



## RAMP - Greening of MSMEs Hackathon Series

### Theme-1: Pharma & Chemical sector

#### **1. Background:**

Micro, Small, and Medium Enterprises (MSMEs) play a critical role in driving industrial growth and generating employment. However, many MSMEs continue to face challenges such as high resource consumption, waste generation, and limited adoption of sustainable and resource-efficient technologies. Under the Greening of MSMEs component of the Raising and Accelerating MSME Performance (RAMP) Program, the Research and Innovation Circle of Hyderabad (RICH) is facilitating innovation-driven solutions to support MSMEs in transitioning towards sustainable, low-carbon, and resource-efficient operations.

As part of this initiative, a total of eight hackathons will be conducted under the Greening of MSMEs component of the RAMP Program to address sector-specific sustainability challenges. The current hackathon is being organized for the Pharma and Chemical sector, focusing on identified problem statements aimed at promoting innovative, practical, and scalable solutions for improving environmental performance and operational efficiency in MSMEs.

#### **2. Objectives of the Hackathon:**

- Collaborative development of scalable and cost-effective innovative solutions for MSMEs
- Facilitate pilot implementation with proactive MSMEs
- Support adoption of clean and sustainable technologies

#### **3. Eligibility criteria to apply:**

Applications are invited from Startups, Technology Providers, MSMEs, Academic and Research Institutions, Students, Individual Innovators, Industry Associations, and NGOs etc. Participants may apply individually or as a team.

Solutions with innovations at Technology Readiness Level 3 (TRL3) and above—indicating at least an experimental proof of concept—are eligible to participate in the program. Applicants should be able to demonstrate the technical feasibility of their proposed solution on the hackathon day. The innovative solutions must not have any negative environmental impact and consumer/ end-user safety.

#### **4. Support provided by the program:**

- Technical mentoring and guidance
- Opportunity for pilot implementation under RAMP Program
- Networking with industry experts
- Recognition certificate
- Provide access to market & investors for proven solutions through a structured MSME hackathon



**5. Applications submission form:** Please access below Google form link for submitting the application

<https://forms.gle/uaX9aXQkG5EQpm8o7>

**6. Contact Details:**

In case of any questions or concerns, please feel free to contact us at

**Research and Innovation Circle of Hyderabad (RICH)**

Contact Person: G. Kishore Kumar

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**7. Application Timelines for RAMP - Greening of MSMEs Hackathon Series**

Theme-1: Pharma & Chemical sector:

Activity	Timeline
Release of Notification	27-April-2026
Last Date for Submission of Applications	31-May-2026
Shortlisting of Applications	9-Jun-2026
Hackathon Event - Pitching session	16-Jun-2026
Announcement of Winners	16-Jun-2026

**8. Evaluation of solutions:**

All applications will undergo a two-stage evaluation process.

- Stage-1: Shortlisting of applications through internal evaluation
- Stage-2: Pitching of solutions to the jury on Hackathon day.

**Stage-1: Shortlisting of applications through internal evaluation:**

Applications submitted will be evaluated by an internal panel of experts comprising Industry bodies, Subject Matter Experts, Investors, MSMEs and Consultants. The minimum cut off for solutions would be TRL-3. Only solutions that are shortlisted shall be invited for the presentations on Hackathon day.



## Stage-2: Pitching of solutions to the jury on Hackathon day:

- A panel of judges (4 - 5 representatives) will evaluate the solutions and finalize the individuals / teams on the Hackathon day.
- The evaluation will be conducted collectively, on a composite score out of 100, and the best solutions will be considered for support through the program.

Evaluation Category	Description	Weight (out of 100)
Relevance to the key problem Area	Alignment of the solution with industrial problem areas	10
Technical strength	Is the proposed solution technically robust?	10
Solution Differentiation	How is the proposed solution different from existing solutions in the market or in development?	20
Readiness	Is the proof of concept clearly demonstrated?	20
Feasibility and Impact	Real-world applicability, scalability, and potential for environmental impact.	20
Team Strength	Strength of the team, technical and business expertise	10
Clarity of Presentation	Structure, visual clarity, and effectiveness of communication in the pitch deck.	10

### 9. Outcome of the Hackathon Day:

- All submitted solutions will be evaluated by an expert jury based on predefined criteria such as technical feasibility, innovation, scalability, sustainability impact, and relevance to the identified problem statements.
- The selected solutions will be considered for further development, validation, and potential pilot implementation in relevant MSME units or industrial clusters.
- Selected solution providers will receive support as outlined in the **Support Section** of the program guidelines, which may include technical mentoring, facilitation for pilot demonstration, industry linkages, and guidance for scale-up and commercialization.



- The Hackathon will enable collaboration between startups, industry stakeholders, and implementing agencies to promote the adoption of innovative and sustainable solutions in MSMEs.
- The overall outcome of the Hackathon is to generate practical, scalable, and sector-relevant solutions that address real industry challenges and contribute to improving resource efficiency, productivity, and environmental sustainability in MSMEs.

#### **10. Arrangements for participants on the Hackathon Day:**

- Participants must bring their own laptops, extension cords, hard-disks or any other equipment they may need for completing the hackathon.
- A/V setup for presentations – projectors, microphones, screens, and speakers will be provided by RICH.
- Basic stationery like pen, A4 papers, and sticky notes will be provided by RICH.
- Participants may use the guest WiFi as required.
- Food and Refreshments will be arranged as necessary to the participants on the Hackathon Day.
- Event volunteers and staff will be available for a smooth onboarding process and event co-ordination.

#### **11. Code of Conduct – Hackathon**

- Participants shall maintain professional, respectful, and ethical behavior throughout the Hackathon.
- All submitted solutions must be original. Any form of plagiarism or misrepresentation will lead to disqualification.
- Participants must comply with all rules, instructions, and timelines communicated by the organizers.
- Any form of harassment, discrimination, or misconduct will not be tolerated.
- Participants shall respect confidentiality and intellectual property rights of all stakeholders.
- The decisions of the jury and organizers shall be final and binding.
- The organizers reserve the right to take appropriate action, including disqualification, in case of any violation of the Code of Conduct.



## 12. Privacy policy:

- This Privacy Policy outlines how the organizers of RAMP - Greening of MSMEs Hackathon Series (“we”, “us”, “our”, “event organizers”) collect, use, store, and protect information provided by participants (“you”, “your”, “users”) during the course of the event.
- We may collect personal identification information from participants at the time of registration and during event interactions. This may include, but is not limited to, your name, email address, contact number, institutional affiliation, and any payment-related details if applicable.
- In addition to personal information, we may also collect non-personal identification information when you interact with our platforms. This may include browser type, device information, operating system, IP address, and other technical data related to your method of access.
- Information collected may be used to manage and operate the event effectively, communicate important updates and instructions, personalize participant experience, and send occasional emails or notifications related to the event. You may opt out of non-essential communications at any time.
- We employ standard security practices to protect your data from unauthorized access, alteration, or disclosure. This includes the safeguarding of sensitive data such as login credentials and transaction details.
- We do not sell, trade, or rent your personal identification information to third parties. However, anonymized and aggregated data may be shared with trusted partners, sponsors, or affiliates solely for purposes related to event improvement and reporting.
- The organizers may revise this policy at any time. Any changes will be communicated through the official event platform. Participants are encouraged to review the policy periodically to stay informed.
- By registering for and participating in the Hackathon, you acknowledge and accept the terms outlined in this Privacy Policy.



### 13. Terms & Conditions:

- By participating in the **RAMP - Greening of MSMEs Hackathon Series**, all attendees agree to comply with the rules, Code of Conduct, and guidelines set forth by the event organizers. These Terms and Conditions apply to all registered participants and are binding throughout the duration of the event.
- All intellectual property created during the hackathon remains the property of the respective participants or teams. However, by submitting their work, participants grant the organizers of RAMP - Greening of MSMEs Hackathon Series a non-exclusive, royalty-free license to use, display, reproduce, and distribute the submitted content, either in part or in full, for promotional, academic, or outreach purposes related to the event.
- Personal data collected during registration and event participation will be managed in accordance with the RICH Privacy Policy. By registering, participants acknowledge and agree to the terms of this policy.
- All participants are expected to contribute to a safe, respectful, and inclusive environment as outlined in the Code of Conduct. Any form of harassment, discrimination, or inappropriate behavior will result in immediate disqualification and removal from the event.
- Any issues, concerns, or incidents during the hackathon should be reported promptly to the organizing team using the official reporting channels provided.
- The organizers of RAMP - Greening of MSMEs Hackathon Series reserve the right to alter the event's schedule, structure, content, or speaker lineup at any time, should unforeseen circumstances arise. Participants will be informed of any substantial changes.
- The organizers, sponsors, and affiliated institutions assume no responsibility for any direct or indirect loss, damages, or personal injury incurred as a result of participation in the event.
- Participation may be revoked at any point if a participant is found to be in violation of the event's Terms and Conditions or is disruptive to the overall experience of others.
- These Terms and Conditions are governed by the laws of **India**, and any disputes shall be subject to the jurisdiction of the courts located therein.
- By registering for and participating in the **RAMP - Greening of MSMEs Hackathon Series**, participants affirm their acceptance of these Terms and Conditions. Those who do not agree with the stated terms should refrain from registering or taking part in the event.



## Appendix1: Problem Statements of Pharma and Chemicals sector

S.No	Problem Statement	Current Industry Practice	Innovation Required
1	Continuous Flow Transition: Shifting from batch reactors to continuous flow to minimize material waste, conserve energy and improve safety.	MSMEs mostly use 500L–2000L glass-lined batch reactors, leading to high solvent use, low energy efficiency and variable purity.	Low-cost, modular "plug-and-play" flow reactors that can handle solids without clogging.
2	Effluent Traceability: Real-time monitoring of specific API traces in wastewater to ensure environmental compliance.	Manual grab sampling and third-party lab testing (2-3 day lag), often missing peak discharge events.	Inline, sensor-based systems (e.g., UV-Vis or HPLC-on-a-chip) for continuous pollutant tracking.
3	Green Catalyst Dev: Replacing expensive precious metals with scalable, earth-abundant or bio-catalysts.	Use of Palladium or Platinum on Carbon, which are expensive and require complex recovery processes.	Stable, recyclable non-noble metal catalysts (Iron, Copper) or enzyme-based catalysts for MSME volumes.
4	Micro-reactor Scaling: Maintaining thermal and hydraulic precision when moving from lab to pilot scale.	Lab-scale glass micro-fluidics are used, but scaling involves jumping back to batch due to lack of pilot hardware.	Scalable metallic/3D-printed micro-reactors with high surface-area-to-volume ratios for heat exchange.
5	Flash Distillation: Separating heat-sensitive intermediates without thermal degradation or high energy loss.	Batch vacuum distillation which exposes the product to heat for hours, leading to impurity formation.	Short-path or thin-film evaporators that reduce residence time to seconds while maintaining high vacuum.
6	Polymorph Detection: Real-time detection of crystal form changes during bulk manufacturing to prevent batch failure.	Off-line XRD (X-Ray Diffraction) after the batch is dry; if the polymorph is wrong, the entire batch is scrapped.	In-situ Raman or NIR (Near-Infrared) probes that monitor crystallization stages inside the reactor.
7	VOC Leak Detection: Identifying fugitive emissions from seals and valves to reduce material loss and pollution.	Periodic "soap-bubble" tests or portable gas sniffer walks which are infrequent and manual.	Low-cost IoT sensor networks or infrared imaging that provides 24/7 leak mapping across the plant.
8	Bio-feedstock Integration: Adapting existing reactors to process highly viscous or corrosive bio-derived materials.	Most units are designed for petroleum-based fluids; bio-oils often cause pump failure or reactor fouling.	Retrofit kits for agitation and pumping systems designed for non-Newtonian, high-viscosity bio-fluids.
9	Supply chain traceability: Manual raw material tracking leading to challenges with identifying expired medicines and reverse logistics / disposal of drugs in a tracable manner.	Batch/Lot-based tracking in ERP or manual registers for raw material and First expiry first output for inventory management. Expired drugs are collected from distributors/retailers and sent for regulated destruction.	RFID, IoT sensors, blockchain, cloud-based supply chain platforms. Use blockchain traceability for raw materials and for expired medicines.



10	Recycling of Packaging material: Tablet packaging comprises of cardboard, mixed plastic and metal foils which is extremely difficult to recycle.	Plastic–aluminum blister packs are mostly landfilled or incinerated. Packaging with High calorific value is sent for incineration or waste-to-energy.	Advance solutions for bio degradable packaging material or development of easy to recycle mono-material blister packs.
11	Chemical waste disposal: Waste streams treated but not reused.		Develop chemical recovery and recycling technologies.
12	High Water Loss from Cooling Systems: Evaporation loss from cooling towers is around 1.7% of the total water circulation.	There is no solution to recover fumes from cooling tower	Low-drift, water-efficient cooling towers with fumes recovery system.
13	Real-time Reaction Endpoint Prediction	Operators rely on experience, periodic sampling and offline HPLC/GC tests.	AI/ML-driven soft sensors that predict reaction completion time using real-time data (temp, pressure, torque, spectral data and others).
14	Heat Management: Exothermic Reactions often leads to run-away reactions causing equipment damage, material loss, discharge to atmosphere	APIs involving nitration, hydrogenation, lithiation, etc. need extreme heat transfer control.	Ultrahigh Heat Removal solutions. Novel reactor jackets, heat-exchange inserts, Immersion heatsink coils, High thermal conductivity linings for glass-lined reactors coupled with sensors for better control and monitoring.
15	Cleaning of reactors: APIs stick to vessel walls.	Cross contamination risks and long cleaning cycles due to APIs stick to vessel walls.	Low Residue, Fast Clean Reactor & Equipment Coatings. Novel antiadhesion polymer/ceramic coatings and solvent resistant hydrophobic/oleophobic surfaces.

**Note: If you have any other interesting problem statements and solutions related to Pharma and Chemical sector, please feel free to propose the same.**