



## European Biomass Industry Association

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**EUBIA**, established in 1996, is an industrial association of:

- market forces (utilities, oil companies),
- technology providers and industry,
- regional and national organisations,
- R&D organisations,
- Educational organisations



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## Mission

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- Promotion of energy from biomass
- Commercial deployment of European bioenergy technologies and know-how in Europe and outside
- Co-operation through projects in third countries

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## The main activities of EUBIA are to assist its members in

- Bioenergy industry **strategies**
- Identification of **business opportunity**
- Consultation with **EU institutions** on programmes, project, standards
- Assistance to **benefit** from the "Single Market"
- Operation of an **information network** for Bioenergy
- Promotion of Industrial Consortia for Specific Bioenergy Complexes or Systems
- Development of **education and training programmes**
- Assistance in **European patent procedures**
- Implementing co-operation programmes with **non-EU Countries**
  - At present, intensive work on projects in China
  - Promotion in Eastern Europe, Latin America and Africa.
- Providing office and conference facilities in the very centre of Brussels

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## EUBIA Members

*(status: June 2003)*

AGRICONSULTING - Italy  
BioAlcohol Foundation - Sweden  
Bioetanolo Energetico - Spain  
C.A.R.M.E.N. - Germany  
CARTIF - Spain  
ECOTRE - Italy  
Energidalen - Sweden  
ENI - Italy  
ETA Energia Trasporti Agricoltura - Italy  
FAL Federal Agricultural Research Centre - Germany  
Florence Energy Agency - Italy  
Fortum Corporation - Finland  
ISET - Germany  
Istituto Sperimentale Colture Industriali, Ministry of Agriculture - Italy  
KEMXX Spa, Italy  
Martezo - France  
Mont-Ele - Italy  
SIEMENS AG KWU1 - Germany  
Studio Tavolini - Italy  
SydKraft - Sweden  
University of Florence, "Sergio Stecco" Department of Energy Engineering - Italy  
University of Pisa, Dept. of Energetics, Italy  
University of Sassari - Italy  
WIP - Germany

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## Bioenergy in the E.U.

Wide commercial application of modern Bioenergy  
in the E.U. is **not yet started**



- Promotion of biomass heat in EC
  - To start with most practical option
- A keen eye to more sophisticated technologies
  - CHP
  - Ethanol with Sweet Sorghum
  - Syngas / DME / hydrogen

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## Comparison of Bioenergy with other R.E.

### Advantages

- Competitive
- High volume
- Variety: Heat - power - transport - chemicals
- Wide range of power
- Environmental
- employment in rural areas for **all** levels of profession

### Challenges

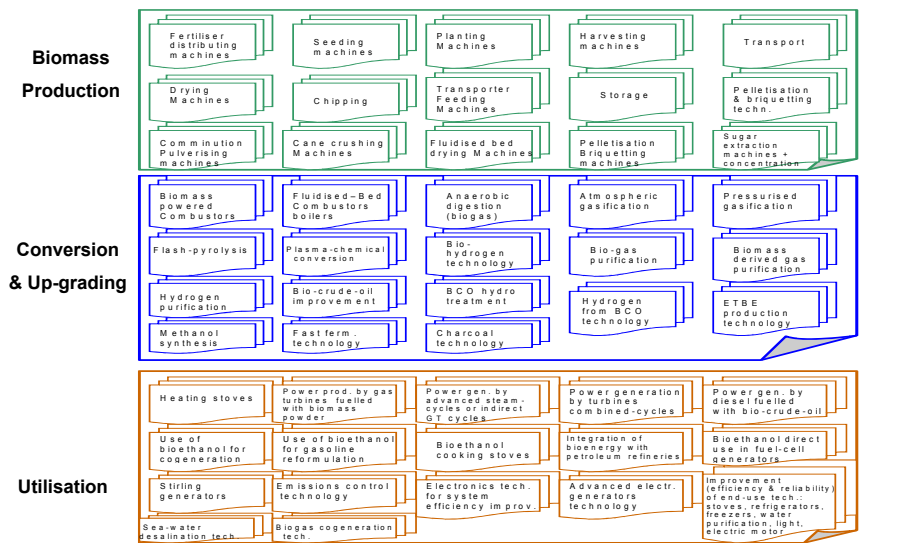
- Collection of feedstock
- Environmental and social constraints
- Complexity of technology

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## Complexity of Bioenergy Technologies and Systems



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## Bioenergy costs

- Costs (per equivalent of barrel crude oil)
  - Fossil fuels 30 – 37 US \$
  - Biofuels (pellets, ethanol, hydrogen) 18 – 52 US \$

Best examples:

- Bioethanol in Brasil
- Wood pellets in Northern Europe (Sweden)



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## Promising technological combinations

### •Sweet Sorghum combination

- Bioethanol
- Bagasse (pellets)
- Grains

Sweet Sorghum compared to Sugar cane

- Less demanding (fertiliser, water, temperature), more side products, higher yield

### •Pellets chain

- Low value biomass (agriforestal waste)
- Collection with mobile pelletiser
- Carbonise → syngas → DME or hydrogen

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## Bioenergy Village Project

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Promotion of a wide -range of commercial technologies & systems suitable for rural development activities

Promotion of sustainable development in villages by addressing several needs: food, feed, heat, water...

Integrated or simultaneous biomass processing is promoted to get more efficient utilisation of biomass and increased economic benefits

From 2004 “turn –key” integrated projects will be available and offered by European Industrial Consortium.

Only small size commercial technologies involved.

Commercial, i.e.: performances and life-time guaranteed

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## Bioenergy Village Project 2

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1- **New drying and pelletisation machines** (1 to 5 ton/hr) – low energy requirements (about 70 Wh<sub>e</sub>/kg) – also mobile units. Lamnet leaflet available

2- **Microdistilleries** for sugar-starch crops (2→15 t<sub>ETOH</sub>/day – 96°)

Bioethanol jelly fuel production for clean cooking fuel - Lamnet leaflet available

3- **Small plants for liquid sugar** production from sweet-sorghum juice

4- **Production of “animal feed” pellets** obtained from mixtures of grain + small bagasse pellets

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## Bioenergy Village Project 3

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5- **CHP plants;**

3 types of commercial (min 10 years of operation) 3 types of cogeneration systems have been identified:

-Gasifier + engine generator (Martezo, France) utilising solid biomass-  
Efficiency : 18%

-Microgas turbines 100 kWe operated with liquid biomass (low-grade bioethanol) Efficiency: 28%

-Microgas turbines operated with Bio-Syngas Efficiency: 28%

Important effort is carried out by EUBIA for the commercialisation of promising biofuel steam engine-generators (5→500 kWe)

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## Bioenergy Village Project 4

6- **Bio-Syngas generators** for the production of M.H.V. gas as clean cooking fuel for villages: 3 steps process, pelletisation, carbonisation, steam reforming. The Syngas may be utilised in microgas turbines as well

7- **Small plants for activated coal** production from agro-forestry residues  
→ important for drinking water production

8- **Small plants for paper production** from residues

9- **Small efficient biogas plants**

10- **Biofuels boilers and stoves**

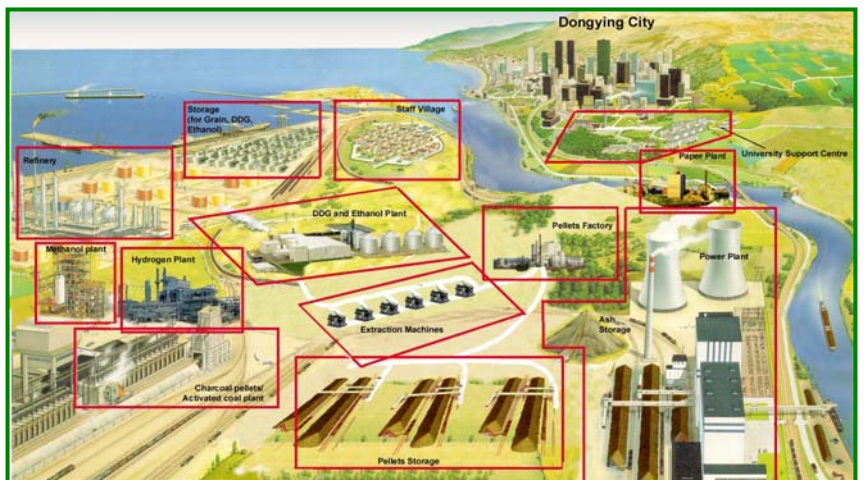
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## Example of Large Industrial Bioenergy Integrated Complex

(ongoing assessment)

70,000 ha sweet sorghum plantation



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## Actions needed

- Definition of EC country needs
- More funding for industrial development of full bioenergy systems
- More focused research and development of sub-systems in cooperation with the industry
- Implementation strategy for selection of best technologies
  - Definition of best systems
  - Design
  - Construction of demonstration plants
- Reinforcement of the international cooperation

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## Conclusions

- Integration of biotechnologies (economy)
- Large scale is already commercial, small scale still needs further development
- Pellet chain gives flexibility in product selection
  - Starts with agriforestral waste
  - Biohydrogen and DME in last research phase
- Sweet sorghum gives good economy + byproducts

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