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LATIN AMERICA THEMATIC NETWORK ON BIOENERGY

LAMNET

In order to promote the sustainable use of biomass in Latin America it is the general objective of this Thematic Network to establish a transnational forum of Knowledge Centres (Universities, R&D Institutes) and SMEs from Latin America in collaboration with such organisations from European and non-European countries. The activities of the Thematic Network include the analysis of existing energy policy frameworks, the assessment of energy demand and biomass resources, the analysis of available bioenergy technologies and systems as well as the development and implementation of policy options for the promotion and deployment of bioenergy.

This Thematic Network is funded by the European Commission, DG Research, in the framework of the programme 'Confirming the International Role of Community Research' (Project No. ICA4-CT-2001-10106).

A GLOBAL NETWORK ON BIOENERGY

Objectives and Strategies

The focus of the project will be the identification of technological objectives and the development of policy options to boost deployment of decentralised biomass production and biomass based energy generation. Concerning the large-scale promotion of bioenergy and the realisation of significant benefits from the deployment of modern, efficient and sustainable bioenergy systems in Latin America. The following key Thematic Priorities have been identified and will be addressed during the implementation of this project.

Analysis of the Energy Policy Framework

In order to facilitate the elaboration of suitable policy options for the promotion of bioenergy it will be essential to directly address existing national and regional energy policy frameworks and to assess benefits and drawbacks of existing bioenergy programs. Energy policies in emerging economies should aim at the strengthening of energy and power infrastructure, the diversification of economy in order to reduce the dependence on petroleum and the exploitation of alternative energy sources including Renewable Energies. The contribution of bioenergy to the realisation of these objectives can be significant due to the large potential of biomass resources. Moreover, the production of liquid fuels from biomass can help to reduce the dependence on petroleum especially in the important sector of transport whereas small-scale decentralised biomass power generation can improve the energy supply of remote villages in rural areas.

Assessment of Energy Demand and Biomass Resources

The assessment of quantitative and qualitative energy demand of various actors in society will address the specific needs of villages, families, SMEs, industries, transport and public infrastructure (hospitals, schools, touristic resorts etc.). Special emphasis will be given to the assessment of current and future primary energy consumption in the heat, electricity and transport sector as well as the demand for high quality fuels for transportation. Additionally, an analysis of local market prices for various energy sources will be performed and economic opportunities, income generation and local rural development options will be identified.

The present and future resources for the use of biomass will be assessed in order to indicate possibilities to meet demand with locally available resources. An important aspect to be addressed is an increased availability of biomass resources. This can be achieved by an enhanced recovery of various agro-forestry residues and the plantation of dedicated crops on surplus, marginal soils.

Analysis of available Technologies and Systems

Suitable and practicable technologies and systems for bioenergy production will be investigated for application in emerging countries. Relevant technologies and systems will be selected on the basis of maturity of the technology, cost-effectiveness, simplicity of maintenance, social acceptability and the impact on development. Moreover, the benefits in comparison with conventional energy supply and the possibility of local production of the technology will be taken into consideration. The main aim is thereby to develop efficient and cost-competitive solutions for the conversion of biomass to energy services and the focus of the activities of the global network will be on the following thematic priorities:

- Small, medium and large scale biofuel (e.g. bioethanol) production
- Small, medium and large scale cogeneration and trigeneration
- Small and medium scale biogas and charcoal production
- Gas generation from agro-forestry residues
- Combustion and co-combustion technologies; Low pollution stoves
- Technologies for the conversion of biomass crops and residues in pellets and briquettes
- Integrated Bioenergy complexes in emerging economies
- Comparison with conventional energy supply regarding cost-effectiveness, simplicity of maintenance, social acceptability, impact on development

Development of Policy Options for the Promotion of Bioenergy

Based on the identification of the energy policy framework and the technical conditions to meet the demand with local resources, policy options for the promotion of bioenergy will be elaborated. In order to indicate sound technical solutions, an involvement of local authorities, project responsibles, decision-makers on the one hand and the Network of Knowledge Centres and SMEs on the other hand has to be assured. The following thematic priorities will be addressed in the framework of this global network:

- Potential and barriers for Clean Development Mechanism (CDM) projects, Joint Implementation and carbon trading
- Strategies for biomass trade (e.g. biofuels)
- Analysis of successful projects/programs (best practice) of biomass use in Latin America, China and Africa including problems faced and overcome
- Programs for the use of modern biomass fuel in the transportation sector
- Promotion of international co-operation (e.g. International Governmental Coalition on Bioethanol)
- Potential and barriers for technology transfer and joint-ventures
- Economic aspects of the promotion of bioenergy (financing and loan schemes, credit mobilisation, investment capital, market penetration)

Implementation of Policy Options for the Promotion of Bioenergy

In order to implement the proposed policy options the global network will assure that they are elaborated in consultation with and are widely disseminated among local authorities, decision-makers, utilities, project responsibles, private investors and communities of highly motivated people. The network will contribute to the promotion of joint-ventures and technological co-operation activities and to the identification of potential demonstration (best practice) projects. Emphasis of the network's activities will be laid on the design and screening of Joint Implementation and CDM project candidates as well as the elaboration of training programmes and awareness campaigns in the fields of operation and maintenance, financing and management.

Dissemination Activities

The efficient dissemination of the results of this project is realised through the publication of a periodical newsletter and the establishment of a project web site (www.bioenergy-lamnet.org). Additionally, it is a focus of this project to establish a shared data-base on a regional scale to allow for enhanced comparability and long-term accessibility of the results of this project.

Several workshops and seminars will be organised during the project with the participation of members of the Thematic Network and interested persons or organisations from Latin America and other European and non-European countries.

Coordination of the Thematic Network

The overall co-ordination of the network is carried out by WIP. Due to the large number of members within the Thematic Network the co-ordination in the EU is performed by the project co-ordinator in partnership with ETA and EUBIA, the European Biomass Industry Association, while the Latin American organisations, Brazilian National Reference Centre on Biomass (CENBIO) and the National University of México (UNAM) act as co-ordination support points on the South- and Central American continent.

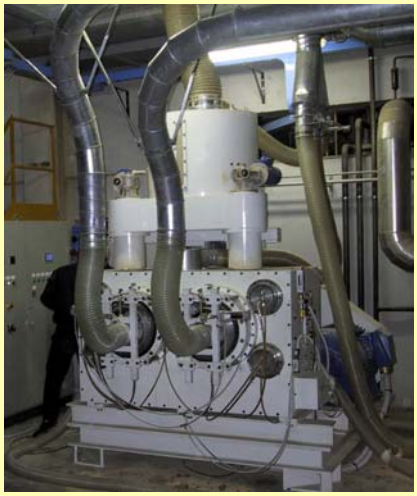
Activities of EUBIA in the LAMNET-project

In the framework of the project LAMNET, it is EUBIA's purpose to follow a pragmatic focus on the promotion of bioenergy by stimulating joint-ventures and transfer of technologies. EUBIA's opinion is that it is a main project objective to undertake complementary actions to the development of policy strategies by tackling bioenergy market opportunities in Latin America, China, and on the African Continent. The contribution of EUBIA will be particularly focused on the promotion of small-scale, decentralised bioenergy technologies. Small-scale is envisaged as its penetration (in comparison to large-scale systems) could be much easier especially in terms of supply of biomass resources and investment level.

In the initial phase of the project, EUBIA is going to prepare a series of documents discribing projects and technologies, which can be promoted in the framework of LAMNET activities. These documents include a detailed technological and economical analysis of the following commercial sub-systems, which can be easily implemented in all the regions tackled by LAMNET:

- new, advanced pelletisation/drying technology
- small co-generation plants (50 , 100, 500 kWe) with an overall electrical efficiency ηel = 22% and a guarantee lifetime of 15 years
- syngas generators
- micro-distilleries for small-scale ethanol production
- charcoal pellets (advanced technology)
- activated coal for water purification
- refrigeration systems

These documents are currently under preparation. It is proposed that these techno/economic descriptions contribute to thematic leaflets produced in the framework of LAMNET activities.



Pelletiser machine, KEMYX, Italy

LABORATORIO DE BIOENERGÍA
INSTITUTO DE ECOLOGÍA,
UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

The Bioenergy Laboratory of the Instituto de Ecología, Nacional University of México (UNAM) and the Grupo Interdisciplinario de Tecnología Rural Apropiada (GIRA) are undertaking a joint research and development program on biomass energy for sustainable rural development. The program departs from an interdisciplinary, systemic and participative approach to technology generation, adaptation and dissemination, and the focus of the progress is on:

- small-scale applications for household energy use and small industries. The group has extensive expertise in the development and dissemination of efficient woodburning cooking-stoves and small-scale kilns for pottery production.
- analysis of regional supply-demand biomass resource flows and their energetic and environmental implications.
- identification of priority regions for the development of bioenergy. Together with the Wood Energy Program of the Food and Agriculture Organisation of the United Nations (FAO) our group has developed the WISDOM (Woodfuel Integrated Supply-Demand Overview Mapping) methodology, oriented to provide a spatial representation of current woodfuel use patterns and resources and to priorise them according to a set of specified criteria.
- mitigation of climate change and the implications of bioenergy for carbon sequestration and substitution. The group has co-developed the model CO2FIX, currently in use in more than 70 countries, for the examination ofcarbon sequestration of forestry projects.

For more information about the group activities, projects and publications, please visit the following sites:
www.oikos.unam.mx/laboratorios/bioenergia and
www.oikos.unam.mx/gira

CENBIO
THE NATIONAL REFERENCE CENTER ON BIOMASS

Founded in 1996, CENBIO is the Brazilian Reference Center on Biomass, with the main mission of fostering energy production from biomass through efficient processes. Located at the University of São Paulo/Institute of Electrotechnology and Energy, São Paulo, Brazil, CENBIO works on research and development of technological, economic, social, environmental and political issues related with biomass conversion and use. Most of the studies and project are carried out together with national and international groups, and are performed for scientific and commercial purpose mainly in the industrial and agricultural sectors.

CENBIO is also in charge of the dissemination of information about biomass for energy, such as the publication of CENBIO News (*CENBIO Notícias*), published quarterly, the elaboration of CENBIO´s homepage (www.cenbio.org.br), as well as the organisation of seminars and workshops with many interested sectors.

CENBIO was created through a joint initiative of:

- The Ministry of Science and Technology (MCT)
- The São Paulo State Secretariat of Energy (SEE/SP)
- The University of São Paulo (USP/IEE)
- The Biomass Users Network from Brazil (BUN)

Recently, also the Ministry of Mining and Energy, the Environmental Secretariat of São Paulo, the regulatory agencies – ANA (the National Water Agency), ANEEL (the National Electric Energy Agency) and ANP (the National Petroleum Agency) - have representatives at the CENBIO Council. Since its creation six years ago CENBIO has been promoting the use of biomass as an efficient source of energy (mainly, in the form of liquid fuels and electricity), a generator of employment (mainly in rural areas) and a mechanism for sustainable development for Brazil.

Since its inception, CENBIO has distinguished itself by always maintaining updated information from most national activities covering its area of interest and collecting and forwarding to national biomass actors information from international sources. National information is collected by fostering partnership with groups and companies active in biomass for energy while international information is compiled through web investigation, exchange of material, subscription of journals and networking with important partners worldwide.

Such effort has paid off: in 1998, CENBIO received the Climate Protection Award from the United States Environmental Protection Agency (EPA), which is aimed at organisations which promote environmental preservation, mainly climate protection. This confirms the relevance of CENBIO activity, which is expected to increase through recognition of its confidence and credibility in business, academic and environmental circles.

CENBIO´s main targets for the upcoming years are:

- Fostering cogeneration from sugarcane bagasse, aiming at the establishment of a large scale program in São Paulo State
- Utilisation of vegetable oils for power generation
- Identification of mitigation measures/policies for the reduction of greenhouse gases in thermoelectric generation in Brazil
- Development of legislation to foster electricity generation from biomass
- Organisation of regional thematic seminars: sugarcane, vegetable oils, briquettes, wood residues, urban and agricultural residues, charcoal
- Organisation of meetings to promote partnerships for technological and industrial development of bioenergy
- Organisation of training activities on bioenergy to improve technical skill
- Establishment of a biomass for energy data base (www.cenbio.org.br)
- Assessment of externalities involving the use of ethanol as a fuel
- Identification and implementation of opportunities to generate/cogenerate electricity from wood residues in isolated areas in the Amazon region
- Evaluation of technical and economical feasibility for the implementation of small electric power plants from biomass in small communities
- Identification of opportunities for electricity generation from urban/rural residues

Distillation column from an ethanol production facility
Source: Copersucar, Brazil

First LAMNET Steering Committee Meeting

The 'kick-off' meeting of the global network on bioenergy took place in Brussels in March 2002. A welcome address to the participants from Brazil, Cuba, South Africa, Sweden, Italy and Germany was presented by Prof. Tilak Viegas, responsible officer for this Thematic Network at the European Commission, Directorate General Research. Prof. Viegas stated the great importance of projects focussing on Scientific Co-operation and Policy Research in general and especially in the field of Renewable Energies.

The European Commission recognises that the creation of suitable policy frameworks is required prior to the development of technologies in order to successfully tackle the main challenges of sustainable development.

During discussions at the Brussels meeting it was concluded that the network's activities regarding the promotion of bioenergy utilisation in Latin America, China and Africa will mainly focus on the following topics:

- Large-scale implementation of bioethanol production based on sugar cane and other suitable biomass resources (e.g. sweet sorghum) including agro-forestry residues; creation of a global bioethanol market
- Promotion of small- and medium-scale decentralised bioenergy systems such as advanced pelleting/drying technologies, small plants for co-generation and refrigeration systems (tri-generation), syngas generators, micro-distilleries for ethanol production, charcoal pellets, activated charcoal for water purification

Some contributions expressed during the meeting are summarised as follows:

Dr. Giuliano Grassi, Secretary General of the European Biomass Industry Association (EUBIA), pointed out the importance of a pragmatic focus on the promotion of bioenergy as opposed to a merely theoretical development of policy strategies. Therefore, EUBIA strongly supports small-scale bioenergy systems, as the penetration to markets of small-scale systems is expected to proceed at a faster pace due to the lower investment level and the reduced required supply of biomass resources.

Prof. José Roberto Moreira, Centro National de Referência em Biomassa (CENBIO), Brazil, reported on the more than 20 years experience in Brazil with its national ethanol programme focussing on the sugar cane based production of ethanol as transportation fuel. It is expected that ethanol will play a major role in the future for Brazil, but for the creation of a global ethanol market the involvement and commitment of a large number of countries will be essential. Prof. Moreira stressed that it is necessary to focus on large-scale markets in order to develop sustainable economies of emerging countries, whereas decentralised, small-scale energy systems may contribute to the reduction of poverty in rural areas of the world. Thereby, a promising strategy to deploy large-scale utilisation of bioenergy is to identify pragmatic options, comprising the availability of biomass resources as well as processing technologies, which are suitable for the penetration into commercial markets.

Dr. Paulino Lopez Guzmán, Bioenergy Development Programme – Ministerio del Azúcar, Cuba, reported that the bioenergy sector in Cuba is almost entirely focussing on bagasse as a residue of the sugar cane processing industry and that 80% of the available agricultural land in Cuba is cultivated with sugar cane. This constitutes an enormous resource of biomass, but unfortunately Cuba has so far not exploited this enormous potential in an efficient way. Therefore, Dr. Lopez Guzmán emphasised the need of acquiring more information on available technologies for an efficient exploitation of sugar cane bagasse (e.g. advanced combustion systems, gasification, biogas) which would be of great benefit for the Cuban sugar cane industry.

Participants of the 'kick-off' meeting of the LAMNET Global Network on Bioenergy in Brussels

Upcoming Events

First Project Workshop in Amsterdam

Date and Time: 19/06/2002 11:00 - 18:00

Location: **Amsterdam RAI** International Exhibition and Congress Centre, Amsterdam, NL

The first LAMNET Project Workshop is organised as Conference Related Event of the 12th European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection. This workshop will constitute a platform for dialogue between the members of the LAMNET network and interested delegates who would like to benefit from a group of international experts working on the application of bioenergy in Latin America. The workshop will serve as a kick-off meeting of the Thematic Network LAMNET. It will be based on few keynote presentations and offer the opportunity for discussion on crucial topics for the development and implementation of policy options for the promotion of decentralised generation of bioenergy in Latin America.

The second LAMNET project workshop is scheduled to take place in Durban, South Africa, 19-21 August 2002. This workshop will be organised in close co-operation with Mr. Denis Tomlinson, Illovo Sugar Ltd, and will include a one-day technical tour to a Sugar Mill operated by Illovo Sugar Ltd.

Related activities of the LAMNET project 'Forum on International Co-operation'

Date and Time: 20/06/2002 14:30 - 18:00

Location: **Amsterdam RAI** International Exhibition and Congress Centre, Amsterdam, NL

The Forum on International Co-operation is organised in the framework of the 12th European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection. This forum constitutes a platform for the dialogue between different stake-holders (bioenergy experts, policy makers, donors, investors, private sector) to accelerate the deployment of bioenergy in emerging and industrialised economies. It will be a unique opportunity to bring together market players and representatives from CEE countries and countries from the Southern Hemisphere and Asia. The main objective is to identify and obtain consensus on the key factors (political, technical and financial), which are setting the stage to facilitate market accessibility and the transfer of bioenergy technology, especially to rural areas. Furthermore, a possible action plan for international co-operation to accelerate the world-wide deployment of bioenergy will be addressed.

This Newsletter is intended to provide information on the LAMNET activities.
Please visit our Website for the latest news on the LAMNET project:

http://www.bioenergy-lamnet.org
http://www.wip-munich.de

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Contents:

In the following a brief description including contact details of all members of the Latin America Thematic Network on Bioenergy is presented.

This Thematic Network consists of 56 scientists and personnel from private companies affiliated with 49 institutions and companies located in 23 different countries. Thereby, 26 members are from 9 European countries, 18 are from 9 Latin American countries, 6 are from 4 African countries and 6 members are from China.

This consortium was established with the aim to combine expertise on a variety of bioenergy related issues.

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