**1st FERIA Conference**

**The European Conference on Fuel and Energy Research**

**and its Applications, the Successor to the ECCRIA Series of Conferences**

**Required Specification for the Preparation of Abstracts**

The abstract **must** fit on a single side of A4 paper.

This page should include the title, authors, their affiliations, keywords and any acknowledgements.

The title should be centred and in Tahoma 14pt font, not to be in all capitals.

All author’s names are to be shown, centred and in Tahoma 12pt font.

Affiliations of the authors are to be shown, centred in italic Tahoma 10pt font.

The corresponding author is to be shown with an asterisk and their contact E-mail address and/or telephone number shown at the bottom of the page.

The text of the abstract is to be justified and in Tahoma 11.0pt, except if it will not go on to one single side of A4 paper, in which case Tacoma 10.5pt font should be used.

New paragraphs should be indented but not spaced.

Appropriate keywords are to be included.

**See page below for example.**

Dr. Alan W.Thompson

14th June 2019

Supergen Bioenergy Hub 2018-2022: Technologies for the Pre-treatment and Conversion of Biomass (Tahoma 14, Sentence case)

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***Abstract*** for oral/poster presentation [please edit] *(Tahoma Italic bold, 11.0 or 10.5, single line spacing):*

(Indent at 1.25, justified) Bioenergy is a uniquely flexible renewable energy vector and previous Supergen hub work has shown that there is scope for it to provide a large proportion of UK primary energy demand if we make best use of wastes and residues from crops and forestry. The Supergen Bioenergy Project is structured around four work packages that consider the full bioenergy system in a wider energy, eco-system and economic context. This presentation concerns WP2, which focusses on the pre-treatment and conversion of biomass. It will provide underpinning data on process conditions, material and feedstock issues and plant design.

In the medium-term fungible hydrocarbons will be required from biomass to liquid technologies. Realising this requires fundamental research on promising catalytic approaches and novel pre-treatment technologies to increase fermentation and anaerobic digestion yields to improve performance and efficiency. Experimental work will be carried out in three complementary world leading laboratories on biological, thermochemical and catalytic approaches, to ensure detailed and accurate assessment of realistic potential across a range of pathways. These three strands of fundamental science are capable of delivering breakthroughs in conversion of biomass via fermentation, pyrolytic and catalytic routes to liquid and gaseous vectors.

**Fermentation**: (Bold) Experimental work will focus on an innovative pre-treatment method, the ionoSolv Process, based on the use of specific low cost organic ionic liquids (ILs) for use with contaminated woody biomasses, such as those found in municipal solid waste. This pre-treatment step aims to break down the complex lignocellulosic structure, making it recalcitrant to the enzymatic hydrolysis required for fermentation.

**Pyrolysis:** (Bold)The amount and type of ash in feedstocks can have a significant effect on the quality of products, especially for thermochemical processes such as fast pyrolysis. The work will use a standard low ash feed such as beech, and a standard high ash feed such as miscanthus as standards. Ash free feedstocks will be doped with varying concentrations of the most common alkali metals to study the effect of fast pyrolysis at various pyrolysis temperature. The effect of blending low ash material with high ash material will be studied to explore the potential of blending to deal with high ash content material, such as wastes. Finally, the potential of utilising residues from biological processes in a thermally orientated conversion process will be explored.

**Photocatalysis:**(Bold)The proposed research is to examine the use of photocatalysts for the deoxygenation of raw and treated biomass e.g. in the form of bio-oils or plasma treated biomass. Herein, the photocatalytic reforming of ethanol, glycerol, sucrose, cellulose, lignin, grass and bio-oil under anaerobic conditions will be undertaken. This will, in general, lead to the formation of syngas which can then be converted back into fuels and bulk chemicals via, for example, Fisher-Tropsch synthesis.

*Keywords :* *(Tahoma 11.0 or 10.5, Italic)* bioenergy, biomass, process technology

*Acknowledgement : (Tahoma 11.0 or 10.5, Italic)* This work is supported by Supergen Bioenergy Hub.

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