



## GENERAL PRESENTATION OF EUBIA

WHAT IS EUBIA ?

**E**UBIA, the European Biomass Industry Association, was registered in 1996 as an international non-profit association in Brussels, Belgium. Its office is based nearby the European institutions.

EUBIA's members are mainly from Europe and include research and promotion centres, utilities, oil companies and biomass-based technology, product and service companies.

EUBIA has started major international cooperation activities with third countries, in particular China and Brazil.

EUBIA is a founding member of EREC, the European Renewable Energy Council, which groups together all main European renewable energy industry and research associations.

### MAIN AREAS OF ACTIVITIES



Small scale activities are carried out to use bioenergy (co-generation, biofuels, etc.) for decentralised areas, mainly rural development inside and outside of Europe.

Industrial schemes: Power generation plants, biodiesel, bioethanol, biomethanol, hydrogen plants,...

Large scale integration of bioenergy, bioethanol, hydrogen, etc. to petrochemicals to improve traditional transportation fuels (e.g.: a study for China reveals the best ways to use bioethanol to improve gasoline).

Other activities include the promotion of education and training activity in bioenergy, the promotion of innovative concepts and technologies.

OBJECTIVES

EUBIA promotes bioenergy activities at small, medium and large scale in collaboration with local authorities, agricultural organisations, local partners and industries.

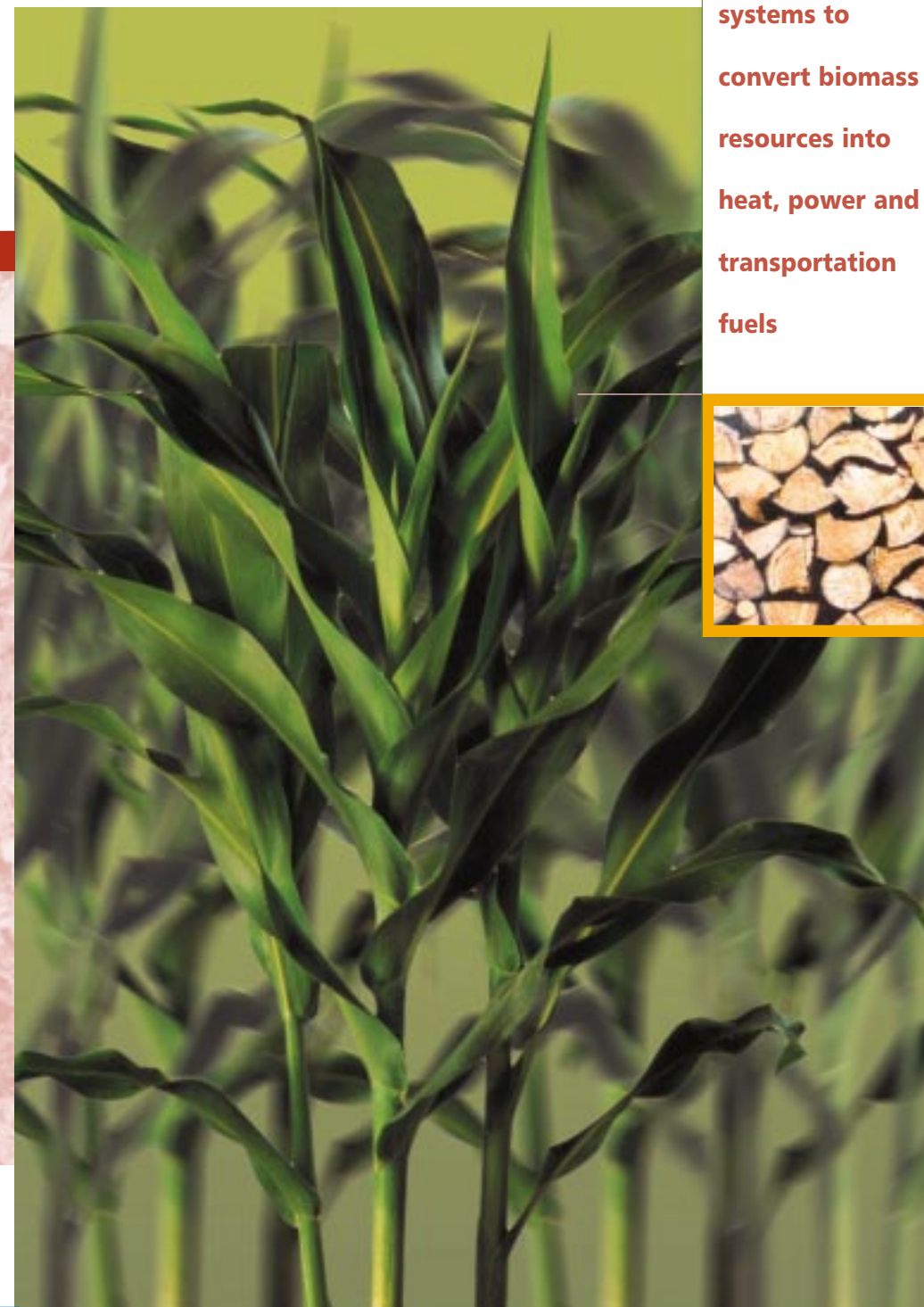
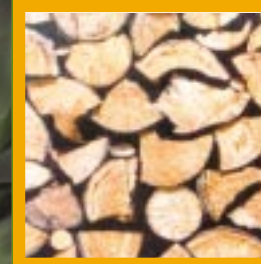
EUBIA also promotes modern, efficient, environmentally sound and commercial bioenergy schemes, technologies, products and markets.

EUBIA strengthens European policies that have a direct or an indirect impact on biomass, protecting industrial interest, identifying new opportunities, promoting job creation and better environmental conditions.

Photos courtesy: Tommaso Guicciardini and O.O. Energiesparverband Design: ACG Brussels

## EUROPEAN BIOMASS INDUSTRY ASSOCIATION

Bioenergy: diversified systems to convert biomass resources into heat, power and transportation fuels



BIOENERGY

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# WHAT IS BIOMASS?



## DEFINITION:

**B**iomass is organic material, either raw or processed, with an intrinsic chemical energy content that allows conversion into electricity or fuel. The following shows the many ways to use biomass: **bioenergy** (divided into "bioheat": thermal energy and "bioelectricity": the electrical energy from biomass), **biofuels**: all fuels generated from biomass, including solid (fuelwood, pellets), liquid (bioethanol, biodiesel, bio-oils), and gaseous (biogas, hydrogen and other gases). **Other uses**: biomass is also used for fibres and other materials, chemicals, as well as various useful fine and bulk products.

The conversion of biomass into usable energy can be summarised by the three main steps:  
Resources — Conversion — End-uses

## MAJOR CONVERSION TECHNOLOGIES

### HEAT PRODUCTION

The majority of current biomass-derived energy comes from wood combustion to produce heat. Direct combustion processes for heat production and driving a steam cycle are already commercial, with a constant drive for the improvement of their efficiency and reduction of their pollutant emissions. There are two different systems of creating heat: **small scale heating systems** and **district heating systems**. The first one uses logwood, pellets, woodchips, etc., the other, typically based on either fluidised bed boilers or grate boilers, can burn wood chips, peat, refuse-derived fuel, waste wood, sawdust and straw.

### CO-GENERATION OF HEAT AND POWER

Combined heat and power (CHP), the simultaneous production of heat and power, is suitable for small scale applications. It can be used to provide space heating and domestic hot water to individual houses or a group of buildings. Excess electricity generated may often be exported to the grid. This relatively new technology has reached the commercialisation stage also for small scale applications (50-500 kW<sub>e</sub>).

### BIOETHANOL PRODUCTION

Bioethanol is an alcohol mainly produced by fermentation of sugar- and starch-containing organic materials. Commercialisation of biofuels for transport could be in the form of neat or blend type (the latter being mixed with oil derived from fossil fuels).

### BIODIESEL PRODUCTION

Rapeseed oil represents the main feedstock (84% of the raw material sources). Other raw materials include sunflower, soybean or used frying oil (waste vegetable oil). Technological progress has been made in the recent past to broaden the feedstock basis and to improve process technology through flexibility in processing multi-feedstocks. Biodiesel as a pure fuel is getting increasing acceptance from car manufacturers, and also heavy duty vehicles (e.g.: Germany).

### CHARCOAL PRODUCTION

A new low cost / low energy input direct process of biomass without any binding compound for converting biomass pellets into charcoal of any kind is now appearing on the market. Charcoal pellets can be utilised for cooking and heating uses, syngas production, hydrogen production for biomethanol synthesis, activated coal production for gas and liquid purification, and in the production of special steel.

## COSTS OF BIOENERGY UTILISATION

With the exception of heat production, the other technologies still face the main barrier of high costs. A lower cost will be obtained by integrated processing and high yield dedicated crops. (Prices quoted: January 2003)

- Heat production : ..... 25 €/MWh
- Solid Biofuel production cost (pellets) : ..... 80 €/t
- Power Generation (from solid, liquid, gaseous biofuels) : ..... 40-50 €/MWh
- Bioethanol : ..... 250 €/t
- Biohydrogen : ..... 1.500 €/t
- Biomethanol : ..... 200-250 €/t

## KEY ADVANTAGES OF BIOMASS

- Abundant availability and no need to import the resource
- Good opportunities for technology exports
- Stable employment opportunities
- Many environmental and energy benefits
- Reduced CO<sub>2</sub> and other emissions
- Contribution to a balanced growth of agriculture



## DEVELOPMENT POTENTIAL OF BIOMASS

**B**iomass potential is very large and widely distributed throughout the world. The present biomass contribution to the total world energy needs approaches 14 % (50 EJ/y on a total contribution of 406 EJ/y) and is essentially based on agro-forestry residues and natural forest. In future, a large contribution may derive from dedicated crops (Short Rotation Forestry plantation, herbaceous crops) grown on marginal lands. Biomass is mostly used for heating and cooking needs in developing countries. There is a need for wider availability of modern and efficient technologies of bioenergy, and great efforts are being made to promote the contribution they can make towards environmentally, technically and economically sustainable use of resources. High demand for biomass conversion and utilisation technologies can be expected in the short term in both industrialised and developing countries, with very likely opportunities for export of technologies, know-how and services, particularly for small-medium capacity plants.

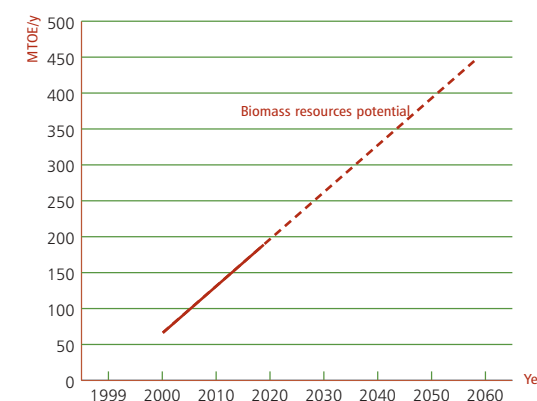
### LONG-TERM DEVELOPMENT POTENTIAL IN EUROPE

Because bioenergy activity can be implemented at small, medium and large scale, it is applicable to a wide variety of resources and processing / utilisation schemes. Its deployment in the EU anticipates a significant potential contribution as shown here below:

### NEW JOB CREATION IN THE EUROPEAN UNION

SECTOR	NEW JOBS (BY 2020)	MAX. LONG TERM (BY 2050)
Heat	325.000 (40 MTOE/y)	730.000
Power	305.000 (30 MTOE/y)	3.180.000
Transport	683.000 (43 MTOE/y)	1.620.000
Chemicals	196.000 (20 MTOE/y)	196.000
Total jobs	1.509.000 (133 MTOE/y)	5.726.000

### BIOENERGY CONTRIBUTION IN THE EUROPEAN UNION



EU TOTAL ENERGY NEEDS:  
Year 2000: 1.580MTOE/y Year 2030: 2.138MTOE/y

### MAIN TYPES OF BIOMASS RESOURCES:

- short rotation forestry (willow, poplar, eucalyptus)
- herbaceous ligno-cellulosic crops (miscanthus)
- sugar crops (sugar and cane beet, sweet sorghum, Jerusalem artichoke, sugar millet)
- starch crops (maize, wheat, corn, barley)
- oil crops (rape seed, sunflower)
- wood wastes (forest residues, wood processing waste, construction residues)
- agricultural residues and wastes (straw, animal manure, etc.)
- organic fraction of municipal solid waste and refuse
- sewage sludge
- industrial residues (e.g.: from the food and the paper industries)

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