



AIChE Sustainable Engineering Forum Newsletter

Fall 2007 (Vol. 1, No. 2)

MESSAGE FROM CHAIR	1
ANNOUNCEMENTS	2
SEF ACTIVITIES	10
IFS UPDATES	11
MEMBER COMMUNICATIONS	13
SEF LEADERSHIP	13

MESSAGE FROM CHAIR

It’s hard to believe that my term as Chair of SEF is almost up, after nearly two years, but given that it is, this would be a good time to reflect on tasks accomplished and work still to be done.

We have definitely made substantial progress over the past two years. Our programming at national meetings continues to grow, with much hard work from our programming chair Helen Lou, and her excellent support team. As I have always believed that one of the most important roles of a technical division is its quality programming, I am greatly pleased that we have established a track record of success, in terms of both quality and quantity. During the Spring meeting, we held our programming for later in the meeting, and still managed to have excellent turnout for our sessions. Clearly, we are developing a technical program that is of great interest to our membership.

Our leadership team has also been expanded during my term. We have solidified the tenure of our committee chairs, and have put in place a full slate of candidates to take over in 2008. Yinlun Huang, currently vice-chair, should have a strong group of volunteers that can move forwards with new activities, including educational initiatives and a new awards program. The leadership team includes many hardworking individuals who will certainly improve the offerings of SEF, making it more supportive of sustainability initiatives within AIChE.

Our virtual meetings continue to be a strength of the Forum, thanks in large part to the untiring efforts of Earl Beaver. Now regularized, and occurring about once every six weeks, these conference calls link people from all areas of the globe to discuss vital issues of sustainability. These efforts have been so successful that the Environmental Division has also adopted the concept, and Earl worked with them to help organize their efforts, as well.

While we have had some successes, we clearly have a lot more work to do. The awards program is just developing, and we need additional volunteers to flesh out the structure and serve on the selection committee. We have begun discussion of educational initiatives, but here again, we are just in the initial stages. We can always use assistance in the programming area. And while our volunteer base is currently strong, we don’t have many people who have not yet been tapped for leadership positions. Many additional volunteers are needed, as there is still a lot of work to do.



AIChE Sustainable Engineering Forum Newsletter

Fall 2007 (Vol. 1, No. 2)

If you will be attending the national meeting in Salt Lake City, please make sure to stop by to our Forum activities. We will have a very full slate of programming throughout the meeting, as we are running two separate topical symposia. We will have our annual business meeting, and various members of the executive committee will be attending numerous committee meetings during the week to promote the activities of the Forum. Stop by at one of our events, or just find one of us, and let us know what we can do in support of your own professional goals. And don't forget to volunteer to help us to accomplish those goals, by serving on a committee or participating in our programming.

It has been my great pleasure to Chair the Forum over the past two years. I came into the role with high hopes of accomplishing quite a bit more than we were able to achieve, but looking back, am pleased with the progress we have made. It's an exciting group to be a part of, and I will look forward to working with the new leadership and continuing to serve in my new role as past-chair.

Martin Abraham
Chair, Sustainable Engineering Forum

ANNOUNCEMENTS

AIChE 2007 Annual Meeting – SEF Programming

SEF will sponsor two topical sessions, a Sustainability Topical (Topical E) and a Sustainable Biorefineries Topical (Topical 4), at the upcoming 2007 AIChE Annual Meeting in Salt Lake City, UT.

Topical E will feature a sustainability plenary with three excellent invited speakers (Dr. Subhas Sikdar, USEPA; Dr. Julio Ottino, Northwestern University; Dr. Rafiqul Gani, Denmark Technical University; and Dr. Yong Jin, Tsinghua University, China along with a total of 60 papers in 10 oral presentation sessions. For complete information about Topical E, please visit:

<http://aiche.confex.com/aiche/2007/techprogram/D1207.HTM>

Similarly, Topical 4 includes a sustainable biorefineries plenary with five invited speakers (Robert L. Fireovid, USDA; Gregory Stephanopoulos, MIT; Paul F. Bryan, Chevron Technology Ventures LLC; Todd A. Werpy, Archer Daniels Midland; and Glenn D. Munkvold, Iogen Corporation), 65 papers in 11 oral presentation sessions, and 1 poster session with 17 participants. For complete information about Topical E, please visit:

<http://aiche.confex.com/aiche/2007/techprogram/D1200.HTM>

Fall 2007 (Vol. 1, No. 2)

In addition, SEF will sponsor four sessions in conjunction with other divisions. The full listing of SEF programming activities for the week are provided below.

Topical E: Sustainability

Monday, November 5, 2007

8:30 AM-11:00 AM

#59 - Sustainability Plenary (TE000)

12:30 PM-3:00 PM

#110 - Sustainable Energy (TE001)

Tuesday, November 6, 2007

8:30 AM-11:00 AM

#165 - Design for Sustainability I (TE006)

12:30 PM-3:00 PM

#223 - Design for Sustainability II (TE011)

Wednesday, November 7, 2007

8:30 AM-11:00 AM

#381 - Sustainability Education (TE009)

3:30 PM-6:00 PM

#502 - Sustainability of Land Use (TE010)

Thursday, November 8, 2007

8:30 AM-11:00 AM

#537 - Green Manufacturing/green Supply Chain (TE008)

12:30 PM-3:00 PM

#591 - Green Chemistry and Engineering for Sustainability (TE007)

3:30 PM-6:00 PM

#649 - Sustainable Fuels (TE002)

#650 - Systems Analysis of Sustainability (TE005)

Friday, November 9, 2007

8:30 AM-11:00 AM

#659 - Life Cycle Assessment And Sustainability Metrics (TE004)

Topical 4: Sustainable Biorefineries

Wednesday, November 7, 2007

8:30 AM-11:00 AM

#382 - Sustainable Biorefineries Plenary Session Invited Papers (T4008)

12:30 PM-3:00 PM

Fall 2007 (Vol. 1, No. 2)

#400 - Catalytic Conversion of Renewable Resources to Synthesis Gases and Pyrolysis Oils (T4001)

#404 - Chemical and Catalytic Conversions and Processes for Renewable Feedstocks (T4000)

3:30 PM-6:00 PM

#471 - Feedstocks and Byproducts: Matching Chemistry to Processes at the Biorefinery Interface (T4009)

#498 - Reactor Engineering for Biomass Feedstocks (T4004)

4:30 PM-6:30 PM

#513 - Sustainability and Sustainable Biorefineries Poster Session (T4010)

Thursday, November 8, 2007

8:30 AM-11:00 AM

#554 - Pretreatment of Lignocellulosic Biomass and Interactions with Other Processing Steps I (T4002)

12:30 PM-3:00 PM

#574 - Biological Conversions and Processes for Renewable Feedstocks (T4005)

#603 - Pretreatment of Lignocellulosic Biomass and Interactions with Other Processing Steps II (T4011)

3:30 PM-6:00 PM

#634 - Life Cycle Analysis of Renewable Feedstock-Based Processes and Products (T4006)

#644 - Pretreatment of Lignocellulosic Biomass and Interactions with Other Processing Steps III (T4012)

Friday, November 9, 2007

8:30 AM-11:00 AM

#655 - Developments in Biobased Alternative Fuels (T4007)

#661 - Separations and Processing of Streams Derived from Renewable Feedstocks (T4003)

2007 SEF Business Meeting Invitation – Salt Lake City, UT

The SEF Business Meeting will be held during the AIChE Annual Meeting in Salt Lake City, UT on Tuesday, November 6th, 2007 from 6:00-7:00pm in Grand Ballroom C. All SEF members are welcome to attend.

1st International Symposium on Sustainable Chemical Product and Process Engineering

The First International Symposium on Sustainable Chemical Product and Process

Engineering (SCPPE 2007) was successfully held at South China University of Technology, Guangzhou, China, from September 25–28, 2007. The National Science Foundation, China (NSFC), National Science Foundation, USA (NSF), and Guangzhou Association of Science and Technology sponsored the symposium. The theme of the symposium was the advancement of product and process engineering through the effective integration of sustainability. The symposium attracted over 400 people from China, USA, Germany, Denmark, UK, Norway, Netherlands, Japan, and other regions, such as Hong Kong and Taipei.

The symposium was co-chaired by Prof. Yu Qian of South China University of Technology and Prof. Yinlun Huang of Wayne State University (Vice Chair of SEF). Prof. Martin Abraham (SEF Chair), Prof. Mahmoud El-Halwagi (SEF Technical Advisor), Prof. Ralph Pike (SEF Education Chair), and Prof. Helen Lou (SEF Programming Chair) all served on the International Program Committee.

Four members of the U.S. National Academy of Engineering, Prof's. James Wei of Princeton University, Prof. Ed Cussler of University of Minnesota, Prof. Ignacio Grossmann of Carnegie Mellon University, Dr. Jeffery Sirola of Eastman Chemicals, as well as Dr. Maria Burka, Director of Process and Reaction Engineering Program of NSF, and Dr. Subhas Sikdar, Associate Director for Science of EPA NRARL (the Founding Chair of SEF), were among the distinguished plenary and keynote speakers of the symposium.

The symposium included two specially designed workshops: Workshop I – Discussions on International Collaboration of Research and Workshop II – Education Perspectives on Sustainable Chemical Engineering. Prof. Luke Achenie of Virginia Tech. and Prof. Mario Eden of Auburn University co-chaired the two mini-workshops. Prof. Robert Hesketh of Rowan University, Prof. Thomas Ho of Lamar University, and Prof. Bhavik Bakshi of Ohio State University were among the panelists of the mini-workshops. Prof. Charles Manke of Wayne State University was invited to speak about how to promote Ph.D. research in the Ph.D. Student Session that was co-chaired by Ms. Cristina Piluso of Wayne State University (Editor of the SEF Newsletter). Additionally, a number of SEF members contributed papers for presentation at the symposium.

Along with the invited plenary and keynote lectures, there were 12 oral sessions and one poster session, covering the following technical areas:

- A. Green Chemistry and Reaction Engineering
- B. Alternative and Renewable Energy and Resources
- C. Integrated Product and Process Design
- D. Green Chemical Technology
- E. Sustainable Chemical Processing
- F. Systems Analysis for Sustainability
- G. LCA of Chemical Products/Processes

The symposium provided a unique forum for the researchers, scientists, and practitioners from different continents to assess and critique the current status of the challenging field and to identify future directions of research and development in designing and manufacturing green chemical products and materials using green processes and technologies.

In addition, the symposium concluded with a tour of Guangzhou, which included visiting sites such as the Chen Ancestral Temple, YueXiu Park, Five-goat Statue, Zhenhai Tower, Sun Yat-sen Memorial Hall, and finally a pleasant night tour on the Pearl River.



Left: SCPPE 2007 opening ceremony panel; Right: Dr. Maria Burka – NSF



Plenary Lectures: Left: Dr. Edward Cussler, University of Minnesota; Left Center: Dr. James Wei, Princeton University; Right Center: Dr. Ignacio Grossmann, Carnegie Mellon University; Right: Dr. Jeffrey Sirola, Eastman Chemical Company



Left: Dr. Subhas Sikdar – USEPA and Dr. Rafiqul Gani – Technical University of Denmark;
Right: Dr. Subhas Sikdar – USEPA and Dr. James Wei, Princeton University

2007 SEF Elections

According to the SEF Bylaws, the current Vice Chair, Yinlun Huang of Wayne State University, will automatically succeed to the Chair. The SEF nominating committee has selected Helen Lou of Lamar University as candidate for Vice-Chair. Robert Hesketh, Chair of chemical engineering at Rowan University, has been nominated for Treasurer. The nominating committee is still seeking candidates for the position of Secretary. In addition, we issue a call for additional nominations for the indicated elective positions. If additional nominations are received before November 15, 2007, an election of all members of SEF will be conducted; otherwise, the slate will be approved by acclamation. Please contact Martin Abraham (martin.abraham@utoledo.edu), SEF chair, for more information on any of these positions, or to submit a nomination.

2008 AIChE Annual Meeting, Philadelphia, PA, November 16-21, 2008

Green chemistry & engineering and sustainability are important and timely issues in the pharmaceutical industry. The SEF (group 23) along with the Pharmaceutical Division (group 15b) will co-sponsor a topical conference at the 2008 AIChE annual meeting entitled “Green Engineering and Sustainability in the Pharmaceutical Industry.” The tentative session list (as of July 26th, 2007) is provided in the table below.

This topical program provides a forum for the discussion of challenges and opportunities, which would enable the transition to a sustainable future. These exist in both R&D and manufacturing activities for the API and the finished drug formulation. We expect this topical to be a forum for the exchange of new concepts and ideas between the stakeholders from industry, academia and government. Papers in all areas related to this field are welcome. Requested topics include:

- Benign / safer solvents and recovery practices

Fall 2007 (Vol. 1, No. 2)

- Batch to continuous processing
- Pharmaceutical environmental metrics / LCA
- Green reactions
- Enzymes and biocatalysis
- Green and novel separations and methods
- Commercializing green technology
- Making the business case for sustainability
- Sustainable downstream bioprocessing
- Green engineering with particle technology
- Green design issues in manufacturing facilities
- Quality by design
- Benign by design
- PAT
- Incentives to promote green engineering in the pharmaceutical industry
- Government programs and partnerships.

Abstract submissions begin February 2008 and end June 2008. Submit electronically through www.aiche.org/Conferences/AnnualMeeting/index.aspx
Go to the Topical Conference session of interest.

Interested in chairing a session? Questions about submitting an abstract? Please contact one of the organizers:

Organizers: Robert Hesketh (hesketh@rowan.edu), Mariano Savelski (savelski@rowan.edu), C. Stewart Slater (slater@rowan.edu), Rowan University
Co-Organizers: David Constable, GlaxoSmithKline and Ann Lee-Jeffs, Johnson & Johnson

Session Title	Session Chairs
Luncheon – <i>Speaker / Merck VP Karen Klimas</i> <i>“The Road to a Sustainable Future for the Pharmaceutical Industry”</i>	Merck VP of Global Safety and the Environment, Karen Klimas (speaker coordinated by John Leazer, Merck)
Benign / Safer Solvents in Pharmaceutical Processing	Chair: David Constable, GlaxoSmithKline Co-Chair: TBD
Pharmaceutical Environmental Metrics / LCA	Chair: Conchita Jimenez-Gonzalez, GlaxoSmithKline Co-Chair: TBD
Green Reactions in the Pharmaceutical Industry	Chair: Kim Albizati, BioVerdant Co-Chair: TBD
The Business Case for Sustainability in the Pharmaceutical Industry	Chair: Ann Lee-Jeffs, Johnson & Johnson, (Berkeley Cue) Co-Chair: TBD

Fall 2007 (Vol. 1, No. 2)

Government Programs and Partnerships <i>(EPA/OPPT/P2, Green Chem, Green Eng, TCNC, FDA - PAT, Pharma Sector Stewardship Challenge), (1 or 2 sessions)</i>	Chair: Nhan Nguyen, EPA OPPT Co-Chair: Richard Engler, EPA OPPT
Batch to Continuous Pharmaceutical Processing Challenges	Chair: Daniel Pilipauskas, Pfizer Co-Chair: Fernando Muzzio, Rutgers Univ
Green Engineering and Sustainability in the Pharmaceutical Industry <i>Poster Session – Papers that don't fit a particular topic, overflow of papers from other sessions, student posters</i>	Chair: Robert P. Hesketh, Rowan Univ Co-Chairs: Mariano J. Savelski, C. Stewart Slater, Rowan Univ
Green Separations in the Pharmaceutical Industry <i>(Nanofiltration, Pervaporation, Supercritical Extraction, Ionic liquids, SPE, etc)</i>	Chair: TBD Co-Chair: Mahmoud El-Halwagi, Texas A&M Univ.
OTHER POTENTIAL SESSIONS	
Green Engineering with Particle Technology <i>Crystallization, Particle Sizing, Blending, etc</i>	
Green Design Issues in Pharmaceutical Manufacturing Facilities <i>(Ultrapure water/DRO/WFI, HVAC, energy, air, solids management)</i>	
Green Engineering by Design / Rapid Drug Prototyping	

SEF Members Speak on Future Virtual Meeting Topics

Recently, a poll was conducted among SEF members and regular participants in SEF Virtual Meetings. A total of 42 people from AIChE, ASCE, AAAS, ASME and IMIQ responded before the “official close” of the poll, but votes continued to arrive as the fall semester began, as some folks returned from vacations and as others got around to cleaning out their in-boxes. When the dust settled, more than sixty people had responded. Some followed the rules; some insisted that the rules were too restrictive; some people wrote a full treatise with opinions on IfS, AIChE and other matters.

Six SEF Virtual Meeting topics are selected; five are scheduled:

- “Planting the Seeds of Sustainability with the Next Generation” - October 25, 2007 at 1 PM EDT
- “Sustainable Actions One Individual Can Take” - November 29, 2007 at 10 AM EDT
- “Reducing Non-Power Plant Mercury Emissions” – December 20, 2007 at 10 AM EST



AIChE Sustainable Engineering Forum Newsletter

Fall 2007 (Vol. 1, No. 2)

- “Impact of Freshwater Pollutants on the Chesapeake Bay” as a substitute for “Oceans: Impacts of freshwater pollutants entering with rivers & runoff, cruise lines & shipping” (change made by popular demand) – January 22, 2008 at 1 PM EST
- “Sustainability Aspects of Brownfields and Greenfields” – February 19, 2008 at 2 PM EST
- “Livestock’s Long Shadow” – Sometime in February 2008

Speakers and content material are welcome, as are volunteers to take notes.

Not known for being silent, SEF members spoke: 16 new topics were suggested for Virtual Meetings and possible meeting programming. A complete list is available from Earl Beaver at Erbeav@aol.com or by checking the SEF website at: http://webpages.eng.wayne.edu/~as8971/AIChE_SEF/

As agreed, the Environmental Division may choose from the topics for their quarterly Virtual Meetings.

Past SEF Virtual Meetings

Information regarding past and upcoming virtual meetings are available on the SEF website (http://webpages.eng.wayne.edu/~as8971/AIChE_SEF/workshops.htm). Please contact Earl Beaver if you are interested in a detailed summary of the main discussion points from these previous virtual meetings or for suggestions for future virtual meeting topics.

SEF ACTIVITIES

SEF Sponsored/Co-Sponsored Activities

The 2008 joint co-located AIChE/ACS spring meeting will be held April 6th-10th, 2008 in New Orleans, LA. SEF will sponsor two symposiums:

1. Topical 9: Sustainability: Lessons, Actions and Outlook (Jointly Cosponsored with the American Chemical Society)

Topical Chair: Benson Pair, Chief Technology Engineer, KBR Energy and Chemicals, Benson.Pair@kbr.com

This topical will include the following sessions:

T9000 Waste to Energy

T9001 Environmentally Benign Energy Technologies

T9002 Predicting Environmental Performance

T9003 Metrics for Sustainability

Fall 2007 (Vol. 1, No. 2)

T9004 Case Studies in Design for Sustainability
T9005 Business Case for Sustainability
T9006 Sustainability and Management Systems
T9007 CO2 Sequestration
T9008 Sustainability and Katrina-Lessons from New Orleans

2. Engineering the Transition to the Bioeconomy

Science/technology and information issues related to sustainable energy, products and materials; Scientific R&D strategies, technology transfer, market research, scientific publishing trends, information portals, and social networking for scientists.

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AIChE Sustainable Engineering Forum
Helen H. Lou, Lamar University
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For further information regarding this event, please contact SEF Programming Chair Helen Lou (Helen.Lou@lamar.edu).

IFS UPDATES

YCOSST

The Youth Council on Sustainable Science and Technology, a partnership between IFS and SustainUS, hosted a discussion meeting at the AAAS on June 25 with university and association leaders in sustainability. The group met to identify the gaps and needs of universities and students in encouraging and implementing aspects of sustainability into ALL undergraduate research, regardless of discipline. The group is inventorying current projects underway with an eye towards leveraging opportunities among the various groups and universities and development of dissemination of information and opportunities. YCOSST is co-chaired by Lyn Beary; Marco Calstaldi, and Katelyn Keefe. Additional information on projects and activities will be available on:

<http://www.aiche.org/IFS/Youth/YCOSST/Index.aspx>.

UVA Project receives YCOSST P3 Award

The University of Virginia's (UVA) Learning Barge Project was the 2007 YCOSST P³ Award Recipient. Katelyn Keefe, YCOSST Co-Chair, presented UVA their award on behalf of the organization. The Third annual National Design Expo and Awards Ceremony featuring EPA's P³ Award took place on April 24-25 in Washington D.C. and featured forty-one college and university teams competing for the EPA P³ Phase I Award. The Youth Council on Sustainable Science and Technology (YCOSST) exhibited, showcasing their recent accomplishments, such as the YCOSST Web site launch and the Citizen Science list serve. This is the second year that YCOSST had the opportunity to present the YCOSST P³ Award to the team that best exemplified considerations regarding development, deployment to regions with limited resources, materials, and youth involvement. The award winning team received a \$1,000 prize as well as the opportunity to present at the 2007 Sustainability Student Conclave at the AIChE meeting on Sunday, November 4, 2007 in Salt Lake City, Utah.

The University of Virginia School of Architecture, in collaboration with community partners, is designing and fabricating an off the grid floating classroom on the most polluted estuary of the Chesapeake Bay. This Learning Barge will provide interactive K-12 and adult education about the tidal estuary ecosystem, wetland and oyster restoration, sediment remediation and sustainable practices. Unlike environmental education centers located in pristine "nature," the Barge will traverse an important urban river linking Norfolk, Portsmouth, Chesapeake and Virginia Beach. Powered solely by solar and wind energy systems, the 32'x120' barge will filter rainwater and graywater in a contained bed wetland of native plants and use recycled and green materials and technologies. For more information on the UVA Learning Barge Project, please visit www.arch.virginia.edu/learningbarge.

CSTP Rolls Out Roadmap for Implementing Sustainability Considerations

The Center for Sustainable Technology Practices introduced the Sustainable Development Roadmap for Industry at a workshop held at NIST in Gaithersburg, MD on September 13, 2007. Presented by Charlene Wall, BASF; Dickson de La Haye, Dow; Dave Taschler, Air Products; Carol English, Cytec, Inc.; Beth Beloff, Golder and Associates; and Javed Talvoki, Lafayette College, the workshop engaged participants in the use of this guide to implement key sustainability considerations into process and product development. A list of 150 key sustainability considerations, the key stakeholders in the consideration, and the suggested step in a gated process/product development were identified. For more information on the CSTP roadmap, contact ifs@aiche.org.

AIChE Sustainability Index Launched

The Institute for Sustainability announced the inaugural AIChE Sustainability Index in the June 2007 issue of CEP. The AIChE Sustainability Index (SI) assesses sustainability performance in seven areas: strategic commitment, environmental performance, safety performance, product stewardship, social responsibility, value chain management, and innovation. Engineering and scientific experts developed the AIChE Sustainability Index, using publicly reported data. They calculate the results in each updated release, basing their analysis on individual company and sector-level data. AIChE SI aggregate data are published regularly in *CEP* magazine and elsewhere. The AIChE SI provides a compelling, overall picture of the chemical process industry's progress toward sustainability. The index provides the opportunities to:

- Benchmark performance in your peer group
- Assess performance against well-defined metrics and indicators
- Measure progress toward internal and external best practices
- Access unbiased, expert interpretation of public data
- Better understand public perception of the data a company makes available

For additional information, see CEP, June 2007 or contact ifs@aiiche.org.

MEMBER COMMUNICATIONS

Sustainability Readings

Lists of valuable sustainability related reading materials, as assembled by Earl Beaver, are available on the SEF website. Anyone interested in learning more regarding the areas of sustainability, global climate change, and how sustainable companies make decisions please see: http://webpages.eng.wayne.edu/~as8971/AIChE_SEF/Readings.htm

SEF LEADERSHIP (2005-2007)

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AIChE Sustainable Engineering Forum Newsletter

Fall 2007 (Vol. 1, No. 2)

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Fall 2007 (Vol. 1, No. 2)

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