showing allocations for each component as per the table below.

**Indicative Budget**

<b>Activity/ Component</b>	<b>IDB/Fund Funding</b>	<b>Counterpart Funding</b>	<b>Total Funding</b>
Feasibility studies on Natural Gas	300,000	-	300,000
RE feasibility studies and pilot projects	400,000	250,000	650,000
Regulatory Framework	100,000	-	300,000
Capacity building and Institutional strengthening	100,000	-	100,000
Project Management	80,000	-	80,000
Auditor	20,000	-	20,000
<b>Total</b>	<b>1,000,000</b>	<b>250,000</b>	<b>1,250,000</b>

IV. **Executing agency and execution structure:** IDB will be the EA through the Energy Division (INE/ENE) based on the GoH’s request. All the activities will be closely coordinated with the Country Office.

V. **Project Risks and issues:** The project does not present any major risks to project execution and achieving project objectives. However, we consider there is a need for coordination and cooperation among the different parties. In order to mitigate this risk, the Bank will engage all the different parties involved in the energy sector in the country to ensure the end results of this TC are utilized in the best possible way.

VI. **Environmental and Social Classification:** There are no environmental issues associated with this operation. Anticipated social risks may be related to animosities regarding who gets selected to participate in the program. To mitigate this risk, clear and transparent selection criteria will be established. ESG will be consulted for a classification.