Discussion paper on possible focus areas for new GBEP work on innovation and sustainability of bioenergy systems

The Technical Working Group is invited to consider the proposals in this paper and discuss the establishment, scope and programme of work of a GBEP Task Force on Innovation and Sustainability and other possible new GBEP work.

Background

The 6th Steering Committee, convened last 15 December 2008 in Rome, suggested exploring the area of innovation and sustainability of bioenergy systems as a possible focus for development of the GBEP Programme of Work. The Chair invited Partners to submit proposals for further work in this area to be considered and discussed in the following Technical Working Group (TWG). The Secretariat has produced this discussion paper on the basis of the comments/proposals received (both orally and in writing) in order to facilitate discussion among Partners. The TWG is invited to explore in more detail how to expand the GBEP programme of work.

Rationale

The discussion on bioenergy is very dynamic and complex. A broad range of approaches and opinions exist which need to be discussed, analysed and used to develop a coordinated, consensus-based and comprehensive framework for policy-makers. Throughout 2008, the discussion of bioenergy sustainability was expanded and involved a wide selection of GBEP participants. During the same year, new impetus has been given to technology-related issues in a range of fora and settings and the last G8 Declaration itself contains a clear reference to it:

G8 Leaders Statement on Global Food Security

“We fully recognize the need for a wide range of mid- to long-term measures to tackle the issue of food security and poverty, inter alia, the importance of stimulating world food production and increasing investment in agriculture. To this end, we will [...] ensure the compatibility of policies for the sustainable production and use of biofuels with food security and accelerate development and commercialization of sustainable second-generation biofuels from non-food plant materials and inedible biomass”

G8 Declaration on Environment and Climate Change

“Substantial progress toward such a long-term goal requires, inter alia, in the near-term, the acceleration of the deployment of existing technologies, and in the medium- and long-term, will depend on the development and deployment of low-carbon technologies in ways that will enable us to meet our sustainable economic development and energy security objectives. In this regard, we emphasize the importance and urgency of adopting appropriate measures to stimulate development and deployment of innovative technologies and practices.”

It is pertinent also to recall the GBEP mandate to “support wider, cost effective, biomass and biofuels deployment, particularly in developing countries”, and hence GBEP work on innovation and sustainability should include a strong focus on technologies of particular relevance to developing country contexts and priorities. This might mean that particular attention should be given to technologies in the context of delivering energy services in rural areas.
The value in terms of sustainable development not only of technology transfer but also of the strengthening of the technological capabilities of developing countries is also widely recognised. There is huge potential in the field of bioenergy to widen the deployment of best currently available techniques and also to help build endogenous capacity in environmentally friendly technologies so that over time the donor-driven character of technology transfer is reduced.

The bioenergy field is experiencing an unprecedented wave of research and development, flowing from both the public and private sectors. Information sharing and co-ordination on an international level in the area of ongoing and planned research and development would help to make the most of resources in seeking to find innovative solutions to global challenges.

Innovation of bioenergy systems plays a paramount role since factors such as increases in productivity (including through the integration of bioenergy production into existing agricultural systems) and conversion of marginal and degraded land into bioenergy production areas could expand the resource base, potentially overcoming the food-fuel debate. Realization of the potential of bioenergy depends to a great extent on the availability of competitive/efficient conversion technologies. However, technology and innovation in the context of potential new GBEP work should not necessarily relate only to processing and conversion, but could include all technologies related to the bioenergy value chain (feedstock production – conversion – end use), including those related to feedstock production. Indeed, innovation in the fields of project financing, water management and anything required to promote sustainable bioenergy development could be worthy of consideration. In particular, GBEP could undertake conceptual work related to enabling conditions and appropriate frameworks for successful technology transfer and adaptation, as well as pilot collaborative and coordinated field projects between Partners. These pilots could then inform a review of the conceptual work for successful technology transfer and adaptation. It might also be useful to facilitate and stimulate a coherent international discussion aimed at broadening the knowledge and insight in direct and indirect effects of different technologies.

Possible focus areas

The proposals received from Partners fall into four main focus areas for next GBEP activities, namely:

1. “Advanced biofuel technologies”, including collection and sharing of information on work in the areas of R,D&D, production/use, policy development, and impacts on sustainability, with a view to identifying consensus, gaps in technology, best practice and areas for collaboration.

2. “Collection and dissemination of good practices” for bioenergy systems in general. It would aim to supply various categories of decision makers with scientifically sound analyses supported by consensus needed for strategic decisions related to technological development of production systems and agricultural techniques as well as policy frameworks.

3. “Technology transfer and adaptation”, with a focus on assisting developing (and developed) countries to adopt the best strategy and technology available over the whole production chain. Relevant support systems should be addressed and collaboration among Partners on coordinated field projects is envisaged.

4. “Indirect effects of bioenergy”, to provide a forum for international discussion and to bring evidence in a form amenable to policy makers in order to agree on achievable and acceptable ways to estimate, monitor and address the potential negative and promote the potential positive impacts.
These possible areas of work are not mutually exclusive and Partners could decide to establish an additional GBEP Task Force with a focus on one or multiple areas and/or integrate proposals into existing work.

The above proposed focus areas as well as their possible outputs are described in more detail below.

1. **Advanced biofuel technologies**

   This work could start with the compilation of an inventory of ongoing R, D&D programmes in participating countries on the so-called “second generation” conversion technologies and advanced biofuel technologies in general (e.g. algal biofuel, biohydrogen, etc.). This will lay the foundation for a gap analysis, with the aim of stimulating knowledge exchange and collaborative efforts to fill key gaps on advanced biofuel technologies and integrated systems for energy/food/feed/chemicals production (possibly including joint demonstration projects).

   The sharing of information about national policies for the development of advanced technology biofuel use and production would be one of the focus activities.

   This work would focus on modern bioenergy, which includes liquid biofuels, biogas, and solid biomass for heat and power generation. Further, sustainability could benefit from the so-called ‘biorefinery’ concept and biotechnology developments, whose impacts should be assessed.

   Key stakeholders normally operating in different geographical locations and market sectors (e.g., transportation fuels, chemicals, energy, etc.) could be brought together in order to discuss common advanced biofuel technology-related topics, to foster necessary R, D&D trajectories, and to accelerate the deployment of developed/available technologies. One aim should be the identification of key barriers for different bioenergy production pathways and the subsequent determining of possible ways to overcome those barriers. The discussion and the gathering of information could take place in the form of workshops and technical conferences alike.

   The Task Force could also investigate the performance of different production technologies against one or more GBEP sustainability criteria (e.g. food security or economic viability). To this end, there is also a need for a mechanism that would encourage sharing of information about the impact of different technologies for bioenergy production and the transfer of relevant technologies and associated capacities from technology producers to technology markets (see proposed work area 3 below).

   The work could also be approached starting with selected case studies, taking into consideration a specific biofuel in a particular geographic region.

2. **Collection and dissemination of good practices**

   This would entail compilation of examples of good practices, which represent concrete means of achieving good performance in terms of environmental, economic and social sustainability, related to specific GBEP criteria. For example, the improvement of resource use efficiency (including production, distribution and use) is a key aspect in relation to the application of innovation for sustainable bioenergy development. Good practices should be identified in the context of a system – the value chain from primary production to use, and the relevant support services;

   Partners should contribute relevant national and international experience (positive and negative) to assemble examples that are of relevance to replication, particularly in developing countries. Relevant good practices from non GBEP countries and private sector and civil society partners should also be included.
The knowledge base established would not necessarily have to take the form of a database. It could be case studies but with clear identifiers of entry points for which this particular case may be relevant, e.g.:

   i. type of feedstock
   ii. type of end use
   iii. type of processing technology
   iv. type of environment (physical, social, agronomic requirements, agricultural systems, technical capacity, support systems).

Ideally all good practice write-ups should follow an agreed format and analysis approach, including assessment of viability, suitability and sustainability for replication.

The activities would build upon existing data, information sources, and conclusions and would not be intended to produce new primary scientific data.

It would provide valuable opportunities to learn lessons and develop good practices for wider application and contribute to building the evidence base among Partners to support policy development and practical action at national, regional and international levels.

3. Technology transfer and adaptation

Considering the comparative advantage of GBEP as a partnership between countries in the North and the South, international agencies and private and civil society stakeholders, one of the priorities for new GBEP work could be to facilitate technology transfer (South-South and North-South) and adaptation for good practices.

The sustainability of the use and transfer of specific technologies cannot be isolated from the context in which it is applied. GBEP work should recognise the importance of value chains in bioenergy and consider technologies in this context. Further, the work should consider relevant support systems (regulatory framework, institutions and governance, technical advice, finance, basic infrastructure, market information, policies) needed for successful technology use and transfer.

This work could include cooperation with ongoing national and international activities and programmes (e.g. IEA Bioenergy Tasks, Implementing Agreements, and EU Technology Platforms) for the definition of a tool to help funding mechanisms (e.g. development banks, UNFCCC, GEF, etc.) to set clear policies/priorities and embark on investment-oriented projects and to help national governments define the technologies/techniques that would best fit local conditions and resources available.

The task could include both conceptual work related to enabling conditions and appropriate frameworks for successful technology transfer and adaptation in bioenergy (possibly as a first phase), as well as pilot collaborative and coordinated field projects between a subgroup of partners (possibly as a second phase). These pilots could then inform a review of the conceptual work for successful technology transfer and adaptation.

A technology transfer and adaptation programme can only be successful if key stakeholders are actively involved and it would be important for GBEP to ensure close collaboration with private and civil society stakeholders in such a programme.

Deliverables could encompass the following:

- Identification of principles, conditions, components and institutional frameworks for successful technology transfer and adaptation,
• Elaboration of a concise "Step-by-Step National Bioenergy Policy Guide", containing "how-to" directions for countries that desire to develop a bioenergy national plan. Such a manual should be able to offer a rational, basic approach framework, through a graphically compelling product and simple language;
• Publication of an "Atlas of Bioenergy" in Africa and/or other developing areas, which could be accomplished through the selection and implementation of an analytical methodology capable of determining each country's potential for bioenergy production and use, according to the existent energy mix, natural resources and available infrastructure. The creation of a cooperation platform for information exchange on "agro-ecological zoning" policy tools could also be addressed;
• Commissioning of a report highlighting available funding options for bioenergy projects, listing multilateral organizations and financial mechanisms that currently offer financial incentives to green field investments;
• Pilot technology transfer activities led by GBEP partners putting into practice the technical guidance developed in the first phase of the work; and
• Creation of a "model bioenergy project" for initial implementation in a member developing country.

4. Indirect effects of bioenergy

Facilitation and stimulation of a coherent international discussion aimed at broadening the knowledge and insight in indirect effects of bioenergy and contributing to agreement on achievable and acceptable ways to address them.

Indirect effects encompass both indirect land use impacts due to displacement of existing agricultural production and indirect impacts on food commodity prices. Growing demand for bioenergy feedstock that cannot be met by existing agricultural production can lead to expansion of agricultural land. Such land-use changes may reduce biodiversity, may cause greenhouse gas emissions and may undermine traditional sustainable agricultural practices and lead to adverse societal impacts. Since the risks for indirect effects mostly depend on factors that exceed the level of individual companies, addressing these effects is mainly a task for governments and international organizations.

To adequately and completely address the sustainability issues of bioenergy it is crucial to take both the direct and indirect effects of bioenergy production/use into account. In order to show that a genuinely sustainable bioenergy industry is possible, an answer is needed on how to deal with possible indirect effects. Recently several reports have been published that have examined the scale of indirect effects, made an inventory of existing relevant data and proposed further steps towards sustainable bioenergy. However there is a growing need for a coherent international approach to gain further insight and to develop adequate instruments to avoid or minimize these effects.

Indirect effects are being addressed to a certain extent in the GBEP Task Force on Sustainability and in the GBEP Task Force on GHG Methodologies. Nevertheless, a more thorough understanding of the issue is necessary for several reasons and possible indirect effects of biofuels are an important concern.

Task Force Membership and Resources

Membership in a new task force on innovation and sustainability would be open to all GBEP Partners. Its work would be undertaken in consultation with key stakeholders, including parties engaged in or responsible for work relating to sustainability of bioenergy production, industry and civil society, and
key international decision-making bodies and institutions. Particular efforts will be made to secure the involvement of biomass-producing developing countries and emerging economies.

The task force would determine its working practices, including the frequency, location of meetings and work plan envisaged for achievement of each output. The task force would raise awareness of its work and outputs through appropriate means and communicate progress regularly.

Participating Partners would provide “in kind” support in the form of staff time and appropriate resources for possible travel to task force meetings. Partners could provide financial support for the work of the task force at their discretion.
### Non-comprehensive list of ongoing activities related with technology/innovation in bioenergy systems

| **BSI** | The Better Sugarcane Initiative (BSI) is a collaboration of sugar retailers, investors, traders, producers and NGOs who are committed to sustainable sugar by establishing principles and criteria that are applied in the sugar growing regions of the world through regionally specific strategies and tools. The BSI aims to reduce the impact of sugarcane production on the environment in measurable ways that will also enable sugar production in a manner that contributes to social and economic benefits for sugar farmers and all others concerned with the sugar supply chain. The goal is to reduce farm and other sugar processing impacts, through the encouragement of better management practices (BMP’s). BSI is establishing Technical Working Groups (TWGs) - teams of technical and scientific experts - with global representation. These TWGs will assess Better Management Practices being used by sugar growers across the globe under three categories: • Environment and agronomy. • Social and community. • Milling and co-products. Based on good practice achievements around the world, the TWGs will develop a set of universally-applicable guidelines for consideration by the BSI membership. Guidelines requiring further consideration will be tested in different cane-growing scenarios around the world to ensure that they are practical and achievable, and have the desired effect of improving the economic, environmental and social sustainability of sugarcane farming. |
| **COMPETE** | The Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems – Africa (COMPETE) aims to create a platform for discussion, knowledge exchange, policy and methodology development in order to provide strategic and practical guidance and tools on the provision of modern bioenergy for the sustainable and optimal usage of these special ecosystems. The main objective of COMPETE is to identify pathways for the provision of bioenergy, which will: • improve the quality of life for the inhabitants e.g. poverty alleviation, value added activities, alternative means of income generation and providing options to reduce vulnerability whilst, in parallel; • aid the preservation of the critical functions of arid and semi-arid regions in Africa as intact ecosystems e.g. maintaining biodiversity and providing ecosystem services, and; • enhance the equitable exchange of knowledge between EU and developing countries in this critical area of activity. |
| **FAO** | Bioenergy technologies: ▪ Study on the livelihood impacts of small scale bioenergy systems in Africa, Asia and Latin America (completed) ▪ UN guidelines on Sustainable Bioenergy “Planning Strategically and Managing Risks in Investment Choices” (under development, co-led by FAO and UNEP) ▪ Module two of the Bioenergy and Food Security (BEFS) project provides a cost analysis for the bioenergy production chain. The module assesses the production costs (feedstock, processing and handling) of biofuels taking into consideration the technological implications for the conversion of the biomass to bioenergy and the adaptability of technology production configurations within the context of the project's partner countries. The basis for the module is a techno-economic analysis prepared by the National University of Colombia Manizales under the guidance of the BEFS technical advisor. ▪ Integration of crop suitability assessment and mapping facility into EcoCrop database for bioenergy crops (AGP/NRCE) ▪ Expanding information on genetic resources of selected bioenergy crop to be integrated into EcoPort and GIPB databases ▪ Producing proceedings on jatropha and sweet sorghum consultations, which organized by IFAD, FAO and UN Foundation ▪ Case studies on biofuel production from rice residues in Asia (China, India, Thailand and Viet Nam) to draw lessons than can guide policy makers |
in developing countries

- Study on small scale bio-diesel production as an agroindustrial diversification alternative (Chile, Bolivia, Brasil and Guatemala)
- Case studies on biofuel policies: Market regulation and improvement of labor conditions (Argentina, Colombia and Paraguay)
- Productive and institutional assessment of biofuel production in Central America
- Land use assessment for energy crops, using ALES (Automated Land Evaluation System) methodology (México, Colombia and Argentina)
- Planted Forests and Second Generation Biofuels, Planted Forests and Trees Working Paper (sent for peer review)
- Woodfuels integrated supply/demand overview mapping – WISDOM

**Technology Transfer**

- Conservation agriculture programme - experience in TTA
- Organic agriculture production and value chain system experiences (research, verification, value chain development, harmonization)
- Bioenergy impact assessment tools – framework, GEF study and other decision making tools under development
- TECA – proven technologies and good practices for smallholders – information system to share proven technologies for agriculture focused on smallholders, standardized documentation system, so far more than 800 proven technologies and good practices are published and available for online consultation ([www.fao.org/sd/teca](http://www.fao.org/sd/teca)); launching of new interactive TECA phase II under approval

**IEA**

The IEA provides support for over 42 international co-operation and collaboration agreements in energy technology R&D, deployment and information dissemination. OECD Member countries, non-Member countries and international organizations may participate.

**IEA Bioenergy** is an organisation set up in 1978 by the International Energy Agency (IEA) with the aim of improving cooperation and information exchange between countries that have national programmes in bioenergy research, development and deployment. It provides an umbrella organisation and structure for a collective effort where national experts from research, government and industry work together with experts from other member countries. In particular IEA Bioenergy has a number of ongoing projects (Tasks) that are addressing bioenergy technology on specific aspects. This includes:

**Task 29. Socio-Economic Drivers in Implementing Bioenergy Projects**

The objectives of Task 29 are to: - achieve a better understanding of the social and economic impacts and opportunities of bioenergy systems to communities at the local, regional and international level; - synthesise and transfer important knowledge and new information in order to foster multi-disciplinary partnerships of key stakeholders in forest biomass production and utilization research, planning and operations; - improve the assessment of the impacts of biomass production and utilisation in order to increase the uptake of bioenergy; and - provide guidance to policy makers. These objectives will be met through the results obtained in the previous Task period and also through the international state-of-the-art socio-economic evaluation of bioenergy programmes. Activities will be expanded to include developing countries through the FAO and similar organisations. This will include the sharing of research results, stimulation of new research directions in national, regional and local programmes of participating countries and technology transfer from science to resource managers, planners and industry.

**Task 30. Short Rotation Crops for Bioenergy Systems**

The objective of Task 30 is to acquire, synthesise and transfer theoretical and practical knowledge of sustainable short rotation biomass production systems and thereby to enhance market development and large-scale implementation in collaboration with the various sectors involved. The Task also aims to
improve the awareness of biomass production potential and to promote the use of biomass for energy in participating countries. The Task is confined to short rotation crops that entirely or by means of residuals may provide biomass to the energy market, and comprises lignocellulosic crops in farming systems and plantation forests grown on short rotations. The latter category includes coppice systems and also fast-growing single-stem plantations (rotation period 6 to 12 years). These short rotation systems usually employ willow, hybrid poplar and Eucalyptus species and produce large quantities of biomass suitable for energy purposes. In many instances, they form an important component of nutrient cycling and thus may play an important role in environmental management. Pest and disease problems associated with short rotation crop systems and ways to mitigate them are an integral part of this work.

Task 31. Biomass Production for Energy from Sustainable Forestry

The objective of the Task is to develop an integrative framework for information related to biomass production for energy from sustainable forestry, based on leading-edge science and technology, and to share and promote the use of such an information framework with advanced information technology and a high level of collaboration. The Task encompasses natural forestry systems and single-stem plantation systems, which can provide a source of biomass for energy. The scope is worldwide. Efforts are made to expand activities to include countries with economies in transition. The work includes sharing of research results, stimulation of new research directions in national programmes of participating countries, and technology transfer from science to resource managers, planners and industry. The emphasis is on an integrated approach to biological, economic, environmental, and social components of forestry systems. Multi-disciplinary partnerships of key stakeholders in forest biomass production research, planning, and operations are fostered. The primary end users for Task outputs are forest managers, researchers and bioenergy planners, but Task outputs will also be useful to policy makers, NGOs and the interested public.

Task 32. Biomass Combustion and Co-firing

The objective of the Task is to stimulate expansion of biomass combustion and co-firing for the production of heat and power on a broad scale. The widespread interest in the work of the Task illustrates the relevance of biomass combustion and co-firing in society. The emphases of the activities in the Task are currently: market introduction to expand the use of biomass combustion in the short term; and optimisation of biomass combustion technology in the longer term so that it remains competitive. Technical issues addressed by the Task are: increasing fuel flexibility, including contaminated biomass and biomass pellets; advanced process control and sensor development; corrosion and deposit formation mechanisms; formation and emission of particulates (aerosols) and primary measures for NOx reduction; and the improvement of existing systems and development of new concepts.

Task 33. Thermal Gasification of Biomass

The objectives of Task 33 are to review and exchange information on biomass gasification research, development and demonstration (RD&D), seek continuing involvement with bioenergy industries and to promote co-operation among the participating countries to eliminate technological impediments to the advancement of thermal gasification of biomass. The ultimate objective is to promote commercialisation of efficient, economical and environmentally preferable biomass gasification processes, for the production of electricity, heat and steam, for the production of synthesis gas for subsequent conversion to chemicals, fertilisers, hydrogen and transportation fuels and also for co-production of these products.

Task 34. Pyrolysis of Biomass

Task 34 started in January 2004 and will finish in December 2007. By agreement between the European Commission (EC) and IEA Bioenergy, it is integrated with the EC Pyrolysis Network, which is part of the new ThermalNet project that started in January 2005 and will finish in December 2007. Thus the two activities are properly synchronised. The technical focus of PyNe is through a set of tasks that are firmly integrated with the other two complementary networks on biomass gasification (GasNet) and combustion (CombNet). This is shown in the figure below. An interesting feature of these tasks is the close interactions and complementarity between the three technology areas that will encourage a high level of interaction in areas of mutual interest. The main activities of the Task will continue to focus on resolution of technical issues to aid commercial implementation of fast pyrolysis,
information exchange and dissemination by: dedicated and focused regular meetings centred on Technologies and tasks that will advance the state-of-the-art through critical reviews and commissioning of specialist material; and collation and dissemination of relevant information through the regular PyNe newsletter, the PyNe website, and direct contact between Task members and invited guests through the planned programme of meetings, workshops, and conferences.

Task 36. Energy Recovery from Municipal Solid Waste
The objective of Task 36 is to maintain a network of participating countries as a forum for information exchange and dissemination. The waste and energy sector worldwide is currently undergoing a period of intense legislative and institutional change. Keeping abreast of both policy and technology developments is a prime aim of the Task. The sharing of good practice and/or new technology and techniques is also a major goal. The Task participants have chosen a number of key Topic Areas for inclusion in the work programme. Over the last few years some significant European led changes have occurred in solid waste management. These include the adoption by the EU of the landfill directive, the agreement on a common position on harmonising MSW and hazardous waste incineration and the increasing application of best practice or life-cycle-based analysis to the determination of waste management policy. These changes will have a profound impact on the way in which solid waste is dealt with, and consequently on the role, and potential for, energy recovery within this. Whilst this impact will be most acute in Europe, other countries will have an interest in developments in Europe and may also follow EU practice. The pressure to divert biodegradable and combustible waste from landfill is driven by a combination of legislative changes and economics - increasingly there is a shortage of suitable landfill void and its cost base is increasing. These drivers provide an opportunity for the development and deployment of cost-effective energy recovery systems. The deployment of these systems depends on improved efficiency (where the systems are already in place) and a legislative framework that encourages their development. In the latter case information on environmental impacts and costs is of prime importance for decision-makers. The work programme for this Task aims to provide such information in a form that is readily accessible.

Task 37. Energy from Biogas and Landfill Gas
The overall objectives of Task 37 are to review and exchange on anaerobic digestion (AD) to produce, upgrade and utilise biogas as an energy source, digestate (compost) as an organic fertiliser and the anaerobic degradation process as a link in the chain of waste (water) treatment. The scope of the work focuses on adoption of appropriate waste management practices, promotion of the commercialisation of biogas installations, improvement of the quality of the products and improving environmental standards. Through the work of the Task, communication between RD&D programmes, the industry and governmental bodies is encouraged and stimulated. To achieve the objectives, the Task maintains strong relationships with the governments of Member Countries, R&D institutions and industry. Partners are plant and equipment providers, actual and future operators and potential clients interested in the products of anaerobic digestion, i.e. fertiliser (digestate) and biogas.

Task 41. Bioenergy Systems Analysis
“Systems Analysis” means the study and analysis of the interaction between different parts of the energy system (eg. consumers, producers, fuel production) as well as the interaction of the energy system with other parts of society. The aim is to get a meta analysis of the larger context to facilitate the drawing of conclusions on priorities, decision making, policy effectiveness etc. The objective of this Annex is to supply decision makers with scientifically sound and politically unbiased analyses and conclusions needed for strategic decisions related to research or policy issues. The target groups are particularly decision makers in Ministries, national or local administrations, deploying agencies/organisations, etc. Depending on the character of the various projects some deliverables are also expected to be of direct interest to industry. Decision makers, both public and private, have to consider a whole range of aspects in their planning and deliberations. Hence the Task will cover technical, economic and environmental data in its work. Because of its special character in terms of participation, financing and cross cutting orientation, the Task is expected to be a valuable resource and instrument for the Executive Committee (ExCo). The Task will provide the ExCo with a highly qualified team of generalists with the capability and resources to carry out projects involving several parties (e.g.
other Tasks and other organisations) as requested by the ExCo. It is expected to collaborate, by mutual agreement, with existing Tasks when they are relevant to a current project. Due to the character of the Task and its close contact with the other Tasks, the Task is expected to develop into a platform for joint Task work and to be a catalyst for proposals from the other Tasks to the ExCo. All deliverables from the Task’s programme of work will be made available to all Members of IEA Bioenergy whether or not they are participants in the Task.

**Task 42. Biorefineries: Co-production of Fuels, Chemicals, Power and Materials from Biomass**

The major objective of the Task is to assess the worldwide position and potential of the biorefinery concept and to gather new insights that will indicate the possibilities for new competitive, sustainable, safe and eco-efficient processing routes for the simultaneous manufacture of transportation fuels, added-value chemicals, (CH) power, and materials. The following activities have been identified and agreed by the participants:

- Prepare a common definition of biorefineries, including a clear and widely accepted classification system;
- Gain better insights into the processing potential of existing biorefineries in the participating countries;
- Assess biorefinery-related RD&D programmes in participating countries to help national governments define their national biorefinery policy goals and related programmes;
- Prove the advantages of biorefinery concepts over more conventional single product processes by assessing and comparing their financial, economic, and ecological characteristics;
- Bring together key stakeholders normally operating in different market sectors (eg. transportation fuels, chemicals, energy, etc.) in multi-disciplinary partnerships to discuss common biorefinery-related topics, to foster necessary RD&D trajectories, and to accelerate the deployment of developed technologies;
- Identify the most promising added-value chemicals, eg., functionalised chemicals and platform chemicals (building blocks), to be co-produced with energy, to optimise overall process economics and minimise the overall environmental impact;
- Co-operate with ongoing national and international activities and programmes, eg. other Tasks, Implementing Agreements, and EU Technology Platforms;
- Disseminate knowledge, including teaching material to make students familiar with the integral concept-thinking of biorefineries.

**IISD**

IISD is currently completing a set of studies on subsidies to the biofuel industry.

**IUCN**

The aim of IUCN’s work on energy is to accelerate society’s transition to energy systems that are ecologically sustainable, socially equitable and economically viable. To this end, IUCN is:

- Working to fill knowledge gaps and support governments and industry in making well-informed decisions and policies.
- Strongly engaged with biofuel standards and criteria setting processes and provides significant expertise and knowledge on ecosystem restoration and management;
- Establishing robust governance frameworks; and
- Managing invasive species risks, ensuring right to land tenure and access. IUCN is a member on the Steering Board of the Roundtable on Sustainable Biofuels (RSB) and heads the environmental working group.
- Providing a balanced platform for informed discussion about biofuels at national, regional and global levels.

**REEEP**

A key activity of REEEP is the support and augmentation of the needs of its Partners and Donors in the renewable energy and energy efficiency sectors through financial funding. Since its establishment as an NGO in 2004, REEEP has supported more than 100 projects. Further, as a partnership focused on the promotion of policies, regulations and finance for sustainable energy and energy efficiency, REEEP ensures that all project work follows the principles of corporate social responsibility. The core activities include reegle - an information gateway for renewable energy. On the top of that, REEEP’s Voluntary Carbon Offsetting scheme is a mechanism by which governments (both local, regional and national), companies and other institutions can outsource the purchase of CDM or Gold Standard Verified Emissions Reductions (VERs) to REEEP as part of a carbon reduction strategy. REEEP has within its partnership thirty-nine national governments as members, plus the European Union.

**UN-ENERGY**

The UN Energy cluster on Renewable Energy jointly led by FAO and UNEP is preparing a decision support tool to assist decision-makers in developing countries in following transparent processes to consider bioenergy development options, assess related risks and identify possible risk mitigation strategies.

The tool will propose decision trees for national level planning and project specific appraisal processes. It will also highlight existing tools, guidelines and other resources that can be drawn upon to analyse specific risks and to identify appropriate mitigation options.
| UNEP | UNEP as lead agency, together with FAO and UNIDO as co-executing agencies, is currently working on the launch of a new GEF targeted research project: “Assessments and Guidelines for Sustainable Liquid Biofuels Production in Developing Countries”. This project is organized in distinct research modules. Two of them – at least – could present a good opportunity for collaboration with a GBEP new focus area on Innovation/Technology of bioenergy systems; these are “2nd Generation” and “Scale up and Integration”. A new Technology Unit UNEP DTIE Energy Branch has recently been created. |
| UNF | The UN Foundation implements the UN Biofuel Initiative as a public charity together with the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Fund for International Partnerships (UNFIP). The Initiative promotes the sustainable production and use of biofuels in developing countries, under conditions that can attract foreign and domestic investment, such as the Clean Development Mechanism (CDM). Launched in June of 2005, the Biofuels Initiative seeks to provide technical analysis of issues related to biofuels production and trade that will impact member countries, especially with the objective of sharing experience and providing support to developing countries. The programme will coordinate economic and trade policy analysis, capacity building activities and consensus building efforts towards the ultimate goal of increasing production, domestic use and trade in biofuels. This will be implemented in Brazil, India, Mozambique, the Philippines and Uganda. The initiative is also forming an International Advisory Expert Group (IAEG) to provide guidance on technical issues related to biofuels production and international trade. Members of the IAEG will facilitate partnerships and advise governments on feedstock potential, technology applications, international trade opportunities, finance, natural resource management, rural development, and potential CDM baseline analysis. |
| UNFCCC | Much work has been undertaken to promote technology transfer within the UNFCCC regime, including the adoption of a framework on the transfer of technology, the establishment of an Expert Group on Technology Transfer (EGTT) that aims to enhance the technology transfer goals of the UNFCCC and the establishment of the Special Climate Change Fund (SCCF) that is intended to support activities in the areas of, inter alia, adaptation and the transfer of technologies. |
| UNIDO | UNIDO is currently working on a number of initiatives that aim to strengthen cooperation on technology-related aspects in the field of bioenergy. Among these, the Guidebook on Modern Bioenergy Conversion Technologies in Africa which will provide comprehensive information on priority modern bioenergy conversion technologies currently in use in Africa. Some of the technology related issues to be discussed include applicable feedstock, economics, applications and environmental impacts and lessons learnt from selected case studies. The guidebook seeks to address knowledge gaps about modern bioenergy conversion technologies across Africa and will provide all key stakeholders with adequate information to support informed decision-making on technology related issues. The Bioenergy Interregional Network, whose objective of the proposed inter-regional bioenergy network is to strengthen cooperation between regions, and assist developing countries and economies in transition in promoting bioenergy related research activities, transfer of appropriate conversion technologies and mobilising investments. The proposed network would play a catalyst role in mapping the potential for and operational modalities of dovetailing the activities of various actors involved in the exploitation of bioenergy with a particular focus on promoting sustainable use of bioenergy for productive uses. The essence of such cooperation is that the wealth of knowledge and capacity across countries and sub-regions, when systematically mobilized and shared, can facilitate the effective participation of the countries in Africa in using bioenergy as a source of energy for industrialisation and poverty reduction efforts. Among other things, the network will promote dialogue among stakeholders on sustainability issues and develop decisions support tools and mechanisms of integrating sustainability aspects into bioenergy value chains. The National Initiative for the Promotion of Bioenergy in the Framework of the Carpathian Convention is also of relevance. This collaborative initiative between UNIDO, UNEP, FAO and the Carpathian Convention aims at establishing a viable network between EU and non-EU Countries of the Carpathian region to promote bioenergy development in the region. Following the initiating workshop, UNIDO is currently preparing a baseline report on renewable energy (bioenergy in particular) policies and financial instruments in the EU and non-EU member countries of the Carpathian Convention. |