

Request for Quotation (RFQ) for the provision of services to undertake a General Energy Assessment at an asphalt product supplier based along the Garden Route.

RFQ 5615/20/08/2020

Date of issue	06 August 2020
Closing Date and Time	20 August 2020
Contact details	For submission of quotations or any other enquiries: tender@csir.co.za Tel no: 012 841 2400

1 INVITATION FOR QUOTATION

Quotations are hereby invited for the supply of service for a **General Energy Assessment**) to be conducted at an **asphalt product supplier** based along the Garden Route., Western Cape.

The on-site General Energy Assessment is to be conducted solely by the recipient of this RFQ and may not be delegated, outsourced nor contracted to any other party without prior written notification to the NCPC-SA Project Manager.

2 QUOTATION REQUIREMENTS

2.1 The overall purpose of the General Energy Assessment utilizing the UNIDO Methodology is to:

- To assist with quantifying energy, and identifying other major consumers within their processes.
- To use the assessment as a tool to identify potential opportunities for the reduction and more efficient use of energy consumed by the facility's motor system.
- To verify whether the energy used is efficient and that there is an ongoing program to monitor and improve the use of this resource.
- To establish an energy consumption baseline by means of normalization (regression analysis with indicated baseload).
- To assist in setting energy efficiency index and targets where applicable.

- To collect quantitative data to determine the percentage energy consumption by specific areas or significant energy users (SEUs) across all energy sources to be considered.
- To provide detailed recommendations for any energy efficiency improvements that will result in kWh reduction and result in economic benefits for the company.
- To undertake an economic feasibility analysis of all identified energy improvement opportunities
- To include possible renewable energy options and provide a high level feasibility analysis.
- To present recommendations to the facility management team on selected feasible and viable options and prioritisation of implementation options.

2.2 PROJECT DELIVERABLES

The following are key project deliverables required:

2.2.1 Project Inception and Planning

The service provider will develop and draft an assessment plan and schedule outlining the proposed activities and visits to be undertaken at the facility.

The inception phase will also involve planning, coordination and review of the activities to be carried out by the service provider with the timelines also being reviewed at this stage.

2.2.2 General Energy Report

Compiling one (1) assessment according to the reporting template provided to the winning bidder which includes:

- Completion of the General Energy Assessment at the facility.
- Preparation and submission of a draft General Energy Assessment Report outlining the findings of the investigation at each facility, along with the following for each plant:
 - i. Report calculations in and excel document
 - ii. All digital and infrared pictures taken on-site during the assessments
- Visual presentation of the findings to management of the facility.
- Presentation of the Final General Energy Assessment Report with Implementation Plan, identifying cost and dates to management of the facility, and identifying the way forward on implementation of potential options as highlighted in the final report.
- A close-out report summarising the interventions at the facility, inclusive of the views of management and their intended way forward.
- Submission of meeting minutes for the inception and feedback meetings.

Attention will be placed on execution of the General Energy Assessment with specific emphasis on the focus areas.

2.2.2.1 Key activities to be undertaken will include:

- Conducting the General Energy Assessment at each facility, using the following steps:
 - i. Walk-through & survey
 - ii. Establishment of process flow diagram
 - iii. Possible measurement of energy sources if deemed necessary
 - iv. Analysis of energy consumption and costs
 - v. Comparison of individual energy resource performance
 - vi. Profiling of individual energy use patterns
 - vii. Inventory of individual energy use and costs
 - viii. Developing a model of facility using regression analysis
 - ix. Identification of improved energy efficiency opportunities as required
 - x. Assessment of the benefits of each the identified opportunities

The above approach is structured to meet the needs of the company and will enable the CSIR's NCPC-SA to gain an overview of the potential for energy savings, as well as gain a good insight into the relevant management issues of the energy resources.

2.2.2.2 The General Energy Assessment report must comprise the following sections:

- [A] Cover page
- [B] Document Control Page
- [C] Executive Summary

The Executive Summary should include:

- a) The Company's current energy resource consumption and cost:
 - i. Plant total Electricity Usage (kWh/Annum)
 - ii. Plant total Electricity Cost (Rand/Annum)
 - iii. Plant total Energy Usage (kWh Equivalent/Annum)
 - iv. Plant total Energy Usage (Rand/Annum)
- b) Potential quantitative annual energy savings reported in bulleted format and preceding the Main Summary Table of Savings Opportunities:
 - i. Annual kWh savings against total plant kWh consumption
 - ii. Total energy savings against total plant energy consumption
 - iii. Annual Rand savings against total plant electricity cost,
 - iv. Annual Rand savings against plant energy cost,
 - v. % saving against annual plant energy cost.
 - vi. Total tons of CO2 reductions
 - vii. Total % CO₂e reduction

The General Energy Assessment Report will highlight no/low cost options to be considered by the company management for immediate implementation. Where investment in new equipment/ technology is recommended, the maximum payback for savings options to be considered will not exceed 2 years in the **Summary Table** in the **Executive Summary Section** of the **General Energy Assessment Report**. The 0-2 year payback period serves to encourage the company to implement energy savings opportunities. Longer-term options will only be considered if aligned to strategic objectives of the company and must be shown in the "**Qualitative Findings**" table separate and below the Summary Table in the Executive Summary.

The summary of recommendations should be reported in the format shown in the following Table in the Executive Summary of the General Energy Assessment Reports. The tables serve as a template and do not suggest the limitation of any recommendations to two **per section in the report as indicated in the Table below**. The full extent of the investigated savings of the each facility is to be reported in the following Summary Tables:

In the case of **Energy and associated Energy savings** recommendations the following Summary Table is applicable:

	Posourco	Estimated Savings Investment		Bayback		
No.	Optimisation	kWh per	Rand per	Ton CO ₂ e	Cost (Rand per	Period
	Opportunities	annum	annum	annum	Annum)	(Years)
	Electr	ical Energy	Savings Rec	ommendatio	ons	
1.						
2.						
	E	Energy Savir	ngs Recomm	endations		
1.						
2.						
		Quali	tative Findin	gs		
1.						
2.						
	TOTALS					

[D] Contents Page [E] Brief Introduction

This section entails a 15-20 line description of:-

- a) The NCPC-SA's mandate in terms of providing assistance to industry in reducing its resource consumption and managing it sustainably.
- b) The Industrial Energy Efficiency Project and its objectives.
- c) The introduction between the NCPC-SA and the Company in building synergies
- d) The Company's objective to have a General Energy Assessment Conducted
- e) The Company's long term goal to manage its energy consumption

[F] Facility/Company Information

This section requires 10-20 lines of the Facility description regarding the following:

- history viz: inception year, location,
- production/product range and specialisation
- growth/expansion/amalgamation from inception to date in term of branches available, staff complement, and product/service range
- Any special technology being used at the facility that is widely publicised and not regarded as Intellectual Property (IP) by the company
- Special accreditations secured by the facility over the years e.g. ISO aligned EnMS 50001, ISO 9001, ISO 14001 accreditation etc.

This section of the report also requires the following information pertaining to each of the Company's plants:

- a) Aerial view of the facility location (e.g. google based)
- b) Street View of the facility location (adjacent to aerial view picture)
- c) Facility contact details in tabulated format:
 - i. Facility Name
 - ii. Physical Address
 - iii. Phone, Fax
 - iv. E-mail
 - v. Website
 - vi. Number of Employees
 - vii. Contact Person Name, Number & Email
 - viii. Identification of Service/Process
 - ix. Departments Identification
 - x. Office hours for facility
 - xi. Production hours of the facility

[G] Process Description

This section must include a basic process description (simple block diagram) and operations description (e.g. seasonal variation, daily shifts and monthly procedures) pertaining to the resource consumption streams on-site including distribution system and end use requirement.

A description of the systems present on site in terms of operational conditions with respect to the Company's product requirements must be provided and may include descriptions of the following:

- a) High level identification of systems
- b) High level identification of parameters of systems
- c) Etc.

[H] Consumption Data

This section entails the following:

a) 24 months latest, tabulated data on:

- i. The facility's kWh consumption and associated cost (Rand), the % contribution of the plant energy cost to the plant's Maximum Demand (MD), its comparison to seasonal production data
- b) 24 months latest and applicable data depicted by a:
 - i. pie chart showing the energy cost proportionated by the to the rest of the plant's energy consumption.
 - ii. graph of production vs electrical and energy cost
 - iii. graph and data of a baseline of energy usage showing the patterns or any other significant activity or independent variable to validate a model through regression analysis
- c) Data Analysis Requirements.
 - The General Energy assessment report must quantify by means of a table, an energy balance, and regression analysis, the energy consumption for at least 12 latest and consecutive months plotted against an appropriate independent variable(s) for the following in order to establish baseline data:-
 - Electricity
 - Energy

[I] Identification of Energy Saving Measures

This section further contains the quantitative and qualitative information for all the different energy efficiency recommendations that will yield kWh and Rand savings for the Company. The service provider must identify and explain each energy saving opportunity briefly in approximately 5-8 lines followed by the following critical data regarding the recommended savings opportunity:

- 1-2 line mathematical calculation (quantitative expression) to substantiate the kWh/kL/tonne saving recommended
- Substantiate Estimated kWh/kL/tonne savings:
- Annual estimated Rand savings
- Capital Cost (Rand):
- Payback Period (Years)

The evidence of software results (in summarised version) must be inserted in this section of the report, showing all relevant and applicable results such as screenshots of input data and output data including an Excel document showing all input data used during the assessment. The detailed results are to be included in the Appendix Section of the General Energy Report

[J] Conclusions

The Service Provider concludes the report by including all the main recommendations in a summarised manner. The following recommendations must be distinct from each other:

• Quantitative recommendations

- Qualitative recommendations
- Long term strategic recommendations of 3.5 4years and more

[K] Recommendations

In this section of the report, the Service Provider prioritises the recommendations in importance of:

- No cost resource savings opportunities
- Low cost resource savings opportunities
- Medium cost resource savings opportunities
- High cost resource savings opportunities

The prioritisation of certain energy savings projects may also be a strategic decision derived from the Company Management and could include ease of implementation. In this case, the service provider must accept this guidance and include this information in the report. The service provider must therefore utilise the time on-site effectively to solicit key company information directly from the plant's appropriate management in this regard.

[L] Appendices

This section must contain but is not limited to:-

- i. detailed tables of data used for measuring and logging.
- ii. detailed graphs of data representing extensive measurement and logging data
- iii. extensive descriptions of parts of the process or the whole process
- iv. detailed and extensive ducting/piping diagrams
- v. maintenance records
- vi. best operating practises
- vii. extracts of guidelines
- viii. detailed calculations pertaining to savings recommendations highlighted in the body of the report
- ix. etc

[M] Reporting and Company Feedback

A Feedback Presentation will be presented to management of each facility following the completion of the detailed General Energy Assessment reports based upon the recommendations identified. The final report will include a utility audit, highlighting of specific areas for potential savings, recommended additional utility metering requirements, as well as further recommendations regarding ongoing energy resource monitoring & targeting, etc.

Historical resource usage data will be expertly analysed in detail through a process of regression, and the report where applicable will include benchmarking data based upon performance indices. These will be used in comparison with known performance indices to further establish the scope for savings potential.

The final report will upon completion, be presented at a formal feedback session with management of the facility, and the intended purpose is to outline the project focus and confirming the options identified for implementation.

A plan of action for possible implementation of the options is then to be agreed upon with management of the facility.

2.3 PROJECT SCOPE AND ACTIVITIES FOR THE COMPANY

Deliverable/Task List	Expected Results	Minimum Estimated Time/ Duration & Location
 Part 1: Meet Facility owners/managers to: a. Introductions between Service Provider and Company Top Management b. Brief presentation and discussion on the General Energy Assessment c. Develop a baseline period for the energy consumptions d. Determine/measure system profiles and trends during the on-site assessment e. Determine facility's electricity and energy consumption and targets for production, usage and optimisation. f. Establish electricity and energy cost and application challenges for present and future systems requirements. 	 Copies of all relevant utility bills. Electricity and energy, parameters information. Meeting minutes and attendance registers 	[0.5 Day] On-Site
 Part 2: Conduct plant walk through in order to: a. Gain familiarity with the facility's production process b. Identify & familiarise the distribution and use of electricity and energy consumption c. Question and photograph (if allowed) the operation and maintenance of significant electricity and energy consumers and observe the behaviour patterns of the various systems present. d. Understand the operating parameters of various equipment on-site eg:- compressed air pressure profile(s), temperature and cooling profiles for various equipment and machines used in the company's process e. Discuss and identify with the appropriate company representative/s (eg:- maintenance manager or site engineer etc), the location of equipment and related pipelines (including electrical distribution boards etc) and end uses where measurements will be conducted during the General Energy Assessment to obtain authorisation and go-ahead from the appropriate Facility Representative/s to complete any measurements required during the assessment and to be included in the Final Report. 	 Records of plant, measurement data and observations regarding: Electricity and Energy, usage. 	[0.5 Day] On-Site

Deliverable/Task List	Expected Results	Minimum Estimated Time/ Duration & Location
 Part 3: Conduct General Energy Assessment: a. Establish, meet and interview the people who influence electricity and energy consumption significantly. b. Identify various resource consumption opportunities that will offer greatest potential for savings by evaluating & determining the various system parameters such as:- motor power drawn, temperature gradients, air flow, pressure at point of generation. c. Review operational controls and record consumption patterns, d. Review operator training, establish the Maintenance Policy and Track Record for equipment significantly impacting electricity and energy consumption e. Note the operating parameters of significant electricity and energy consumption streams linked to equipment that may influence consumption significantly. f. Characterise the current resource consumption and operation of poor performing enduse applications that cause production issues and challenges. g. Note the operating parameters (Min & Max volume/load) of significant resource consumption equipment h. Investigate electricity and energy saving options and quantify the implementation cost and saving benefit using calculations to substantiate savings. 	 Record of: consumption patterns and operating parameters of electricity and energy consumption 	[3 Days] On-Site
 Part 4: General Energy Assessment Report Drafting: a. Analyse Measurement Results. b. Where necessary, conduct research and obtain quotations for any recommendations tabled. c. Draft and refine the General Energy Assessment Report, table recommendations. d. Report Feedback (vetting) will be provided by the relevant NCPC-SA PM, which should be incorporated into the report. 	 Draft General Energy Report(s) and send to NCPC-SA PM. Followed by the Final Assessment Report completion upon feedback from NCPC- SA PM. 	[3 Days] Home Based and On-Site

Deliverable/Task List	Expected Results	Minimum Estimated Time/ Duration & Location
Part 5: Report Feedback Meeting to Company Top Management.		
 a. Project Manager and Service Provider to arrange and secure a suitable and convenient time slot with the Company Top Management to provide a Final Report Feedback and discuss implementation of recommendations. (On-site feedback meeting only – no skype, webinar nor teleconferences or any form of distant meeting format) 	 Attendance Register for Report Feedback Meeting 	[1 DAY] On-Site
b. Incorporate necessary changes to be made to the report after the Final Report Feedback is given to Company Top Management.		
Expected Working Days		8 Days

2.4 USE OR LOAN OF NCPC-SA MEASURING EQUIPMENT

The following NCPC-SA measuring equipment is available to Service Providers:

- Infrared thermometers
- Single phase power analyser
- Current Meter
- Voltmeter
- Lux meter
- etc

The following NCPC-SA measuring equipment is available to Service Providers that have completed the Expert Level UNIDO based systems optimisation training for the purpose of conducting specific systems optimisation assessment:

- Fans Flowkinetics measurement kit
- Pumps Systems Optimisation measuring kit
- Compressed Air Systems Optimisation measuring kit
- Flue Gas Analyser and related equipment making up the Steam Systems Optimisation Measurement Kit
- 3 Phase Power Analyser
- etc

Once the tender is awarded to the winning bidder, the Service Provider is advised to contact the NCPC-SA Project Coordinator directly to inquire on the use/availability of the equipment to be loaned. All equipment queries are communicated directly to the NCPC-SA Project Coordinator.

The name and contact details of the NCPC-SA Project Co-ordinator will be made available to the winning bidder upon request thereof at the end of this tender process.

There is no cost to the service provider for the loan of NCPC-SA equipment. An "equipment loan document" and a "test equipment hiring policy" document have to be signed & completed by the service provider ahead of receiving the equipment from the Cape Town-based NCPC-SA regional office.

2.5 FACILITY TO BE ASSESSED

2.5.1 COMPANY DATA

Once on-site, the Service Provider must confirm accuracy of the information provided in the table below by updating any information in the table that may be incorrect or inaccurate. Neither the CSIR nor the NCPC-SA will be held liable for any inaccuracies that may be contained in the tables below.

INDUSTRIAL PROCESS USED	Manufacturing of Asphalt: Proportioning , Heating, Dust extraction, Mixing, Dispatch
DEPARTMENTS	Admin, Maintenance, production, dispatch quality.
PRODUCTS & PRODUCTION VOLUME PER ANNUM (UNITS)	Asphalt. Up to 132000 ton

UTILITIES			
Name of utility	<u>Quantity</u>		
Compressors	1		
Furnaces	1		
Motors	25		

RESOURCES			
Resource	Annual Quantity (units)	<u>Cost / Annum</u>	
Water	220 k/l	0	
HFO	330 000 liter	R 1864500.00	
Electricity	62000 hw/h/m- 682000kw/h Annum	R1254000.00 Annum	

2.6 PROJECT SCOPE AND ACTIVITIES

The following table outlines the activities that must be followed during the development of the General Energy Assessment Report:

Stages of Assessment	Activities	Duration
Inception Meeting	A meeting with management of the company to discuss the scope of the assessment and to gain their support as well as to request a company contact during the period of the assessment.	0.5 days
Collation of data specific to the NCPC-SA's General Energy Assessment	Collation of completed pre-visit questionnaire (PVQ), conducting interviews or discussions with management of the participating company, and visiting the plant to present details of the planned assessment.	0.5 days
General Energy Assessment	 This includes: i. Walk-through & survey ii. Establishment of process flow diagram iii. Possible measurement of energy sources if deemed necessary iv. Analysis of energy consumption and costs v. Comparison individual energy resource performance vi. Developing the regression analysis model on the facility vii. Profiling of individual energy use patterns viii. Inventory of individual energy use and costs ix. Identification of improved energy efficiency opportunities as required x. Assessment of the benefits of each the identified opportunities 	3 days
Write / Compile General Energy Assessment	Using the provided General Energy Assessment Report template, submit draft reports to NCPC-SA responsible Project Manager, along with all calculations in an excel spreadsheet and providing any additional supporting documentation.	3 days
General Energy Assessment Feedback Meeting	Present the findings of the General Energy Assessment to management of the facility.	0.5 days
Complete final General Energy Assessment report	Responsible Project Manager will send the draft received to the concerned company representatives for approval, before submitting for internal technical review. Depending on the feedback, reworking the draft may be required and an Implementation Plan of recommendations is be included.	0.5 days

2.7 ESTIMATED PROJECT DURATION

It is anticipated that the work will commence upon acceptance and signing of a contract with an appropriate specialist appointed by the CSIR's NCPC-SA, and it is expected that the assessment be completed within one (1) month of commencement of the project, depending on the extent of the project at the plant. Consideration will also be given to the measurement and monitoring needed to be undertaken at the facility.

The table below outlines the sequence of completion along with estimated commencement dates, and the amount of days budgeted for each:

Activity	Assessment Estimated Commencement Date	Amount of Working Days	Assessment Estimated Completion Date
Inception Meeting	24 August 2020	0.5 days	24 August 2020
Collation of data specific to the NCPC- SA's General Energy Assessment	24 August 2020	0.5 days	24 August 2020
General Energy Assessment	25 August 2020	3 days	27 August 2020
Write / Compile General Energy Assessment	28 August 2020	3 days	01 September 2020
General Energy Assessment Feedback Meeting	02 September 2020	0.5 days	02 September 2020
Complete final Assessment report	03 September 2020	0.5 days	03 September 2020

All reports issued and presented to the company will be completed under the CSIR's NCPC-SA brand, and the final report and feedback meetings will be concluded within 3 weeks of on-site assessment completion.

3 EVALUATION CRITERIA

- **3.1** Selection of suppliers will be based on the 80/20 preference point system.
- **3.2** Indicate valid B-BBEE status on quotation. No B-BBEE status will equal zero points.
- **3.3** Indicate CSD number (National Treasury Central Supplier Database) on quotation. If not registered yet on CSD, use <u>www.csd.gov.za</u> to register.
- 3.4 No order will be issued or no contract will be signed without a valid CSD number.
- **3.5** B-BBEE Status: Only the following documents shall be accepted as proof of a bidder's B-BBEE Status level of contributor:
 - B-BBEE Certificates issued by an accredited verification agency and bearing SANAS logo
 - Sworn affidavits
 - Dti issued sworn affidavit / BEE certificate

4 PRICING QUOTATION

- **4.1** Price needs to be provided in South African Rand (excl. VAT), with details on price elements that are subject to escalation and exchange rate fluctuations clearly indicated.
- **4.2** Price should include additional cost elements such as freight, insurance until acceptance, duty where applicable, etc.
- **4.3** Payment will be according to the CSIR Payment Terms and Conditions.
- **4.4** The bidding Service Provider is to complete and submit the table below for each site providing the quotation in response to this RFQ.

4.4.1 Table for Project Milestones and Costing

Project Milestones	Fee excl. VAT (Rand)
Introduction Meeting with Company Management on-site	
General Energy Assessment – Observe, Interview, Measure,	
Log, Analyse Data & Summarise Findings & Recommendations	
General Energy Assessment Report Generation / Development	
Report Feedback Meeting to Company Management on Site	
(Not Skype nor telephonic)	
Transportation and logistics	
Total fee excl VAT (Rand)	
Total fee incl VAT (Rand)	

5 OTHER TERMS AND CONDITIONS

- **5.1** The supplier shall under no circumstances offer, promise or make any gift, payment, loan, reward, inducement, benefit or other advantage, which may be construed as being made to solicit any favour, to any CSIR employee or its representatives. Such an act shall constitute a material breach of the Agreement and the CSIR shall be entitled to terminate the Agreement forthwith, without prejudice to any of its rights.
- **5.2** A validity period of 90 days will apply to all quotations except where indicated differently on the quote.
- 6 No goods and/or services should be delivered to the CSIR without an official CSIR Purchase order. CSIR purchase order number must be quoted on the invoice. Invoices without CSIR purchase order numbers will be returned to supplier.
- 7 Note: This is not a Purchase Order.