



## **INTERNATIONAL WORKSHOP “BIOENERGY FOR A SUSTAINABLE DEVELOPMENT”**

**Casino de Viña del Mar  
Viña del Mar - Chile  
8-10 November 2004**

### **Programme**

#### **OBJECTIVES**

The aim of this international workshop is to promote and improve the knowledge of bioenergies in Chile and in the world as a key tool for sustainable development, and for contributing to the development of clean technologies and the improvement of the quality of the environment. Additionally, this event will provide a forum to discuss policies and regulations related to the use and development of alternative sources of energy in Chile and in the world.

#### **SUMMARY**

Bioenergy, i.e. the use of biomass as renewable source of energy, as well as clean technologies in general are key issues in the worldwide strive for environment protection. The use of bioenergies for domestic or industrial applications normally is related with the introduction of cleaner technologies. The efficient use of biomass can contribute significantly to sustainable development as well as to local and global environment conservation. This is particularly true in a great part of Chile due to the abundant local availability of biomass resources and the large-scale development of the forestry industry.

The **International Workshop on Bioenergy for a Sustainable Development** will gather specialists from all over the world, coming from the academic, private, government and industrial sectors. An overview of the current conditions of bioenergy use in Chile and in the world will be presented, focusing on the availability of resources, bioenergy conversion technologies and the development of policies for the promotion and financing of bioenergy. The Workshop will also act as an interdisciplinary forum to establish contacts and co-operation projects in the various fields of biomass and bioenergy applications.

**PRESENTATIONS OF THE INTERNATIONAL WORKSHOP 'BIOENERGY FOR  
SUSTAINABLE RURAL DEVELOPMENT - LAMNET PROJECT WORKSHOP,**

**8-10 NOVEMBER 2004  
VIÑA DEL MAR, CHILE**

**WORKSHOP PROGRAMME**

**MONDAY, 8 November 2004**

08:00 Registration

**09:00 Opening Session**

Mr. Ivan de la Maza, Governor of the Region of Valparaíso

Mr. Claudio Elortegui, Vice Rector of Finances, P. Catholic University of Valparaíso

Mr. Pablo Zúñiga, Representative of the Minister of Economy in the Region of Valparaíso

Dr. Rainer Janssen, LAMNET Project Coordinator

Dr. Germán Aroca, Director School of Biochemical Engineering, P. Universidad Católica de Valparaíso, Chile

**Plenary Presentations**

09:30 A Global Perspective on Bioenergy  
José Roberto Moreira, CENBIO, Brazil

10:00 Opportunities for Renewable Energies in Chile  
Jaime Bravo, National Commission of Energy, Chile

10:30 Coffee Break

11:00 Biogas Potential in Chile – Technology Transfer from Europe and China to Chile  
Heinz-Peter Mang, German Biogas and Bioenergy Society (GERBIO)

11:30 Brazil Faces the Challenge of A New Energy Paradigm  
Antonio René Iturra, Ministry of Science and Technology, Brazil

12:00 Overview of Biogas Technology and Legislative Framework for Biogas Utilization  
Felipe Kaiser, Bavarian State Research Centre for Agriculture, Germany

12:30 Discussion  
Chair: Germán Aroca, SBE/UCV, Chile

13:00 Lunch

**15:00 – 19:00 Parallel Working Groups**

16:40 – 17:10 Coffee Break

**Working Group 1: Biogas and Waste Treatment**

Chairs: Rolando Chamy, P. Universidad Católica de Valparaíso, Chile, and Felipe Kaiser, Bavarian State Research Centre for Agriculture, Germany

**Contributions:**

Technical, Scientific and Economical Evaluation of State-Aided Hessian Biogas Plants  
Bernd Krautkremer, ISET, Germany

Goals and First Results of the State founded Project "Biogas Powered Micro-gas-turbine"  
Bernd Krautkremer, ISET, Germany

Risks in the Handling of Biogas  
Jean-François Bradfer, AS&D Consultants, Chile

Co-digestion of Coffee Waste with Sewage Sludge  
Madalena Alves, Centro de Engenharia Biológica, Universidade do Minho, Portugal

Rational Energy Use and Alternatives Sources Use of Biogas at USP - PUREFA  
Suani Teixeira Coelho, USP – University of São Paulo, CENBIO, Brazil

Project for the Electrical Co-generation from Biogas in Industry Capel  
Rolando Chamy, School of Biochemical Engineering, P. Universidad Católica de Valparaíso, Chile

Biological Treatment of Biogas  
Germán Aroca, School of Biochemical Engineering, P. Universidad Católica de Valparaíso, Chile

Potential for the Production of Bioenergy in Uruguay  
Liliana Borzacconi, Universidad de la República, Uruguay

**Working Group 2: Biomass for Bioenergy**

Chairs: El Bassam, IFEED - International Research Centre for Renewable Energy, Germany, and Leiner Vargas, CINPE-UNA, Costa Rica

**Contributions:**

Utilisation of Biomass as 'Green Energy'  
Marcia Avendaño, Energía Verde, Chile

Utilisation of Sugar Cane Residues for the Production of Energy in Tucumán, Argentina  
Jorge A. González, Universidad Nacional de Tucumán, Argentina

Characterization of Forest Biomass Particles for its Drying in Fluidized Bed  
Rogelio Moreno, Universidad Austral de Chile

Commercial Prototype of a 35 kW Electricity Generator Based on a Really Tar Free Gasifier  
Leonetto Conti, University of Sassari, Italy

Biocoal from Groundnut Shells - An Example for Sustainable Bioenergy Use  
Benjamin Jargstorf, Factor 4 Energy Projects GmbH

PV-hybrid Systems for Island Grids with a Biogas fired Sterling Engine  
Bernd Krautkremer, ISET, Germany

## **TUESDAY, 9 November 2004**

### **Plenary Presentations**

- 09:00 Technologies for Biomass Reuse and Valorization  
Arthur Teixeira, University of Florida, USA
- 09:30 Biodiesel – Production and Utilization  
Roland Verhe, University of Gent, Belgium
- 10:00 IEA Bioenergy – An International Network for Worldwide Promotion of Sustainable Use of Biomass for Energy  
Julije Domac, Energy Institute 'Hrvoje Pozar', Croatia, Task Leader IEA Bioenergy – Task 29
- 10:30 Coffee Break

### **11:00 – 13:30 Parallel Working Groups**

#### **Working Group 3: Liquid Fuels**

Chairs: Rainer Janssen, WIP – Renewable Energies, Germany, and Jaime Rodriguez, Universidad de Concepción, Chile

##### **Contributions:**

Use of Image Analysis Technique for the Identification and Pursuit of Processes of Ethanol production

Eugenio Ferreira, University of Minho, Department of Biological Engineering, Portugal

Production of Biodiesel from Residual Oils

Raul Almeida, Technical Manager TRIOSA, Chile

Chemical Characterization of *Eucalyptus globulus* and *Eucalyptus nitens* for Bioethanol Production

Carolina Parra, University of Concepción, Chile

Bio-ethanol from Lignocellulosic Material

Jaime Baeza, University of Concepción, Chile

COMBIO - A New Competitive Liquid Biofuel for Heating

Silvia Vivarelli, ETA – Renewable Energies, Italy

Submarine Gas Hydrate Exploration Off the Chilean Coast

Juan Díaz, P. Universidad Católica de Valparaíso, Chile

#### **Working Group 4: International Technology Cooperation and Financing**

Chairs: Germán Aroca, P. Universidad Católica de Valparaíso, Chile, and Denis Tomlinson, Illovo Sugar Ltd., South Africa

##### **Contributions:**

CDM and Financing Energy Projects

Leiner Vargas, CINPE-UNA, Costa Rica

Experiences and Perspective for the Carbon Bond Transaction in Chile

Sebastián Videla, CADEIDEPE consultants, Chile

Biomass Fed Micro-Gas Turbine Plant for Decentralised Energy Generation in Tuscany

Francesco Martelli, University of Florence – Department of Energetics, Italy

Production of Woodpellets in SCA BioNorr AB  
Kent Johansson, SCA BioNorr AB, Sweden

Project "Certification System for the Sustainable Use of Firewood in Valdivia"  
René Reyes, Agrupación de Ingenieros Forestales por el Bosque Nativo – AIFBN, Chile

Biogas and Ecological Sanitation  
Heinz-Peter Mang, German Biogas and Bioenergy Society (GERBIO)

13:30 Lunch

### **Plenary Presentations**

15:00 Bioenergy Development in China – Opportunities for International Cooperation  
Wang Mengjie, Chinese Association of Rural Energy Industry (CAREI)

15:30 FAO Concept of the Integrated Energy Farms for Rural Development and Biomass Resources  
El Bassam, IFEED - International Research Centre for Renewable Energy, Germany

16:00 Advances in Small Gasifiers for Residential Cooking and other Small-scale Heat Applications  
Paul Anderson, Biomass Energy Foundation, USA

16:30 Coffee Break

17:00 LAMNET Global Network on Bioenergy – Results and Outlook  
Rainer Janssen, WIP – Renewable Energies, Germany

**17:30 Conference Closing and Conclusion**

## **WEDNESDAY, 10 November 2004 (LAMNET Partners)**

Venue: School of Biochemical Engineering, P. Universidad Católica de Valparaíso

09:00 Welcome

09:30 Research Activities at the School of Biochemical Engineering  
German Aroca, SBE/UCV, Chile

10:00 Follow-up of LAMNET Activities  
Rainer Janssen, WIP – LAMNET Project Coordinator

10:30 Coffee Break

11:00 Discussion Round – Future Co-operation Opportunities and Lessons Learnt  
Chair: Rainer Janssen, WIP – Renewable Energies, Germany

12:30 Conclusion

## **ORGANIZING COMMITTEE**

### **Dr. Germán Aroca**

Professor

School of Biochemical Engineering, P. Universidad Católica de Valparaíso, Chile

### **Dr. Rolando Chamy**

Professor

School of Biochemical Engineering, P. Universidad Católica de Valparaíso, Chile

### **Dr. Giuliano Grassi**

Secretary General, European Biomass Industry Association (EUBIA)

LAMNET Coordination Partner

### **Dr. Rainer Janssen**

WIP – Renewable Energies

Coordinator Latin American Thematic Network on Bioenergy (LAMNET)

## **SCIENTIFIC COMMITTEE**

### **Dr. Gustavo Best**

Energy Coordinator, Food and Agriculture Organization of the United Nations (FAO)

### **Eng. Tord Fjallstrom**

Director Energidalen, Sweden

### **Dr. Peter Helm**

Director WIP – Chair Steering Committee LAMNET

### **Dr. Omar Masera**

Director Bioenergy Laboratory, Centro de Investigaciones en Ecosistemas (CIECO), Mexico

LAMNET Coordination Support Point Central America

### **Prof. Jose Roberto Moreira**

National Biomass Reference Center (CENBIO), Brazil

LAMNET Coordination Support Point South America

### **Eng. Norbert Vasen**

ETA-Florence, Italy, LAMNET Coordination Partner

## **SUPPORTING ORGANISATIONS**

European Biomass Industry Association - EUBIA

Food and Agriculture Organization of the United Nations - FAO

Government of the Valparaíso Region

National Commission for Energy

National Commission for Environment, V Region

P. Universidad Católica de Valparaíso

Chilean German Chamber of Commerce

Interamerican Association for Sanitary Engineering (AIDIS)



## **Latin America Thematic Network on Bioenergy – LAMNET**

### **Contract number: ICA4-CT-2001-10106**

The project 'Latin America Thematic Network on Bioenergy – LAMNET' is engaged in setting-up a trans-national forum for the promotion of the sustainable use of biomass in Latin America, Europe, China and Africa. Currently, the global network LAMNET consists of 48 institutions (Knowledge Centers and SMEs) from 24 countries worldwide, thereby involving a large number of members with excellent expertise in the field of biomass.

LAMNET supports the elaboration of recommendations for the development and implementation of policy options for the promotion of biomass and bioenergy as well as the identification of commercially available and reliable biomass technologies worldwide.

The web site of this global network on bioenergy was established early in 2002 under [www.bioenergy-lamnet.org](http://www.bioenergy-lamnet.org). It provides detailed information on the objectives, activities and scientific publications of this trans-national forum as well as the contact details of all network members. Further dissemination activities of the LAMNET project include the publication of a periodic newsletter (2 issues per year), a project database providing information on the energy demand and the energy resources in Latin America and other selected emerging economies as well as the organization of several bioenergy workshops.

LAMNET project workshops organized in 2002 include a Conference Related Event on the occasion of the 12<sup>th</sup> European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection in Amsterdam on 19 June 2002, a workshop on 'Biomass, Rural Energy and the Environment' in Durban organized one week prior to the WSSD in Johannesburg (August 2002) as a joint event of the three Thematic Networks CARENSA, SPARKNET and LAMNET and a workshop on 'Bioenergy Policies and Innovative Bioenergy Technologies' in São Paulo and Brasília, 2-4 December 2002.

With respect to bioenergy technologies and systems it is the main objective of the LAMNET project to identify currently available, efficient, cost-competitive and reliable bioenergy technologies which provide opportunities for the conversion of biomass to energy services in Latin America, Europe, Africa and China. Relevant technologies and systems are selected on the basis of maturity of the technology, cost-effectiveness, simplicity of maintenance, social acceptability and the impact on development. Moreover, opportunities for international co-operation, technology transfer and joint-ventures in the field of bioenergy technologies are identified and promoted by the LAMNET network.

Finally, the analysis of the current energy policy framework and support for the elaboration of policy options for the promotion of the sustainable use of biomass follows three main lines within the framework of this global network on bioenergy:

- Involvement in major international events and initiatives focusing on Renewable Energies and Sustainable Development
- Monitoring of the national/regional policy frameworks and the elaboration of advice and recommendations for the development and implementation of policy options for the promotion of bioenergy in close cooperation with the national network members
- Active networking with other organizations, institutions and multilateral initiatives engaged in the field of Renewable Energies and Sustainable Development

### LAMNET Project Coordination

#### WIP

Sylvensteinstr. 2  
81369 Munich  
Germany  
Coordinator: **Dr. Rainer Janssen**  
Phone: +49 89 720 12 743  
Fax: +49 89 720 12 791  
**E-mail:** rainer.janssen@wip-munich.de  
**Web:** www.wip-munich.de

### LAMNET Coordination Partner

ETA – Energia Trasporti Agricoltura  
Piazza Savonarola, 10  
50132 Florence  
Italy  
Contact: **Ms. Angela Grassi**  
Phone: +39 055 500 2174  
Fax: +39 055 573 425  
**E-mail:** angela.grassi@etaflorence.it  
**Web:** www.etaflorence.it

### LAMNET Coordination Partner

EUBIA – European Biomass Industry Association  
Rond Point Schuman, 6  
1040 Brussels  
Belgium  
Contact: **Dr. Giuliano Grassi**  
Phone: +32 2 28 28 420  
Fax: +32 2 28 28 424  
**E-mail:** eubia@eubia.org  
**Web:** www.eubia.org

### LAMNET Coordination Support Point South America

CENBIO – Centro Nacional de Referência em  
Biomassa  
Avenida Prof. Luciano Gualberto 1289  
05508-900 São Paulo  
Brazil  
Contact: **Prof. Dr. José Roberto Moreira**  
Phone: +55 115 531 1844  
Fax: +55 115 535 3077  
**E-mail:** Bun2@tsp.com.br  
**Web:** www.cenbio.org.br

### LAMNET Coordination Support Point Central America

Universidad Nacional Autónoma de México  
Instituto de Ecología  
AP 27-3 Xangari  
58089 Morelia, Michoacán, México  
Contact: **Dr. Omar Masera**  
Phone: +52 55 5623 2709  
Fax: +52 55 5623 2719  
**E-mail:** omasera@oikos.unam.mx  
**Web:** www.oikos.unam.mx

### Steering Committee

Contact: **Dr. Peter Helm**  
**E-mail:** peter.helm@wip-munich.de



The LAMNET Thematic Network is funded by the European Commission, DG Research,  
(Project No. ICA4-CT-2001-10106).