

T1: Sustainable Engineering

To Use this Index: Scroll down or use the bookmarks in the left-hand frame to move to a new location in this index. Click on a [blue paper title](#) to view that paper. To return to this index after viewing a paper, click the PREVIOUS MENU bookmark in the left frame.

Session 1 - Sustainable Processing

Chair: Martin Abraham

Vice Chair: Glenda Harris

- 1a [Simultaneous Environmental and Financial Risk Management in the Decision Making Associated to Process Design](#)
Mayurachat Ounjitti, Saran Janjira, Rathanawan Magaraphan and M. Bagajewicz
- 1b [Calculating Metrics for Acetic Acid Production](#)
Earl R Beaver

Session 2 - Sustainability Metrics and Monitoring

Chair: Heriberto Cabezas

Vice Chair: Bhavik R Bakshi

- 2a [Industry Specific Benchmark Metrics - Chemical Industry Compared to Other Industries](#)
Earl R Beaver
- 2c [Comparative vs. Absolute Performance Assessment with Environmental Sustainability Metrics](#)
Xun Jin and Karen A. High
- 2d [Sustainability of water ecosystem under uncertainty](#)
Y. Shastri and U. Diwekar
- 2e [Adaptive NOX predictive emission monitoring for industrial process heaters](#)
Young-Hak Lee, Minjin Kim and Chonghun Han

Session 3 - Sustainable Energy

Chair: Russell F Dunn

Vice Chair: Lori T McDowell

- 3b [Thermodynamics and the feasibility of sustainable technology Use and abuse of the second law](#)
S. Lems, H.J. van der Kool and J. de Swaan Arons
- 3f [Citrus Peel Gasification using Molten Sodium Heat Pipes](#)
Anindra Mazumdar and Rajiv Srivastava

Session 4 - Green Chemistry for Sustainability

Chair: Michael A Matthews

Vice Chair: Gautham Parthasarathy

- 4a [Polylactides: A New Paradigm in Polymer Science](#)
Birgit Braun and John R. Dorgan
- 4b [Atom Economy, Expanding Boundaries to Incorporate Upstream Reactions](#)
Paul Blowers, Hong Zhao, Paul Case and James Swan
- 4g [Development of a new waste cement recycling process by carbonation for flue gas desulfurization process](#)
Atsushi Iizuka, Yasuro Katsuyama, Minoru Fujii, Akihiro Yamasaki and Yukio Yanagisawa

Session 5 - Industrial Ecology & Life Cycle Assessment of Sustainable Designs

Chair: Tapas K Das

Vice Chair: Rajagopalan Srinivasan

- 5b [Lca for the Evaluation and Design of Industrial Ecosystem](#)
A. Singh, H. H. Lou, C. L. Yaws and J. R. Hopper

- 5c [Life Cycle Engineering in the Oil and Gas Industries, with Reference to Hydrodesulphurization of Gas Oil](#)
Antonis C. Kokossis, Feyi Thompson, Tapas K. Das
- 5d [Using Exergy Analysis for Improving Life Cycle Inventory Databases](#)
Jorge L. Hau and Bhavik R. Bakshi
- 5e [A Life Cycle Impact Assessment Study on Sulfur Hexafluoride \(SF6\) as a Gas Insulator](#)
K. Shiojiri, Y. Yanagisawa, M. Fujii, F. Kiyono and A. Yamasaki
- 5f [Economic versus Natural Capital Flows in Industrial Supply Networks - Implications to Sustainability](#)
Nandan U. Ukidwe and Bhavik R. Bakshi

Session 6 - Environmentally Benign Manufacturing Alternatives & Innovations

Chair: Farhang Shadman

Vice Chair: Ara Philipossian

- 6a [Integrating Life Cycle Analysis \(LCA\) with Process Modeling](#)
Yue (Nina) Chen, Gregory J. McRae and Karen K. Gleason
- 6d [A New Methodology for Automating Waste Minimization Analysis of Batch Processes](#)
Iskandar Halim and Rajagopalan Srinivasan
- 6f [Development and evaluation of environmentally benign techniques for polymer film coating of fine particles](#)
Baohua Yue, Jun Yang, Jose Quevedo, Rajesh Dave, Chien-Yueh Huang and Robert Pfeffer

Session 7 - Principles of Sustainable Engineering

Chair: Martin Abraham

Vice Chair: Nhan T Nguyen

- 7c [A Multiscale Bayesian Framework for Designing Efficient and Sustainable Industrial Systems](#)
Nandan U. Ukidwe, Bhavik R. Bakshi, Gautham Parthasarathy

Session 27 - Chemicals and Materials from Renewable Feedstocks Plenary (Invited Papers)

Chair: James D McMillan

Vice Chair: Paul G Roessler

- 27a [The Role of U.S. DOE Laboratories in the Evolution of the U.S. Bioenergy Industry](#)
Michael A. Pacheco
- 27b [Biomass Refining in Response to Sustainability and Security Challenges](#)
Lee R. Lynd
- 27c [Envisioning Wood Biomass Based Biorefineries and Integration Into Existing Industries](#)
Thomas E. Amidon
- 27d [Progress Towards the Commercialization of PHA Bioplastics](#)
Oliver P. Peoples and James Barber
- 27e [Enabling the Renewable Chemical Industry: Cargill's Perspective](#)
Jim Millis

Session 34 - Life Cycle Analysis of Renewable Feedstock-Based Processes

Chair: Robert P Anex

Vice Chair: John Sheehan

- 34a [Sunlight Ancient and Modern: The Relative Energy Efficiency of Hydrogen and Fertilizer from Coal and Current Biomass](#)
Dr Matthew J. Realff, Ling Zhang

- 34b [Pulp-mill integrated biorefineries: a framework for assessing net CO2 emission consequences](#)
E. Andersson, S. Harvey
- 34d [Life Cycle Analysis of Products made with Bio-Based 1,3-Propanediol](#)
Carl F Muska, Carina Maria Alles, Susanne Veith, Robin E Jenkins and Robert W Sylvester
- 34f [Cradle to farm gate lifecycle inventory and water quality impacts associated with nutrients used for corn, soy, and stover biomass feedstocks](#)
Susan E. Powers

Session 393 - Process Design for Sustainability

Chair: Russell F Dunn

Vice Chair: Paul Blowers

- 393c [Decision Making for a Sustainable Chemical Process](#)
Xun Jin and Karen A. High
- 393e [A Multiscale and Multiobjective Approach for Environmentally Conscious Process Retrofitting](#)
Jorge L. Hau and Bhavik R. Bakshi