



Full Day  
Workshop on  
**Quantitative  
Analytical  
Methods for  
Decarbonization  
of the Energy,  
Fuel, and  
Chemical supply  
chains**

22<sup>nd</sup> July 2022  
9:00 am Onwards  
At The Bengal Chamber Premises

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In association with



# Topic overview

Decarbonization is a rapidly popular term being used synonymously with sustainability efforts for reducing our dependence on fossil energy resources. In our efforts to decarbonize current fossil-based energy resources, a deep understanding of sustainability assessment methods is required. While decarbonization can effectively reduce the greenhouse gas emissions threatening our environmental balance through climate change, there are ripple effects in material use, water use, and supporting energy use that can significantly alter the balance of ecology in the future. Effective sustainability assessment methods need to account for impacts that go beyond just greenhouse emission estimations.

## Target Audience

The workshop is targeted for early career engineers who work in the process industry such as design engineers. The course is also designed for inclusion of non-engineering disciplines where practitioners are involved in environmental impact accounting, consideration of total cost accounting, and optimization. Prerequisites for the workshop include having an advanced degree in a Science or Technology Discipline, however interested participants from relevant decision-making authorities are also encouraged to participate. Preferable knowledge in engineering fields, knowledge of design and costing methods, and an understanding of environmental impacts is desired but not a must to attend the course.



# Instructors



Dr. Debalina Sengupta

Coastal Resilience Program  
Manager, NOAA Sea Grant at  
Texas A&M University

Dr. Sengupta is an expert in quantifying sustainability and has broadly worked in the context of process systems engineering. She is the author of two books, several book chapters, and journal publications. She has worked with the US Environmental Protection Agency, and in leadership roles at Texas A&M University. Her most recent interests are in Disaster Resilient Manufacturing systems, with an emphasis for the nexus in food/energy/water systems. She is currently appointed as the Coastal Resilience Program Manager at the NOAA Sea Grant Texas at Texas A&M University where she is working with communities for raising science and technology-based approaches towards coastal resilience. She lives in College Station, USA.



Dr. Sudipta De


Professor, Mechanical  
Engineering Department,  
Jadavpur University

Dr. De has been teaching at the Mechanical Engineering Department, Jadavpur University, Kolkata for over 30 years. His area of interest is interdisciplinary sustainable energy. He has more than hundred published papers, book chapters, edited books and a text on power plant engineering. He is in the editorial board of the journal Clean Technologies and Environmental Policy (Springer), editor of a few special issues of international journals. He is an Indian National Science Academy (INSA) Teacher Awardee and was the head of Indian delegation in the plenary meeting ISO/TC 238.

# Delegate Fee - ₹ 8000+GST

## Tentative Agenda

9:00 AM – 9:30 AM	Opening introductions – 30 min
9:30 AM – 10:30 AM	<b>Introduction to Quantitative Sustainability Assessment - 1 hour</b> <ol style="list-style-type: none"><li>1. Introduction to Sustainability (Meaning of Systems and Scale, and need for Quantifying Sustainability, role of Industrial Ecology in sustainability) – 30 min</li><li>2. Introduction to Systems Theory – Supply Chains for Energy, Fuels, and Chemicals - 30 min</li></ol>
10:30 AM - 10:45 AM	Coffee/Tea Break – 15 minutes
10:45 AM – 12:15 PM	<b>Sustainability Assessment Methods, Metrics, and Life Cycle Assessment – 1 hour 30 minutes</b> <ol style="list-style-type: none"><li>1. Introduction to Life Cycle Assessment, Total Cost Accounting, and Sustainability Metrics (includes MMRV systems for carbon markets) (45 minutes)</li><li>2. Introduction to Process level Sustainability Quantification Metrics/methods - Exergy Analysis to assess sustainability of energy utilities including power (45 minutes)</li></ol>
12:15 PM – 1:00 PM	Lunch Break -45 min
1:00 PM – 3:00 PM	<b>Case Studies and interactive Q&amp;A Session I – 2 hour</b> <p>Case study of Sustainability Assessment for Propylene production via Propane Dehydrogenation (PDH) (1 hour); Case Study for integrating Chemicals from Biomass into Existing Process Industry (45min); Case Study Overview for Battery/Renewable Electric energy systems (15 min)</p>
3:00 PM – 3:15 PM	Coffee/Tea Break – 15 minutes
3:15 PM – 5:15 PM	<b>Case Studies and interactive Q&amp;A Session II – 2 hour</b> <p>Application of exergy methods: Few case studies on heating/power/cogeneration/polygeneration and interactive session.</p>
5:15 PM – 5:30 PM	Wrap-up/Closing Remarks

 For further details contact:

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