

Policy Department
Economic and Scientific Policy

"Sustainable Biofuel Production in Tropical and Subtropical Countries"

12 June 2008

Workshop proceedings

This study was requested by the European Parliament's Committee on the Environment, Public Health and Food Safety.

Only published in English.

Experts invited for the Workshop **Manfredi Caltagirone**, Ministry of Environment and representative of the Global Bioenergy Partnership (GBEP), Italy
Andrew Turay, Addax Bioenergy, Sierra Leone
Helena Paul, EcoNexus, United Kingdom
Kojo Fosu, Regency Resources Limited (Regency), Ghana
Anna Lerner, Deutsche Gesellschaft für Technische Zusammenarbeit - GTZ, Mozambique

Proceedings **Timo Kaphengst, Stephanie Schlegel**
Ecologic - Institute for International and European Environmental Policy

Administrator: **Yanne GOOSSENS**
Policy Department A: Economic and Scientific Policy
DG Internal Policies
European Parliament
Rue Wiertz 60
B-1047 Brussels
Tel: +32 (0)2 283 22 85
Fax: +32(0)2 284 90 02
E-mail: Yanne.goossens@europarl.europa.eu

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1. Introduction

In January 2008 the European Commission (EC) presented an integrated Climate and Energy package to cut emissions for the 21st Century, including proposals for specific targets on renewable energy (20% by 2020) and greenhouse gas emissions reduction (20% by 2020). The package, amongst others, includes a proposal for a Directive on the promotion of the use of energy from renewable sources (COM(2008)19). The rapporteur MEP Mr Anders Wijkman on the Renewables Directive (opinion from ENVI) has expressed an interest to organise a workshop on “Sustainable biofuel production in tropical and sub-tropical countries”.

There are very good preconditions for biofuel production in some tropical and subtropical countries and increasing production may for some developing countries offer the opportunity to increase exports and at the same time meet some of the internal energy demands. However, the willingness to invest may be constrained by issues of political stability or uncertainties regarding the demands for imports. Most importantly, questions of how to use the potential for production in a sustainable way need to be addressed.

Questions to be raised may include:

- What is needed from the policy side to give the right incentives to sustainable biofuel production?
- What are relevant criteria for a sustainable production of biofuels?
- How can a feasible implementation and reporting on these criteria be ensured and what are the consequences of these criteria for the practical work?

Date: *Thursday 12 June 2008, 09h30 - 12h30*

Venue: *European Parliament, Brussels, PHS 1 A 002*

All documentation will be available on both the Ecologic website (<http://www.ecologic-events.de/sustainable-biofuel/index.htm>) and the European Parliament e-studies webpage (<http://www.europarl.europa.eu/activities/committees/studies.do?language=EN>).

2. Workshop - Programme

Organised by Ecologic and IEEP, together with the European Parliament's Policy Department A and the European Parliament's ENVI Committee Secretariat

ROUNDTABLE

SUSTAINABLE BIOFUEL PRODUCTION

Tropical and Subtropical Countries

12 June 2008, 9h30 - 12h30
PHS 1 A 002, European Parliament, Brussels

Programme

09h30 **Welcome and Opening of the Roundtable**, by MEP Anders WIJKMAN (EPP/DE)

09h40 **First Thematic Session** (Moderated by Catherine Bowyer, IEEP)

1. **Manfredi Caltagirone**, Ministry of Environment and representative of the Global Bioenergy Partnership (GBEP), Italy: *"Experiences from the work of GBEP to develop criteria for sustainable bioenergy"*
2. **Andrew Turay**, Addax Bioenergy, Sierra Leone: *"Africa's potential of biomass and production of biofuels under EU sustainability criteria"*
3. **Helena Paul**, EcoNexus, United Kingdom: *"Can Sustainability Criteria for Certification of Agrofuels be effective?"*

Question and Answer Session

11h00 **Second Thematic Session** (Moderated by Catherine Bowyer, IEEP)

4. **Kojo Fosu**, Regency Resources Limited (Regency), Ghana: *"Growing sugar cane for ethanol - an evolving project in Ghana"*
5. **Anna Lerner**, Deutsche Gesellschaft für Technische Zusammenarbeit - GTZ (organisation for technical cooperation), Mozambique: *"On hands experiences from growing biomass for bioenergy in Mozambique. Social aspects and policy needs."*

Question and Answer Session

12h20 **Closing remarks**, by MEP Anders WIJKMAN (EPP/DE)

3. Curriculum vitae of the experts

1. **Manfred Caltagirone**, Ministry of Environment and representative of the Global Bioenergy Partnership (GBEP), Italy

Manfredi Caltagirone is an Expert in the Department of Environmental Research and Development at the Italian Ministry of Environment Land and Sea (IMELS) and a Research Fellow at the International Bioenergy Initiative of the United Nations Foundation (UNF).

Manfredi works on policies issues related to bioenergy and biofuels development and deployment both in developing and developed countries. He also follows the activities of the G8 Global Bioenergy Partnership and of the EPFL Round Table on Sustainable Biofuels.

Prior to that, he was the coordinator of the IMELS offices in Albania and Macedonia where he was responsible for the cooperation on Kyoto Protocol implementation that he established under the guidance of the IMELS DG.

He also worked in Brussels at the IMELS-EU liaison office dealing with Energy and Environmental Projects in the Balkan region.

Manfredi has a Law degree at the University of Rome “Tor Vergata” and speaks Italian, English and French.

2. **Andrew Turay**, Addax Bioenergy, Sierra Leone

Mr. Turay was originally trained as a general agriculturist but obtained further specialisation in animal production, the Planning and Appraisal Of development Projects (the use of the Log Frame, RBM and Strategic Frameworks as planning tools and in the formulation, implementation, monitoring and evaluation of programmes/projects), project identification, pre-feasibility, feasibility, project preparation, management, implementation, monitoring, evaluation, reviews, closing, impact assessments formulation, re-formulation ,project management, food policy and food security, agricultural policy and rural credit administration, small scale business start-ups and agro-industrial processing.

But over the many years of his work experience and re-training, he has gained expertise in human resources management, public and private sector institutional management, industrial relations, governance and governance reform, diplomacy, negotiations, mediations, conflict management, emergency programme coordination, strategic planning, development planning and resource mobilisation.

He has worked as a Lecturer in the Animal Science Department of Njala University College, the University of Sierra Leone and Editor of Animal production papers for the Journal of the Sierra Leone Agricultural Society.

He has worked as Managing Director of Consulting Firms like Development Consultants Ltd (DEVCONSULT) and ABCO Ltd in Sierra Leone.

He served as a Consultant Agricultural Specialist to the Sierra Leone Produce Marketing Board (SLPMB) where he handled the day-to-day implementation of the Board’s Agricultural programmes.

He was involved in the formation of the National Farmers Association, the National Farmers Cooperative and the National Association of Consultants of Sierra Leone.

He has served as a Chairman or Member of the Boards of several educational institutions, parastatals and social organizations.

He has recently completed consultancy assignments for the EU,FAO and DFID

He is currently managing the ADDAX BIOENRGY project in Sierra Leone that will be putting under cultivation about 25,000 hectares of sugarcane for the production of ethanol and co-generating electricity for sale to the country's national grid.

3. Helena Paul, EcoNexus, United Kingdom

Helena Paul has campaigned on the protection of indigenous peoples' rights and tropical forests in Colombia, Ecuador and Brazil, also on agricultural biodiversity, oil exploitation in the tropics, patents on life and genetic engineering.

She worked with the Gaia Foundation from 1988 to 2000 and co-founded the Forest Network, GM Freeze UK (of which she is the chair) and the Genetic Engineering Network, UK. She advises on the building of campaigns and coalitions in the UK and internationally and has travelled widely, speaking on genetic engineering and corporate power in English and Spanish.

She is co-director of EcoNexus where she is lead researcher on corporations and their negative impacts on the environment and human development. She has worked for more than a decade on GM crops, including GM soya in Argentina; and on the impacts of industrial farming and the production of commodities for export on agro-ecosystems, small farmers and rural life.

She is co-author of HUNGRY CORPORATIONS: TRANSNATIONAL BIOTECH COMPANIES COLONISE THE FOOD CHAIN, published by Zed Books, Oct 2003. In 2006, she began to work on agrofuels, as part of a small group of organisations that launched the first call for a moratorium on EU targets and incentives, and imports from agrofuel monocultures to the EU because of the grave threat posed by the rush for agrofuels to small farmers, local food production, biodiversity and climate. She also shared in writing and coordinated publication of a report from the same group: AGROFUELS: A REALITY CHECK IN NINE KEY AREAS, published in July 2007.

4. Kojo Fosu, Regency Resources Limited (Regency), Ghana

Kojo Fosu attended the University of Ghana in Legon, Accra where he gained a diploma in statistics.

Kojo was employed by Ghana Industrial Holding Corporation (GIHOC) for 9 years where he progressed from sales statistician to statistics/logistics manager. As manager of statistics he supervised the statistics and logistics for all 21 divisions of GIHOC.

In 1980 Kojo was appointed a director of West Africa Timber Products Limited where he was responsible for the co-ordination of production and export trade amounting to several million US Dollars annually.

Kojo was a co-founding director of Regency Resources Limited in 1995. Regency was established as an Infrastructure Project Consultancy and Development company. Kojo was initially responsible for business development and has for the last 9 years acted as Chief Executive Officer. Regency has executed many projects in Ghana mainly in the government and public service domain.

Regency Resources has sponsored the establishment of Northern Sugar Resource Limited (NSR) which company will establish and operate the sugar cane plantation and fuel grade ethanol production facility in Ghana. Kojo has been appointed Chairman and Chief Executive of NSR.

5. Anna Lerner, Deutsche Gesellschaft für Technische Zusammenarbeit - GTZ, Mozambique

Key Qualifications

- Technical support to Ministry of Agriculture (CEPAGRI) and Ministry of Energy of Mozambique on development of sustainability criteria and socio-economic aspects of bioenergy (including small scale farmer inclusion in biofuel value chain).
- Consultant in charge of implementing GTZ - ProBEC bioenergy strategy in the SADC region. Developing national/regional interpretation of sustainability criteria, raising awareness of socio-economic aspects of bioenergy production as well as increasing the SADC Secretariat knowledge and capacity in the area of bioenergy.
- Requested presenter at various high-level bioenergy stakeholder conferences in Africa (RSB – South Africa, UNIDO – Senegal, COMPETE – Tanzania).
- Double **Master's degrees** in social science and in development economics, Lund University, Sweden. Main fields of interests are socially and environmentally sustainable development (sustainable poverty reduction strategies), EU energy efficiency and renewable energy policy in relation to climate change, social and environmental standard and criteria (bioenergy or agribusiness opportunities).
- Fluent in Swedish and **English** with advanced knowledge of **Spanish** and **Portuguese**.
- Internship at Brussels Think-and-do-Tank; The Centre, activities included monitoring policy development of European development strategies for Africa as well as EU directives on climate change, renewable energy and energy efficiency.
- **Master thesis** discussing pro-poor benefits from biofuels production in Mozambique and analyses the possible impacts of the currently developed European sustainability standards.
- Volunteering experience with Mozambican civil society organization Foundation for Community Development (FDC)

4. Briefings prepared prior to the roundtable

4.1. "Experiences from the work of GBEP to develop criteria for sustainable bioenergy" by Manfredi Caltagirone

(Ministry of Environment and representative of the Global Bioenergy Partnership (GBEP), Italy)

There is broad international consensus that sustainable bio-energy can make a valuable contribution to meeting energy security and economic development goals as well as addressing climate change and other environmental issues. Currently there is a multitude of separate initiatives looking at or developing sustainability standards, criteria and certification schemes for bio-energy, mainly biofuels, and a number of regulatory measures are either in development or about to come into force, most notably in the European Union and in the USA. Several studies have also been written and reports produced suggesting what such standards should cover and optimum approaches for their implementation. This level of activity is evidence of the strong global interest and commitment to finding ways of achieving sustainable bio-energy development.

Nevertheless concerns over sustainability and perceptions about negative impacts of biofuels in particular are growing, resulting in the closer scrutiny of policies designed to expand bio-energy use. In fact, there is mounting concern that largely fragmented and uncoordinated efforts could lead to a proliferation of competing and duplicate standards and certification schemes with different requirements and associated adverse consequences, including:

- excessive burdens on producers, with the impact being felt mainly in developing countries and emerging economies;
- difficulties with consistent enforcement;
- a basis for international disputes arising from a lack of a harmonized approach;
- confusion over comparative benefits (especially for consumers) which could influence the acceptability of certain bio-energy technologies and products;
- a barrier to the expansion of global bio-energy markets; and
- a failure to address sustainability concerns in the round at the international level due to a dissipation of efforts.

These issues, if not addressed in an objective and coordinate way, pose a significant risk to bio-energy achieving its full potential.

The Global BioEnergy Partnership (GBEP), with its clear mandate from the G8 Heiligendamm Summit of June 2007 to “take forward the successful and sustainable development of bio-energy”, is ideally placed to contribute in this way

Consequently the main aim of the Task Force on Sustainability will be to facilitate a coherent international discussion with a view to broadening understanding of sustainable bio-energy and effective ways of achieving it. For the purposes of this work the scope will cover all forms of bio-energy (including transport biofuels, solid biomass for energy use and biogas/biomethane) and will:

- Develop an inventory of what is being done internationally on bio-energy sustainability. This will involve identifying current initiatives being undertaken at national, regional and international levels on the sustainability of bio-energy, including sustainability standards initiatives, compliance/certification schemes, research and studies.

The inventory will help inform the analysis and discussions to be undertaken in the second phase.

- Drawing on the inventory and other available information, identify and discuss commonalities and differences in approaches, and issues requiring further consideration.
- Facilitate the sharing of information, data, experiences and best practices relating to sustainable bio-energy production and use. The Task Force will provide a useful platform for those engaged in current work on bio-energy sustainability to share information, data, experiences and best practices.
- Identify synergies between the various initiatives and encourage closer collaboration and integration to promote greater consistency and reduce unnecessary duplication. The Task Force will also contribute to disseminate best practices which interested stakeholders may adopt in accordance with their particular needs and circumstances.

The main outputs of the Task Force will be:

- an inventory of existing initiatives on sustainable bio-energy;
- at least one workshop to facilitate the sharing of information, data, experiences and best practices relating to sustainable bio-energy production and use;
- examples of best practices relating to sustainable bio-energy production and use which may be suitable for adoption or application by interested stakeholders disseminated through appropriate media, including the GBEP web site;
- a report summarizing the work and conclusions of the Task Force, and any recommendations for further work.

In parallel the GBEP is promoting a Task Force on GHG Methodology (co-chaired by the US State Department and the United Nations Foundation) aimed at providing a methodological framework for countries and institutions to use when developing GHG methodologies for biofuels and biomass.

This methodological framework has been developed starting from a series of 10 questions highlighting the main elements that need to be harmonized at the international level in order to facilitate agreement on the elements to consider in a well-to-wheel life cycle analysis. In particular the subgroups formed at the last TF meeting are discussing the following issues:

- Land Use Change and Feedstock Production
- Biomass Processing
- Fuel Transportation and Use
- Bioenergy Usage Compared to Fossil Fuel

The draft methodological framework will be accessible for public comments at the end of the summer, in order to be presented in a consolidated version by March 2009.

4.2. "Africa's potential of biomass and production of biofuels under EU sustainability criteria" by Andrew Turay

(Addax Bioenergy, Sierra Leone)

1. The Biofuels debate

In January 2008, the European Union Commission issued a proposal for a Renewable Energy Directive (RESD) which, among broader targets, mandates the use of 10 % of biofuels in the EU transport fuel mix. The policy objectives behind the proposal are:

- Reduction of Greenhouse gas emissions to tackle climate change
- Reduce EU dependency on fossil fuels in view of fast depleting EU reserves and the concentration of world reserves in unstable regions
- Put a price cap on fast-rising oil prices
- Create a market for EU agriculture and technology

The EU commission has indicated that the bulk of the 10 % is anticipated to be sourced from EU farmers and 2nd generation biofuels. A balance of about 1/3 is supposed to be imported. In order to reduce environmental risks and ensure the effectiveness of the policy, the 10 % mandate is made conditional to:

- Minimum 35 % effective CO2 savings versus the fossil equivalent
- Protection of Ecosystems
- 2nd generation technology becoming available before 2020

The European Parliament is now reviewing the RESD draft, consulting with stakeholders and formulating its recommendations. The implementation of the directive comes at a time of heated public debate over biofuels. Opponents argue that:

- Biofuels mandates will trigger a massive expansion of agriculture into the world's remaining ecosystems, either directly or through displacement of other crops
- Fossil fuel input in the production process and/or carbon stock release through land use change reverse the CO2 emissions reduction potential
- Biofuels are expensive to produce, transport, store and blend and therefore not economically viable
- Biofuel feedstocks compete with food production and contribute to rising commodity prices

Addax Bioenergy has been invited to present the African point of view in the biofuels debate and discuss "Africa's potential of biomass and production of biofuels under EU sustainability criteria."

2. Addax Bioenergy project in Sierra Leone

Addax Bioenergy is a division of the Swiss-based energy group, Addax & Oryx. Addax looks back on 20 years experience investing and operating businesses in the sub-saharan African oil & gas value chain. Addax Bioenergy is now finalizing a feasibility study to set up a 26'000 hectares sugarcane plantation and bioethanol distillery in Sierra Leone for a total investment of approximately 200 million USD.

Our project is supported by the World Bank and the Swedish Government through its development financing institution Swedfund, who is considering acquiring an equity stake. The production of ethanol should start in 2011 and is destined for export to the European Union.

Addax has chosen to adopt the Brazilian sugarcane ethanol model for the following reasons:

- Industrially proven business model (30 years in Brazil)
- Favourable climatic conditions to grow sugarcane in sub-saharan Africa
- Production costs are competitive with fossil fuels due to productive feedstock and straight conversion process;
- Greenhouse gas savings are unrivalled due to biomass-energy self-sufficiency
- Sugar is not a staple food

Fuel Price comparison in Rotterdam		
Source: Platt's European marketscan 6.6.08		
Ethanol ex Brazil	720	USD/ton
Gasoline	1150	USD/ton
Biodiesel	1700	USD/ton

Unless Jatropha is proven industrially (there are doubts on whether it can be scaled up to industrial production), we believe that sugarcane is currently the only viable feedstock for biofuels to be grown in Africa in an export perspective. Our analysis therefore focuses on sugarcane ethanol.

3. The free-trade opportunity

Thanks to free-trade agreements between the EU and most sub-saharan African countries (EPA or EBA), biofuels produced in Africa benefit from a tariff advantage in comparison with Brazilian ethanol which faces high import duties. This makes the African location more attractive for investments in the biofuel sector and offsets some of the less favourable investment challenges.

4. Snapshot of the state of Africa’s agriculture

Africa’s agriculture has two faces:

On the one hand, cash crops like cotton, coffee, cocoa, sugar, fruit and vegetables are produced industrially and exported to the world’s markets. Although profitable, their expansion potential is limited by climatic constraints, inelastic demand and increasingly prohibitive freight costs due to rising fuel prices.

On the other hand, staple crops are either produced through subsistence farming or they are imported. The production of staple crops has attracted virtually no foreign investment mainly because of EU and US export subsidies, trade barriers and failed social policies, usually in the form of price controls. The lack of investment has kept productivity down, increased rural poverty and led to an exodus of the young, unemployed population to urban areas. Today, virtually all rice and wheat are imported, adding to negative trade balances and causing recent hikes in commodity prices to directly hit the poorest of the poor.

The problem is obviously very complex, not the topic of our briefing and will take major trade and government policy changes to be tackled efficiently. However, it is strongly interlinked with the question of the potential of the African agriculture to supply the EU demand for biofuels.

A comparative study by the UN Economic Commission (2004) has pointed to the low productivity:

- Average land productivity in Africa is 42 % of Asian and 50 % of Latin American level despite similar climate conditions
- Only 7 % of arable land is irrigated, compared with 40 % in Asia
- Fertilizer use in Africa is 8 % and 15 % of use in Latin America and Asia respectively
- Mechanization in Africa is 3 times lower than Asia and 8 times lower than Latin America
- Farming practices and agricultural research in Africa are comparatively rudimentary

The low productivity also means that the land currently dedicated to agriculture is used far under its real potential. As African farmers have no capital, their ability to improve the acidity and poor fertility of tropical soils through proper farming techniques like irrigation and fertilizer is low. Therefore, they have to move their fields up to ten times before returning to the original site. This implies that up to 90 % of the “arable” land is not used most of the time.

Furthermore, according to the UNEC study, “Although abundant on a regional scale, only 2.3% of the surface and ground water resources available in Africa are used to meet the different needs.”

5. Land requirements and availability to supply the EU demand

In order to quantify the need of land to grow sufficient feedstock in the unlikely event that *all* bioethanol would be imported from Africa, we assume the following:

The expected EU gasoline consumption for 2020 is expected to be approximately 145 million (mio) tons, or 190 mio cubic meters (IEA).

If E10 is introduced EU-wide, the maximum ethanol blended into the EU fuel mix will be 19 mio cubic meters.

If E85 and flex-fuel cars become available to the larger public, then the 10 % energy *content* target could result in an extra 6.3 mio cubic meters of ethanol and a total EU market of roughly 25 mio cubic meters.

How much land is needed to produce 25 mio cubic meters of ethanol?

Conservatively assuming a sucrose content yielding 75 litres of ethanol per ton of cane and an average yield of 80 tons of cane per hectare (ha), the African producer could achieve an output of about 6 cubic meters of ethanol per ha. This does not take into account the emergence of new, highly productive cane varieties and hydrolysis technology which are expected to become major productivity boosters.

Based on our conservative assumption, the land needed to cover *all* EU bioethanol requirements would be about 4.2 mio ha. Assuming that Africa would only but exclusively cover the EU “fair share of imports” of about 30 %, then the land need would be reduced to 1.4 mio ha.

In comparison, Brazil produced roughly 21 mio cubic meters ethanol on about 3.4 mio ha of land in 2007.

What is the availability of suitable land in Africa?

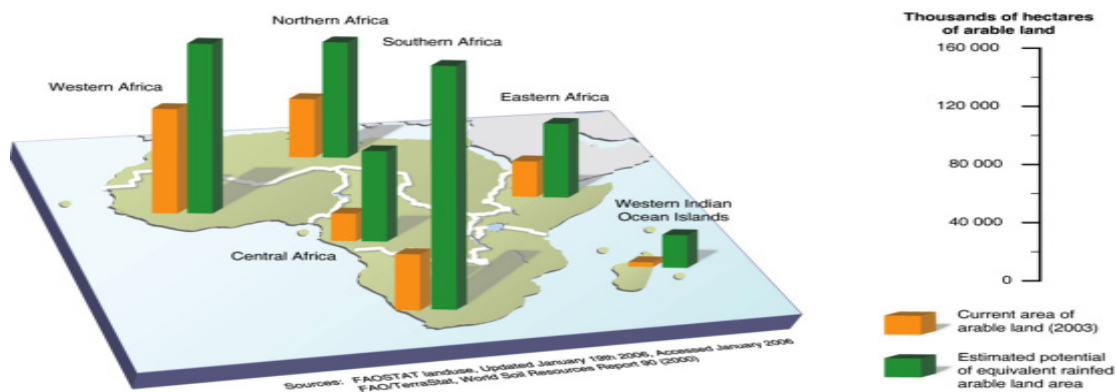
There are broadly two options:

Conversion of arable land for industrial sugarcane, which could raise social issues like taking land from food production and driving farmers off their fields.

Expansion into pasture areas, which could raise environmental issues like the loss of biodiversity and land use change.

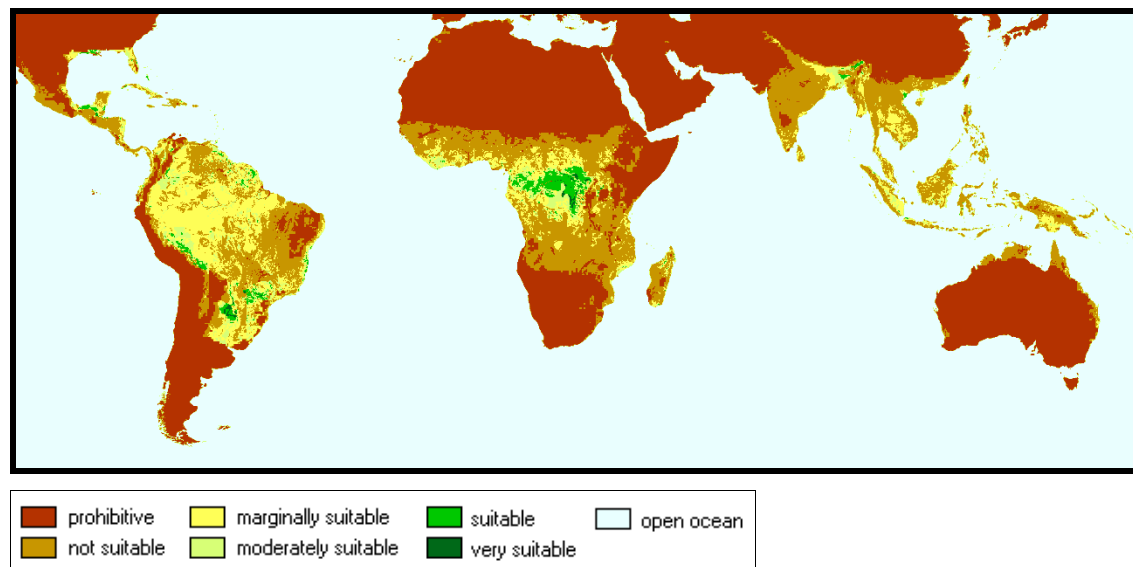
The question on how the risks in both cases can be managed in the light of EU sustainability criteria is discussed below.

In Africa, according to the FAO, out of a total landmass of 2400 mio ha, only about 160 mio ha are currently used for agriculture. The land potentially suitable for agriculture is estimated at 1050 mio ha net of forest and human dwelling and infrastructure areas. A suitability factor adjusts that figure to an equivalent potential arable land availability of about 750 mio ha.



Now how much of that land is actually suitable to grow sugarcane?

The FAO has published the following map which shows the suitability of soil and climate to grow *rain fed* sugarcane (i.e. without artificial irrigation) in the tropical regions:



In Africa, the marginally to very suitable lands for *rain fed* sugarcane, net of forested and inhabited areas amount to 166 mio ha out of which 33 mio ha in West Africa alone.

Obviously, one can raise doubts over the precise nature of the above studies. On the one hand, natural constraints like abrupt terrain, remoteness and lack of available workforce can drastically reduce the suitability of potentially valuable agricultural land. Furthermore, there are probably overlaps between already used arable land and potentially suitable land for sugarcane.

On the other hand, the above studies do not take into consideration the potential for irrigated sugarcane plantations which are already being operated in countries like Senegal, Mali, Sudan and South Africa thanks to the proximity of waterways but rated “not suitable” or “prohibitive” for rain fed sugarcane.

However, the UN and FAO studies allow us to put the needs for EU biofuels and the availability of suitable land into perspective. We can therefore conclude with a high degree of certainty that Africa’s agricultural potential by far exceeds the European need for bioethanol.

6. EU sustainability criteria in the light of the Addax Bioenergy project in Sierra Leone



Our objective is to exceed the minimum sustainability requirements as proposed in the RESD through:

- Location
- Land selection
- Agricultural practices and Production process
- Community participation

A. Location

The selected plantation site is located 150 km by road to the nearest sea-export terminal which is 5 days shipping to the closest EU ports. This compares with average 1000 km internal road transport within and 12 days shipping from Brazil.

The climate patterns in the area are favourable with a distinct dry season which allows a 6 month harvest and a rainfall in excess of 2000 mm during the rain season, thereby reducing the need for irrigation.

Water for irrigation is sourced from a nearby river which carries abundant water throughout the year.

B. Land selection

The plantation site is located on land that has been degraded through human activity. Most of the original vegetation was cleared a long time ago to make way for irregular use as pastures and for subsistence farming. Biodiversity is low. The soils are typical tropical oxysols and laterites with low soil carbon content.

90 % of the area is covered by grass, bushes and small trees and is flash-burnt every year during the dry season.

The remaining areas which are still covered with more dense vegetation as well as low-lying areas which are flooded during the rain season are left aside.

C. Agricultural practices and Production process

The harvest of the sugarcane will be done mechanically in order to avoid flash burning and allow separation of top leaves which will be left on the ground as organic matter. There will be no development on steeper slopes and waterways to avoid soil erosion. Ecological and Development corridors will both allow redeployment of biodiversity and continuation of traditional farming practices.

The vinasse wastewater will be fed through anaerobic digesters to produce biogas to power the factory, the liquid residue will be stripped of pollutants and returned to the fields as fertilizer. Residual fibres (bagasse) will be collected to generate about 20 MW excess power which will be fed into the national grid.

D. Community participation

The land is leased directly from the land owners under the authority of the traditional chief and the government ministry of lands. All stakeholders are being informed about the project benefits and implications for their immediate environment. Beyond direct employment opportunities, health and education, we are considering various community participation schemes. GTZ have proposed to implement an outgrower scheme in the frame of a Public-Private partnership. Furthermore we want to empower farmer cooperatives to combine energy and food crops by using the land left fallow during the 5 year rotation cycle for food production. Our plantation could annually produce up to 150'000 tons of raw cassava, i.e. about 1/3 of the current country output in Sierra Leone (FAO 2004). Finally, substantial co-generated electricity will become available at low cost in a country virtually deprived of electricity.

In view of the above, we believe that our project in Sierra Leone proves the feasibility of sustainable bioethanol production in Africa in terms of CO2 reduction potential and protection of the environment. Furthermore, it substantially improves the livelihoods of the local populations.

7. EU sustainability criteria and Africa: Challenges and Recommendations

From an investors' perspective, sustainability criteria are an important means to achieve customer acceptance and carbon performance is expected to yield a product premium. However we must insist that African producers should not be made accountable for past environmental sins committed in the developed world and that sustainability criteria must be fair, realistic and not used as hidden protectionist measures.

- ⇒ The recent tightening of the water content specification is a hidden protection for EU producers meant to raise the entry barrier for superior tropical biofuels. The admissible water content, while having no consequences whatsoever on engine performance or emissions, is challenging for African producers because of the humid climate and the length of the supply chain. We believe it is in the interest of the European consumer to revert to the former EU water contents specification.
- ⇒ While we welcome sustainability criteria for our industry, there is no reason why the oil, mining, food, cosmetics etc industries should not abide by the same rules.
- ⇒ The challenge lies mainly with the lack of clearly applicable and measurable rules, methods and benchmarks. Currently, there are no directly and universally applicable and binding guidelines. This causes uncertainty and delays investment decisions.
- ⇒ We don't believe that broad land categories and default values can take into account the variety of conditions prevailing in Africa. As the carbon performance is increasingly becoming monetized, it is of utmost importance to avoid abuse on the one hand and "brand" the actual carbon performance on the other hand. This will require carbon measurement methodologies as well as independent certification entities. Their selection should be made a priority as investors need to confirm their assumptions.
- ⇒ To assess the real CO2 savings potential from biofuels, the fossil fuel benchmark should take into account the substitution of light sweet crude oil by carbon-intensive oils from tar sands or heavy crude oil.
- ⇒ In terms of Land Use Change, it is important to take into account human practices before and after land conversion. Current carbon-intensive practices like field burning must be taken into account as opposed to the potential for carbon capture through good agricultural practices. If organic matter cleared from the plantation site is collected and substituted to firewood, it is only logical to offset its carbon content.
- ⇒ Co-generation of electricity from biomass replaces fossil energy and should be included in the CO2 equation.

8. EU targets from the African perspective

Africa has the climate, the land, the people and the proximity to become a major supplier of sustainably produced biofuels to the European Union. However, this will require substantial investments in agriculture, factories, transport infrastructure and human capital. As the investment risk in Africa is high, business plans will only be implemented if the risk is offset by a solid, foreseeable market demand. That is why a lowering or even an abolition of the 10 % target would jeopardize many projects currently considered because of the EU opportunity. This would not mean, however, that biofuel developments in Africa would stop completely. As biofuels make a lot of economic sense in the high oil price environment, other investors would probably seize the opportunity but without the same priority given to sustainable development. If the EU relinquished its leadership role in establishing sustainability standards for biofuels, there would probably be not less but less sustainable biofuels.

9. Conclusions

- ⇒ Sub-Saharan Africa can supply part or all of the European demand for sustainable biofuels due to its size, suitable soils and climate, and the low levels of current utilisation of cultivable agricultural lands. There are vast expanses of land that can be developed without straining water resources, endangering biodiversity or threatening the supply of food.

- ⇒ Tropical biofuels have a high greenhouse gas savings potential, much in excess of the 35 % proposed in the RES directive.
- ⇒ As a global commodity, biofuels present a huge opportunity to kick-start Africa's neglected agricultural sector, through foreign investment, transfer of knowledge and best practices and trade opportunities.
- ⇒ Biofuels can actually help improve the food security through field rotation with food crops and a productivity spill-over effect into staple crop production.
- ⇒ Finally, biofuels present an opportunity for many African nations to reduce their fuel bill and increase their revenue.

4.3. "Can Sustainability Criteria for Certification of Agrofuels be effective?" by
Helena Paul

(EcoNexus, United Kingdom)

Agrofuel production involves the artificial creation of a new market with the help of government incentives, targets and subsidies. These are necessary because agrofuels cannot compete without them, so they need support in order to develop.

However, it is clear that these supportive measures, including the EU target, are already impacting the global South. They are contributing to land seizure, speculation and rising land prices in Africa, Asia and South America. They are also leading to the displacement of food crops and the expulsion of vital food producers from the land. Both agricultural and forest biodiversity, already under threat from climate change and industrial agriculture, are being impacted by an emerging industry that has not proven that it can meaningfully address the problems of climate-forcing emissions. Farmers from indigenous and local communities are being driven off the land into urban slums, where they cease to be food producers and add to the rising numbers of those who need to be fed. As long as targets are in place, the signal to governments and commercial interests is loud and clear: go into agrofuels for export to Europe.

Standards and certification schemes are proposed as a way to address these issues. But there is a major question: when have certification systems, particularly when voluntary, worked successfully in the past, especially in the global South? In the current situation, where EU targets are already causing rapid and irreversible changes, it is hard to believe that EU certification rules, whose scope is still being argued over and which are still to be developed and applied, can really address the issues, especially on the scale that would be required. This is especially troubling in view of the fact that the usefulness of current agrofuels is under increasing question.

The OECD paper “Biofuels: Is the cure worse than the disease?” notes that “enforcement and chain-of-custody control could prove to be an enormous challenge, as recent experiences with the certification of wood products have shown. ... Though theoretically possible, reliance on certification schemes to ensure the sustainable production of biofuels is not a realistic safeguard.¹”

Key questions

1. To what extent can certification schemes effectively address the problems identified?
2. Who is involved in deciding what deserves the label ‘sustainable’?
3. Should schemes be voluntary or mandatory?
4. Would mandatory sustainability certification for agrofuels be tolerated under WTO trade rules?

¹ “Biofuels: Is the cure worse than the disease?”, Discussion paper for the OECD Round Table on Sustainable Development, September 2007, <http://www.oecd.org/dataoecd/33/41/39276978.pdf>

Limits to the capacity of certification to address the issues

Large-scale production of agrofuels will have macro-level impacts, which cannot be addressed by applying a set of criteria to individual producers. In this respect, ‘displacement’ and increased food prices are key issues. Displacement means that when existing agricultural land is used to meet the new demand for agrofuels, current production will be displaced to new areas, for example forests or small scale, diverse agricultural systems. Price shifts in commodity markets influence the price of land and also correlate with land use change, eg: changing world prices for soy have been shown to correlate with Amazon deforestation².

Major obstacles to the development of effective standards and criteria

1) **GHG balance:** There is strong disagreement about these values and recent work that looks at land use change casts serious doubt on earlier optimistic assessments of agrofuel GHG values (eg: Searchinger, Fargione studies³).

2) **Large-scale actors are better able to deal with the administrative burden related to certification than small-scale producers.** In practice, the larger actors also have more power and opportunities to influence the process of setting the criteria, and a greater capacity to find and exploit loopholes in the system.

3) **Producers and traders would be able to serve the certified market and also operate in uncertified markets.** This means they would benefit from the credibility of the certification, while (possibly) continuing to engage in bad practices elsewhere.

4) **The credibility of the certification** depends a lot on which system is used.

- ‘**track and trace**’ follows a product through the whole chain from beginning to end. This is very difficult to apply to commodities traded between countries and companies as these may be mixed during transport and processed with products from elsewhere.
- ‘**book and claim**’ system involves tradable certificates. A company buys a quantity of certified goods and gets the credit for that, but once the goods enter the market they are mixed with others, and could end up anywhere. Such a system is cheaper but more open to fraud. It is clear that the more credible a system, the higher the costs involved, so decreasing its competitiveness

5) **The challenge of verification and monitoring is massive:** different players have different access to legal processes, especially on the ground, where local communities may be the most impacted and be the most difficult to contact and monitor in a meaningful way. There may also be issues of corruption, repression and patronage, and conditions where communities are caught between working in very poor conditions or having no work if mechanization becomes the cheaper option due to demands for improved conditions (eg: sugarcane cutters). If certifiers are paid and chosen directly by the companies whose standards they are assessing, there will be conflicts of interest. But how are costs to be paid and by whom?

² “Cropland expansion changes deforestation dynamics in the southern Brazilian Amazon”, Douglas Morton et al, September 2006, <http://www.pnas.org/cgi/content/abstract/0606377103v1?ck=nck>

³ <http://www.sciencemag.org/cgi/content/abstract/1151861v1>, Searchinger et al, Science, February 7, 2008, ‘Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land Use Change’ and <http://www.sciencemag.org/cgi/content/abstract/1152747v1>, Fargione et al, Science, February 7, 2008, ‘Land Clearing and the Biofuel Carbon Debt’

6) **Divergent interests:** Governments, corporations, NGOs, experts and local communities may have very different interests as well as different degrees of influence over projects. They also have divergent approaches to eg: consultation and participation by affected groups. In many producer countries, human rights violations are already linked to the production of sugarcane, soy and palm oil. As a result, existing ‘sustainability’ claims have already met with opposition from civil society.

7) **Who are stakeholders?** Defining the stakeholders in any process is complex. Should local communities affected both directly and indirectly by agrofuels production be included? How does one deal with divisions between communities in a region that are benefiting from projects and those who are not? It is easy to claim in the abstract that all actors must be involved, but actually achieving this may be very difficult.

8) **Blending and choice:** Since agrofuels are going to be blended with other agrofuels and with petroleum, the consumer will have no means of exercising choice.

Meta-standards based on existing initiatives such as FSC, RSPO, RTRS

The EU-focused initiatives for agrofuel ‘sustainability’ criteria favour what is known as the ‘meta-standard approach’. This would mean that existing or planned labels and certification initiatives like the **Forest Stewardship Council (FSC)**, the **Roundtable on Sustainable Palm Oil (RSPO)** and the **Round Table on Responsible Soy (RTRS)**, could be approved as qualifying as the ‘meta-standard’ for agrofuels. If FSC certification, for example, were accepted as meeting the requirements of the ‘meta-standard’, FSC-labelled biomass could then be approved, provided a GHG calculation were carried out. However, there are serious questions over all these initiatives as regards their effectiveness and balance of participation between different stakeholders, eg: companies and local communities and their influence in the process, etc. To use these initiatives to develop a meta-standard approach is at least premature and could simply incorporate all the problems they already face within their own regions and sectors.

Marginal lands and people

There is much talk of using so-called ‘marginal’ lands for agrofuel production. Such lands may be partly degraded or disadvantaged in other ways, eg: lacking in water. However, such land may be collective or common land, eg: used by nomadic herders or pastoralists, or by poor inhabitants of villages, eg: women and old people. The classification of certain lands as ‘marginal’, ‘underused’, ‘empty’, ‘neglected’ or ‘wasteland’ may be determined more by political priorities than by the state of that land itself. Such land may be important for biodiversity and was described (Melaku Worede: pers comm. May 2008) as a reserve for germplasm for future crop breeding. Often it is the women in a community who know most about what grows on such land and how to use it to provide valuable additions to the diet or at difficult times of the year. In fact, it is likely that women will be among those most adversely affected by agrofuels developments, as they often depend on marginal land because they do not have the same rights as men in the community to land, money and other assets. Groups who use ‘marginal’ land, including nomadic herders, often have no rights, yet may understand better than anyone else how to use such land sustainably.

Jatropha and marginal land

It is often claimed that jatropha curcas can be grown on such land and there are major projects in Africa and India to produce jatropha. However, although it was at first asserted that jatropha flourishes in marginal areas on poor soils with little water, it is now becoming clear that jatropha is far more productive in better soils with more water.

In Tanzania, for example, small farmers are being cleared from the Kisarawe district, where rainfall and soils are adequate for food production, in favour of jatropha. Even if paid compensation as promised, it will be difficult for them to find equivalent land elsewhere as so much of the rest of the country is extremely arid.

Smallholders used as a justification for agrofuels⁴

With certain crops, such as jatropha and oil palm, we are told that small farmers will benefit from producing them. However, there is already evidence that in Indonesia, Ecuador and Colombia smallholders are being forced into oil palm production, so that even if they retain title to their land, they have no say in what they produce on it. Often they operate at a serious disadvantage with large-scale players as regards getting their produce to processing centres. It should be noted that these two crops both currently require manual labour and take some years to mature. Smallholder producers may be drawn into debt through producing these crops, especially since their contracts generally offer no protection against crop failures and loans and other expenses must be repaid.

WTO compatibility

Most commentators and initiatives cite the WTO as a major obstacle to certification. Voluntary certification is allowed under WTO rules, but only if there is free competition among different labels and if no measures are taken to inhibit trade in non-certified goods. Mandatory certification (setting social and environmental standards) could well face a challenge from producer countries. The OECD paper “Biofuels: Is the cure worse than the disease?” says that “even if the certification requirements would apply to all countries and to domestic production in a similar way, the measure might still be found against by a WTO dispute panel on the grounds of having a disproportionate impact on trade.”⁵ However, the countries working on standards (the UK, The Netherlands and Germany) are all members of the WTO and are therefore responsible for setting and changing its rules. The legal situation regarding the WTO and agrofuel certification is far from clear, and much remains up for negotiation. The truth is that WTO rules do give members the right to discriminate in favour of other public policy objectives such as protection of the environment and conservation of natural resources. Yet rather than exploring these possibilities, WTO rules are being used as an excuse for weak certification proposals.

Conclusions

It is clear that the development of criteria for sustainable production of agrofuels is a big challenge, even without considering whether they offer any kind of solution to energy problems. Criteria need to be complex enough to address the issues, yet not so complex as to be inoperable. Since we do not yet understand what sustainable production would involve, we lack benchmarks. Agrofuels have the capacity to cause land use change on a huge scale at unprecedented speed. Indeed they are already doing so. We therefore do not have relevant past experience to apply. Issues of participation by local people are very complex to address and may encounter serious resistance from governments, or be undermined by commercial interests. Above all, at a point when serious questions are being asked about the impacts of industrial agriculture (eg: IAASTD report⁶) it is vital to avoid any risk that certification may somehow help to greenwash a massive expansion of industrial monocultures in the name of addressing climate change but under pressure to use economies of scale to keep prices down. Such an outcome would be at the expense of rural communities, small farmers and local food production, to say nothing of biodiversity and climate.

⁴ Agrofuels - Towards a Reality check in nine key areas, page 24, <http://www.econexus.info/pdf/Agrofuels.pdf>

⁵ “Biofuels: Is the cure worse than the disease?”, Discussion paper for the OECD Round Table on Sustainable Development, September 2007, <http://www.oecd.org/dataoecd/33/41/39276978.pdf>

⁶ International Assessment of Agricultural Knowledge, Science and Technology for Development <http://www.agassessment.org/index.cfm?Page=IAASTD%20Reports&ItemID=2713>

4.4. "Growing sugar cane for ethanol - an evolving project in Ghana" by Kojo Fosu
(Regency Resources Limited (Regency), Ghana)

Speech

Slide1: Thanks for the invitation

Mr. Anders Wijkman, ladies and gentlemen, Thank you for inviting me to participate in this workshop. This roundtable is a commendable initiative and a timely one; it is timely because we stand on the threshold of major decisions that will impact on our common future. It is insightful because it is about the very essence of our existence. I have a key message to share with you, but first, I bring you warm greetings from my brothers and sisters in Africa who stand to benefit if we succeed in doing what we have set forth to do. My message is clear.

Slide 2: Sustainable growth is possible

My main message is that sustainable development is possible! All development demands growth; all growth demands increased use of energy; increased use of energy impacts on climate change. Our challenge is to ensure sustainable development based on good growth and wealth creation. Our dependence on fossil fuels will impact negatively on carbon emissions and consequently lead to climate change.

Those of us in Africa will suffer most from climate change even if as we produce the least emissions per capita. It is quite clear that we will need to develop various energy sources in facing the future. Renewables are quite clearly one way. To my mind Ethanol is one of the most strategic options.

During a mission to Sweden three years ago, Regency Resources entered into an agreement with SEKAB (Svensk Etanokemi AB) to supply 150,000 cubic meters per annum of ethanol to the Swedish market. Subsequently a comprehensive feasibility study was compiled by BBI International of the USA.

Slide 3: What are the main issues?

Land in Ghana with suitable climatic conditions to sustain the establishment of a sugar cane plantation was identified. The land selected for development of the sugar cane plantation is completely uninhabited, has never supported any agricultural activity and is in old river valleys with the main vegetation being savanna type grass.

Thus, there is no question of relocating local residents or of utilizing land which is or has been producing food crops. In passing I must comment on the reason for the lack of sustainable large scale food crop agriculture in West Africa. Due to the subsidies enjoyed by farmers in the developed nations, it is not economically viable to produce crops in our country when the same crops are imported at a lower cost.

The infrastructure of area to be developed for the plantation and process plant needs to be established by the provision of roads, water supply, wastewater management, power supply and flood management. The project will create much needed employment to the area where the rate of unemployment is extremely high at around 85 percent.

The job creation will require the establishment of housing, schools, clinics and recreational facilities for the influx of employees into the area. This will have an obvious pass-on benefit to the local community.

Surrounding land outside the project plantation area may in future be considered for out growers to make beneficial use of their land and contribute feedstock for the process plant.

Slide 4: How will these issues be tackled?

In order to achieve sustainable development we have entered into agreements in Brazil with consultants and contractors. The consultants have assisted us to conclude arrangements with financial institutions in Brazil to provide financial support for the project. The Brazilian banks have formalized a loan agreement for 85 percent of the project budget. Further funding to support the project is being provided through local Ghanaian banks and equity investors.

The Brazilian consultants and contractors bring a wealth of knowledge and many years of experience in the management of cane plantations and the production of ethanol. The establishment of the sugar cane plantation and the ethanol process plant will be performed by the Brazilian contractors. Brazilian management teams will be put in place to provide training and implement operations. The involvement of the Brazilians in this project will lead to the transfer of technology to Ghanaians who will eventually take over the management functions.

Great emphasis is placed on the control of the plantation with regard to soils management, weed control, fertilizer management, planned irrigation and harvest management. The agricultural techniques employed in the plantation will be based on a high level of mechanization.

A small biodiesel plant will be incorporated into the process plant which will use jatropha as feedstock. The production of biodiesel in parallel to an ethanol plant is complimentary as ethanol can be used to remove the water from the biodiesel end product and recycled into the system. The biodiesel produced will be used to supply fuel for the plant and equipment used on the plantation.

The initial agreement with SEKAB for the purchase of 150,000 cubic metres of fuel grade ethanol has been formalized into a ten year off-take contract. This guaranteed market for the ethanol provides the long term security to maintain sustainable development of the project.

The levels of employment generated by the project will not be able to be met by the current population in the area. The workforce both for the construction stages and the operational phase will require the importation of labour. This will enable many previous residents who left for the bigger urban centres in search of work to return home. Housing schemes will be incorporated into the overall project plan to cater for the influx of the workforce and their families.

Roads will be constructed in the plantation areas as part of the project budget. The Government of Ghana is committed to upgrading the national roads in the district.

During the dry season, water will be required for irrigation and the process plant. Reservoirs will be constructed within the project areas to store water. Using up-to-date technology, irrigation of the plantation during the dry season will be by overhead self-propelled spray systems which will reduce the water usage by 50 percent compared to gravity furrow irrigation methods. The maintenance and operation of the irrigation systems will require a substantial labour force. The surrounding local communities will also benefit from the supply of water which will be available to supplement existing water supplies.

When operational the process plant will produce electricity by utilizing the bagasse created during the sucrose extraction as fuel for the boilers incorporated in the cogeneration plant. The electricity produced will be far in excess of the own use requirement of the plant and approximately 30 megawatt will be available to be exported to the national grid. The Ghanaian electrical authorities have expressed their keenness to avail themselves of this electrical power as there are no other sources of generation in the north of Ghana.

The future inclusion of out growers will be organised on a cooperative basis where farm implements and equipment from the project plantation will be available. A further by-product from the bagasse will be animal feed which can support the development of large scale dairy farming in the area.

With the support of the Brazilian financial institutions and the equity investors I am assured of sufficient capital being available to transform this hitherto unused land into a highly productive, cost effective ethanol production facility.

Slide 5: Conditions needed for success

The economic analysis conducted for this project in the feasibility study by BBI, who have a history of evaluating over 200 ethanol projects, conservatively indicate a pre-tax average annual return on investment of 35 percent. The project as modeled by BBI is projected to be an excellent commercial opportunity.

The sustainability of ethanol production in Ghana is competitive because of the availability of technology transfer from our Brazilian friends, the availability of fertile land, abundant sun, adequate water and a labour force capable of being trained as competent farmers. I would mention that the African savannah lands are very similar to the Cerrado plains in Brazil where very high sugar cane crop yields are obtained.

A prerequisite for success on any project is the financial investment and access to capital. The financial arrangements with Brazilian banks and financial institutions, Ghanaian banks who are underwriting part of the loan agreements and the equity investors ensure this project will have the necessary capital requirement.

I have already mentioned the need for the development of the infrastructure and local community, which is essential for the well being of the project.

Consumers and other stakeholders need guarantees that the ethanol we deliver is verified as sustainable so the criteria we meet is the same as followed by SEKAB who work in conjunction with other international organizations like the UN, EU, ILO and a number of NGO's.

Slide 6: Does ethanol production lead to more emissions?

Sugar cane is the most efficient high yield crop for the production of ethanol. Ethanol, together with other biofuels, is decisive in the fight against global warming. The production of biofuels can generate income and employment in the developing countries of Africa, and at the same time produce clean, renewable energy.

The sugar cane plants digest a major volume of carbon dioxide whilst they grow. Ethanol produced by our facility leads to a 90 percent reduction in hydrocarbon emissions.

By pooling our ideas we can together make a substantial difference to the factors affecting global climate change.

My passion is to be at the forefront of change, especially in Africa where development has not been keeping pace with the rest of the world.

Renewable energy sources will not on their own solve the problems encountered with global warming, but can be complementary in the overall efforts to address this situation.

Changing our behavior patterns in daily life will achieve a lot, yet we will still depend on energy sources for the foreseeable future. Ethanol is one good source of energy. It is clean, it is cheap and it is safe.

Slide 7: Thank you

Mr. Anders Wijkman, Ladies and gentlemen, my main message has been that sustainable development is possible. I believe that Ethanol is a strategic option and the conditions in Ghana are excellent for ethanol production. Ladies and gentlemen, I would gladly welcome your support in this quest. The EU can do a lot in terms of policy direction and support. Finally, I thank you for inviting me and I hope that this dialogue is not the end, but rather the beginning of a journey for the sake of our common future. THANK YOU FOR YOUR ATTENTION.

4.5. "On hands experiences from growing biomass for bioenergy in Mozambique. Social aspects and policy needs." by Anna Lerner

(Deutsche Gesellschaft für Technische Zusammenarbeit - GTZ (organisation for technical cooperation), Mozambique⁷)

Summary

Social Criteria: Social standards governing biofuel production should naturally be given equally importance to environmental standards. Within a structure of obligatory sustainability reporting there is room for the most relevant social standards, such as the core labour standards, health and safety regulations and others. Community consultation and equal ownership structures through out the value chain should also be encouraged. Certain detailed social indicators are country specific and should where appropriate be left for the country itself to define and regulate.

Small holders: Including small scale actors in the biofuel industry is one of the mayor challenges facing biofuel producing developing countries. However, including small holders along the biofuel value chain is the most promising path within the bioenergy sector to generate community uplifting, long term rural development, comply with Mozambican developmental goals, and truly reduce poverty. It is thus crucial that the only certification scheme accredited for in the EU market will be a scheme with specially designed measures serving to facilitate the incorporation of small scale actors.

GTZ - ProBEC

The Program for biomass energy and conservation is a regional SADC program implemented on behalf of the German Ministry for Economic Cooperation and Development (BMZ) by the German Technical Cooperation, GTZ. ProBEC biofuel component consists of technical assistance and knowledge sharing in the two areas of sustainability criteria for biofuels and socio-economic impacts from bioenergy production. It is at present active in 10 SADC countries and currently expanding its activities.

Mozambique and its biofuel potential - in brief

Mozambique is considered by many as a Southern Africa country with major production potential for biofuels, especially for national consumption, due to a number of reasons.

- **Favourable climatic condition** characterised by sub-tropical climate and **sufficient rainfall** in many provinces, advantageous for high yielding sugar cane production.
- **Land** suitable for a variety of potential biofuel crops apart from sugar cane, like sweet sorghum, soy, jatropha and other vegetable oil crops.
- Large **population** living in **rural areas** and available for labour intensive biomass production. Most of them experience marginalised living conditions, unemployment and are to a large extend surviving on self-subsistence farming.

⁷ German Agency for Technical Cooperation (GTZ) - Programme for Basic Energy and Conservation. Address 15th Floor, Sable Centre, 41 De Korte Street, Braamfontein, Johannesburg, South Africa. <http://www.probec.org>

- The **Government** of Mozambique (GoM) is highly **supportive** of a biofuel industry serving both as an part of the Mozambican **poverty reduction strategy** and contributing to national energy security.
- Mozambique is **preferentially located** with a long cost line, and access to several **deep sea ports** for possible **export** of biofuels.

So far, the GoM has established an inter-ministerial National Biofuel Task force with four corresponding working groups, one focusing on sustainable production of biofuels. The GoM has further commissioned a Biofuel Assessment Report study in two phases outlining the potential for biofuels in the country. The first phase is recently finalised.

Towards sustainable biofuel production in Mozambique

Mozambican actors are informed about policy developments in the EU to ensure sustainability of biofuels, and are to a large extent, supportive of the discussions outlining sustainable practices.

Sustainability workshop

The discussion of sustainable aspects of biofuel production was launched in Mozambique in December 2007 when the GoM organised a workshop as a response to the EC request for the GoM to submit comments on its proposal “Biofuel issues in the new legislation on the promotion of renewable energy”. For a participatory process, main national biofuel stakeholders were invited. Both the proposal from the EC, as well as the proposals from the Cramer commission and the RTFO were represented and discussed.

Main conclusions from the workshop are that EC definitions on sustainable practice are similar to definitions of the Mozambican stakeholders. Presenters and participants agreed on the importance of safeguarding land with high biodiversity and ensuring a consultative land allocation process acknowledging the right to land for vulnerable rural poor, all to secure natural resources for the use of future generations. Private sector participants lastly voiced concern that cost of compliance and verification of a sustainability scheme might undermine the comparative advantage of Mozambique in biofuel production. A harmonised structure of reporting with and measurable indicators is thus preferred.

National interpretation of sustainability criteria

The GoM has recently introduced a working group on sustainability aspects of biofuel production within the National Biofuel Task Force. Objectives of the working group are to follow developments in international certification schemes more closely, enabling Mozambique to participate actively in discussions and to develop national interpretations of international criteria, adapted to needs and realities of Mozambique’s situation.

Testing of sustainability schemes

GTZ, on behalf of the German Ministry for Economic Cooperation and Development (BMZ) together with SenterNovem of the Netherlands government recently engaged in an appraisal process of sustainability schemes in Mozambique. The consultative results are still being analysed but initial conclusions state that the main challenge for Mozambique in complying with a criteria scheme is to ensure inclusive representation of small scale actors. The lack of organization of Mozambican farmers further poses a huge challenge given that many of the rural developmental benefits promised might be lost if small scale actors are not included in the bioenergy value chain in an appropriate way.

The biggest impediment for small scale farmers to take part in sustainable biomass production is not producing sustainable itself but rather the cost of certification and the lack of appropriate information channels and extension serviced. The cost of informing and training each individual smallholder is higher, than training one manager of a plantation. Further, it is cheaper with one audit or certification for one larger plantation than several audits for each smallholder. The most effective integration of smallholders in certification systems is in conclusion achieved by setting up organized groups of smallholders. Information can then be channelled through one representative, who passes the information on to other members of the group. This would also address the challenge of costs since certification would be more achievable for smallholders if they are certified as a group. Certifying smallholders consequently require a different strategy than for plantations and this feature must be addressed for any sustainability scheme to be truly sustainable in a social aspect.

High Conservation Value concept in Mozambique

GTZ, in cooperation with ProForest, a UK based international environmental consultancy, is planning a regional assessment of areas of High Conservation Value, and areas of critical biological or social value. This project is conducted in the context of sustainable production of biomass for energy purposes. The objective is to develop methodologies for the identification and management of HCV areas at the site level, and, crucially, at the landscape or provincial level.

The concept of High Conservation Value was initially developed by the Forest Stewardship Council, but is now used in commodity crop planning and management and requirements related to HCV appear in most sustainability criteria presently debated.

BIOPEC-project on local prosperity principle

Through GTZ – ProBEC BMZ not only supports the Government of Mozambique in their work towards a sustainable production of biomass, it also engages with other organisations working on sustainability aspects in Mozambique. One example is the upcoming work by Solidaridad, funded by the BIOPEC initiative of the Dutch Government. Solidaridad aims to further develop measurability of the prosperity principle of the Cramer framework and to improve the principle on the implementation level. This initiative will benefit small scale inclusion in the value chain and is thus inline with GTZ – ProBEC strategy.

Social aspects and policy needs

Social criteria

The experience of GTZ-ProBEC in working in biomass in Southern Africa indicates that social standards naturally should be given equally importance to environmental standards. Biofuel projects can generate serious benefits to rural communities in Southern Africa but only if implemented sustainable. A certification scheme further seems to be the most effective way of implementing sustainability criteria for biofuels, and within such a structure of obligatory reporting there is definitely room for the most relevant social standards, such as the core labour standards of ILO, health and safety regulations and other ILO conventions. Nevertheless, some Mozambican stakeholders fear that inclusion of social criteria is an excuse to create a wish-list outlining various criteria governing all problems facing a country in development. One viewpoint is that too many specific social indicators might create a disincentive for investors in Mozambique. Social indicators are often country specific, and should to a large extent be left for the country itself to define. Monitoring of social indicators performance could preferably be done through a centralised reporting structure with flexibility for yearly improvements.

Community consultation should definitely be included in a certification system given its high correlation with sustainable rural development. Mozambique has a well written land law governing community consultation processes but corresponding international criteria will ensure that this practice is governed in all countries producing biofuel sustainable.

Foods vs Fuel

Mozambican stakeholders genuinely agree that the right of food has to be balanced with fuel production. Government policies will be essential to achieve this aim. In the case of Mozambique, one initial step take to minimise the potential conflict on land is a land zoning exercise identifying suitable agricultural land, undertaken by the GoM. Food security concerns are further reflected in technical evaluations on investment project proposals handed to the GoM.

GHG savings

Apart from introducing social standards, the necessity to analyze and measure GHG emission levels from biofuel production is recognised in Mozambique. However, practitioners need support in understanding the methodology used as well as developing appropriate tools to monitor the performance. Technology to improve the GHG balance of biofuel projects given the specific pre-conditions and situation in Mozambique is an area where support is needed on national as well as regional level (SADC). Existing default values must be further expanded and differentiate between production systems and production realities. Nationally adjusted default values should be developed to ensure best practice and provide actors with tangible and understandable example of high performance as an encouragement for other actors to improve their results.

International cooperation

Mozambique will need institutional support in implementing and monitoring sustainability criteria, as well as support in setting up a certification scheme. To develop best practices for production models, feedstock development, generate data on biodiversity regions and enhance local prosperity are other examples of areas that would benefit from close cooperation and knowledge sharing with European counterparts.

5. Proceedings of the roundtable: summary of the findings and the debate

by Timo Kaphengst and Stephanie Schlegel, ECOLOGIC

5.1. Introduction

The debate was structured around two sets of presentations from a panel of experts in the field of biofuel development, predominantly in Africa. MEP Anders Wijkman (EPP/DE) introduced the roundtable providing the context for the debate and linking discussions to his role as Rapporteur for the biomass and sustainability elements of the proposed Directive on renewable energy sources. The discussions were moderated by Catherine Bowyer, a Senior Policy Analyst and biofuel expert from the Institute for European Environmental Policy. The first session included presentations from Manfredi Caltagirone, Andrew Turay and Helena Paul followed by questions from MEPs and the public present. The second consisted of a further two formal presentations reflecting local experiences of bioenergy projects in Africa from Kojo Fosu and Anna Lerner. This was followed by a short presentation from the Brazilian delegation on their role in knowledge sharing expertise on bioethanol production with other Tropical and Sub Tropical countries. Presentations were again followed by a question and answer session; the roundtable was drawn to a close with concluding remarks from MEP Wijkman.

The following proceedings summarise the key discussions. Full details of presentations given can be found online at <http://www.ecologic-events.de/sustainable-biofuel/presentations.htm>.

Opening Address by Anders Wijkman, Member of the European Parliament (EPP/DE)

MEP Anders Wijkman, Rapporteur for the Renewables Directive in the ENVI Committee, opened the roundtable by addressing some of the core issues that are relevant with regard to the production of biofuels in tropical and subtropical countries. He put the current discussions on European bioenergy policies in the context of the past and contemporary views of biofuels. He reflected that not so many years ago biofuels were being praised as the a key solution for addressing emissions from transport, however, of late concerns have increased regarding the potential negative impacts of expanded biofuel use.

He acknowledged the potential role of 'Southern' countries in providing competitive biomass and biofuel imports to the EU and underlined his conviction that with an appropriate policy framework in force, biofuels can be produced in a sustainable way. Reflecting on the proposals as put forward by the European Commission he drew the attention to great uncertainties which still exist regarding the effects of indirect land use change and the availability and affordability of second generation biofuels in the near future. As indirect impacts of land use change are not yet considered in the European Commissions draft in the Renewables Directive he suggested a risk factor be introduced to greenhouse gas calculations to at least acknowledge this. Moreover, Anders Wijkmann reiterated his belief that the Commission's criteria of 35 % GHG savings for biofuels, compared to fossil fuels, is not ambitious enough and should rather deliver at least a 50 % reduction. Bearing in mind the emerging uncertainties over biofuel use he highlighted he will be calling for a target, lower than the Council agreed 10% by 2020, for biofuel consumption within the renewable energy Directive. Finally Mr Wijkman made clear that he sees biofuels as only part of a solution and that there is a great deal of effort to be made to reduce emissions from transport in other ways.

5.2. First session

Manfredi Caltagirone, Ministry of Environment and representative of the Global Bioenergy Partnership (GBEP)

Mr. Caltagirone highlighted the great potential of southern countries to contribute to future energy supply around the world. He demonstrated how trade flows in energy could shift if countries like Brazil, Indonesia but also sub-Saharan countries were to mobilise their potential in terms of biomass production and make this available for international export markets. In order to realise this potential, GBEP is facilitating the sharing of information, data, experiences and best practices relating to bioenergy production and use among countries. With regard to the sustainability of biofuels, GBEP has so far established two task forces: the first on GHG emissions in relation to direct land use changes and the second, started in April 2008, on sustainability criteria.

Andrew Turay, Addax Bioenergy, Sierra Leone

Mr. Turay focused on the potential Africa has to meet Europe's bioenergy needs in a sustainable way. According to his presentation Africa has large potential for biomass production and would be ready to meet EU sustainability criteria. He commented that given this potential, Africa could meet the entire demand for biofuels that would be generated by the EU's 10% target while at the same time delivering high levels of greenhouse gas savings. He made clear that Africa would like to work with the EU to meet sustainability criteria but demanded that *"sustainability criteria should not be used as trade barriers to Africa"* and reminded the audience that if EU imposes import barriers other countries like China would be interested in African biofuels. In general, he sees biofuels as a great opportunity for African countries to benefit from foreign investment, accompanied by new jobs, better education and infrastructure. He highlighted the desire to trade with Europe and the need for clear standards to be set in terms of sustainability and quality so that markets can develop.

Helena Paul, EcoNexus

Referring to different examples from Tanzania, Indonesia, India, the Philippines and other countries in Africa and Indonesia, Ms. Paul commented that the signal sent by the proposal of the EU's 10% biofuel target has already caused a 'biofuel boom' leading to negative environmental and social impacts. Moreover she highlighted the huge difficulties in designing and implementing sustainability criteria for biofuel production due to unmanageable complexity. She raised concerns that many of the certification initiatives under development, such as the Roundtable for Responsible Soy (RTRS), are incompatible with the needs of smallholder and small scale farmers. She concluded that, as to date no sustainability criteria for biofuels are in force and given that there are many serious social and environmental drawbacks of the biofuel boom, the biofuel target is highly questionable and a moratorium should be put in place.

Question and answer session

Referring to the presentations of Ms. Paul, **Mr. Johannes Lebech (MEP)** outlined that there is a clear dilemma for European policy makers in *"being tough on sustainability issues of biofuel production"* without being able to prevent other countries from importing unsustainable biofuels. **Helena Paul** responded directly by renewing her position that the target has to be suspended to ease the pressure on exporting countries while at the same time the debate on sustainability issues of biomass production should be continued at an international level. MEP **Anders Wijkman** added that decisions on targets have not yet been made.

However, he fears that the stepwise development of second generation biofuels would be weakened if policies completely denounced first generation production. In addition, he sees an urgent need for capacity building in developing countries which is not yet included in the current proposal for a renewables directive. To his question whether she would phase out any investment in African agriculture **Helena Paul** replied that investments should instead be much more oriented on farmers' needs and reflect on the conflicts that already occur. **Andrew Turay** registered the clear need for investment in African farmers and advocated the possible synergies between large-scale biofuel production, local biomass use for energy and local food production, if by-products are used. In this regard much can and could be learned from Brazil. **Manfredi Caltagirone** suggested to establish an overall agricultural programme that enforces capacity building and good governance in developing countries and to remove trade barriers for agricultural products. The panelists agreed that it is not a question of whether investments should be made in Africa, but how they can best be linked to requirements for bringing prosperity in rural areas.

In response to the presentations various issues were raised by members of the audience. Firstly it was questioned as to whether unsolved questions of how best to deliver sustainability standards can be resolved within the renewable energy Directive given the complexity of this issues and the short timeframe that is foreseen for agreeing the targets. The EP was also requested to set out suitable support measures to promote second generation biofuels for domestic biomass in the future. MEP **Anders Wijkman** expressed his preference of linking any kind of support schemes for second generation biofuels to their GHG saving performance. He hopes that the EP will come up with a proposal that clearly benefits the use of waste for the production of biofuels as well as production based on cellulosic materials. Responding to the first question, MEP **Anders Wijkman** proposed a learning-by-doing process, with less ambitious bioenergy targets now but a possible adjustment of both targets and criteria over time; importantly he highlighted his addition to the proposal of formalized regular reviews of the Directive. He also explained the necessity of a broad dialogue on the implementation of sustainability criteria that involves all biomass producing countries in order to avoid parallel markets of certified and non-certified biomass products.

Concerns were raised by a representative of an environmental organisation as to whether sustainable production in Africa is really as easily manageable as Mr Turay outlined in his speech, drawing the attention to serious gaps that exist in law enforcement and institutional capacities in many African countries. A representative from a farmer association further reminded that at the COP-9 of the Convention on Biological Diversity in May 2008, African delegations have been more cautious about a further rush into biofuels due to problems with increasing threats for biodiversity.

5.3. Second session

Koju Fosu, Regency Resources Limited (Regency), Ghana

Mr. Fosu reported from a current project in Ghana intended to establish a large-scale sugarcane plantation in a savanna region on formerly unused land. The project is intended to provide biomass for biofuels as part of a broader system that would provide byproducts for local energy production. He commented that the project offers the potential to create new jobs in an area with a high unemployment rate (around 85%). However, a prerequisite for the success of any comparable project in Africa is financial investment and access to capital. Broad consultancy from experienced countries like Brazil and from Europe is also needed to ensure a maximum benefit is achieved from sugarcane plantations in relation to GHG saving and boosting development.

Anna Lerner, Deutsche Gesellschaft für Technische Zusammenarbeit - GTZ, Mozambique

Ms. Lerner reported on efforts within Mozambique to develop a national approach to sustainable biomass development and implementing sustainability criteria. A national working group has been established by the government of Mozambique to create a biofuel strategy for Mozambique - drawing on the current draft of EU sustainability criteria. With regard to the European sustainability criteria Ms. Lerner pointed out that it is crucial to include locally-adapted requirements and social criteria. She commented that the former was particularly important when considering the needs of small scale farmers, in order to avoid unfair competition with large scale producers who can more easily comply with standard due to the beneficial economies of scale.

Question and answer session

In the subsequent session of questions from the audience a representative from the bioethanol industries contributed to the presentations by reporting of the broad experiences in sugarcane production. She highlighted the various potentials derived from the production of ethanol for meeting domestic energy demands for transport but also for electricity. Brazil is willing to share the experiences with other southern countries to establish sound concepts for sugarcane production. In regard to sustainability criteria the representative proposed to establish national and local working groups for better implementation through clear and regionally adjusted indicators. Circumstances differ a lot between countries making a global approach for certification unsuitable.

Mr. Lebech (MEP) reminded the audience that it is important not to exclude any tool with the potential to combat climate change. He, therefore, felt discussions around an EU biofuel target should not lead to their full abandonment, but rather deliver realism regarding bioenergy potentials and their relationship with other renewables, policy tools and incentives, addressing both the energy demand and supply.

The following comments raised by several stakeholder groups are briefly summarised below:

- Patterns of global agriculture have to be considered in the discussion. The question of ownership and "*power over commodities*" is very important, especially for Africa. There were concerns that post-colonial patterns of one-way exports from Africa to Europe should not persist, there should be a sufficient return in terms of funding and capacity building.
- The focus on biofuels and biomass exports from Africa could substantially undermine the possibility of local use of biomass in heat and electricity applications, which are much more needed in Africa than fuel for transport.
- Doubts were raised on the social acceptability of labour conditions on Brazilian sugar cane plantations.
- Measurability of sustainability criteria is crucial for the industry to ensure consumer acceptance.
- Traceability is an important prerequisite for a well functioning biofuel certification system. Current initiatives often show serious gaps in verification. Broader questions regarding the question of how and if traceability can be ensured by the proposed European system were raised.

- Different and conflicting preconditions in different countries hinder the harmonisation of international standards and sustainability criteria, there is a need to take these into consideration within schemes.
- There is still no appropriate methodology in place that ensures the prevention of indirect land use changes possibly leading to serious impacts on GHG emissions.
- Regional adjustments of sustainability standards are necessary for meaningful implementation. However, the proliferation of respective roundtables, initiatives, dialogues etc. leads to an unmanageable and uncontrollable process that can potentially be abused by powerful parties.
- It was commented that the fuel quality standards of biofuels are often neglected in the discussions. However, these can have serious consequences for the adoption of biofuels in European car engines and hold the potential, if too strictly defined, to pose a trade barrier to African imports.

Not all of these questions could be answered by the speakers. However, **Anna Lerner** pointed out, that measurability of criteria can be guaranteed at least for the Mozambican example if flexibility is given for their national adjustments and implementation. In agreement with **Kojo Fosu** she also confirmed that African producers already meet the fuel quality standards set by the EU. **Andrew Turay** called on the EU to come up with clear definitions and standards for fuel qualities and the sustainability of biomass production, to allow African producers to respond to the imposed standards.

Closing remarks

MEP Anders Wijkman thanked the speakers and the audience for their input and the insights offered. He made clear that the European Parliament is not willing to "*close the doors to neither to Africa nor to Latin America.*" On the contrary, their potential for any kind of biomass production is recognised. He commented that high level standards for sustainability are needed but they should be adapted to regional conditions. Mr Wijkman has proposed in his draft report to replace the rather general criteria developed by the European Commission with criteria that take account of regional differences.

He commented that he favours the extension of biofuel standards more generally to agricultural production. He further argued that due to a lot of uncertainties about the outcomes and potentials of second generation biofuels, about indirect land use change, oil prices and other factors, caution is needed in further boosting biomass production for bioenergy. In order to address the lack of information and misunderstandings between different stakeholders international and inter-institutional dialogues are needed. The European Union as a leader in biofuels and biomass use has a major responsibility in facilitating these exchanges. He closed the discussions by commenting that the need for sustainable development will require a rethinking of present economic models and that there is a need to better take into account ecosystem boundaries more generally.

Mr Wijkman highlighted that discussions on the biofuel target, broader approaches to renewable energy and sustainability criteria must be completed by the end of December this year. This is vital given European Parliament elections in 2009 and the need to demonstrate significant progress in Europe before the UNFCCC meeting in Copenhagen in December 2009.

6. Annex: Roundtable presentations

All slides can be found online at the Roundtable webpage at <http://www.ecologic-events.de/sustainable-biofuel/>. An online version of this compilation document can be found at <http://www.europarl.europa.eu/activities/committees/studies.do?language=EN>.