

IEA Task 39 Business Meeting

IEA Bioenergy Task 39 Commercialization of conventional and advanced liquid biofuels from biomass

7-9 April 2018

BUCT, Beijing, China

Multi-function Room, 1st Floor, Conference Centre Building, Beijing University of
Chemical Technology, 15 East Beisanhua Road, Chaoyang District, Beijing, 100029,
China

Saturday, 7 April, 2018

8h30	Coffee
8h45	Welcome by IEA Bioenergy (Jim Spaeth, US DoE and IEA Bioenergy ExCo Chairperson) Welcome to IEA Bioenergy Task 39 meeting. Jim McMillan (NREL) / Huili Zhang (BUCT)
9h00	Overview presentation on the ongoing and proposed activities of IEA Bioenergy Task 39 (Liquid Biofuels) Jim McMillan, Jack Saddler and Susan van Dyk
9h30	Summary of projects covered in the current triennium Meetings and Newsletters Commissioned work Budget/financial status Plans/deliverables for the remainder of 2018 spending plans for remainder of current triennium. (Jim M./Jack S.) <i>(Background information will be distributed, by email, prior to meeting)</i>
10h00	Detailed coverage of the Implementation agendas report An overview of global biofuel production (by country and region, with focus on Task 39 members) <i>Main emphasis on the policies that have been used to promote the production and use of biofuels - Key characteristics and advantages and disadvantages.</i> Summary of the draft report (Susan van Dyk)
10h15	An update of RED II negotiations – Tomas Ekbom
10h30	Coffee/tea break
10h45	Brief (4-5 slides max.) Focus on different biofuels policies in countries, current and future trends Based on the material sent into Susan for the Implementation agendas report. Target biofuels and policies used (10 min each) Australia, Brazil, Canada, Denmark, European Commission, Germany, Japan, Korea, Netherlands, New Zealand, Sweden, USA (Austria and South Africa may send PowerPoints, even though they will likely miss the meeting)
12h45	Invited guest speakers (15 min each) - Indonesia (Mr. Paulus Tjakrawan, Vice Chairman Aprob)
13h15	Lunch
14h00	UPDATE ON COMMISSIONED WORK Advanced Fuels for Advanced Engines - Final report presentation by Germany (Ulrich Arnold) Discuss possible follow-up work with Advanced Motor Fuels (AMF) TCP
14h30	Drop-in Biofuels report update (Susan van Dyk / Jack Saddler) - Production and uptake of drop-in biofuels - Status of technology providers - Refinery integration and co-processing potential and challenges
15h00	Coffee/Tea break
15h15	IEA Bioenergy Roadmap - Adam Brown
15h30	Proposed Task 39 activities for new triennium (Jan 2019 - Dec 2021) Discussions lead by Jim and Jack

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	<ol style="list-style-type: none"> 1) Continued focus on drop-in biofuels incorporation supported by expanded TEA and LCA studies 2) How to strengthen the policy component of Implementation Agendas report? Also increase focus on specific policies for aviation and marine sectors and considerations of international law. 3) Possible four co-leads for ongoing LCA studies (Luisa/Adrian O’Connell (EU), Mark Staples/Michael Wang (US), Don O’Connor (Canada), Antonio Bonomi (Brazil)) 4) Focus on decarbonisation of long distance transport (Air, marine, rail, trucks) via drop-in biofuels 5) Refinery integration and co-processing – Technical and policy issues (Chevron, Ensyn, Total, etc.) 6) Progress on commercialisation of advanced biofuels, particularly cellulosic ethanol plants 7) Update of Biofuels Demonstration Facilities 8) Coordination with IRENA on biofuels developments in non-IEA countries 9) Policy evaluation – carbon tax, low carbon fuel standard and mandates – which one works the best to promote biofuels? (Ties into item 2) 10) Ongoing collaboration with other IEA Bioenergy Tasks, other TCP’s such as AMF and other agencies such as IRENA, GBEP, RSB, FAO, etc. <p>NB. Possible collaboration with Task 43 (Mark Brown) in particular (Feedstock quality/supply focus)</p>
17h00	<p>Future meetings</p> <ul style="list-style-type: none"> - San Francisco, USA, 5-9 November 2018 - Europe, early 2019 - India, late 2019 - 2020?
	<p>Future Newsletters – country profiles for feature stories</p> <ul style="list-style-type: none"> - April 2018 - United States - August 2018 - Canada
	<ul style="list-style-type: none"> - General Discussion
18h00	Close of meeting
19h00	Close of meeting and formal banquet - Da Zhai Men (大宅门) Chinese Restaurant: #3 Building, Huixinbeili, Anyuan Road, Chaoyang District, Beijing

Sunday, 8 April 2018

8h30	Welcome - Review and program for the day’s discussions (Jim McMillan / Jack Saddler)
8h40	<p>Panel presentation & discussion: Sustainability of biofuels and life cycle assessment (Moderator: Jim Spaeth, IEA Bioenergy ExCo Chair and ExCo US member (US DOE))</p> <ol style="list-style-type: none"> a) Michael Wang (Argonne National Laboratory, USA) b) Mark Staples (MIT) c) Don O’Connor (via skype) (S&T² Consultants) d) Rolf Hogan (Roundtable on Sustainable Biomaterials) e) Nan Li - WWF (China) <p>DISCUSSION</p>
10h00	<i>Coffee/tea break</i>

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10h15	<p>Panel presentation & discussion: The role of biofuels – focus on aviation (Moderator: Elisabeth Martin, Boeing)</p> <ul style="list-style-type: none"> a) Elisabeth Martin, Managing Director, Boeing Research & Technology – China b) Robert Boyd, IATA (International Air Transport Association) c) Ken Lai, VP Asia, Lanzatech “Waste to Wing: Converting Residues to Jet Fuel” d) Shutong Liu, Motioneo <p>DISCUSSION</p>
11h30	<p>Panel presentation & discussion: Biofuels development in China (Moderator: Paul Bennett)</p> <ul style="list-style-type: none"> a) Fan Li Senior Researcher, COFCO (Biofuel producer) b) Hailong Lin Chief Engineer, National investment Bio-technology Ltd. Co. / c) DISCUSSION
12h15	Lunch
13h15	<p>Opening speeches</p> <p>Mr. Siqiang Wang, Director of Technology and Facility Division / 科技装备司, China National Energy Administration (NEA)</p> <p>Mr. Jim Spaeth, IEA Bioenergy ExCo Chair and ExCo US member (US DOE)</p> <p>Prof Tianwei Tan, BUCT</p>
14h15	<p>The work of IEA Bioenergy: Presentations from other IEA Bioenergy Tasks</p> <ul style="list-style-type: none"> a) Task 43 (Mark Brown) sustainable production and use of biomass for bioenergy/biofuels b) Task 33 (Gasification) Timo Gerlagh c) Task 34 (Direct Thermochemical liquefaction) Paul Bennett (IEA Bioenergy ExCo New Zealand member; Scion)
15h30	Coffee/tea break
16h00	<p>Final/summary discussions. (Moderator: Jack Saddler)</p> <p>Invitation to end-of-triennium meetings in San Francisco, 5-9 November 2018</p>
17.00	Close of meeting & Informal social event - Pizza Maru: 2nd floor, Jia #35 Building, Area 11, East Beisanhuan Road, Chaoyang District, Beijing (Opposite to BUCT gate)

Attendance:

Jack Saddler, Jim McMillan, Tomas Ekbom, Steve Rogers, Timo Gerlagh, Adrian O’Connell, Tony Bi, Ulrich Arnold, Mark Staples, Satoshi Aramaki, Scott Stanners, Jim Spaeth, Paul Bennett, Henning Jorgenson, Peiyong Qin, Michael Wang, Paulus Tjakwaran, Leif Jonsson, Ian Suckling, Jin Suk Lee, Shiro Saka, Mark Brown, Jianping Su, Ken Lai, Siduo Zhang, Huili Zhang, Antonio Maria Bonomi

Jack – (moderator) welcomed everyone and thanked BUCT and Dr Huili Zhang for all the hard work in organising the meeting. Review of agenda and dinner arrangements. Introduction of Professor Tony Bi and the Canada China Bioenergy Initiative (CCJCBERI) participating in the Task meeting and a separate meeting on Tuesday.

Jim Mc – Thanks and welcome, thanks to BUCT and Huili, giving of gift

Huili Zhang – short welcome

Jim Spaeth – chair of ExCo, welcome

Jack Saddler – Review of the agenda, recruiting new members, progress with China, Indonesia, India, Mexico, any additions required?

Gantt chart – review by Jack of deliverables – marine biofuels report, some tasks not completed (on hold), partly lacking a “point person” to take the lead. Group suggests perhaps too ambitious in goals?
 Jim – important for us to complete our current / planned deliverables this triennium, i.e., by end of 2018 (ideally in advance of end of triennium conference being held in San Francisco in early November).

Jack – review of current projects including implementations agenda report, drop-in report, budget
 Discussion of outstanding deliverables proposed for deferral to next triennium– spatial analysis of feedstock reserves (pursue jointly with Task43?), potential of 1.5 gen feedstocks (potential for China to lead this if they join Task 39?)

Jim – special project proposed by ExCo to look at potential for reducing cost of biofuels starting. Looking forward, feedstock cost is largest element so we should place greater emphasis on use of captive feedstocks, gen 1.5 etc in next triennium.

Jack – goal of identifying co-products that can help drive biofuels – (but already done in workshop in Gothenburg by Task 42?)

Steve Rogers – good point – that Task 42 has been more focused on sugar as basis for multiproduct biorefining, Task 39 should continue working on this – more broadly than just sugar valorization –as its important as a cost reduction strategy

Ian Suckling – maybe part of special project?

Summary, keep focus on biorefinery approach as making advanced biofuels alone difficult to be economical.

Task has been cautious about prematurely reporting “success stories” (e.g., although successfully launched, several pioneer cellulosic ethanol demonstrations plants have since failed to sustain operation (fate of Abengoa, DuPont, Cresentino, etc.)

Proposed work with AMF on Roadmap for integration of advanced biofuels if will fund (Task 39 funded current report and previous algae prospects summary report collaboration)

SvanDyk – presented the implementation agendas (compare and contrast policies used to make and use biofuels) report (see slides). Response to questionnaire was OK but too much of an “apples-and-oranges” comparison. Good discussion followed

Mark Staples suggested also incorporating international regulations (such as CORSIA)

Discussion about unreliability of data, especially for Europe where distinction is made between sustainable proven and sustainable not-proven fuels for the renewable energy market, but not within trade statistics.

Tomas Ekblom presented on RED negotiations (see slides)

Currently at trilogue meeting stage – disappointingly low projections of/aspiration for reduction in fossil dependence by 2030

Member states have set ambitious targets, but the biofuels policies seem “paralyzed” due to an “excessive” focus on sustainability

Morning coffee break followed by country reports: (see posted presentations)

Canada – Susan van Dyk: Funding availability and timeline for introducing new Clean Fuel Standard

Australia – Steve Rogers: There used to be Zero excise for ethanol and biodiesel however excise is now being gradually increased until it reaches a third of gasoline for ethanol and half for diesel (the difference relating to the difference in energy density) ; ethanol production grants program; little to show for investment; State biofuels mandates in Queensland and NSW; education program deployed which was critical to success in Queensland; tallow being exported to Neste in Singapore has led to idled biodiesel plants; excellent R&D support (40-50% rebate)

Brazil – Antonio Bonomi: RenovaBio legislation passed, a new National Biofuel Policy that will support the continued development and use of low-carbon biofuels; to meet Paris commitments; fundamentals of the policy – addition of value to the biomass, strategic role of biofuels in the energy matrix; annual carbon reduction targets; biofuel producers will receive CBios, the number depending on their fuel production volumes and production efficiencies; fuel distributors will have targets; reduce GHG by 37% in 2025; by 43% in 2030; Renova calc based on LCA of biofuel production; determine the competitive differential between mills and favor plants with lower emissions;

Denmark – Henning Jorgenson: support for biogas and electrification; most likely no incentives for advanced biofuels; relaunch of National Bioeconomy Panel; big focus on biogas (receives 25% of all public support for RE); marine biofuels; lignin ethanol oil

European Commission – Adrian O Connell: some discussion on definitions of waste and problems around this; renewable fuels from non-biomass, such as off-gases

Germany – Ulrich Arnold: main driver is climate protection; target of 42% reduction by 2030 and 95% by 2050; summary of policies; production and consumption graphs; advanced biofuel producers;

Japan – Satoshi Aramaki: no domestic production of ethanol, all imported from Brazil, used as ETBE

Korea – Jin Suk Lee: 37% reduction of CO₂ by 2030; domestic feedstock supply (little availability) is a main barrier; mainly use used cooking oil and palm fatty acid distillate

Netherlands – Timo Gerlagh: still a big reliance on fossil fuels; main natural gas fields will be closed by 2030 because of earthquakes increasing in the area. Climate plan will have impact on future policy and is expected this summer.

New Zealand – Ian Suckling: biofuels account for less than 0.1% of liquid fuels; emissions net zero by 2050; binding targets for the first time; emissions trading scheme; limited support for biofuel; policies to support EVs

Sweden – Tomas Ekblom: Gobigas plant closing down, unable to secure new buyer/operator; Sunpine tall diesel plant increasing capacity by 50%

USA – Jim McMillan: positive and negatives; corn fibre-based cellulosic ethanol in existing corn dry mills expanding; CAFÉ vehicle fuel efficiency standards making an impact but under threat to be rolled back; most of the advanced ethanol based on 1.5 gen corn fibre; co-optimization of fuels and engines recommends using higher ethanol blends in higher compression ratio engines; ethanol is the cheapest form of octane

Lunch

Indonesia – Mr Paulus Tjakrawan (Indonesian Biofuel Producer Association): Indonesia B20 development; Indonesia's biofuel program – main start in 2005; 4th highest population in the world; poverty, etc.; in 2008 biofuels became mandatory; current biodiesel blending mandate at 20%; currently doing road tests for B30; renewable energy targets for 2025, 23% and 31% by 2050; hoping to reach B30 by 2020; ethanol produced from molasses from sugarcane; aimed to use jatropha but this did not work out, so started using palm oil; palm oil not grown specifically for biofuel; productivity per hectare is much higher than for other seed oil crops; 6 times higher productivity; 12 billion litres per year installed capacity; production in 2017 was 3.4 billion litres; industry profile mostly in west part of country; a lot of the palm oil is produced by small farmers each cultivating about 2-3 hectares, representing 3.2 million families; important source for farmers income; sustainability – every plantation is certified by ISPO; also other standards such as RSPO and ISCC; quality of biodiesel; sustainability certification can be strengthened to address concerns within EU (and North America); questions and discussion about wide range of other products palm oil is used for.

Afternoon coffee break

Adam Brown (skype from Paris) to review highlights of IEA's updated Bioenergy Roadmap – Delivering sustainable bioenergy. Launched on 30 November 2017. The full portfolio of technologies is needed to reach decarbonization targets; ALL technologies needed to be able to meet the 2 degree scenario (2DS) and even more so to achieve the below 2DS, incl carbon capture and storage; bioenergy essential for all low carbon scenarios; strong accelerated deployment needed from now until 2030; modern bioenergy increases to 70 EJ by 2060, specifically needed in transport as few alternatives exist especially in heavy freight and aviation sectors; advanced biofuels play an important part in 2DS scenario by 2060, electricity and biofuels equally contributing to transport decarbonization; four key actions: 1) promote short term deployment of mature options, 2) stimulate development of new technologies (e.g., advanced biofuels), 3) deliver the necessary feedstock sustainably, and 4) develop capacity and catalyse investment. Need for appropriate policy frameworks to be established, implemented; important to develop cost reduction pathways. What next? Biofuture platform, Mission Innovation, follow up of key deployment indicators, continued cooperation of international organizations; sustainable bioenergy is essential, biofuels particularly important in transportation, scale up and broad deployment of advanced biofuels key to success; progress is much slower than necessary so we need to expand deployment of existing technologies too, etc.

Q – have we had feedback from IRENA or FAO? (A: Not extensively, at least yet.)

Jack – scale up and cost reduction remain key

Ulrich Arnold – update on Advanced Biofuels Survey report; reviewed report structure and exemplary content (see slides). Group agrees that this can be considered as a final report (once final polishes made; send any final input to Olaf Schröder, olaf.schroeder@tac-coburg.de, by the end of April). Once finalized, this report will be posted in the “members only” section of the Task 39 website for 3 months. After this, it will be moved to the publicly-accessible part of the Task website

Discussion of next triennium proposal (prolongation proposal for 2019-2021)

Jack presented slides (based on extracts from the prolongation proposal previously distributed to Task members) to initiate discussion.

Ulrich Arnold presented some comments on behalf of Germany. While in agreement with continuing to follow algae biofuel technology development and pursue further work on advanced fuels in advanced engines with AMF, also worth considering are feedstock approaches to biofuel supply, emerging power-to-liquids (PTL) technologies, methanol-based biofuel (with China), OME fuels and analysis of technology and fuel readiness levels (TRLs and FRLs, respectively) for PTL technologies.

Suggestion to possibly amend the Task title to incorporate the use of non-biomass feedstocks and expand the Task focus beyond biomass-based feedstocks.

Tomas emphasized the importance of trying to get Norway and Finland back into the Task, as well as the United Kingdom and Italy.

Jim concurred and reminded that the more members the Task has for the next triennium, the more it will be able to do and the more comprehensive its deliverables can be.

Timo pointed out probable overlap in some of the proposed work with Tasks 43 and 40, suggesting that feedstock supply chains should be left to (be led by) those Tasks, although Task 39 should continue to work with other Tasks in this area. Timo also indicated that the terminology regarding feedstocks (waste, 1.5 generation, etc.) was confusing and that we should possibly use the term “low iLUC feedstocks.” Consensus was not reached on this point.

Regarding electrofuels, it was proposed that Task 39 should work with AMF. Jim Spaeth also raised the possibility of a separate task being formed for electrofuels, noting that the ExCo is planning a workshop on the subject of electrofuels in the near future.

Jim Spaeth proposed that, unless there are any objections to the proposed Task 39 work for the next triennium, that it should be accepted.

Sustainability will be a core part of the future work of Task 39, and Adrian will become part of the LCA / sustainability assessment expert subgroup of Antonio, Mark Staples, Michael Wang and Don O'Connor.

At the end, it was suggested that Task members get back to Jack/Jim if you had any further feedbacks on what is proposed – or are willing to champion a particular part of the programme.

DAY TWO

Day two of the meeting featured a number of guest speakers in four different panels. See slides for further information. To stay on schedule, Q&A and subsequent discussion was mostly carried out at the end of the day.

- Sustainability and Life Cycle Assessment (Jim Spaeth moderator)
 - o Michael Wang (Argonne National Laboratories) GREET Biofuel Lifecycle Analysis
 - o Mark Staples (Massachusetts Institute of Technology) Life cycle analysis for advanced biofuel
 - o Rolf Hogan (Roundtable on Sustainable Biomaterials) An approach to sustainability
 - o Nan Li (World Wildlife Federation) Sustainability of Alternative Aviation Biofuel
 - o Don O'Connor (S&T2 Consultants) (via Skype)
- Aviation biofuels development (Elisabeth Martin moderator)
 - o Elisabeth Martin (Boeing) Sustainable Aviation Biofuel – Boeing's work in China
 - o Robert Boyd (International Air Transport Association) – The role of biofuels in aviation
 - o Ken Lai (Lanzatech) – Lanzatech technology and progress in commercialisation
 - o Shutong Liu (Motioneco) – The biodiesel industry in China
- Biofuels in China (Paul Bennett moderator)
 - o Fan Li (COFCO) – Fuel Ethanol Industry in China
 - o Hailong Lin (SIDC) – Technical progress of bioethanol in China
 - o Prof Li Chang-Zhu – Bioproduction technology of biodiesel and biolubricants from non-edible oil
- Work of IEA Bioenergy:
 - o Mark Brown (Task 43 – Sustainable Biomass Supply)
 - o Timo Gerlagh (Task 33 – Gasification)
 - o Paul Bennett (Task 34 – Direct thermochemical liquefaction)
- Other distinguished speakers
 - o Jim Spaeth – Introduction to IEA and the IEA Bioenergy TCP
 - o Prof Tianwei Tan – Liquid Biofuels in China and the work of his research group at BUCT
 - o Director-General Siqiang Wang (China's National Energy Administration)

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The general agreement among the participating distinguished speakers and audience from China and IEA Bioenergy was that the planet is faced with ever more pressing problems of environmental pollution and climate change and that parties should come together to meeting the common challenge. We can make positive impacts more quickly together than separately. China has set ambitious objectives and is committed to renewable energy investment and the active development of biofuels.

The final discussion of the day touched on aspects of sustainability and the Life Cycle Assessment models that are currently used. Some discussion took place on the sustainability of palm oil for production of biojet fuels and the perception of sustainability challenges for this feedstock.