



Ethanol Micro Distillery (EMD) Call for Quotations

## **Clean Cooking Madagascar: EMD**

*Call for quotations*

### **Invitation to Propose for a 2,000 – 5,000 liter per day Ethanol Micro-Distillery (EMD) with Sugarcane Feedstock**

***Issued by:***

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**This document invites ethanol distillery manufacturers to submit detailed quotations for the procurement of one ethanol micro distillery (EMD) capable of producing 2,000 – 5,000 liters per day of hydrous ethanol at 94 – 96.4% v/v based on sugarcane feedstock and of the goods and services associated.**

This Call for Quotations must be considered as part of the bidding documents for the EMD, which contain, apart from the Call for Quotations hereby expressed, the Template for Quotations and the Evaluation Criteria to be used for the selection of the contractor.

This document contains general information regarding the project, instructions to bidders for submitting quotations and a proposed description of equipment, goods and services that the bidder is required to supply or for which the bidder may propose alternative solutions. The bidder is to provide price quotations for the equipment, goods and services as well as equipment specifications, bidder's responsibilities, and project schedule, as outlined in the following pages.



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## Project Description

Clean Cooking Madagascar (CCM) is implementing a national Ethanol Stove Program in Madagascar. The program includes installation of a pilot EMD to serve as a proving and training facility that will encourage the installation of additional EMDs in Madagascar.

The EMD will be a joint venture between CCM and a local business implementing partner. CCM will own a majority share of the EMD for five (5) years. After this time, the local implementing partner will have the opportunity to buy out CCM's interest at a discounted price. EMD suppliers are encouraged to consider entering into the joint venture with CCM and the local business by owning a share of the EMD for one (1) to five (5) years.

Now, CCM seeks to procure an EMD with a production capacity of between 2,000 and 5,000 liters per day. The distillery must be able to produce ethanol of hydrous or industrial grade quality at 94-96.4% v/v using sugarcane feedstock.

## Instructions to Bidders

As already stated, this call for quotations must be considered as part of the bidding documents for the EMD Madagascar. In this document the bidder will find a detailed description of the equipment, goods and services required by the Purchaser, which must be the subject of the quotation. The actual quotation must be elaborated by the bidder following the instructions and the structure outlined in the Template for Quotations, keeping in mind the Evaluation Criteria that will be used to evaluate the quotations and select the contractor.

In order to present the quotation for evaluation, the bidder must send the quotation via email with the following format:

To: [Narim@MadagascarEthanolStoveProgram.org](mailto:Narim@MadagascarEthanolStoveProgram.org)

Cc: alex.k.milano@projectgaia.com

Subject: Quotation for EMD Madagascar

The final quotation must be received by **1<sup>st</sup> of March, 2017 before 17:00 Antananarivo time (UTC +3)**. The quotation must be received as a PDF file enclosed to the email. The PDF file must be created strictly following the instructions contained in the Template for Quotations. Quotations received after the deadline will not be considered. The bidder will receive confirmation of receipt of the quotation within 3 working days of its receipt.



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If you have any questions regarding this call for quotations or the bidding documents, please send an email to [Narim@MadagascarEthanolStoveProgram.org](mailto:Narim@MadagascarEthanolStoveProgram.org) putting in copy [alex.k.milano@projectgaia.com](mailto:alex.k.milano@projectgaia.com).

### Project Specifications

**Ethanol Micro Distillery to produce 2,000 – 5,000 liters per day of Hydrous and Industrial Grade Ethanol at 94 – 96.4 % v/v based on Sugarcane. Ethanol will be used for stove fuel and must be low in impurities, especially fusel oils and other higher-order alcohols.**

#### Requirement / Specifications:

Provided here is a suggested specification. Bidders may provide an equivalent or better specification, if so desired, of a different model that has a proof of technical performance.

- |                              |  |
|------------------------------|--|
| <b>1) Plant Capacity:</b>    | 2,000 – 5,000 liters per day capacity (24 Hours/Day) <sup>1</sup>  |
| <b>2) Desired Product:</b>   | Hydrous Ethanol at 94 – 96.4 % by v/v strength   |
| <b>3) Raw material:</b>      | Sugarcane Feedstock  |
| <b>4) Technology:</b>        | Sugarcane Crushing Unit<br>Batch or Continuous Fermentation/Distillation<br>3 stages Distillation System (Mash Column and Rectifier)<br>Degasser and Aldehydes column<br>Fusel Oil separation<br>Heat Integration and Energy Efficiency<br>Lower Spent Wash production |
| <b>5) Days of operation:</b> | 330 days a year non-stop operation (24 hours/day)  |
| <b>6) Design codes:</b>      | ASME / TEMA / ANSI / ISA / API   |
| <b>7) Fuel and Boiler:</b>   | Boiler based on biomass as a fuel  |
| <b>8) Electricity:</b>       | Renewable Powered Electricity Generator capable to run the EMD   |
| <b>9) Instrumentation:</b>   | PLC based controls/Digital Panel for the Parameters with an overvoltage protection system  |
| <b>10) Juice storage:</b>    | Juice storage tank   |

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<sup>1</sup>**Performance Guarantee** is defined as 2 000 – 5000 liters per 24 hour period containing 94-96.4% (v/v) by volume hydrous ethanol. Selected bidder will be required to meet the performance criteria for a period of seven (7) continuous days (Performance Run). All remedies required to meet the Performance Guarantee are the responsibility of the bidder.



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- 11) Product storage:** 15 days in Polypropylene or Thermoset Reinforced Fiberglass or lined steel tank(s) with automatic filling
- 12) Other utilities:** Water treatment, cooling tower etc.
- 13) Safety items:** Fire suppression and other safety equipment including design of safety guards around the machinery
- 14) Water storage:** Above ground tank(s)
- 15) Waste water treatment:** Treatment systems for vinasse, bagasse and water.
- 16) Laboratory and testing:** Equipment for laboratory and testing feedstock and product

### Scope of Supply

S/N <sup>o</sup>	Brief Description
1.	<p><b>Feedstock Crushing and handling system:</b></p> <ul style="list-style-type: none"> <li>• Pre-treatment and handling</li> <li>• Dilution/mixing and sterilization</li> </ul>
2.	<p><b>Fermentation System:</b></p> <ul style="list-style-type: none"> <li>• Yeast Propagation System</li> <li>• Fermentation System</li> <li>• Pumps, etc.</li> <li>• Cleaning in place system (CIP)</li> </ul>
3.	<p><b>Distillation system:</b></p> <ul style="list-style-type: none"> <li>• Beer Holding</li> <li>• Beer Stripper and rectification tower</li> </ul>



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	<ul style="list-style-type: none"> <li>• Degasser and Aldehyde column</li> <li>• Fusel oil separation</li> <li>• Reboiler, Pre-Heater and Condenser</li> </ul>
<b>4.</b>	<p><b>Boiler/Thermal system:</b></p> <ul style="list-style-type: none"> <li>• Biomass fired boiler to generate 300 Kg/hour @ 10 bar</li> <li>• De-aerator and Condensate recovery system</li> <li>• Pressure Reducer</li> </ul>
<b>5.</b>	<p><b>Utilities and Peripheral Equipment:</b></p> <ol style="list-style-type: none"> <li>1. Renewably powered electrical generator capable to run the plant, enclosed</li> <li>2. Explosion proof motors for all pumps in Distillation</li> <li>3. Air Compressor</li> <li>4. PLC controls/Digital control panel for most of the parameters</li> <li>5. MCC Panel</li> </ol>

### Bidder's Responsibilities

1. Planning and Engineering (basic and detailed)
2. Site visit for the services as per scope matrix
3. Site visit for installation, commissioning and training (bidder will be in charge of on-site construction and assembly)
4. Hardware and Spares
5. Local sourcing where possible



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6. Delivery is to be quoted CIF Toamasina and FOB port of loading. Bidder will play a role in shipping according to the method selected by the buyer
7. Installation oversight (1 full-time person responsible for supervising on-site construction)
8. Operational oversight for 14 days including 7-day Performance Run.
9. Training and remote monitoring for three months (with proposal for two-year extended support)
10. Process documentation and operations, safety and maintenance user manuals
11. Clarify what part of your proposal, if any, is not covered by the bid document. This could include basic facilities that should be prepared at/for the site of the micro distillery prior to installation. Please specify any requirements that must be fulfilled by the Purchaser prior to installation.

## Project Schedule

This is an approximate project schedule with main steps between the signature of the contract and the commissioning of the plant. The Purchaser has outlined only some of these, the remaining must be outlined by the bidder in the quotation, according to their capacity of providing the goods and services required. Time is of the essence in completing the contract.

Vendor's selection/Contract signing:	<u>March 2017</u>
Ground breaking and Kick off:	_____
Target shipping date of equipment:	_____
Installation and Construction:	_____
Deficiencies check and water testing:	_____
Commissioning, performance run and start-up:	_____

## Price Schedule

The price should include:

- A. Planning and engineering costs



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- B. Supply of plant and machinery
- C. Installation and supervision costs
- D. Commissioning and Start-up costs
- E. Training costs at the purchaser's premises (plant site, Madagascar).

Pricing in USD should be itemized so buyer can clearly see equipment costs and service costs.

Additionally, the bidder should provide how after-sales services and required spare parts are to be provided. The bidder should be ready to quote price of all bidders' spare parts, which should be valid for at least 12 months after the delivery of the distillery.

### **Additional Service and Support (include or propose as add-ons)**

The Project Partners seek technical services and support including the following:

1. Guidance on site preparation, civil works and utilities, including water
2. Advice on selection and management/utilization of alternative feedstocks (including starch based, such as cassava, cereals, etc.)
3. Advice on fermentation and chemistry of selected feedstocks. Developing written "cook book" recipes or instructions for handling feedstock, mash, and related biochemical use
4. Advice on co-product and by-product development and utilization
5. Extended 2-year support service, to include up to three on-site visits per year plus remote analysis of production data and monthly telephone or SKYPE meeting with production personnel
6. Advice on preventative maintenance and system optimization
7. Spare parts support
8. Advice on modularization and scale-up to larger capacity
9. Advice on design of fuel hopper or storage area for boiler fuel
10. Advice on construction to resist high winds and monsoon weather