

Student Design Competition

2026



University of Vermont
Casella Center for Circular Economy
and Sustainability

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1.0 Overview

1.1 Purpose

The Student Design Competition (SDC) promotes interdisciplinary collaboration among undergraduate students in business, engineering, environmental science, and other fields. By encouraging students to develop innovative and implementable strategies for recovering and repurposing materials within a circular economy framework, the SDC builds skills in design thinking, environmental assessment, business planning, and communication.

1.2 Context

Mattresses are bulky, complex, and highly variable products composed of multiple materials. These characteristics can make discarded mattresses difficult and expensive to collect, transport, dismantle, process, and put to beneficial use. Although many mattress components have the potential to be recovered, recycling efforts are often constrained by processing requirements, inconsistent material quality, limited end markets, transportation costs, and other economic and logistical barriers.

1.3 Design Challenge

The 2026 SDC will focus on advancing circular solutions for **mattress recycling**. Students are challenged to develop an innovative and scalable solution that increases the recovery or beneficial use of materials from discarded mattresses.

Solutions may address one or more stages of the mattress life cycle or recycling process, including collection, transportation, disassembly, material separation, processing, reuse, remanufacturing, or end-market development. A proposed solution may take the form of a product, process, service, business model, policy strategy, or another well-defined approach.

Successful proposals will demonstrate technical feasibility, economic viability, environmental benefits, and potential for implementation at an appropriate scale.

1.4 Organizers and Sponsors

The SDC is organized by the Casella Center for Circular Economy and Sustainability, a research hub at the University of Vermont (UVM). The Casella Center brings together researchers, students, industry leaders, and community partners to rethink how materials are used, reused, transformed, and valued across sectors.

2.0 Competition Overview

2.1 Timeline

➤ **Expert Panel and Kickoff**

Monday, October 19 | 4:00-6:00 PM ET | Aiken Center 110

- ❖ 4:00-5:30 PM: Industry panel. Hear from experts in the field about the current trends and challenges with mattress recycling.
- ❖ 5:30-6:00 PM: Organizers will introduce the design challenge, review the competition requirements, and answer initial questions. Time will also be provided for individual participants and partial teams to meet other students and form complete teams.

➤ **Multidisciplinary Workshop**

Monday, October 26 | 4:00-6:00 PM ET | Aiken 110

This workshop will equip teams with foundational tools for developing their proposals. The program will include short sessions addressing:

- ❖ Business planning and communication
- ❖ Technical design and feasibility
- ❖ Environmental assessment

➤ **Q&A Working Session**

Wednesday, November 11 | 4:30-6:00 PM ET | Davis Center 405 (Spruce Room)

This optional but recommended in-person session will give teams an opportunity to work on their proposals and seek general guidance from mentors. Mentors may help teams consider questions, resources, and approaches but will not directly write, revise, or edit proposals. At least one member of each team is encouraged to attend.

➤ **Final Showcase**

Wednesday, November 18 | 4:00-6:00 PM ET | Davis Center 417 (Frank Livak Room)

Teams will present their proposals to a panel of judges. Proposals will be evaluated according to the criteria described in Section 4.0 and the detailed scoring rubric provided in the Appendix.

2.2 Deliverables

Each team must present its proposed solution at the final showcase. Presentations must address the solution's technical, economic, and environmental dimensions.

Teams may select a presentation format appropriate for their solution, such as a slide presentation, video, live demonstration, physical or digital prototype, poster, or combination of formats. Creative approaches are encouraged, provided that the

presentation clearly communicates the proposed solution and addresses all evaluation criteria.

Each team will have 8 minutes to present, followed by 2 minutes for questions from the judges. Allotted time is subject to change depending on the total number of teams presenting. Teams are responsible for designing a presentation that can be completed within the allotted time.

Teams must also submit any digital products (e.g., slide decks, videos) to the competition organizers at least 24 hours prior to the start of the Final Showcase.

2.3 Team Guidelines

- The competition is open to all currently enrolled UVM undergraduate students, regardless of major or year of study.
- Teams must consist of three (3) or four (4) students. Four-member teams are preferred. A maximum of ten (10) teams may participate.
- Students may register as individuals, partial teams, or full teams. Individuals and partial teams will have an opportunity to connect with other participants and form complete teams during the kickoff event.
- Each team must include students representing at least three (3) distinct UVM colleges or schools (e.g., Grossman, RSEN, CEMS, CALS, CAS, etc.).
- All participants must register through the official competition form. Team composition will be finalized at the kickoff event and may not be changed afterward without approval from the competition organizers.
- A participant who needs to withdraw from the competition must notify their teammates and the competition organizers as soon as possible.
- If a withdrawal leaves a team with fewer than three (3) active members, the organizers will work with the remaining students to determine an appropriate solution. This may include approving a replacement member, combining teams, or allowing the remaining team members to continue. All changes to team composition must be approved by the organizers.

2.4 Registration and Deadlines

- All students must register through the official competition form by 12:00 PM ET the day of the kickoff.
- Participants are expected to attend the competition kickoff. A student who wishes to participate but is unable to attend must contact the competition organizers as soon as possible.

3.0 Rules and Requirements

- **Conduct:** Teams must follow all university guidelines, including the [UVM Code of Student Conduct](#).
- **Originality:** Proposals must represent original work completed by the registered team members during the competition. Teams may seek general guidance from mentors and subject-matter experts, but the development and presentation of the final proposal must remain student-driven.
- **Use of Resources:** Teams may use external research, data, images, tools, and other resources, provided that all sources are appropriately cited.
- **Safety:** Any prototype, demonstration, or physical material displayed at the final showcase must comply with UVM safety requirements. Teams must receive advance approval before bringing potentially hazardous materials or equipment to the event.

4.0 Evaluation Criteria

The judging panel will include representatives from academia and industry.

Proposals will be evaluated according to the following criteria:

- **Economic Viability:** The extent to which the team identifies relevant costs, potential sources of revenue or funding, market demand, and other factors affecting financial viability.
- **Technical Feasibility:** The extent to which the proposed solution is technically sound, supported by evidence, and realistic given available technologies, materials, infrastructure, and other constraints.
- **Environmental Benefits:** The extent to which the proposal could reduce waste, conserve resources, avoid adverse environmental impacts, or provide other measurable environmental benefits. Teams should also identify potential tradeoffs or unintended consequences.
- **Communication and Presentation:** The clarity, organization, persuasiveness, and professionalism of the team's presentation and responses to questions.
- **Interdisciplinary Collaboration:** The extent to which the proposal meaningfully integrates knowledge, methods, or perspectives from the academic disciplines represented on the team.

A detailed scoring rubric, including the weighting assigned to each criterion, is provided in the Appendix.

5.0 Awards and Recognition

Three teams will receive cash prizes:

- **First Place:** \$1,000
- **Second Place:** \$600
- **Third Place:** \$400

Each award will be divided equally among the registered members of the winning team.

Selected teams and projects may also be featured on the Casella Center website and social media platforms.

6.0 Contacts for Support and Questions

- **Competition Coordinator:** Madison Kacica, madison.kacica@uvm.edu
- **Lead Faculty Sponsor:** Dr. Eric Roy, eric.roy@uvm.edu

Appendix A: Rubric

Category	4 – Excellent	3 – Strong	2 – Developing	1 – Limited	Rating
Technical Feasibility (25%)	Clear, innovative, and practical solution supported by credible evidence. Addresses key assumptions, constraints, requirements, and implementation steps.	Sound, relevant solution with reasonable support. Most implementation requirements and constraints are considered, but some details need development.	Relevant concept, but important assumptions, evidence, constraints, or implementation details are underdeveloped. Feasibility remains uncertain.	Solution is unclear, impractical, or weakly connected to the problem. Major claims, requirements, or constraints are not addressed.	___ / 4
Economic Viability (25%)	Credible analysis of costs, revenues, savings, funding, or markets. Assumptions are supported, and a realistic path to sustained implementation is identified.	Demonstrates reasonable economic analysis and addresses most major financial or market considerations. Some assumptions or details require development.	Mentions relevant economic factors, but analysis is incomplete, weakly supported, or overlooks major costs, risks, or funding needs.	Provides little meaningful economic analysis, or the proposed financial model appears unrealistic.	___ / 4
Environmental Benefits (25%)	Clearly supports meaningful environmental benefits using quantitative or strong qualitative evidence. Advances circularity and considers relevant tradeoffs or unintended consequences.	Identifies credible environmental benefits with reasonable support. Demonstrates circularity and acknowledges major tradeoffs, though analysis may lack detail.	Identifies potential benefits, but connections to outcomes are weakly supported. Circularity or environmental tradeoffs receive limited consideration.	Environmental benefits are unclear or unsupported. Connection to circularity is weak, or major environmental tradeoffs are overlooked.	___ / 4
Communication and Presentation (15%)	Clear, engaging, and well-organized. Evidence and visuals reinforce key messages. Responses to questions are accurate and thoughtful.	Organized and understandable with effective supporting materials. Minor issues with flow, clarity, timing, or responses do not impede understanding.	General concept is understandable, but presentation lacks clarity, focus, support, or effective visuals. Responses reveal gaps in explanation.	Presentation is difficult to follow or incomplete. Key claims are unclear, unsupported, or not adequately addressed during questions.	___ / 4
Interdisciplinary Collaboration (10%)	Multiple disciplinary perspectives clearly shaped key decisions and are meaningfully integrated throughout the solution.	Multiple disciplines make complementary contributions, though some perspectives or components could be more fully integrated.	Multiple disciplines are represented, but their contributions are limited, loosely connected, or divided into separate components.	Little evidence that multiple disciplinary perspectives meaningfully influenced the solution.	___ / 4
Comments					