

AIChE

SUSTAINABLE ENGINEERING

FORUM NEWSLETTER

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Message from the Chair

I hope all of you are having a great summer. It is certainly a good time to be a part of the sustainability movement. I am sure most of you have been following the news reports about record investments in the renewable energy sector worldwide this past year. These investments, especially in the developing world, are leading to innovations in the renewable energy technologies.

As you know, the Forum has initiated an election process for establishing a new leadership team for the term of 2012-2013. We will keep you posted about the progress.

The 2011 AIChE Annual meeting is just three months away. We have a number of seminars, workshops, short courses and special events planned, so do mark your schedules accordingly. Details of the proposed sessions are available in the Programming Activities section. The 2011 International Conference on Energy and 1st Annual World Congress on Sustainable Engineering will group high-quality sessions related to energy and sustainability, respectively, under one umbrella. The SEF will also sponsor a special Sustainable Biorefinery and Sustainability student poster session at the AIChE Annual meeting.

Many congratulations to our 2011 Research Excellence in Sustainable Engineering awardees, Dr. Heriberto Cabezas of the US EPA and Prof. Ignacio E. Grossman of Carnegie Mellon University; and 2011 SEF Student Paper awardees Mr. Xiang Li of Lamar University and Mr. Viet Pham of Texas A&M University. They will be receiving their awards at the SEF

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<http://www.aiche.org/sef>

luncheon to be held at the AIChE Annual Meeting.

The 2012 Carbon Management Technology Conference to be held from February 7-9 2012 in Orlando, Florida and the 2012 Sustainable Packaging Symposium from April 3-5, 2012 are events to watch for next year. The IfS Updates column has further details.

We hope you will continue to send us your valuable comments and suggestions regarding the forum and this newsletter. We look forward to hearing from you.

Helen Lou
Chair, Sustainable
Engineering Forum



Announcements

By David N. Thompson

SEF Election

The current leadership of Sustainable Engineering Forum is approaching the end of its two-year term. The Forum therefore initiated an election process for establishing a new leadership team for the term of 2012-2013. Recently, a nomination committee was formed, which consists of the Forum's current, the immediate past chair and the current vice chair (i.e., Helen Lou, Yinlun Huang and David Thompson). A membership-wide election will be conducted for the vice-chair, secretary and treasurer's position. All the other positions will be appointed by the nomination committee, except that the technical areas' Vice Chair will automatically succeed as the Chair of the area. We are collecting nominations and will keep you posted about the progress.

Green Engineering Workshop Proposed

David Shonnard and David Allen are proposing a 3-hr workshop "Green Engineering and Sustainability in the Chemical Engineering Curriculum" for the 2012 ASEE Summer School for the Chemical Engineering Division of ASEE. The Summer School will be held July 21-28, 2012 at the University of Maine. For more information, contact Professor Shonnard at drshonna@mtu.edu.

ICE 2011 – Second International Congress on Energy: Sustaining Supplies

This targeted conference, organized by the AIChE Center for Energy Initiatives, is created by grouping the high quality energy-related sessions submitted to the Annual Meeting under one umbrella. This year's conference brings industry, university and

government leaders together to address the challenge of sustaining the energy supply. For more information, go to <http://energycongress.org/>.

1st Annual World Congress on Sustainable Engineering

A similar effort to the International Congress on Energy is in preparation for the 2011 Annual Meeting in the area of sustainability. The 1st Annual World Congress on Sustainable Engineering (WCSE) will draw existing division, forum, and topical programming sessions under an umbrella topical themed toward sustainability, and will be divided into technical grids aligned with various sustainability topics. The WCSE will have one allocated session, an invited plenary session that presents visionary talks invited by each of its participating co-chairs (one chair each from the SEF, Environmental Division, and the Forest Bioproducts Division).



SEF Events planned for AIChE Annual Meeting in Minneapolis

The following special events are being planned for the upcoming Annual Meeting in Minneapolis. Rooms and times have not yet been scheduled. If you are interested in participating, please watch for updates and plan to attend.

1. SEF Leadership Meeting
2. SEF Programming Meetings for the 2011 Annual Meeting
 - a. Area 23a - General and Area 23c - Sustainable Energy
 - b. Area 23b - Sustainable Biorefineries

3. SEF Luncheon: The winners of the SEF awards will be announced during the luncheon.

SEF to Sponsor Student Poster Awards at 2011 Annual Meeting

The SEF will sponsor a special Sustainable Biorefinery and Sustainability student poster session at the AIChE Annual Meeting in Minneapolis, MN. Three cash awards of \$200 will be provided to the best student posters. The SEF is currently looking for volunteers who plan to attend the Annual Meeting to serve as judges for the poster session. As a special thanks, judges will be given a free ticket to the SEF Luncheon for their service. If interested, please send your name and contact information to SEF Education Committee Chair, Jeff Seay at jseay@engr.uky.edu.



Message from the Chairs of Area 23b

Bruce Dien and David Shonnard wish to announce that the Sustainable Biorefineries programming area will be sponsoring 24 sessions at the 2011 AIChE Annual Meeting in Minneapolis, and welcome all to submit presentations. The sessions are listed below as organized by subject matter:

Feedstock, Pretreatment, Lifecycle, and Poster Session

- Sustainable Biomass Feedstock Production and Supply for the Emerging Biorefinery Industry
- Developments in the Pretreatment of Lignocellulosics for Bioconversion
- Life Cycle Analysis of Renewable Feedstock-Based Processes and Products

- Poster Session: Sustainability and Sustainable Biorefineries
- Industrial ecology enabled by biorefineries
- Biochemical Conversions
- Advances in Algal Biorefineries
- Biological Conversions and Processes for Renewable Feedstocks
- Integrated Processes for Biochemical Conversion of Renewable Feedstocks to Fuels and Chemicals
- Microbial Engineering for bulk value-added products developments in Biobased Alternative Fuels

Thermochemical

- Catalytic Conversion of Renewable Resources to Synthesis Gases and Pyrolysis Oils
- Chemical and Catalytic Conversions and Processes for Renewable Feedstocks
- Integrated thermo-chemical and biochemical processing for renewable fuels

Fundamentals

- Reactor Engineering for Biomass Feedstocks
- Reaction Kinetics and Transport Fundamentals for Biomass Conversion
- Advances in Biofuels: DOE Bioenergy Research Centers (invited)

Please see Area 23b Sustainable Biorefineries in the Preliminary Program for session links. Finally they want to acknowledge in-kind support from the Society of Industrial Microbiology and remind everyone of the excellent upcoming meeting of the [33rd Symposium on Biotechnology for Fuels and Chemicals](#) will be held in Seattle, WA on May 2-5, 2011 (see www.simhq.org for details).

SEF 2011 Awards

By Thomas Marrero

2011 Research Excellence in Sustainable Engineering Award:

Dr. Heriberto Cabezas, Senior Science Advisor, Sustainable Technology Division, National Risk Management Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency



Dr. Heriberto Cabezas joined the U.S. Environmental Protection Agency in 1994. He is the Senior Science Advisor of the Sustainable Technology Division. He is a former Acting Director

of the Division, and a former Chief of the Sustainable Environments Branch in the same division. Dr. Cabezas is a past Chair of the AIChE Environmental Division (2006). He was a recipient of the 1998 EPA Science Achievement Award in Engineering, and the 2007 Distinguished Alumni Achievement Award from the New Jersey Institute of Technology.

Dr. Cabezas received his Ph.D. in chemical engineering from the University of Florida (1985) in the area of thermodynamics and statistical mechanics. He holds a M.S. from the University of Florida (1981) and a B.S. (magna cum laude) from the New Jersey Institute of Technology (1980), both in chemical engineering. He is a Fellow of the AIChE, a member of the American Association for the Advancement of Science, and a Board Certified Member of the American Academy of Environmental Engineers. His past and present areas of research include chemical process design (WAR Algorithm) and solvent design (PARIS II software), the sustainable

management of environmental systems including supply chains and sustainability metrics, and the application of Information Theory to complex environmental problems.

Prof. Ignacio E. Grossmann, Department of Chemical Engineering, Carnegie Mellon University



Ignacio Grossmann is the Rudolph R. and Florence Dean University Professor of Chemical Engineering at Carnegie Mellon University. He is a leading figure in the area of Process Systems

Engineering who has made a number of significant research contributions in the area of sustainability, particularly in the areas of optimal synthesis heat exchanger networks and process water networks, design of biofuel plants and multi-objective design optimization models with environmental concerns.

He obtained his B.S. degree at the Universidad Iberoamericana, Mexico City, in 1974, and his M.S. and Ph.D. at Imperial College in 1975 and 1977, respectively. After working at the Instituto Mexicano del Petróleo in 1978, he joined Carnegie Mellon in 1979. He is currently director of the Center for Advanced Process Decision-making, an industrial consortium that involves about 20 petroleum, chemical, engineering and software companies.

2011 Sustainable Engineering Forum Student Paper Awards:



Xiang Li, Department of Chemical Engineering, Lamar University, "Incorporating Exergy Analysis and Inherent Safety Analysis for Sustainability Assessment

of Biofuels,” published in Ind. Eng. Chem. Res. (2011), 50, 2981-2993. (co-authors: Anand Zanwar, Abhishek Jayswal, Dr. Helen H. Lou and Dr. Yinlun Huang; advisor: Professor Helen H. Lou)

Mr. Xiang Li is a PhD student in chemical engineering at Lamar University. His area of research includes design for sustainability, process modeling and simulation. This paper presents a novel approach for applying exergy analysis and inherently safe design principles to evaluate the sustainability of chemical systems. The efficacy of this methodology is demonstrated through a case study on biodiesel production processes. In conjunction with a multi-criteria decision-analysis method, this methodology will provide critical guidance to the designers.

Viet Pham, Department of Chemical Engineering, Texas A&M University, “Techno-Economic Analysis of Biomass to Fuel via the MixAlco Process,” published in

Journal of Industrial Microbiology & Biotechnology (2010), 37(11), 1157-1168 (co-authors: Dr. Mark Holtzaple and Dr. Mahmoud El-Halwagi; advisor: Professor Mahmoud El-Halwagi)



Mr. Viet Pham is a Ph.D. candidate at the Artie McFerrin Department of Chemical Engineering, Texas A&M University. His work is on the cutting edge of using chemical engineering fundamentals

in a unique, innovative, and rigorous manner to solve a pressing problem in the area of sustainable design. The paper developed and applied various tools for the synthesis, simulation, design, and economic analysis of a novel process to convert various types of biomass into mixed alcohols that can be used either directly as biofuels or converted to liquid transportation fuels.

Programming Activities

By Christina Piluso

AIChE 2011 Annual Meeting

1. Sustainability Plenary

General (23A):

1. Design & Operation for Sustainability
2. Complexity, Networks, Dynamics, & Sustainability
3. Sustainability Metrics, Indicators, & Life Cycle Assessment
4. Sustainable Materials
5. Sustainable Water Use & Management
6. Sustainable Chemicals
7. Water-Energy-Climate in a Sustainable Urban Environment

Sustainable Biorefineries (23B):

1. Sustainable Biorefineries Plenary Session

(Invited Papers)

2. Microbial Engineering for the Synthesis of Bulk and High-Value Products
3. Advances In Algal Biorefineries
4. Catalytic Conversion of Renewable Resources to Synthesis Gases and Pyrolysis Oils
5. Biological Conversions and Processes for Renewable Feedstocks
6. Chemical and Catalytic Conversions and Processes for Renewable Feedstocks
7. Sustainable Biomass Feedstock Production and Supply for the Emerging Biorefinery Industry
8. Poster Session: Sustainability & Sustainable Biorefineries
9. Reactor Engineering for Biomass

Feedstocks

10. Developments in the Pretreatment of Lignocellulosics for Bioconversion

Sustainable Energy (23C):

1. Sustainable Energy Plenary
2. Energy Efficiency, Challenges and Solutions
3. Process Design and Simulation Tools for Sustainable Energy
4. CO₂ Capture, Control and Sequestration
5. Sustainable Electricity: Generation, Transmission, and Storage
6. Carbon Efficient Chemical Engineering Systems
7. Ionic Liquids for Carbon Capture
8. Solvent-Based Carbon Capture Processes

9. Sorbent Processes for Carbon Capture

10. Materials for Solar Energy

11. Sustainable Gasoline from Renewable Resources

12. Membrane Processes for Carbon Capture

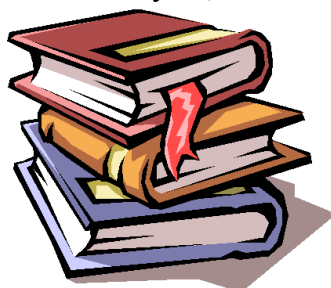
13. Sustainable Diesel Fuel from Renewable Resources

SEF Special Events:

1. SEF Leadership Meeting: Monday, October 17th, 5:00 - 6:30PM
2. SEF Programming Meeting (23A - General & 23C - Sustainable Energy): Tuesday, October 18th, 5:00 - 6:00PM
3. SEF Programming Meeting (23B - Sustainable Biorefineries): Tuesday, October 18th, 6:00 - 7:00PM

Education Column

By Jeffrey Seay



As we begin summer after the close of another academic year, it's never too early to begin thinking about the AIChE Annual Meeting, held this year in Minneapolis, Minnesota. This year the SEF will be presenting a sustainability short course, providing an overview of key sustainability topics and assessment methodologies. Details on this new course offering will be provided in the SEF Fall newsletter.

Once again, a sustainability category will be included as part of the Student Poster Competition at the 2011 AIChE National Student Conference in Minneapolis. This will be the second offering of this new category which will provide a showcase for undergraduate researchers working in the field of sustainability. We are hoping to make this

category a permanent fixture at the student conference, so please encourage any undergraduate students working in the field of sustainability to consider participating.

Finally, as mentioned in the previous newsletter, the SEF will once again sponsor a special Sustainable Biorefinery and Sustainability student poster session at the AIChE Annual Meeting in Minneapolis, MN. Three cash awards of \$200 will be provided to the best entries. The SEF is currently looking for volunteers who plan to attend the Annual Meeting to serve as judges for the poster session. As a special thank you, judges will be given a free ticket to the SEF Luncheon for their service. Please contact the session chair, Bin Yang (binyang@tricity.wsu.edu), session co-chair, Siphon Ndlela (sndlela@gmail.com), or the Education Committee chair if you'd like to volunteer.

Any correspondence with regard to this column should be sent by e-mail to Jeff Seay, Education Committee Chair, at the following address: "jseay@engr.uky.edu". As always, we look forward to hearing from you.

Member Communications

By Heriberto Cabezas

Sustainability Readings

Lists of valuable sustainability related reading materials, as assembled by Earl Beaver, are available on the SEF website.

Please visit the "Readings" section of the SEF website (<http://www.aiche.org/sef>). If you have any new materials to be added in, please contact the webmaster.

IfS Updates

By Darlene Schuster

Call for Papers is Open for Sustainable Packaging Symposium 2012

AIChE Institute for Sustainability and Greener Package will present the 2012 Sustainable Packaging Symposium from April 3-5, 2012 Houston Hilton and George Brown Convention Center in Houston, TX.

<http://www.sustainablepackagingsymposium.com/>

If you missed the 2011 Sustainable Packaging Symposium, the proceedings are available for purchase at:

<http://apps.aiche.org/proceedings/Group.aspx?GroupID=1626&ConfPageMessage=Y>

Carbon Management Technology Conference

The engineering societies, AIChE, AISt, ASCE, ASME, IEEE-USA, SME, SPE, and TMS- with a combined membership of about 1 million worldwide-have collaborated to organize a multidiscipline, multisociety technical conference: the 2012 Carbon Management Technology Conference to be held 7-9 February 2012 in Orlando, Florida. Abstracts are being accepted until July 18.

Information is attached. For an expanded description of these conference topics, please visit <http://www.carbonmgmt.org/>.

The 2011 International Congress on Energy will feature more than 100 sessions related to technology, markets, business strategies and policy covering the solar, nuclear, lignocellulosics, biorefineries, hydrogen production, hydrogen storage and green innovation energy sectors. October 16-21, 2011 in Minneapolis. For further details, please visit <http://www.energycongress.org/>.

Sustainability Metrics for Energy Production

An exploratory Workshop will be held on October 19-21, in Minneapolis. Contact ifs@aiiche.org for additional information.

Register now for "Sustainability: Beyond the Buzz Words" Thursday July 14, 12 noon to 2 pm ET. Corporations, universities and the government are all starting to embrace and implement the concept of sustainability. Attend this Web Forum to learn about what's happening from industry and government leaders. The AIChE Web Forum brings together a panel of experts, including:

Jay B. Clare, PE Vice President of the infrastructure and Environment Division, and Business Lien Director for Sustainability, URS Corporation

Dr. Alan D. Hecht Director for Sustainable Development, Office of Research and Development, U.S. Environmental Protection Agency (EPA)

Julie O'Brien Corporate Sustainability Manager, Air Products

Roger Zellner Director of Sustainability for Research, Development and Quality, Kraft Foods

Register Now at Special Low Rates starting at \$99 for individuals and \$249 for Teams: <http://www.aiche.org/careerseducation/education/webforums/sustainabilityweb.aspx>

Members' Column

By Denise Quarles

Not a member of AIChE or the Sustainable Engineering Forum? In order to guarantee that you are on the current email list and will have access to all existing SEF materials, please follow the link and make sure that you join the SEF!

<https://www2.aiche.org/SolutionSite/default.aspx?tabid=168&action=MBRProductDetails&args=35&aicheskin=aiche>

We are an active group of over 1000 members ranging from industry to academia. The diverse interests of our members have contributed to the range of activities which we offer through the forum.

Please use the link below to access more detailed information on membership requirements and application instructions. As a member, you will be placed on our e-mailing list and notified of upcoming meetings and events.

www.aiche.org/DivisionsForums/ViewAll/SEF.aspx

Three Steps to Membership

1. Applicant's Request for Membership
Complete the SEF Application available online at:

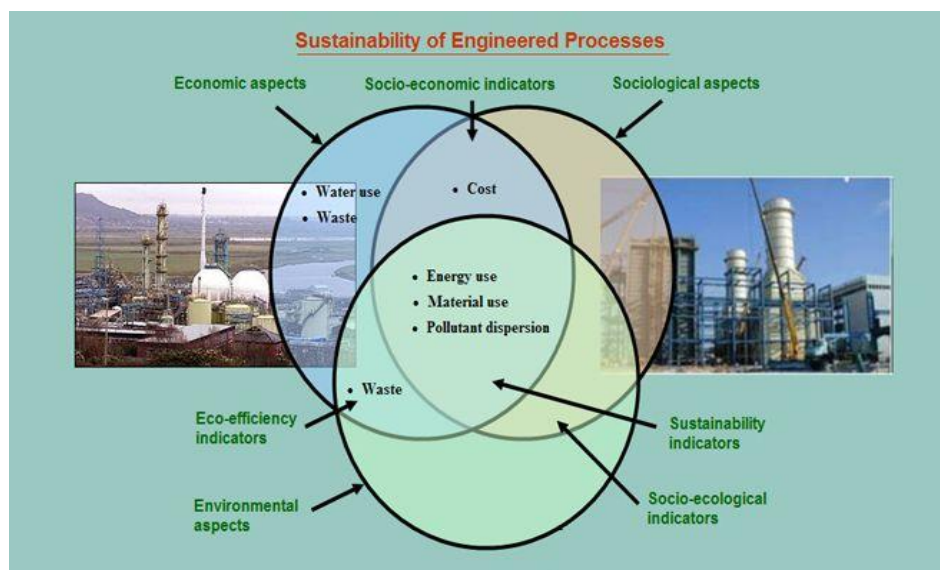
www.aiche.org/DivisionsForms/ViewAll/SEF.aspx

- REGULAR membership annual fee \$20
- STUDENT membership annual fee \$10

Membership fee waived for full-time undergraduate or graduate students for two years provided that student is a paid AIChE member; otherwise, a \$10 annual fee is required.

Mail completed forms to:
AIChE Customer Service,
3 Park Avenue,
New York, NY 10016

2. Staff Review to ensure completeness of application
3. Membership - Welcome!



SEF Leadership 2010-2011

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SEF Leadership 2010-2011

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