

WELCOME from the BANZ Executive Officer



Welcome to the latest *Bioenergy News*.

This issue of *Bioenergy News* comes after a very productive Biogas Workshop, BANZ AGM, and Interest Group inaugural meetings. BANZ has taken a big step forward with the establishment of specific topic Interest Groups. These will allow wider membership involvement and spread the day-to-day activity leadership across a number of industry specialists. The BANZ Board will be able to concentrate more on wider governance, direction setting, and performance monitoring. The Executive Officer will also have the assistance of a number of experienced practitioners in each of the specific topic areas.

Bioenergy is also entering a period where it has improved relative economics compared to other energy fuel sources. It is also more topical as the liquid biofuel debate extends from the industry to include the wider public. This is shown by the number of times that BANZ is now approached for comment on energy matters.

As bioenergy becomes an energy source of choice, compared to coal and gas, then there is a greater need for professional industry practitioner input. This is where BANZ can assist all participants in the industry. However BANZ will be most effective if it is responding to members needs. These can now be channelled through the Interest Groups so that actions are targeted.

Brian Cox, Executive Officer BANZ

This Issue:

- News from the BANZ Board and AGM
- Welcome to new BANZ Members
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- BANZ Interest Groups - Update
- New Zealand News Briefs
- Feature Article – Wood Chips
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News from the BANZ Board and AGM

The last Board meeting was 3rd July 2008. Key issues discussed included:

- Update on the Executive Officer activities
- Action Plan for BANZ work going forward
- Preparation for the July AGM
- Change to the Constitution re the BANZ Interest Groups
- BANZ in the news
- Proposed future workshops
- Accounts update

The BANZ Board continues to work on the Action Plan that is on the Members area of the BANZ website. Members are encouraged to view the Action Plan and provide their views on gaps, priorities etc.

Minutes from the AGM held on the 9 July 2008 are available to **paid-up** Members in the Members Area of the BANZ web-site using this link: <http://www.bioenergy.org.nz/members/login.asp>. Key outcomes from the AGM are:

Appointment of Directors

Natures Flame (Andy Matheson)
Energy for Industry (Grant Smith)
Waste Solutions (Jurgen Thiele)
RCR Energy (Philip Gedye)
Living Energy (Rob Matheson)
Canterbury University (Shusheng Pang)
Vortex (Doug Pigou)
Scion (Michael Jack)
East Harbour (Mike Suggate)
Ernslaw Bioenergy (Murray Cowan)
Massey University (Attilio Pigneri)
Individual) Gary Wilson

EECA are a partner and as such have rights to attend Board Meetings. They are currently represented by Pramesh Maharaj

A chair will be elected at the first Board meeting.

Alteration of Constitution

The constitution was altered to allow for the Conveners of Interest groups to be on the Board

Subscriptions and Interest Group Levy

The membership subscriptions for the 2008/9 year remains as currently set, and a levy for participation in each of the Interest Groups has been set at \$100 plus GST except where modified according to the class of membership:

Corporate Members;

Have right to join any of the Interest Groups with no levy payment

Full Associate Members:

Membership subscription includes participation in two Interest Groups free of levy

Ordinary Associate Members

Membership subscription includes participation in one Interest Group free of levy

Individual Members:

Pay \$100 per Interest Group.

Interest Groups

The following were nominated to each Interest Group Committee

Wood Fuel

Rob Mallinson (Convener)
Allen Estcourt
Murray Cowan
Philip Gedye
Rens Bosman

Wood Pellets

Dave Marriott (Convener)
Bruce Clow
Andy Matheson
George Estcourt

Biogas

Guenter Wabnitz (Convener)
Bob Weston
Tony Rhodes
Rocky Renquist
Humphrey Archer
Andrew Thorpe
Attilio Pigneri
Jurgen Thiele
Siegfried Zoellner
Stephan Heubeck

Liquid Biofuel

Mike Suggate (Convener)
Attilio Pigneri
Jurgen Thiele
Richard Gapes
Shusheng Pang

Welcome to new BANZ Members

Welcome to the following recent 'new' members of BANZ.

Full Associate Membership

- **Pump Systems Ltd** – Contact Ian McEwan
- **Vector Ltd** – Siegfried Zoellner
- **Maunsell Ltd** – Warwick Cutfield

Ordinary Associate Membership

- **Distributed Energy and Waste Systems (DEWS)** - Karl Hartman

Individual Memberships

- **Dairy NZ** — Garry Waghorn
- **Biogas Energy Ltd** – James Young
- **Lincoln Ventures** – Rupinder Singh
- **Armadillo Engineering Ltd** – Allan McCreadie
- **Wallace Corporation** – Shane Carter
- **Turvey Company Ltd** – Alexander Longuet-Higgins
- **Windy Farm Ltd** – Alec Dondertman
- **Albert van Oostram & Associates** – Albert van Oostram
- **Genesis Ltd** – Kimbal McHugo
- **PFS Consultants Ltd** – Peter Brown
- **N&EE Reid** – Steve Shivas and Andrew Hoskins
- **Rose & Heather** – Simon Coughlan
- **Cenaught Ltd** – Andrew Thorp and Cameron Walker
- **Greenlane Biogas / Flotech Ltd.** – Sean Molloy and Hayden Mack

Please note – Membership Subscriptions for existing Members are due for renewal and will be with you soon.

Report back from the Biogas 2008 Conference

Thank you to everyone who attended the Biogas 2008 Conference in Hamilton in July. The event was a great success and had over 140 people in attendance.

The presentations from the day are on the BANZ web-site currently. If you have not yet accessed them please do so quickly as they will soon be moved to the Member's only area of the web-site. The presentations are located here: <http://www.bioenergy.org.nz/workshops.asp#July2008>

For continued engagement in the Biogas area anyone interested should look to the activities of the newly established Biogas Interest Group. A brief summary of the activities is set out below. Updates will be added to the BANZ web-site periodically.

Further details will be available to those participating in the Interest Group's activities through the Members only access on the BANZ web-site. Further details below and also at - <http://www.bioenergy.org.nz/members/login.asp>.

BANZ Interest Groups – Update

BANZ is developing FOUR Interest Groups to target more closely services to members related to their specific interests. The groups are as follows:

- Biogas Interest Group
- Liquid Biofuels Interest Group
- Wood Pellets Interest Group
- Wood Fuel Interest Group

If you are interested in being a member of a specific Interest Group please contact advise the Deputy Executive Officer at Connie.crookshanks@eastharb.co.nz.

The Interest Groups are open to all BANZ Members (subject to a levy according to Membership Class) and they each have a specific focus of activities on topics of interest. A Convener for each Group will guide the interests and activities of the Group and will report back to the BANZ Board. The Convener will be allocated a place on the BANZ Board in addition to those already identified.

Minutes from each of the Inaugural Interest Group meetings held on 9th July 2008 are available to BANZ Members through the BANZ web-site at: <http://www.bioenergy.org.nz/members/login.asp>. If you are not a Member and would like to see the minutes please contact Connie Crookshanks at Connie.crookshanks@eastharb.co.nz.

Interest Group Conveners

The Conveners of each of the Interest Groups are as follows.

Interest Group	Convener
Biogas	Guenter Wabnitz, Maunsell Guenter.Wabnitz@maunsell.com
Liquid Biofuels	Mike Suggate, East Harbour, mike.suggate@eastharbour.co.nz
Wood Pellets	Dave Marriott, Parkwood Fires dave@parkwood.co.nz
Wood Fuel	Rob Mallinson, Living Energy, rob.m@livingenergy.co.nz

Interest Group Work Programmes

The preliminary Work Programmes for each of the Interest Groups were discussed at meetings held before the recent AGM. Details of the Work Programmes are set out in the Interest Groups areas in the **Members Only** section of the BANZ web-site and they are summarized below here.

Current Biogas Interest Group Activities

- Biogas Interest Group web-site – under development
- Terms and Conditions of Interest Group Membership
- Minutes from the Inaugural Meeting
- Contacting Interested Parties
- Planning the next Interest Group Meeting.

Current Liquid Biofuels Interest Group Activities

- Liquid Biofuels Interest Group Web-site – under development
- Terms and Conditions of Interest Group Membership
- Minutes from the Inaugural Meeting
- Contacting Interested Parties
- Planning the next Interest Group Meeting

Current Wood Pellet Interest Group Activities

- Wood Pellet Interest Group Web-site – up-dating of site
- Terms and Conditions of Interest Group Membership
- Minutes from the Inaugural Meeting
- Contacting Interested Parties
- Planning the next Interest Group Meeting
- Training Course development

Current Wood Fuel Interest Group Activities

- Wood Chip Interest Group Web-site – under development
- Terms and Conditions of Interest Group Membership
- Minutes from the Inaugural Meeting
- Contacting Interested Parties
- Planning the next Interest Group Meeting

NEW ZEALAND NEWS BRIEFS:

- Schools benefit from Wood Chip Boilers
- Bioenergy Knowledge Centre – Revamp
- BKC Case Studies - Forest residues as fuel
- EECA - Wood Energy Grant Scheme – funded projects

- Biogas from Kiwi fruit – Zespri Study
- Gull introduces a 10% bioethanol blend for its 91 octane fuel – an NZ first

Schools benefit from Wood Chip Boilers

Living Energy will be installing 6 new wood chip boilers at various schools around New Zealand in the coming months, 3 of which will have an underfed hearth (for dryer wood chip) and the other 3 will have a step-grate system, for chip up to 55% mc. These school boilers range in size from 150kW to 650kW. Rob Mallinson, MD of Living Energy said

“We are very pleased to have been successful with so many schools as part of EECA’s Renewable Heating for Schools programme. The schools can see the benefits of a modern, fully automated wood chip boiler, and their decision will allow their school to significantly reduce its carbon footprint as well as their particulate emissions compared to the coal they were using before.”

The boilers are being manufactured by Binder gmbh, of Austria, who are recognised as one of the leading suppliers of modern wood chip boilers.

“We are hoping that these projects will form a springboard for many other energy users to make the switch to locally sourced wood chip” Rob said.

Bioenergy Knowledge Centre (BKC) – Web-site Revamp

The BKC web-site has a new look. The site is the most comprehensive resource on wood waste and harvesting residues – details at: <http://bkc.co.nz/Home/tabid/36/Default.aspx>.

Speak with an Expert - remember – you can speak with a specialist about whether bioenergy is an option for you - phone: **0800 BIOENERGY (0800 246 363)**.

BKC Case Studies - Forest residues as fuel

Where wood processing residues are insufficient to meet the fuel demand for a biomass fuelled boiler then alternative fuel supplies need to be considered. One fuel to consider is forest residues at landings and skid sites within the forests. Providing factors affecting supply are appropriately evaluated then these forest residues can be a cost effective fuel.

The following link describes a hypothetical assessment of the potential supply and cost of forest residues to a bioenergy plant. <http://www.bioenergy.org.nz/documents/publications/articles/RefProjects/BioenergyRef6.pdf>

Wood boiler fuel - Payment by energy versus weight - Case study - This study determines the effects of moving from a payment system based on weight to a payment system based on energy content at a large industrial site, using woody biomass as a fuel source. More details at: <http://bkc.co.nz/Portals/0/docs/FIDA%20%20Payment%2002%2007%202008.pdf>

Woody biomass for boiler fuel - Guidelines for payment by energy content - A payment system based on energy content is one method of ensuring a high value fuel, which is paid for in a manner fair to both buyer and seller. The higher the quality of the fuel, the higher the energy content, the higher the value to both seller and purchaser. More details at: <http://bkc.co.nz/Portals/0/docs/%20FIDA%20ES%2011%20Guidelines%20V3.pdf>

Forest residue recovery study - Hogging direct to truck versus hogging to ground - fibre loss and cost issues - The Wood Energy Programme Engineering Solutions Phase I study identified a number of potential opportunities to improve the efficiency of forest residue derived fuel delivery. One of these was to reduce fibre loss during hogging and loading. More details at: <http://bkc.co.nz/Portals/0/docs/Hogging%20study%20report%20020708.pdf>

EECA - Wood Energy Grant Scheme – funded projects

The Wood Energy Grant Scheme offers help, by way of funding and information, to those interested in using wood residue as an energy source. The following list is some of the grants EECA has distributed since the Wood Energy Grant Scheme began (including grants from the most recent funding round). More details at: <http://www.eeca.govt.nz/renewable-energy/bioenergy/fida.html>

1. **NZ Foam Latex** - This Christchurch manufacturer has installed a reconditioned boiler to burn wood chips because their existing source of coal-fired steam was from the neighbouring site and was being disconnected.

2. **Starwood** - This Timaru company makes barbecue skewers and is buying a pelletiser to turn their wood residues into a useful commodity, rather than having to pay for dumping the "waste".
3. **Ernslaw / AES** - Ernslaw's Bioenergy company is importing a pilot bio-oil plant from Canada to test the conversion of forest residues into bio-oil. This mobile plant can be easily assembled at skid sites within the forest.
4. **Rakua Energy** - This company is recycling a great amount of demolition waste at its Christchurch site. The funded project will allow them to screen the hog fuel and wood chips to suit various customer requirements.
5. **Findlater Sawmill** - This sawmill in Winton, Southland is installing a wood-fired cogeneration plant to allow the business to grow. The expense of upgrading the electricity supply lines was the driving force.
6. **Waste and Energy Solutions** - This supplier of hogged fuel will now also be able to offer wood chips and pellets to the local market.
7. **Southern Pine Products** - A briquette press is to be purchased to create a useful wood fuel from MDF dust, which is currently sent to a landfill. Briquettes are to be sold to a local plant nursery.
8. **Titoki Healing Centre (EBET)** - This small residential centre near Whakatane is upgrading their heating system to include a new pellet-fired boiler and a pellet burner. This will be supplying space heating as well as domestic hot water.
9. **Fairleigh Farms** - A 200 kW pellet boiler and reticulation system is to be installed to replace LPG heating. The heat is to protect glasshouse-grown flowers from frost.
10. **Lakeland Steel Products** - This design and manufacturing company in Rotorua is starting to manufacture a sawdust-fired boiler that dries the green sawdust before burning it, with heat recovered from the flue.
11. **AgResearch** - The Invermay operation of AgResearch has old boilers that will be replaced with wood chip boilers. This will allow them to provide all the heating requirements for the whole site including three new buildings.
12. **Central Wood Recyclers** - This Taupo-based company has a number of hoppers operating in the North Island. The grant is helping to buy a de-stoning machine that will turn yard scrapings into useful bark for fuel and reusable gravel for the yard.
13. **LanzaTech** - This Auckland company has been researching the conversion of flue gases (predominantly carbon monoxide) into useful liquid fuels using a fermentation process. The grant will allow them to test the possibility of doing the same with syngas from a wood gasifier.
14. **Asplundh** - This project is looking at the possibility of more carefully selecting and chipping the wood residues from Asplundh's arborist operations in order to provide useable wood fuel and minimise dumping.
15. **Fonterra** - This dairy company is undertaking a study at their Brightwater site to convert a boiler conversion to run on wood fuels.
16. **DB Breweries** - This Auckland brewery is looking to convert some of their boiler capacity to wood fuels. The study will look at the economics and other issues to do with supplying wood to a central city location.
17. **Wallace Corporation and Bernard Matthews NZ** - These two North Island meat works are having a feasibility study done to look at the economics of using wood in their boilers.
18. **City Firewood** - A study is being done by a local consultant in Christchurch to study the issues with handling wood chips. The purpose is to improve the flowability so that it can be used where more-expensive pellets may have had to be used.

19. **Manukau City Council** - This study is to look at the range of boiler applications in the council's estate and determine which boiler(s) may be most cost-effectively switched over to run on wood fuels, supplied from the council's own parks.
20. **Development Enterprises Ltd** - Several stakeholders in Kawerau are looking to set up a cooperative that will manufacture wood pellets for the local market.
21. **Kapiti Coast District Council** - The council is looking to reduce their dependence on fossil fuels for their sludge drying process. The study will consider all the issues related to using wood as a fuel instead.

Biogas from Kiwi fruit – Zespri Study

ZESPRI International Limited is the world's largest marketer of kiwifruit, selling kiwifruit into more than 60 countries. Zespri has been looking into ways of turning kiwifruit waste into something more valuable than animal fodder. A recent feasibility study commissioned by Zespri sets out the potential for reducing post harvest costs and improved market access in countries with potential concerns about the carbon footprint of kiwifruit from New Zealand.

Biogas digesters have become symbols for renewable energy on the European markets and Zespri is keen to understand if there is scope for this technology to be introduced into New Zealand. Zespri is keen to demonstrate its commitment to **innovation** and the **environment**. Kiwifruit has a number of advantages with respect to generating biogas: its rich in energy, similar to grapes or other fruit and is principally well suited for anaerobic digestion. Seasonal production however means that an anaerobic digester plant solely fed by kiwifruit waste would only run for six to eight months in a year and would economically benefit from co-processing of other substrates, such as meat waste or communal waste, during the rest of the year. The whole report is available on the publications section of the BANZ web-site [Many thanks to Alistair Mowat from Zespri for permission to use the report].

Gull introduces a 10% bioethanol blend for its 91 octane fuel – an NZ first

Gull has recently introduced a 10% bioethanol blend for its 91 octane fuel - a first in New Zealand – '*Gull Regular Plus*'. Gull has been selling a 98 octane fuel containing 10% bioethanol to drivers of old and new vehicles since August last year. Bioethanol blended petrol is a mix of regular petrol and a percentage of the more environmentally-friendly bioethanol. Gull's bioethanol blended petrol is made from dairy industry by-product in Reporoa from Fonterra.

Parliament is currently considering the Biofuels Bill which will make it compulsory that by 2012, 2.5 percent of all the petrol and diesel oil companies sell must be biofuels. Part of the legislation will ensure that all New Zealand's biofuels come from sustainable sources as they become more widely available. More details at: <http://www.gull.co.nz/>

FEATURE ARTICLE: Wood Chips

The fourth BANZ Interest Group is the Wood Fuel Interest Group. The Group will focus on a range of issues set out in the Work Programme on the BANZ web-site at: <http://www.bioenergy.org.nz/members/login.asp>. This article looks at some of the issues of interest in Wood Chips including Standards, chip boilers, a comparison of wood chip vs pellets and a number of sources of useful reports in wood chips.

Typically, wood chips are a byproduct of other processes such as sawmilling, arboricultural and forestry activities. A common use for chips currently is as a landscaping resource but interest in chips as a fuel is growing. Wood chips are widely available in particular close to areas with significant forestry resources. The chips are air-dried (to achieve a specific moisture content), they are then chipped and screened to ensure their ease of use as fuel in automated boiler systems.

STANDARDS

New Zealand - Currently there is no New Zealand standard for woody fuels so buyers must ensure the wood chips are suited to their needs. This is one of the issues that the new Interest Group will address and to assist this ECA have prepared an initial draft that will now be considered by the Interest Group..

Europe - CEN/TC 335 is the European technical committee developing the draft standard to describe all forms of solid biofuels within Europe, including wood chips, wood pellets and briquettes, logs, sawdust and straw bales. To specify solid biofuels to EN 335, a number of technical standards have been published, including methods of determining various parameters. Key standards include 'Moisture Content' and 'Chip Size'.

- **Measuring Chip Moisture Content**

- CEN/TS 14774-1:2004 sets out the reference method of using oven drying to determine total moisture content
- CEN/TS 14774-3:2004 sets out a method for determining moisture in a general analysis sample.

- **Measuring Chip Size**

Chip size distributions are measured using screens, and again methods for determination are set out in technical standards:

- CEN/TS 15129-1:2006 using an oscillating screen
- CEN/TS 15129-2:2006 using a vibrating screen
- CEN/TS 15129-3:2006 using a rotary screen.

Chip size is a key aspect of the chip detail to be standardized to ensure good operation. The most important consideration for most installations is that there be no long 'slivers' over a certain size as these can cause bridging in fuel feed systems, leading to blockages, and jamming in augers. The system installer should tell the customer of the maximum allowable length. In addition, too many fines (small particles and sawdust) can also cause difficulties as they can build up in places in the fuel feed system and compact over time, potentially leading to obstructions or blockages.

- **Other parameters**

Other parameters of wood chips, set out in EN 335, can also cause problems occasionally:

- **Excessive ash content**, possibly as a result of a high proportion of bark or leaves.
- **Contamination of the fuel** with excessive levels of heavy metals, alkali metals, sulphur or chloride from soil or air or inclusion of dirt, soil or stones.

The wood species used will have a bearing on the **calorific value** of the chips, with hardwood chips being higher than softwood.

Useful UK Wood Chip Reports on Storage - Drying and Design.

1. **Commercial Wood chip storage and drying trials** <http://www.berr.gov.uk/files/file14928.pdf>
2. **Design of a 2.5MW(e) biomass gasification power generation module.** Design based on the generation of electrical power from a wood chip feed stock. Carried out under the DTI's New and Renewable Energy Programme. <http://www.berr.gov.uk/files/file14930.pdf>
3. **Identification and characterisation of factors affecting losses in the large-scale, non-ventilated bulk storage of wood chips, and development of best storage practices.** Report of a project carried out under the DTI's New and Renewable Energy Programme. <http://www.berr.gov.uk/files/file14947.pdf>

Wood Chip Comparison to other Fuels – Wood Pellets and Cordwood

Woodchips are typically less expensive than **wood pellets**. Also, woodchips are theoretically more energy efficient than pellets, because less energy is required for manufacturing, processing, and transportation; however, this assumes that they are consumed in an appropriately designed burner, and as of 2008, these are mostly only available in large systems designed for commercial/institutional use. In contrast to the lack of residential systems, commercial heating installations have been very successful in terms of performance, cost, reliability, and efficiency.^[1]

Woodchips are also less expensive than **cordwood**, because the harvesting is faster and more highly automated. Also there is a greater supply, partly because all parts of a tree can be chipped, whereas small limbs and branches can require too much labor to be worth converting to cord wood. Woodchips are similar to wood pellet, in that the movement and handling is more amenable to automation than cord wood, particularly for smaller systems. Cordwood generally

needs to be "seasoned" or "dry" before it can be burned cleanly and efficiently. On the other hand, woodchip systems are typically designed to cleanly and efficiently burn "green chips" with very high moisture content of 43-47% (wet basis).^[2]

Wood Chips	WOOD Pellets
Moisture	Moisture
Minimum 22% moisture content (EU Standard) Typically around 35% or more.	Maximum 8% moisture content (EU Standard)
Storage and Fuel Delivery	Storage and Fuel Delivery
Requires typically 3 times the storage capacity or more frequent deliveries Capital costs for storage are generally higher because of higher volume of chip and in most cases the need for agitation of the irregular size and high moisture content of chip.	Requires less storage capacity and deliveries. Storage costs are lower due to the energy density of pellets and rarely requires agitation.
Maintenance	Maintenance
Generally require more routine maintenance if quality control on fuel supply is not maintained. Quality control is harder to ensure for chips than pellets.	Less maintenance required with a range of very high quality fully automated boilers now in the market place.
Cost of Chips	Cost of Pellets
Chips are cheaper per tonne but are less energy dense.	Pellets are more expensive per tonne but are more energy dense.
Overall Cost	
Specific valuations are required with reference to the boiler site, its distance to the source of fuel, the quality and reliability of the fuel source and capital cost of the fuel system.	

Wood chip burners – what to know

There are several types of woodchip boiler on the market and each type has its own advantages. The boilers are characterised by the type of combustion and feed mechanisms, such as grate furnaces, under-feed stokers, or fluidised bed combustors. Using modern technology, wood chips can be burned efficiently up to 55% moisture content (wet basis).

Wood chip boilers are capable of using either chip or pellets. Modern wood chip boilers are fully automated with automatic tube cleaning, automatic starting and automatic de-ashing, With efficiency levels of up to 93% such boilers offer levels of performance and convenience comparable to oil or diesel systems.

Wood-fired boilers use heat exchange surfaces to heat water, or to make steam if required for industrial processes. Hot water can be used for space heating using under-floor, radiant, ceiling and forced air central heating. Any user of large quantities of hot water (e.g., hotels, prisons etc) is well-suited to making the switch to wood chip. More details at: <http://www.usewoodfuel.co.uk/Pellet&Chipboilers.stm>

The UK's BIOMASS Energy Centre (BEC) (owned and managed by the UK Forestry Commission, via Forest Research, its research agency) provides information on Wood Chips as a part of a series on 'Virgin Wood' as a fuel:

http://www.biomassenergycentre.org.uk/portal/page?_pageid=75,18515&_dad=portal&_schema=PORTAL

and

http://www.biomassenergycentre.org.uk/portal/page?_pageid=75,17300&_dad=portal&_schema=PORTAL

UK - Wood Chip Articles of Interest

1. **Wood Chip Supply Chain** – A Scottish article setting out the details of a Wood chip Supply Chain - www.nhft.org.uk/pdfs/woodchip%20supply%20chain.pdf
2. **Wood Chip Technology** – A Welsh article about Wood Chip burning appliances. <http://www.woodfuelwales.org.uk/biomass/Technology/woodchip.html>
3. **Wood Chip District Heating Schemes** – “Woodchip boilers on the march - New flats bring big-time biomass heating to southern England”- <http://www.forumforthefuture.org.uk/greenfutures/articles/602760>

FEATURED EQUIPMENT – ROTAMIX - in the Biogas & Bio-Fuel Industry

This is a new feature of the Bioenergy Newsletter where BANZ Members are able to share their experiences of the products they use. Members are encouraged to provide information on specific equipment that could be featured each issue. Priority will be given to Corporate Members.

As interest in bio-fuels grows the ability to turn source materials into viable fuels is one of the first hurdles to overcome. Identifying a system that can offer high efficient mixing with reduced energy costs is key. For almost a decade Pump Systems Ltd has been working with Vaughan Company and its ROTAMIX process mixing system in New Zealand and Australia.

Ian McEwen, MD of Pump Systems Ltd said “Historically the Vaughan ROTAMIX mixing systems have been applied in municipal mixing applications in biogas digesters and sludge storage tanks but increasingly we are receiving inquiries from the bio-fuels sector. The Bio-fuels market offers significant potential in a wide range of applications such as manure waste from livestock being mixed with corn stalks or other high energy fibrous sources”.

The ROTAMIX system has a unique mixing flow pattern which eliminates dead spots, reduces energy requirements and virtually eliminates solids settling out inside the tank. The externally mounted Vaughan Chopper Pump can handle solids laden with various materials and sludge's containing rags, fibres and hair. Its operation stops the problem of fine fibres and hair reweaving into small clumps inside the tank.

The use of ROTAMIX has also been identified as a possible solution in the ethanol industry. Recent computational fluid dynamic models have shown that a normal anaerobic reactor with a volume of over 18,000 m³ could be effectively mixed with as little as 55 kW.

Further details can be found at: <http://pumpsystems.co.nz/vaughan-rotamix-process-mixing-systems/>

INTERNATIONAL NEWS:

- Cow Manure powering the US?
- Biofuels and impact on Food Supplies
- Formation of the World Bioenergy Association (WBA)
- Power generator E.ON has been given the green light to build a £60m renewable energy plant on the site of a former coal-fired power station in the UK burning Recycled Wood.
- The Canadian province of Ontario has introduced regulations which will force landfill operators to capture methane leaking from their tips.
- Energy crops take a Roasting – using Torrefaction to boost crop energy content
- UK Biofuels failing to meet standards

Cow manure could be used to power up to 3% of North America's electricity needs and slash greenhouse gas emissions, researchers have claimed. In an article published in the Institute of Physics' *Environmental Research Letters*, a team from the US say their work is the first attempt to outline a procedure for quantifying the national amount of renewable energy that could be produced by livestock herds. [Cow Power: The](#)

[Energy and Emissions Benefits of Converting Manure to Biogas](#) recommends using anaerobic digestion to turn manure into biogas which standard microturbines can use to produce electricity.

Manure left to decompose naturally emits two of the most potent greenhouse gases - nitrous oxide and methane, both of which are many times more harmful than headline-grabbing CO₂. But the researchers from the University of Texas said using it as biogas has the potential to reduce the US' net GHG emissions by 99m metric tonnes - wiping out about 4% of the country's emissions from electricity production. The current livestock population in the US could produce about 100bn kW hours of electricity, they said.

Authors of the paper Dr. Michael Webber and Amanda Cuellar said: "In light of the criticism that has been levelled against biofuels, biogas production from manure has the less-controversial benefit of reusing an existing waste source and has the potential to improve the environment. "Nonetheless, the logistics of widespread biogas production, including feedstock and digestates transportation, must be determined at the local level to produce the most environmentally advantageous, economical, and energy efficient system."

They admit that the burning of biogas would lead to the emissions of some CO₂, but argued the output from biogas-burning plants would be less than that from coal.

UK expert says biofuel production has almost no impact on food supplies and Government must stop hiding behind the tabloid "food or fuel" debate - Graham Hilton, chair of the Renewable Transport Fuels Working Group and managing director of The Energy Crops Company, accused the Government of panicking in the face of public criticism of biofuels.

Reacting to the publication of the Gallagher Review [see following section in this Newsletter for details of the review], he said the report contradicted Defra's own conclusions about the impact on the food production industry. "Defra have confirmed that biofuels have virtually no impact on the cost of food," he said. "The real reasons behind the rise in the cost of food are lack of investment, an increase in the fuel costs of agriculture and severe weather impacts such as drought and floods."

He said the biofuels industry is working hard to ensure it is responsible and sustainable - claiming other industries are lagging far behind their efforts. "Government should stop hiding behind tabloids and have the courage to encourage an industry that has done more than anybody to put the safeguards in place and to make a real contribution," Mr Hilton added.

The World Bioenergy Association (WBA) has been formed at a recent conference in Sweden. The WBA aims to be the global voice for bioenergy and to promote the use of biomass in a sustainable and economical way. Intended members include the U.S., Canada, Australia, Japan, India, Brazil, Sweden and other EU countries. As the bioenergy industry is fragmented compared to other renewables such as wind and solar power; biomass ranges from animal waste to leftover wood, and end uses range from heat and power to renewable products that can replace synthetic chemicals and plastics the aim of the organisation is to be able to "speak with one voice". The organization will also promote trade with biofuels and biomass, standardization of fuels, technical development and research. The WBA plans to help to develop certification systems to ensure that bioenergy is produced in an environmentally-friendly way, and under acceptable working conditions.

Power generator E.ON has been given the green light to build a £60m renewable energy plant on the site of a former coal-fired power station in the UK burning recycled wood. The new power station, which will be rated at about 25MW, will produce enough power for approximately 40,000 homes by burning **recycled wood**. Construction is expected to start next year at the Blackburn Meadows site, in Sheffield, and the company hopes the plant will be operating by 2011.

It will be built on the former site of a power station, which was demolished in the 1980s. E.ON chiefs said the plant will displace the emissions of about 80,000 tonnes of carbon dioxide a year - the equivalent of taking more than 20,000 cars off the UK's roads each year. Dave Rogers, E.ON's regional director for climate and renewables, said: "We're delighted that Sheffield City Council has given us the green light to develop this project.

"Biomass power stations offer us an exciting opportunity to help combat climate change by using 'carbon neutral' products in the place of traditional fossil fuels to generate electricity - further proof of our commitment to changing energy in the UK."

E.ON already operates a biomass power station in Steven's Croft, near Lockerbie in Scotland. It plans to spend £1bn on new renewables over the next five years, including onshore and offshore wind, biomass, and wave and tidal power. E.ON has set a target to cut the carbon released by each kW of electricity it generates by 10% between 2005 and 2012.

The Canadian province of Ontario has introduced regulations which will force landfill operators to capture methane leaking from their tips. Combined with existing rules for landfill sites, the province believes the new regulations will reduce its annual greenhouse gas emissions by over four million tonnes. Operators will be allowed to burn off the gas or use it to generate electricity.

The regulations will apply to landfills larger than 1.5 million cubic metres with government funding available to offset the capital costs available for smaller operators. Methane is a potent greenhouse gas with a global warming potential 21 times that of carbon dioxide. "Capturing landfill gas has so many benefits - to our planet, our environment and to local residents," said Ontario's Environment Minister John Gerretsen. "Not only will it help us meet our climate change goals, it will improve local air quality.

Energy crops take a roasting – using Torrefaction to boost crop energy content - A process used to roast coffee beans could give Britain's biomass a power boost, increasing the energy content of some of the UK's leading energy crops by up to 20 per cent. The study, carried out by engineers from the University of Leeds, examined the combustion behaviour of crops grown specifically for energy creation when put through a mild thermal process called 'torrefaction' – more usually associated with coffee production.

Torrefaction is increasingly seen as a desirable treatment for biomass because it creates a solid product which is easier to store, transport and mill than raw biomass. The study examined the energy crops willow, canary grass and agricultural residue wheat straw to see what happened when they went through the torrefaction process and how they behaved at a range of temperatures when they were heated to create an energy-enhanced fuel. Results showed that the treated materials needed less time and energy to heat to burning point, and also that they offered increased energy yields upon burning.

Willow emerged as having the most favourable properties, in that it retained more of its mass in the torrefaction process and also performed best in terms of its energy yield. As an example, willow was shown to have an 86 per cent energy yield, compared with 77 per cent for wheat straw and 78 per cent for reed canary grass. "*Raw biomass takes up a lot of space and has a low energy density which makes it costly – environmentally and economically – to transport. Plus you need more of it than say, coal, to produce energy efficiently,*" says Professor Jenny Jones who worked on this study with PhD student Toby Bridgeman.

"Torrefaction is not currently used in the UK in either the agricultural or the energy sectors," says Bridgeman. *"But our paper shows that it has a lot of benefits, besides those to do with fuel handling, so we feel it's definitely something we'd like to explore further."*

This research was supported by the Supergen Bioenergy Consortium, an initiative created by the Engineering and Physical Sciences Research Council as part of its commitment to funding research which will help the UK reach EU targets for the reduction of CO2 emissions and increased use of renewable energy.

UK Environmental groups have called for biofuels targets to be scrapped after data published by the Renewable Fuels Agency showed that less than 20% of biofuels currently on sale in the UK are meeting environmental standards.

The UK Government's Renewable Transport Fuel Obligation (RTFO) aims to increase biofuels to 5% of fuel sold by 2010-11, while the EU is expected to agree a target of 10% by 2020.

The Renewable Fuels Agency's (RFA) first monthly report, which covers the first month of the RTFO from April 15 to May 14, was published on Thursday. It showed that just 19% of biofuels met environmental standards, compared to a 30% target for the year.

The market was dominated by imports, but retailers did not know the country of origin or the feedstock used for nearly half of the fuels they sold. Asad Rehman, Friends of the Earth's biofuels campaigner said: "The shocking admission that we are unable to identify the origin of nearly half the biofuels used in the UK means that the Government cannot assure the British people that the biofuels in their petrol tanks have not destroyed rainforests. "That less than a fifth of the biofuels used fail to meet even minimal environmental standards adds further weight to Friends of the Earth's view that they are a phoney solution to climate change. "The Government must put the RTFO on hold and vote against EU biofuels targets."

International Paper's of Interest – The Gallagher Report on Biofuels

This review, by the independent UK Renewable Fuels Agency has been prepared for the UK Government in response to concerns about the role of biofuels in rising food prices, accelerating deforestation and doubts about the climate benefits. This has led to serious questions about their sustainability and extensive campaigns against higher targets..

As substantial work has already been undertaken about biofuels concerns, the review is narrowly focussed and concentrates upon *the new and emerging evidence of the displacements effects of biofuels on land change and arising GHG emissions; and effects upon food insecurity of rising food commodity prices*. The aim has been to examine the scale of the indirect effects of current biofuels production, and to propose solutions. The review has examined the sometimes inconsistent and limited evidence base. It notes the following in its conclusions:

- **A slowdown in the growth of biofuels is needed** - there is a future for a sustainable biofuels industry but that feedstock production must avoid agricultural land that would otherwise be used for food production.
- **There is probably sufficient land for food, feed and biofuels** - At present, feedstock for biofuel occupies just 1% of cropland but the rising world population, changing diets and demand for biofuels are estimated to increase demand for cropland by between 17% and 44% by 2020. However, the balance of evidence indicates there will be sufficient appropriate land available to 2020 to meet this demand.
- **Biofuels production must target idle and marginal land and use of wastes and residues** - ensuring that agricultural expansion to produce biofuel feedstock is directed towards suitable idle or marginal land or utilises appropriate wastes, residues or other non-crop feedstock.
- **Specific incentives must stimulate advanced technology** - Advanced technologies have the potential to produce biofuels with higher greenhouse gas savings and have the benefit of being able to use a wider range of feedstocks. Some feedstocks for advanced technologies require more land than current biofuel feedstocks, and consequently have the potential to induce more indirect land-use change. Advanced technologies are currently immature, expensive and will require specific incentives to accelerate their market penetration.
- **Biofuels contribute to rising food prices that adversely affect the poorest** - In the longer term higher prices will have a net small but detrimental effect on the poor that may be significant in specific locations. Shorter-term effects on the poor are likely to be significantly greater and require interventions by governments to alleviate effects upon the most vulnerable. There is some potential for the poor to benefit from biofuel production in some areas where land is available and the necessary infrastructural investment is forthcoming. Lower targets and shifting production for biofuels away from agricultural land used for food production should reduce price rises on affected food commodities.
- **A genuinely sustainable industry is possible** - the risks of indirect effects can be significantly reduced by ensuring that the production of feedstock for biofuels takes place on idle and marginal land and by encouraging technologies that utilise appropriate wastes and residues. The evidence gathered in this review does not provide assurance of the sustainability of any particular level of target and the creation of a sustainable biofuels industry cannot be assured. The RFA judgement, based upon the balance of evidence is that if all subsidies and other support for biofuels were removed entirely, this would reduce the capacity of the industry to respond to the challenges of transforming its supply chain and investing in advanced technologies. However, the rate of introduction of biofuels should be slowed until adequate controls are established.
- **Lower targets and stronger controls are needed** - the current RTFO target for 2008/09 (2.5% by volume) should be retained, but the proposed rate of increase in biofuels be reduced to 0.5% (by volume) per annum rising to a maximum of 5% by volume by 2013/14. This compares with the RTFO's current target trajectory of 5% by 2010. During the period to 2011/12, comprehensive, mandatory sustainability criteria within the EU Renewable Energy Directive should be implemented for biofuels and bio-energy, including requiring feedstock that avoids indirect land-use change. The immediate focus for policy should be on implementing the necessary controls and conditions that will enable the industry to develop sustainably.
- **Stronger, enforced global policies are needed to prevent deforestation** - Lower targets for biofuels, with slower increases in penetration and shifting production to idle and marginal land will reduce pressure for land change and reduce the pressure on food price increases. But biofuels are only part of the problem causing damaging land-use change and the measures that we propose here can therefore only form part of the solution. Stronger policies are needed to slow rates of deforestation particularly in South America, Africa and parts of South East Asia. This must form part of the next global climate agreement. Sustainability standards should also be extended beyond biofuels to all agricultural production.

More details and a range of consultancy reports at:

<http://www.dft.gov.uk/rfa/reportsandpublications/reviewoftheindirecteffectsofbiofuels.cfm>

<http://www.dft.gov.uk/rfa/reportsandpublications/reviewoftheindirecteffectsofbiofuels/executivesummary.cfm>

EVENTS CALENDAR:

New Zealand Events:

BANZ 2008 Events – COMING SOON

- **2008 Liquid Biofuel Workshop**
- Use of pellets in commercial / institutional applications – further details to come
- Conversion of hospital boilers from coal to biomass – further details to come

Other NZ Events

The 10th Annual New Zealand Energy Summit - 15 & 16 September 2008. Museum of New Zealand – Te Papa Tongarewa, Wellington - <http://www.conferenz.co.nz/10th-annual-new-zealand-energy-summit-4.html>

International Events:

Sustainable Bioenergy Opportunities for Australia on 8 - 9 December 2008 Sebel Albert Park, Melbourne, Victoria (with a technical tour to bioenergy related destinations planned for 10 December). Expressions of Interest are sought from potential paper and poster presenters, sponsors and trade exhibitors. To express your interest, please contact Stephen Schuck, Bioenergy Australia Manager (Tel: (02) 9416 9246, Email: sschuck@bigpond.net.au) or Hanna Ulkuniemi, Conference Manager (Tel: (02) 9431 8635, Email hanna@conferenceaction.com.au).

European Biofuels and Expo Conference and Exhibition October 15-16th, Nottingham, UK. - The Conference streams take place at the Biofuels-Expo, the UK's major event for Bioenergy with over 100 exhibitors showcasing the latest technology. Visit www.biofuels-expo.co.uk for more information. **Two full days of Bioenergy conference information in three streams – biofuels, Wood/Pellets, Biogas/ Anaerobic Digestion.**

- **Biofuels** - *Focusing on The Good News about Biofuels the two day **Biofuels Conference** will explore the challenges and solutions of producing biofuels and the issues surrounding introducing biofuels into an organisation. An update on the RTFO legislation and its impact in addition to land displacement and taxation issues will also be included on the agenda.*
- **Wood / Pellet Conference** - *Working in conjunction with the National Energy Foundation (NEF) to develop the **Wood Energy Conference**, on Thursday 16th October. The conference will include speakers who will share their experiences of this market in Europe, mobile pellet production and the implementation of biomass heating solutions.*
- **Biogas / Anaerobic Digestion** - *The **Biogas Conference** on Wednesday 15th October will focus on developing a Biogas business, planning, financing and implementing Biogas solutions as well as the potential carbon savings available.*



The Bioenergy Association of New Zealand Inc. (BANZ) comprises companies, research organisations and individuals who have an interest in markets for converting biomass or biomass residues into energy. To receive this newsletter regularly contact the Executive Officer of BANZ for membership details by email: info@bioenergy.org.nz. Back issues of this E-zine are on the website, www.bioenergy.org.nz