The International Partnership on Bioenergy

Preparatory meeting

Part II – Barriers to bioenergy and possible roles of an IPBE

Rome, 6th September 200







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Barriers to the deployment of bioenergy

Actions to overcome the barriers and possible Partnership roles

Conclusions and way forward







Barriers to the development and deployment of bioenergy - process

Bioenergy fuel chain stages considered:



- Bioenergy chains considered:
- Biofuels for transport
- Domestic and small commercial heat and CHP / developed countries
- Domestic and small commercial heat and CHP / developing countries
- Large scale power, heat and CHP
- Hydrogen







Barriers to the development and deployment of bioenergy - process

The barriers have been identified based on five main categories:

- Technical barriers, related to biomass science and technology development
- Financial barriers, linked to the availability of capital for biomass deployment, as well access to it
- Policy and regulatory barriers, related to lack or inadequacy of policy and regulations in the area
 of biomass
- Social barriers, deriving from concerns on the environmental and social acceptability of biomass use
- Market barriers, resulting from inadequacy of energy market structures for the introduction of bioenergy



The analysis led to the identification of:

- A set of barriers common to the upstream steps of the different bioenergy chains:
 - feedstock production
 - transportation, pre-processing and trading
- Different sets of barriers specific to each individual bioenergy chain







Barriers to feedstock production

- Limited understanding of land resource availability and competition between energy and food crops
- Need for improvement in energy crops yields
- Limited experience worldwide on growing of energy crops
- Farmers' reluctance to switch crop
- Little experience in the systematic use of other types of biomass such as animal, agricultural and forestry residues
- Limited energy-recovery focus in municipal solid waste collection and landfill sites management







Barriers to biomass collection, transportation, pre-processing and trading

- Relatively small number of intermediaries trading non-food biomass feedstocks
- Limited awareness of intermediaries being vital to the whole chain
- Dispersed geographical distribution of feedstock producers and conversion plants
- Potential significant cost for biomass transport, especially if bulky and not pre-processed
- Financial barriers to collection and processing infrastructure







Barriers to use of biomass for domestic and small-scale heat and CHP

Developing countries:

- Low income and difficult access to financing
- Subsidies for competing fossil fuels, such as kerosene, in some regions
- Few policy incentives for bioenergy deployment
- Lack of links between different policy areas (e.g. rural electrification and land use)
- Limited awareness of the benefits of bioenergy, sometimes perceived as a "fuel of the past"

Developed countries:

- Initial replacement cost for biomass boilers: often more expensive than conventional ones
- Limited policy incentives to renewable heat: policy support often to renewable electricity only
- Limited awareness of the benefits of bioenergy, sometimes perceived as inconvenient
- Some environmental aspects not fully solved yet (e.g. air quality regulation for boilers)







Barriers to the use of biomass for large-scale power and heat generation

- Insufficient policy support for biomass electricity and heat, or for renewable energy in general
- Early stages of market development, resulting in higher perceived business risk
- Further improvements possible in combustion plant efficiency and costs
- Technology improvements needed in areas such as gasification, multi-fuel plants, polygeneration, co-firing
- Lack of standardisation of feedstocks and technologies
- Difficulties in the planning process for plants in developed countries







Barriers to the use of biofuels

Feedstock **production** and **transport**:

- Feedstock transport and logistics barriers, generally for larger scale plants
- Familiarity and technology development barriers for new crops

eedstock-to-biofuel conversion:

- Process efficiency and greenhouse gas balance requiring improvement
- Significant RD&D efforts required to bring advanced conversion technologies to market
- Significant level of capex required for conversion plants
- Uncertainty on both fuel market and availability of biomass supply
- For fuel distribution and use, lack of market pull in most countries is a barrier:
- Biofuels blending ratio limited by current vehicle standards and warranties
- Limited availability of flexi-fuel and biogas vehicles
- Limited systematic experience in biofuel infrastructure development, due to regional patterns
- Lack of international technical standards, including environmental and social traceability
- Limited competitiveness of biofuels against fossil fuels, when not supported by policy







Barriers to hydrogen from biomass

- Lack of institutional framework for hydrogen, which falls between policy areas
- Limited adoption of policy support for hydrogen production from biomass
- Hydrogen opportunities overlooked in biomass planning due to lack of knowledge about hydrogen
- Lack of information on hydrogen benefits and safety, resulting in concerns over infrastructure
- Further development required in biomass gasification to hydrogen and novel production routes (bacterial photosynthesis, algal processes and dark fermentation)
- Difficult access to finance for large gasification plants, due to the early stage of development
- In most regions, lack of experience and skills in hydrogen handling and transport
- High capital costs for hydrogen supply infrastructure
- Technology improvement and significant cost reductions required in hydrogen fuelled vehicles
- Likely consumer uncertainty over purchase of a new fuel and vehicle







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Actions to overcome the barriers and role for the partnership

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Barriers can be addressed by specific actions in five main areas...

- National and regional policy
- International standards and information flows
- Functioning projects and markets
- Biomass resources
- Developing and transferring technologies







.. and the Partnership can play an important role in:

- National and regional policy
- International standards and information flows
- Functioning projects and markets
- Biomass resources
- Developing and transferring technologies

- 1. Supporting national and regional bioenergy policymaking
- 2. Facilitating international cooperation in bioenergy
- 3. Promoting development of bioenergy projects and markets
- 4. Supporting biomass feedstock supply through information and research
- 5. Encouraging development and transfer of biomass conversion technologies







Possible partnership roles in supporting national and regional bioenergy

policymaking		
Roles for the partnership	Synergies	
Help governments understand:	Link with bioenergy	

- Help governments understand:
 - how bioenergy could contribute to address national policy priorities
 - how bioenergy could help developing countries with wider development objectives, including the MDG

 - Support governments in developing national bioenergy policies
 - Help developing countries build policymaking capacity
- Assist the development of conversion and end use strategies to link with bioenergy resource plans

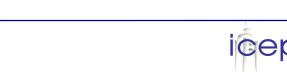
resource assessments; e.g. those developed by

FAO and LAMNET World Bank, UNDP, ESMAP, UNEP-

GNESD

World Bank, UNDP, ESMAP, UNEP-

GNESD FAO, IEA





2. Possible partnership roles in facilitating international cooperation in bioenergy

Roles for the partnership		S	ynergies
•	Gather or integrate existing information on resources and technologies	•	FAO, EIA
•	Keep G8 countries engaged and bring other key bioenergy players in	•	UNDP
•	Work to improve coordination between government and donors		
•	Work with international organisations and industry to develop technical, environmental and social standards	•	IEA, ISO
•	Work with international organisations and existing voluntary certification schemes in food and forestry to develop schemes for bioen. products	•	ISO
•	Work with international hydrogen initiatives to ensure that biomass- derived hydrogen is covered	•	IPHE
•	Engage in international activities on the effect of trade barriers	•	WTO, UNCTAD
•	Develop links and common plans with other institutions on complementary energy resources	•	IEA, World Bank, UNDP, WEC
•	Raise awareness of bioenergy in other organisations in related areas	•	UNFCCC, OECD TFs, APEC







B. Possible partnership roles in promoting development of bioenergy projects and markets

Roles for the partnership		Synergies
•	Identify promising market-building opportunities and initiate discussion	World Bank, A.B.C-

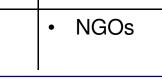
- between stakeholders

 Promote local market stability
- Support policies that promote diverse biconergy routes in each region
- Support policies that promote diverse bioenergy routes in each region

 Emphasise the importance of intermediaries to policymakers and
- Emphasise the importance of intermediaries to policymakers and funding bodies

 Disseminate information to the financial community about bioenergy
- Disseminate information to the financial community about bioenergy, and promote bioenergy in funding institutions

 Encourage policymakers and donors to establish training and skill
- Encourage policymakers and donors to establish training and skill sharing schemes
 Establish networks of government, non-government and private
- stakeholders
 Raise profile of bioenergy infrastructure planning at government level
 Promote information sharing for community involvement methods in
 - project design and implementation



World Bank

REED

REED

World Bank, A,B,C-

WB, UNDP, GFSE, GVEP, REEEP, EU





Possible partnership roles in supporting biomass feedstock supply through

information and research		
Roles for the partnership	Synergies	
 Assist with coordination of existing activities on resource information provision 	• FAO, LAMNET, US DoE, EUBIONET	
 Identify gaps in RD&D on crops suitable for developing countries, and 	IEA task 30	

- promote establishment of international activities in this area
- Instigate activities aimed at providing information and support to farmers
- Encourage information sharing between national forestry associations
- Provide centralised information on the benefits of waste-to-energy and relevant technologies, to the waste industry and policy makers
- Develop guidelines on sustainable biomass production in collaboration with organisations involved in resource production



on bioenergy





IEA task 31

IEA tasks 36 and 37

Possible narthership roles to encourage development and transfer of highest

	conversion technologies		
R	oles for the partnership	Synergies	
•	Exchange with other international activities to provide more integrated and effective knowledge on bioenergy, e.g. web-based information systems on resources and end-uses	• IEA, FAO	
•	Raise awareness within national governments of bioenergy R&D needs		

- **IEA** Support IEA Bioenergy activities, and encourage further participation from developing countries
- IEA, IPHE, national Ensure strong links between biomass and hydrogen R&D activities R&D
- UNDP, UNEP-Promote technology transfer between geographical regions, both N-S GNESD, GVEP, and S-S, for example through technology development partnerships **GFSE**
 - Encourage cooperation between regional and local technology end users and technology developers to ensure that the development and deployment of bioenergy technologies are based on consideration of local conditions



UNDP, UNEP-GNESD, GVEP,

GFSE



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Some high-level considerations can be made...

f a Partnership is to have an impact in accelerating the development and deployment of bioenergy globally to contribute to cleaner and more secure energy provision and improved quality of life, it needs to:

- have a wide and balanced participation from developed and developing countries
- develop a global understanding of bioenergy opportunities and issues
- raise awareness on the barriers and how to overcome them
- establish close links with existing international activities and provide leverage to these activities, though avoiding duplications and overlaps
- have political weight to promote bioenergy effectively

Based on today's suggestions, the activities and scope of the Partnership will be finalized.





