

CASE STUDY

Broadening my knowledge via BRISK Transnational Access



Malwina Śnieg of the University of Warmia and Mazury in Olsztyn, Poland, discusses how visiting the European Bioenergy Research Institute, Aston University, UK, via BRISK Transnational Access enabled her to branch out from her research area to enhance her scientific knowledge.

I am a PhD student at the University of Warmia and Mazury in Olsztyn. My field is agronomy. My research focus is on the productivity and quality of biomass from perennial crops. The objective of my doctoral research is to determine the 26 genotypes of perennial energy crops and assess the properties acquired during thermo-chemical conversion of biomass and the differences caused by varied dates of collection.

My supervisor, Professor dr hab. inż. Mariusz J. Stolarski, made me aware of the possibility of going abroad as part of BRISK Transnational Access. The aim of the BRISK Project is to facilitate cooperation and research across project partner laboratories in the area of biofuels and thermal biomass conversion. I chose to research fast pyrolysis as it was a new area for me and I wanted to broaden the scope of my knowledge. After considering the partners with fast pyrolysis facilities, I chose to apply to the European Bioenergy Research Institute (EBRI) at Aston University, Birmingham, UK, as it seemed the best pan-European institute, with focus on aspects of biomass conversion and utilisation of products for renewable power, heat, transport fuels and chemicals.

The main objective of my work was the characterisation of the pyrolytic behaviours (via fast pyrolysis) of three species of perennial energy crops: Willow (*Salix viminalis*), Virginia mallow (*Sida hermaphrodita Rusby*) and Miscanthus (*Miscanthus x giganteus*) using a fluidised bed fast pyrolysis reactor as well as performing a full characterisation of the pyrolysis products.

The BRISK application procedure was very simple, with all information available on the BRISK website (www.briskeu.com). I contacted the host organisation

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Figure 1: Working with the 300 g h⁻¹ fluidised bed fast pyrolysis reactor.



Figure 2: Loading the Thermo-Gravimetric Analyser (TGA).

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and we started planning the experiment and discussing the purpose and necessary duration of my visit. The EBRI staff were all very helpful: Emma Wylde booked my flights and accommodation, Dr Daniel Nowakowski helped me with my application form and together he and Dr Scott Banks were my supervisors and took the time to show me the facilities and equipment at EBRI.

When everything was arranged I arrived for a two week visit to EBRI. During the first week I worked with Dr Scott Banks to carry out three fast pyrolysis runs on a 300 g h⁻¹ fluidised bed fast pyrolysis reactor with online gas analysis of pyrolytic gases (using the micro-gas chromatograph (micro-GC)) and offline analysis of pyrolysis liquids (using gas chromatograph-mass spectrometer (GC-MS)). During the second week I focused on analysis of thermophysical properties using techniques such as thermogravimetric analysis to determine moisture, water content, ash content, etc. We also conducted further research on the pyrolysis gas chromatograph-mass spectrometer (Py-GC/MS). Furthermore I was also given the opportunity to see the Pyroformer™ plant, which is designed to deliver energy and heat capable of powering buildings etc.

My visit to the European Bioenergy Research Institute (EBRI) at Aston University allowed me to expand my understanding and knowledge of biomass fast pyrolysis processing and characterisation of pyrolysis products. I was fully satisfied with the process; it was an interesting experience and provided the opportunity for academic development. I would highly recommend the BRISK project to all those who wish to share knowledge and engage in research on biomass and bioenergy technology.

Acknowledgment

I would like to thank the staff at EBRI, particularly Dr Daniel Nowakowski, Dr Scott Banks, and the Director of EBRI Professor Tony Bridgwater.



Figure 3: Analysing data.



Figure 4: With Dr Daniel Nowakowski and Dr Scott Banks of the EBRI team.

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