



Bioenergy Australia is an alliance of organisations
fostering biomass for energy and products

Newsletter

October 2001

Bioenergy Australia Membership¹ Update

The Bioenergy Australia membership now includes 45 organisations, with a recent new member being the Victorian Sustainable Energy Authority. Bioenergy Australia wishes to further expand its membership and invites interested organisations to contact the Bioenergy Australia Manager, Dr Stephen Schuck on tel/fax (02) 9416 9246 or email: sschuck@bigpond.net.au if your organisation is interested in joining this bioenergy forum. Bioenergy Australia recently set up a new membership tier to cater for universities and for organisations with an annual turnover of less than \$2 million per annum.

Bioenergy Australia 2001 Conference

Bioenergy Australia will be holding its second annual conference, *Bioenergy Australia 2001* "Realising the Potential of Bioenergy" at the Grand Mercure Hotel, Broadbeach, Gold Coast, Queensland on 3-4 December. On 5 December, as part of the conference, there will be a technical tour to the ethanol plant and to the newly commissioned 30 MW bioenergy plant at the Rocky Point Sugar Mill, and to the ReOrganic Biogas project at Swanbank Power Station. The conference will be opened by the Queensland Environment Minister, Dean Wells. The program will include a keynote address by Dr Josef Spitzer of Joanneum Research, Austria, the Chairman of the International Energy Agency's Bioenergy Program, and a presentation by Professor Tony Bridgwater of Aston University in the UK on the production of novel chemicals and fuels from the pyrolysis of biomass. The conference dinner speaker will be Professor Ian Lowe of Griffith University. The conference program consists of 33 papers spread over five sessions, including parallel sessions plus a panel discussion. The conference will include a trade exhibition.

The early-bird conference registration date for discounted registrations is 31 October. The conference registration fee has been set at about a quarter of equivalent commercial conference rates to encourage participation. A special rate is being provided for students and farmers/agroforesters.

The conference program and registration details are available on both the Bioenergy Australia web page, www.users.bigpond.net.au/bioenergyaustralia and at www.conferenceaction.com.au. For further information on sponsorship opportunities, to exhibit at the trade exhibition, and to register, please contact Emma Waygood of Conference Action, tel: (02) 9956-8333, fax: (02) 9956-5154, email: emma@conferenceaction.com.au.

¹ Founding members: RIRDC and the Australian Greenhouse Office. Membership now also includes DISR, BRS, CSIRO Div of Energy Technology & Div of Forestry and Forest Products, FPA of NSW, Pacific Power, Delta Electricity, Macquarie Generation, Waste Service NSW, Brightstar Environmental & BEST, SEDA, SPM/CPM, Forestry Tasmania, State Forests of NSW, Western Power Corporation, Alstom Power, Stanwell Corporation, CS Energy, NRE -Forest's Service, the Northern Sydney Waste Board, AFFA, Tarong Energy, Great Southern Energy, Rio Tinto R&TD, QFRI, Babcock and Brown, CVC REEF, ForestrySA, Renewable Energy Corp Ltd, CALM, Auspine Ltd, Gunns Forest Products, CSIRO Sustainable Ecosystems, Carter Holt Harvey, Metasource, Primergy, Sugar Research Institute, Queensland EPA (Sustainable Industries), Enecon Pty Ltd, BioForest Ltd, Forest Products Commission of WA, Victorian Sustainable Energy Authority.

IEA Bioenergy Participation by Australia

Bioenergy Australia is the vehicle for Australia's participation in the International Energy Agency's (IEA) Bioenergy program. Bioenergy Australia is providing Australia's annual membership fees and other support for five current Tasks:

- Task 30-*Short Rotation Crops for Bioenergy Systems*
- Task 31-*Conventional Forestry Systems for Sustainable Production of Bioenergy*
- Task 32-*Biomass Combustion & Co-firing*
- Task 36-*Energy from Integrated Solid Waste Management Systems*
- Task 38-*Greenhouse Gas Balances of Biomass & Bioenergy Systems*

These Tasks run from 2001-2003. Subgroups from the Bioenergy Australia membership have formed to participate in these Tasks, with each Task selecting a National Team Leader to co-ordinate involvement. National Team Leaders are: Task 30- Dr Tom Baker, Centre for Forest Tree Technology (NRE), Task 31- Dr John Raison, CSIRO Forestry and Forest Products; Task 32- Peter Coombes, Delta Electricity; Task 36- Paul Wootton, Brightstar Environmental; and Task 38- Dr Annette Cowie, State Forests NSW.

Should you or your organisation wish to obtain information on IEA Bioenergy or participation in its Tasks, please contact Steve Schuck, the Bioenergy Australia Manager and Australia's representative on the Executive Committee of IEA Bioenergy. Tel/fax: (02)-9416-9246, or email: sschuck@bigpond.net.au. IEA Bioenergy has its home page at URL: <http://www.ieabioenergy.com> which provides links to the IEA Bioenergy Task sites and information such as its Annual Report, Strategic Plan and newsletters. With sufficient additional support, Australia could expand its participation to other Tasks, such as the Liquid Fuels Task and the Gasification Task.

IEA Bioenergy Meetings in Australia

Task 36- *Energy from Integrated Solid Waste Management Systems* is planning to hold a meeting in Australia in May 2002. Task 30 *Short Rotation Crops for Bioenergy Systems* is planning to hold a meeting in Australia and/or New Zealand in early 2003. The Executive Committee of IEA Bioenergy is also scheduled to hold a future meeting in Australia in May 2003.

CSIRO Analysis Confirms Wood-Fired Power Stations' Low net CO₂ Emissions

Researchers from the CSIRO have conducted an assessment of a modelling study, much quoted in the print media, claiming that power stations fueled on native forest wood waste produce five times the levels of carbon dioxide emissions than from coal fired power. The CSIRO assessment of the model upon which these claims are based is reported in the Spring edition of the CSIRO newsletter, *ONWOOD*. The CSIRO refute this claim and find the model has several critical flaws, assumptions and errors of logic that invalidate these conclusions. The CSIRO researchers point out that the 'five times' claim is based on gross emissions only, a scenario that implies land clearing where old growth forest is harvested and trees do not grow back, taking up CO₂. Furthermore, the CSIRO found it was assumed that logs harvested from native old growth forest would fire the power stations. This is despite commitments, enforced by legislation, that only mill waste and in some cases residues left on the forest floor after harvesting would be utilised. The CSIRO note that, even if the power station operators were allowed to use the stems, price competition from high-value veneer, sawlog, pulpwood and composite board markets would rule this out.

The CSIRO critique reports the model assumes plantations would replace the harvested old growth forest, despite the proposal for the power stations specifying that their fuel would come from sustainably managed native forest. The CSIRO also note the plantation growth rate assumed in the model is about half that typically achieved.

Other key problems the CSIRO identified include: an assumed ratio of total biomass to stem biomass that is much too great, giving a high figure for CO₂ emissions from residues left to decay after harvest; and use of unrealistically low values for parameters that determine how much energy is obtained from the wood.

Polglase and Stein, the authors of the CSIRO assessment, compiled a set of assumptions that they regard as realistic for a model simulating the wood-fuelled power stations on which the model is based. Applying modified assumptions, they concluded that using wastes and residues from a forest managed for sawn timber production for electricity generation results in the release of about eight times less CO₂ into the atmosphere than generating the same amount by burning coal.

The full 12 page CSIRO analysis of the model is on the CSIRO Forestry and Forest Products website at: <http://www.ffp.csiro.au/fap/bioenergy.html>. Dr Phil Polglase of the CSIRO, one of the assessment authors may be contacted at Tel: (02) 6281 8204.

(Note 1: Bioenergy Australia newsletters have previously carried articles on life cycle emissions of various technologies. A study published by the UK Department of Trade and Industry, reported in the October 2000 Bioenergy Australia newsletter, indicates emissions of 29 g/kWh for a forestry residues-steam cycle bioenergy power plant. This would be approximately **165 times less** than that claimed in the modelling study.

Note 2: The company developing the wood-fired power stations, the subject of the modelling, indicate they now do not intend to use in-forest logging residues; only sawmill waste – Ed.)

Generation Potential of Sewage Treatment Plants in NSW

The NSW Sustainable Energy Development Authority (SEDA) has investigated the extent of the untapped energy resource from the anaerobic sewage treatment undertaken in NSW. Malabar Sewage treatment plant already operates a waste methane gas generator. While not all sewerage treatment plants in the State are suitable for this kind of technology, the study has discovered that there is some unrealised potential in the larger plants for cogeneration.

The study shows that there are about eight plants with potential electrical generation capacity exceeding 80 kW, and these could collectively generate approximately 1,800 kW of renewable energy. The results are tabled in an Appendix of a short guideline to generation from sewage treatment plants. The guidelines also include some basic information on how to assess the potential generation possible at all the known plants in NSW.

To obtain a copy of the guideline or discuss prospective projects please contact Graeme Jessup on (02) 9249 6100. SEDA funding assistance may be available for projects of this nature through SEDA's Renewables Investment Program.

Enersludge™ Oil from Sludge Plant Completed

Environmental Solutions International has completed the world's first commercial sludge to bio-oil plant for the Water Corporation of Western Australia using its proprietary

Enersludge™ technology. The plant is the culmination of over 3 years of design, construction, commissioning and optimisation of operations, by ESI and its joint-venture partner Clough Engineering. ESI has a licence arrangement with Mitsubishi Electric Corporation, Japan for the technology. The technology is capable of processing wastes that include sewage sludge, tannery sludge, pulp and paper residues, agri-wastes, bagasse and potentially other end-of-life products such as plastics, tyres and the organics in municipal solid wastes.

For more information, contact Mr. Denis Glennon on Tel: 08-9470 4004 , Fax 08-9355 0998 or email: lornaf@environ.com.au.

Bioenergy Gasification and Briquetting Project for ACT

Bioenergy Australia members Primergy and Biomass Energy Services and Technology have been granted \$850,000 under the Australian Greenhouse Office's Renewable Energy Commercialisation Program (RECP) to process urban green waste into renewable electricity and clean-burning briquetted synthetic firelogs. The Re-OCC (Renewable Energy – Organic Conversion Centre) project will use Primergy's advanced thermal gasification technology, producing a 'synthesis' gas from organic waste. The new \$5.8 million Re-OCC facility will produce 1 MW renewable electricity and though the clean-burning firewood substitute reduce winter air pollution in the ACT. Re-OCC Canberra will also produce commercial grade charcoal from green waste. The Canberra plant is planned to be the first of several Re-OCC projects to be developed in Australia and the UK by Primergy and its partners. Re-OCC Canberra will operate for eight months as a commercial demonstration showcase when construction is completed in the second half of 2002. Primergy then intends to expand the capacity of the facility and process additional waste streams.

Further information is available from: Brian Stewart, Primergy Limited on Tel: 02 8969 3400 or 0403 465 433. Email: brians@primergy.com.au

Woody Weeds-to-Energy Project Receives RECP Funding

Northern Territory Power and Water Authority (PAWA) has been awarded a grant of up to \$1,000,000 from the Renewable Energy Commercialisation (RECP) Program to construct a grid-connected biomass to electricity pilot plant that utilises the noxious weed *mimosa pigra*, as a fuel. To be located on the Adelaide River flood plain, the innovative power plant will integrate briquetting, gasification and power generation technologies in a modular transportable form. This flexible technology can potentially be applied to other noxious plants in regional Australia and overseas, and is an excellent demonstration of the environmental synergies possible between renewable energy production from biomass, and management of noxious plants.

Project contact: Trevor Horman, PAWA, 08 8924 7093

Renewable Energy Corporation Projects in the USA

Bioenergy Australia member, Renewable Energy Corporation Limited (RECL) is reported to be working with Tyson Foods, a U.S. poultry producer to build a US \$12 million processing plant to convert 80-85,000 tons of chicken litter each year, as well as sludge from Tyson's production facilities, into energy in the form of steam. The project will use the RECL Waterwide close coupled gasifier to gasify the waste into a synthesis gas made up of mostly methane and use it as fuel. The facility will be built in the mid-Atlantic U.S. Chicken litter

will come from Tyson operated farms in the area. Steam will be used by Tyson in its protein conversion plant. A main purpose of the facility is to reduce runoff of nutrients into rivers in the region that adjoin farmland. Chicken litter is currently either stored or spread as fertiliser. Left to decay, chicken litter releases methane and carbon dioxide, greenhouse gases.

In a separate announcement, RECL will be teaming up with Smithfield Foods, the largest pork producer in the world to gasify pig manure from several farms in North Carolina to generate electricity for the grid. A \$4 million pilot plant is expected to lead to an additional 14 plants of 30 MW each at Smithfield pig farms.

RECL's web site is at <http://www.renrg.com/>

Carter Holt Harvey and Renewable Energy Corporation's Teaming Agreement

Renewable Energy Corporation Limited and fellow Bioenergy Australia member Carter Holt Harvey have announced an agreement for RECL to team with CHH's Biogrid division to jointly develop bioenergy projects, initially in New Zealand. CHH's Biogrid division specialises in the supply of biomass on a long term basis to energy projects. RECL will take equity in the energy projects which will supply process heat and/or renewable electricity to customers on a long term contract basis.

SEGHERS Move to Enter Australian Market

SEGHERS better technology companies are involved in the development of technologies dedicated to improvement of the environment. They are specialists in the field of environmental technology and develop systems for:

- Thermal treatment of all kinds of solid waste streams (biomass, industrial, municipal) with energy recovery;
- Drying & pelletizing, combusting and processing industrial and municipal sludge;
- Flue gas cleaning technology (HCl, SO_x, NO_x, dioxins, heavy metals, dust removal);
- Wastewater treatment and water recycling.

SEGHERS have a number of proprietary technologies for biomass to green energy conversion, including SEGHERSmultistage grate, Techform Multi-stage Water Cooled Grate, Fluidised Bed Combustor, and the Multifuel Fluidised Bed Gasifier.

SEGHERS better technology has been chosen as technology partner for a number of facilities in Asia including three Energy-from-MSW plants in Korea which treat up to 160,000 tonnes of waste annually per plant; one EfW plant in Japan; and a Fluidised Bed Hazardous Waste Degradation plant that was recently commissioned for SembCorp Utilities in Singapore. Two EfW plants (annual throughputs 400,000t and 260,000t, producing 20 MW and 13 MW) are being constructed in Shenzhen, China. SEGHERS UNITANK[®] industrial wastewater treatment systems have been built in China, Macau, Malaysia, Vietnam and Singapore. Total Energy Services Tasmania have announced plans for an 180,000-tonnes/year waste to energy facility at Brighton, near Hobart using SEGHERS furnace, grate, boiler and flue gas cleaning technologies as was reported in the Bioenergy Australia February 2000 issue. For further information on SEGHERS better technology please refer to websites www.bettertechnology.com, www.scientecmatrix.com or contact their Singapore office Tel: +65 462 1408 Fax: +65 466 8906.

Oil Mallee Multi-Product Report

A working paper produced by SEA (Sustainability and Economics in Agriculture) entitled “*Oil mallee must look to multi-product industries*” by Don Cooper, John Bartle, Steven Schilizzi and Dave Pannell notes that oil mallees, species of eucalypt chosen for high leaf cineole concentration and coppicing habit, are being developed in Western Australia as a potential woody perennial crop in the lower rainfall agricultural regions. A 1999 feasibility study of integrated mallee processing (the concurrent production of eucalyptus oil, electricity and activated carbon from mallee feedstocks) showed that this integrated biomass industry could be commercially viable. This paper reports on further analysis which shows integrated mallee processing plants could produce eucalyptus oil at a price suitable for the industrial solvent market. It also finds that a single-product industry based only on oil-production would probably not be viable given projected market prices for the oil. For the full paper see URL: <http://www.general.uwa.edu.au/u/dpannell/dpap0104.htm>

(source SEA News/D. Pannell)

Biofacts

- The volume of waste tyres nationally is some 170,000t/yr.
 - In India a Government program promoting biogas technology has facilitated the installation of more than 2.7 million biogas units in rural areas.
 - Ethanol is the most widely used biofuel in the USA, with production currently 7.2 billion litres a year, representing a nearly ten-fold growth from about 756 million litres a year in 1980.
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Biomass on the Internet

The Internet provides a valuable source of information on biomass and allied topics. Below are some Internet addresses to supplement the 800 plus addresses given in the previous fourteen issues of the Bioenergy Australia newsletters. These lists are consolidated as electronic links on Bioenergy Australia’s web page at www.users.bigpond.net.au/bioenergyaustralia

CSIRO critique of the ‘Barnes’ report on CO₂ emissions from native forest biomass

<http://www.ffp.csiro.au/fap/bioenergy.html>

<http://www.users.bigpond.net.au/bioenergyaustralia>

Renewable Energy Action Agenda report

<http://www.isr.gov.au/agendas/sectors/energy/>

Renewable Energy Technology Roadmap

<http://www.isr.gov.au/industry/retr>

Private Forestry North Queensland

<http://www.pfnq.com.au>

The Carbon Trader Summary of Bonn Agreement (COP6B)

<http://www.thecarbontrader.com/news64.001.htm>

RIRDC report ‘Sustaining the Productivity of Tree Crops on Agricultural Land in South-Western Australia (01/09 CSF-53 A)’

Full report (162k)

<http://www.rirdc.gov.au/reports/AFT/01-100.pdf>

Summary (26k)

<http://www.rirdc.gov.au/reports/AFT/01-100sum.html>

Australasian Virtual Engineering Library

<http://avel.edu.au>

CSIRO Life Cycle studies into transportation fuels

<http://www.dar.csiro.au/res/ggss/Life%20Cycle%20Analysis%20for%20Alternative%20Fuels.htm>

Used bioenergy plants for sale
<http://www.bioenergyupdate.com>

Queensland Resource Exchange Register (RXR)
<http://www.rxr.lgaq.asn.au>

"Straw for Energy Produktion" publication (53pp)
<http://www.videncenter.dk>

IEA Bioenergy Task 17 Albany Meeting Proceedings
<http://www.oilmallee.com.au/r&dmenu.html>

Plants for a Future (PFAF Database)
http://www.ibiblio.org/pfaf/D_search.html

Master's Thesis Life Cycle Assessment of a Short Rotation Willow to electricity system
<http://www.lumes.lu.se/ericd/>

IEES Conference on Ecological Engineering for Landscape Services and Products, 25-29 Nov 2001, NZ
<http://events.lincoln.ac.nz/iees/default.htm>

EU directive for biofuels article
<http://ens-news.com/ens/aug2001/2001L-08-21-01.html>

Wood-to-Oil Process
http://journeytoforever.org/biofuel_library/wood_to_oil.html

Transport and Technology R&D Center, Center for Transportation Research, Argonne National Laboratory, US DoE (alternative fuels)
<http://www.transportation.anl.gov/ttrdc/fuels/index.html>

Ethanol fuel cycle report "Effects of Fuel Ethanol Use on Fuel-cycle Energy and Greenhouse Gas Emissions", by M. Wang, Transport and Technology R&D Center, Center for Transportation Research, Argonne National Laboratory, US DoE
<http://www.tis.anl.gov:8000/db1/ttrdc/document/DDD/58.PDF>

Estimating the Net Energy Balance of Corn Ethanol-by Hosein Shapouri, James A. Duffield, and Michael S. Graboski. U.S. Department of Agriculture, Economic Research Service, July 1995.
http://www.ethanol-gec.org/corn_eth.htm

Environmental Solutions International (bio-oil from biomass)
<http://www.environ.com.au>

Environmental Science, Economics, Management and Policy by Kluwer academic publishers
<http://www.wkap.nl>

Cooperative Research Centre for Carbon Accounting
<http://www.greenhouse.crc.org.au>

Environmental Protection and Biodiversity Conservation online database
<http://www.environment.gov.au/epbc/db/info.html>

Bamboo as biomass resource
<http://www.zeri.org>
<http://www.Plyboo-america.com>

Westwind Technology (bamboo)
<http://esi.athenstn.com/wwt>

TOR Plasma Energy Converter (PEC) (pyrolysis)
<http://www.torenergy.com/>

Energy Conversions and Equivalencies
<http://www-personal.umich.edu/~rcnh/gs102/EnergyEquiv.html>

Co-Firing Existing Boilers with Solid Waste Burning, External Combustors - can be downloaded from the "Papers" page
<http://www.heuristicengineering.com>

Greening Australia
<http://www.greeningaustralia.org.au>

Biomass e-group
<http://www.egroups.com/group/biomassGroup>

Purdue University Center for New Crops and Plant Products
<http://www.hort.purdue.edu/newcrop/>

"Life Cycle Analysis of a Biomass Gasification Combined-Cycle System" by Mann and Spath (1997).
<http://www.osti.gov/servlets/purl/567454-cjl8PW/native/567454.pdf>

Price Waterhouse Coopers document "The Future of Australian Renewable Energy: a participants perspective"
<http://www.pwcglobal.com/au/utilities>

New York Times article on Ethanol
<http://www.nytimes.com/2001/07/23/business/23ETHA.html?searchpv=day07>

NECA third anniversary performance assessment
<http://www.neca.com.au/What'snew.asp?CategoryID=32&ItemID=915>

Orenda (pyrolysis bio-oil fired gas turbine)
http://www.orenda.com/AMES/AMES_Biofuel/ames_biofuel.html

Biomass Gasification Group - Danish Technical University
<http://www.et.dtu.dk/halmfortet/publications/>

Future Forestry Lecture (Hamish Kimmins UBC)
<http://www.forestry.ubc.ca/anniversary/hamishmss.pdf>

Benign Energy? The Environmental Implication of Renewables (IEA report)
<http://www.iea.org/pubs/studies/files/benign/index.htm>

IEA bioenergy Task 38 web site (Greenhouse Gas Balances of Bioenergy Systems)
<http://www.joanneum.ac.at/iea-bioenergy-task38>

General Bioenergy
<http://www.bioenergyupdate.com>

Madera bioenergy plant (EPI site)
<http://www.energyproducts.com/EPIEnergySystems.htm>

Fouling and slagging (Tom Miles)
<http://www.teleport.com/~tmiles/alkali/alkali.htm>

Chariton Valley (switchgrass)
<http://www.cvrtd.org/biomass.htm>

Our Forests (Victorian forestry)
<http://www.ourforests.com.au>

Fluidyne Gasifier Archive (includes plans for small gasifier)
<http://members.nbc.com/whitools/>

Southern States Power Company biodiesel demonstration
<http://www.sspowerco.com/press.html>

California Energy Commission Ethanol Survey
http://www.energy.ca.gov/reports/2001-08-29_600-01-017.PDF

National Research Council report by National Academy Press 'Biobased Industrial Products: Priorities for Research and Commercialization' (USA),
<http://search.nap.edu/nap-cgi/naptitle.cgi?Search=biobased> or
<http://www.nap.edu>

AgSTAR Program (USA)
<http://www.epa.gov/outreach/agstar/operation/index.html>

Lipp company (digestors for agricultural waste and energy crops)
<http://www.lipp-system.de>

"Wood-Ethanol Report: Technology Review", Environment Canada 1999
<http://www.pyr.ec.gc.ca/ep/wet/section16.html>

Biomass Gasification Group at the Danish Technical University (DTU).
<http://www.et.dtu.dk/Halmfortet>

USA National Energy Policy
http://www.energy.gov/HQPress/releases01/maypr/energy_policy.htm

JF Bio-Energy (pyrolysis pilot plant - Canada)
<http://www.jfbioenergy.com/home.htm>

How Green is Green (Environmental accounting methodologies proposal)

http://users.tamuk.edu/david.tilley/Research/proposals/LCA_emergy/Green_Product_Index.htm

EU policy relating to MSW bioenergy

<http://ens.lycos.com/ens/jul2001/2001L-07-06-03.html>

European Union and German incentives for increasing renewable energy and combined heat and power (CHP)

<http://www.mnm.ifrf.net/2001/0107art08.html#CHP>

Green LA

<http://www.GreenLA.com/>

Firewood Code of Practice

<http://www.ea.gov.au/land/firewood/publications/strategy>

Dr Outhred's Seminar on The Effectiveness of Measures to Support Distributed Generation in Australia

<http://www.cendep.csiro.au/seminars.html>

National Approach to Waste Tyres report

<http://www.environment.gov.au/epg/oilrecycling/tyres.html>

Pyrolysis Handbook

<http://www.pyne.co.uk/inf5.htm>

Bio-oil in Quebec

http://www.pyrovac.com/site/site_ang/Procede/Procede.html

Refocus magazine free subscription

<http://www.re-focus.net/register/user>

Advance for German Biomass Energy Law

German biomass electricity production is set to increase after a draft standards-setting law moved a step closer to finalisation. Officials claim that the sector's long-term potential is as large as one-fifth of national power supply. The draft biomass ordinance will help to implement last year's renewable energy law by creating legal definitions and standards so that producers can claim premium rates of euros 0.09-0.10 (DM0.17-0.20) per kilowatt hour.

Nearly a year after it was first proposed by the environment ministry, official approval by the economics ministry means the ordinance is now cleared for a second parliamentary reading. It should take effect before the end of the year, according to officials. The ordinance sets out technical and environmental standards and requirements for biomass power production, including limits on the use of wood contaminated by toxic materials and exclusions of certain materials. Peat burning, for example, will not qualify for financial support under the renewable energy law, the environment ministry stressed.

The main biomass fuels likely to be used for power generation in the short term are wood chips and waste from the forestry and wood processing industries. Large quantities are currently landfilled or exported and very little used to generate electricity. Environment minister Jürgen Trittin claimed in the announcement that the ordinance would help lift biomass power production sufficiently to save five to ten million tonnes of carbon dioxide emissions annually by 2010.

(source: ENDS Daily/Ecofys)

Small Modular Biomass Power Project Successfully Completes Test Run

Community Power Corporation of Aurora, Colorado, USA is developing a 12.5 kilowatt modular down-draft gasifier fuelled by coconut-shell-derived-biomass. The project is co-funded with the DOE's Biopower Program. Earlier this year the gasifier, coupled with an internal combustion engine, successfully completed a ten day field endurance run. See: http://www.eren.doe.gov/biopower/projects/ia_pr_sm_CO.htm

DynaMotive Announces 100 tonne per day Pyrolysis Oil Power Plants

Canadian company, DynaMotive has announced that it has formally launched the design of a 100 tonne per day (tpd) pyrolysis plant that will be the core of an integrated biomass-to-energy system. The plant capacity represents a 400% increase in capacity from its original plan. The 100 tpd plant is projected to produce enough fuel to continuously fire a 2.5 MWe turbine and be capable of providing electricity to a small town (2,000 households).

DynaMotive expects to demonstrate the commercial feasibility of its BioOil fuelled system in cooperation with Orenda Turbines (www.orenda.com), part of Magellan Aerospace of Canada, and Border Biofuels Ltd. of the UK. The flagship project is expected to generate 2.5 MWe and be the first BioOil power generation plant of its kind. DynaMotive is currently evaluating sites for the commercial scale energy system. Through the increased capacity of the proposed plant and given the design and construction approach taken, DynaMotive expects to substantially accelerate market deployment of its technology, demonstrate the commercial viability of its energy systems in 2002 and be in a position to service multiple contract requirements by the first quarter of 2003, well ahead of its original schedule.

DynaMotive intends to replicate BioOil fuelled systems in the UK where the company has contracts to provide 69 MWe with guaranteed power purchase agreements under the UK government's now discontinued Non Fossil Fuel Obligation (NFFO).

2.5 MW Pyrolysis Bio-Oil Power Plant for Scotland

DynaMotive Subsidiary, Border Biofuels Limited has submitted planning applications to develop a forest residue fired power station on Arran, an island off the Scottish coast. The project intends to use wood from sustainable production in existing forestry operations on the island to generate 'green' electricity. The power station should generate up to one third of the island's electricity need. The scheme has the benefit of an electricity supply contract awarded under the Scottish Renewables Obligation, a government project designed to foster the development of energy from renewable sources in recognition of its environmental advantages.

For more information contact: Antony Robson, Managing Director of DynaMotive Europe Limited, Email: arobson@DynaMotive.com

Californian Bioenergy Plants Brought Back into Service

The Californian energy crisis this past northern hemisphere summer, has seen the 25 MW biomass-fuelled Madera power station, located near Fresno, California being brought back into service. EP Power Finance L.L.C. provided funding to Madera Power, a subsidiary of Energy Products of Idaho, enabling the company to acquire and refurbish this previously dormant power plant.

This power station, which makes use of 53 different forms of nearby biomass materials as environmentally friendly fuel sources, is one of two power plants to come online in California since the state has been in a power crisis. Madera uses biomass materials that typically include grape by-products, wood chips, and tree trimmings that would otherwise be disposed of in local landfills or burned in open fields for disposal.

World Conference on Biomass for Energy and Industry Proceedings Available

The 1st World Conference and Technology Exhibition on Biomass for Energy and Industry, held in Seville, Spain in June 5–9 2000, combined the biennial *European Conference on Biomass for Energy and Industry* and the *Biomass Conference of the Americas*, thus creating the largest bioenergy event held worldwide to date. Topics covered by the conference were:

- Externalities of biomass
- Biomass resources: demonstration and market
- Feedstocks and commercial biofuels production technologies
- Biofuels market in the transport sector
- Biomass market in the heat and electricity sector
- Biomass non-energy products and markets
- Bioenergy implementation: measures and policies
- Biomass production and utilisation R&D

The two volume 2,135 A4 page Proceedings, covering 470 papers are now available for purchase. For details on purchasing the Proceedings, email to eta.fi@etaflorence.it. You are requested to indicate 'Biomass 2000 Proceedings' as the subject of the email.

Forthcoming Events

- *Bioenergy Australia 2001* conference, Grand Mercure Hotel, Broadbeach, Gold Coast, Queensland, 3-5 December 2001. 5 December will be technical tours of local biomass and bioenergy facilities. Contact: Emma Waygood, Conference Action, Level 10, 33 Berry Street, North Sydney. Tel: (02) 9956-8333, Fax: (02) 9956-5154 Email: emma@conferenceaction.com.au. Web: www.conferenceaction.com.au or www.users.bigpond.net.au/bioenergyaustralia
- *IIR Renewable Energy Market and REC's Review for 2002*, Novatel Brisbane, 5-7 December 2001. Tel: (02) 9923 5090, Web: www.iir.com.au. (Bioenergy Australia members are offered 15% discount. Bioenergy Australia Manager will be chairing a panel discussion at the conference).
- *Queensland Forestry Research Institute Hardwood Plantation Research Field Tour*, 7-9 November 2001. Contact David Lee, QFRI, Tel: (07) 5482 0885, Email: leed@qfri1.dpi.qld.gov.au
- *27th Forest Products Research Conference* "shaping the future", 12-13 November 2001, CSIRO Forest Products Laboratory, Bayview Avenue, Clayton, Victoria. Email: 27fprc@ffp.csiro.au, Tel: John Ward (03) 9545 2351.
- UST Biomass Energy Symposium, 13 November 2001, Carlton Crest Hotel, Brisbane. To register, email: juniper@ultrasys.com.au.
- *ISES 2001 Solar World Congress*, 'Bringing Solar Down to Earth', 25 November – 2 December 2001, Adelaide Convention Centre. Web: <http://www.unisa.edu.au/ises2001congress>
- *Australian Agricultural and Resource Economics Society Annual Conference*, 13-15 February 2002, Canberra. <http://www.general.uwa.edu.au/u/aares/welcome.html>
- *ENVIRO 2002* conference, Melbourne 7–12 April 2002. 600 word abstracts are being sought. Email quitz@bigpond.net.au or contact Stephen Hancock on Tel (03) 9279 2888. Web www.enviroaust.net.
- International Conference on Eucalypt Productivity, A synthesis of the physiological, environmental, genetic and silvicultural determinants of growth, Hobart, Australia 10-15 November 2002. Website: <http://www.cdesign.com.au/eucprod>
- *1st International Congress on Biomass for Metal Production & Electricity Generation*. Congress and Exhibition Centre, Belo Horizonte, Brazil 8 - 11 October 2001. Web: <http://www.issbrazil.org/congress1.asp>

- *World Fuel Ethanol Congress & Expo*, 28-31 October 2001, Beijing, China. The organizers of the *Congress* are BBI International, USA, and BioEnergy Technologies, Hong Kong in conjunction with Tsinghua University, Beijing. Contact: Kathleen Bryan, BBI International. Ph: (0011 1) 719-942-4353, Email: Kathy@bbiethanol.com website: www.bbiethanol.com
- The 3rd *Annual International Symposium on Distributed Energy Resources*, 1-2 November, 2001, Catamaran Resort Hotel, San Diego, California. <http://www.cader.org/Conference.html>
- COGEN Europe's 9th Annual Conference, 7-9 November 2001. Europa Intercontinental Hotel, Brussels, Belgium. Email: Info@cogen.org.
- 5th USA National Symposium, *New Crops & New Uses: Strength in Diversity*, 10-13 November 2001, Omni Hotel at CNN Center, Atlanta, Georgia USA. Details and Preliminary program can be found at <http://www.aaic.org/meetings.htm>. See also: <http://www.hort.purdue.edu/newcrop> and <http://www.newuses.org>
- International Ecological Engineering Society (IEES) Conference on *Ecological Engineering for Landscape Services and Products*, 25-29 November 2001, Lincoln University, Christchurch, New Zealand. Web site: <http://events.lincoln.ac.nz/iees/default.htm>
- *Biomass and Energy Crops II Conference*, 18-21 December 2001, York, UK. Contact: Mike Bullard, ADAS, Tel: +44-1354-692531 Email: Mike.Bullard@adas.co.uk
- International Conference on '*Techno Commercial Aspects of De-Centralised approach in Waste to Energy*' Malaviya Regional Engineering College, Jaipur, India 1-3 March 2002. Web <http://www.icwe2002.com>
- 12th European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection. 17-21 June 2002, Amsterdam, The Netherlands. Email: biomass.conf@etaflorence.it Fax: (0015 39) 055 57 34 25.

Residues

- The Bioenergy Australia Manager, Dr Stephen Schuck gave presentations at: the ESAA (Electricity Supply Association of Australia) *Renewable Energy and Remote Area Power Supplies Conference* at Cairns 27 August, at an Australian CRC for Renewable Energy Policy forum at UNSW on 26 July, at a Waste Management Association of Australia Breakfast seminar in Parramatta on 25 July and participated in an WMAA hypothetical panel discussion on waste-to-energy on 28 August. A presentation was also given to a Timber Industry Development Taskforce meeting on 4 October.
- The Bioenergy Australia Manager convened a forum with environmental groups on 25 July to discuss 'tree energy crops'. The meeting was attended by eighteen invited participants, and was chaired by Professor Snow Barlow of Melbourne University.
- Wesley Stein of the CSIRO DET attended an IEA Bioenergy's Biomass Combustion and Co-firing Task 32 (renewed Task 19) meeting in Switzerland from the 27 to 30 of June 2001.
- The Proceedings of the IEA Bioenergy Task 17 *Short Rotation Crops for Bioenergy* meeting held in Auburn, Alabama, USA in September 1999 are now available on the web at: <http://bioenergy.ornl.gov/pubs/international.html>. Included in the Proceedings is a paper from Bioenergy Australia entitled 'Prospects for bioenergy from short-rotation crops in Australia'.
- The IEA Bioenergy Task 17 Albany, WA Meeting Proceedings are at: <http://www.oilmallee.com.au/r&dmenu.html>
- A *Renewable Energy Action Agenda* report has been released which contains proposals for policy action that were developed by the renewable industry associations on the Renewable Energy Industry Implementation Group and endorsed by the Renewable Energy Industry CEO group. Items raised are energy market reform, increasing the level of the Mandatory Renewable Energy Target, tax issues and net metering. Bioenergy

Australia has been participating in this group. An electronic copy of the report can be found at <http://www.isr.gov.au/agendas/sectors/energy/>

- The former Minister for Resources and Energy, Mr Warwick Parer has been appointed by the Federal Government to chair the Council of Australian Governments' (COAG) Independent Review of Electricity Market Directions. This three person committee will identify strategic issues for Australian energy markets and the policies required and is expected to conclude its work in approximately a year.
- VISY is reported to have entered into an arrangement with Canada's Etho Power for six gasifier or gasification-to-electricity power plants. The deal is worth an estimated \$75 million.
- The IEA Report '*Benign energy? The environmental implications of renewables*' referenced in previous Bioenergy Australia newsletters, comparing the life cycle emissions of various renewable energy sources is on the new web address: www.iea.org/pubs/studies/files/benign/index.htm
- The following articles have been added to the Minnesotans Energy Efficient Economy's Page: <http://www.me3.org/>
 - Bioenergy Projects in Minnesota - from Renewable Plant Information System, developed at the National Renewable Energy Laboratory.
 - EREN's Biopower Site
 - JF Bio-Energy
- The US Department of Agriculture has launched its new biobased industrial products web site. The site has five informational resources: Executive Orders/Federal Register, biobased lubricants and functional fluids, contacts, related links, and vendor registration for entering biobased products into the electronic source book. Link to the web site at <http://www.usda-biobasedproducts.net>
- The State Salinity Council in Western Australia provides information about salinity management around WA and has links to a wide variety of other websites. Its URL is <http://www.salinity.org.au> (source SEA New No 10)
- The United State Department of Agriculture's National Resources Conservation Service (NRCS) and National Agroforestry Center along with two nonprofit organisations Environmental Defense, and Soil and Water Conservation Society have developed a new brochure titled, "Growing Carbon: A New Crop That Helps Agricultural Producers and the Climate Too." The brochure identifies strategies for agricultural producers to grow carbon to ultimately reduce climate change impacts on the environment. Eight topics are discussed in this brochure including: climate change and the greenhouse effect; the impacts of climate change on agriculture; strategies utilised by agricultural producers to reduce greenhouse gas emissions; increasing the storage of carbon on agricultural lands; the benefits of increasing carbon storage; international climate change agreements and U.S. agriculture; the carbon market; and resources for agricultural practices and conservation programs. A PDF version of the brochure is on NRCS web site at: <http://www.nhq.nrcs.usda.gov/CCS/WhatsNew.html>
- The State of New York's Governor issued an executive order mandating that state facilities purchase 10% of their power requirements from renewable sources by 2005 and 20% by 2010.
- A new Cooperative Research Centre for Plant-Based Management of Dryland Salinity has been established. This Cooperative Research Centre has the aim of developing new plant types and new farming systems which are profitable to farmers, and provide additional benefits from salinity prevention or make use of salinised land. It has five programs of work. Web address is: <http://www.general.uwa.edu.au/u/dpannell/crc1.htm> (source D.J.Pannell)
- At the June 28 Bioenergy Australia quarterly meeting, RIRDC launched *The Carbon Farmer* Model. The model and supporting documentation is available on the Web as follows:
 - Summary (8 kb) - <http://www.rirdc.gov.au/reports/AFT/01-060sum.html>
 - Vol 1: (01/059) - the report on the project - Full report (210kb)

<http://www.rirc.gov.au/reports/AFT/01-060.pdf>

Vol 2: (01/060) - the user manual (500 kb)

<http://www.rirc.gov.au/reports/AFT/01-060Manual.pdf>

MS Excel spreadsheet -

http://www.rirc.gov.au/reports/AFT/Carbonfarmer1_2.xls

Help file 1 - http://www.rirc.gov.au/reports/AFT/CF_HELP.HLP

Help file 2 - http://www.rirc.gov.au/reports/AFT/CF_HELP.HPJ

- The US National Energy Technology Laboratory's Gasification Technology Program's mission is to commercialise the gasification-based processes for the conversion of carbon-based feedstocks to electricity, steam, fuels, chemicals, and hydrogen. URL is: <http://www.fetc.doe.gov/products/power1/gasificationframeset.htm>
- The European Parliament has agreed that energy produced from the combustion of the biodegradable portion of municipal and industrial waste will in future be classified as renewable. As a trade-off incinerator operators will be eligible for financial support only if they do not "undermine" the EU's waste hierarchy. The hierarchy obliges EU member states to favor waste prevention and recycling over energy recovery and then disposal. EU policy relating to MSW bioenergy may be found on the Web at: <http://ens.lycos.com/ens/jul2001/2001L-07-06-03.html>
- The following web site is useful for converting units of measure, particularly Imperial and American units to SI: <http://www-personal.umich.edu/~rcnh/gsl02/EnergyEquiv.html>
- For a free subscription to Refocus, an international renewable energy magazine, simply fill in the registration form at <http://www.re-focus.net/register/user>
- The comprehensive publications "Straw for Energy Production" and "Wood for Energy Production", plus technical posters presented at the 1st World Conference on Biomass (Seville, Spain June 2000) and other reports are downloadable in English from the web page : <http://www.videncenter.dk>. Select "Publikationer" and "Engelsk" on the web page.
- The *Plants for a Future* database provides a searchable database of plant types and their uses. See http://www.ibiblio.org/pfaf/D_search.html.
- A complete list of references from an unpublished book by James A. Duke, 1983 entitled '*Handbook of Energy Crops*' is available on the Purdue University Center for New Crops and Plant Products web site at http://www.hort.purdue.edu/newcrop/duke_energy/refa-f.html
- A Master's Thesis on Life Cycle Assessment (LCA) studies in Sweden by Erik Daugherty found net energy ratios to be between 4 and 16 for different production and conversion scenarios of short rotation willow to electricity. The report is available at <http://www.lumes.lu.se/ericd/>
- A Life Cycle Analysis on alternative transportation fuels has been conducted by the CSIRO. The draft report and site for the final report is: <http://www.dar.csiro.au/res/ggss/Life%20Cycle%20Analysis%20for%20Alternative%20Fuels.htm>
- The 160 page "Life Cycle Analysis of a Biomass Gasification Combined-Cycle System" by Mann and Spath (1997) is downloadable in pdf from: <http://www.osti.gov/servlets/purl/567454-cjl8PW/native/567454.pdf>
& <http://www.nrel.gov/docs/legosti/fy98/23076.pdf>
- A report '*Biobased Industrial Products: Priorities for Research and Commercialization*' explains USA development of biomass refining/processing. The report by the National Research Council has been published by National Academy Press. Web address is: <http://search.nap.edu/nap/cgi/naptitle.cgi?Search=biobased>
- PriceWaterhouseCoopers has conducted a survey "*The Future of Australian Renewable Energy: a participants perspective*" Some key findings of the survey are:
 - Significant investment in renewable energy is expected
 - Current penalties for non compliance of MRET are insufficient
 - REC (Renewable Energy Certificate) shortfalls are expected

- The current approach to emissions reduction is inadequate.
- The report is available on the web at <http://www.pwcglobal.com/au/utilities>
- The USDA's Office of Energy Policy and New Uses (OEPNU) has issued a report, *'Economic Analysis of Increasing Soybean Oil Demand Through the Development of New Products'*, in collaboration with USDA's Economic Research Service. The report analyses the benefits of increasing soybean oil production to 756 million litres per year between 2001 and 2010. Download the entire report at: <http://www.newuses.org/EG/EG-23/23OEPNUbd.html>
 - Details of the US DOE's National Energy Technology Laboratory Biomass Power Cofiring project are at: <http://www.eren.doe.gov/biopower/projects/index.htm>
 - The Los Angeles Department of Water and Power (LADWP) has commissioned the largest microturbine power plant in the world designed to run exclusively on landfill gas. The power plant at the Lopez Canyon Landfill has an array of 50 Capstone 30 kilowatt turbines combined for an output of 1.5 Megawatts. The project is part of the Green Power for a Green LA program. See Web at <http://www.GreenLA.com/>
 - The largest stand-alone wood fired power plant in the USA is reported to be the 80 MW Multitrade plant in Hurt, Virginia. A good summary of the project (and many other biomass plants) is on the Web at: <http://www.westbioenergy.org/lessons/>
 - "*Wood-Ethanol: A BC Value Added Opportunity*", from Environment Canada, 1999 provides a good overview of a number of companies and processes developing wood-to-ethanol technologies. The report is downloadable from <http://www.pyr.ec.gc.ca/ep/wet/section16.html>
 - Australian Renewable Fuels Pty Ltd, a wholly owned subsidiary of Amadeus Petroleum is building a \$12 million biodiesel plant in Western Australia, and plans to build five such plants in the coming three years. Each plant will have capacity of 40 million litres of biodiesel per annum with the first plant expected to be in production before the end of June 2002. Leighton Contractors have been appointed a principal contractor to build the first plant in Perth, Western Australia.
 - The US Congress has voted for US \$33.5 billion in new energy tax incentives for wind energy and energy crops projects. A decision is expected to be made by the Senate later in the year.
 - The Biomass Gasification Group at the Danish Technical University has a list of publications and presentations (some downloadable as PDF files) on their web site: <http://www.et.dtu.dk/halmfortet/publications/>
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Opportunities Corner

The Bioenergy Australia Manager would like to assist and facilitate biomass and bioenergy projects and businesses by providing information and industry contacts to link project developers, resource managers, energy companies, and sources of finance. If you or your organisation are interested in such assistance, please contact Steve Schuck for a free listing.

- The Qld Resource Exchange Register (RXR), established by the Local Government Association of Queensland with support from the Commonwealth Department of Transport and Regional Services, the Qld EPA and the Beverage Industry Environment Council, provides a facility and matching services for diverting materials normally discarded to landfill, waterways and the atmosphere, to new markets for re-use, recycling and reprocessing. The RXR aims to provide industry, government and the community with intelligence of "unwanted" resources throughout Queensland and via its partnership with ARRnetwork (Australian Reusable Resources Network, Australia) throughout Australia. For further information, please contact Mr. Vin Naidoo, RXR Project Officer, phone 07 3000 2236 or Email rxr@lgaq.asn.au, or visit the RXR web site <http://www.rxr.lgaq.asn.au/>.
- Several bioenergy power plants and components, ranging in size from 1.2 MW to 22 MW are being offered for sale out of the USA. For detailed information on the equipment, including prices and pictures, see website: <http://www.bioenergyupdate.com>

- A European Environmental Technology firm with fluidized bed, moving grate furnace and boiler technologies is seeking a partner in Australia for the construction in Australia of plants of various sizes for the conversion of biomass to renewable energy. Companies experienced in the fabrication of complex process plants or in boiler engineering, should contact Dr Daud Batchelor, SEGHERS Better Technology, 170 Upper Bukit Timah Road, #17-04 B.T.S.C., Singapore 5881779. Phone: +65 462 1408 Fax: +65 466 8906. E-mail: daud_batchelor@bettertechnology.com
- An Indian company, Harsha Power Project Pvt. Ltd, is seeking an Australian partner/investor to expand the capacity of their 0.7 MW rice husk gasification power plant. The company is seeking an injection of USD \$1.32 million to expand producer gas production and acquire gas engines. The company has indicated they have secured the biomass resources and the necessary government licences and off-take agreement for the electricity. Interested parties are invited to contact: R. Ravi Chander, Director, Harsha Power Projects Pvt. Ltd., 1-9-52/E/8, Ramnagar, Hyderabad, A.P., India - 500048. Email: harshapower@hotmail.com or rangavajjula@rediffmail.com

Bioenergy Australia 2000 Conference Proceedings Available

Bioenergy Australia has a few sets of the Proceedings from the December 2000 two day Bioenergy Australia 2000 conference available for sale. These are being sold for AUD \$110 (including GST, postage within Australia and handling) each. If you are interested in purchasing a set, please contact Steve Schuck on tel/fax (02) 9416 9246. Email: sschuck@bigpond.net.au.

Back Issues of Bioenergy Australia Newsletters – Downloadable from the Bioenergy Australia homepage: <http://www.users.bigpond.net.au/bioenergyaustralia>

The Bioenergy Australia Newsletter is a complimentary service provided by Bioenergy Australia to stimulate interest in biomass and bioenergy in Australia. Email is the preferred way of distributing these newsletters. **Should you have received your copy by post, and you have email, it would be appreciated if you would inform Steve Schuck** (email: sschuck@bigpond.net.au) **of your email address.**

Editor: Dr. Stephen Schuck, Bioenergy Australia Manager
Any comments, suggestions, articles and feedback are welcome. The views expressed in this newsletter are not necessarily those of the member organisations. Bioenergy Australia may be contacted at:
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