



Main Messages from the technical sessions



**BIO-ENERGY
ENLARGED PERSPECTIVES**

Budapest ,16-17 October 2003

A Biochemical conversion systems

- × Most projects consist of elements integrated into an effective chain regarding technological, economic and environmental performances**
- × To ensure feasibility, projects focus on cost reduction (effective feedstock growing, process and control technologies : pre-treatment, conversion, application), profitable utilisation of by-products, multifuel processes including different types of waste (flexible operation, cheap and guaranteed supply)**
- × Accessing countries are more and more actually participating in EU FP research projects as full partners ; this trend must be reinforced in future calls and should associate Newly Independent States institutions in order to involve them in the ERA building process and create scientific and business links all over Europe**

B European Research Area

- × **First IP's and NoE are on the way.**
- × **NoE: “Overcoming barriers to bio-energy” and “ERA bio-energy RTD-strategy”**
- × **IP: “Renewable fuels for advanced powertrains” and “Clean hydrogen-rich synthesis gas”**
- × **The consortia are widely spread throughout Europe and take the needs of the NAS into consideration**
- × **Primarily “strategic aspects” and “liquid biofuels” are analysed so far; but there are still open gaps (like prenormative work, environmental sound heat provision, biogas production, gasification for electricity generation)**

C Combustion and cofiring

- × **Improving environmental performance**
 - ✓ **Reduction of emissions, landfill, etc.**

- × **Improving Operation**
 - ✓ **fouling & slag formation**
 - ✓ **advanced process control**

- × **Systematic Approach**
 - ✓ **Modeling**
 - ✓ **knowledge based tools**

D Gasification and pyrolysis

Pyrolysis

- × Improving oil quality (catalysts/physical operations)
- × Applications (domestic heating, diesel engines, fuel cells)
- × Source of chemicals (phenol-formaldehyde resins)

Gasification

- × Large scale (ash management, new feedstock – wastes)
- × Small scale (commercial exploitation)
- × Longer term (coupling with fuel cells)

Tar Protocol

- × Plants and products certification
- × Reliable reference for coming R&D work

E Combined heat and power

Projects covered potentials for biomass co-generation, technology development, optimisation of existing concepts & process integration

- × Data collection – SWOT analysis & geopolitical considerations**
- × Better fuel management – application of understanding of alkali chemistry (S, alkali, Si, additives) lower SO₂ emissions to new EU limits**
- × Development of small-scale gasifier – Heat Pipe Reformer for distributed systems**
- × Extension of existing concepts (Lahti) – feeding system for loose straw; process proved for straw/wood, cost too high**
- × Process integration – waste incineration + fossil; legal issue with respect to WI Directive (2000/76/EC)**
- × Process control systems – integrated control throughout process on commercial boiler; advisory system mimicking operator**

Industrial message: Cost – Legislative Issues – Public Perception - Safety

F Feedstock

- × **Biofuel production from candidate countries is feasible and should make a small net contribution. Soil quality and climate are the limiting factors in growing crops (remaining gaps are: mapping of resources and integration of socioeconomic aspects).**
- × **New technological processes were introduced to the industry (pulp, paper, leather and waste treatment) to reduce the waste problem and to produce green electricity. Future activities: validation, upscaling, prototypes.**
- × **The example of BIOENERGY CHAINS should be applied also for other biofuels (liquid and gaseous).**
- × **Pre-normative work in bio-energy is essential.**

G Cofiring

- × **Cofiring is an excellent opportunity for using biomass and waste in existing plants but**

- × **Research is still needed along the whole process in particular to:**
 - ✓ **use higher biomass content**
 - ✓ **reduce corrosion problems**
 - ✓ **improve process control**

- × **High number of ongoing projects in the field opens perspectives for efficient solutions in the near future.**

H Gas cleaning & hydrogen production

- x Promising results on catalytic gas treatment at high temperature satisfactory for power production and with prospect for fuel cells**
- x Elimination of inorganics (Cl, S, ...) is the next challenge for fuel cell applications**
- x New gasification concepts (supercritical, CaO ...) can produce an hydrogen rich gas. Up scaling as to prove the economics**