

PROPOSAL FOR PROLONGATION

Task 38: Greenhouse Gas Balances of Biomass and Bioenergy Systems

Planning for the New Triennium 2007-2009

**ExCo58
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in collaboration with the National Team Leaders of Task 38**

Task Period 2007-2009

Task Proposal Summary Sheet – Final Version for ExCo 58

Proposer

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The Task proposed here is cross cutting in that it integrates and analyses information on greenhouse gases, bioenergy, and land use, thereby covering all components that constitute a biomass or bioenergy system. A close collaboration with the other Tasks in the framework of IEA Bioenergy will therefore be essential.

Key Objectives

- Increase the understanding of GHG outcomes, on a life-cycle basis, of bioenergy and carbon sequestration, especially for; bioenergy technologies approaching a break-through, such as second generation biofuels; foster international collaboration and common views of key technical and methodological issues
- Develop, improve, compare and make available models and tools for assessing GHG balances of bioenergy and carbon sequestration systems on the project, activity, and regional levels, also in the context of economic efficiency, and a broader set of goals, including energy security, environmental and socio-economic issues
- Disseminate best practice in biomass based GHG emission reduction, and support technology transfer and implementation of GHG mitigation projects
- Aid decision makers in selecting mitigation strategies that optimise GHG benefits, e.g. allocating biomass to energy vs. use as raw material; considering costs and benefits, as well as the practicalities of different mitigation strategies.

Work Scope

The three main greenhouse gases (CO₂, CH₄, N₂O), emissions and removals over the entire life cycle of biomass and bioenergy systems including carbon sequestration, all biomass pools (above and below-ground biomass, dead organic matter, litter, soils, wood products of various lifetimes, biogenic carbon in landfills) and fossil fuels as an input to the biomass system, and as a reference system. The system boundary will account for both the spatial and temporal scale. The Task will also cover the economics and other externalities as far as they impact the economics of GHG mitigation.

Work programme (examples)

- Develop a methodology for economic assessment of biomass based GHG mitigation options including the costing of other positive and negative externalities besides GHGs.
- **Develop standards for GHG performance in the context of bioenergy policies (such as EU directives, renewable portfolio standards, emissions trading and project-level GHG offset mechanisms), with the goal to provide incentives to optimize GHG benefits.**
- Address methodological issues on linking of Emission Trading Systems and bioenergy /land based offset projects;
- Extend methodologies for estimating GHG impacts of bioenergy and land use in developing countries (CDM and other projects) to assist sustainable use of biomass and bioenergy in these countries;
- Further improve and make available methods for optimisation of GHG reduction strategies for biomass: carbon sequestration, indirect and direct substitution, synergies, biomass recycling and cascading.
- Disseminate knowledge on biomass based GHG mitigation in the international, national and commercial contexts.
- Address methodologies for GHG balance of biomass trading chains, and securing that imported biomass is renewable
- Work with IEA on overview of 'climate change policy and measures'.
- Analyse options for the accounting of carbon sinks and bioenergy in the Kyoto Protocol's second commitment period, with main focus on the implications for bioenergy and bio-based materials.
- New case studies on novel biomass and bioenergy systems.

Deliverables

Position papers, documented workshops, special journal issues, side events at meetings of the UNFCCC Conference of the Parties, set of power point slides on specific topical issues, database on country conditions, contributions to annual reports and reports to Executive Committee, inputs into national discussion circles on the topics of the Task.

Management Qualifications

Bernhard Schlamadinger: Task Leader of previous GHG Tasks. Coordinating lead author of IPCC special report on land-use change and forestry and the IPCC Good Practice Guidance. Work on carbon cycle, bioenergy, wood products, land-use and climate policy for past 15 yrs. drafted the first approved CDM Methodology for reforestation. Kimberly Robertson (New Zealand) is proposed as Co-Task Leader. The Task Leaders will be assisted by Susanne Woess-Gallasch.

Annual budget (US\$): 168,000 assuming 12 participating countries

Annual budget per participant (US\$): 14,000

Greenhouse Gas Balances of Biomass and Bioenergy Systems
Proposal for a new collaborative Task for the period 2007 - 2009

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Greenhouse Gas Balances of Biomass and Bioenergy Systems

Proposal for a new collaborative Task for the period 2007-2009

INTRODUCTION

The main global drivers for bioenergy are the increasing awareness of global climate change issues, the increase in fossil fuel prices and concerns about energy security. The reduction of greenhouse gas (GHG) emissions has become an issue of great international importance: Ever increasing evidence of climate change and its impacts, and the adoption of the Kyoto Protocol and other regional, national, bilateral and multilateral agreements, have greatly increased interest in reducing GHG emissions to and enhancing removals of GHGs from the atmosphere. The Kyoto Protocol entered into force in February 2005. As of April 2006, a total of 163 countries have ratified the agreement. Other International partnerships, such as the “Asia-Pacific Partnership on Clean Development and Climate” (AP6) with the aim to co-operate on development and transfer of technology for reduction of GHG emissions have been established. This is an international non-treaty agreement between Australia, India, Japan, China, South Korea and United States. Negotiations for a successor agreement of the Kyoto Protocol post 2012 have commenced at the 11th Conference of the Parties of the UN Climate Change Convention in Montreal (December 2005), and a dialogue on future climate change mitigation was established which involves all countries, developed and developing. The G8 is discussing climate change as one of its key topics, and the IEA is playing a central role in this. As a result of all these international agreements and due to the awareness of the acute problem, many countries are implementing measures to reduce/offset GHG emissions as part of their climate change mitigation strategies. Measures that encourage the use of renewable energy, promote greater energy efficiency, and enhance carbon sequestration in forest and agriculture lands seem to be among the most widespread mitigation options.

Energy prices are rising and this may continue over time due to increasing global demand for fossil fuels. This will enhance the economic competitiveness of biomass and bioenergy systems and their attractiveness, in the form of solid, liquid and gaseous fuels, for the energy market. The increased use of bioenergy contributes to energy security with less dependence on oil and gas delivering countries. Many countries have therefore developed new policy instruments to increase the use of biomass in the energy sector. The EU, for example, developed a Biomass Action Plan, and Directives for Electricity from renewables and for biofuels. A new Directive on renewable energy in heating and cooling, in which biomass will play a prominent role, is being developed. Emission Trading Systems (ETS) are being set up and bioenergy may play an important role there. The EU ETS commenced in January 2005 and has an estimated annual turnover of 20 billion Euros. ETS are also being developed in Australia (NSW Greenhouse Gas Abatement Scheme), Canada (Large Final Emitters), USA (Chicago Climate Exchange, California Climate Action Registry and Regional Greenhouse Gas Initiative). The role of bioenergy and carbon sequestration in regional Emission Trading Systems will be an important topic for the proposed Task. New bioenergy and biofuels production chains e.g. biodiesel from palm oil or from jatropha trees will have to be assessed through Life Cycle Assessments. With the increased use of bioenergy in projects to offset or reduce GHG emissions, and with the increased trade of biomass, the origin and sustainable production of biomass will assume greater importance. For example, the Executive Board of the Clean Development Mechanism (CDM) has recently issued definitions of renewable biomass (as opposed to non-renewable biomass), and each bioenergy CDM project must prove that it uses renewable biomass, or else deduct from

the Certified Emission Reductions any losses of carbon stocks in terrestrial systems (e.g. from deforestation or forest degradation).

At the same time as high oil prices lead to increased use of modern biomass applications in developed countries, they have also greatly reduced the affordability of fossil fuels to many developing countries, which are thus increasing their use of traditional biomass like fuel wood, charcoal and dung. In order for this to be sustainable, this use must be as efficient as possible.

The primary goal of this Task is to investigate all processes involved in the use of bioenergy and carbon sequestration systems, with the aim of assessing overall greenhouse gas balances and supporting decision makers in the selection of greenhouse gas mitigation strategies. Much methodological work has been completed on the assessment of greenhouse gas emissions of biomass and bioenergy systems. The focus of the Task in this area is to provide tools to facilitate the analysis, and to provide timely responses on technical and methodological questions arising from the new developments outlined above. The new Task will extend the scope of the Task to the economics of GHG mitigation through biomass and bioenergy systems, taking into account the other external benefits of these systems.

1. OBJECTIVES

The proposed Task builds on the achievements of its predecessor Tasks on Greenhouse Gas Balances of Biomass and Bioenergy Systems. There has been increasing demand for information and tools that aid decision makers in implementing measures to limit emissions or enhance removals of GHG. Therefore, the proposed Task will primarily focus on the development and application of methods to aid the implementation of mitigation projects and programmes. In doing so, the Task will support especially the following six “objectives and actions” elaborated in the IEA Bioenergy Strategic Plan:

- 1: to promote the market deployment of technologies and systems for sustainable energy production from biomass; this will be done by emphasising on GHG budgets of sustainable bioenergy systems (see also activities under 3.2).
- 2: to actively encourage the maintenance and development of networks of participants involved in research, development, demonstration, deployment and education, and to provide for the effective dissemination of information on bioenergy (see activities under 3.3)
- 3: to increase the involvement of industry in IEA Bioenergy (see activities under 3.7)
- 4: to increase membership with emphasis on countries with a significant bioenergy R&D infrastructure (see under 7)
- 5: to increase interactions with other global, multilateral energy and environmental programmes (see activities under 3.5)
- 6: to collaborate with the Renewable Energy Working Party REWP (see activities under 3.5)

Based on these general objectives and actions of IEA Bioenergy and the problems and needs outlines in the introduction, the objectives of the Task are to:

- a) Increase the understanding of GHG outcomes, on a life-cycle basis, of bioenergy and carbon sequestration, especially for; bioenergy technologies approaching a break-through, such as second generation biofuels; foster international collaboration and common views of key technical and methodological issues
- b) Develop, improve, compare and make available models and tools for assessing GHG balances of bioenergy and carbon sequestration systems on the project, activity, and regional

levels, also in the context of economic efficiency, and a broader set of goals, including energy security, environmental and socio-economic issues

- c) Disseminate best practice in biomass based GHG emission reduction, and support technology transfer and implementation of GHG mitigation projects
- d) Aid decision makers in selecting mitigation strategies that optimise GHG benefits, e.g. allocating biomass to energy vs. use as raw material; considering costs and benefits, as well as the practicalities of different mitigation strategies.

2. WORK SCOPE

The Task will continue to focus on the GHG impacts of biomass and bioenergy systems but will extend the work scope of the previous triennium to cover the economics and other externalities as far as they impact the economics of GHG. To a certain extent these are linked, necessitating a methodology to allocate the incremental costs to a range of potential environmental and economic impacts (local air pollution, import/export balance, job effects, etc.) rather than only to GHG emission reductions.

The Task will cover: the three main greenhouse gases (CO₂, CH₄, N₂O), emissions and removals over the entire life cycle of biomass and bioenergy systems including carbon sequestration, all biomass pools (above and below-ground biomass, dead organic matter, litter, soils, wood products of various lifetimes, biogenic carbon in landfills) and fossil fuels as an input to the biomass system, and as a reference system. The system boundary will take into account both the spatial and temporal scale of GHG emissions and removals.

3. PROPOSED WORK PROGRAMME

This section provides a list of activities that will be covered by the Task. It has been discussed with NTLs from countries that showed interest to participate in the Task, to arrive at a final work plan. The list has been broken down into three sections, where the first section deals with generic issues related to the topic of the Task. The generic list has been broken down further into two groups with the first group already having received support from at least two candidate participating countries (section 3.1.a) and section 3.1.b containing issue areas that may also be further considered by the Task. The second main section (3.2) addresses possible “subprojects” or “case studies” on the GHG impact of certain bioenergy systems, to be carried out by different Task participants, and the third section (3.3) addresses “basic activities” such as workshops, publications, etc. This is a maximum list of activities, depending on how many countries will participate, on the interests of those countries that finally decide to participate, and on the exchange rate between US\$ and € (the currency on which Task management operates).

3.1. a: Primary list of activities that address generic or methodological issues

- i. Develop simplified tools for assessing greenhouse gas (GHG) balances of bioenergy and carbon sequestration systems at a project, activity, and regional levels. Assess the life-cycle GHG balance of such systems, including leakage, additionality, and uncertainties. These analyses integrate forest and agricultural sectors, bioenergy production and conversion, and carbon sequestration considerations, as appropriate.
- ii. Develop standards for GHG performance indices in the context of bioenergy policies (such as EU directives, renewable portfolio standards, emissions trading, etc.). The goal is to allow new policies to consider the GHG effectiveness of various bioenergy chains, and to provide

GHG performance incentives that allow the use of “optimal” bioenergy chains (see the work on optimization of GHG balances, such as per unit of land, per unit of biomass, etc., undertaken in the previous Task). This topic is highly relevant in the context of national or regional policy making, is relevant when biomass is transported over longer distances, but is also relevant in the context of the Clean Development Mechanism, Joint Implementation or other offset project mechanisms (including in the US Northeast – RGGI, California, Australia, Canada large final emitters scheme). For example, in the CDM, liquid biofuels are stalled due to lacking standards. Ultimately, this work should aid policies that aim at using scarce resources (land, biomass) as efficiently as possible, taking into account competition with other uses.

- iii. Develop a methodology for economic assessment of GHG mitigation options, including the costing of positive and negative externalities. Biomass and bioenergy systems can be used to meet a range of environmental and socio-economic objectives. A methodology for how to evaluate the tradeoffs between these objectives will be developed. This could be carried out in collaboration with other Tasks (e.g. Task 29: Socio-economic Drivers for Implementation of Bioenergy Projects).
- iv. Address methodological issues on linking of different Emission Trading Systems and especially bioenergy and land-use based (LULUCF) offset projects; the role of bioenergy and carbon sequestration in regional Emission Trading Systems (ETS). for example: EU ETS, ETS in Australia (NSW Greenhouse Gas Abatement Scheme), Canada Large Final Emitters scheme, USA (Chicago Climate Exchange, California Climate Action Registry, Regional Greenhouse Gas Initiative).
- v. Develop methodologies for estimating GHG impacts of bioenergy and land use in developing countries (CDM and other projects). 80% of global biomass energy is used in developing countries, and the bulk of this is still as traditional use for cooking and heating. Methodologies are still required for estimation of their GHG impact.
- vi. Analyse the EU ETS: what impact has the internalisation of CO₂ costs, for example in the EU ETS, on biomass utilisation, biomass prices, prices of electricity/heat, need for biomass certification? What are the sensitivities to possible future changes in CO₂ certificate prices? What conclusions can be drawn from other trading systems (Australia, for example), and what conclusions can be drawn for countries that are deliberating to set up CO₂ trading? This work will be done in cooperation with the EU-funded project “Bioenergy Network of Excellence” (www.bioenergynoe.com).
- vii. Extend the standard methodology to support the analysis of longer fuel chains including recycling and cascading systems. There are a number of synergies between the GHG reduction services provided by bioenergy. Potentially biomass sequesters carbon, can be used to make products, recycled to provide other products and at the end of the cycle burnt to provide energy. Best use must be made of limited resource, e.g., biomass residues, land for dedicated crops, demand-side constraints, funds for GHG mitigation.
- viii. In collaboration with Task 40 (Biomass Trade): Consider ways of estimating the GHG balance of biomass trading chains, and securing that imported biomass fuels are renewable (see discussion about renewable biomass in the CDM context, mentioned earlier in his proposal). Possibilities include certification schemes and labelling, use of default emission or removal factors for certain biomass categories. This discussion is also related to the issue of harvested wood products in national GHG inventories, especially when traded between

countries (an issue that appears again in the IPCC 2006 Guidelines for National GHG Inventories). When biomass or wood products are exported, the exporter has no control over its use. When biomass or wood products are imported, the importer may not have much control over the way it was produced. However, data may be exchanged, or default information used, to assess the way biomass has been produced.

- ix. Contribute to the work of the IPCC related to GHG inventories of systems involving carbon sequestration, wood products, and bioenergy. Contribute to the development of international standards (ISO, IPCC etc.) for GHG accounting and verification in the LULUCF and bioenergy sectors, e.g. in a “joint implementation” or “CDM” or domestic setting. This includes baselines, leakage, uncertainty, and requires consideration of both reduction in fossil fuel emission and changes in terrestrial carbon stocks.
- x. Advise on matters of short-term interest of participating countries as required by governments and industry.
- xi. Establish 1-2 position papers / statements on selected topics from the above list.

3.1. b: Secondary list of activities that will be further considered by the participating NTLs before including in the Task work programme

- i. Analyse options for the accounting of carbon sinks and bioenergy in a possible Kyoto Protocol second commitment period, with main focus on the implications for bioenergy and bio-based materials.
- ii. Development of GHG mitigation option supply curves in different countries. Conduct a sensitivity analysis – when does bioenergy become cost effective? At what carbon prices, electricity prices, oil prices?
- iii. Collaboration with major bioenergy users in developing countries (e.g., China, India, Africa etc) including successful policies for implementation, technology transfer, emission trading mechanisms etc.
- iv. Impact of emissions trading on forest management. Managing concurrently for timber production and carbon sequestration may impact on rotation length, choice of pruning/thinning regime, type of harvesting undertaken. Changes in rotation length will impact on carbon stocks, while the choice of pruning or thinning regime will impact on the suitability of wood for different wood products and possibly associated bioenergy. Potential for collaboration with Task 31 will be explored.

This list can be extended based on further inputs from participating countries. This Task proposal is designed to be flexible and accommodating, and work items should be of interest to at least 2-3 participating countries, thus fostering international collaboration.

3.2: Sub-projects/Case Studies

Subprojects on topics that are in line with the Task objectives and with the interests of involved countries /industrial participants will be carried out. Subprojects are funded from the Task budget (up to 20% of total budget depending on participation, see table below) and contracted back to members in the participating countries. Efforts will be made to secure extra funding from outside sources to complement these subprojects. For each subproject the leadership, work scope, terms of reference, and budget will be defined in writing. Funds will be allocated to subprojects, and individuals or institutions in the participating countries selected for coordination

of subprojects, through unanimous decisions by all National Team Leaders. Some projects of particular interest have been identified in the list below¹, and a final selection of the first batch of subprojects will be made by the NTLs at the first Task workshop of the new Triennium (the second batch will be decided in the following year):

- Application of the new developed methodology mentioned above for economic assessment of GHG mitigation options, costing of positive and negative externalities
- CDM, JI and other offset projects using novel bioenergy technologies. E.g. biodiesel from palm oil or from jatropha trees.
- Liquid biofuels including second generation biofuels. E.g. ethanol from cellulosic materials. Explore ways of collaboration with Task 39 (Liquid Biofuels).
- Combined study with forest management strategy and material substitution.
- Combined heat and power in pulp and paper industry: P&P industries could increase electricity production and sell to grid or reduce purchase from grid. This could include conventional CHP and, as variant, gasification options. Potential trade-offs: produce less pulp and more energy. This could involve 2-3 countries plus some forest industries in these countries.
- Replacing paper with “electronic publishing”, including effects on bioenergy. Other measures that reduce energy services. Optimal use of biomass could also include options to reduce demand (Task 38 view has so far focused solely on supply side). Could broaden systems view even further.
- Case study on optimal use of agricultural land from regional perspective, considering alternatives for biomass production, i.e., woody or non-woody crops, crops suited to ethanol or biodiesel production. Will consider impact on biomass and soil carbon stocks, non-CO₂ emissions, land-use opportunity costs, leakage, sustainability of production. (Potential collaboration with Task 30)
- Biomass to liquid using forestry; starting from the existing land-use in a given area (forest, agricultural land, etc.), how should the land in this region be used for optimising bioenergy?
- Collation of case study outcomes, comparing results in terms of emissions reduction per unit land, biomass, and cost.

3.3: Activities that will be pursued on an ongoing basis.

- Semi-annual to annual Task Workshops on any of the topics elaborated in section 3 above.
- Continual update of the Task 38 website, especially the “Methodological Toolbox” aimed at providing easy to use guidelines for estimating greenhouse gas impacts of projects which includes:
 - Methodological guidance
 - an overview of models available for estimating GHG balances of biomass and bioenergy systems
 - links to key data available on the internet and from sources like the IPCC 2006 Guidelines for National GHG Inventories
- Currently Task 38 provides an overview of country policies and measures in the country reports. However these now require updating. IEA Secretariat also maintains two databases, the ‘renewable energy policies and measures’ and ‘climate change policies and measures’. Rather than updating the Task 38 website the Task could engage with IEA in complementing the IEA databases (especially the one on climate-change mitigation) to ensure that the latest information is included for the countries participating in the Task.

¹ This is a preliminary list of projects subject to further addition and revision by the NTLs of participating countries, and not all will be undertaken. Further projects could be suggested by participating countries.

This item could help to fulfil the Task's contribution to ExCo's focus on policy issues (10% of Task budget).

- Special activities according to the short-term needs of participating countries
- Collation and distribution of materials including: posters, transparencies, graphics and photos, position papers, proceedings
- Development of specific presentation files, for use by the participating countries, on key topics
- Regular distribution of information relevant to the Task topics through Newsletters (IEA Bioenergy Newsletter and Newsletters in the participating countries).
- Maintaining contact with the IEA Bioenergy Secretariat and the Operating Agent; preparing contributions for the IEA Bioenergy Annual Report, and regular Task progress reports for the Executive Committee Meetings.

3.4: Co-operation with other Tasks

The Task proposed here is a cross-cutting activity on GHG and carbon sequestration. These issues are analysed in a systems-analytical approach. However, this work is only possible with collaboration and exchange of information (e.g., on process issues relevant to carbon balances) with other Tasks. Key Tasks for collaboration, in IEA Bioenergy, are (reference is made to the ongoing Tasks, assuming that many of them will continue, perhaps in modified form, in the future):

- Task 29: Socio-Economic Drivers in Implementing Bioenergy Projects (topic could be: costing of externalities, including GHG emission reductions)
 - Task 30: Short Rotation Crops for Bioenergy Systems;
- Task 31: Biomass Production for Energy from Sustainable Forestry;
- Task 39: Liquid Biofuels from Biomass: Enhanced collaboration on GHG aspects / LCA of second generation biofuels.
- Task 40: Sustainable International Bioenergy Markets: Securing Supply and Demand (e.g., on LCA of biomass trade, and on ways to demonstrate renewable features of imported biomass).

The ties with these Tasks will be further specified once the work programmes of the Tasks have been finalised. Means of collaboration are, for example: joint workshops, exchange of data, joint position papers.

3.5: Co-operation with other international programmes

- Participants of Task 38 have been involved in IPCC work on bioenergy and Land-Use, Land-Use Change and Forestry. Based on this, the Task will assess the relevance of the new 2006 IPCC Guidelines for National GHG Inventories for bioenergy and carbons sequestration, and make the data and default values available to analyses at the project level, as carried out within the Task.
- Collaboration with the CDM Executive Board and its panels on development of CDM rules and methodologies, for example through submissions following calls for public input.
- Collaboration with the Global Bioenergy Partnership (GBEP), e.g., by conducting collaborative case studies. Task 38 has already fed information into the planning documents of the GBEP.
- Collaboration with the EC, IEA (and their climate-related working groups) and REWP, the European Forest Institute (EFI), the World Bank, the UNFCCC Secretariat and the UN Food and Agriculture Organisation (FAO).

3.6: Means of collaboration within the Task, and with other Tasks / programmes

- Joint position papers according to short-term needs / discussions, and on topical issues
- Workshops (see work programme) to disseminate knowledge on biomass based GHG mitigation in the international, national and commercial contexts. As appropriate, joint workshops with other Tasks on topics of mutual interest outlined above.
- E-mail and teleconferencing on specific topics.
- Limited and carefully targeted resourcing of discrete work packages (e.g., software development and distribution, case studies).
- Exchange of scientists (e.g. post-docs), with funds made available through external sources, and to a limited extent using Task funds (short-term lab visits).

3.7: Industry involvement

One objective of the Task is to involve industrial participants (e.g., electric utilities, oil/gas companies, forest companies, emissions traders, project developers ...) with an interest in the implementation of carbon sequestration, biomass and bioenergy related GHG mitigation projects. Industry interest arises, among other things, from their need to reduce internal GHG emissions and use offset projects, e.g. JI and CDM projects. One strategy of involving industry (directly or through industry associations) is through the development of simple, and specialised online tools for estimating GHG balances of specific bioenergy systems. Another way is through the involvement of national / regional industry associations dealing with bioenergy issues.

4. DELIVERABLES

4.1: Target audience

Scientists, experts, decision makers (nationally and internationally – e.g. Conference of the Parties to the UN Framework Convention on Climate Change; CDM Executive Board), industry, NGOs, the interested public.

4.2: Task Output

The Task will produce:

- Simplified Software tool for assessing GHG balances of bioenergy and carbon sequestration systems;
- Proposed standards for GHG performance, to be used in the context of policymaking at national and regional levels, as well as in the context of project-level mechanisms (CDM, JI, other offset mechanisms).
- Description of methodology for economic assessment of GHG mitigation options, costing of positive and negative externalities. Biomass and bioenergy systems can be used to meet a range of environmental and socio-economic objectives;
- Report or Paper on methodological issues on linking of different Emission Trading Systems and especially bioenergy and land-use based (LULUCF) offset projects; the role of bioenergy and carbon sequestration in regional Emission Trading Systems (ETS);
- Description of methodologies for estimating GHG impacts of bioenergy and land use in developing countries (CDM and other projects).
- Report or Paper on EU ETS analysis concerning impacts of the internalisation of CO₂ costs on biomass utilisation, biomass prices, prices of electricity/heat from biomass certification;
- Position papers on topical issues in a timely matter (e.g. on extension of standard methodology on longer fuel chains including recycling and cascading systems; or on ways of estimating the GHG balance of biomass trading chains);

- Colour brochures summarising the case studies, detailed reports about the case studies, and a summary comparing the effectiveness in reducing GHG emissions, and other key indicators, in the different case studies.
- Workshop presentations that will be available on the Task 38 website; additionally, selected papers may be published as special issues in reviewed journals;
- Updates and expansions of the current Task 38 website; the website has been significantly expanded with country-specific data and information, and with information that is relevant for policy-makers. The website also now contains a ‘methodological toolbox’ section to provide an easy to use guide on how to perform greenhouse gas emission reduction assessments for biomass and bioenergy systems.
- Presentations at international and national conferences, possibly including side events at a UNFCCC negotiating session;
- Contributions to IEA Renewable Energy Working Party (REWP) and IEA Bioenergy Agreement policy papers;
- Materials according to the short-term needs of the participating countries;
- Contributions to the Annual Reports of IEA Bioenergy;
- Semi-annual reports to the Executive Committee;
- A final report after completion of the Task;

4.3: Dissemination of Task output

Currently the main dissemination of Task information is carried out through workshops, and the Task 38 website. Workshops attract a core group of Task participants as well as a number of participants from the country where the workshop is held (to date workshops have been held in 11 of the 12 countries participating in Task 38). The website has also proved to be a very useful way to inform people of Task results, with about 15,000 people visiting the site since its establishment in 1996. The National Team Leaders have an especially important role in disseminating information about the Task in their own country. It is suggested that regular (at least annual) national meetings should be held for that purpose. Also, National Team Leaders should maintain an e-mail distribution list. In order to aid this, a compilation of key experts /scientists, but also industry focal points, has been established by the Task management. This is a searchable database, and accessible through the website.

Other avenues include the use of the bioenergy, climate and forestry mailing lists to ensure Task information is received by a wider group of people. In the future we will also look at issuing targeted press releases to further extend the number of people receiving information about output from the Task.

5. SCHEDULE AND MILESTONES

Duration: 3 years. Milestones: The Task will include four to five workshops at regular intervals, and various special projects with 1-2 years duration each. Basic activities will be carried out continuously.

6. ANNUAL BUDGET (IN US\$)

Currently there are 13 countries participating in Task 38, and most are likely to continue participation. The table below indicates the annual budget for 11 to 14 participating countries, in US\$ per year.

No of countries	Total	Case Studies	Basic activities	Total per country
11	154 000	28 000 (18%)	126 000	14 000
12	168 000	34 000 (20%)	134 000	14 000
13	182 000	41 000 (22,5%)	141 000	14 000
14	196 000	49 000 (25%)	147 000	14 000

The Task aims to involve industrial participants that may contribute additional funds for consultancy work/special projects, particularly where joint project work is a promising option.

6.1: Annual budget (in US\$, assuming 12 participating countries)

- Labour and benefits	90,000
- Workshops, seminars, meetings, etc. (direct costs only, rest in labour costs)	5,000
- Travel	9,000
- Materials, supplies, publications, etc.	6,000
- Contribution to annual report and newsletters (Included in labour costs)	
- Consultants and contracts (special projects, carried out by individuals in the participating countries)	34,000
- Overheads (13% of labour, 7% of other costs, administration and acquisition)	24,000
Total:	168,000

The labour costs are allocated as follows:

• General Task administration (homepage, annual and progress reports, etc.)	40%
• Workshops organisation (preparation, operation, proceedings, etc.)	15%
• Preparation and handling of Task output (website, bibliography, position papers, coloured brochures of case studies etc.)	26%
• 10% for ExCo specific strategic output	19%

On the basis of 12 participating countries the total annual budget is 168 000 US\$, with an annual contribution per country of 14 000 US\$. If more countries participate, it is estimated that 50% of the additional contributions will be needed for additional cost of administration and organisation (for example, making country-relevant information available on the website, greater participation in various collaborative projects, etc.). 50% of the additional funds would thus be available for additional special projects, i.e., contracts with institutes/experts in the participating countries.

7. COUNTRY PARTICIPATION

At ExCo 57 the following indications of participation in the new triennium of Task 38 were given (final minutes of ExCo 57):

- **Expect to participate:** Austria, Canada, Croatia, Finland, Germany, Sweden, and USA
- **Undecided:** Australia, Belgium, Denmark, New Zealand, Norway, and the EC
- **Will probably not participate:** France, Ireland, Japan, the Netherlands, South Africa, Switzerland and the UK
- **Still to respond:** Brazil, Italy

8. INSTITUTION AND PROPOSED TASK LEADER

It is proposed that Task leadership be carried out by Dr. Bernhard Schlamadinger, assisted by Kimberly Robertson as Co-Task Leader. Bernhard is a staff member of Joanneum Research, working in its Institute of Energy Research. In coordinating the Task, he will utilise resources of this institution and will have access to all means required for this duty (including electronic hardware and software equipment, graphics support, and managerial support). He will have close contact with the Operating Agent. Kimberly is based in New Zealand and will maintain close links with both Bernhard Schlamadinger and other Task support staff.

JOANNEUM RESEARCH Forschungsgesellschaft mbH (JR) is Austria's second largest independent research organisation with a non-profit character and is owned by the state of Styria and 10% by TNO (Netherlands). The company has currently about 370 employees and 18 research units. The quality management standards of JOANNEUM RESEARCH are certified according to ISO 9001. As a partner in innovation for business enterprises and political decision-makers this research company focuses on applied research and development in the key technologies. JR aims at being a promoter of customer-oriented applied research and development. The Institute of Energy Research is working on renewable energy sources, with one research group focusing on *land use and global climate change* (carbon balances of land use, forestry, bioenergy and wood products). The Institute has been carrying out work on carbon budgets of forestry, land use and bioenergy systems for the last 15 years. It coordinated sections of the IPCC Special report on Land Use, Land-Use Change and Forestry, to the IPCC Guidelines for National Greenhouse Gas Inventories, and has been leading IEA Bioenergy work on greenhouse gases related to biomass production and use. Over the last ten years Joanneum Research has established an extensive record of publications on carbon sinks in the Kyoto Protocol, has organised two workshops and edited a journal special issue on this topic. Joanneum Research has an excellent track record in coordination of large projects in this field, for example in the following projects:

Completed or ongoing projects / activities that are relevant for this proposal:

- Associate editor of the journal *Climate Policy*, and editorial board member of the journals *Mitigation and Adaptation Strategies for Global Change*, and *Environmental Science and Policy*
- Developed the first approved CDM Methodology for Afforestation and Reforestation
- Coordination role in the Intergovernmental Panel on Climate Change (IPCC) Special Report Land Use, Land-Use Change and Forestry (www.grida.no/climate/ipcc/land_use)
- Coordination role in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry*, „Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol”.
- Task Leader of IEA Bioenergy Task 38 (Greenhouse Gas Balances of Biomass and Bioenergy Systems), www.joanneum.at/iea-bioenergy-Task38.
- Coordination of the EC project *CarboInvent* (Multi-Source Inventory Methods for Quantifying Carbon Stocks and Stock Changes in European Forests) (www.joanneum.at/CarboInvent).
- Member / collaborator of the US / Department of Energy (DOE) *Research Consortium on Carbon Sequestration in Terrestrial Ecosystems* (CSITE; csite.esd.ornl.gov).
- Report for the Pew Center on Global Climate Change: *Land Use & Global Climate Change - Forests, Land Management, and the Kyoto Protocol* (www.pewclimate.org/projects/land_use.cfm)
- Project for the ClimateStrategies network / Shell Foundation: *Carbon sinks and biomass energy production - A study of linkages and implications*, www.climate-strategies.org/projects&reports.htm
- Partner in the Bioenergy NoE (Network of Excellence), leading the work package on bioenergy, climate change and emissions trading.

Individuals leading the work

Dr. Bernhard Schlamadinger (M.Sc. in Mechanical Engineering; PhD Thesis on "Carbon balances of forestry and bioenergy strategies") has been involved in projects on "carbon cycle, bioenergy, wood products and land use" for about 14 years, and spent 18 months on a post-doctoral position at the Oak Ridge National Laboratory (USA), collaborating with ORNL's Carbon Dioxide Information Analysis Center (CDIAC). He is Task Leader of Task 38 "Greenhouse Gas Balances of Biomass and Bioenergy Systems". B. Schlamadinger is participating in the work of the Intergovernmental Panel on Climate Change (IPCC) on the Fourth Assessment Report (chapter on GHG Mitigation in Energy Supply, with focus of his work on bioenergy issues), and on Guidelines for National Greenhouse Gas Inventories. He is Coordinating Lead Author of the IPCC Special Report on "Land use, Land-use Change, and Forestry (LULUCF)" and of the "Good Practice Guidance for LULUCF". Schlamadinger is coordinator of the EU-funded project Carboinvent (Multi-source Inventory methods for assessing Carbon Stocks and Stock Changes in European Forests). He edited a special issue of the journal Environmental Science and Policy entitled "land use, land-use change, and forestry in the Kyoto Protocol" and is the author of the Graz / Oak Ridge Carbon Accounting Model (GORCAM, see www.joanneum.at/Gorcarn.htm). He is a reviewer of CDM baseline and monitoring methodologies for the UNFCCC, and drafted the first approved CDM Methodology for reforestation projects.

Kimberly Robertson (BSc in Zoology/Ecology) has been involved in projects on forest carbon stocks, bioenergy, wood products and land use for about 11 years. She spent 18 months working at Joanneum on Task issues in 2000/2001. Since then she has maintained a role on the Task Management Team. Kimberly has participated in the review of national LULUCF inventories, review of the draft Good Practice Guidance for LULUCF. She has also been heavily involved in the development of forest carbon models and projects on LULUCF accounting for New Zealand's GHG inventories.

The Task Leaders will be assisted by Susanne Woess-Gallasch. She has a Master degree in Geography/Regional Planning and experience in regional and communal energy planning, bioenergy issues and LCA of renewable and fossil energy systems. She has provided assistance to the Task since 2001.

The website development, and preparation of the bibliography, will be carried out by Andreas Hofer.