



**Maire Tecnimont Centre For Research in Waste  
Recycling and Circular Economy**  
National Institute of Technology Karnataka Surathkal  
NITK Campus Post Srinivasnagar Surathkal-575025

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**Advertisement for Maire Tecnimont Research Scholarships for  
Sustainable Development**

**Ref. No: NITK/AAIR/CSR-2021-22**

**Date: 12/10/2021**

Applications are invited for **Maire Tecnimont Research Scholarships for Sustainable Development**. Last date for the submission of application is extended up to 22/10/2021

Applications are invited from interested meritorious candidates under **Maire Tecnimont Research Scholarships for Sustainable Development**, for CSR funded research project on Waste Recycling and Circular Economy

**Objective:**

The **Maire Tecnimont (MTE) Research Scholarships for Sustainable Development**, (is aimed to identify motivated young researchers and provide them support for doing research in frontier areas of **Waste Recycling and Circular Economy**. The fellows will work under a Faculty member from NITK, and it is hoped that this training will provide them a platform to develop as independent researcher. The beneficiaries of this fellowship in the future can support the planners and policy-makers of local governments in strengthening their capacity to manage problems related to waste and access to clean water as well as energy. Further, they can also create employment opportunities, which will help in social upliftment and promote social integration as well as social inclusion. The selected candidates will be encouraged to apply for Ph. D/ M.Tech (Research) at NITK.

The availability of the scholarships' will be for one year. Interested candidates should fill in their academic and personal details in the prescribed application format and send the same along with attested copies of relevant certificates within 10 days from the date of advertisement to the contact person. Only the shortlisted candidates will be informed by post/E-mail/Phone/ Website: [www.nitk.ac.in](http://www.nitk.ac.in).

Shortlisted candidates should report to the contact person for certificate verification, followed by test and technical interview. The interview is most likely to be held during Last week of October 2021. Any change in the date of the interview will be intimated through email. Selection will be based on qualification, experience, test performance, and interview. TA/DA will not be paid for attending the written test and interview. NITK, Surathkal reserves the right to reject any or all the applications without assigning any reasons thereof. Selected candidates will be required to join immediately.



|   |   |
|---|---|
| Title project                                     | Waste Recycling and Circular Economy  |
| Sponsoring Company                                | Tecnimont Private Limited, Mumbai, Indian subsidiary of Maire Tecnimont S.p.A. Milan Italy.   |
| Monthly Fellowships /Research grants available    | Refer Table 01 in P. No. 05   |
| Number of Post-Scholarships Available             | Mechanical Engineering-02<br>Chemical Engineering-01 (Female Candidate)<br>Metallurgical and Materials Engineering-01 (Female Candidate)  |
| Faculty/Mentors Associated from Department/Centre | Department of Mechanical Engineering<br>Department of Chemical Engineering<br>Department of Metallurgical and Materials Engineering   |
| Tenure of availability of scholarships            | Currently for One year, extendable up to two years based on the availability of funding and performance of the candidate.   |
| Qualification and Experience                      | <p><b>Qualification:</b></p> <p><b>Project Associate 1:</b> (Mechanical Engineering)<br/>B.Tech. in Mechanical Engineering and having experience in the research areas related to Renewable Energy/ Waste Recycling and Circular Economy/ Thermal Engineering/Energy Engineering/Chemical Engineering</p> <p><b>Project Associate II:</b> (Mechanical Engineering)<br/>M.Tech in Thermal Engineering/Energy Engineering/ Renewable Energy/ Chemical Engineering and having experience in the research areas related to Renewable Energy/ Waste Recycling and Circular Economy/Thermal Engineering/ Energy Engineering</p> <p>Knowledge of ANSYS and FLUENT Packages <b>OR</b> Process Simulation ASPEN PLUS Modelling <b>OR</b> Knowledge about Analytical techniques using GC, GCMS, GCxGC TOFMS, PTR TOFMS, TGA FTIR, NMR, ICP AES is preferred</p> |



|                                     |  |
|-------------------------------------|--|
|                                     | <p>Project Associate 1: (Metallurgy and Materials Engineering)</p> <p>B.Tech. in Metallurgy / Materials Science/ Materials Engineering/ Production Engineering / Ceramic Engineering/ Chemical Engineering/ Manufacturing Engineering/ Polymer Engineering/ Nanotechnology/ Food Technology and having experience in the research areas Materials related to Renewable Energy</p> <p>Knowledge of ANSYS and FLUENT Packages and SEM,TEM, BET is preferred</p> <p><b>Project Associate II: (Chemical Engineering)</b></p> <p>M.Tech. in Chemical Engineering and having experience in the research areas related to Renewable Energy/ Waste Recycling and Circular Economy</p> <p><b>Experience:</b></p> <p>Knowledge of ANSYS and FLUENT Packages <b>OR</b> Process Simulation ASPEN PLUS Modelling <b>OR</b> Knowledge about Analytical techniques using GC, GCMS, GCxGC TOFMS, PTR TOFMS, TGA FTIR, NMR, ICP AES</p> |
| Desirable qualities                 | <p>The candidate must be able to work independently and flexibly and having the following qualities will be desirable.</p> <ol style="list-style-type: none"><li>1. <i>Basic knowledge about</i> laboratory/benchscale work with a technical focus on the basic fundamentals to understand and optimize the process</li><li>2. <i>Implementation:</i> Pilot/demonstration scale or the fieldapplication projects</li><li>3. <i>Sustainability aspects:</i> Financial, social, environmental aspects,models and simulations, theoretical evaluation, potential analysis, decision support tools</li><li>4. Excellent analytical and writing skills</li></ol>  |
| Additional information              | <p>May be obtained by contacting the Head/ CSR Project Coordinator,</p> <p>Maire Tecnimont Centre for Research in Waste Recycling and Circular Economy directly through email.</p>   |
| Last date for receiptof application | <b>22<sup>nd</sup> October 2021</b>  |



Interested candidates may apply in the prescribed format along with CV, photo copies of relevant certificates, grade/mark sheets, publications etc., and should reach NITK on or before **22/10/2021** by post/email (scanned documents) at the prescribed address below:

Sd/-

Dr. Vasudeva Madav / Prof Ashok Babu

CSR Project Coordinators

Maire Tecnimont Centre for Research in Waste Recycling and Circular Economy

National Institute of Technology Karnataka Surathkal

Email: [mt.center-research@nitk.edu.in](mailto:mt.center-research@nitk.edu.in)

Tel: +91-824-2473670, M: +91-9008889796

Faculty Associated from various Departments/Centre's NITK

From Mechanical Engineering

|  |  |
|--|--|
| Dr. Vasudeva Madav<br>Assistant Professor,<br>Department of Mechanical Engineering<br>National Institute of Technology Karnataka Surathkal<br>P.O: Srinivasanagar, Mangalore, Karnataka- 575 025 | E-mail: <a href="mailto:vasu@nitk.edu.in">vasu@nitk.edu.in</a> |
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| Prof. Ashok Babu T P<br>Professor,<br>Department of Mechanical Engineering<br>National Institute of Technology Karnataka Surathkal<br>P.O: Srinivasanagar, Mangalore, Karnataka- 575 025 | E-mail: <a href="mailto:tpashok@nitk.edu.in">tpashok@nitk.edu.in</a> |
|--|--|

From Chemical Engineering

|  |   |
|--|---|
| Dr. Keyur Raval<br>Associate Professor<br>Department of Chemical Engineering<br>National Institute of Technology Karnataka Surathkal<br>P.O: Srinivasanagar, Mangalore, Karnataka- 575 025     | Email: <a href="mailto:keyurnraval@nitk.edu.in">keyurnraval@nitk.edu.in</a> |
| Dr. Prasanna B. D.<br>Associate Professor,<br>Department of Chemical Engineering<br>National Institute of Technology Karnataka Surathkal<br>P.O: Srinivasanagar, Mangalore, Karnataka- 575 025 | E-mail: <a href="mailto:prsn@nitk.edu.in">prsn@nitk.edu.in</a>              |



From Department of Metallurgical and Materials Engineering

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|--|--|
| Dr. Ravishankar K S<br>Associate Professor,<br>Department Metallurgy and Materials<br>National Institute of Technology Karnataka Surathkal<br>P.O: Srinivasanagar, Mangalore, Karnataka- 575 025 | E-mail: <a href="mailto:rshankar983@gmail.com">rshankar983@gmail.com</a> |
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The fellows will be entitled to receive the grants as given in Table 1 below:

**Table 01: Fellowship and Research Grants**

| Sl. No. | Budget Head           | Project Associate 1 (B.Tech.)           | Project Associate II                    |
|---------|-----------------------|---|---|
| 1       | Scholarship/<br>month | Rs.18,000/- per month<br>(consolidated) | Rs.31,000/- per month<br>(consolidated) |
| 2       | Research<br>Grant     | Rs.30,000/- per annum                   | Rs 32,000/- per annum                   |

Research grant can be used for minor equipment, consumables, contingencies, and domestic travel. There is no provision for providing manpower support under this scheme. The Project Associate is expected to undertake the research objectives by himself/herself during the entire duration of the fellowship.

- The Project Associates are not eligible to receive any other fellowship from any Government or Non-Governmental source during the tenure of the fellowship.
- The Project Associates must seek the consent of Faculty Mentor/Project Coordinator/ Dean R&C if he/she intends to be away from NITK (except for fieldwork related to the project) continuously for a period of more than eight weeks.

## **Research Area:**

### **1. Department of Mechanical Engineering**

#### **Title: Food Waste to hydrogen by steam methane reforming**

#### **Abstract:**

Methane steam reforming is a widely used method to produce hydrogen at a large scale due to well-developed methane infrastructures and the favourably high hydrogen to carbon ratio of methane. Catalyst deactivation is a major problem for steam methane reforming (SMR) reactions, which results mainly due to mechanisms such as poisoning, sintering and fouling. Numerical studies based on computational fluid dynamics (3D) and experimental studies need to be carried out to investigate the effect of varying operating parameters on the H<sub>2</sub> yield and reforming efficiency.



## **2. Department of Chemical Engineering**

### **Title: Food Waste to Bio-CNG**

#### **Abstract:**

Biogas is primarily consisting of methane (50-70% by volume) and carbon dioxide (30-50% by volume) with a traces of other impurities. The conversion of CO<sub>2</sub> to methane in the presence of catalyst is a promising strategy that can offer an efficient solution to the use of CO<sub>2</sub> as renewable and environmental friendly carbon source, and is necessary for the development of technology for long term reduction of CO<sub>2</sub> emissions. In general, high metal dispersion, good anti-sintering property, deactivation of the catalyst due to oxidation and Surface area of catalyst are the four characters of an active catalyst which are the prime limits in the development of CO<sub>2</sub> methanation process and great attention is required in thermal and chemical stability, heat conduction and dissipation properties during design and synthesis of catalysts. The strategies to improve the performance of catalysts is an emerging area. The development of catalysts that can operate at lower temperatures can significantly improve the process economics.

## **3. Department of Metallurgical and Materials Engineering**

### **Title: Hydrogen storage technology**

#### **Abstract:**

Efficient storage of hydrogen is crucial for the success of hydrogen energy markets. The large-scale storage of hydrogen plays a fundamental role in a potential future hydrogen economy. The storage of gaseous and liquid hydrogen applicable to all regions due to varying geological conditions is still a challenge. The application of certain storage technologies, such as utilization of methanol, ammonia, and dibenzyl toluene, metal hydrides are found to be advantageous in terms of storage density, cost of storage, and safety but not universally applicable and hence alternative options must be explored. As the available technologies differ fundamental approach, a common techno economic ground evaluation is yet another challenge.

#### **Documents required (in PDF) should be in prescribed format:**

- Duly Filled Application
- Bio-data
- Age Proof Certificate
- Qualification Certificate
- Undertaking Certificate by the applicant (as per the attachment)

#### **Termination of the Fellowship**

- If any fellow wishes to terminate the fellowship, he/she shall inform the Maire Tecnimont Centre for Research on Waste Recycling and Circular Economy, NITK, Surathkal, through the mentor immediately with one-month notice.



- Maire Tecnimont Centre for Research on Waste Recycling and Circular Economy, NITK, Surathkal reserves the right to terminate the Fellowship at any stage if it is convinced that appropriate progress is not being made or the grant has not been utilized properly.

### **Leave**

MTE- Fellows are entitled to leave as per the rules of NITK. Participation in scientific workshops held in India or abroad will be treated as on duty.



**APPLICATION FOR MAIRE TECNIMONT POSTDOCTORAL FELLOWSHIPS FOR  
SUSTAINABLE DEVELOPMENT**

|   |  |
|---|--|
| <b>For Office Use:</b>                        | Paste your recent<br>Passport size photo |
| Serial Number: .....                          |  |
| Eligible for Written exam/Interview: Yes / No |  |
| Verified the Certificates: .....              |  |

|                             |                           |
|-----------------------------|---------------------------|
| <b>1. Name:</b>             |                           |
| <b>2. Father's Name:</b>    |                           |
| <b>3(a). Date of Birth:</b> | <b>3(b). Nationality:</b> |

**4.Contact information:**

|                                       |  |
|---------------------------------------|--|
| <b>(i) Address for communication:</b> |  |
| <b>(ii) Mobile No:</b>                |  |
| <b>(iii) Email ID:</b>                |  |

**5.Educational Qualifications\***

| Class                   | Subject/<br>Stream | Board/<br>University | Name of<br>Institute | Marks/<br>CGPA | Year of<br>Passing |
|-------------------------|--------------------|----------------------|----------------------|----------------|--------------------|
| X                       |                    |                      |                      |                |                    |
| XII                     |                    |                      |                      |                |                    |
| UG Degree               |                    |                      |                      |                |                    |
| PG Degree               |                    |                      |                      |                |                    |
| MPhil                   |                    |                      |                      |                |                    |
| PhD                     |                    |                      |                      |                |                    |
| <b>Competitive Exam</b> |                    |                      |                      |                |                    |
|                         | <b>Qualified</b>   | <b>Marks / Rank</b>  |                      | <b>Year</b>    |                    |
| CSIR-UGC NET            | Yes / No           |                      |                      |                |                    |
| GATE                    | Yes / No           |                      |                      |                |                    |

**\*Attach self-attested copies of all certificates.**



**6. Work Experience, if any (in years) .....**

| Organization | Designation | Duration | Responsibilities |
|--------------|-------------|----------|------------------|
|              |             |          |                  |
|              |             |          |                  |
|              |             |          |                  |

**7. Number of Publications: (Attach a separate list of publications with full details)**

| National | International |
|----------|---------------|
|          |               |

**8. Workshop/Training programs attended\*:**

| S. No. | Details |
|--------|---------|
|        |         |
|        |         |
|        |         |

\*Attach separate sheet (if required)

**9. Technical Skills**

| S. No. | Details |
|--------|---------|
|        |         |
|        |         |
|        |         |

**10. Other Achievements\*:**

| S. No. | Details |
|--------|---------|
|        |         |
|        |         |
|        |         |

\*Attach separate sheet (if required)

**11. Declaration:** All the above information provided by me is accurate to the best of my knowledge and I understand that, if found incorrect, I may be disallowed to appear in the interview/test or terminated at any stage.

**Date:**

**Place:**

**Signature of the Candidate**

**Note:** Attach the list of enclosures along with the application.



**Undertaking by the Fellow**

I, \_\_\_\_\_, Son/Daughter/Wife of Shri\_\_\_\_\_ resident of \_\_\_\_\_ agree to undertake the following, if I am offered the MTE-Scholarship

1. I shall abide by the rules and regulations of NITK during the entire tenure of the fellowship.
2. I shall also abide by the rules, discipline of the institution
3. I shall devote full time to research work during the tenure of the fellowship
4. I shall prepare the progress report on the 25<sup>th</sup> day of every month and communicate the same to Maire Tecnimont through the mentor and Project Coordinators
5. I shall send two copies of the consolidated progress report at the end of the fellowship period.
6. I further state that I shall have no claim whatsoever for regular/permanent absorption on the expiry of the fellowship.

Date:

Signature