Discussion & Conclusions

- Market issues
- Fuel characterisation and standardisation
- Fuel preparation
- Fuel quality and deposit formation/emissions
- Boiler design

”Fuel Flexibility in Biomass Combustion - The Key to Low Bioenergy Costs?”

In summary ….

Yes!

- Increased fuel flexibility gives advantages on the market

But…

- Higher costs for operation and maintenance

Requirements:

- Technology
- Competence (knowledge and/or experience)

Market Issues

"Fuel Flexibility in Biomass Combustion

- The Key to Low Bioenergy Costs?"

Yes!	But….
• Bioenergy market increases!! • Competition for fuels increase •"Conventional" fuels limited • Closed loops: Waste => Fuel (legislation important) • Energy crops/fast growing tree plantations • Many fuels attractive in co-firing	• Competence to use "difficult to burn"/new fuels limited" • Technical development necessary (small and large scale; dedicated combustion or co-firing) • Fuel quality very varying • Minor fractions • Unsecure availability • "Disturbances" (taxes, directives, …)

Fuel characterisation and standardisation

"Fuel Flexibility in Biomass Combustion

- The Key to Low Bioenergy Costs?"

Yes!	But….
• Extensive on-going efforts in developing relevant biomass fuel characterisation methods for sampling and analysis	• Methods not yet available •Some fuel fractions very hard to characterise • Fuel fractions can be very heterogeneous

Fuel Preparation

"Fuel Flexibility in Biomass Combustion - The Key to Low Bioenergy Costs?"

Yes!	But….
• Market driven fuel development of the fuel preparation process • Good fuel preparation => better combustion performance • Increased sorting of waste => improved possibilities	• Some fuel fractions very difficult to handle • Costs can be high • Technical development required (on-line analysis, ..)

Fuel Quality and Deposit Formation/emissions

”Fuel Flexibility in Biomass Combustion

- The Key to Low Bioenergy Costs?”

Yes!	But….
• Increasing competence on mechanisms, new materials etc • Technical solutions to reduce problems available • Significant experience avalilable from ”learn by doing”	• Higher steam data => more problems! • Improved scientific knowledge on ash chemistry required

Boiler Design

"Fuel Flexibility in Biomass Combustion

- The Key to Low Bioenergy Costs?"

Yes!	But….
• Extensive experience gathered from commercial scale operation – Dedicated biomass – Co-firing	• Design criteria has to be considered