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News video synopsis: Cooking biomass to make bioenergy

As reserves of fossil fuels dwindle and the need to cut carbon dioxide emissions becomes paramount the search is on for renewable energy alternatives that are also carbon neutral.

The hunt for viable forms of bioenergy is well advanced at Aston University, in the West Midlands of the UK, where a research team are leading the field in the development of 'fast pyrolysis', which can convert biomass into a biofuel in a carbon neutral process.

All organic matter is biomass: crops, forest residues and agricultural waste. When treated through a fast pyrolysis process biomass produces clean energy sources, in a sustainable way, in a closed carbon cycle.

An analogy for the fast pyrolysis process is the traditional way of making charcoal, only much faster, and through a complex machine. By heating biomass sources to a carefully controlled temperature around 500 degrees and then cooling the products down at speed, a bio-oil is produced that can be used for energy for power, heat, transport fuels and chemicals.

Two key considerations this process shares with other alternative fuel sources, however, are cost and crop yield. For maximum efficiency, biomass needs to be produced at as high a yield as possible. UK production costs are relatively high but with rising oil prices and progressive R&D this could soon change.

Using a biomass resource with a high yield, like willow or miscanthus, known as elephant grass, the fast pyrolysis process could generate up to three times the amount of renewable liquid fuel from the same land area used to produce bioethanol from straw, corn or sugar; or biodiesel from rapeseed for example.

At the moment fast pyrolysis cannot produce fuel at a competitive cost to fossil fuels, but with rising oil prices and greater political commitment it could make a major contribution to a cleaner and more sustainable planet in the future.

As they continue to research ways to improve on the fast pyrolysis process, the Aston team's future vision is of biorefineries producing sustainable energy products to the order of millions of tons a year.

Footage:

- Planes over
- Traffic, and car exhausts
- Petrol station
- Lab shots
- Samples of biomass
- Straw, agriculture
- Fast Pyrolysis rigs

Interviewees:

- Professor Tony Bridgwater, Chemical Engineering and Applied Chemistry, Aston University
- Mr. Mark Coulson, Chemical Engineering and Applied Chemistry, Aston University