

What is NetZero? Why CCUS is important? How sustainable is this route?

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Abstract:

Global CO₂ emission has touched ~40 billion tons of carbon dioxide per year, and despite all the talk about net zero CO₂ emission, the rate of CO₂ emission is expected to stay at the current level for few more years. While role of solar, wind, hydro/waves, hydrogen etc. (perhaps nuclear as well) is acknowledged, current energy need, and proposed GDP growth of developing countries could not be achieved without ensuring implementation of CCUS. CCUS is essentially a three-step process, i) Capturing or separating the CO₂ from its associated gases, ii) Transporting the captured, relatively purer CO₂ (from step-i) to the utilization site where part of the CO₂ could be processed for its utilization, and iii) Majority of the CO₂ which could not be converted (in step-ii) has to be transported and sequestered for geological timescale. Thus, amount of CO₂ utilized or sequestered is directly proportional to the amount of CO₂ captured. CO₂ capture technology has to become robust, and sustainable with time, this presentation would briefly explain the challenges in adaptation of this technology at larger scale.



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Young Scientist Award in Chemistry for the year 2016. Rajnish Kumar was also recognized by Clarivate Analytics for his influential scientific work as he was identified as Highly Cited Researcher in Engineering in the year 2018. In 2020, Rajnish also received Dr. YBG Verma Award for Excellence in Chemical Engineering Teaching at IIT Madras. Rajnish is one of the editors or in editorial boards of a few journals including, *Environmental Science & Technology Letters*, *Energy & Fuels* and *ACS Engineering Au*.