

# **REQUEST FOR PROPOSAL (RFP)**

**FOR**

**THE FEASIBILITY STUDY TO ESTABLISH A  
MICRO-ELECTRO MECHANICAL SYSTEMS (MEMS)  
FACILITY AT THE CAPE PENINSULA UNIVERSITY  
OF TECHNOLOGY (CPUT)**

**RFP NUMBER: 041/11/08/2009**

**Issue Date: 17 August 2009**

**Response Deadline: 31 August 2009**

## **1. INTRODUCTION**

The CSIR is one of the leading scientific and technology research, development and implementation organisations in Africa. The Advanced Manufacturing Technology Strategy (AMTS) is a Cabinet-approved national strategy of the Department of Science and Technology (DST). The CSIR is currently the host for the AMTS Implementation Unit (AMTS IU) that is tasked with the implementation of certain initiatives that fall within the AMTS.

The DST is introducing new instruments in the National System of Innovation known as Centres of Competence (CoCs). These CoCs aim to close gaps along the technology development value chain, provide support for technology and systems integration, develop production capabilities, develop productive human capacity and facilitate commercialisation.

The establishment of CoCs is therefore envisaged as one of the mechanisms to facilitate collaborative research and development (R&D) leading to commercialisation at industry, universities and science councils.

## **2. INVITATION FOR PROPOSAL**

Bidders are invited to submit a proposal for an investigation into the feasibility of establishing a MEMS facility at the CPUT as part of an updated Business Plan for a proposed CoC in MEMS. The CSIR requires proposals from suitably qualified bidders.

## **3. PROPRIETARY INFORMATION**

The CSIR considers this Request for Proposal (RFP) and all related information, either written or verbal, which is provided to the Bidder, to be proprietary to the CSIR. It shall be kept confidential by the Bidder and its officers, employees, agents and representatives. The Bidder shall not disclose, publish, or advertise this specification or related information in part or as a whole to any third party without the prior written consent of the CSIR. This applies regardless of whether the recipient of this RFP responds with a proposal or not.

## **4. ENQUIRIES & RESPONSES**

All communication and attempts to solicit information of any kind relative to this RFP should be channelled to the contact person named in the RFP. All enquiries regarding this proposal shall be submitted in writing to

[supplier@csir.co.za](mailto:supplier@csir.co.za) with “The feasibility study to establish a MEMS facility at the CPUT – RFP Number: 041/11/08/2009” as the subject.

## 5. MEDIUM OF COMMUNICATION

All documentation submitted in response to this RFP must be in English.

## 6. VERIFICATION OF DOCUMENTS

Bidders 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.

## 7. SUBMISSION OR RFP'S

- 7.1 Proposals should be submitted at **CSIR GATE 03 - main reception** (in the tender box) at the address mentioned below. It is the responsibility of the prospective supplier to ensure that the proposal is deposited in the tender box before **12h00 on 31 August 2009**.

**Council for Scientific and Industrial Research (CSIR)  
Meiring Naudé Road  
Brummeria  
Pretoria**

- 7.2 Four copies of each proposal must be submitted, including the original. In the event of a contradiction between the submitted copies, the original shall take precedence. Telegraphic, telefax and e-mail proposals will not be accepted.
- 7.3 Pricing schedule and B-BBEE credentials should be submitted with the proposal, but as a separate document and no such information should be available in the main proposal.
- 7.4 If a courier service company is being used for delivery of the proposal document, the RFP description must be endorsed on the delivery note/courier packaging to ensure that documents are delivered to the tender box, as mentioned above.

## 8. GENERAL RFP TERMS AND CONDITIONS

- 8.1** Where a proposal is not received by the CSIR by the due date and time, it will be regarded as a late proposal. Late proposals will not be considered.
- 8.2** The bidder is responsible for all costs incurred in the preparation and submission of the proposal.
- 8.3** A bidder shall not assume that information and/or documents supplied to the CSIR, at any time prior to this request, are still available to the CSIR, and shall consequently not make any reference to such information document in their response to this request.
- 8.4** Each proposal shall be valid for a minimum period of sixty (60) days calculated from the closing date.
- 8.5** A copy/ies of any affiliations, memberships and/or accreditations that support your submission must be included in the proposal.
- 8.6** Kindly note that the CSIR is entitled to:
- 8.6.1** amend any RFP conditions, validity period, specifications, or extend the closing date and/or time of RFPs before the closing date. All respondents to whom the RFP documents have been issued, will be advised in writing of such amendments in good time;
  - 8.6.2** verify any information contained in a proposal;
  - 8.6.3** not to appoint any bidder;
  - 8.6.4** vary, alter, and/ or amend the terms of this RFP, at any time prior to the finalisation of its adjudication hereof;
- 8.7** an omission to disclose material information, a factual inaccuracy, and/ or a misrepresentation of fact may result in the disqualification of a proposal, or cancellation of any subsequent contract.
- 8.8** the CSIR reserves the right not to accept the lowest proposal or any proposal in part or in whole. It normally awards the contract to the Bidder who proves to be fully capable of handling the contract and whose Proposal is technically acceptable and/or financially advantageous to the CSIR. Appointment as a successful contractor shall be subject to the parties agreeing to mutually acceptable contractual terms and conditions. In the event of the parties failing to reach such agreement within 30 days from the appointment date, CSIR shall be entitled to appoint the contractor who was rated second, and so on.
- 8.9** The CSIR also reserves the right to award this RFP to:-
- 8.9.1** An organisation that has strong B-BBEE credentials in terms of current B-BBEE legislation.
  - 8.9.2** An organisation that is a joint venture with black empowered company.
- 8.10** The CSIR also reserves the right to award this RFP as a whole or in part without furnishing reasons.
- 8.11** The CSIR also reserves the right to cancel or withdraw from this RFP as a whole or in part without furnishing reasons and without attracting any liability.

**8.12** The Bidder hereby offers to render all of the services described in the attached documents (if any) to the CSIR on the terms and conditions and in accordance with the specifications stipulated in this RFP documents (and which shall be taken as part of, and incorporated into, this proposal at the prices inserted therein).

**8.13** This proposal and its acceptance shall be subject to the terms and conditions contained in this RFP document.

**8.14** The bidder shall prepare for a possible presentation should CSIR require such and the bidder shall be notified thereof no later than 4 (four) days before the actual presentation date.

## **9. PROJECT PROGRAMME**

The Project Programme, as currently envisaged, incorporates the following key dates:

**9.1** Date of Issue: 17 August 2009

**9.2** Submission Date: 31 August 2009

**9.3** Completion of Project: 19 October 2009

**9.4** Proposals shall be submitted at the address mentioned below **no later than 12h00 on 31 August 2009**. The CSIR reserves the right to disregard proposals received after the specified due date.

## **10. PROJECT CONTENT**

South Africa has an established track record of producing world-class technologically rich products with a proven track record for performance. Technology has a very short half-life of about 3.5 years and we always have to re-invent our capability in the production of new products and solutions. MEMS technology is a key enabling technology that impacts products in consumer, commercial and military production through the notion of “systems on chips”, i.e. sensors embedded into silicon substrate material.

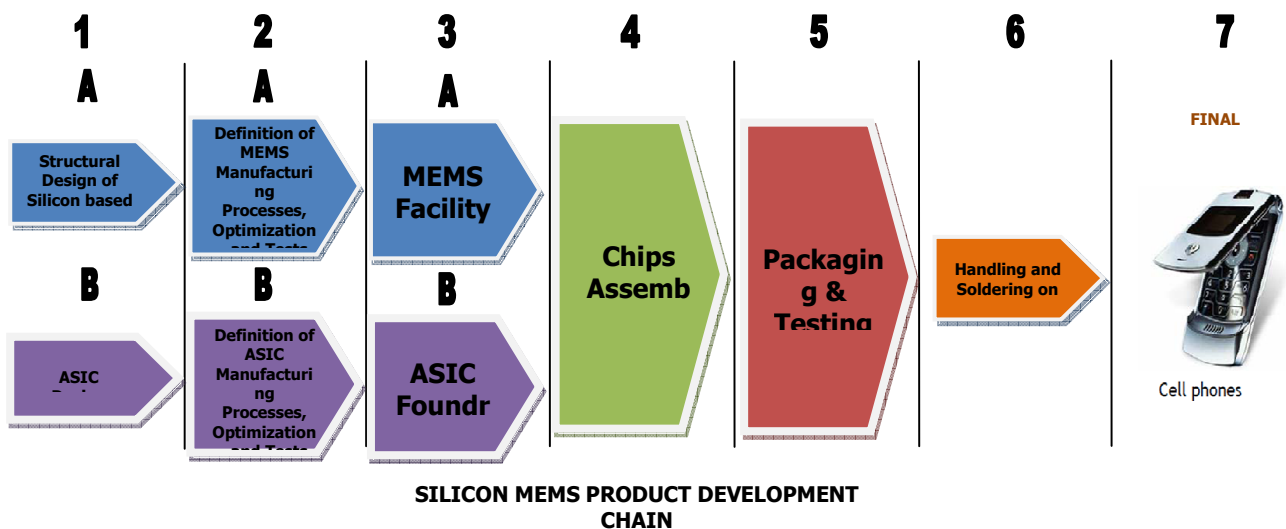
By 2012 it is estimated that the global MEMS market will be worth around \$15b with an average annual growth rate of about 17% and nearly half of this market will serve consumer products. A MEMS facility at the CPUT will focus on developing and manufacturing MEMS devices and provide access to this growing market. Conversely, no access to MEMS technology will not only deny access to this market, but South African companies producing products that could use MEMS will eventually have to close because they will not be competitive.

A consortium of six members (CPUT, Detek, Optocon, SA Micro-Electronics Systems (SAMES), Solid State Technologies, University of Pretoria) have developed a Business Plan for a local MEMS industry based around a microSensor Centre of Competence (CoC) with a focus on micro-Bolometer development and manufacturing. The MEMS manufacturing would be done at the SAMES facility in Pretoria.

Subsequent to the finalisation of the Business Plan, SAMES has decided to discontinue the Complementary Metal Oxide Semiconductor (CMOS) manufacturing activity and has proposed to relocate its equipment to the CPUT.

### 10.1 Why MEMS Manufacturing at CPUT?

Micro-Electro-Mechanical-Systems or MEMS as they are commonly known is an enabling technology that is revolutionising most product categories by infusing silicon-based micro-electronics with micro-machining technologies. It realises the concept of ‘smart’ or ‘intelligent’ products through the development of “systems on chips” where MEMS devices provide sensing functions and micro-electronic integrated circuits act as neural networks relaying electrical signals resulting in an overall adaptation of the structure to suit its environment. The MEMS product development chain (see diagram below) has three main features i.e. Structural MEMS design and manufacture; Application Specific Integrated Circuit (ASIC) design and manufacture; and their integration.



Researchers at the CPUT currently have the capability to conceptualise, design, and optimise MEMS structural elements through a unique and powerful design software, called COVENTORWare (steps 1A, 2A, and 3A).

The current global economic downturn has forced SAMES to refocus its core activities and at a recent Board meeting decided to relocate/donate its entire CMOS facility to the CPUT. This equipment will potentially provide the CPUT with the capability to undertake steps 1B, 2B, and 3B, placing CPUT in a very favourable position to host a National Facility in MEMS. Further funding is required for a MEMS facility, i.e. step 3A.

The CPUT’s Executive Management and Council accepted the proposal and committed to provide the infrastructure required to establish a MEMS

manufacturing facility. This ToR is for a study to investigate, through the provision of a competent Business Plan to the Department of Science and Technology (DST), the establishment of a National Centre in Micro-Electro-Mechanical Systems at the CPUT.

The study will investigate whether or not the current MEMS capability within the CPUT, combined with the equipment and technology provided by SAMES, will provide a natural home for the establishment of the CoC within the Science, Engineering and Technology hub on the Bellville campus of the CPUT

## 11. PROJECT SCOPE

- 1) Review the current Business Plan for a CoC in Micro-Sensors (micro-Bolometers).
- 2) Identify the nature, quantity, condition and suitability of the Micro-Electronics equipment that SAMES has committed to CPUT.
- 3) Identify additional equipment needed to establish the MEMS facility, establish the source and costs of the equipment (refer to Business Plan on “Locally Manufactured MEMS” and review).
- 4) Identify the timeframes and cost associated with transport of the SAMES equipment to the CPUT and the procurement of the additional MEMS equipment.
- 5) Identify the specific infrastructure to establish the specialized manufacturing/prototyping facilities in ASIC and MEMS
  - i. Visit a MEMS fabrication facility in Singapore/Canada
  - ii. Establish building requirements
  - iii. Establish level of clean room specification.
  - iv. Develop conceptual designs, cost and timeline for the specialised manufacturing facility.
- 6) Engage other stakeholders involved in MEMS research in order to ascertain their views on the MEMS facility at the CPUT, in the context of the proposed CoC in Micro-Sensors (Micro-bolometers)
- 7) Identify a clear MEMS product development chain that will include relevant stakeholders and show their particular involvement (include logistics and practicality of integration)
- 8) Identify human resources required to operate the MEMS Facility at the CPUT
  - i. Identify local (CPUT) human resources
  - ii. Identify human resources at SAMES willing to relocate
  - iii. Identify human resources abroad that will be willing to enter into employment contracts at the MEMS facility at CPUT
- 9) From the above three points, review alternative models for a local MEMS manufacturing industry based on the existing Business Plan (e.g. outsource the CMOS manufacturing).
- 10) Develop both capital and operating budgets and develop a lifecycle cost model for the MEMS Facility at the CPUT.
- 11) Develop a proposed funding plan for the facility at the CPUT.

- 12) Carry out a feasibility study on the establishment of a MEMS Facility at the CPUT as part of the proposed Centre of Competence in Micro-Sensors.
- 13) Integrate all of the above into an updated Business Plan for the proposed MEMS industry in South Africa.

### **11.1 Travel**

Local travel to the various stakeholders (consortium members) will be required. The cost of the local out-of-town travel will be covered by the CSIR (and should not be included in the bid price).

It is envisaged that the consultant may be required to travel internationally to visit a MEMS manufacturing facility (e.g. Canada or Singapore). The costs for this visit will be covered by the CSIR (and should not be included in the bid price).

All travel requests must be approved by the AMTS IU and be arranged by the CSIR.

### **11.2 Deliverables**

Deliverables of the study will be an updated Business Plan for a proposed MEMS industry in South Africa including the feasibility for the establishment of a national MEMS facility at the Cape Peninsula University of Technology, as part of the proposed Centre of Competence in Micro-Sensors.

The consultant will report to the AMTS IU for the duration of the project.

## **12. WORKING CONDITIONS**

The bidder shall be solely responsible for the provision of all office equipment, supplies, communications and local (in-town) travel that he/she may require for the execution of the work.

## **13. EVALUATION CRITERIA**

- Familiarity with micro-electronics industry and MEMS applications
- Knowledge and understanding of product development processes
- Business planning and budgeting
- Report writing, compilation and structuring of documentation
- Price
- Historically Disadvantaged Individual , women, disability

## **14. MANDATORY REQUIREMENTS**

**14.1** The bidder shall be involved in most aspects of the programme management including report preparation and periodic evaluation of the projects and programme costs.

**14.2** Prospective bidders should meet the following requirements:

- A degree in Engineering, preferably with a post-graduate qualification;
- Experience in a manufacturing industry environment (micro-electronics technologies);
- Experience in technology and product development;
- An understanding of the National System of Innovation;
- The ability to engage with stakeholders;
- Excellent written communication skills, including the ability to compile and structure a business plan;
- Excellent verbal communication (and presentation) skills and the ability to interact in meetings at all levels;
- An understanding of accounting and financial expertise as needed for business plan development;
- The ability (availability?) to travel locally and internationally.

## **15. SCHEDULE OF REPORTING AND SUBMISSIONS**

Regular reporting to the AMTS IU on the progress of the study must be done. The consultant is required to submit the following to the AMTS IU: (All reports should be submitted as required below and in an electronic and hard copy format.)

**15.1** Interim report, one month after the issue of letter of commencement of work. This report should include an assessment of the original Business Plan plus and an indication on the feasibility of the MEMS manufacturing facility at CPUT.

**15.2** Updated Business Plan for a proposed MEMS CoC in South Africa.

**15.3** Supporting documentation as required.

## **16. NON DISCLOSURE AGREEMENT**

**16.1.** Signed non-disclosure agreement attached to invitation for proposal.

## **17. CONCLUSION**

**17.1** Failure to comply with any of the terms and conditions as set out above will invalidate the proposal.

**17.2** CSIR's decision on proposals received shall be final and binding.