



## **REQUEST FOR EXPRESSIONS OF INTEREST**

### **PROVISION OF FUEL MARKING SERVICES FOR THE ENERGY REGULATION BOARD (ERB) OF ZAMBIA,**

#### **TENDER NO.: ERB/FM/OIS/016/2022**

The Energy Regulation Board (ERB) has reserved funds in its 2023 budget for the procurement of fuel marking services. Bidding is being conducted using Open International Selection Procedures (OIS) and is open to citizen, local and foreign bidders. A foreign bidder who participates in open international selection shall partner with a citizen bidder in accordance with the provisions of the Public Procurement Act No. 8 of 2020 and the Public Procurement Regulations of 2022.

#### **1.0 BACKGROUND**

The Energy Regulation Board (ERB) is a statutory body established under the Energy Regulation Act N0.12 of 2019 that replaced the repealed Act Cap 436 of the Laws of Zambia. The Act mandates the ERB to provide regulatory oversight in the energy sector in Zambia. One of the key functions of the ERB is to ensure the provision of quality petroleum products to consumers by all licensees.

#### **1.1 ZAMBIAN PETROLEUM SUPPLY CHAIN**

Zambia has no oil reserves of her own and therefore imports all petroleum requirements. Refined petroleum products are imported into the country mainly by road and to a lesser extent by rail mostly through the ports of Dar-es-Salaam in Tanzania, Beira in Mozambique with a small proportion from South Africa. In November 2021, Government announced reforms on restructuring the petroleum sub-sector. Under the reforms, INDENI was put on care and maintenance and refining of petroleum feed stock was ceased in the upstream. In the restructured petroleum sub-sector, TAZAMA pipeline will only facilitate the transportation of Low Sulphur Gasoil (LSGO).

Over the years, the demand for petrol, diesel and kerosene has significantly increased due to increased economic activities in the country. Statistics show that the demand for these fuels has increased from 1,136,666.89 MT in 2017 to 1,419,399.19 MT in 2021 as illustrated in the Table below.

### **Evolution of National Consumption of Fuels in Metric Tonnes (MT) From 2017 to 2021**

<b>Year</b>	<b>Kerosene</b>	<b>Unleaded Petrol</b>	<b>Diesel</b>	<b>Total Consumption</b>
2017	16 241.66	325 940.13	794 485.10	1 136 666.89
2018	15 334.97	327 029.05	823 821.73	1 166 185.75
2019	10 831.00	346 575.00	885 453.00	1 242 859.00
2020	7 504.17	339 431.09	912 813.96	1 259 849.22
2021	2 536.84	396 661.37	1 020 200.98	1 419 399.19

Further, the liberalization of the Zambian petroleum market has resulted in the proliferation of industry players and enhanced competition. Unfortunately, this competitive business environment has seen the emergence of malpractices such as adulteration and/or illegal diversion of tax – free transit petroleum products. The said malpractices pose a risk to fuel quality, harm the environment and ultimately deprive the Government of millions of kwacha in revenue due to tax evasion.

Owing to the land linked nature of the country, a large amount of fuels transit through Zambia enroute to Democratic Republic of Congo

### **1.2 FUEL ADULTERATION, DUMPING AND SMUGGLING**

Adulteration involves the addition of undesirable, often inferior, lower value petroleum products that are not suitable for use in motor vehicles and other machinery. Dumping is the offloading of tax exempt product that is meant to transit through the country onto the local market. On the other hand, smuggling is bringing fuel into the country that has not been declared at the port of entry.

Different intervention measures can be implemented to combat adulteration, dumping and smuggling, with one such measure being Fuel Marking. Fuel marking is a technology that has been employed in various parts of the world and has often been coupled with stringent punitive measures against culprits to enhance its effectiveness.

In this regard, the ERB intends to procure the services of a reputable Fuel Marking Company in order to combat adulteration, dumping and smuggling. The fuel marking services shall be on a three year contract subject to renewal.

## **2.0 SCOPE OF SERVICES**

The scope of services for the Zambian Fuel Marking Programme shall require the contractor to do the following:-

- i) To supply portable onsite testing equipment for quality testing of petroleum products in the field in line with the Zambian standards;
- ii) To conduct quality testing of petroleum products in order to ascertain the indicative quality of the fuel prior to marking. The said tests shall be a requisite requirement for marking of petroleum products;
- iii) To supply the marker and perform marking operations by ensuring the right dosage of marker is added to all petroleum products destined for the domestic market. The products to be marked shall be diesel, petrol and kerosene excluding aviation fuels;
- iv) Marking shall be undertaken at the following designated locations:
  - a) Designated entry points (Borders);
  - b) Ndola Fuel Terminal (NFT);and
  - c) Anywhere in the country as and when a case may warrant.
- v) Marker dosing shall be directly into fuel tankers at the designated locations prior to dispatch into the local market. The marking process shall be preceded by verification of fuel volumes, densities, color, temperature and indicative quality testing of the fuel using an onsite portable testing equipment;
- vi) To avail to ERB, appropriate and adequate marker measurement and testing devices for the contract period for purposes of testing fuel samples;
- vii) To prepare and submit to ERB such reports as may be deemed necessary, including but not limited to daily, monthly, quarterly and half-yearly marked products and operations evaluation reports as per ERB approved format;
- viii) To assist ERB to develop and implement systems and procedures for fuel marking operations and testing of petroleum samples ;
- ix) To provide an information management system that gives visibility of the fuel marking monitoring process across the petroleum products supply chain; and
- x) To provide technical knowledge transfer and training to ERB staff including but not limited to, implementation of the marking operations including marker preparations, marking procedures, sample preparations and testing and troubleshooting.

## **3.0 MINIMUM CHARACTERISTICS OF THE MARKER**

The marker should be able to, among others, meet the following mandatory specifications:

1. Be detected at very low concentrations;
2. The marker must be unique and it should not be possible to imitate the marker properties in any way (Evidence of patent rights/or proof attesting to the

uniqueness of the marker and the inability to imitate its properties must be provided)

3. Low taxed fuel products must be marked with a different marker to curb adulteration. Such markers aimed at identifying specific adulterants should be unique to the specific adulterant. The marker should be such that it is not possible for it to be laundered/removed from the fuel once it has been added. (Provide a test certificate attesting that the marker and all its components cannot be laundered or removed).
4. The marker must be invisible and not change the products color during the whole process of marking, sampling and testing. (Evidence must be produced that the marker does not impart color to the fuel during marking, sampling and testing.)
5. Marker should be able to homogeneously mix with the petroleum products and keep its qualities/chemical properties after doping and maintain long term stability in fuel at temperature ranges generally experienced and recorded in Zambia. The marker must be such that the samples that have been tested during the sampling and testing process can be returned to the same products tank of collection for normal use i.e. that the process of testing does not change the nature or properties of the same sample; (Provide proof that marker is homogeneous throughout the temperature range and provide a certificate from a reputable laboratory testifying the description of the process by which the marker is detected in the host hydrocarbon and without compromising the nature or properties of the sample).
6. Marker must be measured/detected directly in petroleum products by the analyzer without the need for addition of a reacting agent or any additional physical or chemical action (provide evidence of certificate ascertaining that the marker is tested directly in fuel without use of a reacting agent, extraction, evaporation or centrifugation).
7. The marker should comply with the national environmental legislations and other international conventions which Zambia ratified aimed at protecting human health and environment from Persistent Organic Pollutants (POP's) and should pass minimum requirements for use of restricted substances with regulatory limitations. (Provide evidence that the marker complies with Environmental Management Act No.12 of 2011).
8. The marker should not contain additives that may cause damage to motor vehicle engines or any other machines; (Certificate that marker is approved as an additive or taggant in fuel for motor vehicle engine).
9. Marker should be fingerprint secure, non-toxic and also be non-reactive with other markers or additives in petroleum products. (Provide evidence)
10. Marker should have long term stability and maintain its stability for at least 12 months. All markers should be organic and should stay stable in fuel and should

not separate from the fuel at all times of the supply chain including instances of water contamination.(Provide evidence attesting to this requirement).

11. Marker must be precisely measured and detected in the field providing on-site qualitative and quantitative results for enforcement and prosecution. (Provide evidence that the marker can be tested precisely in the field with attendant equipment producing dependable and consistent qualitative and quantitative results).
12. The marker should be detectable in petroleum products blended with Ethanol and Bio Diesel (Provide evidence that the marker is usable on fossil fuel blended with biofuels).
13. Bidders must provide a current Material Safety Data Sheet (MSDS) for the marker. (An up to date Material Safety Data Sheet of the marker chemical that is 3 years or less in publication must be provided).

#### **4.0 TECHNICAL SPECIFICATIONS OF THE DETECTION SYSTEM**

1. The field analyzer / detector should be fitted with a simple user friendly interface and be easy to use; (Provide a description of hardware specification to ascertain simplicity and ease of use);
2. The field detector / analyzer should be of a kind that allows the operator to carry out remote troubleshooting in consultation with the technology provider.
3. The detector must be able to conclusively detect dilution of the marker with unmarked fuel and adulteration of fuel with specific adulterants on site. (Provide evidence that analyzer allows direct detection of the dilution / adulteration of fuel using marker testing that is based on internationally recognized testing methods);
4. To ensure a robust program and a broad approach, the marker detection system should comprise of two (2) different types of detectors/analyzers that use different types of test methods for field and central laboratory analysis as follows:
  - a. The first level of detector system should be a field testing analyzer that enables for many samples to be tested on daily, weekly or monthly basis and real time enforcement for non-compliance enforcement to be carried out.
  - b. The second level of detector system should be a central laboratory analyzer that is different from a field analyzer test methods and used as a secondary confirmation of results in case of any dispute of field results.

- c. NOTE: Both field and central laboratory analyzers are used to test for identification of marker and determination of the marker level concentration and not quality parameters of fuel.(Provide evidence that the marker detection system complies with the requirement);
5. The equipment should be a field device either easily carried by hand or mounted in a vehicle without extensive retrofitting (evidence that the equipment meets the requirement and testimonials of use in other similar projects of the same temperature range);
  6. The field detector / analyzer should be able to produce conclusive on-site results with excellent precision within a short period of less than 5 minutes per test to allow for testing many samples in the field per day and real time enforcement to be carried out.(Provide evidence)
  7. The testing instrument/ analyzer should be precise to provide accurate test readings and reliable qualitative and quantitative results on site allowing the operator and other concerned parties direct interpretation on the marker concentration level at the testing site for enforcement and prosecution. (evidence of the testing process and a certificate testifying the testing precision to be within the +5% limits of experimental error);
  8. The field analyzing process should not generate any waste of any substance either physical or chemical so that the analyzed samples are returnable to bulk product tank for normal use (evidence of the testing process and a certificate testifying the testing process from reputable laboratory):
  9. Bidders must demonstrate that the field detector system is capable of securely and automatically transmitting the test results, which results must have a Global Position system (GPS) location, to the client's central monitoring system, agreed central repository and/or head office for effective supervision purposes. (Provide evidence to this requirement)
  10. The field detection system should be able to record and keep in memory for at least 12 months the test results and such other important information on the tests carried out such as date, time, place, type of tested petroleum products, volumes, name of person performing test, name and type of licensed facility's GPS coordinates etc.; (Provide evidence attesting to this requirement):

11. The field detector should be able to print the detailed test results report directly from the analyzer without requirement for any further input of the results. (Provide evidence attesting to this requirement);
12. The test results and data recorded in the detector machine during the testing should be tamper -proof. The field equipment must have the capability to secure results to protect against any type of changes, alteration or manipulation of the data by the testing team or anybody else including an employee of the service provider present at the testing site or in the country Zambia; (Demonstrate and verify how field results are recorded and protected against any type of change, alteration or manipulation of such data by the operator or any other employee. Storage and safe retrieval of data should essentially be infinite, iron-clad and non-corruptible for program data including the device data);
13. The entire marking or marker and detection systems should have International Standard Organization (ISO) accreditation particularly ISO 9001 (the international standard that specifies requirements for a quality management system (QMS)) and/or ISO 17025 (Which specifies general requirements for the competence of testing and calibration Laboratories). This accreditation should remain in force for the entire period of the services; (Provide evidence attesting to this requirement);
14. The detection system should be robust to withstand Zambia climatic operating conditions. (Evidence/proof that the field analyzer can operate and remain stable throughout the temperature range)

## **5.0 KEY REQUIREMENTS FOR SHORTLISTING BIDDERS**

The requirements for this Expression of Interest (EoI) are as per ***The Public Procurement Act No. 8 of 2020 and the Public Procurement Regulations of 2022***. Interested parties are required to submit the following minimum information which shall form the basis for shortlisting bidders:

1. Certificate of Incorporation (company registration) ;
2. International Bidders must submit bids in partnership with Zambian firms or in conjunction with local bidders;
3. Latest and valid Certificate of Tax Clearance from country of origin;
4. Profile of core business with experience of not less than five years in providing similar services using the fuel marking technology;

5. Description of similar assignments undertaken by the bidder. For each assignment performed, the bidder shall provide the name and address of the client, date of execution and value of the project;
6. Interested consulting firms must provide information indicating that they are qualified and have the required expertise, experience and technical back up to undertake the assignment;
7. Availability of appropriate skill by providing bio - data of key personnel to be involved and other relevant particulars such as but not limited to detailed and signed Curriculum Vitae of key staff;
8. In relation to item 7 above, the following is the team composition and qualification requirements for the key experts:
  - a. Team Leader
    - i. Minimum Degree in Chemistry or Chemical or Petroleum Engineering or related field and a Master's Degree in any field.
    - ii. Minimum five (5) years experience managing related field.
  - b. Key consultant/ Project Manager
    - i. Minimum Bachelor of Science in Chemistry or Chemical Engineering or related field
    - ii. Minimum five (5) years experience in related field.
  - c. Other Technical staff
    - i. Minimum Diploma in Laboratory Sciences or Analytical Chemistry or related field.
    - ii. Minimum three (3) years experience in related field
9. Good communication skills, both oral and written in the English language; and
10. Should preferably have experience of conducting similar services in third world countries.
11. The bidder should not be a licensed entity or one carrying out activities requiring a licence by the Energy Regulation Board

## **6.0 DURATION OF CONTRACT FOR SERVICE PROVISION**

The fuel marking services shall be on a three year contract.

## **7.0 SUBMISSION DETAILS**

The EoI shall be addressed to the Director General, Energy Regulation Board and clearly marked "**ERB/FM/OIS/016/2022 Request for Expression of**

**Interest for Provision of Fuel Marking Services".** The EoI shall be submitted in eight hard copies with the original copy initialed on all pages, one soft copy (CD), appropriately bound, sealed and labeled. The EoI shall be deposited in the tender box on the Ground Floor, ERB Head Office, Plot 9330 Danny Pule Road, Mass Media, and Lusaka, Zambia. All requests for clarifications related to the submission of the EoIs shall be made in writing and sent by e-mail to [blombe@erb.org.zm](mailto:blombe@erb.org.zm).

Receipt of clarifications shall be closed seven days before the closing date. This Expression of Interest can also be accessed on the ERB website at [www.erb.org.zm](http://www.erb.org.zm)

**TELEGRAPHIC AND/OR ELECTRONIC SUBMISSION OF EXPRESSION OF INTEREST SHALL NOT BE ACCEPTED**

The closing date for the receipt of the EoI is **2<sup>nd</sup> September, 2022 at 10:30 AM Zambian time** and any EoI received after the time and date stipulated above will not be accepted.

**Brian Lombe**

**Manager - Procurement and Supplies**

**FOR DIRECTOR GENERAL**

**Date of first publication is 12<sup>th</sup> August, 2022.**