

**Request for Information (RFI) from potential suppliers  
or consultants for a conceptual design of a microgrid  
including energy technology development and  
demonstration at CSIR Pretoria campus**

**RFI No. 7022/15/11/2019**

Date of Issue	Monday, 21 October 2019	
Briefing Session	Tuesday, 29 October 2019 Time: 11:00 -13:00 Venue: CSIR Building 22 (Central Station) Address: CSIR, Meiring Naude Road, Brummeria, Pretoria, 0001	
Closing Date	Friday, 15 November 2019	
Place	Tender box, CSIR Main Reception, Gate 3 ( North Gate)	
Enquiries	Strategic Procurement Unit	E-mail: tender@csir.co.za
CSIR business hours	08h00 – 16h30	
Category	Professional	

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## **SECTION A – TECHNICAL INFORMATION**

### **1 INTRODUCTION**

The Council for Scientific and Industrial Research (CSIR) is a world-class African research and development organisation established through an Act of Parliament in 1945. The CSIR undertakes directed, multidisciplinary research and technological innovation that contributes to the improved quality of life of South Africans. The organisation plays a key role in supporting government's programmes and participates in private – public partnerships through directed research that is aligned with the country's priorities, the organisation's mandate and its science, engineering and technology competences.

### **2 BACKGROUND**

The CSIR Energy Centre was established in 2014 to streamline CSIR offerings in the energy field. This centre consolidates the energy-related research that previously took place in the different operating units of the CSIR and focuses on the key energy challenges of the country, SADC/SAPP region and Africa. It has a strong focus on technology integration, policy support and technical and economic modelling of the energy sector.

The CSIR Energy Centre has established a programme called Energy-Autonomous Campus (EAC) which is aimed at reconfiguring the CSIR Pretoria campus into a microgrid that is more resilient to external disturbances, such as, for example, the loss of mains electricity from Tshwane municipality. The current vision of the programme is to supply electrical energy to the CSIR Pretoria Campus from the three primary energy sources: solar, wind and biogas from biogenic waste. Furthermore, the CSIR microgrid will also integrate storage resources (such as batteries, hydrogen fuel cells and heat). Other smart facilities, such as electric and hydrogen-driven vehicles, power-to-liquid and power-to-gas processes, demand-side management, and energy-efficiency measures may also be integrated.

This programme will stand as a real-world research platform for designing and operating a primarily renewables-based energy system at the lowest possible cost in Rands per kWh. This platform will demonstrate in a real-world setting of significant size, how a future energy system based on variable and dispatchable renewables can be designed and operated in the most

cost-efficient manner utilising modern control and visualisation techniques to yield a smart solution. To-date, the EAC programme has integrated PV generation onto the Pretoria campus with the following capacities:

- Single axis tracker: Installed capacity: 558kWp
- Dual axis tracker: Installed capacity: 202.3kWp
- East-West fixed tilt (roof top phase 0): Installed capacity: 250kWp
- East-West fixed tilt (roof top phase 1): Installed capacity: 911kWp

The above generation has a total installed capacity of about 2MW compared to the Pretoria campus's annual peak demand of about 6 MW. The inverters of all these PV generation plants are non-grid forming, hence cannot, at present, form an island during loss of supply from Tshwane municipality, therefore resulting in CSIR being unable to continue normal business operations when this condition materialises. However, the CSIR Pretoria campus has 12 standby diesel generators with a total installed capacity of about 2.9 MVA. These diesel generators are deployed to supply critical loads during loss of electrical supply from the main infeeds.

Although the above milestones have been achieved in terms of integration of PV on the Pretoria campus, the CSIR EAC programme still has a long way to go before the idea of a fully resilient microgrid can be realised. As a result, the CSIR Energy Centre requires specific information from prospective suppliers / consultants on how to devise a solution for a full or partial grid resilience for its Pretoria campus. The CSIR Energy centre requires a conceptual microgrid design with smart capabilities for its Pretoria campus that will address the problem of loss of mains supply from Tshwane municipality. The design capabilities should include supply and demand side management techniques, storage resources such batteries and hydrogen fuel cells, power-to-liquid and power-to-gas synthetic processes.

### **3 INVITATION FOR REQUEST FOR INFORMATION**

Information is hereby invited and requested from suitably-qualified suppliers or consultants, on developing a conceptual microgrid design with smart capabilities for CSIR Pretoria campus. The conceptual design should provide full or partial grid resilience against loss of mains supply from Tshwane municipality including capabilities such as supply and demand side

management techniques, storage resources such batteries and hydrogen fuel cells, power-to-liquid and power-to-gas synthetic processes.

#### 4 RFI SPECIFICATIONS (OVERVIEW OF REQUIREMENTS)

Depending on the information and responses received, the CSIR would like to acquire expert consultancy services for development of a conceptual microgrid design with smart capabilities for CSIR Pretoria campus. The conceptual design should provide full or partial grid resilience against loss of mains supply from Tshwane municipality. The design should further incorporate capabilities such as supply and demand side management techniques, storage resources such batteries and hydrogen fuel cells, power-to-liquid and power-to-gas synthetic processes. This microgrid design needs to be backed by a high-level market analysis to justify the investment, with the consultant considering market requirements for such a design. The conceptual design can follow one of the architectural examples given in figure 1 below. But, it must be stressed however, that figure 1 only serves as an example and any architectural design that differs from figure 1, but satisfies the stipulated requirements, will be considered.

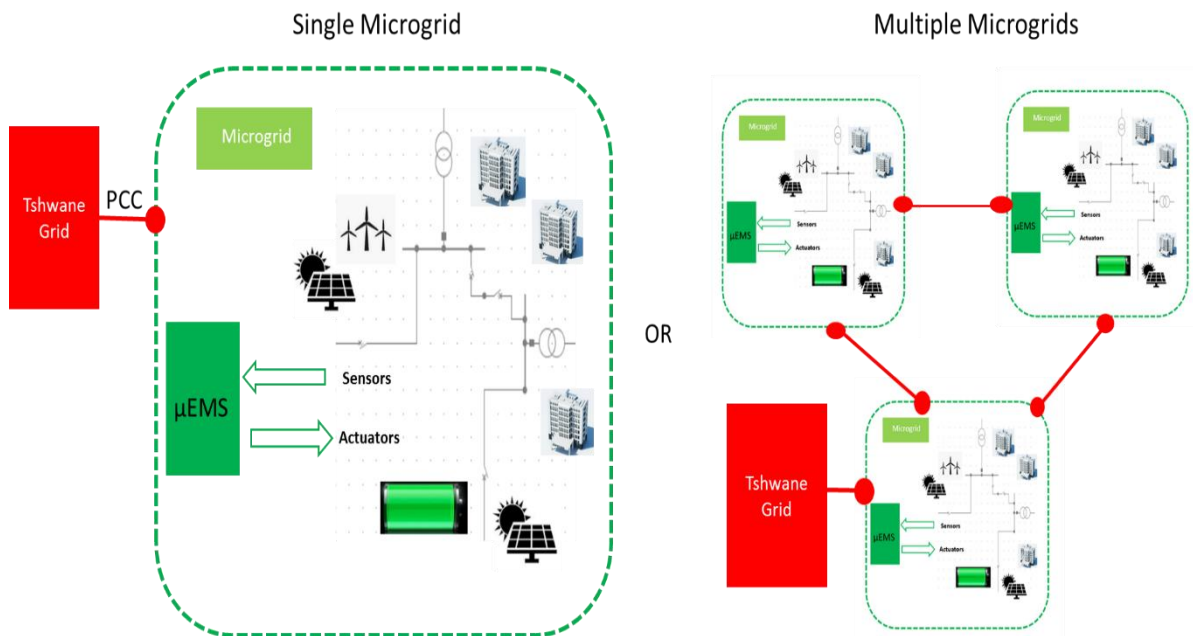


Figure 1: CSIR Pretoria Campus possible microgrid/s architectures

#### **4.1 Design Capabilities**

The conceptual design of the microgrid must be able to exhibit the following properties and capabilities:

1. Must be capable to be used as a demonstration of future energy system and collaborative RDI platform for technology development and localisation.
2. The design must include supply and demand side management techniques, storage resources such batteries and hydrogen fuel cells, power-to-liquid and power-to-gas synthetic processes.
3. The design must be cost-effective and be able to supplement the current CSIR resources and technologies with minimal integration of new resources and technologies.
4. The design must exhibit smart control and visualisation capabilities.
5. The design must demonstrate flexibility to integrate new technologies such as battery banks, hydrogen fuel cells, and biogas plants etc. This can be done in a phased approach while still maintaining cost-effectiveness of the solution.
6. Must maintain synchronism with Tshwane network under normal operating conditions.
7. Must be able to successfully island following separation from Tshwane infeed.
8. Must provide a level of reliability to all CSIR load centres (service points) under normal and abnormal operating conditions.
9. The islanded microgrid must be able to provide continuity of supply to all CSIR critical loads at the least.
10. The islanded microgrid's capability to provide further continuity of supply to all CSIR essential loads or comfort loads or both must be demonstrated (CSIR load classification in terms critical, essential and comfort loads will be provided as part of additional information during the briefing session).

#### **4.2 Key Deliverables**

Over and above the requirements for the microgrid design the expert consultancy service is required to provide CSIR with the following:

1. A detailed report describing the conceptual design and covering all the capabilities outlined above.
2. Cost estimates for implementation of the design (i.e. capex and opex).
3. Bill of materials (BoM).

4. Single line diagrams (SLDs) for the proposed designs.
5. Scope of work for implementation of the project.
6. A high-level market analysis to justify the viability of the solution proposed.
7. A high-level Project Plan and Gant chart outlining the tasks to complete and possible timelines in this regard.

The potential consultant or service provider responding to this RFI is also required to respond with answers and explanations to the following requirements:

#### **4.3 Profile Information**

1. Company or Consultant Name
2. Company Profile or Consultant profile
3. List current offices and locations.
4. List relevant experience of resources that will be assigned to this project.

#### **4.4 Support Options**

1. Please provide details of your track record of previous microgrid designs and implementations, highlighting approach, methodology and client management processes used. (Please append supporting case studies).
2. Please provide specific details of your plan and approach to integrate the proposed microgrid design into CSIR's current network infrastructure.

All information is to be submitted in a format specified in this enquiry (as applicable). However, service providers or consultants are welcome to submit additional or alternative information over and above the originally specified format (e.g. other capabilities that you may deem to be relevant).

**Briefing Session:** There will be a briefing session at Central Station Building 22, CSIR Pretoria campus, on Tuesday, 29 October 2019. The additional information pack that includes relevant CSIR network data will be made available at the briefing session and the service providers will be asked to sign NDA with CSIR before release of this information. The representatives of companies signing the NDA shall have written permission in the form of Resolution of Directors / Power of Attorney.

## SECTION B – TERMS AND CONDITIONS

### 5 VENUE FOR RFI SUBMISSION

Responses must be submitted at:

- **CSIR GATE 03 - Main Reception Area** (in the **Tender box**) at the following address:  
Council for Scientific and Industrial Research (CSIR)  
Meiring Naudé Road  
Brummeria  
Pretoria

International service providers can submit electronically at [tender@csir.co.za](mailto:tender@csir.co.za)

### 6 RFI PROGRAMME

The RFI program, as currently envisaged, incorporates the following key dates:

- |                                     |                          |
|-------------------------------------|--------------------------|
| • Issue of RFI documents:           | Monday, 21 October 2019  |
| • Briefing Session                  | Tuesday, 29 October 2019 |
| • Last date for submission queries: | Friday, 8 November 2019  |
| • Closing / submission date:        | Friday, 15 November 2019 |

All service providers who submit or provide the information requested will be requested to register on the National Treasury Central Supplier Database (CSD).

Respondents to this RFI may be invited to CSIR to formally present on their capabilities.

### 7 SUBMISSION OF RESPONSES

- 7.1 All responses submitted are to be sealed. No open responses will be accepted.
- 7.2 All information submitted is to be clearly marked with the RFI number and the name of the service provider on the outside of the main package.
- 7.3 Responses submitted by companies must be signed by a person or persons duly authorised.



## 8 DEADLINE FOR SUBMISSION

The Request for Information shall be submitted at the address mentioned above no later than the closing date of **Friday, 15 November 2019** during CSIR's business hours. The CSIR business hours are between 08h00 and 16h30.

Where an RFI is not received by the CSIR by the due date and stipulated place, it will be regarded as a late RFI. Late RFI's will not be considered.

## 9 VALIDITY PERIOD OF RESPONSES

Each **Request for Information** shall be valid for a minimum period of three (3) months calculated from the closing date.

## 10 ENQUIRIES AND CONTACT WITH THE CSIR

Any enquiry regarding this RFI shall be submitted in writing to CSIR at [tender@csir.co.za](mailto:tender@csir.co.za) with ***“RFI No 7022/15/11/2019 - Request for Information (RFI) from potential suppliers or consultants for a conceptual design of a microgrid including energy technology development and demonstration at CSIR Pretoria campus”*** as the subject.

## 11 MEDIUM OF COMMUNICATION

All documentation submitted in response to this Request for Information must be in English.

## 12 COST OF REQUEST FOR INFORMATION

Service providers are expected to fully acquaint themselves with the conditions, requirements and specifications of this RFI before submitting responses. Each service provider assumes all risks for resource commitment and expenses, direct or indirect, of RFI preparation and participation throughout the RFI process. The CSIR is not responsible directly or indirectly for any costs incurred by service providers.

### **13 CORRECTNESS OF RESPONSES**

- 13.1 The service provider must confirm satisfaction regarding the correctness and validity of their RFI.

### **14 VERIFICATION OF DOCUMENTS**

- 14.1 Service providers should check the numbers of the pages to satisfy themselves that none are missing or duplicated. No liability will be accepted by the CSIR in regard to anything arising from the fact that pages are missing or duplicated.
- 14.2 **One hard copy and one electronic copy (CD or USB memory key)** of each RFI must be submitted. In the event of a contradiction between the submitted copies, the hard copy shall take precedence.
- 14.3 Emailed Request for Information submissions will not be accepted unless they are from international companies.
- 14.4 If a courier service company is used for delivery of the RFI document, the RFI description must be endorsed on the delivery note/courier packaging to ensure that documents are delivered to the tender box, by the due date as mentioned above.

### **15 NON DISCLOSURE AGREEMENT (NDA)**

- 15.1 Service providers shall sign NDA with CSIR so that they can have access to additional information pack accompanying this RFI. The representatives of companies signing the NDA shall have written permission from the companies concerned in the form of Resolution of Directors / Power of Attorney.

### **16 ADDITIONAL TERMS AND CONDITIONS**

- 16.1 Service providers shall not assume that information and/or documents supplied to CSIR, at any time prior to this request, are still available to CSIR, and shall consequently not make any reference to such information document in its response to this request.
- 16.2 Copies of any affiliations, memberships and/or accreditations that support your submission must be included in the response.

- 16.3 An omission to disclose material information, a factual inaccuracy, and/or a misrepresentation of fact may result in the disqualification of a response, or cancellation of any subsequent contract.
- 16.4 Failure to comply with any of the terms and conditions as set out in this document will invalidate the response.

## **17 CSIR RESERVES THE RIGHT TO**

- 17.1 Extend the closing date;
- 17.2 Verify any information contained in a response;
- 17.3 Request documentary proof regarding any tendering issue;
- 17.4 Cancel or withdraw this RFI as a whole or in part; and

## **18 DISCLAIMER**

This RFI is a request for information only and not an offer document; answers to it must not be construed as acceptance of an offer or imply the existence of a contract between the parties. By submission of its RFI, service providers shall be deemed to have satisfied themselves with and to have accepted all Terms & Conditions of this RFI. The CSIR makes no representation, warranty, assurance, guarantee or endorsements to service provider concerning the RFI, whether with regard to its accuracy, completeness or otherwise and the CSIR shall have no liability towards the service provider or any other party in connection therewith.