International Symposium on

BIOMASS

to H_2

Synergies

Technologies

System Integration

06 – 07 Sept, 2025

Department of Hydro and Renewable Energy

Indian Institute of Technology Roorkee

INTRODUCTION

Global energy demand is expected to rise by 25% in the next two decades, stressing the need for clean, secure, and sustainable energy solutions. Hydrogen plays a critical role in enabling this energy transition, offering a clean and adaptable energy carrier for sectors where direct electrification is difficult. In India, the National Green Hydrogen Mission seeks to accelerate the deployment of green hydrogen to reduce fossil fuel dependence and cut greenhouse gas emissions. Among the various production routes, biomass-based hydrogen or biohydrogen presents unique advantages, including the potential for low or even negative carbon emissions. It also contributes to rural development, promotes energy diversification, and supports a circular, sustainable economy.

However, India faces key barriers in hydrogen production that include inconsistent biomass supply, high capital costs, lack of advanced conversion technologies, limited policy frameworks, and underdeveloped infrastructure. The ways to overcome the barriers in the path of large-scale deployment of hydrogen production and utilization are:

- Strengthening of the biomass supply chain for organized collection, storage, and transportation of biomass.
- Financial incentives and policy support for lowering the capital costs and attracting private investments.
- Investment in research and development to advance the biomass-to-hydrogen conversion technologies.
- Creating decentralized units for biomass processing and the development of logistics for hydrogen distribution.

An international symposium on biomass-to-hydrogen is expected to help accelerate the adoption of biomass-based hydrogen by uniting experts to share knowledge, foster innovation, and guide policy, investment, and collaborative technology pathways.

ABOUT THE SYMPOSIUM

The International Symposium on **Biomass to Hydrogen: Technologies, Synergies, and System Integration** (ISB2H) will take place from September 6-7, 2025, at the Indian Institute of Technology (IIT) Roorkee in India. This high-impact event aims to provide a multidisciplinary

platform for researchers, scientists, industry experts, policymakers, entrepreneurs, and students to promote innovation and accelerate progress in the field of biomass-based hydrogen production. The symposium will cover the most recent scientific and technological advances in thermochemical conversion processes like pyrolysis, gasification, and torrefaction, as well as biological conversion routes like dark fermentation, anaerobic digestion, and bio-photolysis. Beyond the core technological topics, the symposium will additionally address techno-economic assessments, life cycle analysis (LCA), and environmental trade-offs, ensuring a thorough understanding of the viability and impact of different biomass-to-hydrogen pathways. The symposium will promote interdisciplinary dialogue, networking opportunities, and the transition to clean hydrogen solutions that are aligned with national and global sustainability goals through keynote lectures by renowned experts, interactive panel discussions, technical paper presentations, and poster sessions.

TECHNICAL THEMES

Biomass-to-hydrogen conversion technologies

This theme explores cutting-edge methods for producing hydrogen from diverse biomass feedstocks. It covers thermochemical, biochemical, and hybrid processes, including pyrolysis, gasification, and fermentation. Emphasis is placed on process efficiency, catalysts, scalability, and integration with renewable energy. The theme aims to showcase advancements that enable clean, decentralized hydrogen production from sustainable resources.

Biohydrogen economics, impact, market, and policies

It focuses on the financial viability, market potential, and policy frameworks driving biohydrogen adoption. It highlights cost analysis, investment trends, and commercialization pathways, supported by robust life cycle assessments (LCA) to ensure environmental sustainability. Discussions will cover regulatory support, carbon credits, and global strategies. The aim is to align innovation with market readiness and climate goals.

Carbon capture and hydrogen utilization

This theme focuses on integrating CCS technologies with hydrogen production and end-use applications. It explores methods to reduce carbon emissions across the hydrogen value chain while enabling low-carbon hydrogen deployment. Key topics include CO_2 capture from biomass and industrial sources, geological storage, and hydrogen use in mobility, power, and industry. The goal is to drive sustainable hydrogen pathways aligned with climate targets.

Case studies and pilots on biomass to hydrogen

This theme highlights real-world applications, pilot projects, and industrial initiatives across the country. It showcases successful biomass-to-hydrogen conversions, technology demonstrations, and region-specific challenges and solutions. Insights from Indian industries, startups, and research institutions will be shared. The focus is on lessons learned, scalability, and replicable models for sustainable hydrogen deployment in India.

IMPORTANT DATES

Last Date of Abstract Submission	**:**	**August 20, 2025**
Notification of Acceptance	**:**	**August 22, 2025**
Last Date of Early Registration	**:**	**August 31, 2025**
Symposium	**:**	**September 6-7, 2025**

SYMPOSIUM VENUE: APJ AKB Block, Hall No. 103, IIT Roorkee, Roorkee, 247667, India

ABSTRACT, PAPER, AND POSTER SUBMISSION

Authors are invited to submit original research papers, case studies, or reviews aligned with the symposium themes. Abstracts (200–300 words) for paper or poster should include the title, authors, affiliations, and keywords, and be formatted in Times New Roman, 12 pt, single spacing. Accepted abstracts will be selected for oral or poster presentations based on the given preference by the presenter.

Full papers (optional, up to 6,000 words) should follow the standard structure with APA referencing. Submissions must be made in MS Word or PDF format.

Posters should be A0 size (841 × 1189 mm), portrait orientation. Include the title, author names, affiliations, and key sections such as Introduction, Methodology, Results, and Conclusion. Use clear, legible fonts (minimum 20 pt) and high-quality images or graphs. Authors must bring a printed poster and be available during the poster session for discussion.

Selected research abstracts will be invited for full paper submission for the Special Issue related to Biomass to Hydrogen and Biofuels in an Elsevier journal with impact factor > 4.
Email for submitting abstracts: b2hiitr@gmail.com

AWARDS AND PRIZES

Best Paper and Best Poster awards will be presented to outstanding contributions based on originality, scientific quality, clarity, and relevance to the conference themes. Session Chairs will evaluate and decide the winners. Awards will be announced and presented during the closing ceremony.

REGISTRATION INFORMATION

Participants	Programme Fee
International Participants	INR 10000
Participants from Industry	INR 5000
Other Indian participants (faculty/postdocs)	INR 3000
Indian students at all levels (UG/PG/PhD)	INR 2000
IIT Roorkee students (PG/PhD)	INR 1000

*Registration fee includes conference kit and food (tea, lunch) during sessions

Step 1: Please pay online to the following account as per the relevant registration fee.

A/C Name: Conference, Seminar, Symposium & Wshop IIT ROORKEE

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Step 2: Submit your registration details using the link below.

Documents you need ready for upload –

(i) Payment transaction record.

(ii) Employer/Student/Personal ID.

(iii) Passport copy (only for foreign participants)

Form Link: https://forms.gle/aTUiJAqRGgtSQCpG9

Scan QR to register

SPONSORSHIP: The symposium will provide an opportunity for the sponsoring organizations to publicize their products/services to the participants and organizers, and interact with them. For further details of the sponsorship packages, please contact the convener or local organizing committee.

ABOUT HRED

Formerly known as the Alternate Hydro Energy Centre (AHEC), Department of Hydro and Renewable Energy (HRED) is a leading academic and research department at IIT Roorkee, established in 1982 with initial support from the Ministry of New and Renewable Energy (MNRE), Government of India. The department is dedicated to advancing renewable energy and environmental sustainability through education, research, and capacity building. It offers specialized M.Tech. programs in Renewable & Hydro Energy (since 1997) and Environmental Management of Rivers & Lakes (since 2004), and recently launched a B.Tech. in Energy Engineering (2024–25) aligned with NEP 2020. HRED integrates engineering fundamentals with emerging areas like AI/ML, Industry 4.0, energy policy, and entrepreneurship. With strong global outreach through ITEC and ICCR schemes, the department continues to play a pivotal role in India's clean energy transition towards 500 GW non-fossil capacity by 2030 and net-zero emissions by 2070.

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