AIChE Webinar Series

Computing & Systems Technology Division (CAST) Welcomes

Dr. Raymond L. Smith

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GREENSCOPE – A Comprehensive and Systematic Sustainability Evaluation Tool for Chemical Processes

The U.S. Environmental Protection Agency has developed a beta software tool called GREENSCOPE (Gauging Reaction Effectiveness for the Environmental Sustainability of Chemistries with a multi-Objective Process Evaluator) to support sustainable processes and products. Evaluations of existing and new processes can be accomplished using GREENSCOPE with ~140 indicators for objectives in four basis areas: environment, economics, energy, and efficiency. These indicators place process and chemical relevant information in context by providing a range between identified best-target and worst-case limits for each indicator. An indicator score close to the best target will approach 100% sustainability, whereas an indicator score close to the worst case will approach 0% sustainability. Users can then understand whether the evaluated process is performing well or needs to improve for each identified indicator. Thus, areas of high improvement potential, also known as "hot spots" can be identified and targeted for upgrading. Example process evaluations and decision-making methods will be presented. Also, the indicators can be used in a number of applications, including educational scenarios and computer-based optimization methods. The work described in this webinar represents a collaboration with Drs. Gerardo Ruiz-Mercado and Michael Gonzalez.

Biography:

Ray has been a Chemical Engineer in the U.S. Environmental Protection Agency's Office of Research & Development for over 15 years, after earning his PhD in Chemical Engineering from the University of Massachusetts, Amherst. During his tenure with EPA, Ray has established an expertise in sustainability by performing research and publishing in the areas of life cycle assessment, biofuels, industrial ecology, process design, sustainability indicators, optimization, and decision making. As a Principal Investigator, Ray's research on method development for solving sustainability problems describes often overlooked details of seemingly simple systems and shows how to obtain appropriately simplified solutions to complex problems. Over the course of his career he has also been employed in industry and collaborated with domestic and international academic, industrial, and consultant groups. Ray has volunteered his time to the American Institute of Chemical Engineers, serving as the first Chair of both the Environmental Division and (in 2016) the Sustainable Engineering Forum.

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Dec 2, 2014 at 11:00 am Eastern Time

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