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MicroFuel



MICROFUEL PROJECT 'STRIKES OIL'

Can Europe's forestry waste be converted into useful products? The MicroFuel project may have the answer.

The project (full title: *Mobile Microwave Pyrolysis Plant Turns Biomass into Fuel Locally*) has run for three year, funded by the European Commission's Framework programme. The project involves four European forestry associates, plus four companies and research groups from Norway, Italy and the UK.

At the pilot plant of Nor-Tek in Notodden in Norway, the project team has developed a mobile pyrolysis plant. This prototype uses microwaves to convert forestry residue and wood waste into useful products. By using microwaves, the waste is converted by flash pyrolysis into bio-oil and bio-char. The process is rapid (around 1 second).

The MicroFuel process is environmentally-friendly. The bio-oil is renewable and has a much higher energy density than the original biomass. By treating waste wood in this way and using the bio-oil as a fuel, the process is 'carbon neutral', as it does not rot and produce methane (a greenhouse gas). However, if the bio-char in forests and farms to absorb carbon dioxide and promote soil grown, the process even becomes 'carbon negative'.

As the project enters the last few months, the team has finally 'struck oil' producing tens of litres of combustible fuel from woodchips. A crude test of the oil confirmed that it does burn! The project has attracted considerable interest in Norway, including a visit from Norway's Environment Minister Erik Solheim on 6 March 2012.

The MicroFuel team is now wrapping up the project with full testing of the bio-oil's properties as a fuel. There will be further demonstrations of the technology, both within the MicroFuel consortium and to companies and forestry organisations interested in developing the prototype further. Further development could involve producing several transportable versions, fitting into standard 40 foot shipping containers. These could be driven deep into Europe's forests to process forestry waste and produce both char and bio-oil for the forestry owners to sell.

More details of the project are at www.micro-fuel.eu. The images below show the MicroFuel prototype, bio-oil and char, plus Erik Solheim's visit.



The MicroFuel reactor. This consists of a turntable in which woodchips are exposed to microwaves. This causes flash pyrolysis, leaving bio-char, with the resulting gases condensed to harvest bio-oil.

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Bio-oil collected from the pyrolysis process (left). It can ignite, confirming its potential as a fuel (right).

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Bio-char produced in the prototype plant. The waste wood has been fully pyrolysed, leaving light carbonized chips

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Norway's Environment Minister Erik Solheim (right) visits the MicroFuel prototype on 6 March 2012.

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