



Jeet Bindra Distinguished Lecture 2024

Speaker	Dr. Ramesh Gupta
Title	The Carbon Challenge: Background, Current Status and Evolving Carbon Capture Technologies
Time	11:00 AM, 8th November 2024
Venue	Outreach Auditorium
	High-Tea will be served at 10:30 am



Abstract

The explosive increase in fossil fuels use during the last two centuries has resulted in CO₂ accumulation in earth's atmosphere. This buildup of CO₂, a greenhouse gas, is causing global warming that is playing havoc with climate patterns and threatening human welfare. The Paris accord on climate stipulates that the global temperature increase by the end of 21st century be limited below 1.5 ° C to prevent a disastrous change in the climate. There are two approaches for managing atmospheric CO₂ levels. The first approach is to use sustainable technologies and practices to minimize CO₂ emissions. Examples include replacing fossil fuels with nuclear and renewable energy, electrifying transportation, and re-engineering major CO₂ emitting industries such as steel and cement. Also, technologies are evolving that allow production of very large quantities of hydrogen for use as fuel. The second approach is to capture and sequester CO₂ from large point sources by using liquid amines and solid sorbents. Carbon capture technologies are expensive and will likely be economically viable only at a few sites such as steel, cement and power plants. On the other hand, technologies and practices that minimize CO₂ emissions look promising but will require very large scaleup to make a meaningful impact on CO₂.

About the Distinguished Speaker

Ramesh Gupta is an alumnus of IIT Kanpur, where he received a B. Tech. degree in chemical engineering in 1969. He later obtained a Ph.D. from Princeton University and joined the chemical engineering faculty of Caltech as a Research Fellow in early 1973. Ramesh joined Exxon (now Exxon Mobil) Research and Engineering Company in 1977. During his 40 plus year career there, he worked on diverse engineering and research projects, including reactor engineering, multiphase hydrodynamics, refining processes, carbon capture, methane pyrolysis, compressible drilling fluids, and process modeling. He served as an in-house reactor engineering consultant and provided design and troubleshooting assistance to Exxon Mobil's worldwide refineries. While at Exxon Mobil, he also served as an adjunct professor of chemical engineering at Washington University in St. Louis. Ramesh is the recipient of several awards, including four Exxon Engineering Awards of Excellence for finding novel solutions to refining problems, the Best Research Paper award, and the Corporate Research Award for Innovation. He is also the recipient of more than 50 U.S. patents. For his contributions to chemical engineering, he was elected a Fellow of the American Institute of Chemical Engineers. Ramesh lives in New Jersey and periodically works as a technical consultant.

About Mr. Jagjeet Singh Bindra and the Jeet Bindra Distinguished Lecture Series:

Mr. Jagjeet Singh Bindra did his B.Tech in Chemical Engineering from IIT Kanpur in 1969. He earned his master's degree in Chemical Engineering from the University of Washington in Seattle, WA in 1970. Mr. Bindra also has an M.B.A. (honors) from St. Mary's College in Moraga, California. He is a "Distinguished Alumnus" of the University of Washington, College of Engineering, as well as of Indian Institute of Technology, Kanpur. He was awarded Institute Fellow of IIT Kanpur in the year 2021.

Mr. Jagjeet Singh Bindra is on the board of Lyondell Basell Industries NV and HPCL-Mittal Energy Ltd. He is also the director of Edison International and Southern California Edison- one of the United States' largest electric utilities. Before joining Edison, Mr. Bindra served as president of Chevron Global Manufacturing from 2004 - 2009, where he was instrumental in leading the company's worldwide manufacturing operations, including those of 19 refineries



His entire career at Chevron spanned more than three decades, and he started with his work there as a research engineer and attained a series of promotions with increasing levels of leadership. Apart from his positions with Edison, Mr. Bindra is on the board of directors of Larsen & Toubro Limited, India; Transfield Services Limited, Australia and Sriya Innovations Inc., Kennesaw, Georgia; and has chaired the board of directors at the IIT Kanpur Foundation.

Mr. Bindra is among the top donors. Some of his past initiatives at IIT Kanpur are:

- Mr. & Mrs. Gian Singh Bindra Chair.
- Chevron Corporation Chair.
- Foundation for Chemical Eng. Department towards departmental excellence.
- Centre for Development of Soft Skills.
- Department of Chemical Engineering Modernization of the Unit Operations Laboratory (UOL) and the Workshop Facility.
- Graduate student lounge at the Department of chemical engineering and
- Jeet Bindra Distinguished lecture series.