

## **TASK 39**

# **Commercializing Conventional and Advanced Liquid Biofuels from Biomass**

**Final Proposal for Task Prolongation for  
the new triennium 2016-2018**

**ExCo76  
Berlin, Germany**

**26 October 2015**

**Prepared by:**

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Jack Saddler (Co-Task Leader)**

**IEA Bioenergy Task 39**

**'Commercializing Conventional and Advanced Liquid Biofuels from Biomass'**

**Task Period 2016-2018**  
**Task Proposal Summary Sheet**

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**Task Title:** Commercializing Conventional and Advanced Liquid Biofuels from Biomass

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**Proposer**

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**Endorsement by ExCo Member of participating countries**

Country:	USA	Canada
Name:	Jim Spaeth	Ed Hogan
Signature:		

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**Objective**

To facilitate commercialization of conventional and advanced liquid biofuels (spans technical, policy and sustainability considerations).

**Work scope**

The proposed program of work will build on Task 39's established extensive participating network of experts from industry, academia and government research institutions developed over the past and current triennia. Task 39 will continue to facilitate informative and productive fora and deliver high quality reports, benefitting from strong industry involvement in the Task to ensure that Task activities remain topical and relevant. Task 39 participants will continue to promote high visibility for the Task's activities through their individual and collective publications/reports and their continued participation in conferences and workshops. The Task will use these methods as well as participation in pilot, demonstration and commercialization activities to disseminate the Task's activities and the latest developments in the overall biofuels area worldwide. We will continue to build membership in the Task and try to convince China and hopefully India to join IEA Bioenergy and Task 39.

In several cases, because of their on-going importance, we propose to continue work that will build on relevant activities that are underway in the current triennium. Examples include: the potential and challenges of drop-in biofuels; current status and potential of algal biofuels; the comparison of methodologies to measure sustainability attributes of advanced biofuels and conversion routes; advanced fuels for advanced engines; database maintenance and update for biofuels pilot/demonstration/commercial facilities; compare-and-contrast country policies used to develop biofuel markets; biofuels development in emerging markets; biofuels in biorefineries; etc. Due to the fast pace of technology and commercial developments in the biofuels arena, ongoing updates on these topics will be required to keep abreast of the field. This ongoing work will be complemented by also tackling newly emerging areas of interest during the next triennium (e.g., aviation and marine biofuels, advanced biofuels commercialization lessons learned, etc.), as described in the main body of this proposal.

The overall sustainability and potential of biofuels to help alleviate transportation-related emissions to climate change will continue to be an important issue in the next triennium, requiring ongoing use of analytical tools such as Life Cycle Assessment (LCA). The Task will produce summary reports incorporating LCA that will facilitate policy decisions to help implement and accelerate the commercialization and adoption of conventional, advanced and drop-in biofuels. Sustainability analyses will also incorporate environmental and socio-economic components as well as the technical aspects of producing and using biofuels. These analyses, spanning both feedstocks and conversion technologies, will form an important basis of collaboration with other IEA Bioenergy Tasks (Tasks 33, 34, 36 and 37, 40, 42 and 43) as this is an issue affecting all Tasks.

With respect to technology and commercialization strategies, advanced biofuels remain a topic of key importance. The recently released and well received "drop-in biofuels report", which Task 39 members reviewed and commented on extensively, provides the model and foundation for one aspect of the Task's future activities, i.e., maintaining a balance in Task coverage across biochemical, thermochemical and hybrid conversion technologies. Building on the expertise gained from drafting and finalizing the drop-in biofuels report, we propose to undertake further in depth work on the technical and policy aspects of aviation and maritime fuel technologies and markets (potential links with Task 40 and AMF). Other areas of investigation will include: an assessment of advanced biofuels progress and success factors (e.g., review progress to date of the Abengoa, Chemtex, DuPont, GranBio, POET-DSM, etc., cellulosic ethanol plants that started up in 2014-2015); ongoing investigation into how multiproduct algal-based biorefineries can provide a means to bring algal biofuels to market, including advances in technology and commercialization; development and challenges of biogas/biomethane and bio-SNG as transportation fuels (with Task 37); the potential of so-called "generation 1.5" feedstocks (encompassing captive fiber and newer polysaccharide-rich non-food/feed plants that are more easily converted than cellulosic materials) for biofuel production that can help to bridge the gap between conventional and advanced biofuels; and ongoing assessment of the challenges and opportunities for using advanced biofuels in advanced engines (with AMF).

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### Work program

The Task's program of work will continue to be implemented, reviewed, and refined through on-going electronic communications (e.g., emails, conference calls, WebEx tele-meetings, etc.) as well as more formally during semi-annual business meetings. In comparison to prior triennia, increased time will be allocated during bi-annual task meetings to review the Task's budget and finalize task work priorities. Major decisions about work effort priorities and budgets will be made by membership consensus to the greatest extent possible, and by majority if/when consensus cannot be reached.

Through the proactive engagement of both established and newly recruited Task network members (representing government, industry and research communities), the Task will continue to lead and coordinate activities in three main program areas:

- *Technology and Commercialization;*
- *Policy, Markets, Implementation and Sustainability; and*
- *A Multifaceted Communication Strategy* to facilitate knowledge transfer and dissemination of information.

*Technology and Commercialization:* The Task will continue to cover all liquid biofuels including conventional and advanced liquid biofuels, but with an increased focus on advanced and especially advanced drop-in biofuels and technological and commercial developments in this area. Proposed subsets of this work will include aviation and maritime biofuels, as well as biogas/biomethane and bio-SNG as transportation fuels (with Task 37). Ongoing assessment of demonstration plants and commercialization progress will be carried out, while the success of cellulosic ethanol and other advanced biofuel technologies will be specifically assessed. Continued analyses will be carried out on those key issues that limit the integration of conventional and advanced biofuels into existing infrastructure and engines. Developments in algal technologies for biofuels will remain an ongoing area of investigation, with the increased likelihood that it will require a co-product approach (fish feed, nutraceuticals, cosmetics, etc.). This will be a multi-Task activity with Task 39 taking the lead. We also plan to assess the potential of so-called "generation 1.5" feedstocks for biofuel production to act as a bridge between conventional ("generation 1") and advanced ("generation 2") biofuels and their feedstock processing requirements.

*Policy, Markets, Implementation and Sustainability:* This activity encompasses issues that address policy/legislative/regulatory and infrastructure concerns regarding expanding conventional and advanced liquid biofuels. The Task will continue to update the comparison of so-called implementation agendas (a compare-and-contrast of biofuels policies used by member countries and regions, including emerging markets such as China and India, to encourage the development, deployment and use of biofuels). The Task will also review progress in the commercialization of conventional and advanced biofuels (i.e., sugar/starch-based ethanol, oilseed-based biodiesel, cellulosic ethanol and so called "drop-in" hydrocarbons). A cost/benefit analysis and comparison of drop-in (less commercialized, more fungible) versus conventional ethanol/biodiesel biofuels (more commercialized, less fungible) will be carried to better understand feedstock versus infrastructure integration challenges. Sustainability aspects will entail ongoing review and assessment of LCA tools and models (such as GHGenius, GREET, BIOGRACE etc.) to evaluate the sustainability of different biofuels options, as well as review biofuels policies to assess how much they incorporate social and environmental aspects of sustainability.

*Multifaceted Communication Strategy:* The Task will facilitate knowledge transfer and dissemination of information between IEA Bioenergy members and other liquid biofuels stakeholders including other IEA Implementation Agreements (such as AMF, RETD, etc.). This will take place through various interactions, e.g., at workshops and conferences, via personnel exchanges, and using websites/electronic media. The Task will build on its strong, existing relationships with IEA headquarters, more-than-just EU stakeholders (e.g., including Australia, New Zealand, Brazil, Japan, S. Korea, US, Canada, South Africa and, hopefully, China and India), and its effective collaboration with other Tasks and Implementation Agreements (e.g., joint project with AMF, etc). The Task already has a strong track record in this area with a highly accessed website, three newsletters a year, heavily cited commissioned reports, exchange of personnel, well attended conferences and workshops, active engagement of industry, etc.

### Deliverables and Target Groups (biofuels communities)

#### *Technology and Commercialization:*

1. Build on the initial drop-in biofuels study, with specific focus on aviation and maritime biofuels, and assess policy and LCA issues that might influence technology/commercialisation [Report](#)
2. In collaboration with Task 37, investigate the potential of biogas/biomethane and bio-SNG as transportation fuels. [Report](#)
3. Ongoing assessment of demonstration plants and commercialization. [Database & Report](#)
4. An assessment of the success of cellulosic ethanol and other advanced biofuel technologies commercialization. [Report](#)
5. Continued analyses of key issues limiting the integration of advanced biofuels into existing infrastructure and existing and advanced engines. Work initiated in 2015 in this area will be continued in 2016-2018. [Report](#)
6. Ongoing study and update of algal biofuel technologies assuming a co-product approach (fish feed, nutraceuticals, cosmetics, etc.). [Report](#)
7. Potential of so-called "generation 1.5" feedstocks for biofuel production to act as a bridge between conventional and advanced biofuels. [Report](#)

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### 8. Roadmap for integration of advanced biofuels. Report

#### *Policy, Markets, Implementation and Sustainability:*

1. Ongoing projects (reporting every 18 months):
  - (a) Distribution of template and collation of data to provide a compare-and-contrast of each country's implementation agenda/biofuels policies that have been used to develop, deploy and expand biofuels use. Report
  - (b) Review the status of conventional and advanced biofuels demonstration and commercial facilities that are planned, under construction and operating. Ensure that this builds on the already existing information available in databases such as Biofuels Digest or being maintained by commercial companies such as FO Licht, Bloomberg, New Energy Finance, etc. or by agencies such as the US EIA. Database & Report
2. Ongoing projects (tentative; reviewed on an annual basis):
  - (a) In collaboration with Task 38, ongoing assessment of LCA tools and models (such as GHGenius, GREET, BIOGRACE, etc.) to assess the sustainability of biofuels, as well as review and evaluation of biofuels policies to assess how much they incorporate social and environmental aspects of sustainability. Report
  - (b) Assess the integration potential of advanced biofuel technology platform(s) (in conjunction with the Technology & Commercialization deliverables described above);
  - (c) Analyze sustainability of feedstock and technology pathways (with Tasks 38 and 43);
  - (d) Analyze status and development of biofuel production and consumption in emerging markets (e.g., China, India, etc.) (with IEA HQ, FAO and World Bank); and
  - (e) Assess integrated policy mechanisms to support biofuels development within a biorefining framework (with Task 42).

#### *Multifaceted Communication Strategy:*

During the triennium, Task 39 members will either organise or be involved in 3-5 biofuels relevant workshops/conferences. We will continue to convene 2 business meetings each year with one of the meetings used to update our country representatives of the activities carried out in the respective Task 39 member countries in the overall biofuels area. Increased efforts will be made to implement some of the Task's meetings in an electronic manner (e.g., using WebEx, Go-to-meeting, or similar). Efforts to promote effective communications and disseminate relevant information will include: 1) continued improvements and updating of the Task 39 website; 2) publishing 2-3 newsletters per year; and 3) implementing the already initiated planning efforts for business meetings in the 2016-2018 triennium. As well as published proceedings of technical meetings, it is anticipated that any commissioned reports prepared by the Task, after appropriate review and a period of restricted access just for participating countries, will eventually be published and circulated in the public domain. In this way, IEA Bioenergy Task 39 members will benefit from early access to leading edge reports while the Task continues to influence and educate the biofuels stakeholder community.

#### **Management Qualifications**

Task Leader: Dr. Jim McMillan, Chief Engineer within the National Bioenergy Center at the National Renewable Energy Laboratory (US). Dr. McMillan has over 25 years of experience in biofuels research and technology deployment across both biochemical and thermochemical platforms.

Co-Task Leader: Dr. Jack Saddler, Professor of Forest Products Biotechnology/Bioenergy at University of British Columbia (Canada). Professor Saddler has over 30 years of bioenergy research, development and commercialization experience.

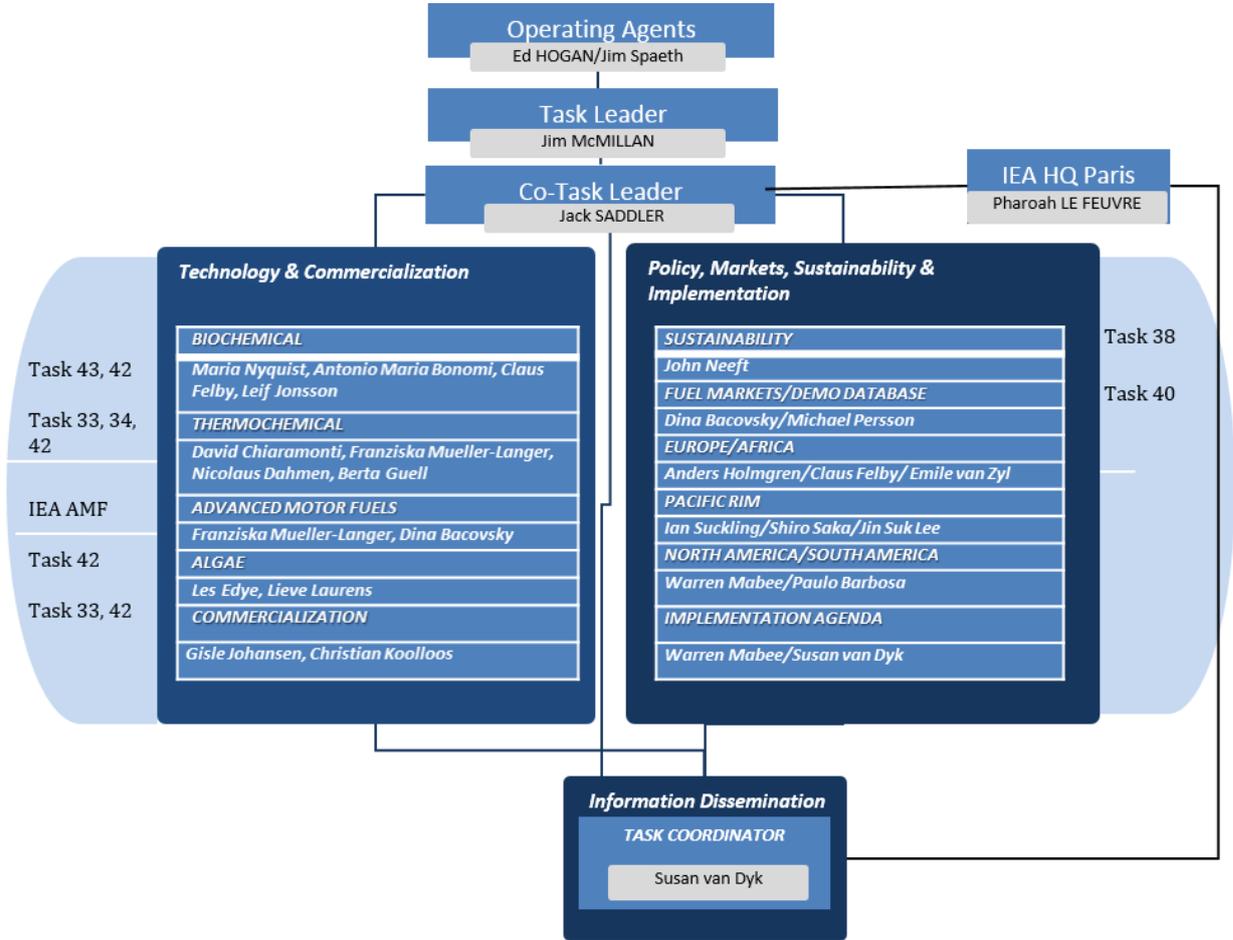
**Annual Budget** US\$ 225,000

**Annual budget per participant;** US\$ 15,000 assuming 15 countries participate. In the case that more/less participants join/leave the Task, the Task's budget (and deliverables) will increase/decrease accordingly. Approximately one third of the budget is used for administration and communication, with the balance of the budget allocated to Task projects, with prospective projects proposed and selected within the Task using a consensus process (or simple majority if needed). Budget status and expenditures as reported to Exco are distributed to all Task members. (See budget breakdown attached)

2. TASK OBJECTIVES, STRUCTURE AND SCOPE

2.1 Proposed Task Structure

The diagram below illustrates how the Task will function.



The Task’s two main Subtasks (**Technology & Commercialization** and **Policy, Markets & Implementation**) will be led by teams of European, North/South American, Asia and Oceania task members, recognized for their ability to work within the broad area of their respective subtask and with acknowledged expertise in relevant Task areas. Task 39 has benefited extensively from having participants from many global regions involved, such as Australia and Japan (well established Task 39 members), South Korea, South Africa and Brazil (relatively newer Task 39 members). In the coming triennium, we will continue to try to recruit other key countries to join IEA Bioenergy and Task 39, e.g., China and India, which each have growing national biofuels programs and have indicated interest in participating but are not yet members of IEA Bioenergy. An initial focus on South America/North American/European comparisons has proven useful in helping us understand and build on specific strengths found on each continent, and network members have benefitted immeasurably from applying lessons learned from one region to the other. For example, South and North American members have had a strong focus on conventional ethanol and liquid biofuels generated through the biochemical platform, while European partners have an established track record on biodiesel as well as a strong focus on thermochemical pathways to liquid fuels, e.g., as demonstrated by companies such as Neste Oil, Chemrec (and previously Choren). Each participating country within Task 39 is now benefitting from R&D investment made by other member countries. This is evident in several of the trans-Atlantic projects being undertaken by Task 39 stakeholder companies such as Abengoa, Borregaard, Chemtex, DSM, Inbicon, Novozymes, etc., which have incorporated elements of conventional and advanced biofuels as well as biochemical and thermochemical conversion platforms into their overall commercialization strategies.

The cross-cutting communications subtask (**Information Dissemination**) will similarly involve the active participation of all Task 39 country representatives. This subtask will continue be responsible for handling the many external inquiries for information the Task receives. It will also ensure the ongoing publication and distribution of the Task’s

newsletter at an approximate frequency of three-times-per-year. This subtask will also continue to work with local groups that generously agree to host and help organize the Task's biannual business meetings and related 2-3 times a year technically- or policy-oriented workshops/symposia.

The proposed Task structure is designed to facilitate cooperation and collaboration with other IEA Bioenergy Tasks, IEA headquarters and related organizations such as the United Nation's FAO as well as anticipated new member countries. In the proposed structure, Pharoah le Feuvre at IEA headquarters (HQ) will collaborate directly with the Task, providing updates from IEA HQ, participating in selected deliverables (e.g., implementation agendas and demonstration facilities) and soliciting feedback and expertise on biofuels issues from Task 39 members as needed.

## ***2.2 Proposed Task and SubTask Leadership***

**Task Leader:** Jim McMillan (USA) will continue to serve as Task Leader. Dr. McMillan is Chief Engineer within the National Bioenergy Center of the National Renewable Laboratory (NREL) in the US and he has been leading Task 39 over the current triennium. Dr. McMillan has been involved in all aspects of running and coordinating Task 39 during this time, including liaising with the IEA Bioenergy ExCo. He has extensive knowledge of the current state of biofuels research and technology deployment, including insights into biochemical, thermochemical and hybrid approaches as well as the many policy issues associated with biofuels. A similar co-leadership structure as has been successfully used over the last three years is proposed for the new triennium, with Dr. Jack Saddler serving as co-Task leader. Dr. McMillan will work closely with Dr. Saddler and his graduate student/post-doctoral group that helps coordinate the Task to ensure that the Task's many activities (including updating and maintenance of the Task's website, responses to inquiries, preparing and distributing newsletters, organizing meetings, preparing and distributing minutes, etc.) all continue seamlessly.

**Co-Task Leader:** As described above, Jack Saddler will serve as co-Task Leader. Dr. Saddler has been involved with IEA Bioenergy Tasks and related activities for many years and has over 30 years of technical and policy experience in the biofuels area. One significant benefit to the Task of this leadership structure is the ability to continue to make use of the expertise, skills and accounting resources available at UBC, where the overhead rate is lower and the personnel (graduate students/Post docs) funded by the Task (to respond/redirect enquiries, maintain the Task website, produce the Task newsletters, organize Task meetings, etc.) are trained, motivated and generally less expensive to cover than an alternative structure would permit.

### ***Technology & Commercialization SubTask***

This SubTask will have responsibility for both technical and commercialization aspects of all conventional and advanced liquid biofuels. It will also have a liaison role with the indicated Tasks working on the other conversion technologies (gasification (T33), pyrolysis (T34) and biogas (T37), all in a biorefinery approach (T42)) as well as biomass feedstock production (Task 43). Each activity will be led by a representative from one of the Task's member countries that has an active national program in this particular aspect of liquid biofuels. Subtask leadership will be jointly led by:

- Maria Nyquist (Sweden). Coordinator of Sweden's biofuels sector activities (spanning industry, government and universities).
- Antonio Maria Bonomi (Brazil). Group leader, CTBE (the Brazilian Bioethanol Science and Technology Laboratory)
- Claus Felby (Denmark). Professor of biomass and bioenergy at the University of Copenhagen (has worked with biomass and biotechnology for more than 15 years).
- David Chiaramonti (Italy). Professor at the University of Florence, Italy (expert on biomass conversion).
- Franziska Mueller-Langer (Germany). Heads the research section on Biorefineries at the Deutsches Biomasseforschungszentrum (DBFZ). Dr. Mueller-Langer contributes with significant expertise on different biofuel technologies and their assessment against sustainability criteria (esp. costs, LCA).
- Nicolaus Dahmen (Germany). Prof. at the Karlsruhe Institute of Technology (KIT) and scientific coordinator of the bioliq<sup>®</sup> plant in Karlsruhe. He provides significant expertise in the field of converting biomass into synthetic fuels and chemicals.
- Les Edye (Australia). Dr. Edye has co-authored commissioned reports and updates on the Australian biofuel industry and, in particular, on algae operations in Australia. He provides significant expertise on the western and southern "Pacific rim" region due to his geographic location and because of his extensive experience consulting in Australia, China, Hawaii, Samoa and other Pacific islands.
- Judit Sandquist (Norway). A research scientist at SINTEC, Dr. Sandquist is an expert in biomass characterization and biomass thermochemical conversion processes.

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- Gisle Johansen (Norway). Heads both Business Development and Research and Development activities at Borregaard and provides an invaluable industry perspective on biorefineries.
- Leif Jonsson (Sweden). Professor at Umea University with extensive knowledge and research experience on biomass conversion.
- Berta Matas Guell (Norway). A Research Manager at SINTEF with particular expertise on thermochemical routes for biomass conversion.
- Anders Kristoffersen works for Novozymes SA Ltd as Public Affairs Manager: Region Europe.

### **Policy, Markets, Sustainability & Implementation SubTask**

This SubTask will have responsibility for policy, market, sustainability and implementation aspects of all conventional and advanced liquid biofuels. It will also have a liaison role with other Tasks working on other policy and social welfare issues such as GHG emissions, trade, employment, etc. This subtask will have representatives from many of the Task 39 member countries that have more extensive experience in biofuels-related policy issues such as regulation, trade, sustainability assessment, etc. Subtask leadership will be jointly led by:

- Dina Bacovsky (Austria). A Senior Researcher in the European organization “Bioenergy 2020+” who has a research focus on bioenergy and biofuel technologies and policies, she has served Task 39 in a communications capacity since 2007, and has co-authored several Task reports.
- John Neeft (Netherlands). An expert in biofuel GHG emissions calculations using the BioGrace GHG calculation tool.
- Anders Holmgren (Sweden). A manager with the Swedish Energy Agency.
- Michael Persson (Denmark). Currently Head of Secretariat, DI Bioenergy and owner of Virimdeque Consulting. Previously Vice President, Partnerships and Stakeholder Relations for Inbicon A/S, he possesses broad renewables and biofuels policy and market knowledge. Earlier, he was a senior business developer at DONG Energy and before then a Vice President at Danisco Sugar with responsibility for sugar activities in Lithuania and for feasibility studies of conventional bio-ethanol factories in conjunction with existing sugar factories in Nakskov and Anklam, Germany.
- Emile van Zyl (South Africa). Professor van Zyl has a long and illustrious background in the biofuels sector and is the “Managing Director” of a large university based group that not only carries out RD&D itself but coordinates much of the biofuels work plans for South Africa specifically and Africa more generally.
- Warren Mabee (Canada). A professor at Queen’s University in Canada whose research focuses on the technical–policy interface as it applies to liquid biofuels. A current Task 39 member and expert on North American bioenergy policy, he has authored a number of significant reports (within and external to the Task), including policy reviews, technical assessments, and forecasts on the future of biofuels.
- Paulo Barbosa (Brazil). Mr. Barbosa will serve on both the technical and policy subtasks because of his extensive “back-up” within Petrobras and the linkages and coordinating roles with government and university groups in Brazil and other South and Central American countries that Petrobras can provide.
- Shiro Saka (Japan). A professor at Kyoto University, Dr. Saka has a highly distinguished career in biomass conversion. He is a member of the International Association of Wood Scientists and is recognized by the Japanese Government as one of the established leaders in the biofuels area.
- Jin Suk Lee (South Korea). Dr. Lee is Principal Researcher at the Korea Institute of Energy Research (KIER).
- Ian Suckling (New Zealand). A chemist at Scion with specialised experience in pretreatment of wood fibres for industrial processing, he has worked closely with the New Zealand pulp and paper industry to optimise their manufacturing systems. His current research involves the development of technologies in biofuel production from woody biomass.

### **Information Dissemination (Cross-cutting Multifaceted Communication Strategy SubTask Activity)**

- Susan van Dyk (*Newsletters/Website/Database*) is a post-doctoral fellow at the University of British Columbia (UBC) working on advanced biofuels, biofuels policy and overall integration of the liquid biofuel industry. Dr. van Dyk has both a legal and science background, specifically in biochemical conversion, and her experience extends into biofuels policy and implementation issues as well as IEA Bioenergy Task 39 coordination activities.

*Consultants:* In most cases, Task 39 will use available expertise and skills provided by Task members to complete commissioned reports, as this approach has proven successful for many past Task reports. However, to a limited extent, we will also make use of consultants external to the Task to assist Task members in preparing specialized reports on issues of topical interest. The drop-in report is an example of where Task 39 members led production of the report while the development of other reports such as the GHG and energy balances report is an example of where an external consultant took the lead. We have effectively used this model previously and expect to be able

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to continue to access relevant internal and external expertise when needed through the excellent participation, interaction and contacts within our Task member countries and IEA Bioenergy Task 39 stakeholder network.

### IEA BIOENERGY TASK 39, WRITTEN DELIVERABLES, 2016-18

Project No.	Topic	Status	2016				2017				2018				Alarm
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
REPORTS	Assessment of <u>large-scale</u> demonstration plants (with Bioenergy 2020+)	Planning													Upcoming
		Actual													
	Update of drop-in report, specifically focusing on aviation and maritime fuels	Planning													Upcoming
		Actual													
	Biogas and bio-SNG as transportation fuels (with Task 37)	Planning													Upcoming
		Actual													
	Update of GHG emissions and energy <u>balances</u> for advanced biofuels	Planning													Upcoming
		Actual													
	Update on status and potential for <u>algal</u> biofuels production in a biorefinery context	Planning													Upcoming
		Actual													
	Advanced biofuels <u>in advanced engines</u> (with the AMF)	Planning													Upcoming
		Actual													
	Assessment of advanced biofuels commercialization success	Planning													Upcoming
		Actual													
	Potential of “generation 1.5” feedstocks (with Task 43)	Planning													Upcoming
		Actual													
Co-products and biorefineries (with Task 42)	Planning													Upcoming	
	Actual														
Update on country policies and implementation agendas	Planning													Upcoming	
	Actual														
<u>Roadmap</u> for Integration of advanced biofuels (with IEA AMF, Task 40)	Planning													Upcoming	
	Actual														
Spatial analysis of biofuel feedstock reserves (with Task 43).	Planning													Upcoming	
	Actual														
Biofuel production and consumption in <u>emerging economies</u> (China, India, etc.)	Planning													Upcoming	
	Actual														
	Planning													Upcoming	
	Actual														
OTHER	--	Task 39 Newsletter	Planning												Ongoing
		Actual													
	--	IEA Annual Report (Task progress)	Planning												Ongoing
		Actual													



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*Identify the actions in the Strategic Plan 2015-2020 that would be addressed by the proposed Task by inserting an X in the 'Tick' column for each relevant row.*

<b>OBJECTIVE</b>	<b>ACTION</b>	<b>TICK</b>
Objective 1: To promote the market deployment of technologies and systems for sustainable energy production from biomass.	Provide a realistic overview of the readiness level of different conversion technologies as well as potential market benefits and impacts.	X
	Provide an integrated technologies approach (synergy) with regard to the use of biomass for energy purposes as well as the use of co-products (chemicals, fodder, fibre, mechanical wood / biomass products)	X
	Identify and characterise the R&D priorities for bioenergy, including the scientific and technical innovations needed for new and growing market. Encourage joint actions on technological innovation in the bioenergy area including energy driven biorefineries and job creation.	X
	Identify the most promising bioenergy technologies and most efficient public policies and investigate technical and non-technical barriers and incentives to the market deployment of these technologies in the context of the scenarios of the 2020-2050 low carbon society (IEA, 2011) and investigate the emerging technologies for this	X
	Encourage and promote the sustainable deployment of technologies with important local, regional, and global socio-economic and environmental benefits that will contribute to a secure energy supply and job creation	X
	Show the potential of bioenergy to contribute to a sustainable environmental footprint e.g. by GHG reductions, soil improvement and nutrient balance, water footprint, material recycling, resource sufficiency	X
Objective 2: To raise public awareness through communication with key stakeholders for the use of biomass as an energy source and to provide clear and verified information on bioenergy	Provide scientifically sound and politically and commercially independent data and information for policy makers, industry and IEA bodies in a format appropriate to the specific audience	X
	Take a leading role in the discussion of current topics in the field of biomass energy	X
	Ensure communication on different levels and with different means, e.g., scientific and easy to read policy oriented reports, strategy papers, website, newsletters, etc.	X
	Develop mechanisms for exchanging feedback with the relevant target groups to gauge visibility and impact	X
	Encourage other sectors of the bio-based economy to apply the same stringent rules for sustainable biomass use as for biofuels / bioenergy	X
Objective 3: To strengthen the outreach efforts of the Implementing Agreement to involve interested new member countries, industry and multilateral organisations	Actively involve relevant industry players by organising topical workshops with panel discussions at both the ExCo and the Task level	X
	Continually adjust the Task work programmes to reflect industry's needs and to promote cooperation with industry	X
	Actively seek new member countries. Educate possible participants about the benefits of IEA Bioenergy through invitations to observe Executive Committee meetings and Task events such as workshops, study tours, and seminars	X
	Encourage industry associations to contribute to Task work where appropriate	X
	Initiate new tasks where new topics emerge that are in accordance with the needs of the members, and close completed tasks	X
	Strengthen the exchange of information and technology transfer with multilateral organisations (e.g., FAO, GBEP, etc.) within the biomass sector to develop global energy and environmental policies with regard to the use of biomass	X
	Encourage information exchange and possible joint research projects at ExCo and at Task level with other IEA Implementing Agreements which are topically close to IEA Bioenergy	X
	Support the development of global, sustainable, bioenergy policies by designing mechanisms that enable the involvement of countries with less developed bioenergy infrastructure and expertise, while maintaining a collaboration which is attractive to internationally leading countries and experts	X
	Identify strategies that encourage existing Contracting Parties to expand their Task participation	X
Objective 4: To increase the dissemination of information	Keep the website of IEA Bioenergy and the Tasks' websites up-to-date and work towards their increased integration	X
	Encourage member countries to create a national distribution list and take responsibility for periodically providing information on relevant IEA Bioenergy publications, newsletters, events etc. by the national delegate	X
	Encourage members who have an expert's presentation at international conferences also to briefly mention the work of IEA Bioenergy (where appropriate)	X
	Strengthen the exchange with IEA Headquarters and get actively involved in the development of road maps, workshops, etc.	X
	Improve interaction with other IEA Implementing agreements through information exchange	X
	Present IEA Bioenergy and its results at national and international meetings	X

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**Task 39 budget 2016-2018 per annum**

Cost per participant	\$15,000
Number of participants:	15
<b>TOTAL</b>	<b>\$225,000</b>

<b>Cost/year (US\$)</b>	<b>Task Administration</b>	<b>Technology &amp; Commercialization</b>	<b>Policy, Market Sustainability &amp; Implementation</b>	<b>Information Dissemination</b>	<b>Total for Task</b>
<b>Labor and benefits</b>	\$35,000.00	\$30,000.00	\$30,000.00	\$10,000.00	\$105,000.00
<b>Workshops, business meetings</b>	\$3,000.00	\$3,000.00	\$3,000.00		\$9,000.00
<b>Travel</b>	\$6,000.00	\$7,000.00	\$7,000.00	\$3,000.00	\$23,000.00
<b>Materials &amp; supplies</b>	\$500.00			\$2,000.00	\$2,500.00
<b>Consultants, contracts</b>		\$24,000.00	\$24,000.00		\$48,000.00
<b>Subtotals</b>	\$44,500.00	\$64,000.00	\$64,000.00	\$15,000.00	\$187,500.00
<b>Overheads (8%)</b>					\$15,000.00
<b>Held-back funds (10%)</b>					\$22,500.00
<b>TOTAL</b>					<b>\$225,000.00</b>