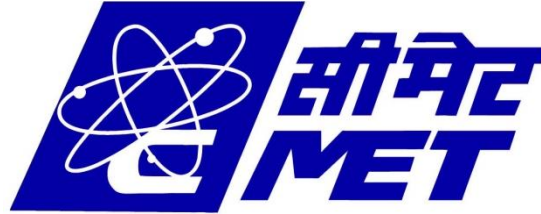


Centre for Materials for Electronics Technology(C-MET)



Inviting

**Expression of Interest (EOI)
&
Transfer of Technology**

Under



**Centre of Excellence
on
E -Waste Management**

www.cmet.gov.in

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PART I: GENERAL

1. Background

Centre for Materials for Electronics Technology (C-MET), an autonomous scientific society of the Ministry of Electronics & Information Technology (MeitY), Government of India, is established with a vision to develop world class capabilities in the area of advanced electronic materials, thin films, special substrates, and components, and to create skilled manpower in these strategically important areas for supporting indigenous electronics hardware manufacturing industries.

C-MET has established a Centre of Excellence (CoE) on E-Waste Management at its Hyderabad Centre, which is focused on developing technologies for effective management and recycling of electronic waste, with particular emphasis on recovering valuable materials from end-of-life electronics.

With the rapid growth in solar energy installations across India and globally, a significant volume of photovoltaic (PV) panels are expected to reach their end-of-life in the coming years. Solar panels typically have a lifespan of 25-30 years, and with India's aggressive solar energy targets, proper management of end-of-life solar panels is becoming increasingly critical. These panels contain valuable materials including silicon, glass, aluminium, silver, and copper that can be recovered and recycled.

C-MET Hyderabad has successfully developed an indigenous technology for the recycling of discarded crystalline silicon solar panels to recover high-purity silicon, glass, and other valuable materials. This technology addresses the growing need for sustainable management of solar panel waste while recovering economically valuable materials.

2. Objective

The objective of this Expression of Interest (EOI) is to identify suitable entities (companies, start-ups, entrepreneurs, or institutions) interested in acquiring the technology and establish plants for recycling of discarded crystalline silicon solar panels developed at C-MET Hyderabad through Transfer of Technology (ToT).

The intended outcome is to enable commercial-scale implementation of this recycling technology, thereby:

- Addressing the growing challenge of solar panel waste management in India
- Recovering valuable materials and reducing environmental impact
- Creating economic value through material recovery
- Supporting Government's circular economy initiatives
- Promoting sustainable practices in the renewable energy sector

3. Purpose

The purpose of this EOI is to:

- Invite interested parties to express their interest in acquiring the solar panel recycling technology
- Assess the capability and readiness of interested parties to commercialize the technology
- Evaluate the commitment of applicants towards establishing recycling facilities
- Enable technology transfer to qualified entities for commercial implementation

4. Definitions

C-MET: Centre for Materials for Electronics Technology.

CoE: Centre of Excellence on E-Waste Management.

EOI: Expression of Interest.

ToT: Transfer of Technology.

Proposer: Proposer means any entity or person or association of persons who submits an application in the prescribed form in response to this advertisement, expressing interest to absorb the end-of-life Silicon Solar Panels Recycling Technology.

“Day” means calendar day.

“Government” means the Government of India.

“Application Form” means the prescribed Form to be submitted by the

PV: Photovoltaic

Solar Panel Waste: End-of-life or discarded crystalline silicon solar panels including damaged, defective, or expired photovoltaic modules

Know-How: Know-How is the technical process as detailed in the Technical know-how document

Grantee: The entity/organization that will receive the technology transfer from C-MET and becomes a licensee-holder of the technology

5. Details of Technology Offered for Transfer

5.1 Technology Overview

The technology developed at C-MET Hyderabad enables comprehensive recycling of discarded crystalline silicon solar panels through a series of mechanical, thermal, and chemical processes. The technology facilitates recovery of high-purity silicon (3N grade i.e. 99.9 grade), glass, and other valuable materials from end-of-life solar panels.

5.2 Process Flow

The recycling process consists of the following key stages:

1. Removal of back sheet, aluminium frame and junction box from solar panels
2. Processing of panels for recovery of Silicon and glass fractions and separation thereafter.
3. Purification of silicon to 3N purity through chemical processing.
4. Recovery of silver (Ag)

5.3 Materials Recovered

From 100 kg of discarded solar panels (after dismantling Al Frame and Junction Box), the following materials can be recovered:

- Glass: Approximately 70 kg (~70 % by weight)
- Silicon (3N purity): Approximately 3.5 kg (3.5 % by weight)
- Other materials: Silver, Aluminium frame, copper wires etc. (recovered during initial dismantling)

5.4 Technology Features

- Environmentally compliant process with gas cleaning and emission control systems
- Recovery of high-purity silicon (3N grade) suitable for potential applications
- Recovery of silver (>2N pure) as revenue
- Scalable process suitable for commercial implementation
- Proven technology demonstrated at laboratory and pilot scale

5.5 Facility Requirements

A pilot plant facility for recycling of 500 kg per day of discarded crystalline silicon solar panels requires:

- Floor Area: Approximately 1000 square meters (including storage space for input and output materials)
- Power Supply: Three-phase electrical connection for operating furnace, scrubbers, and other equipment
- Water Supply: Continuous water connection for scrubbing system and cooling
- Ventilation: Adequate ventilation system for handling chemical processes
- Safety Systems: Emergency shutdown systems, fire safety equipment, and personal protective equipment

6. Cost of the Technology & Payment Terms

6.1 Technology Transfer Cost

The ToT shall be provided to the interested industries on non-exclusive basis at the ToT cost is Rs 8.84 lakhs plus applicable taxes for each plant.

The selected Proposer(s) would be required to pay Technology Transfer Fee. The amount shall be paid in advance on receiving the slot for the ToT but not later than one week prior to the commencement of the training.

6.2 Capital Investment Requirements

The capital investment for setting up a 500 kg batch capacity pilot plant facility is estimated at about Rs. 400 lakhs, excluding land, civil works and other utilities.

6.3 Training and Demonstration

The technology demonstration training will be commenced for 5 days at C-MET Hyderabad with details as:

Day 1:

- Agreement signing
- Removal of back sheet, aluminium frame and junction box from solar panels
- Processing of panels for removal of Silicon and glass fractions

Day 2:

- Recovery of mixed fractions silicon and glass and separations, thereafter.
- Separation of Silicon and glass from mixed fractions
- Processing of as-received silicon chips for purifications

Day 3:

- Purification of as-received silicon chips to 3N purity
- Processing of as-received silicon chips for selective recovery of Silver (Ag)

Day 4:

- Hands-on training to industry representatives/manpower on silicon recovery, purification and silver recovery

Day 5:

- Hands-on training continued and materials hand-over of recovered products

6.4 Important Note

It is the responsibility of the grantee to independently assess the market potential, existing or potential competition, alternate technologies that are existing or likely to emerge, risk factors, etc., before submitting the proposal. C-MET is not under any obligation to provide information/guidance/assistance in this matter.

7. Advertisement and Submission of the EOI

This EOI shall be advertised on the C-MET website (www.cmet.gov.in) and other relevant platforms. Interested parties may submit their Expression of Interest as per the format provided in the annexures.

The advertisement inviting EOIs is in the nature of rolling one, without any last date for submission of EOI. However, it is advised that the interested parties may submit the EOIs at the earliest to gain the advantage of being the early birds.

8. Procedure for Selection and Selection Criteria

After receipt of EOIs, the selection criteria shall be one or more of the following;

- Registration as a recycler with the competent Government agency
- Experience as an aggregator, dismantler, producer responsibility organization (PRO) or recycler in any of the waste recycling
- Possession of land/industrial building in a Red-zone area
- Registration as a start-up for waste management

- Financial strength to set-up the plant
- Willingness to set-up the plant within a period of six months
- Any other criteria as deemed essential by the committee

The training will be scheduled for the party/parties based on the date of full receipt of ToT fee on first-come-first-serve basis.

9. Documents to be submitted

Interested parties must submit the following documents:

- Cover letter expressing interest (Annexure I)
- Profile of the organization/company (Annexure II)
- Declaration regarding conflicting activities (Annexure III)
- Start-up details (if applicable) (Annexure IV)
- Plan of action to set up the solar panel recycling plant (Annexure V)
- Educational qualifications and experience of key persons (Annexure VI)
- Copy of incorporation certificate/registration certificate
- GST registration certificate
- PAN card of the organization
- Audited financial statements for last 3 years (if applicable)
- Any other relevant documents supporting the application

10. Submission of EOI

- a. All the requisite documents shall be placed in a sealed envelope which shall be superscribed "**Expression of Interest for ToT of Solar Panel Recycling Technology**"
- b. The sealed envelope shall be submitted to The Centre Head, C-MET, IDA Phase-III, Cherlapally, Hyderabad – 500 051
- c. As this is a rolling advertisement, interested parties can submit their application at any time and no last date is prescribed. However, it is advised to submit the EOI at the earliest for early bird advantage.

11. The party shall bear all costs associated with the preparation of their proposals and C-MET shall not pay or reimburse any expenses in this regard.

12. The application(s) and material(s) submitted by the Proposer(s) in response to this EOI will become the property of the C-MET.

- 13.** C-MET is not bound to accept any proposal and reserves the right to cancel the selection process at any time without any liability accruing to it.
- 14.** C-MET reserves the right to accept or reject any or all proposals without assigning any reasons whatsoever and its decision shall be final and binding on all the applicants.
- 15.** Selected party has to bring ~50kg End-of-life or discarded crystalline silicon solar panels including damaged, defective, or expired photovoltaic modules for demonstration.

PART II: ANNEXURES

ANNEXURE - I

COVERING LETTER (To be printed on the letter head of the party)

To,
The Centre Head,
Centre for Materials for Electronics Technology (C-MET)
IDA Phase III, Cherlapally, HCL (P.O)
Hyderabad; 500 051, Telangana

Subject: Expression of Interest for Transfer of Technology of Solar Panel Recycling Technology

Sir/Madam,

We hereby submit our Expression of Interest for acquiring the technology for recycling of discarded crystalline silicon solar panels developed at C-MET Hyderabad through Transfer of Technology (ToT).

We have carefully read and understood the terms and conditions mentioned in the EOI document. We confirm our interest in acquiring this technology and our capability to establish and operate a commercial recycling facility.

We hereby declare that all the information provided in this application and its annexures is true and correct to the best of our knowledge. We understand that any misrepresentation or false information may lead to disqualification.

We look forward to your favourable consideration of our application.

Thanking you,
Yours faithfully,

Signature of the Authorized Signatory: _____

Name: _____

Designation: _____

Organization Name: _____

Date: _____

Place: _____

Seal of Organization

ANNEXURE - II

Profile of the Party

Name of the party			
Year of Registration			
Registered Office address			
Legal status			
Number of employees			
No. of branches, if any			
Turnover (Rs. lakhs)	2025-26 #	2024-25	2023-24

If the audited financial statements are not available for the year 2025-26, provisional figures may be provided

Certification from the authorized signatory

I the undersigned certify that to the best of my knowledge and belief the above mentioned particulars correct.

Signature of the authorized signatory

Name

Designation

ANNEXURE - III

**INFORMATION REGARDING ANY CONFLICTING ACTIVITIES AND
DECLARATION THEREOF**

Is the party engaged in any activities which conflict with the proposed activities of CoE as mentioned in this document?

Yes No

If yes:

Please furnish information of activities the institution is engaged in, which in your opinion, is of a nature that conflicts with the assignment desired to be awarded by CoE.

If no:

I/We hereby declare that our organization is not either directly or indirectly engaged in any activities which can be termed as conflicting activities as mentioned in the EOI document. It is understood that any misrepresentation or misstatement in this regard shall render our organization to be disqualified from the entire process.

Signature of the Authorized Signatory: _____

Name: _____

Designation: _____

ANNEXURE - IV
START-UP DETAILS

(To be filled only if the applicant is a Start-up)

Name of the Start-up	
Form of the Start-up (Sole Proprietor/Partnership/Company/Any other)	
No. of members (in case the start-up is other than sole proprietor)	
Year of registration as start-up	
Registration No. (Pl. enclose a copy of the registration certificate)	
Place and State in which registered	
Registered address	
Do the objectives of the start-up include recycling of waste?	
Do the objectives of the start-up include recycling of e-waste/solar panel waste, in particular?	
Objectives of the start-up (in brief): (Attach a separate sheet, if the space is insufficient)	
Amount of Capital invested as on [date] (Rs. Lakhs)	
Amount of Borrowings as on [date] (Rs. Lakhs)	

Signature of the Authorized Signatory: _____

Name: _____

Designation: _____

ANNEXURE - V

PLAN OF ACTION TO SET UP THE SOLAR PANEL RECYCLING PLANT

Please provide all the relevant and important information, since the committee may add weightage to each of the parameters listed below.

Sl. No.	Particulars	Details
1	How many plants are being planned to be set up?	
2	Location or locations of the plant (Pl. provide the name of the District and State)	
3	Per day capacity of the plant(s) to be set up	
4	What is the period in which the plant(s) will be set up?	
5	Do you have qualified/experienced human resources? If yes, details thereof. If no, how do you propose to source the same?	
6	Do you have land/building/other infrastructure available? If yes, details thereof (like own land/building/leased infrastructure, land area, built-up area, permanent/temporary structure etc). If no, how do you propose to source the same?	
7	Do you have financial resources? If yes, details thereof. If no, how do you propose to source the same?	
8	Do you have in-house competency to set up the plant or do you propose to outsource to a turn-key solution provider?	
9	Source of raw materials (end-of-life solar panels). Do you have tie-ups with suppliers?	
10	Market for recovered products. Do you have potential buyers for recovered silicon, glass, and other materials?	
11	Any other information which adds value to your application. Attach a separate sheet if space is insufficient.	

Signature of the Authorized Signatory: _____

Name: _____

Designation: _____

ANNEXURE - VI

EDUCATIONAL QUALIFICATIONS AND EXPERIENCE OF KEY PERSONS

(Please provide details of a maximum of 5 key persons)

Key Person No. 1

Name of the Key Person	
Designation	
Academic Qualification(s)	
Experience (Number of years)	
Field(s) in which experience has been acquired, with particular reference to waste management/solar panel recycling	

Key Person No. 2

Name of the Key Person	
Designation	
Academic Qualification(s)	
Experience (Number of years)	
Field(s) in which experience has been acquired, with particular reference to waste management/solar panel recycling	

(Add similar sections for Key Persons 3, 4, and 5 if applicable)

Signature of the Authorized Signatory: _____

Name: _____

Designation: _____

***** END OF DOCUMENT *****

For any queries, please contact C-MET Hyderabad

www.cmet.gov.in