

Macnab-Lacey Student Design Prize 2024–2025

Introduction

Sustainability should be a key feature of undergraduate chemical engineering education. To reinforce this, the Macnab-Lacey award focuses on sustainability in its judging criteria.

The prize will be awarded to the design project that best shows how chemical engineering practice can contribute to a more sustainable world. To assess this, the judges will be looking for specific data that satisfy metrics in measuring improvements in sustainability. Examples of which metrics can be used are given below, but other metrics may be applied, provided these are referenced and recognised as measures of sustainability. The winning entry might or might not be a conventional “chemical process” scheme, but chemical engineering principles should be a key element of the overall design.

The objectives of the competition are to:

- Encourage students to think of sustainable development as a key element of their design projects;
- Influence chemical engineering departments to position sustainable development at the heart of the curriculum;
- Demonstrate that IChemE takes sustainable development seriously;
- Provide a showcase for student talent, and reward achievement.

The winning entry will receive a prize of £750.

Eligibility for Entry

All design projects involving students on accredited degree programmes are eligible. Entries from individual students or teams of students are eligible. In the case of team entries, the team may include students from other disciplines (acknowledging that sustainability is a trans-disciplinary issue), provided that at least one team member is on an IChemE accredited degree programme and the entry corresponds to the final design project of the degree. While multi-disciplinary projects are encouraged, it is expected that process engineering elements will be a key feature of the design.

The accredited chemical engineering department will be asked to judge internally all of its student design projects, and to submit **one entry** to represent the university.

What the judges are looking for

The project summaries will be reviewed by the judging panel. The judges are looking for either (a) a rigorous analysis with detailed recommendations to improve the sustainability of a “traditional” chemical process design project or (b) an imaginative design that includes new “beginning of pipe” ideas rather than better “end of pipe” solutions.

As examples of recommendations to improve the sustainability of traditional chemical process design projects entries might consider:

1. Minimisation of waste, emissions, water used and energy consumed, etc. in the base case design.
2. For the same raw materials and product, suggestions to modify the existing process for increased efficiency in use of materials, water and energy.
3. For the same product suggestions, redesign of the process and change the raw materials to make the product in a more environmentally benign, safe and economic manner.
4. Suggestions to substitute the product with another more sustainable way of achieving the same function.

Any project is allowed, provided that chemical engineering is a key element of the overall scheme. The judges will be looking for evidence that:

- The analysis and recommendations or design presented do address sustainable development;
- The proposed solution(s) have been thoroughly researched;
- Sufficient qualitative and quantitative technical analysis has been included to discuss the possible impacts of the recommendations or design, during construction and normal operation, on the environment and how these impacts will be minimised.

Examples of metrics that can be used are the [IChemE Sustainability Metrics](#), which can be found on the Sustainability SIG web site. These indicators can be used to measure the sustainability performance of a process scheme. Entrants should make use of these or other metrics to demonstrate improvements of the submitted design over traditional norms. Life Cycle Analysis or other appropriate quantitative methodologies might be employed as long as these are referenced and recognised as providing robust indicators to measure sustainability in its wider context. The marking criteria used by the judging panel follow.

The Resources section in the Sustainability Special Interest Group's website provides useful additional material.

Submission of entries

Entries should take the form of a summary of the project on no more than 4 sides of A4. The summary should clearly show how the design has addressed sustainability issues or should include an analysis of how to improve the sustainability of a "traditional" design project, bearing in mind that the judges will have no other information on which to base their shortlisted selections.

Entries should be submitted to [Oxford Abstracts Macnab-Lacey Prize](#) by **31 October**. The nominator will need to [register with Oxford Abstracts](#). IChemE recognises that this deadline may not fit neatly within the academic cycle of all universities offering accredited courses. Entries may be submitted for students who have graduated, provided that they were undergraduates within the twelve-month period leading up to the deadline.

The nominator will be asked to assist IChemE with obtaining contact details for prize-winning students and their supervisor.

If you have any queries or encounter any issues, please email medals@icheme.org.

Rules

The competition is open to students on IChemE accredited courses worldwide. Entries will be accepted from both individuals and teams. In the case of team entries, the team may include students from other disciplines, provided that at least one team member is on an IChemE accredited course and the project is that student's submission for his/her degree.

Each accredited Department will judge its student design projects and choose one entry to represent the University.

The closing date for the competition is 31 October. Entries received after the closing date will not be eligible for consideration.

The judging panel may request a copy of the full design report.

The winners will receive a prize of £750 (to be shared between team members in the case of a team entry), plus a certificate for each team entrant.

In the event that the judges consider that no suitable entry has been received, IChemE reserves the right not to award the prize.

Assessment Criteria

PROJECT (20 marks)

Evidence that the principles of sustainability have been tested and where possible applied during the design project.

ENGINEERING DESIGN (20 marks)

Evidence that the design complies with fundamental chemical engineering principles (ie it will operate).

SUSTAINABILITY OF THE DESIGN (30 marks)

Evidence that the environmental, economic and social impacts of the project have been analysed and accommodated into the design where possible or if not recommendations for minimizing the impacts highlighted.

SUSTAINABILITY METRICS (20 marks)

Evidence that sustainability aspects have been quantified using recognised metrics.

WRITTEN SUBMISSION (10 marks)

The report is a logical and well presented description of the work with clear objectives and conclusions, that provides the evidence called for in the above assessment criteria