BRISK2
BIOFUELS RESEARCH INFRASTRUCTURE

NEWS
WWW.BRISK2.EU

Issue 4 *September 2019*

100+ APPROVED APPLICATIONS

A group photo of BRISK2 at the Executive Committee and General Assembly meeting at Turin, Italy, June 2019.

Greetings from BRISK2! Welcome to the latest edition of the project newsletter. If you are new to BRISK2, I would like to take a moment to provide a very brief background on what we are all about.

The *Biofuels Research Infrastructure for Sharing Knowledge*, funded by Horizon 2020 provides opportunities for biofuels researchers to access unique equipment and expertise across Europe. This project is truly international, with applications welcome from around the world. As Project Coordinator at KTH, it is a pleasure to be part of BRISK2.

Andrew Martin
BRISK2 Project Co-ordinator, KTH
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 731101.

WELCOME PROJECT CO-ORDINATOR

BRISK2 is a Research Infrastructures project supported by H2020, and conducts activities in three main areas:

- Joint Research, where the objective is the consortium to advance experimental know-how in the biofuels area, including developing innovative measurement techniques;
- Networking, where the consortium reaches out to the European and international biofuels community for spreading the latest research results and best practices;
- Transnational Access, which opens up a multitude of outstanding rigs free of charge for conducting experimental campaigns.

What's special about this type of project is that participation is allowed, and indeed most welcome, from organizations outside the core consortium of 15 partners. So, if you are interested in biofuels research, then by all means, explore what we can do for you!

Since launching the project in 2017, access has been granted to more than 100 researchers from 30 countries.

A special thanks to members of the Users Selection Panel for their expertise in evaluating proposals for Transnational Access. It would not be possible to achieve such high quality without your dedication.

Best regards,

Andrew Martin
Coordinator

In this issue:

TRANSNATIONAL ACCESS UPDATE

Applications are welcome continually until 2022

One of the main aims of BRISK2 project is to establish and execute a common framework for the efficient handling of Transnational Access (TA) with emphasis on objectivity, transparency and quality.

Of the 100+ applications approved by the user selection panel for rigs offered by 15 partners around Europe, 85% applications were from one of EU or H2020 associated countries, out of which 40% of applicants were female. BRISK2 continues to provide free of charge access to researchers all around the world.

The deadline for the next round of TA application is 15 October 2019

Biofuels researchers can apply to BRISK2 via the website www.brisk2.eu at any time whilst the project is active. Applicants must contact the facility of their choice to develop a realistic work plan before submitting an application to the website. Applications are pooled for assessment by an independent panel of biofuels experts. The User Selection Panel (USP) meets a twice a year in each April and October.

Case studies from some recent visits are available on pages 8-16 and feature on our BRISK2 website.

To apply, see page 21 or visit our website www.brisk2.eu, here.

To apply, visit www.brisk2.eu Also see page 21

BRISK2 AT EUBCE 2019

BRISK2 attended the 27th European Biomass Conference and Exhibition in Lisbon, Portugal this May (EUBCE 2019). EBRI's Daniel Nowakowski gave a presentation about BRISK2, highlighting activities and possibilities for research exchange. The BRISK2 stand had over a 100 visitors, some of whom are pictured below.

Clockwise from the top left: Aston PhD students Joseph Socci and Regina Siu; PhD students visiting the BRISK2 stand; Aston PhD Student Joseph Socci with visitors and bottom left, Joseph Socci with Nadia Cerone and Francesco Zimberdi from BRISK2 Partner, ENEA.

EUBCE 2019 STUDENT AWARD

PhD student Lukas von Berg from the Institute of Thermal Engineering at TU Graz University, Austria, has won a EUBCE 2019 Student achievement award following a transnational access visit from fellow researchers Cevdet Dogan and Ebubekir Aydin from Turkey to TU Graz.

Lukas's main field of research is fluidized bed biomass gasification and producer gas treatment with a focus on multi-scale CFD modelling of the gasification process in a fluidized bed.

Along with Cevdet Doğan, Ebubekir Sıddık Aydin, Stefan Retschitzegger, Robert Scharler and Andrés Anca-Couce, Lukas wrote the paper: "Catalytic Tar Reforming with Sewage Sludge Char of a Producer Gas from Fluidized Bed Co-gasification of Sewage Sludge and Wood".

Lukas Von Berg (third from the right, of TU Graz, Institute of Thermal Engineering, winning the 2019 EUBCE Student Award, following BRISK2 transnational access research with Turkish bioenergy scientists .

The abstract is as follows:

Fluidized bed gasification of sewage sludge is a promising method for its valorisation due to the fuel flexibility of the process. The main drawbacks are the impurities present in the producer gas, with a high tar content, and its low calorific value. In this study, sewage sludge and wood mixtures are gasified in a fluidized bed. A tar cracking reactor is used to reduce the amount of tars and to increase the calorific value of the producer gas. Sewage sludge char is employed for tar cracking with a real producer gas, showing the feasibility of the process, which could employ a by-product of the gasifier. Char deactivation is also investigated in a test conducted during several hours, as well as the possibility of reactivating the char with steam, showing promising results.

Download the full paper and presentation here: http://www.etaflorence.it/proceedings/?detail=16458

To apply for the EUBCE Student Awards 2020 please visit http://www.eubce.com/conference/prizes-and-awards/student-awards-2.html

WP5 UPDATE

The report below is by Stefan Retschitzegger from Bioenergy2020+ at Graz University of Technology in Styria, Austria.

In order to reduce dependence on fossil resources, new biomass feedstocks need to be developed to produce biobased-materials and biobased energy. However, new biomass feedstocks can differ significantly from classic biomass feedstocks, such as wood. These differences can cause substantial problems, especially in the conversion processes. Hence, processes suitable for new biomass feedstocks need to be adapted. A detailed characterisation of the feedstocks forms the basis for such adaptation. Within WP5, we deal with the characterisation of new biomass feedstocks with a focus on their behaviour during different conversion processes. For this purpose, existing infrastructure is being adapted and new types of characterisation methods are being developed.

Methods used start from physical and chemical analyses to gain basic data about the feedstocks. To determine conversion characteristics we start small-scale (e.g. TGA thermogravimetric analysis), moving to a larger system (e.g. bench-scale gasifiers). We integrate the results based on experimental data and numerical analyses.

One currently ongoing joint research activity is a comprehensive round robin based on TGA involving seven partners. Although TGA is widely used, the agreement of results originating from analyses with different TGA systems, often obtained by following individual protocols, is not well studied. Hence, results may differ substantially depending on the operator performing the analyses.

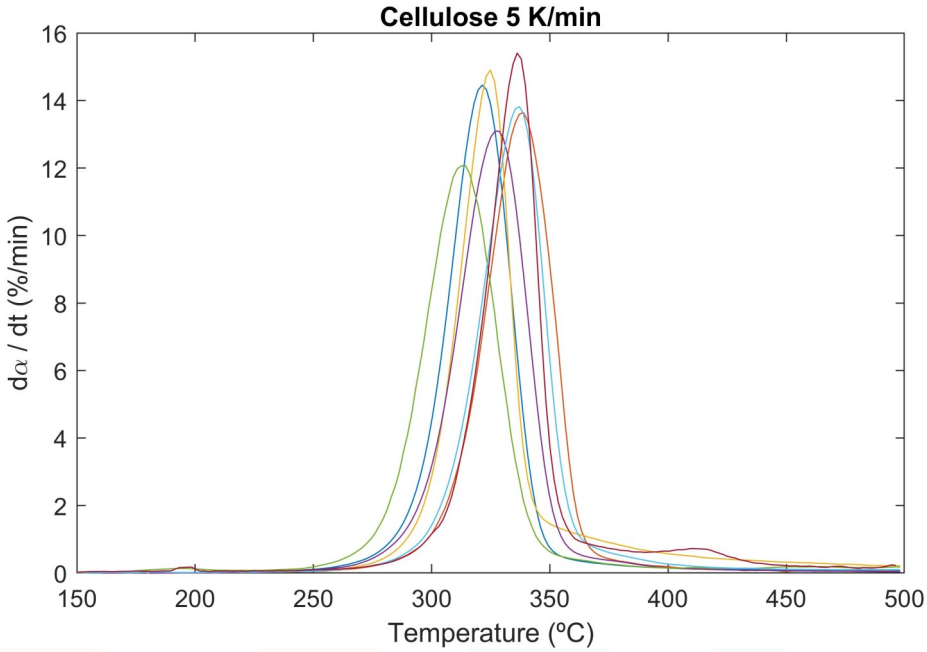

Figure 1: Reaction rate as a percentage of conversion from the TGA (thermogravimetric analysis) experiments performed by seven partners. Each line represents a partner's experimental data.

The aim of the round robin is to evaluate pyrolysis, torrefaction and char oxidation/gasification of new biomass feedstocks and to compare results with better known feedstocks like wood. In order to validate the TGA results against literature and to minimise potential inhomogeneity in biomass feedstocks, Avicel Cellulose PH-105, a well-defined ref-

[] Grønli, M., M.J. Antal, and G. Várhegyi, *A Round-Robin Study of Cellulose Pyrolysis Kinetics by Thermogravimetry.* Industrial & Engineering Chemistry Research, 1999. **38**(6): p. 2238-2244.

WP5 UPDATE (CONTD)

erence material, has been included in the round robin. In the first stage of the TGA round robin, pyrolysis of Avicel Cellulose PH-105 and beech wood (homogenised in the ISO certified lab of CERTH and distributed to all partners) was investigated. For this purpose, an experimental procedure was formulated, which was followed by each partner.

The evaluation of the first stage of experiments is completed and a main result is presented with the temperature of the maximum reaction rate (peak temperature) at a heating rate of 5 K/min. The mean peak temperature for Avicel Cellulose PH-105 was determined with 325°C, which is in good agreement with literature. However, the values of the peak temperature within the round robin ranged from 314°C – 338°C (Figure 1). A comparable range of peak temperatures were found for the beech experiments (335°C – 364°C). The deviation only depended on the instrument and not on the material investigated. (e.g. minimum temperature for Avicel Cellulose and beech obtained by the same partner). This first data set shows that the instruments used have an influence on the results. The ongoing evaluation will help with the determination of the characteristics of the instruments and methods employed by each partner, providing a benchmark for the experiments to follow. By identifying the differences between the various instruments and procedures, it will be possible to obtain meaningful final measurement protocols and results. In future tests within the round robin, new biomass feedstocks and different atmospheres will be investigated. Furthermore, additional partners from the European Energy Research Alliance (EERA) will be included in the round robin in order to extend the range of TGA systems considered. The final results will allow a thorough evaluation of the comparability of TGA tests and the factors causing differences.

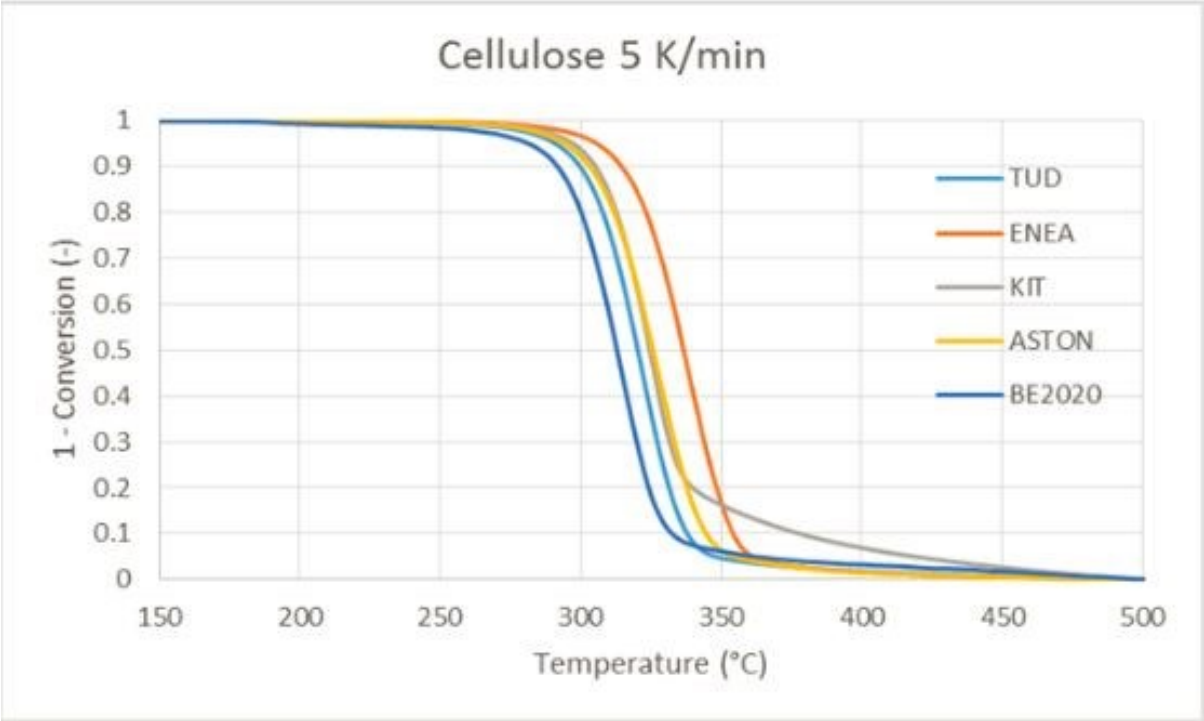

Figure 2: *Conversion of Cellulose during pyrolysis*

Work Package 5 Leader

Feedstock Characterisation

Stefan Retschitzegger

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CASE STUDY—ALBA MARTINEZ I QUER

Alba Martinez I Quer is from Aalborg University in Copenhagen. Her successful BRISK2 proposal took her to SINTEF in Norway from March-May 2019.

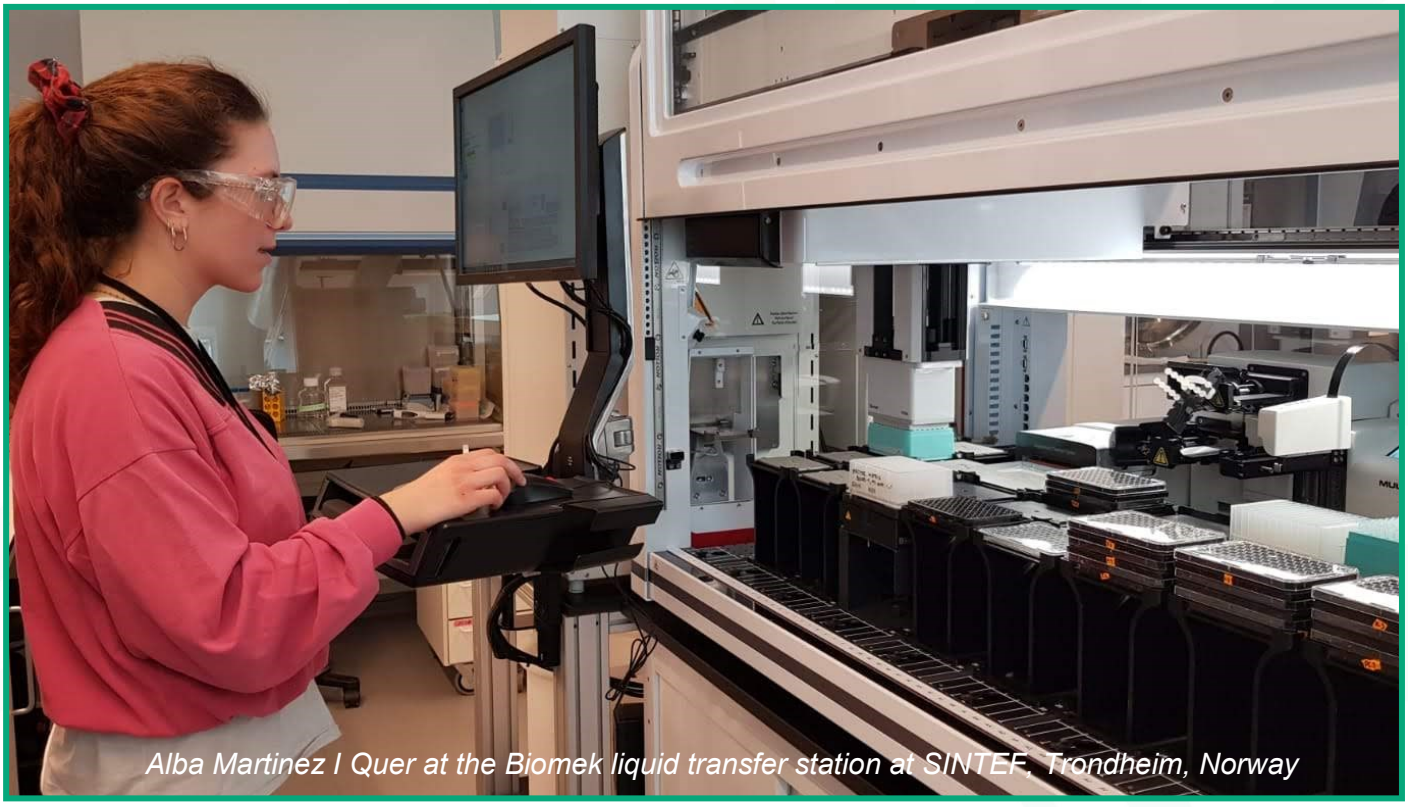
I went to visit SINTEF in Trondheim, Norway, as part of the BRISK2 transnational access programme. My main aim was to use equipment that my home university does not have - a high-throughput sequencing platform.

Earlier, I had carried out a three and six-month enrichment for complex-polymer degrading bacteria, followed by an isolation and screening of the fastest growers. I had been working with eleven unknown and three well-known isolates at my home university.

The main goal at SINTEF was to assemble an artificial consortium with these enriched bacteria and quantify their metabolic activity in comparison with the single strains when degrading lignin. Some research already shows the improved metabolic activity of consortia in comparison with single strains.

Because of the high number of test combinations, a high-throughput approach was required. Thanks to BRISK2, I was able to access to SINTEF's high-throughput platform. Within this platform, I used the liquid-handling robot, which allows you to transfer liquid and inoculate bacteria onto a high number of microtiter culture plates, producing replicates within a short time-frame.

Firstly, a test with all the single strains cultured with purified lignin extracted from wheat straw (brought from my home university), was performed to assess which method of metabolic activity worked best and the variability was analysed. BacterTito-Glo was chosen because of its effectiveness and because of the reliability of the results.



Alba Martinez I Quer at the Biomek liquid transfer station at SINTEF, Trondheim, Norway

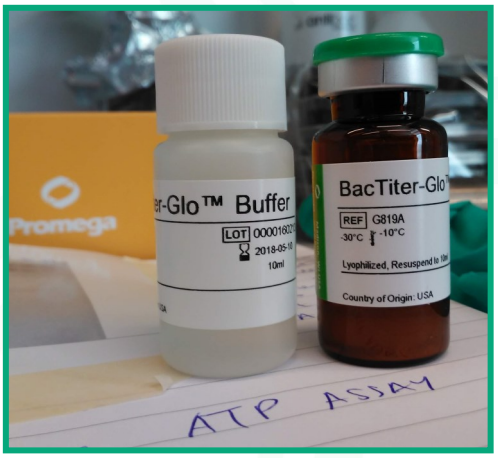
CASE STUDY—ALBA MARTINEZ I QUER

Once the conditions were set up, the first 91 combinations (1 strain to 1 strain) of the 14 strains were done manually in a master culture microtiter plate with a conventional substrate as metabolic enhancer (glucose). After 24 hours of culture, a robotic process transferred 10% of inoculum from the master microtiter plate to other microtiter plates (duplicates, in 100µ), together with a mineral minimal media. Purified lignin was used as a substrate in a granule form, and this was carefully manually added because of its non-soluble substrate.

After the inoculation and the media transfer - all done by robot - all the microtiter plates were cultured off-line in aerobic conditions. After 48 hours, all the plates were analysed using a BacterTiter-Glo kit assay, also measuring the luminescence of each sample. Fourteen mixed cultures were chosen for the next round and the same procedure was repeated three times. As a result, 273 bacterial combinations were tested. The combinations consisted of the isolates enriched and isolated at AAU (Aalborg University). Two different selection steps were performed, where the bacterial consortia with a higher ATP content were selected and combined until they reached up to eight strains per mixture.

The combination which involved up to four strains was the most successful, and when they were cultured on lignin, the bacterial mixtures performed better than the single strains. This was a successful result because it confirmed the initial hypothesis that synergistic enzymatic activity performs better with lignin. The bacterial mixtures were also sensitive to the co-substrate culture (lignin and LDPE as a carbon source instead of lignin alone) in comparison with single strains, which showed no ATP production at all. This suggests a metabolic synergy was needed before a benefit was seen in the bacterial mixture.

In addition, the bacterial mixtures showed better performance when cultured on lignin than plastic, which did not confirm our initial theory about co-substrate cultivation. However it showed specificity for lignin, even if both substrates shared the same target enzymes.



ATP assay: a luminescence test that quantifies the amount of ATP released by a cell as an indirect measure for metabolic activity

I also set up an assay. This allowed follow-up of a high number of cultures while having a non-soluble substrate. It also allowed for a potential growth of the consortia as a biofilm on the substrate, which often hinders accurate measurement. The genomic sequencing of eleven unknown isolates from my home university would not have been possible without BRISK2. This will permit a putative enzymatic study to be carried to link the putative enzyme found on the genome with the biodegradation lignin activity. Also, a bioinformatics expert and a researcher assistant helped me with the genomic material processing. This was extremely helpful **a**nd together we produced crucial data.

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KØBENHAVN AALBORG UNIVERSITET

CASE STUDY — DAMIJAN CERINSKI

My BRISK2 transnational access project, 'The production of syngas with updraft gasification and enrichment in a membrane reactor' took me from Croatia to Italy's ENEA Trisaia Research Centre under Dr Francesco Zimbardi.

Above: The research team at ENEA, Italy

The objective was to gather data for updraft gasification (PRAGA rig) of almond and hazelnut shells using the air with steam as gasifying agent and analysing the produced syngas composition (H_2, CO, CO, C_nH_m and tars) along the height of the gasifier. Furthermore, the syngas was upgraded in the Pd/Ag membrane reactor (MERES rig) and also an ultra-pure hydrogen was obtained.

Updraft gasification was performed in a pilot-scale facility where the main component is a fixed bed, au-

CASE STUDY—DAMIJAN CERINSKI

thothermal, updraft gasifier, operated slightly above atmospheric conditions. The gasifier is cylindrically shaped with a height of 2.4 m and diameter of 0.5 m. The inner wall of the gasifier is coated with 0.1 m of refractory material. The flow of the gasifying agent is introduced at the lower part of the gasifier, below the grate, and it is possible to use air, oxygen and steam or mixtures of them all. The gasifier is equipped with eleven temperature measuring points, six gas compositions and tar-measuring points at different heights from the grate. A Pd/Ag membrane reactor with a capacity of 0.25 m^3/h syngas flow was used to generate the ultra-pure hydrogen and improve the syngas quality by injecting the steam and indicated the water gas shift reaction. Experiments were carried out without significant problems, while the process was effective and stable. Constant mass flows of biomass, air and steam were prescribed through the whole gasification process. The results showed that the gasification of the almond shells yields a higher a percentage of hydrogen (page 12). Results from the Pd/Ag membrane reactor indicate higher hydrogen yield at higher working temperatures and pressures. Experimental data acquired during the visit is going to be used in future mathematical modelling of the updraft gasification and hydrogen enrichment process. It can be concluded that this transnational access visit was successful with respect to the objectives defined at the application stage.

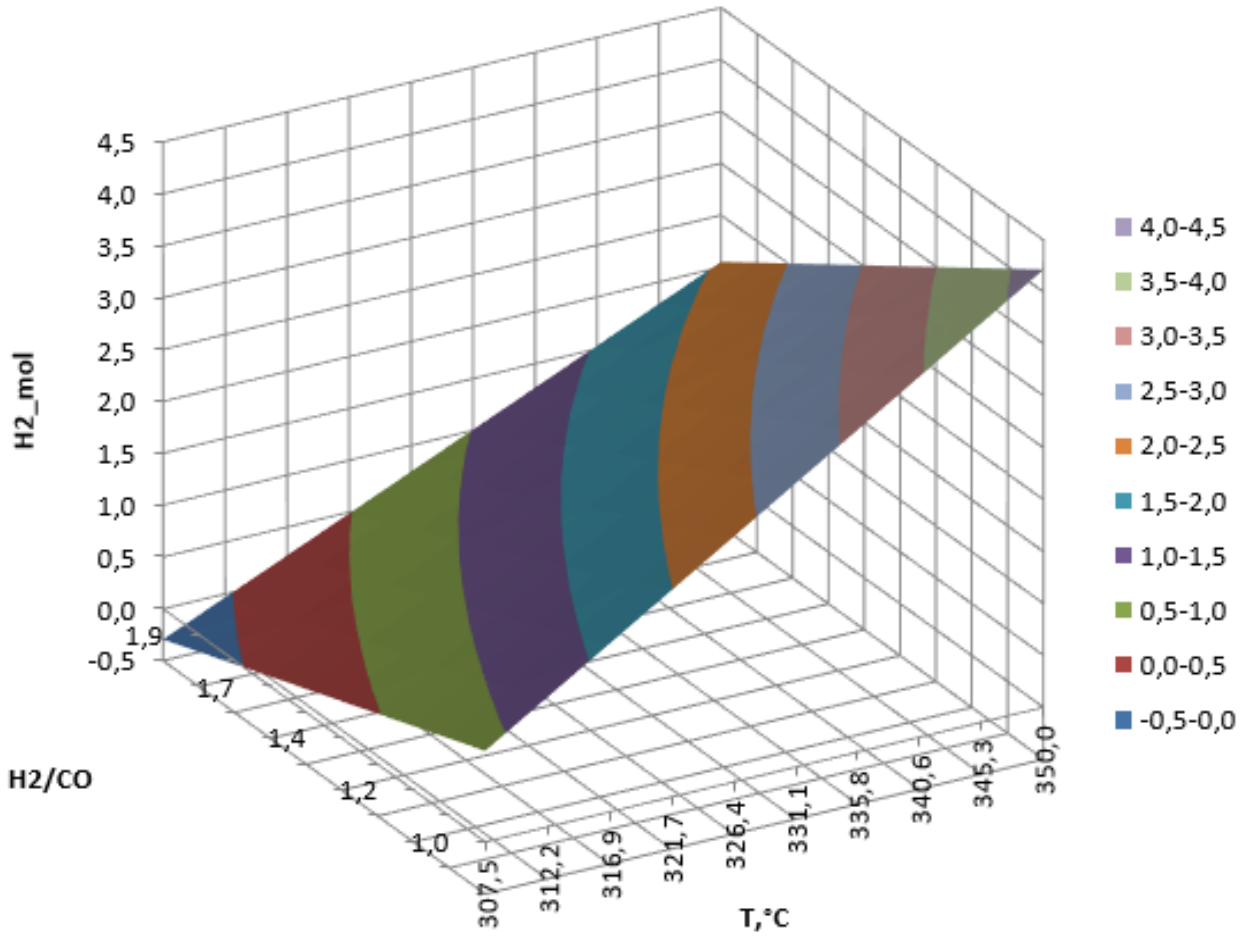
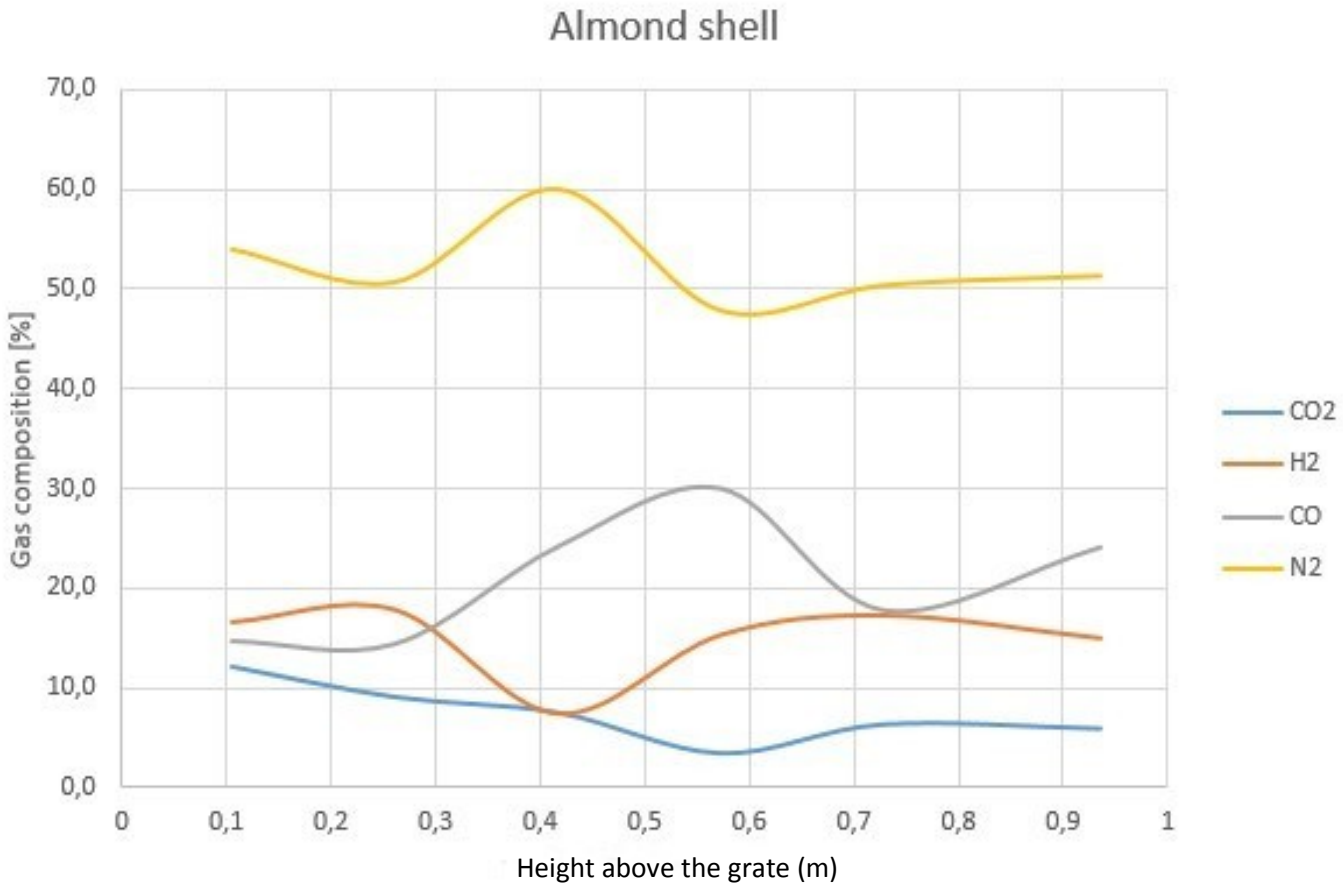
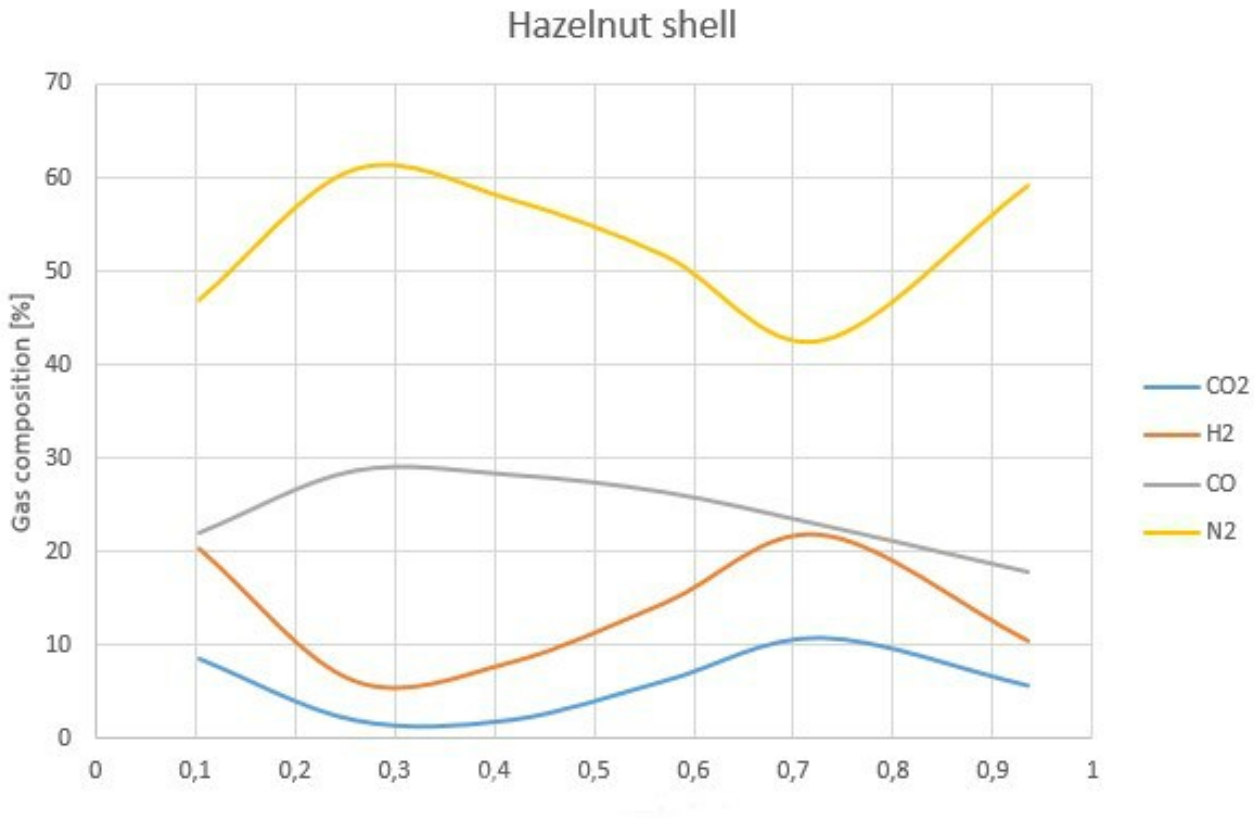


Figure: Meres results

CASE STUDY—DAMIJAN CERINSKI contd





CASE STUDY—DAMIJAN CERINSKI contd

Clockwise from the top: PRAGA plant; hazelnut shell; MERES reactors; almond shell; MERES rig; syngas and tar sampling.

Damijan Cerinski
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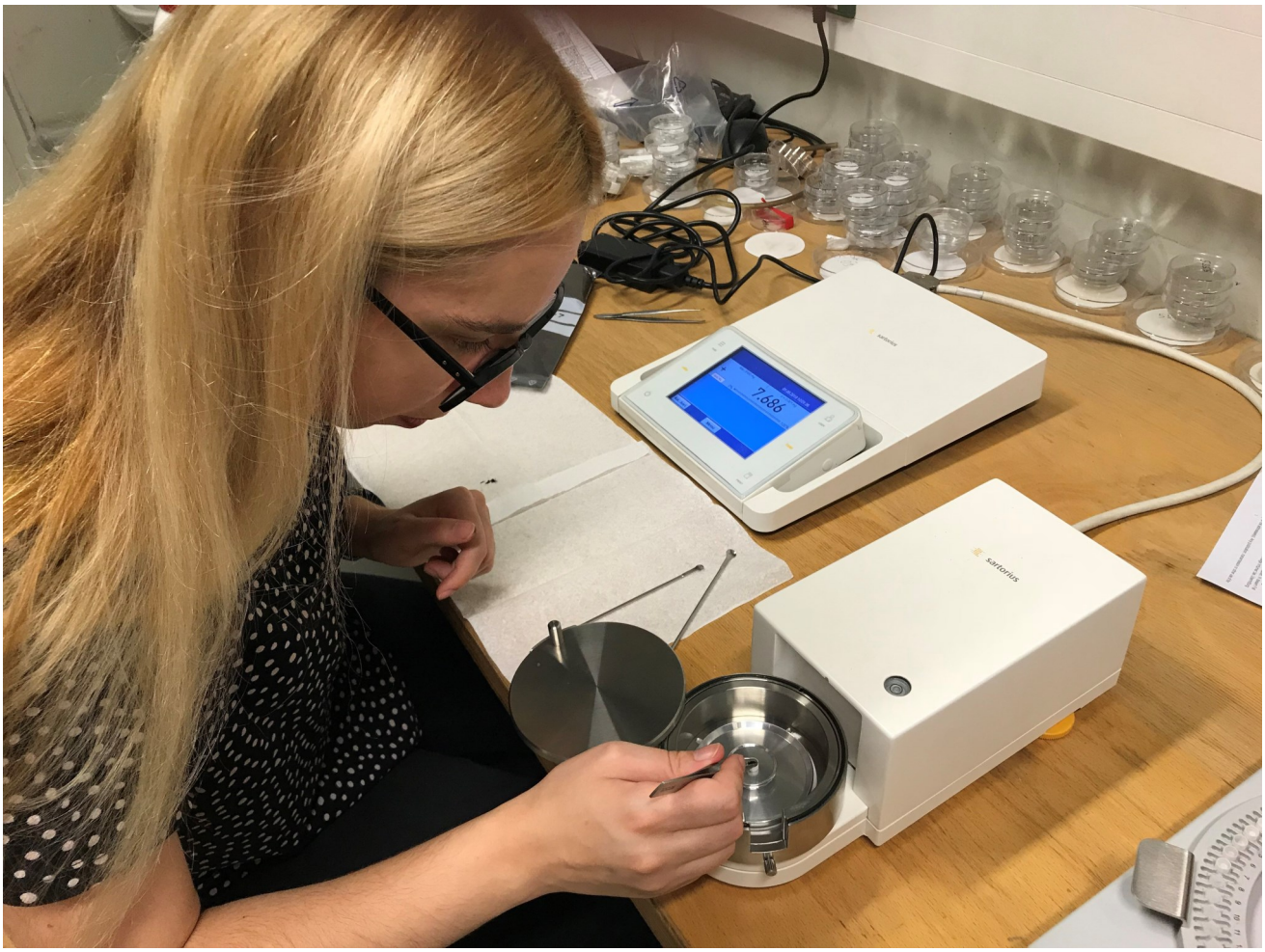
CASE STUDY—LINA KIEUSH & ANDRII KOVERIA

Lina Kieush and Andrii Koveria are from the National TU "Dnipro Polytechnik" - the National Metallurgical Academy of Ukraine. They visited BIOENERGY 2020+ GmbH in Austria in July 2019.

The purpose of the visit was to conduct thermogravimetric analysis to determine the thermal behaviour and kinetics parameters of two biomass types (sunflower husks and walnut shells), as well as their blends with coal. These analyses are important for explaining the interaction of biomass with metallurgical coal within blends and are the continuation of the pyrolysis process studies carried out via the fixed-bed lab-scale reactor. With this in mind, the thermal behaviour and kinetic parameters for blends with charcoal and hard coal were studied via TGA (thermal analyser NETZSCH STA 449 F3 Jupiter). Analysis of the data was performed using the software Proteus Analysis.

The preliminary analysis of the results showed the non-additive behaviour of the TG and DTG mass



Researcher Lina Kieush performing data analysis at BIOENERGY 2020+ in Austria

CASE STUDY—LINA KIEUSH & ANDRII KOVERIA

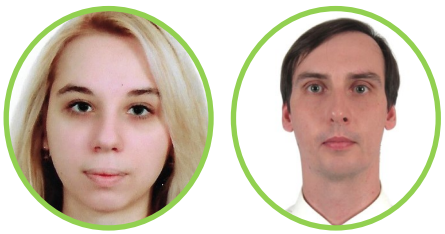
loss curves for biomass mixtures, as well as blends with charcoal and hard coal. The experimental results of thermogravimetric analysis of mixtures with different charcoals and hard coal showed an almost identical character, which may be important for understanding the processes of obtaining fuel and reducing agents for metallurgy, as well as preliminary materials preparation for producing metallurgical fuel and reducing agents. The study's results will be used to recommend the biomass application in metallurgical industry as a substance to substitute conventional fuels and reducing agents and as a basis for joint scientific publications.

We learned new skills and knowledge in the field of thermogravimetric analysis and data analysis.

We would like to express our gratitude to BRISK2, as it allowed us to broaden our skills through the unique research equipment. We find the project an excellent opportunity for international collaboration and knowledge exchange. The required studies have been conducted with the kind assistance of caring and friendly colleagues from BIOENERGY 2020+ GmbH (Graz, Austria).

Top: Researcher Andrii Koveria doing data analysis at Bioenergy 2020+ and directly above, Lina Kiuesh with a co-scientist

Linakeush@gmail.com & KoveriaA@nmu.org.ua



MARIE CURIE RESEARCH—STELIOS STEFANIDIS

Dr Stelios Stefanidis is a Marie Curie Research Fellow at the European Bioenergy Research Institute (EBRI) within Aston University, UK.

Carrying out interdisciplinary research in applied sciences often requires specialized equipment, skills and knowledge. Transnational access research programmes provide mobility for researchers and they allow them to access resources not available locally. By taking advantage of such programmes, researchers can visit organizations in other countries to use equipment, gather knowledge and collaborate with researchers working in similar areas.

In 2018, I was awarded a Marie S. Curie postdoctoral fellowship. This has given me the opportunity to live in the United Kingdom for two years to carry out research at Aston University on new catalytic materials for the conversion of biomass-derived molecules. It has given me access to the European Bioenergy Research Institute's (EBRI's) advanced materials characterization and biomass conversion facilities. It has also connected me to other researchers working on catalytic materials and biomass conversion, such as Dr Amin Osatiashtiani, Dr Scott Banks, Prof Georgios Kyriakou and Prof Tony Bridgwater. As a result I am developing in-depth knowledge of analytical techniques such as nitrogen physisorption, Temperature Programmed Desorption, X-ray Diffraction, X-ray Photoelectron Spectroscopy, Inductively Coupled Plasma Optical Emission Spectroscopy, Gas Chromatography and Mass Spectrometry. Working with EBRI's staff, we have expanded the lab's capabilities by designing and building a new fluidized bed reactor for the testing of novel catalysts on a larger scale than was previously possible. Moreover, utilizing the fellowship's travel funding, I visited the University of Cordoba in Spain for a month and gained additional knowledge on catalyst synthesis techniques. I have also attended conferences in Japan, Ireland and Finland on catalytic biomass conversion.

Overall, this fellowship has been an opportunity to work abroad and experience new places, acquire new skills, meet colleagues, strengthen my international research network and build the foundation for future collaborations. Equally important was the transfer of knowledge between the host institutions. This has been pivotal in meeting research goals, as well as future research efforts on the utilization of biomass resources.

Dr Stelios Stefanidis analysing catalyst samples

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JOINT RESEARCH ACTIVITIES

BRISK2 partners take part in the following Joint Research Activites:

- **WP5 Integrated multi-scale characterisation of new feedstocks for thermochemical and biochemical conversion processes** employs methods applied at molecular, particle, and macro-scale levels for analysing key thermochemical and biochemical conversion processes.
- **WP6 Advanced measurement techniques for enhanced process flexibility and reliability** links BRISK II instrumentation to the needs of emerging technologies in commercial-scale fast pyrolysis, gasification for synthetic natural gas production, and other processes.
- **WP7 Innovative biorefining approaches for sustainable biobased products** combines BRISK II infrastructure for joint investigations with the circular biobased economy in focus. Research activities consider infrastructure modification and upgrading in pretreatment and fractionation technologies, biobased intermediates conversion, and downstream processing.
- **WP8 Development of system simulation tools for comprehensive modelling of biomass conversion and biorefinery** integrates experimental results generated in WP5-7, combined with results obtained from Transnational Access, for developing and improving existing simulation tools in technoeconomic, environmental, and social impact assessments.

In this newsletter, we feature three joint research activity updates for Work Packages 4, 6 and 7.

WORK PACKAGE 4

This update is by Lydia Fryda, leader for WP4, Protocols & Benchmarking. Lydia is based at ECN>TNO, the Netherland's Organisation of Applied Scientific Research, which merged with Energieonderzoek Centrum in 2018.

LNEG focused on gathering and preparing protocols for the datasets (round robin activities) in tasks 6.1 Advanced Gas measurement techniques, 7.2 Biomass pre-treatment/fractionation and 5.2 Determination of kinetic parameters of pyrolysis, oxidation and gasification of biomass, while **CENER** took care of the benchmarking activities regarding these datasets. Questionnaires were sent around the participating partners in order to gather data in a consistent manner on the benchmarking of these round robin activities.

ECN>TNO is finalizing the new upgrade and update of the new Phyllis website. It has proven to be a challenging task - to categorize biomass resources and include all physico-chemical properties in such a way that provides valuable assistance to bioenergy and biofuels researchers. A demo is due out soon, but several functions are already in place (downloads in Word and PDF formats of multiple entries).

As WP4 also aims to propose new standards, the team members are following the CEN TC groups: CEN TC 411 – Biobased products and CEN TC 454 – Algae and algae products standardization. In the frame of WP4, the BRISK2 consortium will evaluate the opportunity for new standards.

JOINT ACTIVITIES RESEARCH

Members from BE2020+, ECN and CERTH and TUG at the labs of TU Graz: from left to right: Jacqueline Lagler, Lukas von Berg, Peter Sommersacher, Timotheus Tsiotsias, Stefan Martini, Tzouliana Kraia,, Johan Kuipers, Marco Geusebroek, Gernot Pongratz and Andrés Anca-Couce

with

WORK PACKAGE 6

This report by Andrés Anca-Couce focuses on a round robin of the sampling and analysis of producer gas composition from biomass gasification, including impurities. It took place in May 2019 at TUG, and was organized by Lukas von Berg and Andrés Anca-Couce.

Members from BE2020+, ECN and CERTH participated in this activity. The producer gas composition of a lab-scale fluidized bed gasifier operated continuously steam was measured, using wood pellets and Miscanthus pellets as a fuel.

The targeted compounds to be measured were main permanent gases (H2, CO, CO2, CH4, CxHy), tars with a high interest in light tars, S-compounds (H2S, S-tars as thiophene, mercaptans, dibenzothiophene), N-compounds (NH3, HCN, N-tars as pyridine) and other compounds such as chlorine.

Several methods were employed for sampling and analysis, including continuous gas analysis, micro-GC, tar protocol (standard and with modifications from

JOINT ACTIVITIES RESEARCH

partners), SPA, FTIR or wet chemical methods (for H2S, NH3, …). Furthermore, obtained samples were distributed to BE2020+, ECN, CERTH and CENER for further analysis. Results will be made available in the following weeks.

WORK PACKAGE 7

This joint research update comes from Carl Safi and Wim Mulder from WP7, Biorefining Approaches. Carl and Wim are based at the Wageningen University & Research Centre in the Netherlands.

WP7 has recently been focusing on investigating new pre-treatment and fractionation processes for lignocellulosic biomass, herbaceous biomass and marine biomass (macroalgae). These processes will be evaluated mainly by a round robin study using the three types of biomass and the application of a variety of fractionation processes. In addition, several partners upgraded and/or modified their existing infrastructure to expand the capabilities for fractionation and downstream processing of the extracted products beyond the state of the art. The round robin study will provide a basis for looking at current performance, variations and important factors that influence the fractionation of biomass, as well as the relevance of the fractionation methods for different valorisation routes of the biomass components. Furthermore, the study will allow for benchmarking the standard protocols available for the characterisation of solid biomass-derived samples. In addition, similarities and differences in performance will be assessed for the same fractionation process using different biomass types.

These advances - beyond the state of the art - can also be used to assess the needs for international standardisation of the fractionation and analysis methods under development to obtain more comparable results.

It is noted that the selection of a promising fractionation method is strongly interlinked with subsequent questions on the feedstock selection as well as products that need to be obtained in the downstream processing after fractionation. The data and information obtained from this study will be gathered together as a report, and will help the scientific community to elucidate the new findings in a comprehensive and consistent experimental framework. They will also be a basis for creating more standardised procedures in biorefinery activities.

Miscanthus grass

BIOENERGY NEWS—Supergen Bioenergy Hub

The UK Supergen Bioenergy Hub works across a wide range of stakeholders to develop sustainable bioenergy systems to support the UK's transition to an affordable, resilient, low-carbon energy future.

Supergen is now based at Aston University in Birmingham, UK, having moved from the University of Manchester. It is under the direction of Professor Patricia Thornley and the management of the Supergen Bioenergy Hub is undertaken by the Core Management Group. Our work is funded jointly by the Engineering and Physical Sciences Research Council (EPSRC) and the Biotechnology and Biological Sciences Research Council (BBSRC) and is part of the wider Supergen Programme. The Hub's work programme covers:

Resources: Researching and developing the production and potential of different biomass and waste feedstocks without negatively impacting food production and maximising local environmental and global climate benefits. This Topic Group is led by Iain Donnison (Aberystwyth University).

Pre-treatment and Conversion: Identifying preferred bioenergy pathways and developing new technologies and systems that support the Hub's vision for UK bioenergy. This Topic Group is led by Jason Hallett (Imperial College London), Tony Bridgwater (Aston University) and Chris Hardacre (University of Manchester).

Vectors: Identifying and selecting appropriate energy vectors to determine how they fit within a wider biorefinery strategy to reduce carbon and reliance on fossil fuel, and to maximise national and regional resilience. This Topic Group is led by Marcelle McManus (University of Bath).

Systems: Assessing the role and sustainability of bioenergy on energy systems and related sectors, and its impact on the energy trilemma of affordability, resilience and carbon reduction. This

Resources Leader Iain Donnison (third from left) at the joint Supergen launch event at the Houses of Parliament, June 2019

Topic Group is led by Mirjam Röder (Aston Univ). We also have Topic Group Leaders: Rebecca Rowe (Centre for Ecology and Hydrology) representing Resources and Systems; Andrew Welfle (University of Manchester) representing Vectors and Resources; Robert Holland (University of Southampton) representing Systems and Resources; and Katie Chong (Aston University) who represents Pre-Treatment and Conversion and Vectors.

Join: If you wish to join the Supergen Bioenergy Hub and have access to the researchers' meetings, annual assemblies and SHARE network for early career researchers, as well as being able to apply for our flexible funding calls, please contact our Project Manager, Emma Wylde at: e.wylde@aston.ac.uk,

Also connect with us at www.supergen-bioenergy.net. We're also organising the 'Building a Sustainable European Biofuel Industry' conference in Gothenburg from 4 to 6 November with two Nordic partners, Bio4Fuels (Norway) and Renewable Transportation and Fuels (Sweden). Attendance is free – sign up at bit.ly/BASEBIconference.

BRISK2
BIOFUELS RESEARCH INFRASTRUCTURE

HOW TO APPLY FOR TRANSNATIONAL ACCESS

The call for Transnational Access applications is open. Biofuels researchers from industry and academia are welcome to apply via the BRISK2 website at www.brisk2.eu.

Applications for TA must fulfil strict eligibility criteria:

- The minimum level of qualification required is a Bachelor of Science (BSc) or equivalent in a relevant Science or Engineering discipline.
- Applications can only be made to host organisations within the BRISK2 network and outside that of the applicant's own country and organisation
- Priority will be given to applicants who do not normally have access to similar research facilities within the country they are based
- Priority will be given to first time applicants
- Applications are welcome from across the world. However, the majority of grants will be available to EU member and Horizon 2020 associated states.

BRISK2 Application Steps

1. **Contact** your preferred BRISK2 project partner and discuss the viability of your proposal. Contact information is on page 23.
2. **Complete** the Transnational Access Application Form available at www.brisk2.eu/how-to-apply under consultation with your BRISK2 project partner.
3. **Submit** the completed PDF form via the BRISK2 website.

Pool Deadline	Assessment	Notification	Access Period
15 Oct 2019	Oct/Nov 2019	30 Nov2019	Nov 2019-Apr 2020
1 Apr 2020	Apr/May 2020	15 May 2020	May-Oct 2020
15 Oct 2020	Oct/Nov 2020	30 Nov 2020	Nov 2020-Apr 2021
1 Apr 2021	Apr/May 2021	15 May 2021	May 2021– Oct 2021

Choose from
15 partners
55 installations
11 countries

Individuals or teams of researchers are eligible to apply. BRISK2 will cover the cost of travel and subsistence up to the value of €1200 per visit

Transnational Access is coordinated by KTH

Applications can be made online. General enquiries can be sent to:
Mahrokh Samavati at brisk2@energy.kth.se

INTERNATIONAL BIOENERGY EVENTS

PILOTS4U UPDATE

Pilots4U Database has a new Look!

The development of a thriving bio-economy is vital in achieving a resource-efficient and sustainable economy.

One of the main challenges in the bio-economy innovation chain in Europe today is the step from technology to deployment. In most cases, it can be addressed through access to pilot and demo plants which are expensive industrial installations that most companies do not have direct access to.

One solution is the 'open access pilot- and multipurpose demo-infrastructures'. Hence, Pilots4U sets out to map all existing open access pilot and demo-infrastructures across Europe, with the aim of creating one, very visible and easily accessible network for the European bio-economy.

In this light Pilots4U launched a new website with a new look including many changes amongst which availability of different search options making the search for open access facilities easier and more user friendly.

See the database here:

Pilots4U
BIOECONOMY INNOVATION DATABASE

www.biopilots4u.eu/events

8th Annual European Biofuels Seminar
20 September, Brussels, Belgium

Argus Biofuels
8-11 October 2019, London, UK

12th International Scientific Conference on Energy and Climate Change
9-11 October 2019, Athens, Greece

International Biomass, Biofuels & Biogas Congress & Expo
22-23 October 2019, Brussels, Belgium

Renewable Energy, Biofuels & Green Technologies Congress
23-24 of October in 2019, Rome, Italy

Argus Biomass Nordics and Baltics
29-31 October 2019, Copenhagen, Denmark

Conference on Environmental Projection & Climate Change
4-5 November, Barcelona, Spain

Building a Sustainable European Biofuel Industry
4-6 November 2019, Gothenburg, Sweden

Ecomondo 2019
5-8 November 2019, Rimini, Italy

Power On Gas
20-21 November 2019, Copenhagen, Denmark

European Pellet Conference
March 4-6 2020, Wels, Austria

International Conference on Biofuels & Bioenergy
March 19-20 2020, Berlin, Germany

KEY CONTACTS

TA & General Enquiries to brisk2@energy.kth.se

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Work Package 4 Leader—

Protocols & Benchmarking

Lydia Fryda

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Work Package 5 Leader—

Feedstock Characterisation

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Work Package 6 Leader—

Advanced Measurement Techniques

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Work Package 7 Leader—

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Contributions for future BRISK2 newsletters are welcome. Please submit articles, photos and graphs to:

BRISK2 Newsletter Editor

Karola Woods

K.woods2@aston.ac.uk

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