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**DSI-CSIR Nanomaterials Industry Development Facility Call for Participation**

**1. Invitation**

The Department of Science and Innovation -CSIR Nanomaterials Industrial Development Facility (NIDF) invites expressions of Interest (EoI) from small, medium and micro enterprises (SMMEs), established private companies and higher education institutions in response to this call focusing on new or improved materials/technologies development that will lead to a competitive chemical and polymer industry in South Africa. We encourage innovative applications by SMMEs and established larger private companies in nanotechnology, which includes polymer composites and chemical processes related to nanotechnology. Projects that require localisation of technologies developed or used outside of South Africa are also eligible for consideration.

**2. The DSI-CSIR Nanomaterials Industry Development Facility (NIDF)**

The NIDF offers an integrated access to three key research and development components, namely scale-up facilities, well equipped characterization laboratories and multi-disciplinary researchers (comprehensive technical support). The facility was specifically designed to enable the transition from laboratory to industrial scale and ultimately industrialization of products and technologies. The facility can support both SMMEs and large entities with product/process development needs as well as extensive chemical/materials characterization using state of the art equipment. The NIDF is staffed, and has access to a team of chemical engineers, researchers, polymer chemists, nanotechnology specialists, project managers and formulation scientists who apply their knowledge to assist SMMEs and large entities from prototype to pilot scale production.

**2.1 Summary of NIDF user benefits:**

* Optimisation of chemical and polymer processes and technologies by experienced chemical engineers.
* Scaled-up manufacture of nanomaterials and polymer formulations for quality and market testing.
* Application development for the products/materials by experienced researchers.
* Proper process costing based on scale up of manufacturing.
* Technology/process safety risks assessments and mitigation measures.
* Assistance with the technology value chain and value proposition development.

**2.2 Support offered by the NIDF**

**Pilot scale production:** nanomaterials, chemical and polymer processing pilot plants.

The chemical processing plant is equipped with:

* High temperature (180oC) and pressure (14 bars) chemical reactors (autoclaves);
* Stainless steel process tanks ranging from small (100l) to large (1 200l);
* Filter press, dryers and a bag house; and
* Other small processing equipment.

In the polymer formulation and processing plant we offer:

* A 40 L/D co-rotating twin screw extruder: for compounding of polymer composites;
* 500kN injection moulding machine: for production of injection moulded products and test coupons;
* A 5-layer cast sheet and blown film co-extrusion line: for production of multi-layered polymer films and sheets; and
* Other smaller processing equipment.

Characterization facilities:

* All typical polymer characterization and testing equipment including: Differential scanning calorimetry (DSC), Thermogravimetric analysis (TGA), Melt flow index (MFI), Tensile Strength, Impact Strength etc;
* Specialized instruments such as scanning and transmission electron microscopes (TEM and SEM); and
* X-ray diffraction (XRD), Ultraviolet–visible spectroscopy (UV-Vis) and Fourier-transform infrared spectroscopy (FTIR).

The NIDF supports SMMEs and large entities with any of the following:

* Characterization and testing of materials and products using state of the art equipment;
* Application development for the products/materials by experienced researchers;
* Optimization of your nanotechnology, chemical and polymer processes and technologies by experienced chemical engineers;
* Proper processing costing based on scale up manufacturing;
* Scale up manufacture of materials for quality and market testing;
* Technology/process safety risks assessments & mitigation measures; and
* Technology value chain and value proposition.

The following explanatory examples can assist to elucidate the type of support offered by the NIDF:

**Example 2**

Plastics Co (Pty) Ltd (not real name) approached NIDF to assist with the improvement of their polyethylene plastic formulation, which is used for the production of vegetable plant growing trays. The NIDF assisted them with the development and optimization of a new formulation and the production of 100kg of the material. Tests samples were injection molded and in turn characterized for tensile and impact strength. Plastics Co used the material to run trial productions at their plant and provide 100 test trays to their customers resulting in substantial orders.

**Example 1**

Powder Co (Pty) Ltd (not real name), a newly established SMME submitted an expression of interest to the NIDF which was accepted. Once all documentation including an NDA was completed the company brought 200kg of reagents to the NIDF for the production of their special nanopowders. With the assistance of NIDF/CSIR engineers and researchers they managed to optimize their production process to produce 100kg nanopowder. Using SEM and XRD, the powder was characterized and found to be of good quality. Now, with the assistance of the NIDF polymer processing expertise and compounding equipment, Powder Co (Pty) Ltd concluded three trial runs of incorporating their powder in polyethylene. Tests samples were injection molded and in turn characterized for tensile and impact strength. Powder Co was now able to provide three companies with 25kg test samples of their polymer formulation and within three months was able to get commitment from two companies to purchase 10tonnes per month. This enabled Powder Co to successfully approach the Industrial Development Corporation (IDC) for additional investments in their company to set up their powder production facility in an industrial environment.

**2.2 Safety, health and the Environment (SHE)**

The NIDF is well aware that nanotechnology and particularly the use of nanostructures in products is something new to the South African industry. For that reason, we also assist users to identify and mitigate potential health and safety aspects of particular nanotechnologies. Being part of the DSI-CSIR National Centre for Nanostructured Materials, the NIDF has established a Safety, Health and Environmental (SHE) system that plays a critical role in identifying and successfully managing these issues.

**2.3 Intellectual property ownership**

Ownership of possible intellectual property (IP) developed during the project will be determined by the parties’ contribution in effort as well as their investment. CSIR is guided by the IPR Act of 2008 and any financial investment by the CSIR into intellectual property developed will be negotiated in compliance with the act.

**3. Submission Requirements**

To apply, please complete the attached EOI form and e-mail the PDF versions of completed forms, CVs, BBEEE certificate/affidavit and proof of registration with the Companies and Intellectual Property Commission (CIPC) to nidf@csir.co.za .

Please use the following naming convention for attached documents:

|  |  |
| --- | --- |
| **Application:** | **CVs, certificates, etc**. |
| Name of Enterprise\_EOI- February 2020 | Name of Enterprise\_CV Jane Doe\_March 2020, Name of Enterprise\_CIPC proof of registration\_March 2020 |

Proposals must align to the objectives of this call and include the following aspects that will form part of the assessment criteria.

1. Project duration: Projects with development time less than 12 months will be prioritised.
2. Scientific excellence & technology readiness: Submissions that show great scientific excellence and technologies that are at a prototype/proof of concept stage that has been demonstrated in a relevant environment will be prioritized.
3. Compatibility with existing infrastructure and skills set: only submissions that are aligned with the NIDF’s expertise and infrastructure, as outlined above, can be supported.
4. Technical risks (safety and scalability): Projects with lower safety risks and fewer hurdles to scale up will be prioritized.
5. BEE status: Entities with a commitment to transformation as evidenced by their BBBEE certificate will be preferable.
6. Impact: Technologies that have the potential to impact industry through job creation and technological innovation are prioritized.
7. Business case: Applications that clearly show evidenced market potential are prioritized.

**2.3 Exclusionary criteria:**

**The NIDF is not a project funding agency;** it only provides access to a wide range of processing equipment, laboratory facilities, and research and development expertise to assist you with your product development and/or project. The supported enterprise will carry costs of its own resources, equipment and raw materials. As NIDF:

* We do not provide funding to the entities we support.
* We are not an incubation centre.
* We are not able to provide SABS certification.
* Participation is limited to South African entities.
* Applications that are not aligned with the NIDF’s skills and infrastructure will not be considered for support.
* Entities that do not fit the Small Enterprise Act definition (as revised on 15 March 2019) of an SMME (<https://www.gov.za/sites/default/files/gcis_document/201903/423041gon399.pdf>) will be expected to fully fund the activities proposed in their applications.
* Submissions received after posted deadlines will not be considered.
* Handwritten applications will not be considered.
* The applicant’s enterprise must be registered with the CIPC and proof of registration must be provided with the application or the application will be excluded from the process.
* Applications that are not accompanied by CVs will be excluded.
* Applications sent to any e-mail address other than nidf@csir.co.za will be excluded; and
* Submissions received after the closing date (**Friday, 20 March 2020**) will not be considered.

**4. Evaluation Process**

Following the publication of this call, the applicants are required to submit their proposals to the NIDF before the closing date.

Upon receipt of the proposals, the NIDF shall first assess the admissibility of the applicant’s proposal. The proposal is only admitted for further evaluation where all formal requirements have been met. In all other cases the proposal shall be rejected. Where the proposal is compliant with the formal requirements, it will be submitted to the NIDF advisory panel (AP) for evaluation. The AP will make recommendations to the NIDF steering committee (SC).

The NIDF SC will evaluate the proposal and either approve or reject proposals. The outcome of this evaluation process will be communicated to all the applicants.

**5. How to submit an EoI**

Applicants wishing to apply should submit their proposals to nidf@csir.co.za by 20 March 2020 at 16:30. Take note that no late or hand delivered or hand written submissions will be considered.

**6. Reporting Requirements**

Successful applicants will be expected to report on any jobs created, increase in revenue, improved competitiveness, as well as sales of products developed as a result of the NIDF support. Evidence of these will be required, and the format will be established during contracting. Any other investment secured and awards received as a result of the NIDF support should also be reported.

**For more information, please contact** Dr Mike Masukume at MMasukume@csir.co.za or on 012 841 4269.

**Expression of Interest proposal**

***Successful bidders may be invited for a more detailed interview***

**Closing date for applications is Friday, 20 March 2020**

**Please e-mail PDF versions of completed submission forms to** nidf@csir.co.za

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| **Enterprise name:** |  |
| **CIPC registration number:** |  |
| **Contact person(s):** | **Name and surname:****Position in enterprise:** |
| **Contact details** | **E-mail:****Landline:****Cell number:****Physical address of enterprise:****Postal address of enterprise:** |
| **Ownership arrangement** |  | Demographic | Gender |
| Black | White | M | F |
| Mark with X |  |  |  |  |
| **Directors/ members:** |  |
| **Years in business:** |  |
|  |  |
| **Annual revenue (if any):** |

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| Turnover Range \*  | 0-R150k | R151k-R500k | R501k-R500k | R5001k-R25M | R25M-R50M |
| *mark with X*  |   |   |   |   |   |
| Asset Range \*  | Micro (<R100k) | Very Small (R101k-R500k) | Small (R501k-R4.5M) | Medium (R4.5M-R18M) | Large (R18M+) |
| *mark with X*  |   |   |   |   |   |

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| **Number of current employees** | Permanent:  |  | Temporary: |  |
| **Applicable Industry:**(E.g. Chemical or Polymer or nanotechnology) |  |
| **BBEEE status level:** |  | Attach BBEEE certificate/or affidavit |
| **Date of this application:** |  |
| **1. Description of your core business and whether or not you are currently manufacturing and/or selling products, as well as your current turnover.** |
| **Core business:****Current status of manufacture and scale at which manufacturing:****Current turnover:** |
| **2. Description of the market need addressed by your product/processes and the potential market size (try and be as specific as possible).** |
| **Market need:****Market size:****Route to market (identified or already in place?):** |
| **3. Description of the product(s) you wish to manufacture and what differentiates them from competitor products.** |
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| **4**. **Support requirement:***Specify what support is needed from the NIDF.* |
| **5. Description of the technology you plan to use to manufacture the product.** |
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| **6. What is the expected development time to market?** |
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| **7. Please indicate the potential social and economic impact of the proposed business, specify cost benefit analysis** **(budgets, resource requirements, capital budgeting analysis).** |
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| **8. Please indicate the job creation potential of your business.** |
| **Type of job:** | **Number** | **By when** |
| ***Existing permanent jobs*** (permanent jobs currently in the enterprise):  |  | March 2020 |
| ***Direct permanent jobs*** (permanent jobs to be created in the enterprise): |  |  |
| ***Direct temporary jobs*** (temporary jobs to be created in the enterprise): |  |  |
| ***Indirect permanent jobs*** (permanent jobs to be created in the value chain, i.e. supply distribution, maintenance, packaging etc.): |  |  |
| ***Indirect temporary jobs*** (temporary jobs to be created in the value chain, i.e. supply distribution, maintenance, packaging etc.): |  |  |
| ***Other jobs to be created*** (specify): |  |  |
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| **9. Please list all sources and value of funding/support received to date.**  |
| **Source** (E.g. TIA, IDC, government, venture capital, incubator support, etc.) | **Programme** | **Nature of support** (funding/training/mentorship, etc.) | **Value of support if known** | **Period of support** |
|  |  |  |  |  |
| **10. Are you currently incubated/supported by any other incubator, enterprise supply chain development programme, etc.? Please specify and quantify support being received.** |
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| **11. Please attach short resumes/CVs (1/2 page each) of key personnel in your enterprise.** |

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| **12. Team composition (both business/technical management; if not identified, proposed):***List your team: What is the team’s background, expertise and experience (business and technical)?* |
| **Name** | **Highest academic qualification** | **Position in proposed entity** | **Previous business management/technical positions/experience** | **Previous experience in proposed nanotechnology/chemical/ polymer processing business area** |
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| **13. Please indicate the size of your company:****What is your potential to co-fund participation in the programme/NIDF?**

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**14.** **Do you have your own or licensed intellectual property (patents or know how) for the technology?** *Please explain.* |
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