CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY (CIPET)

Institute of Petrochemicals Technology (IPT) – Ahmedabad

E - C E L L P R E S E N T S

EUREKA 2026

Pitching Competition

EVENT REPORT

Participation, Innovation & Outcome

Member Name :- Arj Gandhi

Maitri Shekhat

I D E A S P I T C H E D

1. Silicon Anode Binder (Arj Vikrambhai Gandhi)
2. Modified Reclaimed Rubber (Maitri Shekhat)

1. Introduction

EUREKA 2026 was a flagship pitching competition organised by the Entrepreneurship Cell (E-Cell) of CIPET: Institute of Petrochemicals Technology (IPT), Ahmedabad. Held on 22 August 2026 in the Conference Hall of the Admin Building, the event aimed to foster innovation, entrepreneurial thinking, and real-world problem-solving among students and young innovators.

The competition provided a platform for participants to present original ideas to a jury comprising industry professionals, technical experts, and academicians. With free registration and a focus on practical, scalable solutions, Eureka 2026 attracted 13 competing teams. The event formed part of the broader National Entrepreneurship Challenge (NEC 2026) ecosystem promoted by E-Cell IIT Bombay.

Our team of two – Arj Vikrambhai Gandhi and Maitri Shekhat – participated with two distinct deep-tech ideas rooted in materials science and sustainability:

- **Silicon Anode Binder** (presented by Arj Vikrambhai Gandhi)
- **Modified Reclaimed Rubber** (presented by Maitri Shekhat)

The Modified Reclaimed Rubber idea secured the **1st Prize** and received a Certificate of Achievement. This report documents the event, our participation, the technical depth of both ideas, and the strategic next steps for turning the winning concept into a viable startup.

2. Event Overview

Eureka 2026 was structured as a high-stakes pitching competition. Teams were required to present a clear problem statement, a differentiated solution, technical feasibility, and a realistic path to market. The jury evaluated ideas on originality, technical depth, market potential, scalability, and the quality of the pitch itself.

Key highlights of the day:

- Formal presentations with projected slides in the Conference Hall
- Interactive Q&A sessions with the jury
- Certificate distribution and recognition of winners
- Group photographs and networking among participants, faculty, and organisers



Figure 1: Maitri Shekhat presenting the Problem Statement for the Modified Reclaimed Rubber idea

3. Our Participation – Two Ideas, One Team

Our team deliberately brought two complementary ideas to Eureka 2026 – one focused on next-generation energy storage materials and the other on circular economy in rubber. This dual approach allowed us to demonstrate both deep technical capability and a strong sustainability orientation.

3.1 Idea 1: Silicon Anode Binder (Presented by Arj Vikrambhai Gandhi)

Problem Context

Conventional lithium-ion battery anodes rely heavily on graphite. Silicon offers nearly ten times higher theoretical capacity, yet its extreme volume expansion during charge–discharge cycles causes particle fracture, loss of electrical contact, and rapid capacity fade. Existing binders struggle to accommodate this expansion while maintaining mechanical integrity and conductivity over hundreds of cycles.

Our Solution – Core-Shell Architecture

We proposed a dynamic core-shell micro-particle system that combines biogenic silicon extracted from agricultural waste (Rice Husk Ash) with a self-healing dynamic polymer matrix. The architecture consists of three synergistic components:

1. **Bio-Silicon Core:** Porous silicon derived from rice-husk ash via sustainable extraction. The porous structure reduces volume-change stress and improves electrolyte accessibility.

2. **Self-Healing Polymer Shell:** A dynamic hydrogen-bonded network (Diels–Alder chemistry / reversible bonds) that reforms after mechanical damage, preventing pulverisation and maintaining particle integrity during repeated expansion–contraction cycles.
3. **Practical Composite:** A formulated electrode blend (approximately 10% Bio-Si + 80% graphite + conductive additives) delivering stable capacity (~650 mAh/g) with long-term cycling stability – a practical balance between energy density and cycle life for commercial adoption.

This approach simultaneously addresses three critical challenges: sustainability (use of agricultural waste), performance (higher capacity than pure graphite), and durability (self-healing mechanism that extends cycle life).



Figure 2: Arj Vikrambhai Gandhi presenting the "Our Solution" slide for the Silicon Anode Binder



Figure 3: Arj engaging with the audience and jury during the Silicon Anode Binder pitch

3.2 Idea 2: Modified Reclaimed Rubber (Presented by Maitri Shekhat) – 1st Prize Winner

Problem Context

India generates millions of tonnes of end-of-life tyres and rubber waste every year. Conventional reclamation processes often yield material with inferior mechanical properties, limited processability, and restricted high-value applications. As a result, a large fraction of rubber waste is either landfilled, incinerated, or down-cycled into low-grade products, creating both environmental burden and lost economic value.

Our Solution – Property-Enhanced Reclaimed Rubber

The Modified Reclaimed Rubber concept focuses on chemical and physical modification of reclaimed rubber to restore or even enhance key performance attributes – tensile strength, elasticity, abrasion resistance, and processability – so that the material can re-enter high-value applications such as automotive components, industrial products, and construction materials.

Strategic Advantages for a Startup

- **Circular Economy Fit:** Directly addresses the growing regulatory and corporate pressure for sustainable materials and Extended Producer Responsibility (EPR) compliance.
- **Cost Competitiveness:** Reclaimed and modified rubber can be significantly cheaper than virgin rubber while delivering comparable performance for many applications.

- **Local Feedstock Availability:** Abundant tyre and rubber waste streams across India reduce raw-material risk and logistics cost.
- **Scalable Process:** The modification chemistry and process steps are designed for industrial-scale continuous or batch production.

The jury recognised the practical relevance, environmental impact, and clear commercial pathway of this idea, awarding it the **1st Prize** and a Certificate of Achievement.



Figure 4: Maitri Shekhat delivering her pitch for Modified Reclaimed Rubber

4. Outcome & Recognition

Out of 13 competing teams, the Modified Reclaimed Rubber idea presented by Maitri Shekhat was adjudged the winner and awarded the **1st Prize** along with a Certificate of Achievement. The Silicon Anode Binder idea, while technically sophisticated, did not receive a separate award on this occasion.

The certificate ceremony and subsequent group photographs marked the formal conclusion of the competition. The recognition validates the commercial and environmental relevance of advanced rubber recycling technologies and provides strong external validation for the team’s work.



Figure 5: Certificate distribution – Team members receiving Certificates of Achievement

5. Deep-Dive: Turning Modified Reclaimed Rubber into a Startup

Winning a campus pitching competition is an important milestone, but the real journey begins with converting the idea into a sustainable business. Below is a structured startup-oriented analysis of the Modified Reclaimed Rubber opportunity.

5.1 Market Opportunity

- **Indian Rubber Industry:** India is among the top global producers and consumers of rubber. The domestic tyre industry alone generates massive volumes of end-of-life tyres.
- **Regulatory Tailwinds:** EPR rules for waste tyres, plastic waste management rules, and corporate sustainability commitments are creating mandatory demand for recycled content.
- **Price Sensitivity:** Many downstream manufacturers (especially MSMEs) actively seek cost-effective alternatives to virgin rubber without sacrificing critical performance.
- **Export Potential:** High-quality modified reclaimed rubber can also serve export markets where recycled content mandates are tightening.

5.2 Value Proposition

A startup built around Modified Reclaimed Rubber can offer:

1. Consistent quality reclaimed rubber with improved mechanical properties
2. Customised grades tailored to specific applications (tyre compounds, conveyor belts, footwear, moulded goods, etc.)
3. Technical support and formulation guidance for customers transitioning from virgin to recycled content
4. Traceability and sustainability documentation that helps customers meet their own ESG targets

5.3 Suggested Next Steps (0–18 Months)

Phase 1 – Validation (0–6 months)

- Lab-scale optimisation of the modification process and generation of reliable technical data sheets
- Independent third-party testing of key properties (tensile, elongation, abrasion, Mooney viscosity, etc.)
- Initial customer discovery interviews with tyre manufacturers, rubber compounders, and industrial users

Phase 2 – Pilot & Partnerships (6–12 months)

- Set up a small pilot production line or partner with an existing reclaim plant for toll manufacturing
- Supply sample quantities to 3–5 pilot customers and collect performance feedback
- Explore funding avenues: CIPET incubation support, state startup schemes, BIRAC/DBT if biotech angles exist, or early-stage angel/seed funding

Phase 3 – Commercialisation (12–18 months)

- Formal company incorporation and brand development
- Secure first commercial purchase orders
- Build a lean sales and technical service team focused on the western and northern Indian rubber clusters

6. Key Learnings from Eureka 2026

Participating in Eureka 2026 provided several valuable insights:

- **Clarity of problem statement matters:** Juries respond strongly when the real-world pain point is quantified and made tangible.
- **Technical depth + commercial realism wins:** Ideas that balance scientific novelty with a clear path to market tend to outperform purely academic concepts.
- **Presentation skills are decisive:** Confident delivery, clean slides, and the ability to answer tough questions under time pressure significantly influence outcomes.
- **Campus competitions are launchpads:** Winning or even participating builds credibility, networks, and the confidence needed to approach incubators, investors, and industry partners.

7. Acknowledgements

We express our sincere gratitude to:

- The E-Cell, CIPET: IPT – Ahmedabad for organising Eureka 2026 and providing a professional platform for student innovators
- The jury members and industry experts who evaluated the pitches and offered constructive feedback
- The faculty and administration of CIPET IPT Ahmedabad for their continuous support of entrepreneurial activities on campus
- Fellow participants whose ideas and energy made the competition inspiring and competitive



Figure 6: Group photograph of Eureka 2026 participants, organisers, and faculty at CIPET IPT Ahmedabad

8. Conclusion

Eureka 2026 was a significant milestone for our team. Securing the 1st Prize for Modified Reclaimed Rubber validates both the technical approach and the market relevance of advanced rubber recycling solutions. Simultaneously, the Silicon Anode Binder idea demonstrated our capability in high-performance materials for energy storage – an area that remains strategically important for future exploration.

We now move forward with a clear focus: convert the winning Modified Reclaimed Rubber concept from a competition pitch into a real, revenue-generating startup. The learnings from Eureka, the external recognition, and the networks formed on 22 August 2026 will serve as strong foundations for this journey.

We look ahead with confidence and commitment to building a sustainable materials enterprise that contributes to India’s circular economy goals.