Approved Project Preparation Funding Application

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<th>Application Title</th>
<th>Arundo Donax Renewable Bio-Mass Fuel for Belize - Feasibility Study and Funding Proposal Preparation</th>
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<td>Country/ Region</td>
<td>Belize</td>
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<td>Accredited Entity</td>
<td>Caribbean Community Climate Change Centre</td>
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<td>Approval Date</td>
<td>22 January 2018</td>
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GCF DOCUMENTATION

PROJECTS

GREEN CLIMATE FUND
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Please submit the completed form to:
ppf@gcfund.org

and use the following name convention for the file name:
“[PPF]-[Agency Short Name]-[Date]-[Serial Number]”

For more information regarding the PPF, please go to:
http://www.greenclimate.fund/partners/countries/fine-print
### A. Executive Summary *(in one page)*

**Accredited Entity**: Caribbean Community Climate Change Centre

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**Concept Note Title (reference number)**: Arundo Donax Renewable Bio-mass Fuel for Belize- Feasibility Study and Funding Proposal Preparation

**Country/Region**: Belize
This application for Project Preparation Facility (PPF) financing is being sought in order to enable Belize to develop and implement a bio-mass energy project, utilizing an indigenous fast growing C3 perennial rhizomatous grass - *Arundo donax* – currently available and to be cultivated widely on marginal lands in Belize. The PPF will be used specifically to fund the conduct of (a) A Feasibility Study to ascertain the technical, financial and economic viability of undertaking the full-scale project; (b) An Environmental and Social Impact Assessment; (c) A Stakeholder Analysis; and (d) A Gender Analysis. These studies are essential to developing a full funding and applicable supporting documents that are in accordance with the prescribed GCF processes and requirements. The proposed concept is consistent with The Government of Belize (GoB) objective of expanding the utilization of biomass to meet some of the country’s energy needs and achieve the dual aim of reducing the country’s carbon footprint and adapting to climate change impacts.

The GoB has requested the Caribbean Community Climate Change Centre (“5Cs”) - the entity that is charged with coordinating the Caribbean’s response to climate change - to spearhead the effort to analyse and determine a suitable and sustainable way forward for addressing the energy needs of the country.

In pursuit of that overarching objective this project aims to initially introduce a new high energy crop as a supplementary fuel for generation of electricity in Belize. Thereafter, large-scale cultivation on a commercial basis for ongoing use and for expanded use elsewhere will be pursued.

A successful fossil fuel displacement project, albeit partial in scope, will represent significant progress towards realizing Belize’s goals of becoming energy self-sufficient. The opportunity exists via previously undertaken and contemplated future investment to leverage existing infrastructure to provide immediate and direct benefits by inter alia overcoming a major national energy challenge. Developing a commercial renewable enterprise based on the use of *Arundo donax* could bring significant benefits to Belize and the Caribbean. The immediate benefits would be to stabilize power production from BELCOGEN, provide clean sustainable power throughout the year, create new jobs in the cultivation of *Arundo donax*, save foreign exchange by displacing imported Mexican power, increase energy security, reduce Belize’s greenhouse gas emissions and reduce BEL’s cost of power.

The feasibility study will assess the viability of this potentially significant source of green energy for Belize, that can displace the costlier and more high polluting alternative imported fossil fuel, thus lessening the strain on an already heavily burdened national economy.

An amount of US $ 694,000.00 is being sought to undertake the requisite project preparation activities for this vital, transformative and impactful project.

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<th>Anticipated Duration</th>
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<td>Estimated cost</td>
<td>Total Cost: US$739,700.00</td>
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<td>Funding amount requested to GCF: US$694,000.00</td>
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B. Description of Activities

The Government of Belize, through its accredited entity the Caribbean Community Climate Change Centre (CCCCC), is submitting this proposal to the Green Climate Fund to finance the feasibility assessment, environmental and social assessment and management plan, gender mainstreaming and stakeholder engagement that is expected to lead to the development and implementation of a fully scalable and bankable bio-mass energy production project in Belize, utilizing the native, fast growing, widely available C3 perennial rhizomatous grass - *Arundo donax*.

The objective of these project preparation assessments are to demonstrate, using an innovative and impactful approach, the long-term feasibility of a viable and environmental and social implications of renewable energy programme based on the utilization of the widely available, indigenous *Arundo donax*.

The activities to be funded through this request will comprise two inter-related and inter-dependent components:

**Component 1: Funding Proposal Preparation**

The activities involved in the funding proposal preparation will assess the merit and fundability of the concept, titled “*Arundo Donax Renewable Bio-mass Fuel for Belize*”. These activities include conducting:

i. A Feasibility Study, which will focus on the Technical, Financial and Economic feasibility of the concept as well as proposed operational and funding models that results in a sustainable project.

ii. A Stakeholder Analysis and Management and Engagement Plan, which will identify the stakeholders, and actions to engage these stakeholders, pertinent to the successful implementation and sustainability of the project. This include the general population, private sector, civil society, Non-Governmental Organisations (NGOs), Government of Belize and vulnerable groups such as the differently able, indigenous communities, women and children.

iii. A Gender Study and Gender Action Plan, which will mainstream gender consideration into the funding proposal and implementation of the project as well as ensure that women and children will duly benefits from the implementation of this project both in short- and long- run.

iv. An Environmental and Social Assessment (ESIA) and Environmental and Social Management Plan (ESMP), which will: (a) identify all potential environmental and social impacts of the project and measures to prevent, minimize, mitigate or compensate for adverse environmental and/or social impacts; (b) assess the legislative and regulatory environment; (c) identify appropriate institutional /organizational arrangements for this renewable energy initiative on a sustainable basis; (d) survey of the commercial interest from the sugar industry and other pertinent third parties (e) Investigate and present findings for PPP investment options in the underlying project and for the long-term sustainability of the investment (f) describe the nature and number of beneficiaries potentially affected by the proposed project; and (g) opportunities, risk and concerns/issues related to the proposed project.

Consultants will be hired to conduct above listed studies which are required to produce a Funding Proposal [FP] for the project and are applicable supporting documents that shall be included in the submission of funding proposal to the GCF. The project preparation activities will be streamline by a Project Coordinator. The Project Coordinator will manage all activities related to the project preparation as well as providing progress reports to the CCCCC. The Project Coordinator will be assisted by a Project Development Specialist of the CCCCC and Technical Officer. Two fielder officers will also help to ensure the smooth execution of, and reporting on, activities, especially those related to harvesting and processing of the Arundox Donax.
Component 2 – Fuel Compatibility Test

The conduct of Compatibility Test to assess the viability and compatibility of the fuel produced from *Arundo donax* fuel (shredded and dried) with the co-generation plant owned and operated by BELCOGEN in Orange Walk, Belize. The technical compatibility of the fuel with BELCOGEN’s co-generating equipment is to be determined through the actual use of the desiccated and shredded grass in the facility’s feeder systems and furnace over a period of time, a minimum of at least two days. The conduct of the compatibility assessment is an indispensable requirement for verifying the feasibility of the undertaking. During the assessment, the facility’s performance will be closely monitored.

An initial compatibility test was conducted in January 2017 following a request from the Company for shredded material which was delivered to the factory in November 2016. A total of nine (9) tonnes was made available. During one of the maintenance periods after the end of the milling season, the company introduced this amount to the furnace to determine whether it would support or sustain combustion. During this test, combustion was maintained but it was concluded that the amount utilized, was too small and was consumed too quickly to determine the impact on steam pressure and other parameters monitored during the operation of the furnace. The Company suggested that about 275 tons be delivered to facilitate a longer and more complete period of testing, but subsequently agreed that 150 tons would be adequate. The company indicated that this furnace consumed about 40 tons of biomass per hour”.

The *Arundo donax* to be used in the BELCOGEN facility must be delivered dried and shredded to the facility. The initial supply of the bio-mass material for this purpose will be harvested from natural stands occurring along the Monkey, Sittee, and North Stann Creek Rivers, where the plant is already growing densely and flourishing. Once harvested the material must be allowed a period of 6 months to dry so that the moisture content is reduced to a level that would render it suitable for use in the co-generation plant.

The proposed harvesting of a required minimum initial quantity of one hundred and fifty tons [150 tonnes] of *Arundo donax* will be collected in a manner as to avoid any environmental impacts/damages. This will be assured by: a). The harvesting will take place no closer than 66 feet from the highwater level of the rivers, which is the size of the buffer zone required by the Government. The harvested material will re-grow within a year and the SCs will comply with any additional requirement listed in the license from the Government. b). The harvesting will be done manually using motorized hand operated bush cutters to avoid any heavy equipment going into the growing area, thereby averting any environmental damage.

Previous compatibility test did not produce any residue that could be extracted or collected for enhancement of soil quality. Observations during the initial test did not show any kind of deposit falling to the floor of the burner. Furthermore, the cameras aimed at the exhaust showed a much cleaner exhaust than bagasse and The Arundo donax burns clean in the factory’s suspension furnace. If there is any residue however the expectation is that it will deposited/spread in the fields where the Arundo donax is cultivated.

It is proposed that harvesting begins in the second quarter and continues into the third quarter of the year. It could even begin late in the first quarter. This takes advantage of Belize’s dry season (March to May) to enable access to the locations where the grass grows (river banks). These locations would otherwise be inaccessible during the rainy season (beginning in late May into June), with the additional risk of flash floods and loss of the harvested material where the harvesters would have to work. The schedule for harvesting also takes into the consideration, the maintenance periods of the factory at the end of the sugar cane grinding season during which the tests might be conducted, and allows for some months of drying of the biomass since it has to be at least 50% or less moisture content for the furnace. It would require about three to six months of air drying to bring this quantity of biomass to the required minimum level of moisture content.”
The previously conducted, initial compatibility test utilized some 8 to 9 tons of Arundo donax and the costs was funded by the Centre. Due to the distance between the harvest sites and the ASR/BSI factory, the estimated cost of harvesting and delivery was US $1000.00 per ton. This base cost has been scaled up for the 150 tons required by the factory on this occasion. In anticipation that the entire 150 tons would not be obtained from national lands, some provision is made to procure from private land owners, who have indicated a price of US $ 10 per ton. Provision is made to procure up to 33% of the required volume from private land owners, whose landholdings are located in the same vicinity as the national lands.

Under this component the calorific value and/or efficiency of Arundo Donax will also be determined. This is to include an examination of the option of mixing Arundo donax biomass with bagasse in various proportions to examine relative performance.

### C.1 Background

Caribbean countries Belize included, are predicted/projected to be among the most highly vulnerable to the impacts of climate change. Climatic scientific data and other pertinent evidence confirm that these countries must of necessity adapt to climate variability and change, especially as they are expected to be dramatically impacted by among other things sea level rise and extreme weather events. However, it is well known that the economic costs of adaptation will be high and is required at precisely the time when the developing countries of the Caribbean have limited fiscal space and supporting resources. This scenario is compounded by the fact that most member countries of the Caribbean currently expend in excess of forty (40) percent of their foreign earnings and in some cases, more than 100 percent of export earnings to pay for imports of fossil fuel. This is not only unsustainable in the short and medium term, but also undermines the long-term sustainable development prospects of the region.

Among the myriad of measures that member states must pursue in order to mitigate and adapt to the effects of climate change, taking proactive steps to reduce the drain on national income arising from high energy costs is of utmost priority. In that regard the pursuit of a renewable energy option has assumed critical importance in the context of future development options.

Biomass is one of many renewable energy opportunities/options available to Belize, including wind, solar, geothermal, hydro, and waste and ocean energy, but biomass is particularly attractive for several reasons:

- Biomass can be used to create energy on a stable, able to dispatch basis, unlike intermittent sources of renewable energy,
- Belize has significant land resources that are not suited to feasible food crop production and therefore readily available for biomass production.
- it is the only proven renewable source of liquid transportation fuel, making its development invaluable in reducing imports of petroleum products;
- Lignocellulosic biomass can be converted into biofuels or fuel additives that are chemically, similar enough to petroleum-based fuels to allow for the continued use of existing engines and fuel distribution infrastructure;
- Biomass and biofuels can be transported away from where they are produced, thus presenting additional economic benefits;

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1. UNECLAC. Review of the Economics of Climate Change in the Caribbean. Retrieved in 2013 from [http://www.Caribbeanclimate.bz/closed project/2010-2011.-review of the economies of climate change-recc-eclacc.]: Studies conducted by the Economic Commission for Latin America and the Caribbean (UN ECLAC) for the Caribbean in 2013 indicated that these costs range from between US$20 billion to US$100 billion, with these costs likely being adjusted based on the degree to which the temperature changes.
Despite this potential, there have been relatively few commercial projects in Belize and in the wider Caribbean to develop biomass as a renewable energy source. This project seeks to address that deficiency by seeking to reduce the dependency on a volatile commodity such as fossil fuel but also offers the potential for:

1. The development of a new industry both at the community and company levels;
2. Increased energy security;
3. Increased adaptive capacity to climate change;
4. Increasing the country’s contribution to the reduction of GHG emissions;
5. Increased competitiveness through reduction in the cost of energy;
6. Improvement in the living standard of the country, as a whole, by providing new jobs.

Belize Sugar Industries (BSI) currently combusts bagasse in its 27.5 MW BELCOGEN co-generation plant to meet its own power and steam needs. BSI also sells excess power to Belize’s national power grid under a power purchase agreement (PPA) with Belize Electricity Limited (BEL), Belize’s primary distributor of electricity. However, BSI’s supply of bagasse is currently sufficient to fuel BELCOGEN only during the sugar season, roughly seven months of the year, so the facility remains idle for a significant portion of the year.

So this is energy production potential that is remaining idle at the same time that (i) the country is in the throes of an energy crisis and (ii) the GoB urgently needs to consider and explore options to realise a greater level of energy security so vital for realizing the country’s economic development potential. There is clearly a market for additional power, since the Government of Belize (GoB) will facilitate the sale of up a 100 Gigawatts hours annually, and currently BELCOGEN is only providing in the region of 60 Gigawatts hours annually.

The resultant shortfall in power supply from BELCOGEN adds to the financial burden on BEL, by reinforcing its dependence on imported power from the Mexican Federal Electricity Commission (CFE). BEL discussed this challenge in its 2011 annual report, stating that, “during the sugarcane’s off crop, BELCOGEN can only produce 5MW compared to the 13.2MW capacity under the PPA. Without full generation from BELCOGEN, in times when the CFE supply is unavailable, BEL would barely be able to meet the country’s peak power demand,” (of 82MW).

Supplying biomass to BELCOGEN in the off-season could enable the plant to operate throughout the year, and to provide power to Belize’s grid under the existing PPA. This agreement was signed in 2007 for 15 years. The plant design was for the production of 150 Gigawatts hours per year, representing 50 MW for internal consumption and 100 Gigawatts hours for sale to BEL. However, BELCOGEN has not been able to deliver at the agreed level due to insufficient bio-mass material and as a result, there is an ongoing pressure to renegotiate the agreement, based on the performance to date.

Increased power generated from BELCOGEN would in turn help BEL and by implication the sovereign state of Belize address some of its supply challenges, and reduce its dependence on the costlier diesel imported from Mexico. It would also yield substantial economic benefits for ASR/BSI, which could see power sales increase by nearly 22 GWh/year, yielding significant cost benefits to the country as a whole. This will come about since the rated installed capacity of the BELCOGEN facility is 27.5 MW which is comprised of 12.5 MW of back pressure turbines and 15 MW of condensing turbines. The back pressure turbines provide all power for internal use and the provision of process heat for the factory, the condensing turbines is to provide an estimated 13.5 MW for sale to the BEL. As a result of the design in the cooling system the production has been in the region of 10 MW for sale. So until the cooling system is upgraded the upper limit for power sale will be 10 MW.

The back pressure turbines produce power for the plant and process heat. These turbines cannot be used when there is no sugar production. So the maximum power output for export to BEL would be 13.5 MW in the off-season.

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2 The CFE is a company created and owned by the Mexican government. It generates, distributes and markets electric power
Finally, this project would validate the economic and technical feasibility of using the new energy crop, representing a first step toward expanded cultivation for the crop that could help Belize address its energy security challenges and meet its national goals.

C.2 Justification on request

Please provide rationale for GCF funding.

Apart from being one of the most vulnerable countries in the world to climate change, Belize is beset with mounting socio-economic problems including sluggish economic performance, and burgeoning unemployment particularly among the youth, failure of the private and public sectors to generate the level of economic activity to address rising unemployment, escalation of crime, High levels of poverty, etc. The Government of Belize is hard pressed to address these issues and at the same time to make the types of investment necessary to realize national objectives in respect of green growth, building climate resilience and sustainable development.

A GCF contribution in the form of financing of the proposed project preparation activities including feasibility and environmental and social impact studies are indispensable in assisting Belize to make further progress in advancing its green growth and climate change adaptation objectives, and in this particular case to be able to catalyse/mobilize private sector investment to deliver sustainable development solutions.

The conduct of these Preparatory Studies is an important transformational step in the development of a renewable energy project in Belize and by extension the Caribbean. Given the significance and scope of the proposed project as well as the fact that the project is the first major initiative of this kind in Belize and the Caribbean region, a thorough and comprehensive feasibility assessment and analysis must be undertaken in order to enable the eventual implementation of successful future investments. Only with the support of the GCF at this stage - in the form of support for the background feasibility assessments that will inform the nature and configuration of the eventual future investment - is it possible to catalyse the advancement of this major transformational initiative.

The availability of GCF funding at this stage is necessary to:

Assure technically and financially sound future investments by ensuring that the implementation of all subsequent investment in the sector will take place in a technically and financially sound and integrated manner, will be properly informed of viable scalability and replicability options, build the foundation for the implementation of a vital pioneering initiative in the region, as well as assessing the sustainability and viability of future investment.

Contribute to the implementation of a major climate mitigation initiative that can have a profound effect on the pursuit of the sustainable development goals of the country and the region: The conduct of this feasibility study is imperative for the realization of a climate change initiative that is considered a climate change priority for the region by national and regional governments and governing agencies (e.g. CARICOM). It will contribute to addressing a deep-rooted crippling vulnerability that the Caribbean faces which has been a fetter on the development of the region and its ability to realise its full development potential including becoming competitive in a liberalized global economy. As long as energy costs remain such a significant drain on national incomes and a major barrier to achieving competitiveness, the ability to attain sustainable development goals will remain elusive.

Contribute to the pursuit of investments aimed at reducing the country and region’s carbon footprint

Like the vast majority of CARICOM member states, Belize is net importer of fossil fuel which consumes a significant portion of its export earnings and is a major CHG pollutant. This puts a severe drain on the limited
financial resources of the country resulting in inter alia a diversion of valuable resources away from mitigation and adaptation related-initiatives. The feasibility Study is essential to effecting the paradigm shift that will see the region seeking to reduce in a meaningful way importation of fossil fuel through the development and use of the significantly lower polluting indigenous renewable energy.

**Provide Support for an Ongoing internally driven Climate Change Adjustment Measure:** The conduct of the Feasibility Study is essential to build on work that was undertaken previously with resources provided by the 5 Cs that confirmed conclusively *Arundo donax*’s suitability as a renewable energy crop because of inter alia its high energy and low ash content. The feasibility study is needed to advance this initial work some steps further towards realizing major investment in this vital sub-sector.

**Contribute to the implementation of a pioneering/flagship PPP project that is seeking to respond to Climate change variability and impact in Belize and the Caribbean in a proactive manner:** There has been extensive public, private partnership in the evolution of this pioneering initiative to date. A significant amount of previous preparatory work in advancing this project has already been done and financed by CCCCC and the private entity BELCOGEN. This partnership has developed based on the recognition of the significant transformative impact that this initiative can have on the economy of Belize and eventually by extension the region. The principal motivation and driver for the project goes well beyond the immediate commercial benefit and represents a decided step in the pursuit of the energy security goals and objectives of the country. In the absence of this feasibility Study, this potentially major impactful project may not see the light of day.

**Inform and Contribute to a Project that is projected to strongly satisfy GCF Investment Criteria:** Support for this initiative is fully justifiable on the grounds that the projected realizable investment that will be ushered into being facilitated by this feasibility study is prima facie strongly aligned with the investment criteria defined in the GCF’s Investment Framework.

**National Energy Security:** While it may not be immediately attractive to private capital, the pursuit of investment that contributes to national energy security is a major national development objective and of paramount importance to the Government and people of Belize. The country's overdependence on overland power supply from Mexico which in itself is highly vulnerable to various factors including climate related/climate induced factors, underscores the importance of this investment initiative.

Belize does not at the present time have the resources required to finance the feasibility study that it is hope will open the gateway to exploiting the full energy production and national economic potential of indigenous local bio-mass

### D. Implementation Plan

#### D.1 Implementation approach

The funds to be provided for this initiative will be managed in accordance with the terms and conditions of Readiness Framework Agreement between the Caribbean Community Climate Change Centre (CCCCC), and the Green Climate Fund (GCF). The CCCCC will also be responsible for reporting on the progress of the implementation of all envisaged activities.

Funds received according to an agreed disbursement schedule will be placed in a separate designated account established exclusively for the purpose of implementation of this PPF. The CCCCC will follow internationally acceptable financial standards in the management of all funds received under the PPF.

As an accredited entity of the GCF, CCCCC will also act as delivery partner. The CCCCC will identify a designated Project Manager who will serve as the principal interlocutor for the purpose of implementation of this initiative which role shall encompass inter alia ensuring that envisaged activities are progressing as per work plan and
budget; coordinate the project’s financial management and related reporting to ensure all necessary information is provided in a timely manner; Be integrally involved in overseeing the process of contracting the services to be performed; oversight of the conduct of envisioned studies. The PM has a coordination role across all committees and units.

The CCCCC will be responsible for all fiduciary (banking, procurement and hiring an independent auditor at the end of the project to audit the project). The CCCCC will procure all services for the project using international best practice and the appropriate procurement method. The independent auditor to be hired must have proven track record and will be ranked among the top 10 national auditors.

A system of quarterly reporting will be employed during the period of implementation. This report will detail both technical accomplishments and financial expenditure at that time. Additionally, there will be a final report at the end of the period of implementation. This report will also be accompanied by the final project financial audit to be completed by an Independent and accredited auditor. All records on this project will be kept for at least five years for review by the GCF or its authorized bodies after project completion.

Implementation of the Funding Proposal Preparation (Consultancy)

The expertise to coordinate this PPF and undertake the different studies will be sourced through a competitive bidding process to be administered by CCCCC. The Consultants will undertake the preparatory studies and analyses needed to assess the viability of future investment in bio-mass energy production in Belize utilizing Arundo donax as source material, and to use this as the supporting documentation to prepare a full Financing Proposal [with applicable supporting documents] for submission to the GCF for financing consideration.

Although, CCCCC will dedicate a project development specialist and a technical officer to aid in the coordination and execution of activities related to this project preparation, it must increase it human capacity to effectively and efficiently execute the project. This project is specific to the energy sector, particularly bio-mass; therefore, a project coordinator with experiences in the area of bio-mass and renewable energy will be hired to coordinate the activities identified. Additionally, two (2) field officers will be hired to monitor and report on field activities related to harvesting and processing of the Arundo Donax. This will ensure quality control, efficiency, safety and wellbeing and accountability.

Detailed ToRs detailing the tasks of the different Consultants have been developed by CCCCC and the Ministry of Finance and Economic Development of the Government of Belize (NDA) and are attached to this PPF application. However, these TORs are subject revision as inputs from other stakeholders are taken into consideration.

Compatibility Test

The precise scheduling of the supply of the dried and shredded Arundo donax to be used for assessing the calorific value of the material will depend on the request made by ASR/BSI. However, it is proposed to harvest the grass during the dry months of the year (March to May) due to the area in which it grows naturally and the difficulty of harvesting during the rainy season.

The material will then be shredded and dried for a period of at least five months. Past experience with BELCOGEN indicates a delivery date of November in order that testing be done during the off season regular maintenance of the furnaces.

Contractual arrangements

CCCCC will perform the function of Executing Agency for the various activities to be funded and the tender process will follow CCCCC established procurement procedures. This applies to all works, services and supplies that are proposed to be procured.
D.2 Implementation Schedule

The duration of the activities described in the table below should be completed within a 15-month period.

**Arundo Donax Project Preparation Implementation Schedule – 2017**

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<tr>
<td>Activity 2.1: Obtain DOE &amp; FD Permits</td>
<td>X</td>
<td>X</td>
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<td>Activity 2.2: Procure Shredder</td>
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<td>Activity 2.3: Procure Storage &amp; Drying facilities</td>
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<td>Activity 2.4: Harvest Arundo Donax</td>
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<td>Activity 2.5: Shred &amp; Dry Arundo Donax</td>
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<td>Activity 2.6: Loading and Delivering Arundo Donax to Plant</td>
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<td>Activity 2.7: Conduct Combustion Tests and Analysis</td>
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<td>Mid-Term Review</td>
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<tr>
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</tbody>
</table>

See also Excel document titled, “PPF Implementation Plan with Costs attached”.
The disbursement of this PPF will be in accordance with the Readiness Framework Agreement between the CCCCC and GCF. CCCCC shall be entitled to submit its first request for disbursement at any time following the effective date; thereafter, the CCCCC shall be entitled to submit two requests for disbursement each year, which must be submitted to the GCF within 30 days of receipt by the semi-annual report, “Portfolio Report”.

CCCCC will undertake continuous monitoring of the project through site visits and monthly reports, which will feed into the bi-annual progress reports. These will be used to assess the progress of the project implementation activities, compliance with CCCCC’s Accreditation Master Agreement and project agreements and monitor progress in achieving project outputs. CCCCC reporting to the GCF fund will be guided by its Accreditation Master Agreement and terms to be agreed in the funding agreement. The bi-annual reports will include all the completed technical studies as well as an overview of the progress made as per the agreed workplan, as well an explanation of any foreseen changes for the future.

To ensure projects continue to be both viable and sustainable, detailed timely reporting, monitoring and evaluation will be carried out. The project coordinator will provide CCCCC with (i) monthly monitoring reports in a format consistent with CCCCC project management and performance reporting system; (ii) consolidated into bi-annual progress reports including (a) progress achieved by output, (b) key implementation issues and solutions; and (c) updated Work Plans. These progress reports will be submitted to the GCF every six months. Financial audits of all accounts will also be conducted on a yearly basis.

CCCCC will also undertake a mid-term review in the 9th month after the start of the project preparation. The midterm review mission will:

1. review institutional, administrative, organizational, technical, environmental, social, economic, and financial aspects of the project and identify potential risks and corresponding mitigate actions.
2. review contracts to assess whether they are still relevant or need to be changed, or waived due to changing circumstances;
3. assess the need to restructure or reformulate the activities and the effects of this on the immediate objectives (purpose); and,
4. update the project’s design and monitoring framework if restructuring or reformulation is necessary.

A final report (completion report) will be submitted within three months after the completion of the project preparation activities. Additionally, within 6 months of physical completion of the project preparation activities the CCCCC will submit a full Funding Proposal for the concept described within this document.

D.3 Procurement Plan

*Please provide detailed procurement plan including methods, terms of reference of consultancy services.*

See Procurement plan below

E. Financing Plan
### Outputs and Activities

<table>
<thead>
<tr>
<th>Component 1: Feasibility Study and Funding Proposal Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity 1.1: Environmental and Social Impact Assessment and Management Plan</strong></td>
</tr>
<tr>
<td>International consultant (2 persons @ 60 days each)</td>
</tr>
<tr>
<td>Local consultant (1 person @ 120 days)</td>
</tr>
<tr>
<td>Travel (2 persons for 6 weeks)</td>
</tr>
<tr>
<td>Consultations (Meeting, Workshops, Focus Groups, Surveys)</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
</tr>
</tbody>
</table>

| **Activity 1.2: Stakeholder Analysis and Management and Engagement Plan** |
| Local/Regional consultant (1 person @ 80 days) | 80 | $400.00 | $32,000.00 | - | $32,000.00 |
| Travel | 1 | $2,500.00 | $2,500.00 | - | $2,500.00 |
| Consultations (Meeting, Workshops, Focus Groups, Surveys) | 40 | $500.00 | $20,000.00 | $5,000.00 | $15,000.00 |
| **Sub-total** | | | **$54,500.00** | **$5,000.00** | **$49,500.00** |

| **Activity 1.3: Gender Analysis and Gender Action Plan** |
| Local/Regional consultant (1 person @ 80 days) | 80 | $400.00 | $32,000.00 | - | $32,000.00 |
| Travel | 1 | $2,500.00 | $2,500.00 | - | $2,500.00 |
| Consultations (Meeting, Workshops, Focus Groups, Surveys) | 40 | $500.00 | $20,000.00 | - | $20,000.00 |
| **Sub-total** | | | **$54,500.00** | **-** | **$54,500.00** |

| **Activity 1.4: Feasibility Analysis (Technical, Financial and Economic)** |
| International consultant (2 persons @ 50 days each) | 100 | $550.00 | $55,000.00 | - | $55,000.00 |
| Local consultant (1 person @ 100 days) | 100 | $200.00 | $20,000.00 | - | $20,000.00 |
| Travel (2 persons for 6 weeks) | 12 | $2,500.00 | $30,000.00 | - | $30,000.00 |
| Consultations (Meeting, Workshops, Focus Groups, Surveys) | 20 | $500.00 | $10,000.00 | $2,500.00 | $7,500.00 |
| **Sub-total** | | | **$115,000.00** | **$2,500.00** | **$112,500.00** |

| **Activity 1.5: Draft GCF Funding Proposal (CCCCC)** |
| Project Development Specialist (1 person @ 120 days) | 120 | $250.00 | $30,000.00 | $20,000.00 | $10,000.00 |
| **Sub-total** | | | **$30,000.00** | **$20,000.00** | **$10,000.00** |

### Component 2: Fuel Compatibility Test

| Activity 2.1: DOE & FD Permits | 2 | $1,000.00 | $2,000.00 | - | $2,000.00 |
| Activity 2.2: Shredder | 1 | $15,000.00 | $15,000.00 | - | $15,000.00 |
| Activity 2.3: Storage & Drying facilities | 1 | $45,000.00 | $45,000.00 | - | $45,000.00 |
| Activity 2.4: Harvest Arundo Donax (cutting and haulage) (150 tons) | 150 | $320.00 | $48,000.00 | - | $48,000.00 |
| Activity 2.5: Shred & Dry Arundo Donax (150 tons) | 150 | $150.00 | $22,500.00 | - | $22,500.00 |
| Activity 2.6: Loading and Delivering Arundo Donax to Plant (150 tons) | 150 | $540.00 | $81,000.00 | - | $81,000.00 |
### Activity 2.7: Conduct combustion tests

| Sub-total | $213,500.00 | - | - | - |
| Activity Total | $607,500.00 | $27,500.00 | - | $580,000.00 |

### Project Management and Reporting

<table>
<thead>
<tr>
<th>Position</th>
<th>No. of</th>
<th>DSA (Hotel)</th>
<th>DSA (Meal)</th>
<th>No. of TRIPS</th>
<th>Unit Cost (est.)</th>
<th>Ground Transportation</th>
<th>Other Expenses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Coordinator (1 person @ 110 day)</td>
<td>110</td>
<td>$200.00</td>
<td>$22,000.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$22,000.00</td>
</tr>
<tr>
<td>Technical Officer (1 person @ 90 days)</td>
<td>90</td>
<td>$100.00</td>
<td>$9,000.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$9,000.00</td>
</tr>
<tr>
<td>Field supervisors/officers (1 persons @ 90 days)</td>
<td>180</td>
<td>$80.00</td>
<td>$7,200.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$7,200.00</td>
</tr>
<tr>
<td>Auditor (2 Audits)</td>
<td>2</td>
<td>$5,500.00</td>
<td>$11,000.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$11,000.00</td>
</tr>
<tr>
<td>Sub-total</td>
<td>-</td>
<td>$49,200.00</td>
<td>$16,200.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$33,000.00</td>
</tr>
</tbody>
</table>

| | Grand total of operation costs | $656,700.00 | $43,700.00 | - | - | - | - | $613,000.00 |
| Contingency (3.6%) | - | - | - | - | - | - | - | $23,000.00 |
| AE Fee* (10%) | $58,000.00 | - | - | - | - | - | - | $58,000.00 |
| Grand total | $739,700.00 | $45,700.00 | - | - | - | - | - | $694,000.00 |

*The AE Fee is aligned with the Accreditation Master Agreement between the GCF and CCCCC. In this case it will cover costs associated with the operation of the centre including office space, utilities, equipment, vehicle(s), fuel, executive and technical involvement, quality control, monitoring and evaluation and reporting.

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### TRAVEL BUDGET FOR CONSULTANTS

<table>
<thead>
<tr>
<th>COUNTRY TRAVELLED</th>
<th>NO. OF NIGHTS</th>
<th>DSA (Hotel)</th>
<th>DSA (Meal)</th>
<th>NO. OF TRIPS</th>
<th>UNIT COST (EST.)</th>
<th>GROUND TRANSPORTATION</th>
<th>OTHER EXPENSES</th>
<th>TOTAL</th>
</tr>
</thead>
</table>

**Activity 1.1: Environmental and Social Impact Assessment and Management Plan**

| Consultant #1 | 42 | 120.00 | 85.00 | 3 | 1,400.00 | 1,290.00 | 900.00 | 15,000.00 |
| Consultant #2 | 42 | 120.00 | 85.00 | 3 | 1,400.00 | 1,290.00 | 900.00 | 15,000.00 |

**Activity 1.2: Stakeholder Analysis and Management and Engagement Plan**

Consultant #1 (Local) | 1,400.00 | 1,100.00 | 2,500.00 |

**Activity 1.3: Gender Analysis and Gender Action Plan**

Consultant #1 (Local) | 1,400.00 | 1,100.00 | 2,500.00 |

**Activity 1.4: Feasibility Analysis (Technical, Financial and Economic)**

| Consultant #1 | 42 | 120.00 | 85.00 | 3 | 1,400.00 | 1,290.00 | 900.00 | 15,000.00 |
| Consultant #2 | 42 | 120.00 | 85.00 | 3 | 1,400.00 | 1,290.00 | 900.00 | 15,000.00 |

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### F. Risk and Mitigation measures
Please describe the financial and operational risks and discuss mitigating measures.

<table>
<thead>
<tr>
<th>Financial Risk</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexpectedly high cost of cultivation and delivery</td>
<td>Use existing methods of planting sugarcane and locate plantation within 20-mile radius of the furnace</td>
</tr>
<tr>
<td>Financial support to the project is inadequate</td>
<td>Activities can be scaled down</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational Risks</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inability to secure the quantity required for compatibility testing</td>
<td>At least three major sources are already approved for the 5Cs to harvest.</td>
</tr>
<tr>
<td>Loss of the crop to wildfires</td>
<td>Construction of buffer roads &amp; security men on duty</td>
</tr>
<tr>
<td>Failure to meet ASR/BSI deadline for delivery</td>
<td>Instructions to supply sent to 5Cs several months in advance of testing date</td>
</tr>
</tbody>
</table>

Please briefly specify the substantial environmental and social risks that the readiness support may face and the proposed risk mitigating measures.

The Environmental and Social Screening (ESS) for the project preparation activities are minimal. Additionally, an assessment of the activities that will potential be scaled up during the full implementation of the project. The proposal activities are assessed against the eight Performance Standards (PS) of the GCF: PS1: Assessment and Management of Environmental and Social Risks and Impacts; PS2: Labor and Working Conditions; PS3: Resource Efficiency and Pollution Prevention; PS4: Community Health, Safety and Security, PS5: Land Acquisition and Involuntary Resettlement; PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources; PS7: Indigenous Peoples, and PS8: Cultural Heritage. This screening takes into consideration the findings articulated in the Environment and Risk Management Plan for Piloting the Cultivation of Arundo Donax in Northern Belize³.

The main findings of the screening can be summarized as follow:
1. The project is a category B project having “activities with potential mild adverse environmental and/or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.”
2. Further assessment of the environmental and social impacts need to be conducted to identify the most suit activities to include it the project proposal and the ‘best’ approach, which mitigates environmental and social risk, for implementation.
3. Harvesting the Arundo Donax does not pose any health risks.
4. Safety measures and guidelines are in place; however, the project coordinator must ensure that these are adhere by person directly involved in the implementation of the project.
5. The energy generated by using Arundo Donax as a biofuel will reduce Belize’s demand for energy produced using fossil fuel.
6. Project will be on remote marginal land, which are owned by the Government of Belize; therefore, the project will not displace peoples.
7. The project preparation stage requires little to no training; however, during the project preparation it is the CCCCC’s intention to identify the knowledge gaps and training and certification needed to fill these gaps.
8. The Compatibility testing of the Arundo donax (a grass) in the furnaces of the Company (ASR/BSI) requires harvesting of a quantity from the natural habitats. This has been facilitated under permits issues.

³ This report is an Environment and Risk Management Plan that was drafted for the project in February, 2016. This report is annexed to the PPF application.
9. The Project does not involve large-scale infrastructure development.

10. Gender Analysis proposed under the PPF will better articulate the actions needed to mainstream gender consideration into the full funding proposal.

### Project Environmental and Social Risk

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Categories</th>
<th>Project Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td><strong>Category A</strong>&lt;br&gt;Activities with potential significant adverse environmental and/or social risks and/or impacts that are diverse, irreversible, or unprecedented.</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td><strong>Category B</strong>&lt;br&gt;Activities with potential mild adverse environmental and/or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.</td>
<td>X</td>
</tr>
<tr>
<td>Low/No</td>
<td><strong>Category C</strong>&lt;br&gt;Activities with minimal or no adverse environmental and/or social risks and/or impacts</td>
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</table>

Based on these findings the request for an Environmental and Social Impact Assessment and appropriate Action Plan is justified and will be prepared in line with regulations of the Government of Belize, CCCCC and GCF environmental and social safeguards and best practice. The outcomes of consultations held with stakeholders throughout the project preparation process will aid in the implementation of the project. It will also mainstream gender considerations in the project and detail actions for stakeholder engagement and management.
a Concept Note has not been submitted for the underlying project for which the Project Preparation Grant is being requested, kindly complete the following sections.

**Project / Programme Information**

<table>
<thead>
<tr>
<th>Project / programme title</th>
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<tbody>
<tr>
<td>Country (ies) / region</td>
<td></td>
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<tr>
<td>Mitigation / adaptation focus</td>
<td>Mitigation ☐  Adaptation  Cross-cutting ☐</td>
</tr>
<tr>
<td>Results areas</td>
<td>Please list here the options from Annex - Table 1 that apply to this project/program</td>
</tr>
</tbody>
</table>

**Project / programme description (including objectives)**

Please describe briefly (up to 1 or 1.5 pages) the background, objectives, components and main activities of the proposed project/programme

**Alignment with GCF Criteria**

Please provide a short summary of alignment of this project/programme with GCF’s investment criteria

**Brief Rationale for GCF Involvement and Exit Strategy**

Please provide a short summary explaining why the GCF contribution is critical for the project/programme and how the project/programme sustainability will be ensured in the long run (after the project/programme is implemented with support from the GCF and other sources)
### Financing/Cost Information
Details on financing sources:

<table>
<thead>
<tr>
<th>FUNDING SOURCE</th>
<th>AMOUNT (USD/EUR/JPY/GBP)</th>
<th>FINANCIAL INSTRUMENT (Equity, loan, guarantee, grant)</th>
<th>Tenor</th>
<th>Pricing</th>
<th>Seniority</th>
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</thead>
<tbody>
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<td>(   ) years</td>
<td>%</td>
<td>Options</td>
</tr>
<tr>
<td>Co-financing from AE</td>
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<td>(   ) years</td>
<td>%</td>
<td>Options</td>
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<tr>
<td>Other (please specify name of institution)</td>
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<td>(   ) years</td>
<td>%</td>
<td>Options</td>
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<tr>
<td>TOTAL PROJECT FINANCING</td>
<td>= Total project cost</td>
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</tbody>
</table>

Table 1. Results Areas

Which of the following targeted results areas does the proposed project/programme address?

**Reduced emissions from:**
- Energy access and power generation
  - (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- Low emission transport
  - (E.g. high-speed rail, rapid bus system, etc.)
- Buildings, cities, industries and appliances
  - (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- Forestry and land use
  - (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

**Increased resilience of:**
- Most vulnerable people and communities
  - (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
- Health and well-being, and food and water security
  - (E.g. climate-resilient crops, efficient irrigation systems, etc.)
- Infrastructure and built environment
  - (E.g. sea walls, resilient road networks, etc.)
- Ecosystems and ecosystem services
  - (E.g. ecosystem conservation and management, ecotourism, etc.)
### Table 2. Investment Criteria Guidance Notes

The following guidance note may help to present the potential of the Project/Programme to achieve the Fund’s six investment criteria.

| D.1. Climate impact potential  
[Potential to achieve the GCF’s objectives and results] | Specify the climate mitigation and/or adaptation impact. Provide specific values for the below indicators and any other relevant indicators and values, including those from the Fund’s Performance Measurement Frameworks.  
- Total tonnes of CO₂ eq to be avoided or reduced per annum  
- Expected total number of direct and indirect beneficiaries and number of beneficiaries relative to total population (e.g. total lives to be saved from disruption due to climate-related disasters) |
|---|---|
| D.2. Paradigm shift potential  
[Potential to catalyze impact beyond a one-off project or programme investment] | Provide the estimates and details of the below and specify other relevant factors.  
- Potential for scaling-up and replication (e.g. multiples of initial impact size)  
- Potential for knowledge and learning  
- Contribution to the creation of an enabling environment  
- Contribution to the regulatory framework and policies |
| D.3. Sustainable development potential  
[Potential to provide wider development co-benefits] | Provide the estimates of economic, social and environmental co-benefits. Examples include the following:  
- Economic co-benefits  
  - Total number of jobs created  
  - Amount of foreign currency savings  
  - Amount of government’s budget deficits reduced  
- Social co-benefits  
  - Improved access to education  
  - Improved regulation or cultural preservation  
  - Improved health and safety  
- Environmental co-benefits  
  - Improved air quality  
  - Improved soil quality  
  - Improved biodiversity  
- Gender-sensitive development impact  
  - Proportion of men and women in jobs created |
| D.4. Needs of recipient  
[Vulnerability to climate change and financing needs of the recipients] | Describe the scale and intensity of vulnerability of the country and beneficiary groups and elaborate how the project/programme addresses the issues. Examples of the issues include the following:  
- Level of exposure to climate risks for beneficiary country and groups  
- Does the country have a fiscal or balance of payment gap that prevents from addressing the needs?  
- Does the local capital market lack depth or history?  
- Needs for strengthening institutions and implementation capacity |
| D.5. Country ownership  
[Beneficiary country ownership of project or programme and capacity to implement the proposed activities] | Provide details of the below and specify other relevant factors.  
- Coherence and alignment with the country’s national climate strategy and priorities in mitigation or adaptation  
- Brief description of executing entities (e.g. local developers, partners and service providers) along with the roles they will play  
- Stakeholder engagement process and feedback received from civil society organizations and other relevant stakeholders |
<table>
<thead>
<tr>
<th>D.6. Effectiveness and efficiency [Economic and financial soundness and effectiveness of the proposed activities]</th>
<th>Provide details of the below and specify other relevant factors (i.e. debt service coverage ratio), if available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Estimated cost per t CO2 eq (total investment cost/expected lifetime emission reductions)</td>
<td></td>
</tr>
<tr>
<td>• Co-financing ratio (total amount of the Fund’s investment as percentage of project)</td>
<td></td>
</tr>
<tr>
<td>• Economic and financial rate of return</td>
<td></td>
</tr>
<tr>
<td>- With the Fund’s support</td>
<td></td>
</tr>
<tr>
<td>- Without the Fund’s support</td>
<td></td>
</tr>
</tbody>
</table>
Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

Accredited entities may choose to submit a concept note, in consultation with the relevant national designated authority, to present the proposed project or programme idea in order to receive early feedback and recommendation.

Project/Programme Title: **Arundo donax Renewable Bio-mass Fuel for Belize**

Country/Region: Belize

Accredited Entity: CCCCC

National Designated Authority: Yvonne Hyde, CEO, Ministry of Finance and Economic Development, Belize
### A. Project / Programme Information

<table>
<thead>
<tr>
<th>A.1. Project / programme title</th>
<th>Arundo donax Renewable Bio-mass Fuel for Belize</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.2. Project or programme</td>
<td>Project</td>
</tr>
<tr>
<td>A.3. Country (ies) / region</td>
<td>Belize Caribbean</td>
</tr>
<tr>
<td>A.4. National designated</td>
<td>Yvonne Hyde, CEO, Ministry of Finance and</td>
</tr>
<tr>
<td>authority(ies)</td>
<td>Economic Development</td>
</tr>
<tr>
<td>A.5. Accredited entity</td>
<td>Caribbean Community Climate Change Centre (CCCCC)</td>
</tr>
<tr>
<td>A.6. Executing entity /</td>
<td>Executing Entity: CCCCC</td>
</tr>
<tr>
<td>beneficiary</td>
<td>Beneficiary: Belize</td>
</tr>
<tr>
<td>A.7. Access modality</td>
<td>Direct ☒</td>
</tr>
<tr>
<td></td>
<td>International ☐</td>
</tr>
<tr>
<td>A.8. Project size category</td>
<td>Micro (≤10) ☐</td>
</tr>
<tr>
<td>(total investment, million</td>
<td>Small (10&lt;x≤50) ☒</td>
</tr>
<tr>
<td>USD)</td>
<td>Medium (50&lt;x≤250) ☐</td>
</tr>
<tr>
<td></td>
<td>Large (&gt;250) ☐</td>
</tr>
<tr>
<td>A.9. Mitigation / adaptation</td>
<td>Mitigation ☐</td>
</tr>
<tr>
<td>focus</td>
<td>Adaptation ☐</td>
</tr>
<tr>
<td></td>
<td>Cross-cutting ☒</td>
</tr>
<tr>
<td>A.10. Public or private</td>
<td>PPP</td>
</tr>
<tr>
<td>A.11. Results areas</td>
<td>Which of the following targeted results areas</td>
</tr>
<tr>
<td>(mark all that apply)</td>
<td>does the proposed project/programme address?</td>
</tr>
<tr>
<td></td>
<td>Reduced emissions from:</td>
</tr>
<tr>
<td></td>
<td>☒ Energy access and power generation</td>
</tr>
<tr>
<td></td>
<td>(E.g. on-grid, micro-grid or off-grid solar,</td>
</tr>
<tr>
<td></td>
<td>wind, geothermal, etc.)</td>
</tr>
<tr>
<td></td>
<td>☐ Low emission transport</td>
</tr>
<tr>
<td></td>
<td>(E.g. high-speed rail, rapid bus system, etc.)</td>
</tr>
<tr>
<td></td>
<td>☐ Buildings, cities, industries and appliances</td>
</tr>
<tr>
<td></td>
<td>(E.g. new and retrofitted energy-efficient</td>
</tr>
<tr>
<td></td>
<td>buildings, energy-efficient equipment for</td>
</tr>
<tr>
<td></td>
<td>companies and supply chain management, etc.)</td>
</tr>
<tr>
<td></td>
<td>☒ Forestry and land use</td>
</tr>
<tr>
<td></td>
<td>(E.g. forest conservation and management,</td>
</tr>
<tr>
<td></td>
<td>agroforestry, agricultural irrigation,</td>
</tr>
<tr>
<td></td>
<td>water treatment and management, etc.)</td>
</tr>
<tr>
<td></td>
<td>Increased resilience of:</td>
</tr>
<tr>
<td></td>
<td>☒ Most vulnerable people and communities</td>
</tr>
<tr>
<td></td>
<td>(E.g. mitigation of operational risk associated</td>
</tr>
<tr>
<td></td>
<td>with climate change – diversification of</td>
</tr>
<tr>
<td></td>
<td>supply sources and supply chain management,</td>
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<tr>
<td></td>
<td>relocation of manufacturing facilities and</td>
</tr>
<tr>
<td></td>
<td>warehouses, etc.)</td>
</tr>
<tr>
<td></td>
<td>☒ Health and well-being, and food and water</td>
</tr>
<tr>
<td></td>
<td>security</td>
</tr>
<tr>
<td></td>
<td>(E.g. climate-resilient crops, efficient</td>
</tr>
<tr>
<td></td>
<td>irrigation systems, etc.)</td>
</tr>
<tr>
<td></td>
<td>☐ Infrastructure and built environment</td>
</tr>
<tr>
<td></td>
<td>(E.g. sea walls, resilient road networks, etc.)</td>
</tr>
<tr>
<td></td>
<td>☐ Ecosystems and ecosystem services</td>
</tr>
<tr>
<td></td>
<td>(E.g. ecosystem conservation and management,</td>
</tr>
<tr>
<td></td>
<td>ecotourism, etc.)</td>
</tr>
<tr>
<td>A.12. Project / programme</td>
<td>.............................. years</td>
</tr>
<tr>
<td>life span</td>
<td></td>
</tr>
<tr>
<td>A.13. Estimated</td>
<td>Start: ...........................................</td>
</tr>
<tr>
<td>implementation start and</td>
<td>End: .............................................</td>
</tr>
<tr>
<td>end date</td>
<td></td>
</tr>
</tbody>
</table>

1 Please use the following naming convention for the file name: “[CN]-[Agency short name]-[Date]-[Serial number]” (e.g. CN-ABC-20150101-1).
### B. Project/Programme Details

The Fund requires the following preliminary information in order to promptly assess the eligibility of project/programme investment. These requirements may vary depending on the nature of the project/programme.

<table>
<thead>
<tr>
<th>B.1. Project / programme description (including objectives)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project is a joint public-private sector initiative that aims to limit the impacts of Climate Change as well as contribute to the global climate change mitigation efforts. Impacts limitation and adaptation will come through the socio-economic benefits that will accrue, whilst mitigation will come through the reduction of GHG emissions.</td>
</tr>
<tr>
<td>1. The principal collaborators in the development of the project are:</td>
</tr>
<tr>
<td>1. The Government of Belize (GOB)</td>
</tr>
<tr>
<td>2. The Caribbean Community Climate Change Centre (5Cs)</td>
</tr>
<tr>
<td>3. The Global Environmental Facility (GEF) through its Implementing Agency, the World Bank (WB)</td>
</tr>
<tr>
<td>4. The American Sugar Refinery (ASR) through its Belize subsidiary the Belize Sugar Industry (BSI)</td>
</tr>
<tr>
<td>5. The Belize Electricity Limited (BEL)</td>
</tr>
<tr>
<td>This investment initiative is a scalable four-year project on the use of Arundo donax as a renewable energy source. The energy source raw material – the Arundo donax - is an indigenous fast growing plant species that is prevalent on marginal, non-agricultural land which is abundant throughout Belize. The feasibility of the crop as a high energy production source has already been proven and established/demonstrated through previous study and analysis undertaken by 5Cs. The project has thus far evolved through an iterative process of development that includes a prefeasibility study, to be followed by inter alia an assessment of the feasibility and sustainability of the undertaking from a technical, economic and financial (including distributive and sensitivity analyses), institutional and managerial, environmental and socio-cultural standpoint. It is the expectation that once the feasibility of the initiative is confirmed, it will serve as the platform for replication and scaling up in Belize and other CARICOM countries.</td>
</tr>
<tr>
<td>The principal objective of the project is to demonstrate - using an innovative and impactful approach - the long-term feasibility of a viable renewable energy programme using Arundo donax that can be firstly implemented in Belize and thereafter replicated in the wider Caribbean and hemispheric region.</td>
</tr>
</tbody>
</table>

### Rationale

Member countries of the Caribbean Community are net fossil fuel importers for which a significant portion of their export earnings is used. This puts a severe drain on the limited financial resources of most Caribbean countries that results in diverting valuable resources from adaptation related and sustainable development initiatives. A meaningful reduction in the importation of fossil fuel through the development and use of an indigenous renewable energy source will yield significant, transformative, socio-economic and environmental benefits to the country and region as a whole.

<table>
<thead>
<tr>
<th>B.2. Background information on project/programme sponsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe project/programme sponsor’s operating experience in the host country or other developing countries.</td>
</tr>
<tr>
<td>The Caribbean Community Climate Change Centre (CCCCC) coordinates the Caribbean region’s response to Climate Change, working on effective, innovative and transformative solutions and projects to combat the environmental impacts of Climate variability, Climate Change and extreme weather events. Guided by its Regional Strategic Framework – Achieving Development Resilient to Climate Change (2009 – 2015), and its accompanying Implementation Plan (2011-2021) to actualize the Framework, the Centre provides Climate Change-related policy advice and guidelines to the Caribbean Community (CARICOM) Member States through the CARICOM</td>
</tr>
</tbody>
</table>

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2 These should detail your cost benefit and/or cost effectiveness analyses, detail your discount factor being applied and justify same and the market demand and supply conditions.
Secretariat and to the United Kingdom (UK) Caribbean Overseas Territories. This project builds upon the Centre’s more than ten (10) years of impactful experience, having been a regional leader carrying out catalytic pilot/demonstration type projects in the Caribbean region, and scaling these up with national governments to bring about transformational change. Examples of such efforts include the pursuance of water security in four (4) Member States, i.e., Barbados, Belize, Grenada and St. Vincent and the Grenadines, through the usage of saltwater reverse osmosis (SWRO) desalination plants utilizing a renewable energy source in solar energy; and presently the pursuit of a bio-diesel project in Belize. For better project coordination, based on a programmatic approach, the Centre has established the Programme Development and Management Unit (PDMU). The PDMU is comprised of Project Developers, Project Managers, Project Analysts, and a Monitoring and Evaluation Specialist. In managing this project, the PDMU will work closely with the Renewable Energy Unit at the Centre and will appoint a special Project Manager, with a dedicated Accountant, and an agriculturalist and will draw upon the other collective expertise within the Centre to carry out the Project Implementation function. All activities must be consistent with the Centre’s approved Environmental and Social Safeguard (ESS) Policy to ensure they are in consonance with the objectives of that Policy. Furthermore, gender and no-discriminatory considerations and strict adherence to financial best practices will be pursued.

The Centre is also the archive and clearing house for regional Climate Change data and documentation in the Caribbean and has an in-house Communications Specialist, thus making it uniquely positioned to share in issues of lesson learned from adaptation and mitigation interventions which can be scaled-up to other Caribbean territories. In its role as a Climate Centre, the entity is recognized by the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Environment Programme (UNEP), and other international agencies as the focal point for Climate Change issues in the Caribbean. It has also been recognized by the United Nations Institute for Training and Research (UNITAR) as a Centre of Excellence, one of an elite few.

Through its role as a Centre of Excellence, the Centre will support the people of the Caribbean as they address the impact of climate variability and change on all aspects of economic development through the provision of timely forecasts and analyses of potentially hazardous impacts of both natural and man-induced climatic changes on the environment, and the development of special programmes which create opportunities for sustainable development, as this one is expected to do

The CCCCC has an established and proven track-record as the leader in climate change adaptation planning and management throughout the Caribbean. It has many operational program linkages and networks. This unique capacity will ensure effective and efficient project delivery, and guarantee the sustainability of program outcomes and impacts. More importantly, the CCCCC is the repository of current state of the art climate change models in the Caribbean region. Furthermore, the Centre remains a major implementer of substantial projects, inclusive of the European Union Intra-ACP Global Climate Change Alliance (EU-GCCA) Project in the Caribbean, a Coastal Protection Project being financed by the German Development Bank, and the United Kingdom Support for the Implementation Plan Project. Additionally, the Centre was/is one of the implementing agencies of the United Nations-Economic Commission for Latin America and the Caribbean’s (UN-ECLAC’s) Regional Economics of Climate Change Studies (RECCS) for the Caribbean, the Inter-American Development Bank (IDB) co-financed Caribbean Carbon Neutral Tourism Project (RG-T1640); and the Database Management System for a Regional Observing Network for Environmental Change in the Wider Caribbean (RG-T1813), and the Pilot Program on Climate Resilience (PPCR) Regional Component. All of these projects are being implemented in the Centre’s Member States, with whom it has and continue to work closely.

Of critical importance is the fact that the Centre has financed the precursor activities that have contributed to the development of the project to date. This is demonstrative of the Centre’s commitment and competence in contributing to the transformation of
the development paradigm in a region that has to confront the challenges of a changing climate regime.

Describe financial status and how the project/programme sponsor will support the project/programme in terms of equity, management, operations, production and marketing.

The conduct of a feasibility study is proposed that will inter alia examine options, and present for consideration and decision making, various modalities for the proper structuring of an investment package to advance the commercialization of arundo donax as a renewable energy alternative in Belize. That will include a consideration of investment options, equity investment, management, operations, production and marketing, etc.

<table>
<thead>
<tr>
<th>B.3. Market overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the market for the product(s) or services including the historical data and forecasts.</td>
</tr>
<tr>
<td>Provide the key competitors with market shares and customer base (if applicable).</td>
</tr>
<tr>
<td>Provide pricing structures, price controls, subsidies available and government involvement (if any).</td>
</tr>
<tr>
<td>A comprehensive market assessment inclusive of the above issues will be examined and presented as part of the findings and output of the Feasibility Study.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B.4. Regulation, taxation and insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide details of government licenses, or permits required for implementing and operating the project/programme, the issuing authority, and the date of issue or expected date of issue.</td>
</tr>
<tr>
<td>Describe applicable taxes and foreign exchange regulations.</td>
</tr>
<tr>
<td>Provide details on insurance policies related to project/programme.</td>
</tr>
<tr>
<td>The aforementioned issues will be thoroughly examined and considered as part of the feasibility assessment process, and the findings and recommendations presented for consideration as part of the Funding Proposal preparation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B.5. Implementation arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe construction and supervision methodology with key contractual agreements and the operational arrangements with key contractual agreements following the completion of construction.</td>
</tr>
<tr>
<td>Provide a timetable showing major scheduled achievements and completion for each of the major components of the project/programme.</td>
</tr>
<tr>
<td>The aforementioned issues will be thoroughly examined and considered as part of the feasibility assessment process, and the findings and recommendations presented for consideration as part of the Funding Proposal preparation.</td>
</tr>
</tbody>
</table>
C. Financing / Cost Information

C.1. Description of financial elements of the project / programme

Please provide:
- a breakdown of cost estimates analysed according to major cost categories.
- a financial model that includes projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale;
- a description of how the choice of financial instrument(s) will overcome barriers and achieve project objectives, and leverage public and/or private finance.

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Amount</th>
<th>Currency</th>
<th>Tenor</th>
<th>Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total project financing (a) = (b) + (c)</td>
<td>...............</td>
<td>Options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Senior Loans</td>
<td>Options</td>
<td>( ) years</td>
<td>( ) %</td>
<td></td>
</tr>
<tr>
<td>(ii) Subordinated Loans</td>
<td>Options</td>
<td>( ) years</td>
<td>( ) %</td>
<td></td>
</tr>
<tr>
<td>(iii) Equity</td>
<td>Options</td>
<td>( ) years</td>
<td>( ) %</td>
<td></td>
</tr>
<tr>
<td>(iv) Guarantees</td>
<td>Options</td>
<td>( )</td>
<td></td>
<td>( ) % IRR</td>
</tr>
<tr>
<td>(v) Reimbursable grants *</td>
<td>Options</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(vi) Grants *</td>
<td>Options</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Please provide detailed economic and financial justification in the case of grants.

C.2. Project financing information

<table>
<thead>
<tr>
<th>Total Requested (i+ii+iii+iv+v+vi)</th>
<th>Options</th>
</tr>
</thead>
</table>

(c) Co-financing

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Amount</th>
<th>Currency</th>
<th>Name of Institution</th>
<th>Seniority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Options</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
D. Expected Performance against Investment Criteria

Please explain the potential of the Project/Programme to achieve the Fund’s six investment criteria as listed below.

D.1. Climate impact potential

(Potential to achieve the GCF’s objectives and results)

Specify the climate mitigation and/or adaptation impact. Provide specific values for the below indicators and any other relevant indicators and values, including those from the Fund’s Performance Measurement Frameworks.

- Total tonnes of CO₂ eq to be avoided or reduced per annum
- Expected total number of direct and indirect beneficiaries and number of beneficiaries relative to total population (e.g. total lives to be saved from disruption due to climate-related disasters)

A successful Project/investment will represent significant progress towards realizing Belize’s goals of: (i) reducing its carbon footprint by 2020, (ii) having 80% of its energy for household and industrial uses generated from renewable energy sources, while (iii) simultaneously leverage existing infrastructure to provide immediate and direct benefits in response to the national energy challenges.

Fully exploiting and developing the potential of *Arundo donax* to provide a renewable source of fuel to drive the national and regional economies, could bring significant benefits to Belize and the Caribbean. The benefits of investing immediately in Belize would be to:

i. increase power production from the ASR/BSI BELCOGEN,
ii. provide clean sustainable power throughout the year,
iii. create new jobs in cultivating *Arundo donax*,
iv. replace imported Mexican power,
v. increase energy security, and
vi. reduce Belize’s greenhouse gas emissions and the country’s cost of power.

As such, through this project it is estimated that the total tons of CO₂ equivalent emissions avoided annually would be 19309 (tCO₂). Also the number of direct beneficiaries is estimated at over 5,000 or approximately 2% of the total population. The indirect beneficiaries would be the entire country through lower cost per KWh of electricity.

Metrics for the key Impact Potential indicators are to be examined and presented as part of the findings and output of the Feasibility Study.
D.2. Paradigm shift potential
(Potential to catalyze impact beyond a one-off project or programme investment)

Provide the estimates and details of the below and specify other relevant factors.

Potential for scaling-up and replication (e.g. multiples of initial impact size)
This project has significant potential to be replicated and scaled-up, given the multiple benefits of an environmental and socio-economic nature that are expected to accrue, e.g. reduced cost of power, increased competitiveness of manufactured output, greater energy security and reduced poverty. The following additional factors that can contribute to the success of the undertaking must also be taken into consideration moving forward:

- The Potential for scaling-up depends on the availability of marginal land. In Belize marginal land is estimated at 467,000 hectares. Replication in other CARICOM Countries such as Guyana and Suriname would also be possible.
- The potential for the transfer of knowledge and learning to other regions should pose no challenge given the 5Cs network of partners and the planned knowledge sharing mechanisms identified earlier.

Potential for knowledge and learning
The knowledge and experience gained through the process of developing the investment thus far has/will provide ample knowledge, familiarity and the justification for scaling-up and replication, and also contribute to the development of an appropriate regulatory framework and policies that are essential to support this transformation.

As is often the case of the introduction and/or evolution of any new industry- in this case a new large scale agro-forestry industry- there will be lessons learnt in the process that would contribute to the minimization of risk in the commercialization phase.

Such risk reduction areas would include:

- Reduction in environmental impact
- Cultivation-related issues
- Harvesting and transportation-related issues
- Production and storage-related issues

Contribution to the creation of an enabling environment
Economic co-benefits from a full scale-up programme in the form of jobs and reduction in foreign currency leakage would be:

A total of new jobs of at least 1,000 initially increasing to nearly 5,000 once project is fully operational.

Annual foreign currency savings would be in the order of US$24 million. This is derived using an average US$0.10/KWh under the PPA between BEL and CEF of Mexico for approximately 233,150 MWh provided annually.

Government's budget deficits reduced by about 1 percentage point during the pilot phase.

Contribution to the regulatory framework and policies
A successful project would supply concrete evidence in support of the MESTPU strategic plan which among other things calls for a significant use of different forms renewable energy in the energy matrix by 2030. Lessons learned in its commercialization could help guide or refine the regulatory policy framework to systematically drive investment in low-emission technologies.
Provide the estimates of economic, social and environmental co-benefits. Examples include the following:

- **Social co-benefits**

  It is well known that Energy Intensity is a measure of the energy efficiency of a nation’s economy. High energy intensities indicate a high price or cost of converting energy into GDP. Low energy intensity indicates a lower price or cost of converting energy into GDP. In 2011 the energy intensity of Belize was 400 which is above the global average of 298 and much higher than neighbouring countries in Central America with an average of 153. A successful project could provide the enabling environment for reducing the energy intensity and making it comparable to the other countries in Central America. This would contribute to a significant improvement in the overall level of competitiveness of the economy and enable Belize to better attract foreign investment and to improve the competitiveness of its products in export markets. This could lead to:

  - Increase in job opportunities
  - Increase in disposable income from reduced cost of electricity
  - Development of new skills in the country.

  Other social benefits could also be derived through the reduction in the cost of electricity which would enable the extension of the current grid network to rural communities not currently on the grid. Such extension would lead to an

  - Improved health and safety in rural communities through increase availability of potable water made possible through the availability of electrical energy, and
  - Reduction in poverty as persons who are now connected to the grid would now be in a position to acquire consumer durable goods, such as a refrigerator, thus leading to more food being stored, rather than disposed of.

- **Gender-sensitive development impact**

  As with other agro-related industries in Belize, opportunities would be equally distributed between male and female. Given that women are an integral part of the agricultural sector in the country, benefit sharing is expected to be equally distributed as the Centre is an equal opportunity employer.

- **Economic co-benefits**

  Using the sugar cane industry as a guide, the economic co-benefits from a full scale-up programme in the form of jobs and reduction in foreign currency leakage is estimated to be of the order of:

  - at least 1,000 new jobs initially increasing to nearly 5,000 once project is fully commercialized
  - Annual foreign currency savings would be in the order of US$24 million. This is derived using an average US$0.10/KWh under the PPA between BEL and CEF of Mexico for approximately 233,150 MWh provided annually.
  - Government’s budget deficits reduced by about 1 percentage point during the pilot phase.
Describe the scale and intensity of vulnerability of the country and beneficiary groups and elaborate how the project/programme addresses the issues. Examples of the issues include the following:

- Level of exposure to climate risks for beneficiary country and groups
- Does the country have a fiscal or balance of payment gap that prevents from addressing the needs?
- Does the local capital market lack depth or history?
- Needs for strengthening institutions and implementation capacity

Belize is located in the northwestern Caribbean within the tropical north Atlantic hurricane belt. Additionally, the country has been known to be affected by other extreme weather events associated with other tropical weather systems. With global climate models (downscaled to acceptable resolutions for the Caribbean) indicating more intense weather phenomenon, the country faces increased risks from heat and possible pest infestation, and hurricanes and floods associated with more intense periods of rainfall. The latter two can compromise the current energy sector by overturning poles, causing the power supply to be disrupted and increasing the damage ratio to the country. Fortunately, these weather events are not expected to significantly impact the project due to the resilient nature of the Arundo donax plant to climate variability and extreme weather events.

Since, the project will be using the adapted indigenous species of the Arundo donax plants it is not anticipated that there will be much pest infestation. However, constant monitoring of the plants will be carried out, and should any pest problem develop, the Centre will work with the Forestry Department and the Ministry of Agriculture to resolve same.

Belize, like many other Caribbean economies, is heavily integrated within the global economy. As such, the country also felt the impact of the financial meltdown in the global economy in 2008/2009. At the same time, the significant increase in oil prices in 2008 to over US$140/barrel has left the country with a balance of payment deficit, reduced revenue and limited fiscal space within which to pursue its sustainable development aspirations. It continues to be heavily dependent on support from regional and international financial institutions and is therefore seeking ways to consolidate its portfolio as it strives for positive economic growth.

Belize has a nascent capital market that continues to be governed by traditional ways of conducting business. The local capital market, therefore, lacks the depth to handle investments of this nature and remain very conservative and restrictive in their lending policies.

5Cs has continued to carry out its functions with a cadre of dedicated technical and administrative staff. Given the pioneering nature of this project for Belize, and by extension the region, it is imperative that we “get it right”. The Centre is confident that it has the resident capacity, and moreover within the Renewable Energy Unit that is staffed with two high-level technical personnel, who will provide oversight in implementing this initiative.
Provide details of the below and specify other relevant factors.

- Coherence and alignment with the country’s national climate strategy and priorities in mitigation or adaptation
- Brief description of executing entities (e.g. local developers, partners and service providers) along with the roles they will play
- Stakeholder engagement process and feedback received from civil society organizations and other relevant stakeholders

The Arundo donax pilot project is aligned with the country’s strategy and priorities outlined in its Climate Change mitigation and adaptation programme. This investment is endorsed by the Ministry of Energy, Science and Technology and Public Utilities (MESTPU) that is charged with the mandate of seeking to strategically integrate energy and science and technology into national development planning and decision-making to catalyze sustainable development. The MESTPU has established a strategic plan to enhance its planning for a Sustainable Energy Sector in Belize. The purpose of this sustainable Energy Strategy 2012 – 2033 is to establish a framework that will result in transitioning the energy sector and economy towards more favorable low carbon development. **The Arundo donax project is one of the major initiatives within that transition framework.**

A considerable amount of stakeholder engagement has taken place including at the policy level, with private sector partners and international supporters/collaborants. This has involved inter alia meeting with and elaborating the project idea to a range of local and international stakeholders including the WB/GEF and the Clinton Foundation, both of whom visited Belize and held further exploratory discussions with GOB, ASR/BSI and the Centre, as part of their scoping exercise to determine possible assistance in the development of the initiative. Engagements with a range of other stakeholders are ongoing.

Significantly, the Centre has been engaging a key partner, the GOB, whose tangible commitment to the project has already been manifested in among other things, the issuance of the leaseholding on lands to be used for demonstrating the full scale commercialization of production utilizing various agronomic parameters, as well as facilitating the use of multilateral resources from the World Bank/ERCAP project in prefeasibility activities to develop and demonstrate the feasibility of Arundo donax as an energy source.

Extensive discussions have also taken place with private sector interests in terms of their interest in purchasing the power and/or raw materials produced for the production of energy.
D.6. Effectiveness and efficiency

[Economic and financial soundness and effectiveness of the proposed activities]

Provide details of the below and specify other relevant factors (i.e. debt service coverage ratio), if available.

- Estimated cost per t CO2 eq (total investment cost/expected lifetime emission reductions)
- Co-financing ratio (total amount of the Fund’s investment as percentage of project)
- Economic and financial rate of return
  - With the Fund’s support
  - Without the Fund’s support

The co-financing, leveraging and the potential for the mobilization of long-term investments, whilst not absolutely assured, are reasonably assured by the current collaborating partners, i.e. the Government of Belize, American Sugar Refinery and the Belize Electricity Limited.

The purpose of all pre-feasibility studies undertaken to date, and the proposed feasibility assessments are to establish among other things the cost-effectiveness and efficiency of the investment prior to commercialization. The envisaged economic and financial soundness of the project may be assumed from the composition of the collaborating partners which consists of the private and public sectors and multi-lateral institutions. A considerable amount of confidence can be derived from the fact that it is unlikely that the private sector partners would have signed on to collaborate in an investment project with only a marginal likelihood of success.

The financial viability of the initiative in the long run beyond GCF’s intervention, the financial and economic rate of return, estimates of the investment costs, estimates of other key efficiency and effectiveness indicators, etc, are among the key considerations to be examined as part of the feasibility study.

E. Brief Rationale for GCF Involvement and Exit Strategy

Please specify why the GCF contribution is critical for the project/programme. Please explain how the project/programme sustainability will be ensured in the long run, after the project/programme is implemented with support from the other sources and GCF.

With GCF’s support a new agro industry could be created that would contribute to the GDP at a level comparable to that of the other major agro-industries in Belize (Sugar, Citrus and Banana). The new industry would have higher climate resilience than the current agro-industries, which are considered as very vulnerable to impacts of Climate Change and extreme weather events. Without the Fund’s support the full economic, social and environmental and other prospective benefits of this potentially transformative investment would not be realized.

In addition to the above, it is to be noted that the MESTPU 2012-2017 Strategic Plan provides a summary of the strategies to develop a framework that will result in transitioning the energy sector and economy toward low carbon development. Part I of the Plan recommends a set of programmes and action plans to achieve the low carbon economy by 2033, through:

1. improved energy efficiency and conservation
2. developing Belize’s domestic energy resources to facilitate private sector participation and investment in the new low carbon energy sector
3. empowering rural communities to participate in income-generating activities, particularly women and young people, and
4. encouraging and advising the public, the private sectors and the general public to become more aware of the critical energy issues, and to take appropriate actions and response measures.

The successful completion of the project by 2020 will greatly contribute to the achievement of the low carbon economy as envisaged under the MESTPU 2012 – 2017 Strategic Plan.

Funding for previous phases of this investment were proactively secured by CCCCC utilizing a mix of public, private and multi-lateral support. Funding for the next two phases is being proposed and sought through the climate finance mechanisms operated under the auspices of the GCF.
The approach being utilized of conducting a feasibility Study and preparation of the Funding proposal as a seamless undertaking, it is hoped, will result in a seamless transition to a full-fledged investment in a timely manner and thereby ensure there is no loss of momentum in bringing this vital, bold, climate smart investment for Belize and the Caribbean region to fruition. As the global leader in Climate Finance and the institution at the spearhead of the global climate change response effort, GCF’s involvement and imprimatur for this initiative is critical to its completion and realization in a timely manner.

The contribution of GCF is critical to unlock the full Investment potential of this initiative. Once the investment potential has been confirmed by the feasibility study, we anticipate that the private sector will demonstrate the same relatively high level of enthusiasm and commitment for the initiative that it has exhibited thus far even in this tentative, formative phase of the investment’s gestation. Once conclusive evidence of the feasibility and viability has been provided, we anticipate that the private sector will thereafter “lead the charge” in advancing future investments in this area.

The project has evolved thus far with the full knowledge, involvement and participation of the public and private sector agencies and officials from the key sectors that are critical to the realization of this potential investment. Hence, if on assessment the viability is deemed to be positive, the key local actors/agencies would have already been aware of the potential feasibility and viability of its full-scale commercialization. As an investment undertaking the project offers the prospect of being able to successfully develop at least three distinct business components either individually or together i.e. feedstock for co-generation, biofuel production and torrefied pellet production. It should also be noted that the successful completion of the project will not only reduce the dependency on a volatile, non-renewable, greenhouse gas (GHG) emitting commodity such as fossil fuel but would also offer the potential for:

i. The development of a new industry both at the community and company levels;
ii. Provide energy security to the country(s);
iii. Reduce the region’s contribution to GHG emissions;
iv. Increase the adaptive capacity of the country(s) involved;
v. Prove the demonstrable benefits of public-private partnerships;
vi. Increase the competitiveness of participating country(s) through reduction in the cost of energy;
vii. Improve the living standard of the country(s) as a whole by providing new jobs, expanding economic activity and reducing cost of energy-related services; and
viii. Ensure Greater predictability in the price of energy.

F. Risk Analysis

Please describe the financial and operational risks and discuss mitigating measures.

Please briefly specify the substantial environmental and social risks that the project/programme may face and the proposed risk mitigating measures.

The conduct of Risk analysis/Assessment [financial, operational, social, environmental and associated mitigating factors] are to be defined, investigated and outlined as part of the Feasibility study.

G. Multi-Stakeholder Engagement

Please specify the plan for multi-stakeholder engagement, and what has been done so far in this regard.
## H. Status of Project/Programme

1) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section J.

2) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/programme: Yes ☐ No ☒
   *(If ‘Yes’, please provide them in section J.)*

3) Will the proposed project/programme be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/programme (e.g. scale up or replication)? Yes ☐ No ☒
   *(If yes, please provide an evaluation report of the previous project in section J, if available.)*

## I. Remarks


## J. Supporting Documents for Concept Note

- ☐ Map indicating the location of the project/programme
- ☐ Financial Model
- ☐ Pre-feasibility Study
- ☐ Feasibility Study (if applicable)
- ☐ Environmental and Social Impact Assessment (if applicable)
- ☐ Evaluation Report (if applicable)
ECONOMIC DEVELOPMENT AND PETROLEUM

P.O. Box 42
Ground Floor, Sir Edney Cain Building
Belmopan City
Belize, Central America

Ref: IA/GCF/1/17(40)

September 15, 2017

Mr. Howard Bamsey
Executive Director
Green Climate Fund
Songdo Business District
175 Art center-daero
Yeonsu-gu, Incheon 22004
Republic of Korea

Dear Mr. Bamsey:

Re: Proposal for the GCF Project Preparation Facility by Caribbean Community Climate Change Centre (CCCCC) regarding Arundo Donax Renewable Bio-mass Fuel for Belize- Feasibility Study and Funding Proposal Preparation

Dear Sir/Madam,

We refer to the Project Preparation Facility proposal Arundo Donax Renewable Bio-mass Fuel for Belize- Feasibility Study and Funding Proposal Preparation for preparation of the Arundo Donax Bio-fuel Project in Belize as included in the PPF proposal submitted by Caribbean Community Climate Change Centre (CCCCC) to us on 05 September 2017.

The undersigned is the duly authorized representative of the Ministry of Economic Development which is the National Designated Authority/focal point of Belize.

Pursuant to GCF decisions B.08/10 and B.13/21, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the Project Preparation Facility activities as included in the PPF Proposal.
By communicating our no-objection, it is implied that:

(a) The government of Belize has no-objection to the Project Preparation Facility request as included in the PPF Proposal;

(b) The PPF Proposal is in conformity with Belize's national priorities, strategies and plans; and

(c) In accordance with the GCF’s environmental and social safeguards, the PPF activities as included in the PPF Proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the PPF Proposal has been duly followed.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

YVONNE HYDE
Chief Executive Officer and
National Designated Authority - Belize

c: Pa Ousman Jarju
   Director of GCF’s Country Programming Division.
TERMS OF REFERENCE

Consultancy Services to the Caribbean Community Climate Change Centre for the Conduct of a Stakeholder Analysis and development of a Stakeholder Management and Engagement Plan: Arundo Donax Renewable Bio-mass Fuel for Belize

September 2017
1.0 BACKGROUND

The Caribbean Community Climate Change Centre (5Cs) is in the process of developing a Funding Proposal [FP] for submission to the Green Climate Fund [GCF] seeking financing for investment in a bio-mass renewable energy project. This project will be based on the utilization of the indigenous fast growing C3 perennial rhizomatous grass - *Arundo donax* – currently available and to be cultivated widely on marginal agricultural lands in Belize. The process of proposal submission and consideration of this project by the GCF requires inter alia the conduct of Stakeholder Analysis and the development of a Stakeholder Management and Engagement Plan. The conduct of this precursor study is necessary to ascertain the viability of the undertaking, on the basis of which a full scale Funding Proposal will be developed and submitted to the GCF for consideration.

The conduct of all such precursor studies is consistent with The Government of Belize (GoB) objective of expanding the utilization of biomass to meet some of the country’s energy needs and achieve the dual aim of reducing the country’s carbon footprint and adapting to climate change impacts.

The Caribbean Community Climate Change Centre (“5Cs”) - the entity that is charged with coordinating the Caribbean’s response to climate change - is spearheading the effort to mobilize resources for this major transformative project including overseeing the conduct of all precursor studies and analyses.

The process of consideration and assessment of the merit and fundability of the proposal requires the conduct of a number of analyses and evaluation exercises including:

- Feasibility Study
- Stakeholder Analysis and Management and Engagement Plan
- Gender Study and Action Plan
- Environmental and Social Assessment Study

The Consultancy /Assignment to which this Terms of Reference pertains is for the conduct of the Stakeholder Analysis and Management and Engagement Plan.

2.0 OVERALL PURPOSE

The overall purpose of the Consultancy is to conduct a Stakeholder Analysis and Management and Engagement Plan that will form part of The preparation of a full Funding Proposal for the *Arundo donax Renewable Bio-mass Fuel Investment initiative for Belize* in accordance with GCF guidelines. The Consultancy must analyze and present findings in respect of applicable international, regional, and local legislation, policies, norms, standards, guidelines, and current best practice that are pertinent to this investment undertaking.

3.0 SPECIFIC OBJECTIVE

The main objective of this consultancy is to present reports that provide insight and recommendations from a stakeholder engagement and management perspective on the project entitled *Arundo Donax Renewable Bio-mass Fuel for Belize*, and specifically how to meaningfully and effectively integrate stakeholders into the design and scope of the referenced project to align with best policy and practice locally, regionally, and internationally.
4.0 SPECIFIC TASKS AND RESPONSIBILITIES
The indicative tasks to be undertaken to realize the expected objectives and output of this assignment shall include but is not limited to:

A  PRELIMINARY TASKS:
• Conduct wide ranging consultations with key stakeholders and other interested parties in the country, including local civil society organizations, and review relevant background information in order to gain an insight/understanding of the requirements of the assignment and most importantly to garner feedback from all key stakeholders.

B. PRINCIPAL TASKS
An indicative listing of the activities to be undertaken and issues to be studied and reported on, and recommended approaches [Methodology] to the conduct of this assignment shall include but is not limited to the following:

Task 1:
Conduct a Stakeholder Analysis and present findings/analysis/recommendations in respect of the issues listed hereunder and any other pertinent considerations:

• International and national regulatory and governance framework on stakeholders and climate change adaptation and mitigation, especially that of the Green Climate Fund. Particular attention should be paid to women, vulnerable groups like at risk youths, the elderly, children, the differently able, etc.
• Estimate stakeholder attitude and influence: assess for each stakeholders group how favorable they are towards the issues at hand and how strong their influence is to impact the direction and outcome of climate change actions. Ensure that there is proper communication about the objective of the stakeholder analysis in order to successfully manage the expectations of stakeholders. Tailor strategies for each stakeholder group to take greater advantage of opportunities and avoid or mitigate unwanted climate – related risks when these become apparent.
• Identify why different stakeholder types behave differently from one another and why they behave the way they do.
• Systematically gather and analyze qualitative data to determine whose interests should be taken into account when developing and/or implementing this investment project and pertinent related interventions
• Undertake a stakeholder analysis to understand the different stakeholder types involved in, likely to be impacted by or otherwise would have an interest in the implementation of this investment project including networks or groups of vulnerable populations, and analysis of institutional structures and capacities for addressing stakeholder engagement and concerns. Related, identify who are the main stakeholders? What is the current stakeholders’ knowledge of climate – related issues, especially those that the project proposes to address? What do the stakeholders see as possible advantages of CCCCC led interventions on climate action in the area, etc.? 
• An analysis of existing national policies, strategies and action plans and elaboration on the importance of integrating stakeholder perspectives into national climate change adaptation strategies related to coastal zone management and related issues.
• Identification of issues relevant to the diverse and representative group of stakeholders whose interest would have to be factored into the design and implementation of this investment project
highlighting the socio-political, economic and cultural aspects of climate change adaptation and mitigation: poverty, cost, etc.

- Provision of data disaggregated by age, socio economic wellbeing, vulnerable groups, and any other important geo political and cultural classifications, and the nature of their access to the resources in the project area; on control over these resources; on management and distribution of benefits arising out of the use of these resources, and on threats to the use of those resources.
- Analysis of significant causal relationships and factors that must be taken into account in order to ensure meaningful stakeholder engagement.
- Present a stakeholder matrix with a list of key stakeholders, contact information, importance, potential impact and influence on the project and an effective medium for communication.
- A report card on the level engagement at the time of reporting. This should identify stakeholders engaged thus far, locations and dates of meetings, individuals, groups and organizations consulted and key issues and concerns.
- Conclude with a number of recommendations on how to engage stakeholders and manage expectations in relation to the investment proposal. This draft proposal will be provided after the Consultancy is assigned. Among other things, it should include recommendations about how to engage stakeholders in every step of the proposed investment project, including decision-making and proposed activities.

**Task 2:**

Develop a **Stakeholder Management and Engagement Plan** in respect of the findings in Task 1, those listed hereunder and any other pertinent considerations. The **Stakeholder Management and Engagement Plan** should:

- Identify actions required to engage stakeholders and manage expectations through the duration of the project. These should include, but not limited to:
  - Information dissemination and channels for feedback
  - Conflict management and settlement
  - Key issues and concerns and how to address them
  - Key individuals, groups and organizations
  - Monitoring and reporting
- Enable conscious and rational relationship management of key stakeholders.
- Recommend a strategy to effectively implementation the **Stakeholder Management and Engagement Plan** both in its entirety and pertinent actions contained within.

**5.0 OBLIGATIONS OF CCCC**

CCCC commit to the following:

- Provide the Consultant with the latest draft of the PPF application proposal **Arundo donax Renewable Bio-mass Fuel for Belize**
- Provide the Consultant with a previous report entitled “Study of the Impacts of Climate Change on Vulnerable Groups in PPCR Participating Countries in the Caribbean” (Bynoe, 2014).
- Participate in structured dialogue(s) with the consultant to address any questions or concerns and to provide updates about progress made on the study.
- Provide a level of agreed support to the Consultant in the process of the conduct of this undertaking.
- Review the draft report within a week of its submission, providing feedback to the consultant.
6.0 DELIVERABLES AND REPORTING REQUIREMENTS

1. **Inception Report** that includes the revised work plan, revised schedule of all activities, any revision to the approach and methodology to executing the assignment, matters for decision making and any initial findings within one (1) week of contract signing.

2. **Draft Stakeholder Analysis** of no more than 30 pages plus appendices and including an executive summary (maximum 2 pages) that highlights the most important findings.

3. **Draft Stakeholder Management and Engagement Plan** of no more than 15 pages plus appendices and including an executive summary (maximum 2 pages) that highlights the most important findings.

4. **Final Stakeholder Analysis** of no more than 30 pages plus appendices, incorporating suggestions and feedback from the project core team during the review, and including an executive summary (maximum 2 pages) that highlights the most important findings.

5. **Final Stakeholder Management and Engagement Plan** compliant with the format and requirements of GCF [see format attached]

The principal output(s) of this Assignment shall include, *inter alia* a comprehensive report based on the scope of works and specific activities outlined below. The report shall provide a basis for future decision making in respect of the project.

This report must conform to the following minimum requirements:

- Must be a comprehensive straightforward document that can be used in discussions with potential partners, the community, government, service providers and others to prove/provide evidence of the feasibility of and obtain support for the development of the project.
- It must/should contain a time-bound roadmap/blueprint for pursuing recommendations emanating from this assignment
- Data and information in the report must be presented in an analytical manner and address the issues highlighted below
- A draft copy of the final report must be prepared by the consultant and submitted to the CCCCC for approval and agreement prior to finalization.

7.0 QUALIFICATIONS AND KEY EXPERTISE

- Master’s degree, preferably in the field of anthropology, gender, development, social sciences, stakeholder engagement, climate change, land use management, coastal zone management or other field relevant to environmental sustainability and climate.
- At least 10 years of experience conducting stakeholder analysis.
- At least 10 years of relevant experience in the Caribbean.
- Strong track record of preparing high-level documents and reports on climate change and stakeholder.
- Understanding of the culture in Caribbean island nations.
- Strong writing skills in English.
• Previous experience working with the Green Climate Fund/USAID/ CCCCC would be an asset.

8.0 LOCATION AND DURATION OF ASSIGNMENT
Location: Belize
Duration: 4 months

9.0 MANAGEMENT OF THE ASSIGNMENT
The consultancy will be commissioned by CCCCC who is the Contracting Authority for the purpose of the assignment. The Consultant will report to a designated official of the CCCCC for contractual and administrative purposes. CCCCC will constitute a core team to provide additional technical advice and inputs, overall coordination and oversight for this study. Changes in the TORs can be made subject to and only after written mutual agreement between the Consultant and CCCCC

10.0 REFERENCES/APPENDICES
(i). Arundo Donax Renewable Bio-mass Fuel for Belize: Project Preparation Facility Application
(ii) Arundo Donax Renewable Bio-mass Fuel for Belize: Funding Proposal Application [draft]
(iii) Stakeholder Management Plan Template
TERMS OF REFERENCE

Consultancy Services to the Caribbean Community Climate Change Centre for the Conduct of an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP): Arundo donax Renewable Bio-mass Fuel for Belize

September 2017
1.0 BACKGROUND
The Caribbean Community Climate Change Centre (5Cs) is in the process of developing a Funding Proposal [FP] for submission to the Green Climate Fund [GCF] seeking financing for investment in a bio-mass renewable energy project. This project will be based on the utilization of the indigenous fast growing C3 perennial rhizomatous grass - *Arundo donax* – currently available and to be cultivated widely on marginal agricultural lands in Belize. The process of proposal submission and consideration of this project by the GCF requires inter alia the conduct of an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP). This assessment and complementing management plan is necessary to ascertain the socio-economic and environmental implications of the proposed project on the society.

The conduct of the Environmental and Social Impact Assessment (ESIA) is consistent with The Government of Belize (GoB) objective of responsibly expanding the utilization of biomass to meet some of the country’s energy needs and achieve the dual aim of reducing the country’s carbon footprint and adapting to climate change impacts.

The Caribbean Community Climate Change Centre (“5Cs”) - the entity that is charged with coordinating the Caribbean’s response to climate change- is spearheading the effort to mobilize resources for this major transformative project including overseeing the conduct of all precursor studies and analyses.

The Environmental and Social Impact Assessment (ESIA) and complementing Environmental and Social Management Plan (ESMP) are critical to the process of assessment and consideration of the merit and fundability of the proposal by the GCF. The Study will assess the environmental and social footprint of this potentially significant source of green energy for Belize, that can displace the costlier and more high polluting alternative imported fossil fuel, thus lessening the strain on an already heavily burdened national economy.

The services of a suitably qualified Consultancy Firm are being sought to undertake the following Tasks (the terms of which are defined below):

(i) The conduct of an Environmental and Social Screening of the proposed investment
(ii) The conduct of an Environmental and Social Impact Assessment (ESIA) and
(iii) The preparation of an Environmental and Social Management Plan (ESMP)

2.0 SPECIFIC OBJECTIVE
The main objective of this consultancy is to conduct an Environmental and Social Impact Assessment (ESIA) and develop an Environmental and Social Management Plan (ESMP) for the investment proposal entitled *Arundo donax Renewable Bio-mass Fuel for Belize* that will provide the decision makers in Belize, CCCCC and the GCF with sufficient information to justify acceptance, modification or rejection of the proposed project for financing and implementation.
3.0 SPECIFIC TASKS AND RESPONSIBILITIES
The indicative tasks to be undertaken to realize the expected objectives and output of this assignment shall include but is not limited to:

A. PRELIMINARY TASKS:

- Submit a detailed work-plan including a time schedule, budget, the names, professional status and biographic data of all professional staff to be deployed on this assignment, along with a description of the duties to be performed by each expert,

- Review all relevant documentation pertinent to the conduct of this assignment.

- Conduct wide ranging consultations with key stakeholder and other interested parties, and review relevant background information in order to gain an insight/understanding of the requirements of the assignment

B. PRINCIPAL TASKS

An indicative listing of the activities to be undertaken and issues to be studied and reported on, and recommended approaches [Methodology] to the conduct of this assignment shall include but is not limited to the issues listed hereunder.

Overall the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) involves a detailed assessment of the institutional and managerial, regulatory and policy, environmental, socio-cultural and socio-economic implications of the proposed project/investment. This must necessarily encompass analysis of, and the presentation of findings/recommendations in respect of the subject areas listed in turn hereunder. Since the ultimate aim of the assignment is to develop a Funding Proposal seeking GCF funding for the investment, in formulating the proposal, particular attention has to be paid to demonstrating the extent to which any proposed future investment is aligned with the investment criteria that are defined in the GCF’s investment framework. Moreover, The Consultant is obliged to ensure that the assignment is conducted in a manner that conduces to the preparation of the FP in a seamless manner.

DELIVERABLE I. ENVIRONMENTAL & SOCIAL SCREENING CHECKLIST

Conduct a preliminary environmental and social screening/assessment of the expected environmental and social risks and impacts of activities\(^1\) proposed as part of this investment programme. This ESS screening must be conducted in accordance with GCF’s Guidelines for the Environmental and Social Screening of proposed Activities [see copy of guidelines attached]. The results of the screening forms the basis for assigning the environmental and social risk category of activities and informs decisions on the extent and depth of environmental and social due diligence that will be undertaken. On the basis of the projected environmental and social footprint of the investment, the Consultant is required to undertake an ESIA and produce an ESMP as part of Deliverables II & III for which indicative activities are outlined below.

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\(^1\) For the purposes of this document, “activities” shall refer to programmes, projects and subprojects.
DELIVERABLE II. ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT [ESIA]-

Task 1 Programme Description, Diagnosis and Characterization

Program Description. Detailed description of any proposed infrastructure, if any, to be financed under the Project/Investment or to be rehabilitated or built as part of the Project/Investment, including, among other relevant aspects:

- Project/Investment activities including detailed scheduling and cost;
- Infrastructure (co-generation plant and roads) and lands (plantations) associated with the Project/Investment;
- Personnel to be hired temporarily and permanently during the stages of construction and operation of the Project/Investment; and,
- How and if "Sustainable Infrastructure" principles have been included in the Project/Investment with focus on: energy efficiency and use of renewable resources, conservation of resources such as water and energy, internal air quality, and community involvement.

Location. Where appropriate describe and present schematically, the administrative, political and geographical location of all envisaged infrastructural works of the Project/Investment, as well as the areas of both direct impact (DIA) and indirect (IDA). Provide definition and description of the Project/Investment area including associated facilities and activities

Environmental Characterization. Characterization of the area of influence where the Project/Investment will be carried out, describing the current environmental conditions, and detailing the characteristics of the area where the Project/Investment will be implemented. This characterization must include the appropriate definition of both the Area of Direct Influence (ADI) and the Area of Indirect Influence (AII) of the Project/Investment. This information should for the most part be based primarily on quantitative data. The factors to be considered should include inter alia:

- Land characteristics and use (i.e., topography, soil characteristics, terrain stability and susceptibility to erosion or landslip, existing land uses occurring at the proposed site, and existing surface characteristics of the surrounding area). Further, existing land uses occupying the surrounding area should be delineated; particularly for those land uses which would be sensitive to industrial development or other types of uses, and which could contribute to cumulative effects on local and regional resources.

- Landscape character and existing views (i.e., existing character of the landscape both on the development site and in the surrounding area; and views of the site from adjoining properties and public areas, particularly where these are sensitive, e.g., residential, recreational or tourist areas, etc.).

- Air quality including: (1) meteorological data, particularly on prevailing wind direction and speed, rainfall, and temperature; (2) occurrence of extreme weather events such as tropical storms and droughts, and their location and duration; (3) existing ambient air quality, particularly dust loading and existing sources of gaseous air emissions in the local and extended area of the Project/Investment; and (4) risk related to inversion conditions. Existing air quality cannot be determined with precision without sampling over an extended period. This may not be practicable, and a descriptive approach based on prevailing weather conditions and identification of the main local emission sources affecting air quality (e.g., traffic and heavy industries with multiple stacks) is often a better approach.
• Noise levels are relatively easy to measure, and this may be undertaken at the nearest sensitive receptor locations; e.g., residential areas or schools which are nearby the proposed Project/Investment, activity, or action. Existing sources of elevated noise levels, which might result in nuisance conditions even if they are located a considerable distance from the source, should be considered.

• Geology and soils-related information, with particular attention given to the presence of erodible soils and/or contaminated soils.

• Natural and Manmade hazards (seismic, faults, sink holes, flooding, hurricanes, chemicals or hazardous materials, etc.)

• Description of potential natural disasters on Project/Investment facilities including associated facilities.

• Description of prevailing waste management practices of the communities.

• Water, including hydrology, surface runoff, groundwater and water quality. Topics which should be addressed include: (1) existing drainage, including the location and capacity of sensitive receptors such as canals, drains and rivers; identification of areas prone to flash floods; and depth to groundwater; (2) surface water and groundwater movement patterns, including groundwater hydrology, the range of water levels and daily flushing regime in canals, drains and rivers, tidal ranges and wave climate in coastal areas and sediment transport processes; (3) the quality of waters, both surface water and groundwater; and (4) abstraction of waters including abstraction of groundwater, reservoirs and intakes of surface waters, the usage of the waters for irrigation, public water supply or watering of animals, industrial plant water supply, and the quantities abstracted, etc.

• Habitats – terrestrial and aquatic. As appropriate, two types of habitats may be relevant; namely, natural habitats and critical natural habitats.

• Flora (especially tropical rain forests, wetlands, or unique or sensitive habitats).

• Fauna

  If applicable, endangered and threatened species (including sensitive species, economically important species, and critical habitats).

• National parks or protected areas.

• Traffic flows and transport infrastructure aspects.

Social Characterization. An overview of the existing social and cultural conditions should be provided in order to place the Project/Investment in context. The baseline information considered important for the ESMP should be presented. This should include:

• Towns/communities surrounding the area, and their population and socioeconomic characterization by age, gender, ethnicity, language, literacy/education, income and occupation;

• Sources of livelihood (level/availability of employment by gender/occupation and income patterns);

• Land tenure/titling;

• Migration and settlement patterns;

• Health and education levels (including disease patterns and endemic diseases);
• Archeological/cultural sites and monuments, including sacred sites such as caves, lakes, quarries, etc.;

• Services and infrastructure (i.e., existing utility infrastructure including water supply, sewage, wastewater treatment works, power lines and transformer sub-stations; and existing capacity of and load on utilities infrastructure);

• Access to basic healthcare, education (i.e., existing clinics/hospitals, capacity of healthcare system; existing schools’/training centers, and daycare facilities);

• Social organizations and dynamics;

• Access to infrastructure/roads or network of existing transportation modes to/from the proposed development Project/Investment, activity, or action;

• Vulnerable populations (elderly, poor, disabled, and young);

• Identification and description indigenous peoples or communities that may be potentially affected by the Project/Investment; and

• Identification of any communities or households that will need to be resettled or compensated arising out of implementation of the investment.

Task 2 Legal and Institutional Framework

• Description of legislative and institutional norms, systems and environmental licensing requirements, and other necessary requirement for the implementation of the Project/Investment;

• Description of any specific and applicable local regulations and requirements relating to the energy sector and other pertinent sector/sub-sectors, and in respect of issues such as water and the food sector, solid waste, wastewater, air pollution, labor, and health and safety. In addition, the consultant will include a description of the requirements, which are applied for the activities of the Project/Investment, of other institutions such as the GCF, World Bank / IFC, World Health Organization, and other entities;

• Identify compliance required in accordance with the Environmental and Social Safeguards Policy of the CCC and GCF, and where applicable, compliance with policies of Access to Information, Disaster Risk Management, Gender in Development and Involuntary Resettlement;

• Identify international and regional legislation, policies, norms, standards, guidelines, and current initiatives relating to social and environmental impacts in the energy and related sectors, in Belize and the Caribbean, and ascertain how these legislative tools, policies, norms, standards, guidelines and initiatives relate and apply to the activities proposed/envisaged for the Project/Investment;

• Examine alignment with national and international strategies and plans including Intended Nationally Determined Contributions (INDCs) and Sustainable Development Goals (SDGs);

• Describe, if applicable, mechanisms of Public/Civic Participation and Consultation to include information related to public consultation processes and citizen participation as requirements for the construction and operation of the Project/Investment;

• Determine the applicability of any proposed activities within the context of GCF ESS Standards (IFC Standards);

• Examine the extent to which implementation of environmental safeguards and controls might be hindered (for example policy overlaps). This will provide an overview of the existing
environmental management regimes and the extent to which these are applicable to this proposed undertaking;

- Assess the contractors and/or executing entities capacity to manage the safeguard requirements of the Project/Investment; and
- Assess the capacities of the stakeholders to support and carry out identified arrangements to deliver the envisioned benefits or mitigate negative impacts. Where constraints are identified and characterized, the ESIA shall describe measures to develop the capacities/capabilities of the stakeholders.

**Task 3 Assessment of the Environmental and Social Impacts of the Project/Investment**

- Identification and assessment of environmental and social impacts of the project/investment, including those impacts related to occupational safety and health in the stages of construction, operation and maintenance should be done. Consideration should be given to all potential direct and indirect negative impacts. The ESIA should:
  - Consider the supply chain impacts, especially, the supply of wood/biomass needed to keep the plant running and the operations viable.
  - Outline how the project would comply with the AE's and GCF's ESS standards.
  - Address any national regulatory issues related to the environmental and social assessment of the project, for example, the license permits from the national regulator.
  - Identify, describe and assess all potential environmental and social, direct and indirect, short and long-term, temporary and permanent impacts, indicating their importance level and their probability of occurrence. The importance level may be assessed on the basis of the nature, extent, intensity and duration of the impact, as well as on the sensitivity of the concerned environmental and social components and perceptions of the public.
  - Highlight ALL impacts including irreversible or unavoidable impacts. Cumulative and scale effects shall also be addressed taking into account ALL planned activities or actions in the project area.
  - Identify, describe and assess impacts on the biodiversity of surrounding areas, including but not limited to:
    - Any protected areas proximate to the plantation sites;
    - Weed risk assessment, including the risk of genetic invasion and possible impacts on the native vegetation, biodiversity and ecological services; and,
    - Assessment - based on applicable national and international standards – of the air quality and emissions from stacks of the thermal power plant associated with the combustion of Arundo donax.

- The identification and evaluation of socio-environmental impacts must be based on the characterization of the area of influence. This characterization outlines the general conditions of the area without the effects of the Project/Investment and constitutes the basis for analyzing how the Project/Investment will impact the area.

- The assessment of the environmental and social impacts should be done by identifying and describing impacts and overall impact by the proposed investment on the environment as a result of the interplay between the different stages and activities as well as with other projects and facilities.

- Describe the evaluation method used, indicating the criteria for assessment and pointing out its limitations, according to the environmental characteristics of the area of influence of the Project/Investment and its activities. Such assessment should have their respective categories so as to facilitate the qualitative and quantitative weighting of impacts.
• Recommend methodologies for the assessment of the risks and impacts and the significance criteria and definition.

**Task 4 Assessment of Alternatives**: identification of alternatives considered for the Project/Investment including sites, technologies, approaches, etc. With each alternative, assess the environmental implications, and social risks and potential impacts.

**Task 5 Disaster Risk Assessment and Disaster Risk Management Plan [DRMP]**

This must involve the identification and evaluation of potential natural and manmade Project/Investment risks that can occur in the context of the Project/Investment. This Disaster Risk Assessment (DRA) shall require the preparation a Disaster Risk Management Plan (DRMP) that will cover the management of the disaster risks identified in the Project/Investment design, construction and operation. This DRMP will be integrated into the Environmental and Social Management Plan. A detailed guideline for the preparation of the said DRMP is included (Annex 1).

**DELIBERABLE III. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)**

**Task 6 Environmental and Social Management Plan (ESMP)**

The Consultant(s) is required to prepare an environmental and social management plan for the Project/Investment that includes the following components:

- Detailed description of all proposed environmental and social control and mitigation measures that are needed based on risks arising out of the Project/Investment as a whole, the type of activity undertaken or actions during construction (e.g., air quality management plan, and landscape management plans) and operation (e.g., hazardous materials and fuel management, transport and packing management, maintenance and site security plans, and emergency evacuation and contingency plans). The ESMP must:
  - Identify mitigation measures to prevent, minimize, mitigate or compensate for adverse environmental and/or social impacts.
  - Develop enhancement measures to improve project environmental and social performance.
  - Present initiatives proposed to complement the enhancement and mitigation measures.
  - Include a biodiversity management plan, if supplying the feedstock will involve growing out other plants.

- Detailed description of a planned environmental and social monitoring program for both construction and operation and a discussion of how the information will support management practices.

- Description of planned worker health and safety plan, procedures and controls.

- A management plan covering the transport, handling, storage and disposal, with associate management and reporting practices including preventive and contingency measures, in consultations with potential workers and communities (if applies). Include an annex of restricted toxic substances that may be an input or output of this project/investment, referencing international treaties such as Basel Convention, Rotterdam Convention, and others.

- Description of planned environmental contingency plan and procedures.
• Description of a proposed environmental, health and safety management system (including personnel, training, documentation, auditing, etc.).

• Where applicable Description of a plan to manage population influx into the Project/Investment site or controlled land use area (e.g., contracting requirements to manage potential worker expectations).

• Formulation of a plan to manage regeneration and cultivation of Arundo donax to mitigate the spread to vulnerable habitats. The recommended actions and indicators should be suited to the Belizean context and must additionally be guided by the IFC Performance Standard 6 on alien invasive species and the IFC guidance on biomass.

• Enhance, where necessary, the actions identified in the environment and risk management plan for piloting the cultivation of Arundo donax in Northern Belize.

• Description of a plan/mechanism to receive and facilitate resolution of affected community concerns and grievances about the Project/Investment, activity, or action and its negative impacts. Develop a mechanism for project-level grievance redress including the Accredited Entity's (AE’s) institutional level grievance redress mechanism. The mechanisms should provide a user friendly medium/process by which people affected by the project can bring their concerns to the attention of the AE.

• Description of a plan to protect, reduce, and manage the negative impacts on any sacred/archaeological and historic sites/monuments if applicable.

• Description of Project/Investment, activity, or action-specific supervision and evaluation actions to be implemented.

• Public awareness, communication and training programs for operational staff.

• Indicators of compliance with licensing and approval requirements.

For each component listed above, the proposed time schedule (i.e., when initiated, when completed, and frequency), responsibility (i.e., who will implement), and the estimated cost should be provided; As appropriate, this information should also be provided for the individual actions within a component.

More specifically, monitoring/evaluation parameters which may be relevant include:

• Performance indicators in relation to critical operational issues (i.e., water quality -- marine and freshwater, shoreline morphology and sediment budget, soils and sediments, noise and air quality, public health indicators, land surface and hydrology, flora and fauna, etc.).

• Waste management performance indicators in relation to recycling and reuse.

• Documentation of complaints received.

• Also, monitoring procedures should cover:
  - The key conditions that will be monitored and their criteria and reason for monitoring such as noise (low frequency, high frequency, and vibrations), dust (particulate matter), air emissions (NO₂, SO₂, CO, CO₂, H₂O %, metals, etc.), wastewater (volume, suspended solids, pH, toxic substances, etc.), waste (solid waste and hazardous waste) and odor;
  - The monitoring locations (air emission outlet: particulate matter, CO₂, NO₂, and SO₂; the property boundary: noise, odor, particulate matter, CO₂, NO₂, SO₂ and other relevant substances; outdoor storage areas for raw materials (dust fall from the areas), intervals and duration;
- Actions to be undertaken if the monitoring indicates a noncompliance condition or abnormality; and,
- Internal reporting and links to management practices and action plans.

- Reporting to relevant authorities and, if appropriate, to the consent authority or the community on matters such as reports on interruptions of operations, operational journals, list of used raw materials, protocol on stored raw materials, dustfall reports from the storage areas for raw materials, and noise documentation.

- Reports on odor and air pollutant emissions and ambient concentrations, CO₂ equivalent documentation reports for greenhouse gases, energy consumption reports, wastewater reports, etc.

- Grievance reports and complaints received, non-compliance reports.

### 4.0 RELEVANCE

This is to involve verification of the relevance of the proposed project in addressing existing problems/exploiting opportunity in economic, social and environmental terms.

An assessment/verification of the extent to which the proposed project is coherent with the country’s macro-economic environment, and addresses economic or social demands through the examination of various options and alternatives is vital. Among other things this will involve an examination of:

- the nature and number of beneficiaries potentially affected by the proposed project;
- all organizations and agencies affected by or involved in the proposed project;
- all major problems/opportunities related to the proposed project, experienced by the beneficiaries and other parties involved, the causal inter-relationships of these problems/opportunities, and the inter-sectoral linkages;
- other interventions or priorities of ministries, agencies and donors which may affect or be affected by the proposed project/investment;
- information from previous studies and evaluations relevant to the proposed project/investment.

- Overall objectives: Why is the project important to the target groups and beneficiaries, the region and the Government? What is the desired economic, social and environmental development/impact, as possibly expressed in the Indicative Programme?
- Project purpose: Why do the target groups and beneficiaries need the project?
- Project results: What products and services will the project deliver to the target groups and beneficiaries? What assumptions are required to achieve the project purpose?
- Project activities: What is the precise scope of activities to be undertaken and what are the associated assumptions for achieving the project results. The project purpose and results should be measurable by indicators, and project activities should be quantified wherever possible.

### 5.0 SUSTAINABILITY

The consultants will assess the sustainability of the proposed initiative using applicable sustainability factors in that assessment including but not limited to:

- policy and coordination;
- demand and economic sustainability;
- financial sustainability;
- institutional and management sustainability;
- environmental and sociocultural sustainability;
- regulatory and operational sustainability.
6.0 PRE-REQUISITE CONDITIONS

The consultants will advise of any preconditions/pre-requisites for undertaking the investment that is imperative for project viability and sustainability.

The consultants are required to propose an efficient project organization and any phasing of project activities considered necessary for the success of the undertaking. Cost estimates are to be provided for all project activities.

The lists of issues set out above are not exhaustive. The consultants are required to use their professional judgement, experience and competence to review all relevant/pertinent factors and to table these for consideration in the conduct of the studies and the preparation of the FP.

7.0 OBLIGATIONS OF CCCCC

CCCC commit to the following:

- Provide the Consultant with the latest draft of the PPF application proposal Arundo donax Renewable Bio-mass Fuel for Belize.
- Provide the Consultant with a previous report entitled “Study of the Impacts of Climate Change on Vulnerable Groups in PPCR Participating Countries in the Caribbean” (Bynoe, 2014).
- Participate in structured dialogue(s) with the consultant to address any questions or concerns and to provide updates about progress made on the study.
- Review the draft report within a week of its submission, providing feedback to the consultant.

8.0 DELIVERABLES AND REPORTING REQUIREMENTS

1. **An Inception Report** to be submitted within one (1) week of contract signing that includes a Workplan with timelines for completing the assignment.
2. A report detailing the outcome of the Environmental and Social Screening Exercise to be produced within 1 month of the commencement of the assignment.
4. **A Draft Environmental and Social Management Plan (ESMP)** for the Proposed Project on Arundo donax Renewable Bio-mass Fuel for Belize.
5. **A Final Environmental and Social Impact Assessment (ESIA) Report and Environmental and Social Management Plan (ESMP)**, incorporating suggestions and feedback from the project core team during the review of the draft, and including an executive summary that highlights the most
important findings (maximum 2 pages). This document is one of the principal output(s) of the Assignment and shall provide a basis for future decision making in respect of the project. It is required to be comprehensive and based on the scope of works and specific activities outlined and must conform to the following minimum requirements:

a. A document that can be used in non-technical discussions with potential partners, the wider society public and private sector officials, service providers and others to prove/provide evidence of the feasibility/viability of and obtain support for the development of the project.
b. It must/should contain a time-bound roadmap/blueprint for pursuing recommendations emanating from the assignment
c. Data and information in the report must be presented in an analytical manner and address the issues highlighted above
d. A draft copy of the Final report and plan must be prepared by the consultant and submitted to the CCCCC for approval and agreement prior to finalization.

9.0 QUALIFICATIONS AND KEY EXPERTISE
The Contractor is expected/required to propose a team of Consultants that should ideally comprise the following mix of competencies:

- Proven expertise and in-depth knowledge of sustainable energy and climate change policies and practices in the Latin America and the Caribbean context;
- Knowledge of the electricity industry in Belize and/or in the Caribbean and Latin American region especially in relation to matters such as: technical requirements, necessary permits and procedures for connection, etc.
- Knowledge of renewable energy, particularly in the field of bio-energy (biomass) and solar energy.
- Must have knowledge of the biomass market and the characteristics of available biomass in the Latin American region.
- Previous experience and qualifications with biomass based conversion technologies (gasification, direct combustion) exceeding 7 years and ideally with innovative technologies such as torrefaction and gasification.
- 10 years of experience conducting environmental impact assessments, environmental analyses or research in the field of environmental life cycle impacts and climate change.
- Track-record of participating in the engineering, execution, operation and/or maintenance aspects of at least 5 similar projects, and experience of biomass based systems of >1 MW. Experience with conducting prefeasibility and feasibility studies is an asset.
- Must have at least 10 years proven experience in renewable energy projects especially conducting Environmental and Social Impact Assessments at national, regional and international levels.
- Should hold advanced degrees in their respective areas of expertise (social sciences, engineering, energy, environmental sciences, energy law, environmental policy, sustainable development, or other relevant fields)
- Conversance with the GCF procedures and prior experience in preparing a GCF Funding proposal would be an asset.

The following indicative subject matter specialist are considered as a minimum requirement for the composition of the Consultancy team:
Expert I/Team Leader: Environmental and Social Impact Assessment Specialist with expertise preferably in the field of environmental sustainability, environmental science, environmental engineering, eco-system services management, environmental and social sciences or other field relevant to environmental sustainability and climate change.

Expert II: Graduate qualifications/expertise in Mechanical, Civil Engineering, renewable energy (bio-mass) or related fields. 10 years’ experience working in the areas of mechanical or civil engineering, renewable energy (bio-mass) or related fields.

Expert III: Graduate qualifications/expertise in Agricultural Science, Agronomy Natural Resource Management, Agricultural Extension or related fields. 5 years’ experience working in the areas of agriculture, agronomy natural resource management, agricultural extension or related fields.

10.0 LOCATION AND DURATION OF ASSIGNMENT
Location: Belize
Duration: 6 months

11.0 MANAGEMENT OF THE ASSIGNMENT
The consultancy will be commissioned by CCCCC who is the Contracting Authority for the purpose of the assignment. The Consultants will report directly to CCCCC for contractual and administrative purposes. CCCCC will constitute a project core team to provide additional technical advice and inputs, overall coordination and oversight for this assignment. The Consultants will liaise with everyone from the project core team but will ultimately report to CCCCC. Changes in the TORs can be made subject to and only after written mutual agreement between the Consultants and CCCCC

12.0 REFERENCES/APPENDICES
The Consultant is required to consult and review all the background information that has contributed to the evolution of this investment opportunity in its present form, as important reference data and information to inform the conduct of the assignment.

An indicative List of the previous studies conducted [not exhaustive] include:

1. Belize Bio-mass Project Opportunity – Clinton Foundation [Clinton Climate initiative] Caribbean Community Climate Change Centre
2. Environment and Risk Management Plan for Piloting the Cultivation Of Arundo donax in Northern Belize