

## Final project conference in Wales

**Severn Wye**, in conjunction with **Cwm Harry**, recently hosted the final conference for the EU-funded project, RE-DIRECT, which has developed innovative technology to promote sustainable use of biomass resources, by conversion into biochar and activated carbon products. Project partners in Wales; **Severn Wye**, **Cwm Harry** and the Institute of Biology, Environmental and Rural Sciences (IBERS), Aberystwyth University; were joined by European partners from Germany, France, Belgium and Ireland, at the community owned Ffarm Moelyci in North Wales.

During the morning, Professor Iain Donnison, IBERS, related how sustainable management of biomass resources can contribute towards several key Welsh Government policies, including the Environment Act and Wellbeing of Future

Generations Act. Olaf Herrmann, of the Baden-Baden wastewater treatment works and recycling centre, Germany, described how activated carbon has been produced on site using unique pyrolysis and activation technology, and has been used to filter micro-pollutants out of the water before it is discharged to watercourses.

"80 % of the received water is discharged from the sewage plant, and it increasingly contains pharmaceutical, industrial and agricultural pollutants", said Olaf Herrmann, Head of Wastewater Treatment, Baden-Baden, "we had the idea that we could produce activated carbon from the waste biomass resources brought to site to improve the water cleaning process".

Dr. Korbinian Kaetzl, University of Kassel, and Luned Roberts, IBERS, presented analytical data relating to biochar and activated carbon produ-



*Left: Picture of the new small-scale pilot plant at Ffarm Moelyci in Wales.*



*Right: Colin Keyse from the hosting project partner Cwm Harry moderates the panel discussion with the other speakers of the RE-DIRECT final conference. From left to right: Colin Keyse, Dr. Tim Scholze, Olaf Herrmann, Prof. Iain Donnison, Dr. Korbinian Kaetzl and Luned Roberts.*

ced from Welsh biomass resources, including bracken, rush and rhododendron, as well as organic waste received at the Baden-Baden recycling centre.

Presentations from the conference are available on Severn Wye's RE-DIRECT web page.



In the afternoon of the conference, Colin Keyse and Dr. Dave Ellis of Cwm Harry gave a tour of the farm scale biomass to biochar plant located on the farm. This included the screw press module where the wet, silaged green material is separated into press cake and liquor; the biogas module where the liquor is digested to produce methane and CO<sub>2</sub>; and the combined heat and power unit that uses the biogas to create electricity and hot water used in the process. There was a mobile biochar kiln in operation (an Exeter Retort - *pictured at top right*) to demonstrate the final step of the process - the conversion of press cake and other biomass to biochar, and an



illustration of the types of product that can be made from the outputs.

The demonstration was followed by a workshop session including for example the Product Development workshop which was based on Design Thinking methodology and was led by experts from the BLINC Cooperative and Innopreneurship Masters students from University Duisburg-Essen, Germany. The one-hour workshop encouraged delegates to think outside the box to come up with innovative biochar products. Each delegate team was guided through unique innovation sports exercises by the students to develop creative ideas and connections. Afterwards the product ideas were pitched to the whole group and were evaluated by the other participants to find the winning team! The session was fun and informative!







## RE-DIRECT comes to an end ...



The RE-DIRECT project finishes in December 2019, and the project team across Europe are currently collating the data, knowledge, experiences and research to produce Regional Development plans.

The project has converted a wide range of organic resources; ubiquitous rural vegetation (rush, bracken, Molinia, rhododendron, gorse), roadside verge arisings, invasive species, green waste and horse manure; into biochar and activated carbon. The research in Wales has focused on biochar uses for sustainable agriculture to reduce greenhouse gas emissions, reduce water pollution from run off, and improve on-farm nutrient management, as well as to improve gas yields from anaerobic digestion plants.

Our partners in Baden Baden, Germany, have focused on activated carbon production for wastewater treatment, and have installed unique pyrolysis and activation technology at the wastewater treatment works to produce filtration products from locally sourced organic resources, which result in significantly reduced micro-pollu-



tants being discharged to local watercourses.

During the project we have identified that biochar has the potential to play an important role in assisting Wales to hit its targets set out in the Wales Environment Act (2016), Well Being of Future Generations Act (2015), and amendment of 2008 Climate Change Act. Biochar use in agriculture can contribute towards the difficult task of reducing agricultural emissions in response to The Committee on Climate Change's Net Zero report (2019), by reducing enteric GHG emissions, improving soils and sequestering carbon.



## New innovative project in Wales to deliver on multiple cross-cutting priorities

### **THREE C: Creating and sustaining Charcoal value chains to promote a Circular Carbon economy in NWE Europe**

As a result of the work carried out by the RE-DIRECT project, the opportunities in developing a circular carbon economy in Wales became apparent. This led to **THREE C**, a new innovative European cooperation project which has successfully received approval from the EU's Interreg NWE programme. This carbon economy will focus on the production of biochar, activated carbon, and novel innovative goods from under-utilised biomass resources and organic waste

sources. The project aims to transform the existing limited, heterogeneous, EU carbon industry by creating carbon hubs in each partner region, which will focus on developing innovative prototypes, products and services based on local carbon feedstocks, thereby developing business and entrepreneurship opportunities in the circular carbon economy.

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