<p style="text-align:center">Call for Proposals - Terms of Reference</p>

Data analysis and machine learning for accelerating clean energy through a mobile financing marketplace

<p style="text-align:center">February 2019</p>

Context

MicroEnergy Credits (MEC) was founded in 2007 with the objective of facilitating lending for clean energy products that have a positive benefit for the climate.   For over a decade, MEC has worked with local financing partners who have delivered millions of loans for clean energy products, including solar lights, improved cookstoves and water filters.

MEC is building off this experience to launch Chaguzi, a mobile marketplace for lending for clean energy, in Kenya (with expansion to other geographies in the future).   Chaguzi ("choice" in Swahili) is a FinTech solution to enable customers without formal credit histories to access clean energy via a mobile phone platform, enabling them to choose both their clean energy product and financing. Chaguzi brings together lenders, clean energy product suppliers and customers.

Chaguzi seeks to use *data analytics and machine learning* to achieve a number of goals: i) improve the sales and promotion activities of local financing partners, ii) assess client risk upfront, iii) recommend to clean energy product suppliers the financial partners and clients that are likely to be customers, iv) matches clients to clean energy products they like and v) match clients to lenders that are appropriate for each other (in terms of client risk and other characteristics). Data analytics and machine learning will be core to the success of the Chaguzi platform.

MEC is looking to contract with a data analytics and machine learning supplier/partner to enable Chaguzi to achieve the above goals, utilizing the data that MEC has collected previously as well as new data collected as Chaguzi moves into a beta pilot phase through to commercial scale, in a long term arrangement.

This work is in part supported by Energy and Environment Partnership covering Southern and East Africa (EEP Africa).

Objectives of assignment

MEC seeks to contract with a data analytics and machine learning organization ("data firm") to perform the following functions:

1. <u>Develop product, client and financing suggestion engines</u>:
   (a) Use the depth of historical data that MEC has collected as well as additional data that MEC is able to obtain, and external historical data sets to the data firm is able to identify and procure to develop predictive suggestion engines for:
      i. Improving the sales and promotion activities of local financing partners
      ii. Recommending to clean energy product suppliers the financial partners and clients that are likely to be customers,
      iii. Recommending to clients the clean energy products they may be interested in obtaining
      iv. Recommending to clients the lenders that may be interested in their profile (e.g. client risk, occupation, geography) and recommending to lenders clients that are likely to be clients that are interested in lending to.
   (b) Identify and procure external historical data that may be relevant and incorporate into the development of the product, client and financing suggestion engines
   (c) As the data set expands (particularly in Kenya), update the suggestion engine model to incorporate new loans

and customer interactions

       (d) Enable the suggestion engines to be utilized by MEC to inform financing partners, supplier partners, and clients on a real-time or near-real time basis

2. <u>Develop credit scoring engine</u>:

       (a) Use i) historical customer data, ii) external data and additional historical data and iii) data to be collected as part of the Chaguzi beta pilot (to be defined in part through the data firm as articulated below) to develop a predictive credit scoring engine, that provides a customer-by-customer prediction or recommendation on the likelihood of repayment (or categorization by risk profile, or similar articulation of risk to be agreed with MEC)

       (b) Test efficacy of credit scoring engine to predict repayment with incoming borrower data through the beta

       (c) Enable the credit scoring engine to be utilized by MEC as part of Chaguzi in real time, as confidence in the efficacy of the recommendations is achieved.

3. <u>Identify data needs and priority sources to be incorporated into Chaguzi</u> to enable development and improvement of the engines identified in (1) and (2)

       (a) Review academic and non-academic literature, the previous experience of the data firm, and other similar efforts by other organizations or companies for potential relevant data sources or factors that would be important to collect as inputs to the suggestion engines and the credit scoring engine. At a minimum, the potential data sources the data firm should examine (but not be limited to) data available on mobile phones, credit bureau data, personal information questions, third party data, and data available through partnerships from lenders.

       (b) Work with MEC technology development team to identify data sources and factors that Chaguzi would have the capability of collecting in a reliable way

       (c) Prioritize based on i) likely relevance and ii) capability to recommend what data sources and factors should be built into Chaguzi, so that MEC may collect that data throughout the beta pilot to enable the data firm to develop or improve the suggestion engines and credit scoring engine.

4. <u>Ongoing support for data management, data quality review, and periodic analysis</u>:

       (a) Work with MEC data team to ensure that data is collected in form and stored in a manner that ensured data quality and enables the data firm to be able to utilize the data during and after the beta pilot for the engines in (1) and (2)

       (b) Provide periodic analysis on outcomes to MEC, as required to identify progress towards refining the predictive models

The assignment is projected to last up to two years, contingent on performance.

Deliverable milestones

The following are expected deliverable milestones, including expected timelines:

Deliverable	Timeline
Initial product, client and financing suggestion engines, including identifying, procuring and incorporation of external data and additional data as available	30 days after signing of contract
Recommendations on needs and priority sources to be incorporated into Chaguzi, based on i) relevance and ii) capability	30 days after signing of contract
Revised product, client and financing suggestion engines, including enabling real time use by MEC for financial partners, suppliers and clients	60 days after signing of contract
Initial credit scoring predictive engine	90 days after signing of contact for credit engine driven by historical data, 180 after signing for credit scoring based off data collected as part of Chaguzi beta pilot

Enable real time use by MEC of credit scoring predictive engine	30 days after completion of relevant initial credit scoring predictive engine
Testing of efficacy and revision of credit scoring predictive engine	Ongoing up to 24 months after signing of contract
Testing of efficacy and revision of product, client and financing suggestion engines	Ongoing up to 24 months after signing of contract
Periodic support and analysis (see objective 4)	Ongoing up to 24 months after signing of contract

Qualifications

The data firm will be expected to have the following qualifications:
1. Demonstrated capability for implementing data analytics and machine learning projects, as evidenced by completed projects with other clients
2. Experience building ongoing live applications with data that is changing and of variable quality
3. An ability to scale to needs of the client, either up due to immediate client needs to complete a deliverable or down due to a data collection phase
4. Demonstrated capability to securely data in a manner than ensures strict confidentiality and non-disclosure
5. Ability to operate in English

Asset qualifications:
1. Experience with developing i) product suggestion engines and ii) credit scoring predictive engines, in particular with alternative data sources.

Data availability

MEC has a depth of data available, of which a selected subset will be shared on a confidential basis with the data firm. Potential data available includes data on geography of purchase, date of purchase, product purchased, previous products used by the customer, and loan amount and loan structure, for over a million customers that have been extended loans by a variety of financing partners in three geographies (India, Mongolia and east Africa) for purchase of products from a variety of suppliers of clean energy products. In addition, MEC has interviewed over 3000 customers some time after product purchase related to product usage and working status. MEC also has information on the credit officer, gender and occupation for a subset of customers. MEC will seek to obtain additional data from financial partners, including repayment data.

As data is collected through the Chaguzi beta pilot (with data collection to be specified in conjunction with the data firm), that data will also be shared with the data firm on a confidential basis.

Proposal

Interested qualified firms are expected to submit:

A technical proposal, including:
1. A statement of qualifications of the firm as they relate to the objectives of the project
2. Example projects that demonstrate the firm has the capability articulated in the statement of qualifications
3. Qualifications (CVs) of key staff that would be assigned to this project
4. Commentary on the objectives and description of how the firm would approach implementing the project
5. Policies, procedures and capabilities related to data management within the organization

The **technical proposal must be submitted as a pdf to**:   TechnicalProposal@microenergycredits.com

Please title the proposal with "Name of firm – technical proposal"

A <u>financial proposal,</u> including:
1. Daily rates of key staff
2. Allocated time to complete the objectives and deliverables outlined

The **financial proposal must be submitted as a pdf to**:   FinancialProposal@microenergycredits.com
Please title the proposal with "Name of firm – financial proposal"

Please **do not submit the financial proposal and technical proposal together in a single email** – they must be sent to separate emails as articulated above.

Proposals will be considered as they are submitted, with final submission due 14 days after the posting data of the terms of reference. This terms of reference was posted on February 13, 2019, with final submission due on February 28, 2019.

The original posting can be viewed on www.microenergycredits.com

Questions and clarifications can be directed to info@microenergycredits.com

Final thoughts: the opportunity

Working in partnership with Chaguzi represents an opportunity to work with a leading social enterprise at the nexus of clean energy, access to finance and positive impact on the climate. MEC pioneered the development of clean energy lending with MFIs, and seeks to partners with an equally pioneering firm on applying data analytics and machine learning to overcoming access to finance for clean energy. MEC seeks to work with an ambitious firm and group of people that share our passion for positive impact, to further the mission of enabling low income, unbanked customers to switch to clean energy and have a positive impact on their lives and the climate.