



## CSIR-IICT's Breakthrough in Clean Energy

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Researchers at the [Council of Scientific & Industrial Research \(CSIR\)](#) - Indian Institute of Chemical Technology (IICT) have produced [biohydrogen \(bioH<sub>2</sub>\)](#) from [food waste](#).

- **BioH<sub>2</sub> Production:** Food waste undergoes microbial fermentation in an **upflow reactor** with a **self-regulating buffering system**, optimizing **bioH<sub>2</sub>** yield and **minimizing methane** and [Carbon dioxide \(CO<sub>2</sub>\)](#) emissions compared to traditional **biogas methods**.
  - Fermentation is the **anaerobic (absence of oxygen) breakdown** of compounds by **microorganisms (such as bacteria or yeast)**, releasing energy.
  - The study addresses both **waste management and clean energy needs**, supporting [net-zero targets](#).
- Another study led by the chief scientist at IICT demonstrated an efficient method to convert **CO<sub>2</sub>** into [ethanol](#) and [acetic acid](#), reducing [greenhouse gas emissions](#).
- **CO<sub>2</sub> Conversion: Traditionally, H<sub>2</sub> is needed for CO<sub>2</sub>** conversion into products like methane, ethanol, or acetic acid.
  - The study used **high-pressure gas fermentation (HPGF) reactor**, eliminating the need for **H<sub>2</sub>**, making the process more sustainable, energy-efficient, and cost-effective, yielding **higher ethanol and acetic acid**.
- **CSIR-IICT:** Established in 1944, **CSIR-IICT** in Hyderabad is one of the oldest **National Laboratories** recognized for its expertise in **chemical technology, applied research, and commercialization**.

Read more: [Biofuels](#)

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