Newsletter Issue #25 September 2010

Commercializing Liquid Biofuels from Biomass

Task 39
IEA Bioenergy

Inside This Issue

From the Task

From Jack Saddler and Jim McMillan, Task Co-Leaders

Welcome to the latest IEA Bioenergy Task 39 Newsletter! Our network has had a very productive last few months. Our colleagues have completed three timely reports that are currently posted either on the public or members only sites of the Task 39 website. One of these reports, written by our Austrian colleagues entitled Status of 2nd generation biofuel demonstration facilities is available now for your download at www.task39.org.

IEA Bioenergy Task 39 also recently completed two other reports: 1. *"An Overview of the Sustainability Criteria for Biofuels"* as well as; 2. *"A review of the Status and Potential of Algal Biofuels Production"*. These reports will eventually be made available to public stakeholders in November 2010 after they have been reviewed and assessed by the member countries of Task 39. If you would like to review a copy of these "Member Country only" reports, please contact your Country Representative (listed below on page 1). If your country is currently not part of IEA Bioenergy or IEA Bioenergy Task 39, please contact your government biofuels stakeholders to arrange and encourage them to join!

In the next few months our Task 39 group will meet near Sydney, Australia. As well as our regular business meeting, where we will discuss the overall progress of Biofuels in our member countries, and we will also participate in the annual Bioenergy Australia conference. This meeting will have an emphasis on liquid biofuels and Algal biofuels, in particular. We will also continue our tradition of linking our next Task 39 meeting with the western, "Biotechnology for Fuels and Chemicals" Symposium that will be held in Seattle in early May, 2010. We look forward to seeing many old and new Task members at these upcoming meetings!

- Jack Saddler and Jim McMillan

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Editor's Notes

From Jana Hanova, Task Coordinator

Welcome to the 25th Issue of the Task 39 Newsletter. The last few months have been very productive for Task 39, lots of work behind the scenes, a newly updated Task 39 website, and the release of three reports (two available for a limited time for our Country Members only, and a third that was immediately publically available). As I hope you can see, IEA Bioenergy Task 39 has undergone an extensive re-branding effort to transform its image and update the Newsletter and Task 39 website (www.task39.org). Thus far we have received very positive feedback on the site's layout and increased effectiveness of information sharing. I'd like to thank all of you who responded with advice on how to improve our communication efforts and let you know that we welcome any additional feedback or suggestions you may have for our continued improvement.

As you know, in each Newsletter issue we try to highlight one of our member countries, as we have done with recently profiled New Zealand, Japan and Denmark. Issue 25 features an article from the UK and we thank Tony Sidwell and Kristan Wadrop for sharing their thoughts on UK biofuel policy and the historical and more recent advancements of ABE fuels (Acetate, Butanol, Ethanol).

It is our hope that in the upcoming issues we will be able to share invaluable perspectives from South Korea, Brazil, Finland, and some our other members as we are certain that the Newsletter readership benefits from learning more about the approaches each country has taken to advance the deployment of sustainable 1st, 2nd and, advanced generation biofuels!

As always, I would like to invite you to submit your feedback and input for Issue 26 as new information becomes available over the next few months. The benefits of participation include increased exposure of your country's efforts and further discussion of issues of particular relevance. Please send me your:

- Industry developments (incl. important press releases)
- New R&D updates and partnerships, reports and publications
- Opportunities for collaboration secondments or faculty exchanges
- Other relevant material on biofuel advancements

Jana Hanova - IEA Bioenergy Task 39 Co-ordinator, Editor, Webmaster

We welcome your feedback on the layout and scope of the Newsletter & website – Please Contact Us with feedback!

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Recent Developments of ABE biofuels in the UK

Authors: Tony Sidwell & Richard Stark – British Sugar plc
Kristan Wadrop – Chief Operating Officer, Green Biologics Ltd

Introduction

Biofuel use in the UK reached into the mainstream adoption in 2005 when the government introduced a fuel tax cut for bioethanol and biodiesel. That year, 85 million litres of bioethanol and 33 million litres of biodiesel were sold (0.2% of a 56 billion litre diesel and petrol market). By the end of 2008, the share of biofuels has increased to 2%. In April 2008 the UK Government introduced the Renewable Transport Fuel Obligation (RTFO), which obligated all fuel suppliers to provide 2.5 % of their fuel from renewable sources, this obligation was then to increase to 5% by 2010. However, after the Gallagher Review, published in July 2008, it was decided that the blending targets too ambitious and the 5% target is now instead to be reached by 2013/14. The RTFO also introduced voluntary carbon and sustainability reporting on all blended biofuels. As of April 2010 the fuel duty rebate on blended biofuels has been removed, except for those on used cooking oil.

The United Kingdom covers over 240 000 square km with a population of over 60 million. The UK is a member of the European Union and is the third largest member state by population.

The current situation

The latest figures released by the UK's Renewable Fuels Agency (RFA) indicate that 1 568 million litres of biofuels were sold in the UK in the "obligation year" of 2009/10. This was approximately 3.33% of the market, which exceeded that year's 3.25% target. Significantly more biodiesel (71%) had been sold than bioethanol (29%). For the 2009/2010 year, only 33% of the biofuels were certified to have met the voluntary environmental standard - the target for certified biofuels is set at 50%. On average, biofuels reached 51% GHG emission reductions relative to fossil fuels, exceeding the government target of 45%.

Only 10% of the biofuels sold during the 2009/10 period were grown in the UK, however it noteworthy to mention that 98% these UK sourced fuels met the required environmental standards. It may be possible for the UK-based fuel proportion to increase over the next few years, as the Ensus bioethanol plant has just come online 2010 and the Vivergo Fuels bioethanol plant due to start up in 2011. Both these plants produce ethanol from feed wheat, have a production capacity of over 400 million litres per year each, and could also produce mid protein animal feed co-products.

Future developments

By December 2010 all EU member states will implement the Renewable Energy Directive (RED) and the amended Fuel Quality Directive (FQD). Whereas the RTFO has voluntary sustainability reporting, the Renewable Energy Directive introduces compulsory sustainability standards for renewable fuels; suppliers will have to demonstrate that all the fuel they supply meet standards. There will also be mandatory targets for renewables reaching 10% of energy delivered by 2020. Biofuels need to initially demonstrate minimum GHG savings of over 35% (relative to fossil fuels), which will increase to 50% by 2017. All new biofuel production facilities coming online after 2018 need to demonstrate saving of at least 60%; biofuels from high carbon stock land or areas with high biodiversity will not be allowed. Fuels produced from wastes, residues and non-food feedstocks (not yet defined) will count double towards the targets.

Similarly to the RED, the amended Fuel Quality Directive (FQD) also contains changes that will affect the biofuel markets. The FQD has thus far mandated that only 5% blends can be sold in Europe, and the blending limit will now allow for 10% ethanol blends. The FQD also mandates fuel suppliers to reduce the carbon intensity of transport fuels of 10% by 2020. It should be noted that the FQD is an obligation of fuel suppliers, whereas the RED is an obligation that Member States. Some of the reductions are anticipated to come from limiting flaring at oil/gas operations and the Clean Development Mechanism (CDM), but 6% of the 10% must come from real fuel Carbon content reductions; it is anticipated that these reductions will be achievable by blending biofuels with the more conventional petroleum counterparts. All biofuels used to meet FQD targets have to meet the same sustainability standards as outlined in the RED. The outlined GHG reductions will be especially difficult to meet since conventional petroleum is becoming increasingly rare and the world is exploring and increasingly relying on fossil fuels with a high embodied carbon content including stranded gas fields and tar sands.

Green Biologics Ltd

Green Biologistics Ltd (GBL) is one of the leading research companies in the UK which has been developing novel fermentation technologies for a number of years, including the production of biobutanol. The company serves a number of customers but is also involved in a number of research projects including a recent grant from the UK Government's Carbon Trust. The remainder of the article shares some highlights on the company's R&D and applied efforts.

Green Biologics Ltd uses advanced fermentation biotechnologies to produce renewable butanol and other chemicals from waste and agricultural by-products. GBL is based in the UK and serves markets around the world, but focuses on Brazil, India, China, where there is both the abundance of appropriate feedstock and sustained economic growth. The company seeks to re-introduce ABE technology (Acetone, Butanol, Ethanol) through deployment of advanced microbes and fermentation processes.

GBL's approach differs from other biochemical and biofuel technology companies currently operating throughout Europe and the USA, since it engages with the market early in the technology development cycle, thus enabling a deeper understanding of process economics and the realities faced by bulk commodity chemical producers. This approach results in a faster time to market for the products, and lower venture capital requirements.

The GBL uses its genetic manipulation of the microbe through to fermentation expertise to develop and scale-up fermentation and product separation processes for GBL's pilot plant. In conjunction with venture capital finance, GBL benefits from a number of UK government grants to support technology R&D. GBL has worked both alone and as part of a consortium on projects that received matching funding from the a number of granting agencies that biofuel companies draw support from: the 1) Carbon Trust, the 2) Technology Strategy Board and 3) the South East England Development Agency (SEEDA). All these UK government funded bodies support R&D of SMEs (Small to Medium Enterprises).

Biobutanol History

Whilst identified as one of the new and revolutionary advanced biofuels, many people might be surprised to know that biobutanol (n-butanol) has been around in one form or another at industrial scale for close to 100 years.

First reported by Pasteur in 1861 it was not until 1916 that Chaim Weizmann first commercialised what is known today as the ABE (Acetone, Butanol, Ethanol) microbial fermentation. Butanol fermentation

technologies ware initially conceived to produce intermediates for the synthetic rubber process. However,with the advent of the World War I, the requirement for acetone as a component of cordite for ammunition took precedence and the ABE process became industrially important. As a result of the demand, production facilities using the ABE process sprung up in the USA and Canada.

Picture 1: National Chemical Products ABE Facility in Germiston, South Africa

Between the WWI and WW2, the technology was adopted around the globe in regions with suitable feedstocks. As microbiologists gained a better understanding of solventogenic microbes and isolated more strains, the technology first used starch based materials but then transitioned to sucrose based feedstocks (molasses) to achieve better process economics.

Today the microbial genus *Clostridium* is widely regarded as the only naturally occurring solventogenic microbe producing butanol. Depending on the substrate and microbe combination involved, other products such as acetone, iso-propanol, 1,3 propane diol, ethanol and hydrogen can also be produced. The applications of the ABE process declined in the West after the advent of the petrochemical industry in the 50's and 60's;fermentation could not compete with "cheap oil" abundantly available in that era. The oil crisis in the early 70's caused a resurgence of interest in the technology, which was particularly evident in increased academic research activity. During the 80's and 90's this research culminated in an increased understanding the microbe genus, molecular biology techniques and behaviour characterization of the various strains.

During the last 10 years, the emphasis on renewable fuels and an increased focus on energy security have helped facilitate the construction of ABE facilities in China and Brazil,thus creating a new generation of ABE producers. Some of the previous process challenges still remain, but companies like GBL are committed to working with their customers to overcome these by providing best in class biotechnology and fermentation processes.

Challenges

The traditional ABE fermentation technologies are currently limited by a number challenges, when compared to ethanol (Table 1). Butanol is highly toxic to biological systems at relatively low concentrations, resulting in rapid product inhibition. The ABE fermentation broth comprises around 2% product whereas ethanol fermentations contain 10-13%. Molecular engineering techniques such as mutagenesis have been used to produce strains exhibiting more favourable characteristics; however, inhibition remains a significant challenge of the process.. Some efforts have been directed toward expressing solventogenic genes in other microbes (*e.coli* and yeast), but this has been achieved only with limited success.

Table 1 – Comparison of ABE vs First Generation Ethanol Fermentation

	Ethanol	**ABE**
Organism	Saccharomyces (Yeast)	Clostridium
Feedstock (substrate) Range	Traditionally C_6 and di-saccharides	C_5,C_6 monomers, di and poly saccharides
Products	Ethanol, Carbon Dioxide	Acetone, Butanol, Ethanol, Carbon Dioxide, Hydrogen
Substrate concentration (g/L)	200-250	50-70
Product concentration (g/L) (Butanol)	100-130	15-21 (10-14.5)
Process Yield (% substrate fed) (liquid products)	40-48	28-34

Source: GBL Data

The cost of product recovery from low concentrations is expensive and involves an energy-intensive process. The product recovery process is also complicated by the need to recover 3 liquid products which adds significant equipment capital investment requirements.

The microbial bi-phasic fermentation is also associated with several operational complications resulting in variable performance; the complications are compounded when the system productivity is considerably lower than ethanol fermentation (0.2-0.3 g/L/hr for ethanol vs. 1.0-1.5 g/L/hr for ABE). An ABE plant of comparable size would have higher capital costs than an ethanol facility.

Opportunities

As the world diversifies away from fuel alcohol production from traditional feedstocks (starch and sugar), the strain *clostridia* becomes more competitive relative to standard yeast fermentation organisms:

Table 2 – Sugar utilisation chart for clostridia and yeast

Feedstock	**Sugar**	**Yeast**	**GBL *clostridia***
Molasses	Sucrose	+	+
	Glucose	+	+
	Fructose	+	+
Starch (e.g. wheat, corn, cassava etc)	Starch	+	+
	Maltose	+	+
	Isomaltose	+	+
	Glucose	+	+
Corn Cob Hydrolysate	Cellulose	-	?
	Cellobiose	-	+
	Xylan	-	+
	Xylobiose	-	+
	Xylose	-	+

	Glucose	+	+
	Arabinose	-	+
	Acetate	+	+
Rice Bran	Cellulose	-	?
	Cellobiose	-	+
	Glucose	+	+
	Starch	+	+
	Maltose	+	+
	Isomaltose	+	+

Source: GBL data

Clostridia's natural ability to metabolise a wide range of carbohydrates into desired products while maintaining yields and process efficiencies provides a substantial advantage over the yeasts used in 1st gen ethanol production. Recombinant yeasts developed for 2nd gen aren't as efficient at metabolising lignocellulosic hydrolysates, and potentially shift the economics in favour of biobutanol as a liquid fuel.

Since the ABE process was abandoned in most countries prior to the development of computers, the technology has never benefited from high quality control and modelling/optimisation (in both the design and operation phases). Whilst plants using ABE have been built in China in recent years, these appear to be largely manual (some PLC control on distillation) and their plant design was most likely dating back to the 1970's.

While feedstock is associated with highest costs of fuel production, the energy requirements for the distillation process (and associated costs) are the second highest. Literature suggests several variations on distillation configuration, ranging from 5 to 8 columns. Rigorous modelling and advanced control systems (DCS) enable substantial process heat integration, reducing the energy costs considerably. Historically, it took over 12 tonnes of steam to purify 1 tonne of ABE, whereas a state-of-the-art fuel ethanol distillery requires less than 2 tonnes of steam per 1 tonne ethanol. Alternative purification technologies have been explored for several decades, these include:

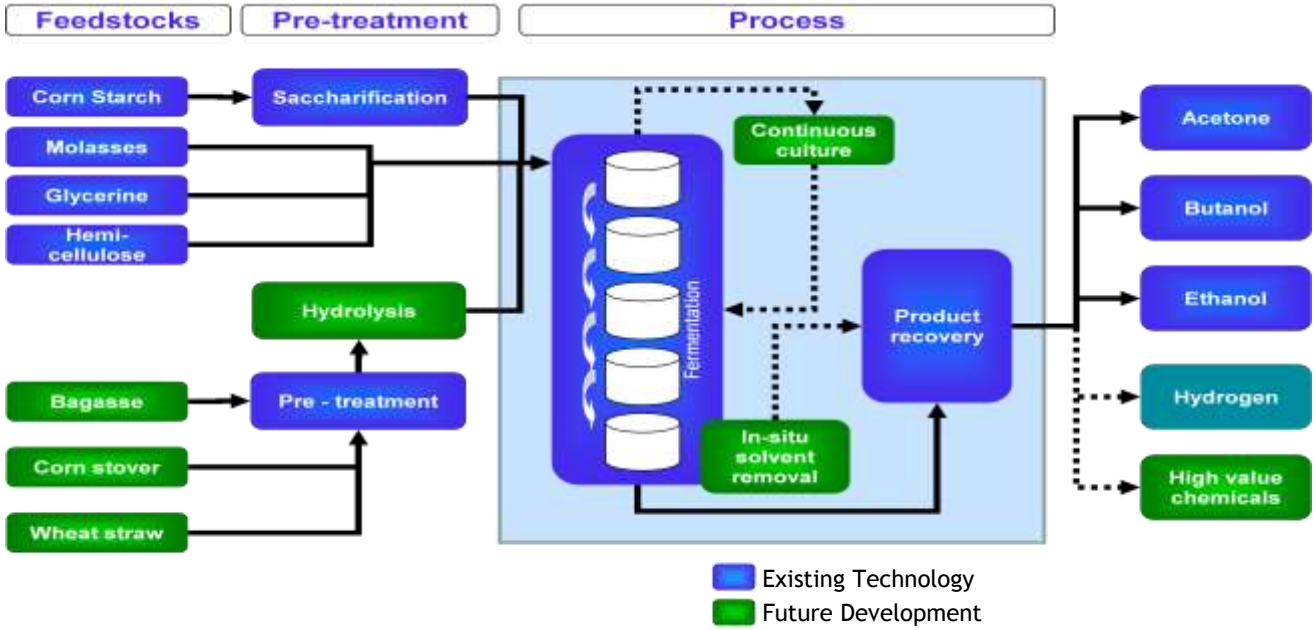
- Liquid-liquid solvent extraction
- Gas-liquid extraction
- Pervaporation
- Perstraction
- Selective Adsorption
- Selective Absorption

Some of the above technologies have been trialled in in-situ fermenters to overcome product inhibition; however most remain external unit operations. All of these technologies have yet to be proven commercially viable, and they have yet to be demonstrated to be as robust as distillation. Advances in membrane technology to improve flux and to accommodate the range in physical properties of the three key products, at this stage of the commercialization, continue to remain elusive. Process sustainability is also a key factor influencing biobutanol production, in particular, water management is of significant concern. Developing an sensible and efficient water management system with efficient recycling while at the same time maintaining favourable economics, continues to be a challenge. Another challenging aspect of the process is the industry's increased use of environmentally damaging chemicals (acids/alkalis) in hydrolysis processes.

Future

Since the demise of the original ABE industry, the scientific community has continued to develop a better understanding of the solventogenic microbes that produce biobutanol, however that research has yet to be fully embraced and perfected using modern engineering design and operation tools. Building upon the past 40 years experience in metabolic engineering, computer aided plant design, operation and optimisation, the ABE process hold significant potential.

Figure 3: Schematic Flowchart of ABE production process



Biobutanol is widely regarded as a superior liquid alcohol fuel due to its similarity to gasoline (biobutanol is more similar to gasoline than to ethanol). Presently, there are several companies championing biobutanol development and its reintroduction into the global marketplace.

Acknowledgements

The authors would like to thank colleagues at GBL for providing input and data for this article. For a more in-depth review of the technology the author recommends: “Acetone-Butanol Revisited”, David T Jones and David R Woods, Microbiological Reviews Dec 1986.

Reports and Research

IEA Bioenergy Task 39 Report

Status of 2nd generation biofuels demonstration facilities

This report gives an overview on 66 projects that are being pursued currently and provides details on the facility size, feedstock in use and technology applied. About 50 companies have provided data on their projects directly to the authors. A high number of projects are in the initial phases and only few facilities in the demonstration scale are actually operating. The technologies applied vary widely, as do the raw materials of choice. More (report)… Visit the online 2nd gen biofuel demonstration facilities database.

Policy and Standards

US DOE releases National Algal Biofuels Technology Roadmap

The U.S. Department of Energy (DOE) Biomass Program's National Algal Biofuels Technology Roadmap was prepared with the input of more than 200 scientists, engineers, industry representatives, research managers, and other stakeholders. This Roadmap summarizes the state of technology for algae-based fuels and documents R&D challenges associated with producing fuels at a commercial scale. More…

Sustainability

World Bank publishes report into price relationships of raw materials, energy, food and biofuels

After three decades of falling raw material prices (metals, energy and agricultural products) prices started to rise again from around the year 2000. Food prices fell between 1975 and 2000 by over 50%. Between 2003 and 2008 the prices of energy and metals rose by 230%, the price of food doubled, and the price of rice doubled in just five months during 2008. Further research into these elements was conducted by the study placing the 2006/2008 Commodity Price Boom into Perspective. More…

Placing the 2006/08 Commodity Price Boom into Perspective

This paper—a product of the Development Prospects Group—is part of a larger effort in the department to gain a better understanding of the causes and consequences of the 2006–08 commodity price boom. The 2006-08 commodity price boom was one of the longest and broadest of the post-World War II period. More…

Carbon accounting of forests for energy is more complex than most people previously thought

Manomet and its partners have released the results of a six-month study to better understand the implications of using wood for energy in Massachusetts, titled "Biomass Sustainability and Carbon Policy Study." The study was conducted for the Massachusetts Department of Energy Resources. The full report, or its component chapters, can be downloaded. More…

In the News

~ IEA Bioenergy Task 39 launched its new and redeveloped website ~
~ Please let us know what you think www.task39.org ~

Industry Developments

Cosan and Shell sign Joint Venture

A US$12-billion joint venture between Shell International Petroleum Company Limited (Shell) and Cosan S.A. (Cosan) moved closer to reality today when the two companies signed binding agreements. More…

Petrobras working to optimize production of cellulosic ethanol from sugarcane waste

KL Energy Corporation announced that Petrobras, through Petrobras America, has entered into a Joint Development Agreement with KL Energy Corporation, to jointly optimize KLE's proprietary cellulosic ethanol process technology for sugarcane bagasse feedstock More…

BP and Verenium close deal

On 2 September 2010 Verenium, dedicated to the development and commercialization of industrial enzyme solutions, announced the closing sale of its cellulosic biofuels business to BP Biofuels North America for $98.3 million (€76.3 million). More…

Policy and Standards News

Corbey Commission recommends not increasing target in the transport sector for 2020

The Corbey Commission (Commission for Sustainability Aspects of Biomass) has published its fourth set of recommendations: First quality, then quantity. These recommendations concern the contribution that biomass can make to achieving sustainable energy targets, and have been submitted to Minister Cramer. The Minister had asked the CDB to advise the government on sustainable energy targets for the transport sector, and also to look at opportunities to increase this target above the original 10%. More…

Sustainability News Items

European Commission sets up system for certifying sustainable biofuels

The EC decides to encourage industry, governments and NGOs by setting up certification schemes for all types of biofuels, including imported fuel. This will help implement the EU's requirements that biofuels must deliver substantial GHG reductions and should not come from forests, wetlands and nature protection areas. This is part of the Renewable Energy Directive (effective Dec 2010). More…

EU sued over lack of transparency

A group of environmental lawyers are suing the EU over alleged attempts to restrict access to information and a lack of transparency in the bloc's biofuels policy. On Sept 20 ClientEarth filed a lawsuit against the European Commission in the EU's General Court in Luxembourg, charging the executive body with having failed to release "documents containing previously undisclosed information on the negative climate impacts of widespread biofuels use." More…

RD&D & Funding

DOE Announces up to $11 Million for Biofuels Technology Development

The U.S. Department of Energy (DOE) today announced up to $11 million in funding over three years for research and development in the area of thermochemical conversion of biomass into advanced biofuels that are compatible with existing fueling infrastructure. More…

Brazil to invest over $5 billion in renewable energy

In Brazil a recently held biomass, wind and hydroelectric auction is expected to encourage $5.52 billion in investments in alternative energies in the region. The auction came as the Brazilian government aims to further diversify its clean energy matrix. It contracted power from biomass plants, 89 wind farms and small hydroelectric plants and will add 2 892 MW to the grid More…

China becomes third largest biofuel producer

China has become the world's third largest manufacturer of ethanol. The increase comes after the Chinese government ramped up the production of ethanol from non-grain feedstocks including straws, cassava and bagasse. Food security concerns led the government to curb the cultivation of first generation crops for use in biofuel production. More…

European Commission steps up biomass use – Nearly € 80 million for biorefinery research

Researchers and industry plan to develop new ways to convert biological feedstock into energy and valuable material using biorefinery technology. The Commission will fund the programme with € 52 million for 4 years. 81 partners from universities, research institutes and industry in 20 countries will invest an additional € 28 million. More…

Three DOE National Labs Receive R&D 100 Awards for Biomass Technology Advancements

Three U.S. Department of Energy (DOE) national laboratories were honored for their contributions to the advancement of biofuels and biobased products. R&D Magazine describes the coveted R&D 100 Awards as the "Oscars of Innovation," which aim to identify and celebrate the top high technology products of the year. More…

USDA and DOE Partnership Seeks to Develop Better Plants for Bioenergy

Energy Secretary Steven Chu and Agriculture Secretary Tom Vilsack announced research awards under a joint DOE-USDA program aimed at accelerating genetic breeding programs to create plants better suited for bioenergy production. The $8.9 million investment is part of the Obama Administration's broader effort to diversify the energy portfolio. More…

EU Commission launches public consultation on Indirect Land Use Change (ILUC) and Biofuels

The EC has launched a public consultation on Indirect Land Use Change (ILUC) and biofuels, which will run until October 2010. Comments are invited from all biofuels stakeholders and the wider public. More…

Government of Canada invests in biodiesel

In an effort to reduce carbon emissions and further renewable energy solutions, the Canadian government is to invest up to CA$18.79 million (€14 million) in Biocardel Quebec, a biofuels plant producing biodiesel and glycerol located in Richmond, Quebec, through its ecoENERGY for biofuels programme. More…

Technology and Innovation

Direct Conversion of wet algae to biodiesel

Researchers at the University of Michigan have published the feasibility of a two-step hydrolysis-solvolysis process to produce biodiesel directly from wet algal biomass, eliminating the need for costly biomass drying, organic solvent extraction and catalysts. The paper on the process was published in the ACS journal *Energy & Fuels*. More…

Nanobiotechnology-manipulated light helps accelerate algal growth

A Syracuse Univerity team has developed a new bioreactor that can enhance algae growth. They accomplished this by utilizing nanoparticles that selectively scatter blue light, promoting algae metabolism. When the optimal combination of light and confined nanoparticle suspension configuration was used, the team was able to achieve growth enhancement of an algae sample of greater than 30 percent as compared to a control. More…

Airlines chief urges more investment in biofuels

The head of the world's biggest airline association, IATA, berated the oil industry and governments on Friday for investing "peanuts" in cleaner biofuels. Bisignani told an industry conference on aviation and the environment that the oil industry had huge multibillion dollar earnings yet little is being done to prop up biofuels made from non-food crops. Governments had invested "peanuts, and what have the oil companies done? Peanuts." he said. More…

IEA Bioenergy News

IEA Bioenergy – Executive Committee – "IEA Bioenergy News"

IEA Bioenergy News is the newsletter of IEA Bioenergy. This issue covers the May ExCo65 meeting in Nara City, Japan. It also features an editorial on Bioenergy in Japan, a focus on Task 32, the Noticeboard, and recent publications and upcoming events. More…

IEA Bioenergy Task 32 and 33 are organizing a joint workshop "State-of-the-art technologies for small biomass co-generation"

The workshop will be held Thursday 7 October 2010 in Copenhagen. A full programme and registration info can be found here. More…

IEA Bioenergy Task 32 - Pellet Handbook and Combustion Handbook

Task 32 took the initiative to compose a comprehensive handbook on pellet production and utilization (49.99 Euro.). Also, the Handbook of Biomass Combustion and Cofiring is now available as a paperback edition (49.99 Euro). More…

IEA Bioenergy Task 37 – Workshop on Digestate and biogas utilization

This workshop held in Copenhagen, Denmark covers presentations on digestate as fertilizer and biogas for grid injection. Presentations from country members available. More…

Joint workshop: Task 40 (Sustainable International Bioenergy Trade) & EUBIONETIII

International trade of bioenergy commodities: Experiences with certification and setting up sustainable supply chains (Rome, Italy on the 21st of October 2010). More…
The aims of this workshop are:

1) Provide an overview of sustainability certification, including the current EU legislation
2) Show concrete case studies of ongoing sustainable international supply chains
3) Identify and discuss both opportunities to develop sustainable international bioenergy supply chains and identify (policy) barriers to be overcome.

IEA Bioenergy Task 40 - Opportunities and barriers for international bioenergy trade

This report provides up-to-date overview of how market actors perceive major opportunities and barriers for current and future development of international bioenergy trade. It focuses on three internationally traded bioenergy commodities: bioethanol, biodiesel and wood pellets. Data was collected through an internet-based questionnaire, completed by 141 respondents. Results include: import tariffs and sustainability criteria as barriers for bioethanol, while logistics are seen as an obstacle mainly for wood pellets. More…

IEA Bioenergy Task 40 - Updated overview of bioenergy sustainability certification initiatives

The report includes an extensive overview on relevant certification initiatives and systems for biomass and bioenergy certification, based on the year of 2009. Examples of included initiatives are the roundtable initiatives (RSB, RTRS, BSI, etc), forestry standards (FSC, PEFC), agricultural standards (SAN, GlobalGAP) and specific voluntary standards for bioenergy (ISCC, NTA8080). Every initiative gives a description of the context, status and organization structure. More…

Upcoming Task 39 Meetings

The following is a tentative schedule of Task 39 meetings over the course the next two years (2010-2012):

- Australia - *December 2010 (w/Bioenergy Australia)*
- Vancouver/Seattle, USA - *2-5 May 2011 (Planning/Special Session, 33rd Symposium)*
- Graz, Austria - *September 2011 (Policy & Implementation Workshop)*
- Location TBD – *August 2012 (Planning/Technical Conference)*

Please visit Task 39 at www.task39.org

Submit a NEWS item for the next IEA Bioenergy Task 39 Newsletter