IEA Bioenergy

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TASK 38

Climate Change Effects of Biomass and Bioenergy Systems

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

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in collaboration with the National Team Leaders of Task 38

Task Period 2016-2018
Task Proposal Summary Sheet

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Objective

The Task aims to promote understanding of the role of bioenergy in climate change mitigation. The task will:

1. Continue to update and improve the "Task 38 standard methodology" for the calculation of climate change effects of bioenergy, based on life cycle perspective, by incorporating new issues, technologies and topics as they arise;
2. Interact with researchers and policy-makers to improve understanding of the standard methodology
3. Work with other IEA Bioenergy Tasks to assess climate change effects of emerging bioenergy technologies;
4. Apply the standard methodology to assist in developing best practices for reducing GHG emissions using biomass and bioenergy; and
5. Aid decision makers in selecting mitigation strategies that optimise climate outcomes by disseminating the results of the above-mentioned activities.

Work scope

The Task will continue to focus on the development and demonstration of methods to quantify the climate change effects of biomass and bioenergy systems. In the new triennium Task 38 will extend the activities of the previous triennium to include:

1. development of guidance to policymakers and researchers on the application of the improved Task 38 standard methodology;
2. guidance on the appropriate application of the so-called attributional and consequential approaches to life cycle assessment (LCA) ;
3. investigating trade-offs between using simplified and comprehensive assessments to inform policy development and implementation;
4. integration of LCA and system level modelling;
5. assessing relevance of short-lived climate forcers to the climate effects of bioenergy; and
6. consideration of methods to include risk and uncertainty in the estimation of climate change effects.

Work programme

1. Demonstrate the updated standard methodology through application to specific case studies;
2. Work with technology and/or feedstock-specific Tasks to apply the updated standard methodology to emerging technologies and biomass systems;
3. Apply the standard methodology to bioenergy systems of relevance to participating countries, including boreal, temperate and subtropical environments, to quantify the potential mitigation contribution of these systems;
4. Prepare policy papers on key emerging issues;
5. Hold an annual workshop in cooperation with another Task, on topical issues of relevance to participating countries;
6. Hold an annual working meeting to stimulate discussion on issues listed above amongst Task38-NTLs, formulate a detailed programme of action to address these issues, and progress the workplan;
7. Engage with climate change and renewable energy policy development and sustainability certification processes to improve understanding of, and provide input on methods for quantifying, the climate change effects of bioenergy systems; and
8. Communicate with industry to provide input on quantification of climate change mitigation value of bioenergy systems, and to improve the understanding on the critical aspects of the climate impact analyses of bioenergy.

Deliverables

- Three workshops in cooperation with other Tasks.
- Technical papers published in scientific journals on the key issues in methodology development.
- Plain English summary of scientific papers for non-technical audience

Management

Task Leader: Annette Cowie, NSW Department of Primary Industries

Annette is Principal Research Scientist Climate policy, at NSW DPI and Professor at the University of New England. Her research focuses on sustainability assessment, greenhouse gas accounting in agriculture and forestry; life cycle assessment of forestry, bioenergy and biochar systems. Further details at http://www.une.edu.au/staff-profiles/acowie

Task Manager: Miguel Brandão

Budget per participant: US$16,000; **Annual Budget** US$128,000, assuming 8 countries participate.

Climate Change Effects of Biomass and Bioenergy Systems

Proposal for the period 2016 - 2018

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1 BACKGROUND AND RATIONALE

The primary goal of IEA Bioenergy Task 38 "Climate Change Effects of Biomass and Bioenergy Systems" is to develop, demonstrate and promote methods to assess the net climate effects of bioenergy, to support greenhouse gas accounting for bioenergy, and to inform decision-makers in the selection of GHG mitigation strategies.
Governments are being lobbied to reduce or withdraw subsidies for bioenergy, and support for bioenergy amongst policy-makers has diminished. Thus, the role of Task 38 in disseminating information about the potential for bioenergy to contribute to climate change mitigation is now more important than ever.

Challenges

The urgent need for strong action on climate change was stressed by the IPCC in their 5th Assessment report, released in 2013-14. Bioenergy has been accepted as a beneficial alternative to fossil fuels, delivering renewable electricity, heat and transport fuels at lower greenhouse cost. However, the climate change mitigation benefit of bioenergy has been challenged by studies pointing to loss of carbon stock in forests used for bioenergy, and indirect effects (notably indirect land use change, and "rebound[1]") that are said to reduce the benefits of bioenergy. The debate began around 2008, initiated by publication of several high-profile papers including by Tim Searchinger (Searchinger et al, 2008; Searchinger et al, 2009), and boosted by various studies on a similar theme (e.g. Walker et al, 2010; Hudiburg et al, 2011; Schulze et al, 2012). Some of these studies have received wide publicity and have raised doubts in the community and amongst decision-makers about the effectiveness of bioenergy as a climate change measure. Recently the debate has again intensified, as a result of a report and paper, again by Tim Searchinger (Searchinger and Heimlich, 2015; Searchinger et al., 2015), again questioning GHG accounting in current policies (claiming "double-counting"), and focussing on the supposed land use trade-off between food and bioenergy. High-profile researchers from the USA have lobbied the US and UK governments to withdraw policies supporting the pellet industry[2]. In Australia, the debate was stimulated by the recent decision to approve biomass from native forests as an eligible feedstock under the Renewable Energy Target. Supported by a paper published in the prestigious journal Nature Climate Change (Macintosh et al, 2015), several researchers have waged a campaign against the decision, in the environment pages of the news media[3].

Task 38 has actively contributed balanced and science-based input to this ongoing debate, publishing a range of papers and reports explaining the Task 38 "standard methodology", that have been widely cited (Cherubini et al, 2009; Bird et al, 2011); working with other Tasks on

[1] In conservation and energy economics, the **rebound effect** is the reduction in expected gains from new technologies that increase the efficiency of resource use, because of behavioral or other systemic responses. (Wikipedia, 2015). Studies have estimated that the displacement factor for biofuels ranges between 0.25 and 1.6, and is usually less than 1, due to the rebound effect (reviewed by Cowie et al, 2015).

[2] http://www.prnewswire.com/news-releases/90-scientists-urge-congress-not-to-cook-the-books-in-co2-accounting-for-biofuels-other-bioenergy-sources-94741714.html
http://www.dogwoodalliance.org/wp-content/uploads/2013/05/Biomass-Scientist-Letter-to-EU-Government.pdf

[3] http://www.abc.net.au/environment/articles/2015/06/29/4263947.htm
http://www.abc.net.au/radionational/programs/backgroundbriefing/hazelwood-considers-clean-energy-biomass-burning-option/6641880

specific issues including indirect land use change (Berndes et al, 2010, 2011, 2012), and the effects of timing of emissions and removals (Cowie et al, 2013). Task 38 has responded to published papers (Pingoud et al, 2010; Bright et al, 2012). In 2014 Task 38 led the inter-task activity to host a joint workshop (also involving EEA, JRC and IINAS) on "Forests, bioenergy and climate change mitigation" in Copenhagen in May 2014 (see http://.ieabioenergy-task38.org/html/body_copenhagen_2014.html). This comprehensively-planned event brought together experts and decision-makers with divergent views on the role of bioenergy in climate change mitigation, and facilitated dialogue amongst the participants, in order to increase understanding of the climate change effects of bioenergy, and elucidate the basis for alternative perspectives amongst experts. Most recently Task 38 members have submitted a response to the Macintosh paper, which is currently[4] under review by Nature Climate Change.

In the new triennium, Task 38 will continue contributing to this debate in a constructive manner: publishing papers that describe a comprehensive approach to quantifying climate change effects; encouraging dialogue amongst experts; providing interpretation to IEA Bioenergy Executive Committee and the bioenergy community of new studies critical of bioenergy – exposing methodological flaws and biased assumptions; providing briefs that expound a balanced, holistic view of bioenergy.

LCA methodology for assessing climate change effects of bioenergy

Many published studies of climate effects of bioenergy have used the so-called *attributional* LCA approach. Recently this has been criticised, with claims that the attributional approach is too limited and fails to account for indirect effects, especially rebound (Plevin et al, 2014). Task 38 members have responded to this criticism, supporting the notion that the alternative *consequential* approach is more appropriate for assessing the effects of a new policy, while acknowledging that the attributional approach is applicable in other circumstances. Another contested aspect of LCA methodology is the choice of baseline, especially the land use baseline, against which a bioenergy system is compared. Task 38 has been working on this topic for several years, hosting two international workshops, and drafting a paper on the topic (Koponen et al. in preparation). Task 38 members have also published a paper reviewing the application of land use baseline in attributional LCA (Soimakallio et al, 2015), and an example of its use in agro-bioenergy production (Koponen & Soimakallio 2015). In the new triennium, Task 38 will prepare a paper discussing the application of consequential and attributional approaches to LCA for assessment of bioenergy.

Task 38 has also investigated the methodological issue of accounting for time in LCA. In the current triennium, Task 38 collaborated with Tasks 43 and 40 to prepare a short report "On the Timing of Greenhouse Gas Mitigation Benefits of Forest-Based Bioenergy" that was published by ExCo in July 2013 (Cowie et al, 2013). This document also formed the basis for presentations delivered in several conferences and workshops in 2014. Task 38 is currently preparing a paper reviewing alternative metrics for assessing the climate effects of GHG emissions from bioenergy systems (Brandão et al, in preparation). Through Task 38 workshops and conference presentations, and review of recent literature, it has become apparent that several research groups working in similar climates with similar forestry systems have reached different conclusions on the climate effects of bioenergy based on harvest of biomass from existing forests. Task 38 will collaborate with Task 43 in the new triennium to undertake a joint project comparing modelling approaches, and examining the basis for these different results. This joint

[4] September 2015

project will also consider the benefits and limitations of product-based LCA for assessing bioenergy, and consider the potential need for approaches beyond conventional LCA.

Negative emissions

It now appears very likely that the world will fail to constrain emissions to a level consistent with limiting global warming to 2ºC. Therefore, to minimise the damage caused by climate change, scientists and policy-makers are searching for "negative emissions" technologies that can withdraw CO_2 from the atmosphere. Options include afforestation, reforestation and management of soil carbon in agricultural systems – but these options are limited in capacity, and are vulnerable to future reversal through land use change or natural disturbance. Bioenergy-CCS (BECCS) is perceived by climate modellers as an important contributor to future low-C energy systems and as a viable future technology with substantial capacity to deliver negative emissions. Nevertheless, there are many questions about how much mitigation can be delivered through BECCS, and how indirect effects can be minimised as biomass production is expanded. There are concerns that the simplified modelling of biomass production that is included in global modelling undertaken to date may have produced inaccurate estimates of the net effects of BECCS systems. In the new triennium, Task 38 proposes to work on methods to link LCA with global modelling approaches.

2 OBJECTIVES

This proposal builds on the achievements of Task 38 in previous triennia, including its predecessor Tasks titled *Greenhouse Gas Balances of Biomass and Bioenergy Systems*.

The proposed Task will primarily focus on the development, demonstration, and promotion of methods to aid the implementation of GHG mitigation projects and programmes. In doing so, the Task will support the following objectives elaborated in the IEA Bioenergy Strategic Plan 2015-2020:

1. To promote the market deployment of technologies and systems for sustainable energy production from biomass;
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;
3. To strengthen the outreach efforts of the Implementing Agreement to involve interested new member countries, industry, other IEA efforts, and several multilateral organisations addressing biomass and bioenergy systems[5];
4. To increase the dissemination of information.

Based on these objectives and the challenges presented in the introduction, the proposed Task will focus on the development and application of methods to assess the climate effects of bioenergy systems. The objectives of the proposed Task are to:

1. Promote the sustainable use of biomass and bioenergy through increased understanding of the climate change effects of biomass production and utilisation for energy;

[5] Examples include the Global Bioenergy Partnership (GBEP), the Sustainable Energy for All (SE4ALL) and its high impact opportunity projects, and the IEA activities of how to guide the development of bioenergy as part of low-carbon technology strategies. All of these, and others, are linked to the recognition that biomass and bioenergy have an important role to play among renewable energy options. [see http://.globalbioenergy.org/ ; http://www.se4all.org; and http://www.iea.org/media/technologyplatform/BioenergyHow2Guide_projectoutline_fortheweb_05.03.2014.pdf].

2. Revise and promote the updated "standard methodology" for the calculation of life cycle climate change effects, incorporating current and emerging issues, technologies and topics;
3. Work in cooperation with other IEA Bioenergy Tasks to assess the climate change effects of new bioenergy technologies and biomass production systems; and
4. Aid decision makers in devising policy and selecting mitigation strategies that optimise climate change benefits by disseminating the results of the above-mentioned activities, including recommendations on the cascading use of biomass.

3 WORK SCOPE

The Task will focus on quantifying the climate change effects of current and emerging biomass and bioenergy systems. The Task will keep abreast of the changing scientific understanding of bioenergy and present the implications of these changes to ExCo and policy makers in participating countries.

The scope of work of Task 38 in 2016 – 2018 will include some or all of the following specific topics:

1. Development of guidance to policymakers and researchers on the application of the improved "Task 38 standard methodology" for estimating the climate change effects of bioenergy, based on a holistic life-cycle perspective;
2. Development of guidance on appropriate application of the so-called attributional and consequential approaches to life cycle assessment (LCA);
3. Investigation of trade-offs between using simplified and comprehensive assessments to inform policy development and implementation;
4. Integration of LCA and other system-level modelling;
5. Assessment of the relevance of timing of climate forcers to the climate effects of bioenergy;
6. Assessment of the relevance of short-lived climate forcers to the climate effects of bioenergy;
7. Harmonisation of input and output data of biomass and bioenergy systems;
8. Consideration of methods to include risk and uncertainty in the estimation of climate change effects;
9. A joint study with Task 36 and 40 on trade of waste-to-energy (WTE) streams;
10. A joint study with Task 40 and 43 on how to mobilize sustainable biomass for trade and demonstrate benefits of bioenergy in the biobased economy;
11. A joint study with T43 on comparing the various forest growth and bioenergy models and studies between Finland, Sweden and Norway, as well as between different US states;
12. Assessment of GHG effects of emerging technologies relating to, for example, algal biofuels.
13. Assessment of the impacts of harvesting agroforestry residues for bioenergy production on GHG emissions.

The Task will analyse climate change effects by applying the Task 38 standard methodology, which covers the three main greenhouse gases (CO_2, CH_4, and N_2O), emissions and removals over the entire life cycle of biomass and bioenergy systems, all biomass pools (above and below-ground biomass, dead wood, litter, soils, and wood products in service and in landfills) and fossil fuels as an input to the system being studied. In addition, the Task will expand knowledge of the climate change benefits of bioenergy by including the following current and emerging issues:

1. GHG accounting for carbon in wood products and use of post-consumer wood products for energy;
2. the timing of GHG emissions and removals; and
3. non-CO_2 climate forcers such as albedo and black carbon.

To accomplish this objective the Task will strive to assess, develop and propose new methods that encompass these themes and include probabilistic reference systems, and model and parameter uncertainty, for a better understanding of the confidence of the climate change impact predictions.

4 PROPOSED WORK PROGRAMME

4.1 Primary activities

The primary activities proposed for Task 38 in 2016 - 2018 are:

1. Demonstrate the updated standard methodology through application to specific case studies;
2. Work with technology-specific Tasks to apply the updated standard methodology to emerging technologies;
3. Apply the standard methodology to bioenergy systems of relevance to participating countries, including temperate, tropical and subtropical environments, to quantify the potential mitigation contribution of these systems;
4. Prepare policy papers on key emerging issues;
5. Hold an annual workshop in cooperation with another task, on topical issues of relevance to participating countries;
6. Hold an annual working meeting to stimulate discussion on issues listed above amongst Task38-NTLs and formulate a detailed programme of action to address these issues; and
7. Engage with climate change and renewable energy policy development and sustainability certification processes to provide input on quantification of climate change mitigation value of bioenergy systems.
8. Communicate with industry to provide input on quantification of climate change mitigation value of bioenergy systems, and to improve the understanding on the critical aspects of the climate impact analyses of bioenergy.

The results of the primary activities will be published as policy briefs and "plain English" summaries that are supported by detailed research reports.

Like other Tasks under IEA Bioenergy, Task 38 is a network that brings together expertise from its members. Thus, our work relies on the input provided by our members. The work programme is a flexible framework, adapted to the interests and capacities of the members. Also, we need to maintain some capacity to deliver responses to important events (e.g. a piece of controversial media negating the climate benefits of bioenergy) relevant to the work of the task. We have deliberately not included a specific timetable for the publication of the proposed reports, as this depends on the priorities of the task members. However, in general, we strive for continuous and evenly distributed output of reports throughout the triennium.

4.2 Collaboration with other Tasks

The topic of Task 38, quantifying climate change effects of biomass and bioenergy systems, is cross-cutting, so is relevant to the Tasks focused on biomass supply, sustainability and specific conversion technologies. Thus it is critical that Task 38 works closely with other Tasks, to

ensure that our assessments are applicable to the latest technology developments and issues of emerging interest and concern to the industry.

Therefore, the topics in the Work Scope above, as well as the Activities listed above will be undertaken in close collaboration with other Tasks. Specific collaborations planned include:

- Comparison of tools for GHG assessment - with Task 39
    - review and assessment of LCA tools and models (such as GHGenius, GREET, BIOGRACE etc.), to understand the basis for differences between the tools, and to evaluate the climate effects of different commercial biofuel options
    - Harmonisation of input and output data (functional unit) of proposed projected biomass and bioenergy systems based on analyses of the literature data, preferably engineering level data - with Task 39

- Modelling bioenergy systems based on boreal forests - with Task 43
    - carbon dynamics and GHG fluxes in forest biomass and soils, and forest products, in Nordic region and North America
- Improving methodologies for assessing greenhouse gas emissions from LULUCF - with T43 and T40.
    - Including analyzing the relationship between climate policies and resource availability, impacts on near term GHG targets, and cascading concepts and other restrictions that limit the acceptable bioenergy feedstock resource; expanding modelling approaches beyond LCA.
- Integrated landscape management with Task 43
    - joint study tour April 2016
- GHG balance of hybrid systems – eg bioenergy linked with solar - with Task 43
- Inter-task project on Measuring, governing and implementing sustainable bioenergy
    - Task 38 to lead a components on: Overview of calculation methods & tools to assess the sustainability of various biomass and bioenergy supply chains and assess potential for a uniform/harmonized framework
- Inter-task project on Waste management strategies within a circular BioEconomy - led by Task 36, and involving Tasks 40 and others
    - GHG cost of trading different waste types; comparison of waste management options comparing various bioenergy pathways, and biomaterials, with conventional practice.

The capacity for Task 38 to pursue each of these proposed activities is dependent on the number of participating countries, the priorities of those countries, and the expertise of the individuals nominated as NTLs and "Task 38 associates"[6].

4.3 Subprojects

Papers to demonstrate the improved standard methodology will be developed as commissioned subprojects. Other subprojects may include case studies on bioenergy systems that are of interest to participating countries, and activities that contribute to the collaborative projects described above in d 4.2. The Task contributes a portion of the subproject costs, allowing preparation of a summary for a lay audience, including policymakers. The majority of the costs of data collection and analysis are borne externally to the Task, but leveraged by the Task. Funds will be allocated to individuals or institutions in the participating countries selected for coordination of

[6] Task 38 encourages NTLs to involve a wider group of relevant experts from their country. We refer to these people as "Task 38 associates". They are invited to participate in Task 38 internal workshops, and to undertake discrete items of work, overseen by the NTL.

subprojects, through unanimous decision by all NTLs. The specific topics will be determined by the Task members once participation in the new triennium is determined.

4.4 Supplementary activities

The Task will also:

1. Respond to issues that arise (significant new papers published, articles in the popular press, opportunities to provide input to policy development), advising on matters of immediate interest to governments and industry in participating countries; and
2. Advise IEA Bioenergy on implications of international and national developments in GHG accounting and bioenergy.

4.5 On-going activities

In order to contribute to the "objectives and actions" as elaborated in the IEA Bioenergy Strategic Plan, the Task will continue to undertake the following activities:

- Annual Task Workshops which communicate results and focus on emerging issues;
- Maintenance of the Task 38 website;
- Development of presentation slides, for use by the NTLs of participating countries, on key topics;
- Regular contributions to Newsletters (IEA Bioenergy Newsletter and Newsletters in the participating countries);
- Communication with the IEA Bioenergy Secretariat and the Operating Agent; preparing contributions for the IEA Bioenergy Annual Report, and regular Task progress reports etc. for Executive Committee Meetings.

4.6 Co-operation with international programmes

Participants of Task 38 have been and will continue to be involved with:

- IPCC assessments of potential mitigation through bioenergy, and development of methods for GHG quantification for bioenergy, wood products and other elements of the Agriculture, Forestry and Other Land Use sector (Pingoud, Chum, Goss Eng);
- UNFCCC development of methods and approaches for GHG inventory and accounting (Rüter);
- The Roundtable on Sustainable Biomaterials (RSB), in development and implementation of sustainability certification for biofuels and assessments of these activities globally (Chum);
- ISO development of GHG and LCA standards. Commencement of revision of ISO TS 14067 (Carbon footprint of a product) has recently been approved, and revision of the GHG standards 14064 parts 1 and 2 is progressing. ISO standard 13065 Sustainability criteria for Bioenergy has recently been approved for release, and will inform the revision of 14067 (Cowie);
- Collaboration with the EC and their institutions working on Task38 topics, such as JRC through its work on inclusion of timing of emissions and removals in methodology for life cycle assessment (Cowie, Brandão);
- Dissemination of Task 38 deliverables and findings to GBEP participants, particularly developing countries, to provide practical guidance on the standard methodology, GHG accounting, and practices for mitigating climate change through biomass and bioenergy production. This includes participation in capacity building events sponsored by GBEP,

which are also co-sponsored by the IEA and Sustainable Energy for All (Johnson, Chum); and

- Collaboration with other international institutions working on Task38 topics (all),
    - IEA (and their climate-related working groups) and IEA Working Party on Renewable Energy, IEA International Low-Carbon Strategy (Chum),
    - the UN Food and Agriculture Organisation (Chum),
    - Scientific and Technical Advisory Panel of the Global Environment Facility (Cowie), and
    - Dissemination of the SCOPE (Scientific Committee on Problems of the Environment) report "Bioenergy & Sustainability: Filling the Gaps," launched on 4/14/2015 and available at http://bioenfapesp.org/scopebioenergy/images/chapters/bioenergy_sustainability_scope.pdf (Chum).

Through these interactions Task 38 members will work to influence the development of policy and operations of government and industry to accurately reflect the GHG effects of bioenergy systems, and to provide appropriate incentives for bioenergy. Task 38 will report on involvement in these activities in its regular reporting to ExCo.

4.7 Intra-task activities and national capacity-building

Within the Task, collaboration between NTLs will be promoted through:

- Business/working meetings;
- Workshops on topical issues;
- Regular E-mail and teleconferencing;
- Limited and carefully targeted resourcing of discrete work packages (e.g., topical reports, case studies); and
- Collaboration on development of policy briefs, technical papers and input to consultation processes;

Furthermore, NTLs are encouraged to involve other experts from participating countries through invitation to participate in workshops hosted by Task 38, development of reports, papers and policy briefs. In this way, Task 38 contributes to capacity-building in participating countries.

4.8 Industry involvement

As a cross-cutting task focused on research and development of GHG accounting and climate change assessment, task activities generally involve experts in life cycle assessment, climate change science, and resource management. These experts tend to come from public and private research institutions, Natural Resource Management and LCA consultancies, and government. Thus Task 38 has limited direct involvement from the commercial bioenergy industry. However, Task members interact frequently with industry representatives to provide advice on quantifying GHG balance for their systems.

For the next Triennium Task38 will continue to seek opportunities to present its methodology and findings to industry, and to engage with industry to conduct case studies, for example, on the design of sustainability standards and the assessment of the climate change effects of specific bioenergy supply chains.

5 DELIVERABLES

The intended deliverables for Task 38 in the 2016-2018 triennium are:

1. Three workshops in cooperation with other tasks;
2. Three business meetings;
3. Technical papers published in scientific journals on the key issues in methodology development;
4. Plain English summary of scientific papers for non-technical audience;
5. Studies highlighting the application of the standard methodology in addressing key issues and identifying promising biomass and bioenergy systems; and
6. Contribution to outputs from collaborative projects.

5.1 Target audience

The target audience of Task 38 outputs is broad and includes: decision-makers and processes, both nationally and internationally (e.g., national environment and industry development departments, Conference of the Parties to the UN Framework Convention on Climate Change; CDM Executive Board); industry; NGOs; scientists and the interested public. Much of the information communicated will also be prepared and targeted through the ExCo.

5.2 Outputs

The Task will produce[7]:

1. Policy briefs, technical papers and publications on the following topics:
    a. The role of LCA in informing policy and industry for bioenergy
    b. An improved "standard methodology" for estimating the climate change effects of biomass and bioenergy systems;
    c. Incorporating timing of emissions and removals in LCA and GHG accounting of bioenergy systems;
    d. The role of short-lived climate forcers in the assessment of the climate change effects of biomass and bioenergy systems;
    e. Harmonising input and output data of biomass and bioenergy systems; and
    f. Dealing with risk and uncertainty in the estimation of climate change effects of biomass and bioenergy systems.

2. Input to reports in collaborative projects which may include the following topics:
    a. Trade of waste-to-energy (WTE) streams;
    b. How to mobilize sustainable biomass for trade and demonstrate benefits of bioenergy in the biobased economy;
    c. Comparing the various forest growth and bioenergy models and studies between Finland, Sweden and Norway, as well as between different US states; and
    d. The assessment of GHG effects of emerging technologies relating to, for example, algal biofuels.

3. Workshop and working meeting reports;

4. Task 38 website with all presentations and publications;

5. Contributions to IEA Bioenergy publications and consultations; and

6. Reports as required by IEA Bioenergy

[7] Until it is determined which countries will participate, and therefore which experts will be involved, we cannot guarantee which of these topics will be addressed.

a. Six-monthly reports to the Executive Committee;
b. Annual reports of IEA Bioenergy

5.3 Schedule and Milestones

Deliverable	Date
Business/working meetings and workshops organized by Task 38 (1 per year, 3 in total)	Q 1 annually
Collaborative workshops (3 in total)	Annually – scheduled in collaboration with other Tasks
Methodology paper 1 and associated policy brief – The role of LCA in informing decision makers in government and industry	Q3 2016
Methodology paper 2 and associated policy brief – Harmonizing input and output data on current commercial biofuels by harmonizing existing tools in existing legislation to the extent possible.	Q1 2017 scheduled in collaboration with Task 39
Methodology paper 3 and associated policy brief – The improved standard methodology for estimating climate change effects of bioenergy systems	Q3 2017
Methodology paper 4 and associated policy brief – Incorporating timing of emissions and removals in LCA and GHG accounting of bioenergy systems	Q3 2017
Methodology paper 5 and associated policy brief – The role of short-lived climate forcers in the assessment of the climate change effects of biomass and bioenergy systems	Q1 2018
Methodology paper 6 and associated policy brief - Harmonizing input and output data on developing biomass and bioenergy systems from various methodologies used in legislation	Q1 2018 – scheduled in collaboration with Task 39
Methodology paper 7 and associated policy brief – Dealing with risk and uncertainty in the estimation of climate change effects of biomass and bioenergy systems	Q3 2018
Collaborative reports with other Tasks based on activities described in section 4.2.	Q4, 2018

Paper titles are indicative until participation is confirmed

A Gantt chart providing further detail is included at Appendix II.

5.4 Dissemination

The main instruments for disseminating Task outputs are the annual workshops and the Task 38 website. Workshops attract a core group of Task participants as well as a number of experts from the country where the workshop is held. The website is the major avenue for disseminating task outputs to a broader audience.

Other avenues include the use of the bioenergy, climate and forestry mailing lists to ensure Task information is received by technical experts. A more directed audience will be the multilateral collaborating organizations which will receive input in a targeted form for their deployment and dissemination of best practices activities.

6 BUDGET (IN US$)

6.1 Income

The following budget assumes the participation of eight countries.

	USD/year
Contributions	128,000
Retained funds	-12,800
Net	115,200

* based on an assumption of eight participating countries with a contribution of US$ 16,000 each, less 10% retained by ExCo.

6.2 Expenses

The proposed annual budget assumes eight participants, noting that only six countries indicated participation for the new triennium, and another five indicated the possibility of participation:

	Administration /coordination	**Inter-task collaboration**	**Technical studies**	**Outreach**	**Total**	**% of Total**
salaries	$28,400	$5,000	$5,000	$10,000	$48,400	42.0
contracts		$12,800	$11,700		$24,500	21.3
meetings and workshops		$3,000	$5,000		$8,000	6.9
travel	$7,500	$10,000	$10,000	$3,000	$30,500	26.5
communication/ dissemination				$2,000	$2,000	1.7
minor consumables	$1,800				$1,800	1.6
Total	**$37,700**	**$30,800**	**$31,700**	**$15,000**	**$115,200**	
% of Total	32.7	26.7	27.5	13		

Notes on budget

Salaries: cost of remuneration of Task Leader and Manager for administration, outreach activities, coordination and review of technical studies, research summaries, policy briefs; and administrative assistance in organising meetings and workshops, preparing minutes, reporting, management of contracts, finances.

Contracts: Fees paid to task members to facilitate their contribution to technical studies including collaborative projects

Communication/dissemination: includes costs of preparing, printing and distributing report summaries, policy briefs, web site management.

Meetings/workshops: costs of venue hire and catering.

Travel: for participation of Task Leader and Task Manager in workshops and meetings.
Inter-task collaboration: Includes $30,000 across the triennium towards collaboration with other Tasks, as indicated in Section 4.2.

7 COUNTRY PARTICIPATION

The following table indicates countries that participated in Task 38 in the current triennium, and the indication of participation given at ExCo 75:

Country	Current	Indication for 2016-2018	Representative
Australia:	Y	Y	Annette Cowie, University of New England/ NSW Department of Primary Industries
Brazil:	Y	?	Manoel Regis Lima Verde Leal, Brazilian Bioethanol Science and Technology Laboratory
Denmark:	N	?	
European Commission	N	?	
Finland:	Y	Y	Sampo Soimakallio, Finnish Environment Institute (SYKE) and Kati Koponen, VTT Technical Research Centre of Finland
France:	Y	?	Formerly Roland Gerard, now Alice Gueudet.
Germany:	Y	Y	Sebastian Rüter, Federal Research Institute of Rural Areas, Forestry and Fisheries
Netherlands, The:	N*	?	Jan Ros, Netherlands Environmental Assessment Agency
Norway	Y	Y	Anders Strømann, Norwegian University of Science and Technology
Sweden:	Y	Y	Leif Gustavsson, Linnaeus University and the late Matti Parikka, Swedish Energy Agency
United Kingdom	N	?	
United States, The:	Y	Y	Alison Goss Eng and Kristen Johnson, U.S. Department of Energy

*The Netherlands participated only for 2013.

8 TASK MANAGEMENT

Operating agent: Stephen Schuck
Task leader: Annette Cowie
Task manager: Miguel Brandão

It is proposed that Task leadership be carried out by Annette Cowie, with Miguel Brandão as Task Manager. Annette is based in Australia at the University of New England. In the role of task leader Annette will have access to the required research and management resources, including office facilities and administrative support and expertise in web site maintenance. She will have close contact with the Operating Agent, Stephen Schuck. Annette will maintain close links with Miguel Brandão, the Task manager. Miguel recently took up an associate professorship at the Royal Institute of Technology (Stockholm, Sweden) in August 2015. As current task manager (since November 2014) Miguel is well-placed to assist Annette.

8.1 Short biographies of key personnel

Dr Annette Cowie has a background in agriculture and forestry, with particular interest in sustainable resource management. She is Principal Research Scientist, Climate, in the NSW Department of Primary Industries, and adjunct professor at the University of New England. Her research focuses on greenhouse gas (GHG) accounting, investigating key aspects of carbon sequestration in forests, soil carbon dynamics, and life cycle assessment of GHG effects of reforestation, bioenergy and biochar systems. She contributes to development of climate change policy, including GHG accounting for emissions trading at state, national and international levels. During 2011, Annette was one of the six inaugural members of the Domestic Offsets Integrity Committee, an independent expert committee that was established to assess offset methodologies proposed under Australia's Carbon Farming Initiative. Annette was a member of the International Standards Organisation working group that developed the standard for quantifying and communicating the carbon footprint of products, and currently participates in the committee developing sustainability criteria for bioenergy. She has more than 50 peer reviewed publications, largely focused on carbon cycle and climate change policy for the land sector. Annette has been the Australian national team leader for Task 38 since Australia joined the Task in 2000. She was Co-Task Leader from December 2007 until taking over task Leader position in 2013.

Dr Miguel Brandão is Associate Professor in Industrial Ecology and Life Cycle Assessment at the Royal Institute of Technology (KTH) in Stockholm, Sweden. He is also Task Manager for IEA Bioenergy Task 38. Miguel has extensive expertise in Life Cycle Assessment, particularly focused on the land sector. His research includes assessment of land-use competition, particularly the consequential effects of using land for food, feed, fuel, timber and carbon sinks on the economy, ecosystems and climate. He has developed methods for the impact assessment of land use in LCA and for quantifying indirect land-use change, and for quantifying the effects of timing of GHG emissions.

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Appendix I: Contribution to the IEA Bioenergy Strategic Plan 2015-2020

OBJECTIVE	ACTION	TICK
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 benefits and impacts on the market.	
	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)	
	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 area of bioenergy including energy driven biorefineries and job creation.	
	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	
	Encourage other sectors of the bio-based economy to apply the same stringent rules of sustainability in using biomass as in the case of biofuels and bioenergy	
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	
	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	
	Initiate new tasks where new topics emerge that are in accordance with the needs of the members, and close completed tasks	
	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 the 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	
	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	
	Identify strategies that encourage existing Contracting Parties to expand their Task participation	
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	X

	(where appropriate)	
	Strengthen the exchange with IEA Headquarters and get actively involved in the development of road maps, ETPs etc.	
	Improve interaction with other IEA Implementing agreements through information exchange	
	Present IEA Bioenergy and its results at national and international meetings	X

Appendix II: Task 38 Proposed schedule of activities, events and deliverables for the triennium 2016-2018

	2016				2017				2018			
Events and deliverables	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Business/working meeting and workshop												
Collaborative workshop												
Technical Paper 1 – Role of LCA in informing policy and industry for bioenergy												
Policy paper based on Technical paper 1												
Technical Paper 2 - Harmonizing input and output data on current commercial biofuels and harmonizing existing tools in existing legislation to the extent possible.												
Policy paper based on Technical paper 2												
Technical Paper 3 – The improved standard methodology for estimating climate change impacts of bioenergy systems												
Policy paper based on Technical paper 3												
Technical Paper4 – Importance of time in assessing climate effects												
Policy paper based on Technical paper4												
Technical paper 5 – The role of short-lived climate forcers in the assessment of the climate change impacts of biomass and bioenergy systems												

Policy paper based on Technical paper 5												
Technical paper 6 – Harmonizing input and output data on biomass and bioenergy systems from various methodologies used in legislation												
Policy paper based on Technical paper 6												
Technical paper 7 – Dealing with risk and uncertainty												
Policy paper based on Technical paper 7												
Reporting to ExCo												
Reports in collaboration with other tasks – timing tbc												