

IEA Task 39 Business Meeting

**IEA Bioenergy Task 39
Commercializing 1st - and 2nd-generation
liquid biofuels from biomass**

MINUTES

Intercontinental San Francisco Hotel
San Francisco, USA

02 May 2009

Attendees (*IEA Task 39 Business Meeting*)

Host:

Jim McMillan (USA)

Task 39 Members:

Les Edye	(Australia)
Manfred Wörgetter	(Austria)
Bill Cruickshank	(Canada)
Emmanuel Ackom	(Canada)
Warren Mabee	(Canada)
Jack Saddler	(Canada)
Henning Jørgensen	(Denmark)
Michael Persson	(Denmark)
Niklas von Weymarn	(Finland)
Jerry Murphy	(Ireland)
Emile van Zyl	(South Africa)
Lisbeth Olsson	(Sweden)
Tony Sidwell	(United Kingdom)

Regrets:

European Community, Germany, Italy, Japan, Netherlands, Norway

Introduction and Welcome - *Jim McMillan, Jack Saddler*

Jack welcomed us to the meeting and expressed regrets on behalf of those who were not able to travel to be with us. He described the agenda for the day and asked for any changes or amendments to the agenda. Key issues flagged for discussion are: (a) topics for the next triennium's workplan (i.e. algal biofuels), and (b) upcoming meetings – who might like to host a future session. Potential future members of the Task were also listed (India, China, Brazil). Linkages to other Tasks (i.e. the Biorefining Task) were identified as subjects of interest.

Roundtable introductions followed.

Jim McMillan welcomed us to San Francisco and to the meeting. There are 800 pre-registered people for the 31st Symposium, and the thought is that there will be up to 900 folks at the meeting. There will be a media forum held on Tuesday, May 5 from 2-5 (room to be announced) – IEA members should be aware of this session. The University of California, Berkeley Energy Biosciences Institute (funded by BP) is one of the major sponsors of the meeting and, as a big proponent of high media participation, has been coordinating the media forum.

Progress report (*see attached presentation*)

Jack provided an overview of the progress within the Task. One of the points that was raised in the discussion was how we might differentiate future research in algal biofuels from other efforts (one suggestion was the issue of intellectual property); another issue was the desire to get Brazil engaged in IEA Bioenergy Task 39, which is difficult – new interest in 2nd-generation biofuels in Brazil might help us. If Brazil is going to attend the ExCo meeting, perhaps we could use this to engage them better, or we could try to access industrial partners who can bring pressure to bear.

A number of reports have been generated in the last few months – they are available online and can be accessed by the members. Special mention was made of Dina Bacovsky's Demonstration Plant report, the report done with IEA HQ by Mabee, Saddler et al., and the work done by Axel Munack in liaising with the AMF Implementing Agreement.

Country Representative Updates (*see attached presentations*)

- **Austria** (*Manfred Wörgetter*) – There is a new government in Austria. The 10% biofuels goal has been (more or less) cancelled as a result, mainly because of the food vs. fuel conflict. The Austrian biofuels policy will be based on the European Renewable Energy Directive. There is a new institution (Bioenergy 2020+) which is the merger of the Austrian Bioenergy Centre and RENET. In principle, the government is moving towards the 5.75% goal set by the European Union, and to reach this goal there is a new standard for biodiesel (up to 7%). Austria has a biofuel production capacity of 438,000 tonnes per year, and bioethanol production capacity of 160,000 tonnes per year – however, it is anticipated that some smaller players in the Biodiesel sector will be lost as the economic situation continues. Biofuel use in 2007 was 4.23% of total fuel use. There is a program underway to establish E85 gas stations, but this is difficult due to high costs and an expectation from industry for extensive government support. It is possible to produce about 180,000 tonnes of biodiesel based on Austrian feedstocks, which means that extensive imports are required. Austria is about the 4th ranked biodiesel producer in Europe. A

report on the activities related to 2nd-generation biofuel activities may be found online at http://www.abc-energy.at/aktuell_38htm. Highlights include discussion around innovative biofuel feedstocks, biomimetic pretreatment, integrated polygeneration, biomethane use, and methanation technologies. The development of CO₂ emissions in Europe has been dominated by the transport sector, as opposed to industry and households (both decreasing). There has also been a comparison between the use of biomass for electricity production vs. the production of liquid biofuels. From the discussion – the cost of service stations is a barrier to putting gas instead of liquid into the transport sector. The cost of putting a pump for E85 is high but cheaper than the conversion of a facility to CNG or other gas options. Feedstock availability is an issue particularly in regions where multiple plants and other uses are prevalent.

- **Australia** (*Les Edye*) – Major ethanol producers include CSR (cane molasses) at 55 ML per annum, Manildra (wheat) at 50 ML, Heck Group (cane molasses) at 3-9 ML, Dalby Biorefinery (sorghum) at 90 ML (under construction), Primary Energy (grains) (stalled), and Agri-Energy (grains) (stalled). Largest biodiesel producers include BP (>100 ML), Australian Renewable Fuels (2 plants, both mothballed), Australian Biodiesel Group (largest producer at 160 ML capacity, mothballed) – Australia has not yet corrected policy mistakes made in 2007. Granting schemes include the Climate Ready Program, giving funding to cellulosic ethanol production, the Renewable Energy Demonstration Program (up to \$435 M over 7 years, part of the \$500 M Renewable Energy Fund – majority will go to stationary power generation including CHP), and the Gen 2 Program (\$15 M for RD&D of 2nd-generation biofuels technology, with focus on thermochemical and algal technologies – on the last point, there are specialists in Australia with expertise in raceway ponds and technologies). From a policy perspective, the final version of the Garnaut climate change review was issued in September 2008, which highlighted the impact that climate change may have on Australia. Key points - anything less than 15% reduction in CO₂ emissions would not be worthwhile, and coal-fired power plants should not get a free ride (which they do under current policy). Australia is waiting to see what the USA will do in terms of cap-and-trade/carbon pricing. Australia has a distributed resource base that is remote from the population base; this has driven the research agenda within the country. Means of densifying biomass (such as bio-oils) is therefore a priority. All biofuels in Australia are treated the same under policy, notwithstanding the actual life cycle related to feedstocks. Biomass opportunities like prickly acacia, which has overtaken productive agricultural land – thus issues around iLUC are important, since removing the prickly acacia (which dates to pre-1990) would involve creating a carbon debt (although the land could be improved that way). Competition for feedstocks is also of interest; the forest industry in Australia has considered the impacts of ethanol production on fibre supply and found that recycled paper occupies the same price space that ethanol would take, meaning that there is potential competition. From the discussion – it would be interesting to look at hybrid systems that could combine various technologies (algal hydrogen and pyrolysis oils, for example). What about the Carbonol process (piloted in Canada and not followed up on). There are many similarities between Australia and South Africa.
- **Canada** (*Bill Cruickshank*) – Jody Barclay sends regrets. Canada's bioenergy supply is 6% of the total primary energy demand, mostly in the forest sector. Canadian ethanol production is about 870 million litres (capacity 1.4 billion litres); Canadian biodiesel production is about 100 million litres per year (capacity 100 million litres). Bill C33 (legislation) has been passed mandating an average 5% ethanol in the gasoline pool by 2010 (2.2 billion litres), average 2% biodiesel in the diesel pool by 2012 (0.7 billion litres); regulations to enforce are being drafted now. There is no specific legislation about 1st, 2nd-generation biofuels. Key innovators: UBC, Lignol, Logen (is in

negotiation for money from Sustainable Development Technology Canada for demo-scale plant), Enerkem (gasification technology), Greenfield. Another participant is Vaperma (who makes hollow-fibre polymeric membranes) – will reduce energy requirements for ethanol dehydration. Policy programs – ecoEnergy for Biofuels, up to \$1.5 billion over 9 years; ecoABC (\$200 million over 4 years, up to \$25 million per project); NextGen Biofuels Fund of Sustainable Technology Development Canada (\$500 million over 8 years). From discussion – there are no specific mandates or incentives for cellulosic biofuels (other than the NextGen fund, which is not specifically targeted). It seems like the knowledge and excitement about 2nd-generation biofuels does not make it to policymakers, with the possible exception of the USA. How can we address this issue? Part of the problem may be that the primary deployers of 2nd-generation technologies will be 1st-gen producers, who don't want to make their own industry look bad. It is helpful to consider the specific issues of each country (high vs. Low carbon footprint, etc.); rural development is also a helpful approach for promoting 2nd-generation biofuels. It was pointed out that the discussion of 1st- vs. 2nd-generation biofuels may be less useful – there are opportunities with all technology platforms.

- **Denmark** (*Henning Jørgensen, Michael Persson*) – Current use of biofuels in Denmark – there is no biodiesel on the market, although there is a test in the city of Aarhus, but there is production of biodiesel (about 5500 TJ in 2009, production capacity). Biodiesel is produced in two plants (one since 1992, one since 2008). There is no production of bioethanol in Denmark, but Statoil offers E5 on the Danish market, and has since May 2006; this is about 12 million litres of ethanol. To meet 5.75% of fuel demand, the increase would be massive. There are new plants under production to produce 1st-gen as well as 2nd-generation bioethanol from straw, some of which may be operational by the end of 2009. Projects are being led by Inbicon, Biogasol, Danish Biofuel Holding, BSG Nakskov Biogas, and Tonder Biofuel. Danish policies state that renewable energy will cover 30% of energy in 2025, with EU targets for renewable energy in transport (10% by 2020). There is no incentive to blend ethanol in gasoline or use biodiesel. Proposed law for mandatory blending of 5.75% biofuel by 2010, with 2nd-gen biofuels to count double in meeting this target. Energy development and demonstration projects from 2007-2010 will have invested €100 M in total, with €25 dedicated to 2nd-generation biofuels. Many research and development projects are underway within Denmark, ranging from technology development to the growth and use of biomass. From the discussion – double-counting of renewable energy (i.e. electricity generated from windmills being used in the transport sector). Biogasol's project in North America (with Pacific Biofuels) may be stalled. The Energy Map of Denmark was also highlighted as something Task 39 might want to emulate in developing web presence (www.energymap.dk). Targets for renewable energy were discussed; some countries have posed very ambitious targets but later stepped back on them, but industry may be leading the way now in terms of actually moving towards renewable energy generation. The point was made that much biomass is actually being used right now for combined heat and power; should this biomass be diverted to biofuels? Of course, you don't need spare heat in the summer, so how could this be better used? Discussion returned to the issue of energy storage, and the issue of linking companies who have synergistic needs for energy.
- **Finland** (*Niklas von Weymarn*) – A biofuel obligation law came into effect in 2008 – biofuel shares will rise to 5.75% in 2010 from 2% in 2008, but the 2010 goal is still conditional, and the law allows significant flexibility. Finland has 28% renewable energy right now in total primary energy supply. Biofuel production in Finland comes from NExBTL, which produces a biofuel based on hydrogen treatment of vegetable oils and animal fats. This company has two plants

(170,000 tonnes per year each, opened in 2007 and 2009) mostly using palm oil. ST1 Biofuels also produces bioethanol by cleaning 'dirty' ethanol from Russian production. This company has three plants (1.5 ML per year each, opened between 2007-2009). Combined production capacity in 2009 adds up to almost 10% of transportation fuel consumption. Projects in the pipeline are focused on 2nd-generation biofuels; partners include Stora Enso & Neste Oil (building a demonstration plant to use forest residues in gasification); UPM & Andritz & Carbona (has pilot facilities for F-T diesel); UPM & Lassila & Tikanoja (has pilot facilities to do fibre-based ethanol); bio-oil by pyrolysis, and; microbial oils. Policies in Finland include a biofuel obligation law (2008-2010), an updated national Energy and Climate Strategy (2008) (currently in Parliament reading, and designed to ratify the EU RES directive), and a fuel tax exemption for demonstration purposes. One study is underway by VTT examining fuel taxation based on fuel quality. There are several RD&D initiatives; one program, funded by the Ministry of Employment and the Economy, provided €9M per year for piloting 2nd-generation biofuel solutions (2007-2008) and continues as a €5 M per year fund. From the discussion – it seems that E85 use is really driven by price, but if prices fall in line with gasoline prices the use falls away. The provenance of 'dirty' Russian ethanol is unknown, but 30-40 plants in Russia are active (mostly using wood) but the economics and technology are very different.

- **Ireland (Jerry Murphy)** – The Renewable Energy Standard is focused on electricity; the RES for electricity wants 15% renewable by 2010, 40% by 2020. RES for heating is 5% by 2010, 12% by 2020. RES for transport is 2% (energy basis) by 2008, 5.75% by 2010 (reduced to 3% by energy or 4% by volume), 10% by 2020 (non-kerosene). There will be tradable certificates to facilitate the use of E85 or other higher blends. Total portion of renewable energy by 2020 is 16% by 2020. Biofuel growth to date is about 0.45% total transport (by 2007); the Irish Government has set a target of 10% of all vehicles in the transport fleet by electricity to help meet the renewable energy targets (which are now broader than just biofuels). The government sees electric cars as a way to store wind-generated electricity, and has signed an agreement with ESB and Renault-Nissan on the supply of electrical vehicles (the proposal is 200,000 cars by 2020). Indigenous production of biodiesel is dominantly from rapeseed, with some from tallow and used cooking oil; biodiesel is the dominant biofuel, followed by bioethanol and then pure plant oil). The Draft Renewable Directive has sustainability criteria – 35% reduction in GHG in lifecycle compared to the fossil fuel that it replaces; threshold value will increase. Article 18 states that biofuels from wastes, non-food cellulose and lignocellulosic material will get a double benefit. The draft states that feedstocks in EU are grown under cross-compliance rules. One barrier to converting grassland to other uses – Ireland does not want to become locked-in to wrong biofuel systems, and thus there is an insignificant indigenous biofuel industry. Grass in Ireland is about 22% solids content, due to the prevalence of rain in summers – this could be a feedstock for biofuels (particularly given the low economic returns attached to cattle production). Support for biofuels includes Department of Agriculture, Fisheries and Food funds (€45 per ha), the National Crop Energy Premium (additional €80/ha), and the Bioenergy Scheme. From the discussion – batteries for electric vehicles will be a major impediment to using 'green' electricity as it has been proposed, and the motor vehicle manufacturers can't sell cars right now. We need to see an LCA for car batteries, in order to do a fair comparison. There needs to be policy that can take a portfolio approach, and which recognizes the way that all renewable technologies can work together – grow the pie, don't create artificial competition within the renewable energy sector. There are still many questions about the efficiency of different

systems for energy transport and delivery – such as the question of coal-fired electricity vs. Gasoline use.

- **Japan** (*Jack Saddler*) – Shiro Saka sends his regrets, and Jack presents in his stead. There will be a Japanese delegation attending the IEA Meeting in Vancouver this August, including researchers, industries, and government (NEDO). Japan continues to focus on ETBE instead of ethanol. There is also an interest in bamboo for biomass, palm oil, jatropha, and other feedstocks. From the discussion – there is perhaps a need to consider third-world vs. first-world approaches, where labour costs vary and mechanization levels are different. A problem might be the iLUC associated with converting woodlands to jatropha or other fast-growing species.
- **South Africa** (*Emile van Zyl*) – Biofuel development in South Africa was once strong; in the 1970's, there was a comprehensive research program focused on bagasse-to-ethanol using enzymatic hydrolysis. A number of new yeasts (i.e. *Candida shehatae*) were investigated for their ability to do 5C fermentation; consolidated bioprocessing was also an interest. Biodiesel was also of interest in the 1970's. Sasol developed a model for initiating commercial biomass conversion, based on coal-to-synfuel facilities (Fischer-Tropsch technologies). The final Industrial Biofuels Strategy appeared in December 2007. The target now is a 2% rate by 2013; the government's primary focus was job creation. Maize was excluded from this target, as was jatropha; biofuel blending will not be mandatory. This has left the program in a stalemate. The primary objectives were good, but the general consensus is that the program will not incentivize a biofuels program. Currently, the exclusion of maize has meant that 8 plants to be built were put on hold. South Africa has been producing neutral ethanol but this is all used for non-transport uses. There is interest in the use of ethanol gel as a safe alternative to kerosene. The South African government is participating in the industry, through the Industrial Development Corporation and the Energy Development Corporation – government investment is about \$437 M (USD). About 100 ML of bioethanol will be produced from sugar cane, and a further 90 ML of bioethanol will be produced from sugar beet. A further three projects may be in the pipeline. In the production of biodiesel, more than 200 small entrepreneurs are involved. Feedstock costs are a major concern, as is uptake (most production is for local use), and meeting specs (not standardized). In Mozambique, the government has approved a \$280 M (USD) bioethanol project from sugar cane; other projects by ProCana and Groun resources are also involved, bringing total investment to \$710 M (USD). In Zimbabwe, major projects are being proposed from jatropha and coconut oil. At this time, only 3% of the renewable energy target for South Africa in 2013 has been realized. A Renewable Energy Summit in March 2009; resolutions were taken to get the government back on track, and the creation of a Ministry of Energy was discussed. The Chair for Biofuels will consider bioprospecting, process engineering, and chemical engineering; analysis from this group indicates that there is the potential to replace fossil transport fuels in South Africa with biofuels. From the discussion – the South African government has introduced feed-in tariffs for renewable energy, but has overlooked sugar cane bagasse. The cost of biomass resources for bioenergy has not yet been calculated for South Africa, although there is some concern that estimates have been low (as they have been in North America). It was pointed out that the surplus amounts in South Africa are not really significant; the response is that if there is an alternative market, more land will be converted to maize increasing the availability. South Africa has the ability to be a technology provider and a leader for the rest of Africa; how can we best capitalize on this? There will be opportunities at the Vancouver meeting in August to build further links with other African colleagues.

- **Sweden** (*Lisbeth Olsson*) – Guido Zacchi sends regrets. There are two sectors of importance to Sweden impacted by the financial climate – car manufacture (Volvo is having trouble) and the forest industry (which faces major challenges around the world). Sweden has infrastructure for the distribution of high-blend (E85) biofuels, but much of the biofuel used has been imported – SEKAB has been the major importer in the past, but now somebody else will do it (we don't know who exactly, but one of the gas companies). When it comes to process development and demo plants, SEKAB is the dominant player. SEKAB is pulling out of 1st-generation fuels and overseas projects, but continues to focus on 2nd-generation biofuels. Many biofuel initiatives have not progressed as fast as was expected, and there is debate about 'food vs. Fuel' which has impacted things. There is some interest in biobutanol (Procista? Is a company working in this area), there is interest in algae, gasification, etc. Biorefinery development has been split between biotechnology and gasification processes. The research program on cellulosic ethanol will end in one–two year's time, but there has been a very large change in the granting system and researchers don't know what will happen. Government wants to increase support directly to universities, rather than the granting agencies; the government has made a list of research priorities (including energy, but not really specific to biofuels) and will identify specific universities that can apply for additional funds. That means that a few universities will have major funding to pursue projects, but this also means that some researchers will be left out. There is uncertainty about the future for research funding. There has been an initiative from Chalmers University to get a national centre for transportation fuels (this is supported by industry). The basic idea behind this centre or network would be an independent assessment of different energy types, from a systems perspective, in order to identify the best use of resources and the best fuel types. There have also been initiatives around the forest industry; there is a call for a wood science centre (400 million Swedish Kroner over 10 years) – Chalmers and KTH are working together on this project. The focus will be on material development and the use of fibres, which will have interest for biofuels in the future. From the discussion – focus of the wood science centre will include lignin, cellulose, hemicelluloses products, nanotechnologies, etc. Sweden seems to be going down the route as the UK, in building 'virtual' centres rather than bricks and mortar. The E85 market in Sweden seems to have stopped, because of the relatively high cost of this fuel; people with flex-fuel vehicles are actually using petrol since it is cheaper. Sweden wants to use a loophole in import laws to import ethanol as a chemical, rather than a fuel, which would reduce the cost of Brazilian ethanol (this has already been in effect for a few years). An issue which was raised is the focus on trade markets vs. Domestic production, and the benefits of focusing on national-level resources for local biofuel production.
- **United Kingdom** (*Tony Sidwell*) – Growth of biofuels has been steady over the last few years. Biodiesel has grown to be about 4% of the market, while ethanol has grown less (at about 0.9% of the gasoline market). There is about 20 billion litres demand for gasoline and diesel (each). Since the Renewable Transport Fuels Obligation was introduced, the demand for biodiesel peaked at close to 5% in August 2008 but has been dropping since then. This is because the UK government has not created a strong definition of what the blend mandate actually meant – addition of any amount of biofuel to fossil fuel moves the fuel into a new category. Bioethanol production is at 70 million litres per year (British Sugar, since 2007) and two plants are under construction (Ensus – 400 million litres by end of 2009) and Vivergo Fuels (joint venture with British Sugar, BP and DuPont) (420 million litres by spring 2010). Biodiesel production is at 558 million litres per year (three companies – Greenergy, Earls Nook Ltd, and Argent Energy). Nobody is actually building a biodiesel plant in the UK right now, although some companies say

that they might do something. The RFTO act has been amended, with a slow-down in the take-up (target for 5% by volume was originally set for 2010; now phased in by 2014). The amendment redefined what relevant hydrocarbon oil is (to address definitional problems), and introduced new qualifying fuels (biobutanol and 'renewable' diesel). TMO Renewables have a small pilot plant in the UK now for 2nd-gen lignocellulose-to-ethanol. The Sustainable Bioenergy Research Centre has received £27 million in government funding (spread over 5 years). This Centre focuses on 6 strands (perennial bioenergy crops, cell wall sugars, cell wall lignin, and lignocellulosic conversion to ethanol, 2nd-generation bacterial biofuels, and marine wood borer enzyme discovery) – this is being run by the British Biological Research Council and involving many universities and some industry participation. The sustainability reporting continues in the UK – first reporting period (15 April 2008-14 January 2009) saw 987 million litres biofuel used (majority imported), and only 18% of biofuels met the sustainability standard (target was 30%). However, 99% of the biofuels from UK sources met environmental sustainability standards. The GHG savings were 46% (target 40%); companies were 'named and shamed'. From the discussion – transparency is key to the longer-term survival of the industry, and that means expanding on the transparent reporting the UK (and others such as the Netherlands) has pioneered. British Sugar's continued interest in butanol was discussed, and other corporate developments were also introduced. There are a number of new product options that aren't on the agenda yet, but perhaps should be.

- **United States** (*Jim McMillan*) – in the USA renewable energy is about 7% of the total energy demand, half of which is ethanol. The current production status for biofuels: dominant source is grain (corn), but major fluctuations in corn prices over past year have been impacting the industry: 34 billion litres production (2008), 212 plants operational or under construction (production capacity 45 billion litres) – of the 212 plants, roughly 177 are operating, 15 are idled, and 20 are being constructed (most recent numbers from Renewable Fuels Association, ethanolrfa.org). Estimated biodiesel production at 3 billion litres (2008) and ramping up. Outlook for biofuels: increase in ethanol to 50 billion litres by 2010. Primary driver: the Energy Independence and Security Act of 2007. The Act mandates a cap on corn ethanol at 15 billion gallons. Biodiesel exports into the European market will be limited through outlawing of 'splash-and-dash'. What is an advanced biofuel? It must have a 50% reduction in GHG emissions (and measurement of the reduction is not agreed upon). Cellulosic biofuel must have a 60% reduction in GHG emissions. The biggest problem is the role of indirect Land Use Change – no agreement on how that will be handled. An area of interest in the DOE program is advances in the development of new enzymes and new organisms – more information to be found at www.eia.doe.gov and at www.obpreview2009.govtools.us/biochem. Big issues that remain: cost of carbon, indirect land use change (which may unfairly target biofuels by assuming a 'steady state' for agricultural/forest land around the world). From the discussion – iLUC seems to be a delaying tactic to slow biofuels progress. Carbon leakage is also an issue – who gets the carbon credit or the carbon debt? We need balance in the discussion – we need a norm for comparison, or a systems approach to this issue.

Upcoming Meetings

- Manfred Wörgetter provided a summary of the Dresden Meeting, which will be held 3-5 June 2009. This meeting will have sessions focusing on international issues, technology progress, the German biofuels roadmap, and lignocellulosic ethanol technology, as well as policy and implementation issues. More information is found in the presentation (attached).

- Jack Saddler provided a summary of the Vancouver Multi-Task Meeting, which will be held 23-26 August 2009. This meeting will cover many aspects of IEA Bioenergy, with input from many of the active Tasks within the Implementing Agreement. Task 39 might hold a business meeting on Sunday the 23rd in the afternoon. More information is found in the presentation (attached).

Consultant's Reports

- Manfred Wörgetter provided an overview of the *Demonstration Plants Review* conducted by Dina Bacovsky. This report was designed to provide a comprehensive list of the facilities we have the production of lignocellulosic biofuels – in order to describe the status of development of the main 2nd-generation biofuels. Both liquid and gaseous biofuels were included, as were biochemical and thermochemical routes; plants built, planned, or under construction were included. Data on a variety of factors was collected, using a standardized data survey. A total of 170 projects were listed in November 2008, with 49 documents gathered from the web. The data was organized into a database and then mounted on the internet. Fifty-seven lignocellulosic projects are listed in the project. Open questions – how often should the database be updated, how long will the service be provided, and are there more funds available? **Action items:** Manfred to invoice Jack for work done; continuing work on the Demo Plant review to be included in the proposal for the next triennium.
- Jack Saddler provided an overview of Don O'Connor's most recent report on the *Potential for Improving Carbon/Energy Balance of Bioethanol*. The Global Renewable Fuels Alliance issued a press release and organized a news conference the first week of April to assist with the broad dissemination of the results. Some of the questions that arose – is there a similar report for biodiesel? Is there a similar report for 2nd-generation biofuels? Don proposes that Task 39 may wish to commission a similar report on biodiesel. There may also be a role to play in the evolving assessment of life cycle assessment. Groups including IEA Bioenergy Task 38, IEA AMF Task, Industry Associations, and governments are focused on these issues. A suggestion for future work was to look at the differences in model inputs between different countries or continents for things like fertilizer, chemicals, etc. **Action item:** Jack to contact Don, request a proposal for work on the differences in LCA inputs and approaches among Task 39 countries as well as a proposal for work on the aspects of biodiesel production.

New Triennium Proposal

Jack introduced the proposal for the next triennium. One area of immediate interest is the algal biofuels component. IEA wants to look at algae, and the Advanced Motor Fuels Implementation Agreement has put in a proposal for work in this area – however, nobody on the proposal has (in our opinion) real expertise in the area. Arguably, Task 39 is better positioned to do work in this area. There has been lots of work on algal biofuels – the US DOE has done a report, and contributed to other US and international reports on the status of algae. John Benneman wrote a report 15 years ago and not much has actually changed since then, although interest has taken off and many people seem convinced that this is the future of biofuels, including IEA AMF. There is solid expertise in both the USA and Australia that we can build on; Jim McMillan and Les Edye have shown leadership and could take on this role within Task 39. What role can Task 39 play that is (a) different and (b) value-added, when compared to the ongoing work in other areas? It is important to set the boundaries of what Task 39 is interested in before going too far down this road.

Other areas of interest: the Task is proposed to consider both policy and technology as in the past, with a bit of an extra focus on lignocellulosic pathways (where there is additional expertise within the Task). Multiple future meetings are proposed and we are looking for hosts for upcoming sessions. It is helpful to have other meetings to attend or piggyback upon. Suggestions for the planning session in January might be the UK or Austria. Another suggestion is that we hold a meeting in Nov/Dec 2010, in conjunction with Bioenergy Australia which is expected to have 400+ attendees (proposed for Autumn 2010). Another suggestion is that the Autumn 2011 might be held in South Africa.

Jack and Jim will be liaising with the ExCo at the meeting next week – they will confirm the ideas that we have discussed here and ask for input to move forward.

Action items: Jack to speak to AMF about the ways in which Task 39 could work with them on the algal biofuel issue; all Task members to follow up on preference for meeting locations through the next triennium.

Close of Meeting

Jack Saddler thanked all participants and closed the meeting at 4:30pm.