

IEA Bioenergy Task 39
Commercializing Conventional and Advanced Transport Biofuels from Biomass
and Other Renewable Feedstocks

IEA Bioenergy Task 39 Virtual Business Meeting
Monday & Tuesday, 23-24 November 2020, 2-4:15PM CET

Draft Meeting Minutes and Agenda

Attendance: Adam Brown, Alok Satlewal, Adrian O’Connell, Andrea Sonnleitner, Cecilia Higa Gonzales Morilla, Dina Bacovsky, Don O’Connor, Duncan Akporiaye, Franziska Müller-Langer, Glaucia Mendes Souza, Jack Saddler, Jianping Su, Jim McMillan, Jin-Suk Lee, Jose Muisers, Leif Jönsson, Mahmood Ebadian, Nicolae Scarlat, Nicolaus Dahmen, Nuwan Kapu, Oshada Mendis, Pablo Silva Ortiz, Paul Sinnige, Ravi P. Gupta, Rubens Maciel Filho, Tomas Ekbohm, Tor Ivan Simonsen, Steve Rogers, Sune Tjalfe Thomsen, Susan van Dyk, and Yuta (“Shibby”) Shibahara.

Regrets: Kyu-Young Kang, Johan van Doesum, Paul Bennett, Michael Persson, Seonghun Park, Shiro Saka, Stephen Dooley.

Similar to the last two meetings, the third Task 39 business meeting of 2020 was held virtually, using Zoom. A majority of Task 39 country representatives were able to attend, despite the widely different time zones across member countries. The main goal of the meeting was for the many project leaders to present progress updates and describe next steps for their respective projects. This virtual meeting(s) also provided a forum for Task 39 members to share questions, thoughts and ideas regarding the scope, objectives, methodology and interim findings of each project.

Day one: 2.00-4.15PM CET, Monday, 23 November, 2020

1. Welcome and introduction

Jim McMillan (Jim) called the meeting to order at 14:00 CET (5:00 PST), welcoming Task 39 members to the third virtual Task 39 business meeting of 2020. Jim thanked everyone for joining the meeting and then reviewed the meeting agenda which was structured to provide updates on Task 39’s activities and progress since the task’s last virtual meeting held in June 2020. Since the June meeting the Task has: published newsletter #55 (profiling Sweden) and the peer-review manuscript in the journal Energy Policy entitled “Biofuels policies that have encouraged their production and use: An international perspective”). It has also carried out other information dissemination activities, notably a joint webinar panel discussion with the [BC-SMART Biofuels Consortium](#) in late June 2020 entitled “Crystal ball gazing: How do we decarbonise long distance transport during/after COVID-19”. It also contributed to the recently completed IEA Bioenergy Task 41 funded Special Project report led by Dina Bacovsky, “The contributions of advanced renewable transport fuels to transport decarbonisation in 2030 and beyond”. The final project report is now available at the IEA Bioenergy TCP (and AMF TCP) website: [The Role of Renewable Transport Fuels in Decarbonizing Road Transport](#).

Jim suggested that, due to ongoing travel restrictions impacting most (if not all) of Task 39’s members, although it is difficult to make firm decision at this time, it is likely the proposed future Task 39 meetings planned in Denmark on 21-23 April and in Australia in late 2021 will not take place physically. (More discussions on this topic took place at the end of second day and are summarized in section 3 of these meeting minutes).

Although materials had been distributed prior to the meeting, Jim briefly described the status and breakdown of Task 39’s 2020 budget as well as the Gantt chart showing the status of Task 39’s deliverables for the 2019-2021 triennium, which had also been presented at the IEA Bioenergy ExCo86 Virtual Meeting held on 22 October, 2020.

Jim finished his presentation by reminding participants about the upcoming Task 39-Task 44 Joint Workshop entitled “Role of biofuels producing biorefineries in grid balancing” to be held at 3:00-5:00pm CET Wednesday 25 Nov 2020 and encouraging Task 39-members to attend and participate in this workshop if their scheduled permitted.

#Note on additional meeting for preparing the next triennium 2022-2024

2. Project update presentations

Eleven current and “developing” projects were presented by their respective project leader(s). The presentations summarised each project, progress made so far and next steps. (To avoid repeating the content of presentations here, Task 39 members are encouraged to review them via the members-only part of the task’s website). A copy of the presentation slides and the recording of the virtual meeting are posted on the “Members Only” section of Task 39 website; contact Mahmood if you have difficulty accessing them.

Adam Brown “kicked-off” the meeting by updating the group on recent activities at IEA headquarters concerning Renewable Energy and the Biofuture Platform.

2.1. Progress with Biofuture Platform (Adam Brown)

Adam Brown (Adam) presented some of the recent Renewable Energy activities that IEA is leading, including the “IEA Energy Technology Perspectives (ETP) update report-2020” and “Renewables 2020”. The IEA ETP 2020 report updates the role of biofuels in future lower carbon intensity transport with the emphasis on combining biofuel production and carbon capture, utilization and storage (CCUS). Other options include hydrogen-based fuels, electricity, etc. Adam also updated the group on the “Biofuture Platform (BFP)” initiative including changes in its organizational structure and how it is now part of the Clean Energy Ministerial (CEM) initiative to encourage more country membership and industry engagement. Adam also described the BFP’s 5 COVID principals and the policy blueprint used to identify stronger and weaker policy areas to encourage further production and use of bioenergy.

Adam mentioned that some of the current Task 39 projects such as recently launched “Lessons Learned/Success Stories” InterTask project have good synergy with BFP activities (e.g., the development and deployment of advanced biofuels). He suggested having follow-up discussions to explore possible collaborations between Task 39 and the Biofuture Platform.

2.2. Introduction and Overview of India’s Biofuels Activities (Ravi P Gupta)

We are very pleased to now have India as a member of Task 39! To begin to familiarize the group with the situation in India, Ravi P Gupta (Ravi) provided an overview of energy consumption in India and the activities underway and planned to reduce the carbon intensity of its energy sector. As in many other jurisdictions, fossil fuels remain the primary source of energy in India with a total share of 91% of the country’s primary energy consumption. As Ravi explained, total GHG emissions by India are the third largest in the world although per capita emissions remain well below the global average. Increasing the use of biofuels and other renewable energies is being championed by the government as a major strategy to reduce the dependence on imported fuels and reduce national GHG emissions. The primary policy tool is the country’s “National Biofuel Policy 2018” that includes the ambitious goal of increasing ethanol blending in gasoline from a current level of 4.3% to 8-10 % by 2020-21.

Ravi also described the major national programs that support the implementation of biofuels. The government has established five dedicated bioenergy centers for biofuel research. Ravi also described the existing and proposed advanced biofuels plants in India.

Ravi also shared a recent news item, “India only G20 nation on track to meet Paris pact’s 2°C goal”. Read more at: <https://timesofindia.indiatimes.com/home/environment/global-warming/india-only-g20-nation-on-track-to-meet-paris-pacts-2c-goal/articleshow/79292694.cms?>

2.3. Update on biofuels in marine shipping report (Sune Tjalfe Thomsen and Tor Ivan Simonsen)

Sune Tjalfe Thomsen (Sune) described the progress that his team has made on “updating the biofuels in marine shipping report”. He shared some of the main outcomes of their survey regarding “the barriers for implementation and deployment of biofuels in the marine sector”. Stakeholders participating in the survey so far include GoodFuels, Wärtsilä, NYK Line, MAERSK, BMW, Blended Fuel Solutions NZ, Port of Rotterdam and Port of Vancouver. Sune summarised the stakeholders’ responses to “future role of biofuels in the marine fuel market”, “expected biofuel market share”, “most promising alternative fuel” and “the largest barriers for marine biofuels”. Most of the surveyed stakeholders see an important role for biofuels in decarbonising the marine sector. Price, availability of supply chain infrastructure to supply commercial quantities of biofuels and uncertainty in sustainability criteria are seen to be the main barriers to achieving substantial biofuels penetration into the marine sector.

Leif Jonsson (Leif) shared a link for a Swedish-Dutch initiative on marine biofuels: <https://www.sekab.com/en/press-releases/sekab-and-vertoro-to-build-large-scale-demonstration-plant-to-produce-a-new-platform-for-sustainable-fuels-chemicals-and-materials/>

Franziska Mueller-Langer (Franziska) also shared the IEA AMF TCP’s Annex 56 which also includes methanol for shipping: https://www.iea-amf.org/content/projects/map_projects/56

2.4. Analyze status of biofuels production and use in non-IEA countries/emerging economies (Glaucia Mendes Souza, Heitor Cantarella, Luis Fernando Cassinelli, Luiz Horta Nogueira, and Rubens Maciel Filho)

Rubens Maciel Filho (Rubens) described the selected countries considered to be emerging economies, containing large populations and, on average, with lower energy consumption compared to developed countries. The countries include Brazil, Argentina, Colombia, Mexico, South Africa, Nigeria, India, China, Thailand, Malaysia and Russia. Data collected for each country includes “GHG emissions from fuel consumption”, “Electricity domestic consumption”, “Share of renewables in electricity production”, “Final energy consumption and share of biofuels” and “Feedstocks used in the production of biofuels”. Rubens also described the methodology used for data collection and compilation and the key performance indicators used to compare and contrast the countries. One of the main conclusions of the project so far is that bioenergy has the potential to be a significant part of the energy matrix (biomass-based biofuels and biochemicals) in each of these emerging economies.

Glaucia Mendes Souza (Glaucia) also reminded the group that the virtual BBEST/BIOFUTURE 2020 conference will be held 30 Nov-2 Dec 2020. It will include a series of online events such as a policy day forum and reformulated poster sessions to provide more exposure and opportunities for interaction between the participants and sponsors. Task 39 members who already registered for May 2021 event will be automatically registered for this event for free. She also mentioned that Task 39 members who have not registered yet and are interested in participating in the virtual event should contact her (Glaucia at glsouza@iq.usp.br) to secure a free registration. The full program for the May 2021 meeting can be found here: <https://bbest-biofuture.org/v2/program-2/>.

2.5. Inter-Task Lessons Learned Biofuels (Tomas Ekbom and Franziska Müller-Langer)

Tomas Ekbom (Tomas) provided an update on the status of the project which was slightly delayed in starting due to finalizing the scope and securing funding from the IEA Bioenergy ExCo (Task 41). The project team held its initial meeting on 23 September 2020, identifying markers to serve as guides to compare projects and plants as case studies. Tomas described the project organization which includes a steering group, project coordinators and the project team (T39, T40 and T45). The project is structured into six work packages (WPs) including WP 1 (Status quo biofuel projects), WP 2 (Meta-analysis existing studies), WP3 (Case studies technologies), WP 4 (Case studies supply chains) and WP5 (Synopsis/synthesis of key issues). This project is scheduled to be completed by 31 October 2021.

Adrian O’Connell (Adrian) mentioned that the EU’s Joint Research Center (JRC) has summary research reports which may be of use to the project. For example, the report entitled “ Low Carbon Energy Observatory”. The JRC has looked at the perceived technological bottlenecks for advanced biofuels (and advanced alternative fuels more generally), with a view to where to best direct R&D funds. The hyperlink to access this JRC report is:

https://publications.jrc.ec.europa.eu/repository/bitstream/JRC118317/jrc118317_1.pdf

Paul will provide some information about the DSL1 project from SkyNRG (FML: <https://skynrg.com/press-releases/klm-skyng-and-shv-energy-announce-project-first-european-plant-for-sustainable-aviation-fuel/>)

2.6. Update on LCA activities including RenovaBio GHG Emissions (Don O’Connor, Adrian O’Connell)

Don O’Connor (Don) summarised Task 39’s long involvement in LCA work, which was initially documented in 2008 with the publication of the report, “An examination of the potential for improving carbon/energy balance in biofuels”. Since then, seven more reports have been prepared and published (in 2010, 2012 and 2015-2018). Don also described the group’s progress developing a regional Life Cycle Inventory database with a current focus on sugarcane ethanol plant inventory data made available through Brazil’s RenovaBio program. So far, data has been collected from over 65 sugarcane-ethanol mills.

Adrian provided an update on the current activities that the Task 39 LCA team is leading. This includes assessing the renewable content (& carbon Intensity) of co-processed drop-in fuels based on the four methods being used to track or estimate the bio-component levels achieved via co-processing. The LCA team is also working on “Summary Papers for Policy Makers” to highlight the key factors that influence biofuel LCA’s. Don also reiterated that the LCA team will continue to collect biofuels production life cycle inventory data and maintain rapport with other biofuels LCA modellers.

Jack Saddler (Jack) emphasized the ongoing importance of LCA projects in Task 39's program of work. Although it increases complexity, he recommended that the Task 39 LCA group also consider other aspects of "overall sustainability" in addition to Carbon Intensity (CI).

Day two: 2.00-4.15PM CET, Tuesday, 24 November, 2020

2.7. Technology pathways used to produce SAF/biojet fuels: Potential and challenges (Susan van Dyk and Jack Saddler)

Susan van Dyk (Susan) described progress made in reviewing the various biojet fuel technology platforms (including electrofuels or e-fuels) and the companies developing and deploying these technologies, current biojet fuel global production, biojet fuel production capacity forecast, flights that have used biojet fuels so far, ongoing ASTM certifications, and current and emerging biojet fuel policies. She also described the challenges and opportunities of the various biojet fuel technology platforms. A primary barrier to the expanded commercial use of biojet fuels is their much higher selling price. COVID-19 has increased the price gap between conventional jet fuel and biojet fuels. The draft biojet report now in progress will be shared with Task 39 member for review and comments in early 2021.

(Subsequent to the meeting, Ravi sent Susan a summary of the CSIR-IIP, India HEFA technology for biojet.)

Adrian mentioned that the JRC is doing a lot of work on electrofuels and he will be happy to provide further information.

Franziska also expressed an interest providing further inputs on e-fuels.

Paul Sinnige (Paul) mentioned that the Netherlands has announced an obligation for 14% SAF in the Netherlands. This will be an opt-in until 2025 and the aim is for this to become a European obligation after this date.

2.8. Opportunities for advanced biofuels supply chain & CAPEX/OPEX cost reduction (Alok Satlewal and Ravi P. Gupta)

Ravi and Alok Satlewal (Alok) have generously agreed to lead the proposed project originally planned to be led by Ireland. (Stephen Dooley is contributing to the update of biofuels in the marine sector). India will take the lead on a modified project focused on cellulosic ethanol with inputs from the US, Brazil and Germany, as all four countries are continuing to try to commercialise this technology.

Alok described the proposed scope, deliverables and the timeline for this project. Phase one will involve an assessment of biomass availability of Indian feedstocks, a review of potential biomass supply chains, pretreatment technologies and process schemes used in cellulosic (or 2G) ethanol technologies. This will be followed by life cycle analysis and environmental impact assessments to identify the GHG emissions and energy consumption hotspots within lignocellulosic bioethanol production processes.

Dina Bacovsky (Dina) asked if this is a new project and about its allocated budget. The task leaders clarified that this is an adapted project from what was in Task 39's original 2019-2021 work plan (Supply chain analysis & CAPEX/OPEX reduction) for which a "champion" had previously not been found. The original budget allocation was \$US25,000. Ravi and Alok will be

able to significantly leverage this investment with in-house funding from Indian Oil; Ravi has already received internal support/permission to proceed with this project from senior management within Indian Oil.

2.9. Update on Demoplants Database (Dina Bacovsky)

Dina mentioned that her colleague, Andrea Sonnleitner (Andrea), is in charge of this project and hopes to collect updated data from Task 39 colleagues for their respective countries. Andrea introduced herself and mentioned that she has already sent out emails to Task 39 members and reminding them to review and send back their input ASAP. Dina described that in addition to updating the website platform, she and Andrea continue to update the online database. She provided some examples of recent updates, including Versalis and Eni restarting the plant in Crescentino, Italy, Advanced Biofuels Solutions plant in the UK, Södra's biomethanol plant in Sweden and the Omega Green Project in Paraguay.

2.10. Update on the implementation agendas report (compare-and-contrast of biofuels policies) (Mahmood Ebadian)

Mahmood Ebadian (Mahmood) mentioned that the 2018-2019 update report has been well-received by many different stakeholders; he has received feedback from the IEA Bioenergy TCP, local and regional policy makers and the biofuels industry. He thanked all the Task 39 members for their contributions to their respective country chapters.

Mahmood briefly reviewed the scope of the implementation agendas report. An elaborated summary of the 2018-2019 update report was recently published open access in the peer-reviewed journal Energy Policy. The manuscript is entitled "Biofuels policies that have encouraged their production and use: An international perspective" and it can be viewed or downloaded at: <https://doi.org/10.1016/j.enpol.2020.111906>.

He described the progress made in preparing the 2020-2021 update report. The majority of Task members have completed the revised questionnaire and updated their country chapters. New additions to the 2020-2021 update report will include national GHG emission data, a timeline of biofuel policies, import and export of biofuels and feedstocks, oil refineries and co-processing, impact of biofuels policies on fuels price at the pump, non-compliance penalties (where they exist), feedstock sustainability criteria and updates on biofuels policies.

2.11. Identifying certification scheme improvement opportunities (Paul Sinnige and José Muisers)

Paul and José Muisers (Jose) provided a summary of a recent report by SQ Consult & Jinke van Dam Consulting entitled "Accessibility and traceability in sustainable biofuels supply chains" that describes the perceived risks of assessing the sustainability of feedstocks and possible approaches for addressing current concerns. This report can be viewed or downloaded at:

<https://platformduurzamebiobrandstoffen.nl/infotheek-item/accessibility-and-traceability-in-sustainable-biofuel-supply-chains/>.

Jose and Paul plan to build on this report and propose this project comprise four Work Packages (WPs), which will discuss the legal frameworks of major producers and users of transport biofuels such as the US, EU, Brazil, Canada, Germany, etc.

The proposed project was well-received by Task members, as the sustainability of feedstocks is widely recognized to be a critical element within existing and emerging biofuels policies. Paul stressed that it might be challenging to complete the

proposed project as only one year is left in the current triennium. The proposed project was supported and will likely continue as one of the ongoing Task 39 projects for the next triennium.

2.12. The potential of co-processing to expand the production of low-carbon-intensive (CI) drop-in fuels (Jianping Su, Susan van Dyk, Jack Saddler)

Jack described this project, which is a continuation of the 2014 and 2019 drop-in biofuels reports with a primary focus on co-processing of biocrudes with fossil crudes at existing oil refineries. Depending on the type of biogenic feedstock (e.g., lipid or lignocellulose-based biocrudes) and the oil refinery configuration (Hydrotreater/FCC/Hydrocracker) different co-processing pathways are usually followed. He described the current findings on the advantages and disadvantages of co-processing and stand-alone facilities for the production of low-carbon intensive fuels.

Ravi mentioned that IndianOil R&D also has hydrotreating-based technology for co-processing of Jatropha oil to green diesel a.k.a. renewable diesel and shared an article discussing this (<https://economictimes.indiatimes.com/indian-oil-develops-technology-for-co-processing-non-edible-oils-in-its-refinery/articleshow/20312580.cms?>)

3. Concluding remarks and wrap up

Ravi have already drafted a feature article on India for the end-of-2020 newsletter to be published in the second half of December. Thanks to Adrian, the first newsletter of 2020 will profile Ireland's activities on biofuel development and deployment. Adrian will coordinate with Mahmood to prepare the April newsletter feature article.

There was a short discussion inviting possible Task 39 new project ideas for the next triennium (2022-2024). The proposed project on "Identifying certification scheme improvement opportunities" by Paul and Jose was supported. Also the TEA project idea led by Duncan will be further elaborated with support from Nicolaus and Franziska to be a proposed project in the next triennium. InterTask projects (like Lessons Learned Biofuels) are recognized as champions.

The timeline for the proposal for the triennium 2022-2024 is: proposal draft to ExCo until 04/2021 with final approval in autumn 2021. The group agreed that we need to dedicate a specific meeting to this topic, start with a discussion on a project idea list, sometime in late January/early February. This meeting will be timed to better accommodate Australasian time zones, likely putting the early bird effort on the Europeans and the night owl effort on the North Americans (and short straw middle-of-the-night timing for our Brazilian colleagues); maybe also having additional meetings to prepare the triennium proposal, regionally grouped. The brief questionnaire on possible topics that Tasks might tackle in the coming triennium had been distributed to IEA Bioenergy Task leaders and completed by Jim and Jack (that was submitted to ExCo in August) is attached to these minutes. The main content of this questionnaire was whether Tasks intend to continue into the next triennium and what key topic areas might they cover. It was suggested that the submitted questionnaire might form the basis for the upcoming "brainstorming" session on possible Task 39 work for the next triennium.

Although it is unlikely we will have a face-to-face meeting in Denmark next April as originally planned, it was suggested that we keep these meeting dates (21-23 April, 2021) for another virtual Task 39 meeting, with a potential focus on country updates using the information from the updated Implementation Agendas report as the basis.



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There was no discussion regarding the end of the triennium meeting that was supposed to be held in Australia in conjunction with the IEA Bioenergy ExCo88 meeting and end of triennium conference. Although everyone hopes for travel and face-to-face meetings to be possible by then, ongoing uncertainty in light of the pandemic has left the location and timing of this meeting unresolved.

The Task Leaders thanked everyone for attending and hoped to “see” them again at Wednesday’s joint T39-T44 workshop.

A copy of the meeting agenda is provided below.

2.00-4.15PM CET, Monday, 23 November, 2020

15 minutes	General Introduction; Update on Task 39 projects, activities, budget, ExCo, etc. (Jim McMillan, Jack Saddler and Mahmood Ebadian)
10 minutes	Update on Biofuture Platform (Adam Brown)
20 minutes	Introduction and overview of India's ongoing biofuels activities and projects (Ravi Gupta)
20 minutes	Update on biofuels in marine shipping report/Issues affecting utilisation of advanced biofuels in the marine sector (Sune Tjalfe Thomsen and Tor Ivan Simonsen)
20 minutes	Biofuels production and use status in non-IEA Bioenergy countries/emerging economies (Glaucia Mendes Souza, Rubens Maciel Filho, Pablo Silva Ortiz)
15 minutes	Successes and lessons learned for conventional/advanced biofuels deployment (Franziska Müller-Langer and Tomas Ekbom)
15 minutes	LCA, sustainability of biofuels pathway to identify key metrics beyond GHG reduction, spanning both feedstocks and conversion technologies (Adrian O'Connell and Don O'Connor)
20 minutes	General Discussion

2.00-4:15 PM CET, Tuesday, 24 November, 2020

20 minutes	Update of technical aspects of biojet fuel/SAF/decarbonization of the aviation sector (Susan van Dyk and Jack Saddler)
20 minutes	Feedstock-to-biofuel(s) supply chain analysis. Focus on CAPEX and OPEX cost reduction opportunities for advanced biofuels- proposed project for 2021 (Ravi Gupta and Alok Satlewala)
10 minutes	Update on Biofuels Demonstration Plants website (Dina Bacovsky)
15 minutes	Update on the implementation agendas report (compare-and-contrast of biofuels policies) (Mahmood Ebadian)
15 minutes	Review existing/proposed certifications used for oleochemical and lignocellulosic-based biofuels supply chains; identify certification scheme improvement opportunities- proposed project for 2021 (Paul Sinnige and Timo Gerlagh)
10 minutes	Update on potential of co-processing to reduce the carbon intensity of transportation fuels/drop-in fuels (Jianping Su, Susan van Dyk and Jack Saddler)
10 minutes	General Discussion
10 minutes	Proposed future Task 39 business meetings in current triennium 1) Denmark, 21-23 April, 2021 (possibly virtual?) 2) Australia for late 2021, in combination with end of triennium (IEA Bioenergy) meeting Planning for newsletters to be published in 2019/2020: Late 2020- India Early 2021- Ireland? Mid 2021-Norway? Late 2021-volunteer?
15 min	Possible Task 39 new project ideas for next triennium (2022-2024) - Group Discussion
10 min	Concluding remarks and wrap up (Jim McMillan and Jack Saddler)