



# Newsletter

Number 6: May, 2003

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## FROM THE TASK LEADER

*Don Stevens*

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It is with regret and deep sorrow that I must announce the passing of Dr. Raymond Costello, the Operating Agent for Task 39, last April after a lengthy battle with cancer. Ray was an avid advocate for the IEA in the Department of Energy and will be sorely missed. The following obituary is supplied by the IEA Bioenergy Secretary and reprinted from IEA Bioenergy News, Volume 15(1)

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## OBITUARY – DR RAYMOND COSTELLO

A native of New York, Ray grew up in the Bronx attending Aviation High School. He graduated from the University of Connecticut, where he received a doctorate in environmental engineering. He worked for Boeing Aerospace for a short period and then served in the Marine Corps during the Vietnam War.

In 1979 he settled in the Washington area and worked briefly for Combustion Engineering, a consulting firm before joining the US Department of Energy. From the early 1980's he was a leader for technology development in the Biomass Fuels and Power programmes and as part of his brief was the Member for USA on the IEA Bioenergy Executive Committee. He was particularly enthusiastic about his role in IEA Bioenergy and did an excellent job in representing the interests of USA.

Ray attended his first ExCo meeting (ExCo18) in Vienna in October 1986. He was Vice Chairman for three years from 1991 to 1993 and then Chairman from 1994 to 1996. He also served on a number of IEA Bioenergy strategic planning committees. In total he attended 26 ExCo meetings, the most recent being ExCo50 in Helsinki.

Ray did much more than represent US interests in the Agreement. He had a truly global perspective of the energy problem and believed strongly in the value of global cooperation. An example of his ability to see the big picture was his proposal to join European and American Biomass Conferences for a "world millennium conference" in 2000. The idea was taken up enthusiastically but it still took some lobbying to get the high level commitments necessary for the very successful "First World Conference on Biomass for Energy" in Seville, attended by more than 1000 participants from 61 countries.

He was able to use his experience as a long serving Member of the Committee and ex-Chairman, to act as a sounding board when Members wanted to test ideas or resolve a critical situation. He would frequently and effectively work behind the scene to achieve progress. He was always strongly focused on industrial application and deployment from the international RD&D collaboration. His positive attitude and sense of humour were widely recognised. Most of all Ray was a dear friend and colleague to his international network and will be sorely missed.

Ray died of cancer at Inova Fairfax Hospital on 24 April 2003. He was buried with full military honours in Arlington National Cemetery, Washington DC on Tuesday, 13 May. He is survived by his son, mother and two sisters.

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## TASK 39 CONTINUANCE

We are planning to continue the work associated with Task 39 into the next triennium and have tabled a proposal at the last Executive Committee meeting in Sydney, Australia (April ?). There was some discussion on this topic at the recent business meeting in Breckenridge, Colorado in early May. Over the next few months the various country representatives in the current Task will be contacted and asked

for their support or suggestions for changes that would allow them to support the proposal. We will also be seeking support from countries that are not in the current Task but that shown interest in its activities such as Australia and Japan.

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## WORLD EVENTS/INFORMATION

### Promotion of the Use of Biofuels

[http://www.europa.eu.int/eur-lex/en/dat/2003/1\\_173/1\\_12320030517en00420046.pdf](http://www.europa.eu.int/eur-lex/en/dat/2003/1_173/1_12320030517en00420046.pdf)

### Changes to EC Directive relating to the quality of petrol and diesel fuels

[http://www.europa.eu.int/eur-lex/en/dat/2003/1\\_076/1\\_07620030322en00100019.pdf](http://www.europa.eu.int/eur-lex/en/dat/2003/1_076/1_07620030322en00100019.pdf)

### The strategic cost of energy supply from near East

<http://195.54.160.191/NewsDetail.asp?Page=1&NewsID=12>

### Congressional Update March 2003 - American Bioenergy Association

<http://www.biomass.org/alerts.html>

### Michigan: Biodiesel Bill Now Law

<http://biobased.org/list2.php?storyid=4141>

### Washington DC: Senate Energy Committee Passes Crucial Biodiesel Amendment

<http://biobased.org/list2.php?storyid=4135>

### Colorado: Breckenridge Biodiesel Tests Set a Precedent

<http://biobased.org/list2.php?storyid=4096>

### U.S ethanol industry produces all-time monthly record in April

<http://www.ethanolrfa.org/pr030521.html>

### Iogen doubles Ecoethanol Capacity

[http://www.iogen.ca/news/28\\_03\\_2003.html](http://www.iogen.ca/news/28_03_2003.html)

### Manitoba to make Ethanol-blend Gasoline Mandatory

<http://www.planetark.org/dailynewsstory.cfm/newsid/20600/story.htm>

### World oil demand to jump 50 pct by 2025 - US government

<http://www.planetark.org/dailynewsstory.cfm/newsid/20667/story.htm>

### EU assembly urges more biofuels in road transport

<http://www.planetark.org/dailynewsstory.cfm?newsid=20134&newsdate=13-Mar-2003>

### US Senate panel OKs energy tax credits, incentives

<http://www.planetark.org/dailynewsstory.cfm?newsid=20370&newsdate=04-Apr-2003>

### USDA to Publish Final CCC Bioenergy Program Rules for FY2003

<http://www.ethanolrfa.org/pr030505.html>

### Global green energy 'roadmap'

[http://www.wbgu.de/wbgu\\_jg2002\\_presse\\_engl.html](http://www.wbgu.de/wbgu_jg2002_presse_engl.html)

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## BIODIESEL SUBTASK

*Manfred Wörgetter*

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I am publishing a newsletter on Renewable Raw Materials for the Austrian Ministry. The language is mostly in German, but the web links on page 15 may be of interest. Contributions in English can be found on pages 6, 10 and 28. [http://www.blt.bmlfuw.gv.at/bio\\_nawa/vero/mnawa/mnawa.htm](http://www.blt.bmlfuw.gv.at/bio_nawa/vero/mnawa/mnawa.htm)

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### European Biodiesel Board

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<http://www.ebb-eu.org>

Brussels, 7/05/2003

### EBB POSITION PAPER ON CAP MID-TERM REVIEW PROPOSALS FOR NON-FOOD AND ENERGY CROPS

Generally speaking, EBB acknowledges the efforts made by the European Commission in its Mid-Term Review proposals in order to increase the competitiveness of EU agriculture. With respect to non-food crops, EBB wish to remind that two major Directives detailing **an overall EU strategy in favour of the development of biofuels will be approved shortly**. This EU strategy has set two ambitious targets of market penetration for biofuels of 2% in 2005, and of 5.75% by 2010.

This implies that the EU production of biofuels shall increase in the forthcoming years.

Today EU biofuels production amounts to almost 1,5 million tonnes – of which biodiesel represents around 75%. This is less than 0,4% of the market of conventional fuels. By 2005 biofuels production should rise to more than 6 million tonnes in order to meet the 2% target: this means that **at least an additional 4 million hectares of non-food and energy crops surfaces are needed in order to fulfil the first 2% biofuels target for 2005**. Obviously the additional non-food surfaces that will be required in order to comply with the 5,75% target for 2010 are much higher.

In this frame, and for the sake of coherence, a new reform of the CAP can only but aim at increasing at least by 4

millions hectares the availability of non-food crops and more specifically of non-food oilseeds for biodiesel production. Now, contrary to that, the Mid-Term Review proposals issued by the Commission on non-food energy crops would clearly have a negative impact on the availability of non-food raw materials, especially on future availability of rapeseed for biodiesel production.

In such perspective the EBB wishes to express its deep concern about the proposals tabled by the Commission on January 2003. More specifically EBB strongly recommends EU authorities to:

- **reject the proposed 10% rate of long term environmental set-aside** in which no energy crops could be grown. Such a measure, in fact, would dramatically reduce the overall surfaces available for both non-food and food oilseeds crops, thus hampering the development of the EU biodiesel and oilseeds sector.
- **maintain the principle of a non-food regime on set-aside land.** However a revision of the actual non-food set-aside system should be undertaken in order to create a new system in which the Blair House limit on oilseeds grown on set-aside land would not anymore be applicable.
- **introduce the possibility of increasing the proposed 45 €/ha carbon credits aid to a higher level of aid, depending on future market requirements.** Considering actual oilseeds average yields the proposed 45 €/ha aid would only represent no more than a 18 €/tonne aid: this would mainly cover management and bureaucracy costs related to the aid. Within the next three years it might be necessary to increase such a premium in the proportion necessary to maintain a real incentive for growing energy crops.
- **progressively extend the 45 €/ha carbon credits aid for energy crops from a maximum of 1,5 million hectares up to a maximum surface of at least 3 million ha by the end of 2005.** A lower surface in fact would not represent a valuable support scheme to approach the 4 million additional hectares needed within the EU biofuels strategy. Although the carbon credits scheme may represent a new interesting tool for supporting energy crops, such scheme should not be seen as a replacement of the actual set-aside regime, but rather as a complementary support for non-food crops. Already today, in fact, set-aside areas are largely insufficient to provide even the sole bio-

diesel industry with an appropriate supply of raw materials.

As a conclusion it is worth highlighting that the guarantee of a stable supply of agricultural raw materials represents a crucial issue for both the future of the EU biodiesel industry and the success of the EU biofuels strategy.

In this perspective **EU policies for non-food crops and for biofuels must be consistent.** The recent Mid-Term CAP reform proposals need to be amended in order to acknowledge the enormous future potential of biofuels as well as in order to take into account the important and evident needs of the European biodiesel sector.

The European Biodiesel Board (EBB) is the European Federation of biodiesel producing companies, it represents the major biodiesel producers in the EU accounting for more than 90% of the EU biodiesel production and has 18 Members and Associate Members.

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*Heinrich Prankl*

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Biodiesel has become a fast growing renewable liquid biofuel within the European Community. In order to ensure customers' acceptance, standardisation and quality assurance are key factors in the market introduction of biodiesel as a transport and heating fuel.

Minimum requirements and test methods are included in the forthcoming standards for biodiesel. However, during the standardisation process major significance was attached to fuel stability as one key parameter. In 2001 the European funded project 'Stability of Biodiesel' (BIOSTAB) was started in order to gather information on determination methods, storage stability, additives and effects of a low stability during use.

On July 3rd, 2003 the results of the BIOSTAB project will be presented in Graz Austria. Please use this opportunity to gather information on this topic of great importance.

[http://www.blt.bmlfuw.gv.at/menu/index\\_e.htm](http://www.blt.bmlfuw.gv.at/menu/index_e.htm)

All necessary information can be obtained from Sabine Minarik (<mailto:minarik@vkmb.tu-graz.ac.at>) at the Technical University Graz. Looking forward to seeing you in Graz!

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## ETHANOL SUBTASK

*Jack Saddler*

<mailto:saddler@interchange.ubc.ca>

This is the last year of Task 39 and, as mentioned in other sections of this issue, we have already started the process of proposing a continuation of our activities into the next three-year period. I shall be contacting the country representatives of the ethanol subtask to gather their thoughts on the structure and work required for them to provide continued support.

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### "CURRENT STATE OF FUEL ETHANOL COMMERCIALIZATION"

MAY 5, 2003

BRECKENRIDGE, COLORADO, USA

I would again like to thank the organisers at NREL of the 25<sup>th</sup> Symposium on Biotechnology for Fuels and Chemicals (Mark Finkelstein and Liz Willson) for providing continued support for our Task by allowing us to hold a Special Topics Session.

The session had 9 speakers each presenting for 10 minutes with a 5 minute question period. A 20 minute panel discussion was held following all of the presentations. These notes reflect a summary of the key points made by the speakers on the central theme of the workshop. I would like to thank each of the speakers again for providing their insights into this topic and being so cooperative in staying within the 10 minute time-frame.

Over 250 participants took part in this session and there was a good response from the crowd providing insightful questions and comments on both the state of fuel ethanol commercialization as well as what governments could do to help with the introduction of these technologies into the market.

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### THE UK LIGNOCELLULOSIC BIOETHANOL CHALLENGE

*Gary Punter*

*British Sugar, Peterborough, UK*

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As described in the last newsletter issue the 2002 Pre-Budget Report announced that the UK Government would introduce a new duty differential of **20 pence per litre (\$1.14/US Gal) for bioethanol**. This differential will help to offset the additional production costs of bioethanol and allow the UK to benefit from the **reduction in greenhouse**

**gases** and local pollution that it can offer. To ensure that industry is in a position to take advantage of this incentive, and has sufficient time to make the investment needed, the Government has discussed with stakeholders the optimum date of introduction.

Following these discussions, Budget 2003 announced that the new rate of duty for bioethanol will become effective from 1 January 2005. *The Government is also considering how best to give further support to bioethanol produced from ligno-cellulosic feedstocks, which offer even greater environmental benefits, and would welcome views on how any such support might be structured.*

New technologies will have to justify further financial support as the government has only committed to a 48% GHG saving in comparison to fossil fuels. Saving is calculated by comparing GHG emission (kg eq CO<sub>2</sub>/MJ) for fuel production method vs relative fossil fuel. Depending on the feedstock type, level of ethanol in the transportation fuel and level of implementation bioethanol can provide from 50 to 90% saving of GHG over fossil fuels. Ligno-cellulosic feedstocks provide an 82% saving.

Gary then presented the following summary of a way forward for the UK. The government will support UK environmental gain but not at any cost. Investors will seek to meet the UK Governments goals whilst managing risk and investment returns. The UK is clearly interested in supporting bioethanol technologies with claims of enhanced CO<sub>2</sub> reduction. Investors will be required to develop the most cost effective environmental solutions.

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### CURRENT STATE OF LIGNOCELLULOSIC FUEL ETHANOL COMMERCIALIZATION

*Bob Benson*

*TEMBEC Industries Ltd, Quebec, CANADA*

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The commercialization of fuel ethanol from lignocellulose is still far away. We are at the stage where competing technologies are under development with only one company, Iogen, working on a demonstration plant scale.

There are several barriers to commercialization including the need to operate at high throughput rates to make a reasonable profit. An intermediate barrier is the need to construct a demonstration plant that is too small to generate a profit before we build a large-scale profitable plant. Only project owners with deep pockets and access to large quantities of suitable biomass can get past the obstacle of cost.

Other barriers include low petroleum selling price, com-

petitive processes based on corn, competition for Lignocellulosic raw materials and complex energy intensive process designs.

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## REDUCING THE COST OF LIGNOCELLULOSIC CONVERSION TO ETHANOL

*Greg Luli, Brent Wood, Bin Yang, Charles Wyman, Shengde Zou, Yilei Qian & Lonnie Ingram*  
BCI International Corporation, Florida, USA  
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Although the cost of making ethanol from biomass has dropped significantly over the last several decades, biomass-derived ethanol is still too expensive to compete with fossil fuels without subsidies. Therefore, the key challenge is to reduce the major operating costs of biomass conversion processes, primarily pretreatment and enzymes. We believe that the integration of a reduced cost pretreatment with an ethanol-producing microorganism capable of utilizing oligomeric carbohydrates would represent a major step towards that goal.

Prof. Ingram and colleagues have developed microbial technology that is capable of simultaneous hydrolysis and fermentation of amorphous cellulose without added enzymes. The microorganism, *Klebsiella oxytoca*, can utilize dimers and trimers of glucose and xylose, and can metabolize the five major sugars of lignocellulosic feedstocks. This strain, designated SZ21, also secretes two synergistic endoglucanases to sufficient levels to completely hydrolyze amorphous cellulose. Thus, this organism represents an advanced ethanol producer for SSF processes and has been shown to reduce the enzyme requirements by up to 60%.

This same approach is now being implemented to address the simultaneous hydrolysis and fermentation of hemicellulose oligomers produced during low or no added acid pretreatment. Previous work has shown that ethanol-producing *Escherichia coli* can co-produce xylanases during fermentation of hemicellulose hydrolysates from dilute acid pretreatment. Prof. Ingram *et.al.* have developed a new strain that can secrete xylanase activity in sufficient quantities to hydrolyze xylo-oligomers produced by low or no added acid pretreatment of bagasse.

Previous work with low or no added acid pretreatment processes has resulted in relatively low yields of monomeric sugars (relative to standard dilute acid processes) and low solubilization of hemicellulose. Although significant cost savings can be realized in no added acid processes, the low yields were not economically viable for conventional ethanol-producing organisms. With the development of advanced organisms that can utilize oli-

gomer substrates, there is no longer a need for high monomer yields. Thus, low or no added acid processes can now be further developed.

The integration of low or no added acid pretreatments with advanced ethanol-producing microorganisms represents a significant step towards lowering the cost of biomass conversion processes.

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## PROSPECTS AND PROGRESS TOWARD BIOMASS HYDROLYSIS COMMERCIALIZATION

*David A. Glassner*  
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There has been substantial progress towards the commercialization of biomass-to-ethanol and other chemicals. The last five years has seen several major changes:

- Industrial interest is at an all time high as measured by the number and size of companies investing in biomass hydrolysis technology
- Enzymatic process focus has taken over by a wide margin as measured by the dollars invested in R&D
- Large investment in R&D by U.S. government has created a sufficient pool of expertise to support the technology development

Currently the focus is on the big names that have jumped into the biomass hydrolysis arena including Shell Global Solutions, DuPont, Abengoa, and Cargill Dow. The efforts of these companies, in many cases in collaboration with the U.S. government, will cause the following progress in the next 5 years:

- Start of construction on a large demonstration or a commercial scale plant before early 2008
- Cellulase enzymes will become commercially available at costs that begin to make the biomass hydrolysis technology attractive
- More large scale efforts, particularly out of the EU
- More incentives to drive commercialization will become available, particularly in the EU and Asia

By 2010 the world will see a few commercial biomass hydrolysis facilities in operation producing products such as ethanol, and polylactide polymers. By 2015 several addi-



tional facilities will be built and opened and the early adopter's technology development will be complete. The presentation provided the rationale and evidence for the conclusions stated above.

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## THE LIGNOL APPROACH TO COMMERCIALIZING BIOMASS-TO-ETHANOL AND CHEMICALS

*E. Kendall Pye*

*Lignol Innovations Corp., British Columbia, CANADA*

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It is generally agreed that the cost of ethanol manufacture from cellulosic biomass is presently greater than that from starch-based or sugar-based feedstocks. However, cellulosic materials are regarded as preferred raw materials for ethanol production because of the much larger potential volume from these sources. Major efforts are now being made to reduce the costs of ethanol production from cellulosic biomass through strategies such as reductions in cellulase enzyme cost and the fermentation of pentose sugars from the hemicellulose component.

An alternative, but not incompatible approach favored by Lignol Innovations is to increase revenues through the co-production of valuable chemicals from the biomass feedstock. Many other ethanol-from-biomass technologies view the non-cellulosic fractions of biomass as low value solid fuel at best, or an effluent requiring treatment at worst. Using organosolv-based biorefining processing of the raw feedstock, Lignol recovers valuable chemicals such as organosolv lignin, acetic acid, furfural, xylose and "extractives" from the process. The added revenues from these chemicals make even relatively small ethanol-from-biomass facilities in the range of 100 tpd of dry biomass input economically viable. Furthermore, organosolv processing generates a cellulose fraction having a very high susceptibility to enzymatic saccharification and fermentation.

Results of recent studies and their impact on total process economics and near-term commercial viability were discussed.

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## PROCESS DEVELOPMENT AND PILOT PLANT DEMONSTRATION OF BIOMASS ETHANOL PRODUCTION

*Quang Nguyen*

*Abengoa Bioenergy, Missouri, USA*

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Abengoa Bioenergy, a business unit of Abengoa (Seville, Spain), is the largest grain ethanol producer in Europe and 5<sup>th</sup> largest in the U.S. Significant growth potential for etha-

nol exists in the EU and US. The growth could be realized through improvement or expansion of current grain ethanol production facilities, new plants, or through conversion of non-starch carbohydrates (such as grain fiber, corn stover and straw).

Abengoa Bioenergy is evaluating bioconversion processes and coordinating R&D efforts in improving current grain ethanol technologies and developing competitive technologies for converting agricultural residues to ethanol. An overview of technical issues related to process development and demonstration of enzyme-based biomass ethanol production was presented.

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## A PILOT PLANT FOR ETHANOL FROM WOOD WASTE

*Guido Zacchi*

*Lund University, Lund, SWEDEN*

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In Sweden the company Etek Etanolteknik AB has made a process design of a pilot plant or Process Development Unit (PDU) with a capacity of about 400-500 liter ethanol/day or a feedstock input of 2 ton of dry substance/day. The plant is designed for development of both a two-step dilute acid hydrolysis process and a combination with enzymatic hydrolysis. The reactor in the second dilute acid hydrolysis step is a countercurrent reactor, which has a good potential to increase the yield and reduce the amount of byproducts. The main feedstock is softwood but other raw materials like hardwood and annual crops like straw and reed canary grass will also be tested.

The pilot plant will be open for cooperation with partners all over Europe and may be other countries. It will be located in Ornskoldsvik in the northern part of Sweden, close to an existing sulfite pulp ethanol plant.

The construction and erection has started and the pilot plant is planned to be in operation in the end of 2003. The plant is linked by ownership to the three Universities in the region, The Univ. of Umeå, Mid Sweden Univ. and The Technical Univ. of Luleå. Other Universities in Sweden are represented in the scientific board supporting the management in the development of the plant and the process. Etek Etanolteknik AB, owned by regional Energy companies, will be responsible for the construction and operation of the plant.

The investment cost is about 16 million EURO and the annual operating cost is about 1,3-2,0 million EURO depending on the research program. The Swedish National Energy Administration will be the main financier of the plant with 12 million EURO.

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## CURRENT RESEARCH PROJECTS ON LIGNOCELLULOSICS-TO-ETHANOL IN JAPAN

*Shiro Saka*

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Due to global warming caused by excessive use of fossil resources, renewable biomass resources will become more important in the future as alternatives to fossil resources. In addition, according to our recent investigation, about  $370 \times 10^6$  tons of biomass resources such as lignocellulosics are generated annually in Japan, of which  $77 \times 10^6$  tons are not used efficiently. Therefore, technologies that can convert them to valuable liquid fuels and chemicals will be important for solving our energy and environmental problems. Particularly, the conversion of lignocellulosics to ethanol is one of the main concerns in bioenergy research and development in Japan to fulfill the target in Kyoto Protocol for the reduction of greenhouse gas emissions.

There are currently several research projects for industrial application of lignocellulosics-to-ethanol underway in Japan. These include the concentrated sulfuric acid process from Arkenol Inc. and the dilute sulfuric acid process from BC International Corp., both in the NEDO technology development projects for bio-energy conversion study. There is also increasing academic interest in supercritical water ( $>374^\circ\text{C}$ ,  $>22.1\text{ MPa}$ ) technology. For example, in our laboratory supercritical water treatment was used on lignocellulosic materials to obtain ethanol and useful chemicals.

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## OVERCOMING BARRIERS TO THE COMMERCIALIZING BIOETHANOL PRODUCTION

*Warren Mabee*

*University of British Columbia, BC, CANADA*

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The creation of a viable, commercial-scale bioethanol industry will rely to a large degree on movement from discrete process elements that work effectively at the laboratory- or pilot-scale, to integrated processes that are suitable to the political and ecological conditions under which the process must operate. The most significant barriers to a viable industry will involve both technical and socio-economic variables.

A current Task 39 study will examine the availability of biological substrate for energy production, the efficiency and scalability of process elements, and the economic viability of co products from the process, and will link these variables to current socio-economic conditions in a 'road-mapping' exercise for two case studies. The case studies employed in this study are chosen as representative of a

number of parallel business models, and can be described by their position along a number of descriptive axes. One axis is size; there are large established organizations as well as small entrepreneurial start-ups actively seeking viable bioethanol production processes. Another axis describes business interests; some groups have an existing, vested interest in one or more elements of the bioethanol production process, while others seek to develop process elements and integrated solutions for licensing or commercial development. The final axis describes political considerations; some models must operate under North American political structures that include large subsidies for existing fossil fuels, while others operate under European policies that have much lower subsidies and may be more proactive in developing a bioethanol industry.

The ongoing research study is currently collecting data and liaising with IEA partners, and will submit a final report in December of 2003. By the end of the program, the research team will be able to inform the program partners on a number of issues for bioethanol commercialization.

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## PANEL DISCUSSION

Each presenter was asked to provide a short response to the question:

***"What actions would you ask of your government, in order to enhance commercialization of biomass to ethanol?"***

David Glassner – Have the government pay 50% of the capital on the first lignocellulosic plant.

Shiro Saka – Provide tax relief for ethanol fuels and set up fuel specifications.

Greg Luli – There are barriers to the introduction of the product into the market and competition with dry milling plants. There are three areas for the government to be involved: overcoming the risk of first plant through direct investment or loan guarantees, more government support for the industry in general and relaxation of Genetically Modified Organisms (GMO) regulations.

Guido Zacchi – Long-term government support i.e., greater than 5 year commitment.

Gary Punter – Determine whom is the customer for lignocellulosic ethanol and then you will probably know what is required by the government and individual stakeholders to move the technology forward.

Kendall Pye – Loan guarantees and extended government

support for the introduction of lignocellulosic ethanol into the marketplace to offset the risk.

Bob Benson – More clarity between government departments on policies related to Kyoto Accord implementation and ethanol part in that implementation. Also a stronger sustained will on the part of the government to implement these technologies.

Quang Nguyen – Lobby the support groups such as the farmers to help us convince the government of the importance of this issue.

Warren Mabee – Do not pay for the first demonstration plant but there is a need to guarantee long-term substrate availability so have the government support studies on this.

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## A RESPONSE TO THE TASK 39 SESSION AT BRECKENRIDGE

*Dr. Warren Mabee*  
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Creating a viable, commercial-scale bioethanol industry is an endeavour that will require the coordination of technical expertise within certain political and ecological realities. A 'roadmap' describing where we are going, how we wish to get there, and the challenges that must be faced along the way may be a helpful contribution. Building on lessons learned at the 25th Symposium on Biotechnology for Fuels and Chemicals, the authors are in the process of creating such a document for submission to the IEA in fall 2003.

One of the tasks that this exercise will fulfill is an update and expansion upon a previous report to the IEA, titled Liquid Fuels from Biomass - North America: Impact of Non-Technical Barriers on Implementation. We propose to significantly change the organization of this document, dividing the present report into three major sections. The first of these sections, Short- to Medium-Term Strategies, looks at ways in which we can identify and reward 'green' performance. The second section examines Medium- to Long-Term Strategies, and identifies ways in which we can promote security and sustainable development through biofuels use. These two sections will be further organized under four broad headings. The first of these is Research, in which the existing knowledge will be referenced and gaps in understanding identified. The second heading is Existing Policy, where a review of policies that apply to the section at hand will be conducted. The third heading is Market Considerations, where producer and consumer variables of import will be highlighted and discussed. Finally, the fourth heading is Policy Choices, where oppor-

tunities for government to make a difference are identified. Some of these opportunities may include supplying secure supplies of substrate, or providing funding for the construction of demonstration plants.

The third section brings these strategies together and links them with key actors in the biofuels industry today, and evolves a roadmap for the development of our industry. The actors of interest in this section are those companies actually interested in producing bioethanol. It is postulated that these companies can be identified by their position on three unique axes: their geographic location, whether in Europe or North America; their relative size and the importance of ethanol in their product line; and their orientation within the ethanol-production process, in terms of technical development (middle of the process) or substrate/fuel production (ends of process). This section will examine two case studies which occupy divergent positions on this set of axes.

This exercise will pay particular attention to the need to develop lignocellulosic sources of bioethanol, for reasons that relate to overall supply, environmental performance, and security of the resource. It will be reviewed by policymakers in Canada and the United States, and will hopefully provide valuable information to the industry at a crucial time in its development.

For more information on this project, please feel free to contact the author.

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## BUSINESS MEETING MAY 6, 2003 BRECKENRIDGE, COLORADO, USA

A business meeting was held with the Ethanol SubTask country representatives in Breckenridge to discuss the following issues:

1. Remaining activities for the ethanol subtask of Task 39. There will be a end of Task meeting in Copenhagen, Denmark over the period November 20-21, 2003. Lisbeth Olsson graciously offered to host the meeting and we have finished all of the preliminary details. This meeting due to the size of the venue will be by invitation only and provide an final update on the current state of fuel ethanol commercialization. We also discussed the possibility of sending industrial participants in that meeting on to the 4<sup>th</sup> European Motor Biofuels Forum in Berlin, Germany taking place November 24-26<sup>th</sup> and potentially also on to the Bio-energy Australia Conference in Sydney, Australia on December 8-10<sup>th</sup>. As at the York meeting it was felt by the participants that we could probably convince in-



dustrial interests to go to Berlin but the Australia conference would be much harder to sell due to the distance.

2. Feedback and discussion on the past activities, newsletter, website, Task structure, etc.; Generally all of the participants were happy with the types of activities in Task 39 although more collaboration between the policy and technical subtasks (similar to the successful York meeting) should be encouraged. There were a number of the participants that felt the newsletter was too long and that the articles should be reduced in size. Over the remaining three newsletters the editor will try and move the more time sensitive sections such as the World News headlines and Conference announcements to the Task 39 website to help reduce the newsletter size.
3. Discussion on continuance of the Task into the next IEA Bioenergy period and the draft proposals that were tabled at ExCo51 in Sydney, Australia. There was a fairly lengthy discussion of this item at the meeting and the only real conclusion was that the current management is flexible in both the structure and types of work to be done. More discussion with feedback from all of the currently participating countries will be pursued in the next few months.

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## FUTURE WORKSHOPS/SYMPOSIA

20<sup>th</sup> Anniversary Windsor Workshop: Towards Sustainable Transportation

June 2-5, 2003

Toronto, Canada

<http://www.windsorworkshop.ca/2003html/general.html>

Hart World Fuels Conference

May 19-20, 2003 – Brussels, Belgium

June 8-11, 2003 – Rio de Janeiro, Brazil

August 24-26, 2003 – Singapore, Thailand

September 21-23, 2003 – Washington DC, USA

<http://www.cwacts.com/hart/>

Bioenergy 2003 International Nordic Bioenergy Conference and Exhibition

September 2-5, 2003

Jyväskylä, Finland

<http://www.finbioenergy.fi/index.asp>

The Eighth Grove Fuel Cell Symposium

September 24-26, 2003

London, UK

<http://www.grovetfuelcell.com/organisers.htm>

IEA Task 39 'Liquid Biofuels' - Bioethanol Workshop

November 20-21, 2003

Copenhagen, Denmark

<mailto:cblyth@interchange.ubc.ca>

<mailto:lo@biocentrum.dtu.dk>

<http://www.forestry.ubc.ca/task39/GT4/Frames/indexN4.html>

4<sup>th</sup> European Motor Biofuels Forum

November 24-26, 2003

Berlin, Germany

<http://www.europoint-bv.com/events/biofuels2003/index.htm>

Australia Bioenergy Conference

December 8-10, 2003

Sydney, Australia

<mailto:sschuck@bigpond.net.au>

<http://users.bigpond.net.au/bioenergyaustralia/>

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## BIODIESEL

Stability of Biodiesel Workshop

July 3rd, 2003

Graz, Austria

<http://www.biodiesel.at>

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## ETHANOL

EPACs 13<sup>th</sup> Annual Ethanol Conference

June 11-13, 2003

Big Sky, Montana, USA

<http://peakstoprairies.org/greening/index.htm>

BBI International's Fuel Ethanol Workshop and Trade Show

June 16-19, 2003

South Dakota, USA

<http://www.bbiethanol.com>

World Summit on Ethanol for Transportation

November 2003

Quebec City, Quebec, Canada

<http://www.bbiethanol.com/wset/index.html>

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## POLICY/REGULATORY ISSUES

IEA Bioenergy – Task 39

Policy/Implementation Subtask

Late Sept.

Location, TBD

## CONTACT INFORMATION

Please find information below for both the IEA Bioenergy contacts and IEA Bioenergy Task 39 contacts. Additional information is available at <http://www.iea.org> and <http://www.ieabioenergy.com>.

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	IEA Task 39 Country Representative
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## IEA MEMBERSHIP

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Australia	✓ Bio-	✓	
Austria	✓	✓	✓
Belgium	✓ ✓ Bio-	✓	
Brazil		✓	
Canada	✓	✓	✓
Croatia		✓	
Czech Rep.	✓		
Denmark	✓	✓	✓
European Comm.	✓	✓	✓
Finland	✓	✓	✓
France	✓ Bio-	✓	
Germany	✓		
Greece	✓		
Hungary	✓		
Ireland	✓	✓	✓
Italy	✓	✓	
Japan	✓ Bio-	✓	
Korea	✓		
Luxembourg	✓		
Netherlands	✓	✓	✓
New Zealand	✓ Bio-	✓	
Norway	✓ Bio-	✓	
Portugal	✓		
Spain	✓		
Sweden	✓	✓	✓
Switzerland	✓	✓	
Turkey	✓		
UK	✓	✓	✓
USA	✓	✓	✓
Total	27	20	10