

**A Symposium on Biofuels:
Measurements and Standards to Facilitate the Transition
to a Global Commodity**

**Cosponsored by the US National Institute of Standards and Technology,
and
Brazil's National Institute of Metrology, Standardization and
Industrial Quality**

ABSTRACTS

Abstracts

Biofuels Symposium Session 1 Biofuels: R&D Agenda I

USDA Biofuels and Biobased Products Research and Development Priorities

Ghassem Asrar, USDA, Agriculture Research Service, US Department of Agriculture, Beltsville, MD 20705-5140

Abstract: The U.S. Department of Agriculture has the research capacity and is well positioned to lead and partner with other U.S. Federal agencies such as the Departments of Commerce (DOC), Energy (DOE), Interior (DOI) and the Environmental Protection Agency (EPA), States and private sector to develop energy efficient, economical, sustainable, and socially acceptable technologies to make U.S. agriculture energy independent, and to be a major supplier of renewable energy for the Nation.

The goals of USDA Bioenergy and Bioproducts Research and Development are to:

- 1) Exploit the potential of molecular biology to improve quantity and quality of agricultural biomass feedstocks and to improve the effectiveness of conversion organisms.
- 2) Match the characteristics of biomass feedstock with the requirements of conversion organisms.
- 3) Improve efficiency and reduce costs for conversion of biomass and waste materials to energy/fuels.
- 4) Advance development of enzymes, microbes, chemical, biochemical and engineering processes required in production of bioenergy/fuels and co-products.
- 5) Develop on-farm energy/fuels generating systems powered by combination of renewable sources to reduce energy cost for agricultural operations.

USDA pursues an integrated system approach in conducting and sponsoring research, development, demonstration, and production of renewable energy/fuels. This research benefits from the

scientific, technical, and financial resources of four USDA Mission areas (i.e. Natural Resources and Environment; Research, Education and Economics; Marketing and Regulatory Programs; and Rural Development) and more than seven Agencies within the Department. This comprehensive internal network of experts also works closely with U.S. academic institutions, especially Land Grant universities, and the private sector to achieve the USDA vision/mission. The Department also greatly benefits from its international partnerships with Europe, Asian and Americas to achieve its goals.

Overview of DOE Activities in Biofuels

Neil Rossmeyssl, US DOE, Efficiency and Renewable Energy, 1000 Independence Avenue SW, Washington, DC

Abstract: During the 2006 State of the Union Address, the President announced the Advanced Energy Initiative (AEI) aimed at reducing US dependence on foreign sources of energy. Biofuels was named as part of the renewable energy portfolio and provided funding to accelerate research into "cellulosic ethanol" to make it cost-competitive by 2012, offering the potential to displace up to 20% of the Nation's current fuel use within ten years. DOE and USDA led a series of Workshops, during which representatives from all Federal agencies involved in biomass-related work came together to identify areas of overlap or gaps in their work. This interagency group has been working to develop a strategy for meeting the goals of the Biofuels Initiative. This presentation will describe the research agenda proposed in this strategy.

Overview of EU Activities in Biofuels

Kyriakos Maniatis, EU Directorate General Energy and Transport, Brussels, 1049, Belgium

Abstract: The European Commission's Directorate-General Energy and Transport is responsible for both the transport and energy

policies of the EU, both of which are at the heart of European policies and have a considerable impact on the everyday life of citizens. To a very large extent, Bioenergy can address the issue of fossil fuel replacement, and as such has become a common term in international and national policy discussions. The EU provides a framework for biofuels research through its current 7th framework programme for research and on policy issues through the Biomass Action Plan. The EU promotes the use of biofuels as an alternative energy source for transport, and the EC proposed in its 2007 "Energy Package" to step up its efforts and proposed a mandatory target of 10% by 2020. Both policy issues and the R&D framework will be addressed in this presentation.

Renewable Fuels: Challenges, Technology Development and the Brazilian Experience

Silmara Wolkan, PETROBRAS – CENPES Rua Horacio Macedo, 950, Rio de Janeiro, Brazil

Abstract: Petrobras is a Brazilian oil company headquartered in Rio de Janeiro, Brazil. Its research and development center, known as CENPES, houses Brazil's Renewable Energy Technology Program. This program includes research into biomass, as well as biofuels (both alcohol and biodiesel). Brazil is investing approximately 70% of its renewable energy investments into biofuels. Petrobras is listed in the Dow Jones Global Sustainability Index (DJSI), the leading international index used as an analysis parameter by socially and environmentally responsible investors.

Biofuels Symposium Session 2 Biofuels: R&D Agenda II

International Activities on Biofuels

Greg Manuel (Department of State) and **Jonathan Shrier** (National Security Council), US

Abstract: In his 2007 State of the Union Address, President Bush announced his plan to reduce US dependence on foreign oil which has created economic and safety vulnerability. It was proposed that homegrown sources of energy insulate us from spikes in oil prices while providing national, economic and environmental security. An MOU between US and Brazil was signed March 9, 2007 that indicates that we will work together to expand the use of biofuels worldwide. This MOU also calls for working with the EU, and other countries. The UN's International Biofuels Forum (IBF) was announced on March 2. The focus is to move toward more compatible international standards to aid the commoditization of biofuels.

EPA Perspective on Biofuels

Karl Simon, US EPA, Compliance and Innovative Strategies Division, 1310 L St. NW, Washington, DC.

Abstract: Karl Simon will discuss the Environmental Protection Agency's recent actions regarding biofuels, including the development of the Renewable Fuels Standard as well as actions being considered in response to the April, 2007 Supreme Court greenhouse gas decision and the related May, 2007 Executive Order.

Biofuels Brazilian Regulation - Focus on Quality

Rosângela Moreira, ANP (Agência Nacional de Petróleo), Brazil

Abstract: As the regulatory body for fuels, the Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP) defines the structure of the commercial chain and also specifies fuel quality.

The presentation will show the way ANP strives to enable the expansion of the biofuels sector through discussions with fuel producers, suppliers and engine manufacturers focusing on society's needs relative to environmental and consumer interests, as well as the economic situation of Brazil. In

addition, the ANP's viewpoint will be presented with regard to the build-up of international specifications in order to make biofuels more sustainable commodities.

Specification and Production Technologies of Bio-Fuels in Japan

Kinya Sakanishi, Biomass Technology Research Center, AIST, Japan

Abstract: Japanese regulation and specification of biofuel-containing gasoline and diesel fuels are briefly reviewed from the viewpoints of vehicle safety and environmental protection. In terms of blending ethanol to gasoline, E3 was enforced at 2003, and the discussion on E10 for gasoline has been started. Fuel specification of diesel containing FAME in Japan was regulated to 5% blending of FAME with its quality and specification.

Production technologies of second generation biofuels from lignocellulosic biomass such as agricultural and woody wastes are also reviewed in terms of bioethanol fermentation from woody biomass through non-acidic mechanochemical and/or hydrothermal refining pretreatments in combination with enzymatic saccharification, and BTL(biomass to liquids) diesel production by clean gasification, F-T synthesis and catalytic upgrading reactions. We focus on feasible utilization technologies of woody biomass resources because their amounts are abundant in Japan and Asian countries, and the woody biomass resources not only contribute to the substitution of fossil fuels such as coal and crude oil, but also considerably reduce the CO₂ emission due to their carbon neutrality and deliberate plantation for their sustainable utilization.

Sugar Cane Bagasse and Harvesting Trash conversion to Bio-ethanol in an existing Distillery: a more efficient use of cane biomass

Carlos Eduardo Vaz Rossell, UNICAMP (Universidade de Campinas), Caixa Postal 6192 – CEP 13084-971, Campinas, Brazil

Abstract: Bio-ethanol production from sugar cane total reducing sugars has been proved as an efficient process of biomass conversion; energy balance is better compared to other crops as well as carbon dioxide sequestering.

A typical distillery unit daily mills 12000 metric tons of cane, rendering 1000 000 liters of ethanol, an efficient energy production system could generate an excess of cellulose biomass which can be converted by hydrolysis to a reducing sugar liquor able to be fermented to ethanol. Trash resultant from harvesting of cane that nowadays are burned or left on fields can be collected, transported to the cane processing mill and burned at boilers for energy production or converted to ethanol. Clean cane stalk contains near 14% of lignin cellulose material on dry basis, trash left on crops after harvesting accounts for an extra 14% cellulose materials which can be harvested cleaned and used for fuel purposes or biomass refining. It is forecasted that 50% of all the trash (apex, green and dry leaves) can be recovered. A new generation of ethanol distilleries designed for an efficient use of energy can render a large excess of biomass for biorefining. In this new scenario hydrolysis processing of biomass can be integrated to ethanol production from cane sugar. Biomass from sugar cane can be obtained at lower cost, compared with other agricultural or forest sources. It is shown that that an introductory hydrolysis technology can increase ethanol production approximately in 15 %. An optimized process converting hexoses as well as pentoses coming from the cellulose-hemi cellulose-lignin biomass source can extend ethanol production to near 41%. Routes for bagasse conversion to ethanol are discussed.

The Biodiesel Industry: technology and infrastructure issues

Russell Teall, Biodiesel Industries, Inc, 435 1/2 El Sueno Road, Santa Barbara, CA

Abstract: Biodiesel Industries is a US based company that has invested the time and resources necessary to complete the largest network of biodiesel production facilities in the United States. Efficiency and quality control are emphasized in Biodiesel Industries' standard Modular Production Unit (MPU) which is capable of producing up to 3,000,000 gallons of biodiesel annually.

Biofuels Symposium Session 3 Standards Needs: Stakeholder Perspectives

International Fuel Quality Developments

Liisa Kiuru, International Fuel Quality Center
Hart Energy Consulting, 1616 S. Voss, Suite 1000,
Houston, TX

Abstract: *International Fuel Quality Center (IFQC)* is recognized as the most extensive and comprehensive source of information on the dynamic worldwide fuels industry available today. Our new expanded and specialized *Global Biofuels* service, established in December 2004, brings timely, accurate data about critical global renewable transport fuel developments to our *Global Biofuels Center* members: global usage of Biofuels as transportation fuels; dedicated and flexi-fuel *vehicles* and emissions; detailed Country Reports on *policies* and *taxation*, *quality specifications* and *regulations*, *production facilities* and *technologies*, *climate change*, etc. Today, *Global Biofuels Center* members are serviced by dedicated professional staff located around the globe in Bahrain, Brussels, Houston, North Dakota, Mexico City, UK, Washington, and Singapore.

Opportunities and Obstacles for Ethanol Infrastructure Development in the US

Bob Dinneen (invited), Renewable Fuels
Association, One Massachusetts Avenue, NW,
Washington, DC

Abstract: As the national trade association for the U.S. ethanol industry, the Renewable Fuels Association promotes policies, regulations and research and development initiatives that will lead to the increased production and use of fuel ethanol. Ethanol is sold nationwide as a high-octane fuel that delivers improved vehicle performance while

reducing emissions and improving air quality. By reducing fuel imports, ethanol reduces our nation's trade imbalance, improves our energy security, creates American jobs and provides value-added markets for American agriculture. In the midst of record growth, the ethanol industry will continue to play a larger role in helping to meet our nation's fuel needs.

Biofuel Quality Needs for Automakers

Ellen Shapiro, Alliance of Automobile
Manufacturers, 1401 Eye St., NW, Washington,
DC

Abstract: The Alliance of Automobile Manufacturers is a trade association representing nine car and light truck manufacturers selling vehicles in the United States. Formed in 1999, the Alliance serves as a leading advocacy group for the automobile industry on a range of public policy issues. On behalf of the Alliance, Ellen Shapiro will explain the importance of biofuels to automakers and the need to ensure good fuel quality to minimize vehicle emissions and optimize vehicle performance and fuel economy. She will review some of the automakers' specific concerns related to biofuels and how the industry is helping to address these issues.

Impact of Biofuels on Gasoline and Distillate Product Quality

David Blatnik, Marathon Ashland Petroleum,
LLC, St Paul, MN

Abstract: Marathon Petroleum Company is a highly efficient, cost-effective and competitive refining, marketing and transportation company, commanding approximately \$8 billion in assets. With a complementary network of operations stretching across 21 states, it is positioned to respond to market changes and challenges; enhance supply options and product choice for its customers; and create value for its stakeholders. MPC's industry rankings point to its strengths. Building on these strengths, finding new efficiencies and new interrelationships are the logic and the theme of this exciting company. Business is conducted in accord with the highest standards

of environmental stewardship, safety, community responsibility and business ethics.

Increasing Biofuel Utilization while Meeting the Needs of the Marketplace

Chuck Corr, Archer Daniels Midland Company, 4666 Faries Parkway, Decatur, IL

Abstract: Production and utilization of biofuels are increasing in many markets. Biofuels represent only one part of the overall transportation energy picture. It is important to ensure that all of the parts fit together to meet the needs of the local market.

Biofuels Symposium Session 4 Needs for New Reference Materials and Test Methods

Standards and Codes Needs for Expanded Use of Biofuels

Neil Rossmeissl, US DOE, Efficiency and Renewable Energy, 1000 Independence Avenue SW, Washington, DC

Abstract: In his State-of-the-Union address, the President outlined an aggressive plan to reduce gasoline use by 20 percent in 10 years. This initiative has two critical components, reduce the cost of biofuels production from cellulosic feedstocks by 2012 and reduce investor risk for these cellulosic biorefineries.

A very aggressive integrated government and private sector effort will be required to achieve this objective. This includes the required efforts in: feedstock development, biochemical and thermochemical conversion technology development, distribution and use infrastructure development and finally the necessary policy and financial incentives to the private sector to enable this vision.

The construction and initial start-up activities associated with any building project involves a certain degree of inherent risk for all stakeholders.

The development and scale-up of new biomass refinery technologies may present process guarantee, insurance compliance, and permitting risks that could result in the canceling of the project, significant delays and/or higher costs. In many cases, the risks and their associated costs are a function of the barriers and the uncertainty among the various stakeholders to address them during the engineering and project development phase.

The Department of Energy in partnership with the Department of Agriculture, Environmental Protection Agency, Department of Commerce, and Department of Transportation has worked with the biomass industry over the last year to identify key barriers that could derail the President's 20 in10 initiative. The results of these meetings and the proposed activities will be presented.

Market Specification and Bio-ethanol Fuel Quality – a point of view

Jose Félix da Silva, Copersucar, Avenida Paulista, 287, 1º, 2º e 3º andares, Sao Paulo, Brazil (International Ethanol Association, Union of Sugar Cane Industry)

Abstract: The use of a bioethanol/gasoline blend as a fuel is expanding world-wide. In order for it to be an international commodity, the quality specification must be uniform. This is particularly critical to facilitate trade as bioethanol blends increasingly enter the international market. Brazil's decades long experience is well-known, and during this time we have addressed issues raised by automotive industry (the primary biofuel user) with regard to corrosion, blockages, deposits, and so on. This paper compares the three main specifications used today - Brazil, ASTM and European draft – and proposes a specification for undenatured anhydrous ethanol that could be adequate for end use. In addition, methods of analyses along with their reported units must be uniform for the results to be comparable and understandable by the entire supply chain (producer-supplier-buyer). The average quality of bioethanol as produced in some mills in Brazil will also be presented.

European Bioethanol Standards and Regulations

Jacco Woldendorp, Shell Global Solutions International B.V., Amsterdam, The Netherlands (CEN)

Abstract: A task force of experts has been assembled under the guidance of CEN TC19/WG 21 (gasoline specification) to draft an EN specification for anhydrous ethanol as a blending component in European lead-free gasoline conforming to the standard EN 228. This activity was undertaken in response to a mandate to CEN from the Commission of the European Union in support of its policy to promote renewable fuels. CEN/TC19 decided to launch the formal vote on prEN 15376.

prEN 15376 comprises a set of properties and limit values to define an adequate quality of automotive ethanol for blending in gasoline at up to and including 5%, an advice on suitable denaturants if required, and recommendations for precautions to be taken. It should be noted that the standard has been considered for a 5% by volume blend of ethanol in gasoline, and the limit values of the properties are chosen for this percentage. An eventual increase in the proportion of ethanol blended will require a revision and readjustment of certain properties of the ethanol.

The European Commission has indicated recently (Jan. 2007) its intention to create a gasoline grade containing 10% maximum ethanol content in EN 228 gasoline, and this will require an adaptation of the ethanol draft standard. The experts of the Ethanol Task Force have already begun to examine prEN 15376 with a view to adapting it to this new fuel grade, in anticipation of a mandate from the Commission to CEN. The approach of the ETF is to define a single grade of ethanol that may be used safely as a blend component at all percentage levels with gasoline.

Bioethanol Standards and Regulations in the US

Ben Bonazza, TI Automotive Systems, 326 Green Street, Caro, MI (ASTM)

Abstract: Ben Bonazza serves at the first vice chair of ASTM International Committee D02 on Petroleum Products and Lubricants. ASTM International Committee D02 on Petroleum Products and Lubricants and Subcommittee

D02.A0 on Gasoline and Oxygenated Fuels have established several standards governing the use of ethanol and ethanol blended fuels; these include ASTM D 4806 (Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel), ASTM D 4814 (Specification for Automotive Spark-Ignition Engine Fuel), and ASTM D 5798 (Specification for Fuel Ethanol (Ed75-Ed85) for Automotive Spark-Ignition Engines); they have also published a research report on reformulated gasoline (ASTM Research Report D02:1347) which provides information on the requirements of reformulated gasoline for ground vehicles equipped with the spark-ignition engines that are required by federal and state reformulated gasoline programs.

European Biodiesel Standards and Regulations

Barry Cahill, PSA Peugeot Citroën, 18 rue des Fauvelles, 92250 La Garenne Colombes (CEN)

Abstract: Barry Cahill serves as convenor of two CEN Task Forces: one on ethanol and one on biodiesel. Biofuels have a positive environmental impact – they reduce exhaust pollutants as well as CO₂ emissions. EU policy calls for 10% bioenergy by 2020. To implement this policy standards and regulations have been established. Fuel specifications are established by three methods. The first is by EU Directive that is obligatory to EU member states- parameters and limits are those that influence the environment. The second is by CEN standards, which are drawn up by industry experts. The third are national standards that apply in special cases, such as France allows B30 for captive fleets. Next steps for biodiesel include: creating a new diesel fuel standards to permit B10 and a review of EN14214 biodiesel standard to allow a wider feedstock base.

Biodiesel Standards and Regulations in the US

Steve Howell, National Biodiesel Board, 3337a Emerald Lane, Jefferson City, MO (ASTM)

Abstract: Steve Howell serves as the chair of ASTM's Biodiesel task force. ASTM recently

released a new standard for biodiesel that supports biodiesel blends up to 20%, and will be compatible with future diesel exhaust technology. The biodiesel industry works with engine makers and exhaust after-treatment companies to ensure that high quality fuels specifications exist, that can adapt to important changes in diesel technology. The ASTM D6751 now includes an important stability specification for B100 biodiesel.

Report of the APEC Biofuels Task Force: Initial Findings and Next Steps Forward

Jeffrey Skeer, US Department of Energy, 1000 Independence Avenue SW, Washington DC

Abstract: The APEC Biofuels Task Force reported its initial findings to the Eighth APEC Energy Ministers Meeting (EMM-8) in Darwin, Australia on May 29, 2007. Among the key findings are that biofuels from a wide variety of crops are cost-effective, that biofuels can lower greenhouse gas emissions, and that biofuels have the potential to displace a significant share of petroleum use over time. Going forward, APEC has efforts underway to undertake more detailed assessments of biofuel resources and to help define the basis for standards that are needed to underpin biofuels trade. This presentation by the chair of the APEC Biofuels Task Force will detail its findings and plans going forward.

Biofuels Symposium Session 5 Reference Materials and Test Methods: Current Activities and Plans

The Brazilian Program for Metrology and Certification of Biofuels

João Jornada, Instituto Nacional de Metrologia, Normalização e Qualidade Industrial, Rua Santa Alexandrina 416 - 10º andar - Rio Comprido, Rio de Janeiro, 20261-232, Brazil

Abstract: INMETRO is a regulatory agency, responsible for scientific and industrial metrology,

legal metrology, assessment, national accreditation and Brazil's body for technical collaboration. Its strategies as Brazil's NMI include building a strong science and technology base, producing and certifying relevant CRMs, provide a network for its industry that include secondary laboratory producers, disseminating knowledge, and establishing strong international partnerships and mutual recognition, to support Brazilian Government policies. INMETRO has convened two relevant panels: alcohol fuel (Oct 2003), Biodiesel (Nov 2005), and has planned a panel on S&T strategies for Biofuels (Oct 2006). These panels engaged the S&T community and the government, and identified metrological needs for the continued development of biofuels as a commodity and agreed on the need for standardization. INMETRO has recently released an Ethanol fuel Certified Reference Material, the first (and only) ethanol fuel standard in the world. Parameters certified include: water content, acidity, pH, conductivity, density, copper content, and alcohol content. INMETRO has both developed new methods and used existing methods such as ASTM D8423 and ABNT (Brazilian Association for Technical Standards Organization) NBR 10891. INMETRO researchers have also been studying the effects of biodiesel fuels on engine parts. Under controlled temperatures and for periods up to 6000 h, engine parts are exposed the biodiesel fuel to detect surface changes in the material. In addition a Motors and Fuels Laboratory has been designed to evaluate emissions, power output, energy consumption and wear of biodiesel engines over time.

R&D Needs in the Biofuels Area from a European Metrology Perspective

Ed deLeer, NMI Van Swinden Laboratorium B.V. Thijsseweg 11, P.O. Box 654, NL-2600 AR Delft, Netherlands (EURAMET)

Abstract: EURAMET will develop and execute *The European Metrology Research Programme* (EMRP). The EMRP is a partnership among 16 EU Member states, along with Norway, Switzerland and Turkey. It aims to join relevant European national programmes and activities to accelerate the development of vital research capabilities. **Grand challenges** comprise multidisciplinary metrology research needed to meet key socio-economic objectives in the fields of **health**,

energy, environment, and new technologies. One of the current challenges is to explore the different solutions for transforming the current fossil fuel energy system into more sustainable ones based on a wide range of renewable energy sources. This challenge for new sources of energy addresses new technologies as well as energy efficiency, security of supply, climate change (highly connected with environment and climate changes) and EU competitiveness.

The Biofuels Initiative in South Africa

Sara Prins* and Wynand Louw, National Metrology Institute of South Africa, Private Bag X34, Lynnwood Ridge, 0040, South Africa

Abstract: The draft South African Biofuels Industrial Strategy was published by the Department of Mineral and Energy in December 2006. The biofuels drive is well underway with significant investment in at least five projects for the production of fuel-grade ethanol initiated under the Industrial Development Corporation. With proposed fuel levy incentives for bioethanol and biodiesel of up to 40%, and up to 100% for small producers (< 300 m³ annually) investment into this market is expected to grow exponentially over the next few years.

The existing oil industry is regulated, and already facilitates guidelines to accommodate biofuels, but the regulations and standards have to be further refined to ensure compliance of biofuels from all different sources (sugarcane, maize, sunflowers, granola). Testing methods have to be developed to allow specially the smaller producers access to affordable methods to ensure compliance to the regulations.

The NMISA is liaising closely with the South African Bureau of Standards (SABS) to ensure that proper test methods are in place and accessible to all to meet the requirements of the South African and international biofuel standards.

US Reference Materials for Biofuels

Steve Wise, National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD

Abstract: For over four decades the National Institute of Standards and Technology (NIST) has provided reference materials for fossil fuel

matrices including residual fuel oil, diesel fuel, kerosene, gasoline, and coals. The first materials were residual fuel oils certified for sulfur content, and sulfur is still a primary focus in many of these fuel-related SRMs. With increasing production and use of biofuels, both biodiesel and bioethanol, NIST has initiated efforts to develop reference materials to support accurate measurements of the chemical composition of these biofuels. NIST is currently developing two biodiesel matrix SRMs, a soy-based and an animal-based biodiesel material. The proposed materials will be certified for the key chemical constituents and parameters specified in ASTM 6751. The need for calibration solution SRMs containing the appropriate fatty acid methyl esters related to biofuels has also been expressed through ASTM, and the development of these calibration solution SRMs are planned in the coming year. To support bioethanol measurements, NIST currently has a suite of ethanol in gasoline SRMs that were developed in the late 1980s and early 1990s and a 95% ethanol-water solution SRM developed for forensic needs. These SRMs will be evaluated and redesigned to meet future reference material needs for bioethanol production and use including characterization for important constituents and parameters other than ethanol content. The current activities and plans for reference materials development at NIST to support chemical measurements associated with biofuels will be discussed.

Methods of Analysis for Biodiesel Feedstocks

Gina Clepper, American Oil Chemists' Society, 2710 S. Boulder, Urbana, IL

Abstract: AOCS mission is to be a global forum to promote the exchange of ideas, information, and experience, to enhance personal excellence, and to provide high standards of quality among those with a professional interest in the science and technology of fats, oils, surfactants, and related materials. AOCS has several products that focus on available biodiesel standards, quality of biodiesel feedstocks, including cleanliness, purity, water content, acidity, sulfur, phosphorous, and oxidative stability.

Biofuels: Transforming a Product into a Commodity - building a bridge for the transition

Romeu Daroda, Instituto Nacional de Metrologia, Normalização e Qualidade Industrial, Rua Santa Alexandrina 416 - 10º andar - Rio Comprido, Rio de Janeiro, 20261-232, Brazil

Abstract: It is very complex to change a world that is extremely dependent on petroleum as a source of energy, to a non-petroleum source. However, environmental pressures as well as the fact that petroleum is a finite resource, is forcing the introduction of a new fuel, a renewable fuel. The introduction of a new product/fuel traded worldwide requires evaluations and decisions on quality parameters that can affect its performance. Trade will require mutual understanding of quality specifications, and analysis methods. The consensus on decisions will build a bridge for the transition from a product sold regionally to a worldwide commodity.

Fast Biodiesel Typification and Quality Control by Direct Infusion Electrospray Ionization Mass Spectrometry Fingerprinting

Marcos Eberlin, INMETRO-UNICAMP (Universidade de Campinas), Brazil

Abstract: Direct infusion electrospray ionization mass spectrometry of aqueous/methanolic extracts is shown to permit simple and very fast fingerprinting typification of biodiesel samples. In addition, it also allows the identification of the alcohol used in the transesterification process and the monitoring of degradation and the screening of residual glycerol and mono, di, and tri-glycerides.

Corrosion Control on Biofuels – the Brazilian Experience

Eduardo Cavalcanti, Instituto Nacional de Tecnologia, Corrosion and Degradation Division Av. Venezuela, Rio de Janeiro, Brazil

Abstract: The key issues concerning the corrosion behavior and compatibility of metallic and non-

metallic materials and components in contact with ethanol and biodiesel are presented. How the Brazilian production and distribution sectors, end-users markets, R&D and standardization communities jointly tackled and solved these problems at the early stages of the National Brazilian Ethanol Programme and at present days are also discussed. The recently introduction of biodiesel in the Brazilian market and the growing production of biodiesel derived from multiple grease raw materials has raised several questions on quality control, stability, storage, materials compatibility and corrosion related problems. The ways that governmental science & technology laboratories, standardization and regulation agencies and private companies are addressing these problems are described. The present Brazilian biodiesel key research, standardization and test methods issues concerning materials performance, corrosion mitigation and degradation control are also discussed.

Biofuels Impact on the Commercial Infrastructure

Carol Hockert, National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD

Abstract: The US infrastructure for transportation fuels relies heavily on the self policing of the well-established petroleum industry in assuring the quality of fuel. There are no federal laws in place to address fuel quality, and many of the states have limited or no fuel quality enforcement programs. The introduction of biofuels and biofuel blends into this infrastructure highlights a gap in the current system that needs to be addressed to avoid unforeseen problems for industry and consumers. Possible solutions to this gap include: required minimum quality standards for fuels, including biofuels; required accreditation of fuel quality testing laboratories; and the development of guidelines and procedures that promote consistent state enforcement of fuel quality.

Biofuels Symposium Session 6 Biofuels: Measurements and Standards – Next Steps

Building Biofuels Infrastructure – A Workshop Summary

Shannon Fraser* and Sam Beatty, Office of Energy and Environmental Industries, Department of Commerce, International Trade Administration 14th & Constitution Ave, NW, Washington DC

Abstract: Highlights and Outcomes of ITA's June 19 Building Biofuels Infrastructure Event: On June 19, the International Trade Administration hosted a one-day event to provide biofuels-related industry members with information on USG programs that are advancing biofuels developments, both domestically and internationally. The afternoon session of the event highlighted the challenges that U.S. biofuels industry is encountering as biofuels developments are expanding in the U.S. The forum serves as an initial step in identifying both the challenges and solutions to advancing U.S. biofuels infrastructure.

Cooperation in Development of Biofuels Standards and Related Infrastructure

Fran Schrotter, American National Standards Institute, 25 West 43rd Street, New York, NY

Abstract The successful rollout of alternative energy resources depends upon a reliable and broad set of standards and related compliance programs.

Frances Schrotter, senior vice president and COO of the American National Standards Institute (ANSI), will explain how the Institute is cooperating with stakeholders in the domestic and international arenas to develop standards-based solutions that will support the widespread commoditization of biofuels.

She will introduce the newly formed ANSI Biofuels Standards Panel (ANSI-BSP), a cross-sector coordinating body that brings stakeholders together to identify existing and needed standards and the organizations that develop them. The panel is working with a wide range of organizations to coordinate, catalog, accelerate and promote the creation of the appropriate deliverables while mitigating duplication and overlap.

Coordination with regional and international standards setting bodies is also being managed through existing and new bilateral and multilateral initiatives. As an example, Ms. Schrotter will provide an update on a partnership between ANSI and ABNT, the national standards body for Brazil, to introduce a biofuels activity within the International Organization for Standardization (ISO).

Measurement and Standards Needs for an Advanced Biofuels Economy

Willie May, National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD

Abstract: The transition to biofuels as a global commodity requires active communication among producers and users of biofuels, as well as Standards Developing Organizations and National Metrology Institutes worldwide. Dr May will summarize the stakeholder comments, concerns and needs as presented in the symposium with a focus on the measurement and standards needs, and proposed next steps.

Biofuels Symposium Session 7 Biofuels: Technical Working Group Follow on Meetings

Session to discuss bioethanol and biodiesel standards (US/EU/Brazil and others), and to define an agreed upon framework or path to move forward.