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## Blog

### Guest Blog: My 2nd Biomass Breakfast – Aston University seeks to transform life in rural India

By Elizabeth Block

Faithful readers of this blog will remember my first biomass breakfast – out at a rugby club somewhere where wood pellets were on the menu, as it were. Actually there were bacon sandwiches, no pellets – and an opportunity to “see” wood pellets whisked into a boiler. Not there was anything to see except the pellet-bearing lorry. The hosepipe was opaque, so, alas, we could not see the flow.

For some reason, fate invited me to another biomass breakfast, this time at the fashionable Cinnamon Club in Westminster. I was in the library and the big square table did not have a bit of biomass on it – except in the sense that everything on earth except stone is potentially “biomass.”

Anyway, there were lovely plates of fruit, croissants and cheese. All this was courtesy of [Aston University](#) in Birmingham. Why was this?

Because Aston’s in-house outfit, the European Bioenergy Research Institute (EBRI), has developed the [Pyroformer™](#). This remarkable mobile machine uses a thermal treatment process for up to 100 Kg/h of biomass feed. When coupled with a gasifier it will have an output of 400 kW – equivalent to providing power for 800 homes (based on a consumption of approximately 3,000 kWh per home). A Pyroformer was operational through 2012 at Harper Adams University in Shropshire and an industrial size demonstrator is being constructed on the Aston University campus. It will be operational from autumn 2013.

#### EBRI intends to help local farmers in India’s Punjab region stop burning their excess straw and instead convert it into oils, gas and biochar – a highly renewable process.

EBRI, which is led by Professor Andreas Hornung, intends to help local farmers in India’s Punjab region stop burning their excess straw and instead convert it into oils, gas and biochar – a highly renewable process. This burning is illegal in some places but it still goes on.

So millions of tonnes of this straw, which is left over from wheat and rice harvests, is wasted when burned, mainly to clear the land. Not only is it wasted but it also kills off nutrients and adds to pollution. According to EBRI, about 116 million metric tonnes of this crop residue are burned each year.

With the Pyroformer, however, all sorts of benefits are at hand. The waste straw suddenly gains value and forms the basis for decentralised electricity – eliminating the need for expensive diesel. Of course, the air quality improves once the burning stops, and the oils produced can be used to drive engines to power farming equipments.

And the biochar can be used as a fertiliser to increase crop yields. Good news: a pilot project is on and EBRI is now looking for other countries where this technology could be applicable.

The work of EBRI has been recognised: in March 2013, it won the “Best Technological Breakthrough” award for its innovative bioenergy technology, which transforms multiple waste products into cost effective heat and power. The technology works by heating and chemically treating waste in a single, sealed process and produces oil and gas as by-products.

#### Tests show that unlike other bioenergy solutions, the Pyroformer has no negative environmental or food security impacts.

Tests show that unlike other bioenergy solutions, the Pyroformer has no negative environmental or food security impacts. As it uses multiple feedstocks, it does not require the destruction of rainforests or the use of agricultural land for the growth of specialist biocrops. The process is emission free and is said to dramatically reduce the amount of material sent to landfill – and reduce the world’s reliance on fossil fuels.

Dr Hornung could not attend the breakfast but Dame Julia King, Vice-Chancellor of Aston University was there. She said: “Our goal is ‘exploitable research.’ This is an international social enterprise and we are working with the Indian Institute of Technology in Ropar.”

The pilot started in June 2013. The pilot scale plants in three local villages are low cost and small scale. According to Robert Berry, Executive Dean of the School of Engineering and Applied Science at Aston (*pictured*), the team spends eight weeks in each village and hope to demonstrate the benefits within three months.

He emphasised the Indian input: “It is clear that this project has struck a chord with people in India and beyond. They want to be involved and to make a difference.”

He added: “It was very clear that there needed to be increased Indian involvement and investment. So we are in the process of establishing a charitable trust with IIT Ropar. And we want Indian manufacturing. This could work in Egypt and other developing countries.”

Berry said that the charitable trust will be responsible for raising the funds needed for the next phase: a further five to six mobile units to conduct further testing and business modelling throughout India.

“If the price of the waste exceeds the price they get from the local paper mill, the farmers could sell the waste,” he said.

**Trials**



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## **Trials**

The mobile harvest waste to energy unit is currently being trialed in the village of Khusapura where the villagers are receiving training and supervision to run the technology themselves. Following this trial, further trials will take place in the villages of Ladal and Hussainpur. The results of these trials using wheat and rice straw to generate energy will be available later this year.

Aston's efforts have already attracted financial support from the [Oglesby Charitable Trust](#).

In sum, this initiative out of Aston has the opportunity not only to transform the lives of people in remote villages in poor countries but has applications here in Europe. The Pyroformer, it is hoped, will provide commercially viable solutions to dispose of a variety of waste streams, including digestate from AD plants.

Aston is promoting this technology through a company called Optimus Energy, with advice from EIDC – the Environmental and Infrastructure Company. Optimus may be viewed as a university spin-off but has not yet been officially launched. ♦

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*Elizabeth Block is a freelance journalist based in the UK.*