IChemE
Sustainability
Special Interest Group

Macnab-Lacey Student Design Prize 2018-2019

Introduction

The Macnab-Lacey Award will be run again for academic year 2018-19 with the same criteria as last year. We are keen to encourage entries from traditional design projects and have included some examples of what the judges will look for from such entries. Sustainability should be a key feature of undergraduate education and to reinforce this the competition will as usual focus on sustainability issues as the 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. 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 £750.00.

Eligibility for Entry

All design projects involving students on accredited courses are eligible for entry. The competition is open to individual students or teams of students. In the case of team entries, the team may include students from other disciplines (in acknowledgement that sustainability is a trans-disciplinary issue), provided that at least one team member is on an IChemE accredited course and the project is that student's 3rd or 4th year submission for his/her degree. Although multi-disciplinary projects are encouraged, it is expected that process engineering elements will be a key feature of the design.

Each accredited chemical engineering department will be asked to judge internally all of its student design projects, and to **choose one entry to represent the university** in the "international finals".

What are the judges looking for?

The judges will be 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. The base case fully detailed project which seeks to minimise waste, emissions, water used and energy consumed etc.
2. For the same raw materials and product, suggestions to modify the existing process for increased efficiency in using materials, water and energy.
3. For the same product suggestions to redesign the process and change the raw materials to make the product in a more environmentally friendly, 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 the manner in which these impacts will be minimised.

The IChemE Sustainability Metrics (see www.icheme.org) provide a set of indicators that can be used to measure the sustainability performance of a process scheme. Where appropriate, entrants are encouraged to make use of the Metrics to demonstrate improvements of the submitted design over traditional norms. Alternatively, Life Cycle Analysis or other appropriate quantitative methodologies might be employed.

A visit to the IChemE Sustainability Special Interest Group's website (see www.icheme.org), in particular the Resources section, provides useful additional material and the opportunity to join a network of professional chemical engineers seeking to apply the principles of sustainability in their work and lifestyles.

A copy of the marking protocol to be used by the judging panel is attached.

Submission of entries

Entries for the first round of judging should take the form of a summary of the project on no more than 4 sides of A4, and should be submitted by 28 June 2019 at the latest. They should be clearly marked 'Macnab-Lacey Prize for Student Design Projects'. 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 short listed selections. Writing short project summaries is a key skill for practicing chemical engineers and entrants are advised to give significant thought to the way in which they “present” their design projects.

The Institution recognises that this deadline may not fit neatly with the academic year cycle of all universities offering accredited courses. Entries may be submitted for students who have graduated ahead of this date, provided that they were undergraduates at some time within the twelve month period leading up to the deadline.

Each entry should include full contact details (including out of term contacts) for the entrant or entrants and their supervisor.

Email entries should be sent to:
specialinterestgroups@icheme.org

Postal entries should be sent on CD-ROM or post to:
Macnab-Lacey Prize for Student Design Projects
Member Networks Department
IChemE
Davis Building
165-189 Railway Terrace
Rugby CV21 3HQ
UK

The Judging Process

All of the project summaries will be reviewed by the judging panel, to select a short list of entries for the final round of judging. In this final round, entrants may be asked to make available their full design reports for detailed examination by the judging panel.

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.

Entries are to be submitted in electronic format, on CD-ROM, by post, or via email, in accordance with the instructions given above.

The closing date for the competition is 28 June 2019. Entries received after the closing date will not be eligible for consideration.

After the first round of judging, short listed entrants may be invited to submit their full design reports for detailed review by the judging panel.

The winner will receive a prize of £750.00 (to be shared between team members in the case of a team entry), plus a certificate (one for each team member in the case of a team entry).

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

MARKING PROTOCOL

Macnab-Lacey Student Design Prize Assessment Form

Entering University

Project Title

Assessor

Marks

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) A logical and well presented description of the work with clear objectives and conclusions and providing the evidence called for in the above assessment criteria	----------
TOTAL MARKS (Out of 100)	
Signature …….. Date …….	