

Program

Bioenergy - I: *From Concept to Commercial Processes*

**March 5-10, 2006
Tomar, Portugal**

Conference Chairs

Dr. Muthanna Al-Dahhan
Washington University

Dr. Kevin Hicks
ERRC/ARS/USDA

Dr. Charles A. Abbas
Archer Daniels Midland Company

ECI

Engineering Conferences International
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Pacheco Filho, Universidade Federal de Pernambuco

Maria Isabel Pais, Pontificia Universidade Catolica

M.I. Rajoka, NIBGE, Pakistan

Sunday, March 5, 2006

17:00 – 19:30	Registration
19:30 – 21:00	Opening Dinner
21:00 – 22:00	Opening Reception

NOTES

- **Please observe “No Smoking” at ECI technical sessions, meals and social hours.**
- **Speakers should allow time at the end of their presentation for questions and discussion.**
- **Please silence your cell phone during technical sessions.**

Monday, March 6, 2006

- 07:30 – 08:15 Breakfast Buffet
- 08:15 – 08:30 Conference Overview and ECI welcome
- Session I: Fuel Alcohols from Grains and Sugar**
Session Chairs: **Kevin Hicks and Zhongping Shi**
- 08:30 – 09:10 **Plenary Lecture: Jay Shetty**, Genencor International, USA
State-of-the-art production of fuel ethanol using granular starch hydrolyzing enzymes
- 09:10 – 09:40 **David Johnston**, ARS, USDA, USA
New enzymatic advances in the dry grind (Grain) ethanol process
- 09:40 – 10:10 **Jeffrey Robert**, Delta-T Corporation, USA
Enhanced profitability through technology, integration and diversification
- 10:10 – 10:40 Coffee Break
- 10:40 – 11:10 **José Cardoso Duarte**, INETI, Portugal
Continuous culture of flocculent yeast for ethanol production: physiology, productivity and modeling
- 11:10 – 11:40 **Kurt A Rosentrater**, USDA, ARS, Brookings, SD, USA
Ethanol processing co-products - current constraints and future directions
- 11:40 – 12:10 **Zhongping Shi**, Southern Yangtze University, China
The acetone-butanol fermentation industries in China
- 12:10 – 12:40 **Robbert Kleerebezem**, Delft Technological University, Netherlands
Mixed culture fermentation for bioenergy production
- 12:40 – 13:40 Lunch
- 13:40 – 16:00 *ad hoc* sessions/Free time
Poster Session I available for viewing
- 16:00 – 16:30 Afternoon Coffee

Monday, March 6, 2006 (continued)

Session II: Fuel Ethanol from Biomass and Cellulosics

Session Chairs: **Kevin Hicks and José Cardoso Duarte**

- 16:30 – 17:10 **Plenary Lecture: Bruce S. Dien, ARS, USDA, Peoria, IL, USA**
An overview of recent advancements in lignocellulose to ethanol conversion technology
- 17:10 – 17:40 **Lisa Rosgaard, Novozymes Inc., Denmark**
Boosting the cellulytic degradation of pretreated barley straw
- 17:40 – 18:10 **Danny E. Akin, ARS, USDA, Athens GA, USA**
Structure and chemistry of lignocelluloses and biological modification for bioenergy
- 18:00 – 18:15 Stretch break
- 18:15 – 18:45 **William D. Provine, Dupont Company, USA**
Development of a world-class cellulosic ethanol process
- 18:45 – 19:15 **Constance Schall, University of Toledo, USA**
Enhancement of cellulose saccharification kinetics using an ionic liquid pretreatment step
- 19:15 - 19:45 **Aiduan Li, University College London, UK**
Bioethanol production from Municipal Solid Waste
- 20:00 – 21:30 Dinner
- 21:30 – 22:30 Social hour

Tuesday, March 7, 2006

07:30 – 08:30

Breakfast Buffet

Session III: Biogas and BioHydrogen

Session Chairs: **Methanna Al-Dahhan and Mohammed Jawed**

08:30 – 09:10

Plenary Lecture: Grietje Zeeman, Wageningen University,
Netherlands

Bio-methane production by anaerobic digestion

09:10 – 09:50

Plenary Lecture: Said Elnashaie, University of British Columbia,
Canada

**Technological, economical and sustainable engineering
aspects for the different routes of biomass to biofuels**

09:50 – 10:10

Irini Angelidaki, Technical University of Denmark, Denmark

Modeling and control of biogas processes treating manure

10:10 – 10:40

Coffee Break

10:40 – 11:00

Mehul Vesvikar, Washington University, USA

**Effect of scale on the performance and hydrodynamics of gas
recirculation anaerobic digester**

11:00 – 11:20

Masamitsu Tomiyama, National Institute of Agrobiological
Sciences, Japan

Hydrogen production by dark fermentation from food wastes

11:20 – 11:35

Elba Vivanco, Pontificia Universidad Catolica de Valparaiso,
Chile

Biogas potential in Chile

11:35 – 11:50

Mohammad Jawed, Indian Institute of Technology, India

**Judging the adaptability of anaerobic biomass to changed
feed substrates through methanogenic activity tests and its
verifications**

11:50 – 12:05

Zhen He and Lars Angenent, Washington University, USA

**The upflow microbial fuel cell: simultaneous electricity
generation and wastewater treatment**

12:05 – 12:20

May-Britt Hägg, Norwegian University of Science and
Technology, Norway

**Upgrading of biogas by membranes – for vehicle fuel or
European Gas Network**

12:20 – 12:35

Song Jin, Western Research Institute, USA

Generation of biogenic methane from oil shale

Tuesday, March 7, 2006 (continued)

12:35 – 13:50	Lunch
13:50 – 17:00	Conference Excursion (Trip to castle with guide, walking distance)
17:00 – 18:00	<u>Poster Session I - Fuel Alcohols</u> Session Chairs: Kevin Hicks and David Himmelsbach Introductions (one minute and one slide for each poster)
18:00 – 19:30	Poster Session with coffee (Fuel Alcohols)
19:30 – 21:00	Dinner
21:30 – 22:30	Social hour/poster session (Fuel Alcohols)

Wednesday, March 8, 2006

- 07:30 – 08:30 Breakfast
- Session IV: Biodiesel**
Session Chairs: **Muthanna Al-Dahhan and Peter Reimers**
- 08:30 – 09:10 **Plenary Lecture: Jorge Marchetti, PLAPIQUI**
Techno-Economical Assessment of Biodiesel Alternatives
- 09:10 – 09:40 **Donato Aranda**, GreenTec - Escola de Química – UFRJ, Brazil
E. Park, Shizuoka University, Japan
Palm Fatty Acids Esterification On Heterogeneous Catalysts
- 09:40 – 10:10 **P. Vasudevan**, University of New Hampshire, USA
Biodiesel production by enzymatic transesterification of olive oil
- 10:10 – 10:40 Coffee Break
- 10:40 – 11:10 **Marc A. Dubé**, University of Ottawa, Canada
A Novel Membrane Reactor for the Continuous Production of Biodiesel
- 11:10 – 11:40 **J. Pacheco Filho**, Universidade Federal de Pernambuco, Brazil
Determination of the blend level of mixtures of biodiesel with mineral diesel fuel using near infrared spectroscopy
- 11:40 – 12:10 **Lara Trigueiro Moura**, Instituto Superior Tecnico, Portugal
Quantification Of Energy Consumption And Emissions Using Biodiesel In An Urban Heavy Duty Fleet
- 12:10 – 12:40 **Peter Reimers**, ADM, Germany
Title to be Announced
- 12:45 – 13:45 Lunch
- 13:45 - 17:30 Optional Excursion (perhaps trip to Fatima or another area of interest)
- 17:30 – 18:00 Afternoon Coffee
- 18:00 – 18:40 **Plenary Lecture: Milorad Dudukovic**, Washington University, USA
Multiphase Reactions in BioConversion

Wednesday, March 8, 2006 (continued)

18:40 – 19:20

Poster Session II: Biogas, Biohydrogen, Fuel Cell, Biodiesel, Thermal Conversion, Environmental, Economic, Policy, and Energy Balance Issues.

Session Chairs: **Muthanna Al-Dahhan and Ana B. Henriques**

Introductions

(one minute and one slide for each poster)

19:30 – 21:00

Dinner

21:00 – 22:00

Poster session II /social hour (Biogas, Biohydrogen, Fuel Cell, biodiesel, Thermal Conversion, Environmental, Economic, Policy, and Energy Balance Issues)

Thursday, March 9, 2006

07:30 – 08:30

Breakfast Buffet

Session V: Biomass thermal conversion

Session Chairs: **Thomas Adams and Kevin Hicks**

08:30 – 09:10

Plenary Lecture: Dr. Thomas Adams, University of Georgia, USA
University of Georgia Integrated Biorefinery and Carbon Cycling Initiative

09:10 – 09:40

Jan Baeyens, University of Antwerp, Belgium
Operating parameters for the circulating fluidized bed (CFB) pyrolysis of biomass

09:40 – 10:10

Maria Costa-Ferreira, INETI, National Institute for Engineering, Technology and Innovation, Portugal
Conversion of lignocellulosics to biofuels – a Portuguese case study

10:10 – 10:30

Coffee Break

10:30 – 11:00

José Corella, University “Complutense,” Spain
Hydrogen production by biomass gasification with steam-O₂ mixtures followed by a steam reformer and co-shift catalytic beds

11:00 – 11:30

Cesar Augusto García U. Universidad de los Andes, Colombia
Brickfurnaces – Hoffman Type: Technical feasibility of incinerating municipal solid wastes (MSW)

11:30 – 12:00

Henry Liu, Freight Pipeline Company, USA
Biomass Logs: A densified fuel or feedstock for combustion, liquefaction or gasification

12:00 – 13:30

Lunch

13:30 – 15:30

ad hoc discussions/free time

Session VI: Environmental, Economic, Policy, and Energy Balance Issues

Session Chairs: **Kevin Hicks and Hosein Shapouri**

15:30 – 16:10

Plenary Lecture: Hosein Shapouri, USDA/Office of the Chief Economist, USA
Bioenergy production: economics, policies, and environmental considerations

Thursday, March 9, 2006 (continued)

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|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16:10 – 16:40 | Ana Cristina Oliveira , INETI-Departamento de Energias Renováveis, Portugal
Biofuels production in Portugal: An overview |
| 16:40 – 17:10 | Fausto Freire , ISEC, Coimbra Polytechnic Institute, Portugal
A comparative assessment of rapeseed oil and biodiesel (RME) to replace petroleum diesel use in transportation |
| 17:10 – 17:30 | Coffee Break |
| 17:30 – 18:00 | Gregory Bohlmann , SRI Consulting, USA
Biorefinery process economics |
| 18:00 – 18:30 | Farooq Latif , National Institute for Biotechnology and Genetic Engineering, Pakistan
Ethanol production studies from lignocellulosic biomass |
| 18:30 – 19:00 | Free Time |
| 19:00 – 21:00 | Conference Banquet |
| 21:00 – 22:00 | Social Hour |

Friday, March 10, 2006

07:30 – 08:30

Breakfast

Session VII: New Paradigms

Session Chairs: **David Johnston and Vijay Singh**

08:30 – 09:10

Vijay Singh, University of Illinois at Urbana-Champaign
Development of new corn for dry grind corn processing

09:10 -- 09:40

Michael A. Cotta, USDA, ARS, NCAUR, Peoria, IL
Development of forage crops as feedstocks for production of fuel ethanol

09:40 – 10:10

Kevin B. Hicks, USDA, ARS, ERRC, Wyndmoor, PA
Increasing yield of fuel ethanol from barley with β -glucanases and β -glucosidases

10:10 – 10:30

Coffee Break

10:30 – 11:00

Henry R. Bungay, Rensselaer Polytechnic Institute, USA
A biomass paradigm for the chemical industry

11:00 – 11:30

Andriy A. Sibirny, Institute of Cell Biology, NAS of Ukraine
***Hansenula polymorpha* as a new promising organism for high temperature alcoholic fermentation of lignocellulose sugars**

11:30 – 12:00

Final Announcements, Conference Concluding Remarks

12:00 – 13:30

Lunch and Adjournment

Poster Presentations

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POSTER SESSION I

Poster I.1	Production of ethanol from pre-treated maize silage in anaerobically digested and wet-oxidized manure	Piotr Oleskowicz-Popiel
Poster I.2	Gene shuffling to generate new high performance enzymes	Jean-Marie Sonet
Poster I.3	Kinetics study and simulations of lactose to ethanol fermentation using a recombinant <i>Saccharomyces cerevisiae</i>	José António Teixeira
Poster I.4	Successful expression of bacterial <i>xylA</i> genes encoding xylose isomerases from <i>Escherichia coli</i> and <i>Streptomyces coelicolor</i> , in the methylotrophic yeast <i>Hansenula polymorpha</i>	Andriy A. Sibirny
Poster I.5	Development of Forage Crops as Feedstocks for Production of Fuel Ethanol	Michael A. Cotta
Poster I.6	Study of Shear Effect on the Morphology and Enzyme Production of <i>Trichoderma reesei</i>	Nilesh Patel
Poster I.7	Determination of the Branching Ratio in the Starch of Ground Grain by Proton MAS NMR Spectroscopy	David S. Himmelsbach
Poster I.8	The current situation of fuel ethanol in China	Dehua Liu
Poster I.9	Research on Mix-Fermentation Biomass with Microorganisms to Produce manifold Sugars	Shu-lin Yang
Poster I.10	Production of ethanol from hydrol	Muhammad Arshad
Poster I.11	Optimization of culture conditions for minimizing byproduct formation in a Pakistani distillery	Muhammad Rashad
Poster I.12	Production of cellulases and ethanol from perennial grasses using cultures of <i>Trichoderma harzianum</i> E58 and <i>Saccharomyces cerevisiae</i>	Farooq Latif
Poster I.13	Enhanced production of ethanol by a depressed mutant of <i>Saccharomyces cerevisiae</i> in a semi-pilot scale process	Muhammad Ferhan
Poster I.14	Kinetics of ethanol production by a thermotolerant of <i>Saccharomyces cerevisiae</i>	Farman Ali Shah
Poster I.15	Direct bioconversion of brewers spent grain to ethanol	Charilaos Xiros
Poster I.16	Construction of a Recombinant D-Xylose utilizing <i>Saccharomyces cerevisiae</i>	Yefu Chen
Poster I.17	Expression of a Hyperthermophilic α -amylase Gene from the Archaeon <i>Pyrococcus furiosus</i> in Different Host Strains	Wei Shen

Poster Session II

Poster II.1	Biomass Energy Priority for Developing Nations	Henry R. Bungay
Poster II.2	Prediction of the environmental effect of increasing nitrogen by bioenergy production in East Asia	Junko Shindo
Poster II.3	Impacts of climate change to potential areas for energy crops: a case study of rice family crop	Katsuo Okamoto
Poster II.4	Environmental and socio-economic evaluation of the production of Bioethanol and Power Generation from forest waste	Joana Portugal
Poster II.5	Possibilities to increase the production and consumption of biofuels for reducing emissions causing climate change in Finland	Jyrki Tenhunen
Poster II.6	Sequestration of Carbon Dioxide with Simultaneous Production of Succinic Acid by Metabolically Engineered Escherichia coli	Mark A Eiteman
Poster II.7	Implications of Intensified Animal Based Agriculture in Washington State, USA	Alexandra Holland
Poster II.8	The model of biogas production in a small town of China	Wenquan Ruan
Poster II.9	Effect Of Sparger Design On The Hydrodynamics Of Anaerobic Digester Mixed By Gas Recirculation.	Rajneesh Varma
Poster II.10	Production of bioenergy and biochemicals from industrial and agricultural waste water	Lars Angenent
Poster II.11	Biological and bioelectrochemical hydrogen production from glycerol	Tatuso Yagishita
Poster II.12	Effect of temperature and microbial activity on passive separation of digested cow manure	Kaparaju, A. & Angelidaki, I.
Poster II.13	Esterification of used frying oils with a high content of free fatty acids using solid resins	Jorge M. Marchetti
Poster II.14	Homogeneous acid catalysts for biodiesel production by esterification	Rafael Thomaz P. Santos