

NATIONAL WEBINAR

On

CIRCULAR ECONOMY APPROACH FOR MITIGATION OF PLASTIC WASTE: CHALLENGES, OPPORTUNITIES AND FUTURE PROSPECTS

7th & 8th October, 2024

IN HYBRID MODE



Organized by

**INDIAN INSTITUTE OF CHEMICAL ENGINEERS
AMARAVATI REGIONAL CENTRE
JKC College Campus, Ring Road
GUNTUR-522 006 (AP)**

In Association with all Student Chapters under ARC

Hosted by

Student Chapter: IICChE NIT Andhra Pradesh

ABOUT IICChE

Indian Institute of Chemical Engineers (IICChE) is a confluence of streams of professionals from academia, research institutions and industry. It provides an appropriate forum for joint endeavors, hand-in-hand, to work for enhancement of knowledge and development of necessary skills through application of Chemical Engineering and allied sciences contributing to sustainable development of the society. To those interested in or involved in Chemical and allied Engineering activities, programmes of IICChE are expected to be immensely beneficial, opening up new horizons in their careers.

ABOUT IICChE ARC

The Amaravati Regional Centre (ARC) of Indian Institute of Chemical Engineers (IICChE) was established in the year 2015 to promote Chemical Engineering activities in the region. Among lofty aims of establishing Industry-Professional body relationship and improving competency of budding engineers, IICChE ARC strives to promote the importance of Chemical Engineering among public.

The centre is aiming to play an important role in the growth of Chemical Industry in the region, by creating awareness about the latest technological developments in the field of Chemical Engineering. The centre also promotes the activities of student chapters of Chemical and Allied Engineering in this region. The Centre has been bestowed three times with the best regional center award in 2017, 2020 & 2022 and three times the second best award in 2018, 2021 & 2023 under "B" category centers for its dynamic & proactive activities.

ABOUT THE WEBINAR

The global consumption of plastics has been increasing over the years, particularly because they are lightweight, resilient, relatively low-priced and long-lasting. The plastic industry produced approximately 300 million tons of plastics in 2020. Of the total quantity of plastic waste generated, only 7% is recycled, about 8% is incinerated and the residual is landfilled. In the landfilling process, toxic chemicals leach out causing degradation of soil while incineration produces CO, CO₂, oxides of N₂, SO₂ and other toxic gases causing air pollution and global warming. To limit the global warming and achieve carbon neutral by 2050 or so, it is necessary to reduce the consumption of petroleum and other fossil related raw materials for the production of plastics and energy and replace to certain extent by renewable sources. Therefore, to meet the growing consumption of plastics and sustainable environmental material usage in the near future, it is high time that the **circular economy approach** needs to be developed and plastics must be recycled or reprocessed to avoid problems in landfills, emission of greenhouse gases and reduce the production of virgin polymers.

India's Recycling Landscape

India's consumption of plastics is estimated at over 16 million tons annually. However, inadequate waste management systems lead to approximately 26,000 tons of plastic waste being generated daily, of which only a fraction is recycled. Much of this plastic waste ends up in landfills, water bodies, and oceans, causing severe environmental degradation and health hazards.

Recognizing the urgency of addressing plastic

pollution, the Indian government has implemented several initiatives to promote sustainable plastic recycling: a) Established the Waste to Wealth Mission in 2021 to leverage science, technology, and innovation to create financially viable and sustainable circular economy models. b) Amendments to the Plastic Waste Management Rules in 2022 to tackle plastic waste and move towards a more circular economy for plastics. c) Amendments to the Extended Producer Responsibility (EPR) guidelines which will drive market demand for good quality recycled plastics. These regulatory changes have set clear targets to drive up the use of recycled content in packaging and eliminate single-use plastic packaging. The market for recycling plastic waste in India reached 9.9 million tons in 2023. It is projected that by 2032, this figure could rise significantly to 23.7 million tons.

Over the last two decades or so, several studies have suggested alternatives to the conventional petroleum-based plastics. One such alternative is bioplastics, which are polymeric compounds that are both functionally like synthetic plastics and largely environmentally sustainable. A variety of bioplastics have been developed to address environmental issues associated with conventional petroleum-derived plastics and found that some bio-based plastics cannot be recycled and end up in landfills, which decompose gradually and produce methane gas. Further, the bioplastics may not replace petroleum based plastics for all applications. For these reasons, people are starting to believe that bioplastics should be used only where suited, with tailor-made properties. Some studies show that the drawbacks associated with bioplastics are less severe when compared to

conventional plastics. In order to confirm the eco-friendliness of new bioplastics, future studies need to be conducted through Life Cycle Assessments (LCAs) and Land Use Change (LUC) analyses to determine whether the use of new-generation bioplastics is indeed beneficial to the environment and become alternative to the virgin polymers based on petroleum.

In this two-day webinar, to motivate the students to take active part and engage them in the proposed topic, a special session is allotted for amateur students to speak on the proposed topic. Technical papers are invited from the students and a selective number of students will be invited for oral presentation based on the merit of the papers submitted by them.

In this webinar, the lectures by the distinguished speakers are expected to cover the various mechanical/chemical technologies currently available for reuse of recycled plastics, the status of advanced recycling technologies to convert back recycled plastics into their basic components and challenges to overcome the obstacles, priority areas for research and innovation, strengthening waste management systems and creating awareness among all the stakeholders, the government policies, guidelines, strategies, specific goals, timelines, incentives and investment opportunities etc. for the circular economy related to plastics. Further the scope of sustainable bioplastics as alternative to the conventional petroleum based plastics is expected to be covered. It is likely that the series of expert lectures by the distinguished speakers shall create awareness and motivate, especially the student community to contribute towards sustained environment for the benefit of all living beings.

ORGANIZING COMMITTEE

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INFORMATION TO THE STUDENT PARTICIPANTS FOR PAPER PRESENTATION COMPETITION

Selection of the Papers

1. The students participating in the competition should submit an **extended abstract** on any sub-topic related to the main theme of the webinar.
2. The Extended Abstracts will be screened by a committee and a selective number of papers will be invited for oral presentation by the student authors.
3. **The last date for submitting Extended Abstract: 21st September 2024.**
4. The acceptance of a paper selected for oral presentation based on the Extended Abstract will be intimated to the student authors by **25th September 2024**. The oral presentation should be made by the student authors only.
5. A maximum of two student authors are permitted per paper.
6. The full paper should be submitted by the student authors on or before **2nd October 2024**.
7. Cash prizes and Certificates of Merit will be given to the 1st, 2nd and 3rd positions in the paper presentation category. Other students in this category will be given "Certificate of Participation and Presentation" of the papers.
8. The students who submitted Extended Abstract within the prescribed last date but not selected for oral presentation are also permitted to submit the full papers. The students who submit the full paper on or before **2nd October 2024** will be given "Certificate of Participation in the Competition" and two consolation prizes for best papers in this category.
9. All other participants will be given Certificate of participation in the webinar.

GUIDELINES TO THE AUTHORS

Extended Abstract

Title : The title of the paper should be brief and informative.

Author: Name, course, year of study, email and college affiliation, mobile number should be given below the title.

Text: The extended abstract, not exceeding 300 words, should cover a brief introduction, relevance of the topic to the current needs of the society, the objective and state of affairs on the sub-topic, and finally conclusions. If the sub-topic chosen is related partly or fully to the internship or any training in any company, or a project work, please mention the details highlighting them at the beginning of the text both in abstract and full paper.

References: The important sources of reference of scientific/technical papers/ reports should be numbered in the extended abstract and those references must be listed at the end of the extended abstract. The limit of 300 words does not apply to the list of references.

Digital Copy: The extended abstract should be typed with a font size of 12 in Times New Roman having a line space of one and half in Microsoft word.

Full Paper

Please note that the papers selected based on the extended abstract will be permitted for oral presentation. However, all the students participating in the competition are encouraged to submit full papers. Please refer S.No.8 under the heading "Selection of the Papers" for clarity.

Title: The title of the full paper is expected to be identical as that of the extended abstract.

Author: The details of the authors as given in the extended abstract should be mentioned below the title.

Text: The text should cover introduction, objective of the work, literature review on sub-topic chosen, your own experimental/theoretical work if any, summary and conclusion. All the tables and figures should have

captions with numbers in Arabic numerals (Ex: Fig. 1 or Table.1 followed by caption) and refer the Table or Figure numbers in the text wherever required. The books, scientific journals, reports etc referred to collect the information should be referred sequentially in the text writing Arabic numerals in parenthesis, ex: (1), (2) etc. Keep the same number given to a particular report or journal paper if that report or journal referred again.

References: All the reports, journal papers, books you referred to collect the information and numbered in the text should be listed sequentially at the end of the text in standard form shown below:

1. Carberry, J R and Bridgewater J, Chem. Eng. Sci, 22, 1516 (1967)
2. Levenspiel O, Chemical Reaction Engineering, P. 269, John Wiley and Sons, Inc. N.Y. (1967)

Digital Copy: The full paper should be typed with a font size of 12 in Times New Roman having a line space of one and half in Microsoft word.

ORAL PRESENTATION

1. Student authors will be given 12 minutes time for oral presentation followed by questions and answers for about 3 minutes.
2. Care must be taken by the authors to prepare the slides in M.S. Power Point such that they are clearly visible to the audience at a reasonable distance.
3. The students presenting the papers are encouraged to deliver the talk spontaneously instead of reading from the slides.

ELIGIBILITY

1. UG, PG and Research students of Chemical Engineering & allied branches including Chemistry are eligible for participation and submission of papers.
2. Teaching Faculty and Working professionals are eligible for participation.

INAUGURAL SESSION :: 07.10.2024 (Monday) 09.30 am to 10.30 am		TECHNICAL SESSION :: 07.10.2024 (Monday) 11.00 am onwards	
INAUGURAL FUNCTION	GUESTS	MORNING SESSION	SPEAKERS
Chief Guest 	Smt. Sheela Vice President, IChE Former Deputy Chief Executive Nuclear Fuel Complex, Hyderabad Plot Number 3/208, 7th Cross west Hastinapur Colony, Hyderabad - 500094 [Mobile]: 9440587828 Email: sheela2490@gmail.com	10.50 am to 11.50 am 	Dr. Suneel Pandey, Ph.D. Director Circular Economy and Waste Management Division The Energy and Resources Institute (TERI) India Habitat Centre, Lodhi Road, New Delhi 110 003 Email: spandey@teri.res.in Title: Plastic Waste Management in India with reference to single use plastics
Guest of honour 	Prof. N. Balasubramanian Honorary Treasurer, IChE Department of Chemical Engineering A G Tech, Anna University Chennai 600025 [Mobile]: 9444954151 Email: nbs.bala@gmail.com	11.50 am to 12.45 pm 	Dr. Virendra Kumar Gupta, Ph.D. Head R&D, Polymer & Senior Vice President Reliance Industries Limited Navi Mumbai, India Email: virendrakumar.Gupta@ril.com Title: Circularity in Plastic Economy: Challenges and Opportunities
Guest of honour 	Mr. Dhawal Saxena Honorary Registrar, IChE CEO & CTO, Bhumistha Infra Services E 17, RH 4, Sector 6 Vashi, Navi Mumbai - 400703 [Mobile]: +91 9323363077 Email: dhawal_saxena@hotmail.com	AFTERNOON SESSION 02.00 pm to 03.00 pm 	02.00 pm to 05.00 pm: Dr. Prakash P. Wadgaonkar, Ph.D. Emeritus Scientist Polymer Science and Engineering Division CSIR-National Chemical Laboratory Dr. Homi Bhabha Road, Pune 411008 Email: pp.wadgaonkar@ncl.res.in Title: The Greening of Synthetic Polymers: Myths or Reality
10.30 am to 10.45 am	Tea Break	03.00 pm to 05.00 pm	Paper Presentations by Students
TECHNICAL SESSION & VALEDICTORY FUNCTION :: 08.10.2024 (Tuesday) 09.30 am onwards			Paper Presentations by Students & Valedictory function

**Address for Communication: Dr M Venkateswara Rao, Organizing Secretary :: Mobile: 09440010190, Email: iichearc2015@gmail.com,
Website: <http://iichearc.org.in>, Registration :: Free, Registration Link: <https://forms.gle/MUG7K43Z5UEazNj27>**