



Biomass Taskforce

June 2000

Biomass Taskforce Membership¹ Update

The Biomass Taskforce membership continues to grow. Membership has now reached 32, with recent new members being Babcock and Brown Pty Ltd, CVC REEF, ForestrySA, and the newly formed Renewable Energy Corporation Ltd. Thirty-four organisations now formally participate in the Biomass Taskforce, with the CSIRO Divisions of Energy Technology and Forestry and Forest Products sharing a membership and Brightstar Environmental participating with their subsidiary, Biomass Energy Services and Technology. The Biomass Taskforce wishes to further expand its membership and invites interested organisations to contact the Biomass Taskforce Manager, Dr Stephen Schuck on tel/fax 02 9416 9246 or email: Steve.Schuck@bigpond.com if your organisation is interested in joining this bioenergy development forum.

IEA Bioenergy – Australia Participates in Five Tasks in 2000

The Biomass Taskforce has become the vehicle for Australia's participation in the International Energy Agency's (IEA) Bioenergy program. The Biomass Taskforce is providing Australia's annual membership fee to the IEA Bioenergy Executive Committee, with the Biomass Taskforce Manager convening a group which has been participating in IEA Bioenergy Task 17, *Short Rotation Crops for Bioenergy* since the beginning of 1999. From January 2000 the Biomass Taskforce has been directly participating in four additional Tasks. These new Tasks are:

- Task 18-*Conventional Forestry Systems for Bioenergy*
- Task 19-*Biomass Combustion*
- Task 23-*Energy from Thermal Conversion of MSW and RDF*
- Task 25-*Greenhouse Gas Balances of Bioenergy Systems*

Subgroups from the Biomass Taskforce membership have formed to participate in these Tasks, with each Task selecting a National Team Leader to co-ordinate involvement. The Biomass Taskforce recognises that there are persons and organisations that are not in a position to participate in IEA Bioenergy through membership of the Biomass Taskforce, yet whose participation is desirable. Scope exists to allow participation of such parties by invitation. National Team Leaders are: Task 18- Dr John Raison, CSIRO Forestry and Forest Products; Task 19- Peter Coombes, Delta Electricity; Task 23- Paul Wootton, Brightstar Environmental; and Task 25- Dr Annette Cowie, State Forests NSW.

Dr Steve Schuck recently attended the 45th Executive Committee Meeting of IEA Bioenergy in the Netherlands, where Tasks for the period 2001-2003 were to be decided. This Meeting included

¹ Founding members: ERDC (replaced by DISR), RIRDC, Environment Australia (now the Australian Greenhouse Office), GRDC. Membership now also includes BRS, CSIRO Div of Energy Technology & Div of Forestry and Forest Products, FPA of NSW, Pacific Power, Delta Electricity, Macquarie Generation, Waste Service NSW, EDL & BEST, SEDA, SPM/CPM, Forestry Tasmania, State Forests of NSW, Western Power Corporation, ABB Power Generation Ltd, Western Sydney Waste Board, Stanwell Corporation, CS Energy, NRE -Forest's Service, the Northern Sydney Waste Board, AFFA, Tarong Energy, Great Southern Energy, Energy Equipment International Pty Ltd, Rio Tinto R&TD, QFRI, Babcock and Brown, CVC REEF, ForestrySA and Renewable Energy Corp Ltd.

a technical tour to the recently completed 20 MW_e Cuijk bubbling fluidised bed wood fired power plant which runs unattended over nights and on weekends.

Should you or your organisation wish to obtain information on IEA Bioenergy and possible participation in this program, please contact Steve Schuck, the Biomass Taskforce Manager and Australia's representative on the Executive Committee of IEA Bioenergy . Tel/fax: (02)-9416-9246, or email: Steve.Schuck@bigpond.com. IEA Bioenergy has its home page at the new URL: <http://www.ieabioenergy.com> which provides links to the IEA Bioenergy Task sites and information such as its Annual Report and the Strategic Plan.

IEA Bioenergy - Australia Hosts International Meetings

Australia hosted the annual international **Task 17 Short Rotation Crops for Bioenergy** meeting in Western Australia from 5 - 10 March. This meeting consisted of a number of field visits, focusing on native mallee eucalypts as a large-scale, short rotation tree crop for salinity control, bioenergy and co-products; effluent irrigated bluegum plantations; and bioenergy from forestry residues (plantations and native forests) plus formal sessions to consider the implementation of short rotation energy crops. This meeting was attended by a number of international experts in the field from participating countries Denmark, the Netherlands, the USA, UK, Sweden, Canada, Croatia, Italy, and Australia, plus the European Commission. The meeting was organised by CALM, Western Power Corporation, the Oil Mallee Company WA, Enecon Pty Ltd and the Biomass Taskforce.

Task 18 Conventional Forestry Systems for Bioenergy will be holding its annual workshop "Bioenergy from Sustainable Forestry: Principles and Practice" in south east Queensland and northern NSW from 16 to 20 October 2000. The technical sessions will be held at Coffs Harbour from Wednesday 18 to Friday 20 October. Task 18 is developing systems and guidelines for environmentally sustainable and economic production of biomass for energy from conventional forestry systems; and to promote their acceptance and use in relation to silviculture, forest management, harvesting and transportation. The meeting is being hosted by the Australian Biomass Taskforce and State Forests of NSW. Contact: Dr Annette Cowie, of State Forests NSW, email: annettec@sf.nsw.gov.au, tel: (02) 9872 0138.

Task 19 Biomass Combustion is planning to hold its second 2000 international workshop in Australia, probably in November in NSW. This will be confirmed in future newsletters. It is also likely the successor Task to **Task 25, Greenhouse Gas Balances for Bioenergy Systems** will hold a meeting in Australia in the first half of 2001. Again details will be provided as they come to hand.

Biomass Taskforce Review

The Biomass Taskforce was formed by its four founding members in July 1997 for an initial three year period. Membership has grown eight-fold since its formation, reflecting the level of interest in biomass energy. The Centre for International Economics was engaged by RIRDC on behalf of the Biomass Taskforce members to conduct a review of the Biomass Taskforce with view to its continuation. The final report was presented at the March quarterly meeting of the Biomass Taskforce. The report not only recommends that the Biomass Taskforce continue, but recommends it evolves into a more permanent entity under the direction of a Management Committee. On the basis of this report, the Biomass Taskforce membership was canvassed regarding continuation for a further three years, with all Taskforce members having indicated their ongoing support for the Taskforce. A new name for the Biomass Taskforce to reflect its ongoing nature has been canvassed from the membership, and this should be decided at the forthcoming Biomass Taskforce quarterly meeting on 29 June.

9,500 GWh Additional Renewable Energy Legislation Imminent

The Bill that will mandate that Australian electricity producers provide an additional two percent renewable energy (see Biomass Taskforce Newsletter of February 2000) by 2010 is expected to be submitted to Federal Parliament in the coming weeks. In the announcement following Cabinet's decision to proceed with the measure, the target was set at 9,500 GWh/a from 2010 until 2020, to be phased in gradually from 2001. The measure will apply to wholesale purchasers of electricity on grids larger than 100 MW capacity, with self-generators being excluded as liable parties. The measure will operate through the trading of renewable energy certificates. Biomass energy is expected to provide a substantial proportion of the renewable energy to meet the target.

Information on the 9,500 GWh/a target may be found on the Australian Greenhouse Office's website at: www.greenhouse.gov.au/markets.2percent_ren/fs_boost.html.

1st World Conference and Exhibition on Biomass for Energy and Industry

Five Australians (four from member organisations of the Biomass Taskforce), plus the Biomass Taskforce Manager, Dr Stephen Schuck, attended the 1st World Conference and Exhibition on Biomass in Seville, Spain from 5-9 June. The conference was attended by 1,062 people from 61 nations. The trade exhibition, an integral part of the conference, attracted 156 exhibitors predominantly from Europe. The technical program consisted of 34 oral sessions, eight visual presentation sessions with 673 posters on the program (a few not on display), and seven workshops on the topics of:

(1) Biofuels and Food-ways for a sustainable approach; (2) Biomass Co-firing; (3) Gasification, Combustion and Co-utilisation of Solid Biomass and Waste Recovered Fuels-R&D Needs for Conversion Technologies; (4) Bioenergy Complex for Commercial Production of Bioethanol towards Large Potential Markets; (5) How to Accelerate Biomass Implementation in Europe; (6) Pyrolysis Applications; (7) Energy Conversion Devices in Biomass Gasification.

The titles of the technical papers and visual presentations may be found on the conference web site: www.etaflorence.it/sevilla.htm. The Proceedings of the conference are expected to issue within the coming months. For further information contact Steve Schuck on email: Steve.Schuck@bigpond.com, Tel: (02) 9416-9246.

Renewable Energy Commercialisation Program Round 3 Grants

The Australian Greenhouse Office has announced the outcome of the third round of the Renewable Energy Commercialisation Program grant offers. Five of the 12 projects are biomass projects:

Food energy to green energy

A grant of \$1,000,000 has been offered to **EarthPower Technologies Sydney Pty Ltd** to design and construct an anaerobic digestion facility (biomass to energy) in Camellia, Sydney. It will recycle/convert up to 82,000 tonnes/year of food wastes from industrial and commercial sectors into biogas, organic fertiliser and reusable clean water. The biogas will be used both in the drying process for the organic fertiliser and exported to neighbouring industry to replace natural gas in energy production. Diverting biomass waste from landfill reduces emissions of methane and other greenhouse gases that would otherwise occur.

Contact: Mr Ron Mendelsohn, *EarthPower Technologies Sydney Pty Ltd*, (03) 9654 6799

Bulk Bagasse Dewatering

A \$1,000,000 grant has been offered to **Mackay Sugar Co-operative Association Limited** to build a commercial scale bagasse dewatering station at Racecourse Mill, utilising bulk bagasse from all four sugar mills at Mackay, Queensland. The facility aims to reduce the moisture content of bulk bagasse stored uncovered to 50% and demonstrate the technology and economics of production, transport, storage and use of bagasse as a renewable energy source for sugar mill cogeneration year round. Successful bagasse management would displace the use of some 50,000 tonnes/year of coal thereby reducing CO₂ emissions by 122,000 tonnes/year.

Contact: Mr John Peake, Mackay Sugar Co-operative Association Limited, (07) 4953 8280

Gasification of Biomass for Coal Drying

Thiess Contractors Pty Ltd have been offered a grant of \$1,000,000 to design, construct and operate a 4.75MW Waterwide Close Coupled Gasifier (CCG) and boiler at the Herman Research Laboratories at Morwell, Victoria. The coal drying facility will utilise locally available biomass for the generation of steam to be used in the brown coal drying process. The CCG will also be capable of handling a variety of biomass fuel types, and be available on a commercial basis for trialing various biomass fuels. Utilisation of biomass to produce heat for fuel drying reduces the quantity of brown coal required to produce each KWh of electricity and thereby reduces greenhouse emissions.

Contact: Mr Tony D'Alessandro, Thiess Contractors Pty Ltd, (07) 3002 9404

ReOrganic Energy

A consortium of **Thiess Environmental Services Pty Limited, Landfill Management Services Pty Ltd, New Hope Coal Australia** and **CS Energy Limited** have been offered a grant of \$1,000,000 to use landfill gas and bio-gas to directly supplement the coal-fired Swanbank Power Station at Ipswich, Qld. An engineered bio-cell will be established at the adjacent landfill facility for the enhanced production of bio-gas from waste. The landfill and bio-cell will utilise technology that accelerates the degradation process, thereby increasing the production rate of landfill gas and bio-gas. Recovered landfill gas and bio-gas will be processed and piped to the Swanbank Power Station for use as a renewable fuel source.

Contact: Mr John Falzon, Landfill Management Services Pty Ltd, (08) 8363 0100

Medium Scale Biomass Fuelled Power Generation Plant in South Australia

Origin Energy Limited (formerly Boral Energy Ltd) have been offered a grant of up to \$750,000 to commercialise a 20MW biomass power station using mainly plantation timber in the Mt Gambier area of southeastern South Australia. The fuel-handling and combustion systems will use a variety of biomass fuels including wood residue from established softwood plantations, recent hardwood plantings and associated saw milling and logging operations as well as some agricultural waste.

Contact: Mr Andrew Stock, Origin Energy Ltd, (08) 8223 8300

Further information is available from the Australian Greenhouse Office. Contact Gillian McDonald, Program Manager, Renewable Energy Grants Programs, telephone (02) 6274 1376 or the Renewable Energy Hotline on (02) 6274 1880.

SEDA's Assistance Program for Renewable Energy Projects

Applications are presently being invited for funding under the 4th round of SEDA's Renewable Investment Program. SEDA's program supports the construction of small to medium scale energy generators powered by renewable resources such as biomass. This round makes \$2 million available for renewable energy projects. To date projects funded under this scheme have been concentrated in regional and rural areas, creating new economic and employment opportunities

and underlining the fact that renewable energy industries are a source of growth for regional and rural Australia.

Renewable energy projects funded so far have included the Whytes Gully Green Waste Gasifier at Wollongong and the Broadwater Sugar Mill Bioenergy Cogeneration plant.

Applications for funding close on 14 August 2000 - contact SEDA for a copy of the funding Guidelines. For further information phone Graeme Jessup on (02) 9291 5285 or Email jessup@seda.nsw.gov.au

Renewable Energy Certificates

The AGO has released a report by McLennan Magasanik Associates Pty Ltd modelling various price projections of the renewable energy certificates from 2001. The report, *Projections of Price of Renewable Energy Certificates to Meet the 2% Renewable Energy Target*, describes a range of values for the certificates under a number of different scenarios. The report is available in PDF format from

http://www.greenhouse.gov.au/markets/2percent_ren/expert/mma/index.html.

An expectation is that certificate (each certificate is for 1 MWh) prices will range from under \$20 in 2001 to \$41 in 2010 and gradually increase to around \$50 by 2020.

Brightstar Environmental's Green Waste Gasification Project Officially Opened

The NSW Minister for Energy, the Honourable Mr Kim Yeadon opened Brightstar Environmental's green waste to energy project at Whytes Gully near Wollongong NSW on 18 May. The opening marks the completion of the initial phase of this world first Solid Waste to Energy Recycling Facility (SWERF) for the City of Wollongong. The Whytes Gully waste to energy project processes green organic materials such as urban tree loppings and is designed to process a nominal 20,000 tonnes per annum green waste as fuel. The green waste is shredded and fed into a gasifier and converted to a clean synthetic fuel gas. The synthetic fuel gas is combusted with methane, extracted from the adjacent landfill to power a spark ignition gas engine to produce electricity. The second stage of this project will extend the technology to process municipal solid waste and is planned to be eventually expanded to process up to 150,000 tonnes of MSW and generate 120 GWh electricity per annum. This stage will comprise a total of four gasifiers and eight generator modules.

Contact is: Mr Bill Lazarus, Tel: (07) 3275 5600, Email: bill.lazarus@brightenv.com

Agreement for Chicken Litter Power

Independent electricity retailer W. A. Consolidated Power (WACP) has signed an agreement to purchase power from Australia's first large scale chicken litter fuelled renewable energy power station to be built in Western Australia. WACP Chief Executive Officer Charlie Abner says the WACP agreement with Blair Fox Generation essentially underwrites the \$26 million power station by agreeing to buy its entire 10 Megawatts of output for a minimum of fifteen years. In the next few months WACP and Blair Fox are scheduled to negotiate a final Power Purchase Agreement.

The power plant will generate enough renewable electricity to power 13,000 average homes and will reduce WA CO₂ emissions by some 70,000 tonnes p.a. A secondary benefit is one of public health as the new power station will use all of the 100,000 tonnes of chicken litter produced each year by the WA chicken meat industry, now used as fertilizer by the state's horticulture industry.

Chicken litter used in this manner is reported to be a serious health issues in regional WA, as it is a significant breeding ground of the Stable Fly, a scourge of many rural communities. Mr Abner related that the agreement also allows WACP to enter into new retail electricity markets, as outlined by the WA state government's Green Energy Policy, which allows for renewable energy producers to sell electricity (via retailers like WACP) to customers with annual electricity consumption greater than 300 MWh per year.

For further information contact Matthew Rosser, Managing Director of Blair Fox Generation WA on Tel: (08) 9228 8846, Fax: (08) 9227 0488 , Email: blairfox@cygnus.uwa.edu.au

Renewable Energy Action Agenda Launch

The Minister for Industry, Science and Resources, Senator Nick Minchin will launch the Renewable Energy Action Agenda at Parliament House, Canberra on 20 June. A Renewable Energy Leadership Group, chaired by Mr Greg Bourne, Regional President of BP Australia Ltd was formed from chief executives from industry, with representation by the Chief Executive of the Australian Greenhouse Office, Gwen Andrews and Division Head, Patricia Kelly of DISR. The Leadership Group also included industry association advisers, including the Biomass Taskforce Manager, Dr Stephen Schuck.

Information on the Action Agenda may be found on the web at: www.isr.gov.au/agendas.

Sugarcane Trash Harvesting for Bioenergy

SEDA has signed an agreement with the NSW Sugar Milling Cooperative to use more waste from the sugar growing industry to generate electricity. The SEDA grant provides a four-year low-interest loan to help develop and implement a modification to current sugar cane harvesting methods. It is common practice now to burn off a canefield before harvesting. This burns most of the leafy material of the cane plant. Cane is sometimes cut "green", but the "trash" (the leafy material) is dumped on the field, where it is normally burnt before growing the next crop. The finance is to allow modifications to harvesters so that the cane will be cut green, and the trash chopped up and collected as the cane is cut. The collected trash will then be available as an additional fuel for burning in the mills' boilers for generating electricity.

The trash collection project should supplement the current bagasse fuel by at least 50%. As previously related in the Biomass Taskforce newsletters, the NSW Sugar Milling Co-operative and Delta Electricity are planning to install a 30MW co-generation plant at Condong. Similar plants are planned at Broadwater and Harwood.

USA FERCO/Batelle Gasifier Receives US \$16 Million Support

Future Energy Resources Corporation (FERCO) has announced that it has received US\$16 million to move its biomass gasification process towards production and marketing. The investment came from billionaire philanthropist Ted Turner's Turner Foundation and others. The U.S. Department of Energy had previously supported the technology with US \$26.9 million in funding. The biomass process is the first of its kind to produce electric power from biomass feedstock using an unmodified product gas to power a gas turbine. Feedstocks from forestry, agricultural, and municipal waste are converted to a medium heating value gas that can replace natural gas often used to fuel gas turbine generators. Process gas could also be used to power vehicles or as a base chemical for synthetic petrochemicals. The process is also a way for municipalities to dispose of waste. The FERCO process was first developed by the Battelle Memorial Institute in the 1980's.

Microturbine News

Canadian power company Hydro-Quebec, through its venture capital subsidiary CapiTech, has invested US \$8 million in Capstone Turbine Corporation - maker of the 30 kW MicroTurbine™. Capstone has in turn announced yet another business partnership - this time with Meidensha Corporation and Sumitomo Corporation. The two Japanese companies will jointly distribute the MicroTurbine for stationary applications, develop combined heat and power technology and include systems integration and maintenance programs with installations.

The Capstone turbine can currently run on biogas from landfills and anaerobic digestors, and is being further developed to run on gasified biomass. Capstone Turbines are being marketed in Australia through Harris Energy Solutions Pty Ltd.

Capstone's web address is <http://www.capstoneturbine.com/>. Harris Energy Solutions may be contacted on Tel: 0408 257 322, Email: greghar@mpx.com.au

Biobased Polymer Plant Under Construction in the USA

On 25 April, Cargill Dow, a 50:50 joint venture between the Dow Chemical Company and Cargill Incorporated, broke ground on the world's first global-scale polylactide (PLA) manufacturing facility. The Blair, Nebraska-based plant will specialize in a new polymer called NatureWorks PLA that can be used in a wide variety of consumer goods. The plant will use a process of simple fermentation, distillation, and polymerization of natural plant sugars to "harvest" the carbon that plants remove from the air during photosynthesis as the basis for PLA. The \$300 million plant, expected to be operational in 2002, will require 40,000 bushels of corn each day to meet its worldwide production capacity and could employ up to 100 workers. Cargill Dow is the first company to offer polymers derived entirely from renewable resources to its customers. (Source: Biobased Products and Bioenergy Bimonthly Newsletter)

Gasification of Olive Wastes

In May PRM Energy Systems and its Licensees PRiMEnergy, LLC, Tulsa, Oklahoma, and Guascor, S.A. of Spain, successfully completed the installation, startup and testing of a new Guascor internal combustion engine/generator, designed to operate on 100 percent low calorific synthesis gas produced from olive waste by the PRME Biomass Gasifier. The Guascor engine operating on olive wastes at the PRiMEnergy Biomass Gasification Center in Tulsa is similar to six (6) Guascor engines that are to be installed at a 3.8MWe olive waste fueled, power generation facility under construction in Italy. The PRME Biomass Fired Engine Generator System (BFEG) is available in sizes from 750kW to 10MW. The system is capable of operating with most biomass materials as fuel. More information is available on the following web sites: <http://www.prmenergy.com> ; <http://www.primenergy.com> ; <http://www.guascor.com>

Contacts are: PRM Energy Systems, Inc. - Ron Bailey Jr. Tel: (0011 1) 501-767-2100; Fax: (0011 1) 501-767-6968; Email: rbaileyj@prmenergy.com

PRiMEnergy LLC - Bill Scott - Tel:918-835-1011; Fax:918-835-1058; Email: wnscott@primenergy.com

Algae Power

Bright green pond algae could be a major source of hydrogen, if scientists are correct.

Researchers at the University of Berkeley in California and the U.S. National Renewable Energy Laboratory have discovered that when bright green algae known as *Chlamydomonas reinhardtii* are deprived of sulfur they produce the enzyme hydrogenase. Hydrogenase can split water into hydrogen and oxygen - a biological version of electrolysis. Presently the hydrogen production is too low for commercial use; however scientists feel hydrogen production can be increased ten-fold with mutant versions of the algae. At higher levels of production a small-pond could power a dozen cars for a week. Hydrogen could power fuel cells or combustion engines. The full text of the research is in the January edition of *Plant Physiology*. Alternatively visit UC Berkeley at <http://www.urel.berkeley.edu/release>.

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 addresses given in the previous nine issues of the Biomass Taskforce newsletters. These lists are consolidated as electronic links on the Biomass Taskforce's web page at [http:// www.users.bigpond.com/Steve.Schuck/ABT](http://www.users.bigpond.com/Steve.Schuck/ABT)

Municipal Solid Waste

<http://conx.com/ceed/elecgenmix/munisolwas.html>

<http://www.ngsa.org/rc-msw.html>

Natural Step Environmental Institute

<http://www.ozemail.com.au/~natstep/index.html>

Decton Burn Systems (US)

<http://www.decton.com>

Maps of biomass in Europe

<http://www.eeci.net/>

Australian Hemp Resource and Manufacture (industrial hemp)

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

Directory of waste recycling and recovery operators in Tasmania

http://www.dpiwe.tas.gov.au/env/recycling_directory

"Growing Carbon: A New Crop that Helps Agricultural Producers and the Climate Too" (USDept of Agriculture)

http://www.swcs.org/docs/carbon_brochure.pdf

Ensyn (pyrolysis bio-oils)

<http://ensyn.com>

Anaerobic digestion

<http://www.webconx.com/methane.htm>

<http://waste2profits.com/articles.htm>

Ag Fiber Technology News

<http://www.agfibertechnology.com/424956.html>

Environmental Media Services

<http://www.ems.org>

E3 Consultants

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

Hazelwood Power

<http://www.hazelwood-power.com.au>

BG Technologies (Indian gasifier technology)

<http://www.bgtechnologies.net>

Enecon Pty Ltd

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

The ANZSES Solar 2000 Conference

<http://www.solar2000.aust.com>

Siemens Power

<http://www.siemens.de/kwu/>

NetEnergy - Journal of the Energy and Environment Division of the Department of Industry, Science and Resources
<http://www.isr.gov.au/resources/netenergy>

Ag Fiber Technology News.
<http://www.agfibertechnology.com/066042.html>

Fluidyne gasification archive
<http://members.xoom.com/whitools/>

USA National Biodiesel Board
<http://www.nbb.org/>
<http://www.biodiesel.org/>

AVEL (Australasian Virtual Engineering Library) -
<http://avel.edu.au>

Australian Academy of Science
<http://www.science.org.au>

CSIRO DWE 'futures to 2050' workshop series
<http://www.dwe.csiro.au/futures/ecumene/DIMAwshopReps.htm>

Oregon Office of Energy
<http://www.energy.state.or.us/biomass/workshop.htm>

Sustainable Energy Day - 2000 Monash University on July 12
<http://www.ecse.monash.edu.au/prof/sustenergyday/index.html>

VTT's publication, '*Safe handling of renewable fuels and fuel mixtures*'
<http://www.inf.vtt.fi/pdf/publications/1999/P394.pdf>

Wankel (rotary Engine) for producer gas
<http://www.pegasuspowers.com>.
<http://www.bgtechnologies.net>

Gasification (Tom Reid)
<http://www.woodgas.com>

Initiative for Future Agriculture and Food Systems (IFAFS)
<http://www.reeusda.gov/ifafs>

Joint Institute for Energy and Environment
<http://www.jiee.org/Alliance/workshop.html>

Sattler (gas storage tanks) for the agricultural, industrial and sewage treatment sector.
<http://www.sattler-europe.com>

American Scientist article on effect of poultry and pork production on a river (relates to AD)
<http://www.amsci.org/amsci/articles/00articles/mallin.html>

Anaerobic digestion sites

NTNU - Norwegian University of Science and Technology
 Department of Hydraulic and Environmental Engineering
<http://www.ntnu.no/~inm/>
<http://www.cambi.no/>

Effluent-Irrigated Plantation Research
http://www.ffp.csiro.au/pff/effluent_guideline/

Sustainable Minnesota Newsletter Page
<http://www.me3.org/issues/biomass/>

The Carbon Trader
<http://www.thecarbontrader.com>.

Summary of a feasibility study of parallel combustion of biomass at an existing 600 MW coal-fired power plant
<http://www.caddet-re.org/html/100art3.htm>

"Natural Capitalism - Creating the Next Industrial Revolution" by Paul Hawken, Amory & Hunter Lovins.
<http://www.naturalcapitalism.org>

Carbonization & Torrefaction of Briquettes at
<http://www.rwedp.org/acrobat/rm23.pdf>

Community Power site
<http://www.goepc.com>

Wood combustor (to 10 MW)

<http://pages.infinet.net/energfei>
 Australian Science Future
<http://www.science.org.au/future>
 biomass gasification.
<http://www.marick.co.uk>
 Gasifier stove video and web page
<http://www.retsasia.ait.ac.th>
 Renewable Energy Industry Development (REID) program component of RECP
<http://www.greenhouse.gov.au/renewable/recp/reid>
 "Charcoal production and pyrolysis technologies". REUR Technical Series No. 20, 1991, p.101 - 114, publ. by the Food and Agriculture Organization of the United Nations
<http://www.techtp.com/torrefied%20wood.htm>
 "Sustainable Energy Day-2000" Monash University
<http://www.ecse.monash.edu.au/prof/sustenergyday/index.html>
 TEPCO (re renewable energy legislation in Japan to subsidise renewables)
<http://www.tepco.co.jp/index-e.html>
 Resource Development Associates (Phil Lusk)
<http://www.biogasworks.com>
 Prime Energy (rice gasifier)
<http://www.guascor.com>
 The other Steve Shook's forest directory website (University of Idaho)
<http://www.forestdirectory.com>
 Wood pellet stoves
www.pelletstove.com
 The making of the Källe-gasifier " (published in 1942)
<http://www.artech.se/~joacim/gengas>
 IEA Bioenergy Task 29
<http://www.eihp.hr/task29.htm>
 IEA CADDET Renewable Energy Centre Technical Brochures
 114: Wood Waste as a Substitute for Coal (The Netherlands)
<http://www.caddet-re.org/assets/no114.pdf>
 115: A Diesel Engine Fuelled by Spent Vegetable Oil (Japan)
<http://www.caddet-re.org/assets/no115.pdf>
 116: Wood Chip Gasifier Supplies Heat to Small Community (Denmark)
<http://www.caddet-re.org/assets/no116.pdf>
 117: Waste Biomass Use at the New Oslo International Airport (Norway)
<http://www.caddet-re.org/assets/no117.pdf>
 118: Co-digestion of Manure with Industrial and Household Waste (Denmark)
<http://www.caddet-re.org/assets/no118.pdf>
 AGORES, the official EU website for renewable energy
<http://www.agores.org>
 U.S. Energy Association
<http://www.usea.org>
 Fluidyne Gasification pictures showing some machines with coppice willow
http://members.xoom.com/_XMCM/whitools/index.html
 Report from Jaakko Poyry called "The need for Change - Positioning Australia's Forestry Industry for the Changes/Opportunities of Tomorrow". Forestry Action Agenda paper
<http://www.affa.gov.au/ffid/final-report.pdf>
 Pyrolyser/ charcoal making stove & research
http://www.ikweb.com/enuff/public_html/Turbo/Turbo.htm
http://www.ikweb.com/enuff/public_html/aburner/td1.htm
 Discussion about Ethanol - April 19th, 2000, the Portland Hilton, Oregon.
<http://www.energy.state.or.us/biomass/workshop.htm>
 Forest and Wood Products Action Agenda
<http://www.affa.gov.au/affa/subjects/forestry.html#5>

Forthcoming Events

- IEA Bioenergy Task 18 *Conventional Forestry Systems for Bioenergy* meeting. 16-20 October, 2000, Brisbane and Coffs Harbour. Contact Dr Annette Cowie, State Forests of NSW, email: annettec@sf.nsw.gov.au, tel: (02) 9872 0138.
- 5th International Conference on Thermochemical Biomass Conversion, Tyrol, Austria, 17-22 September 2000. Main topics to be covered are: Feedstock Preparation, Pretreatment, Conversion, Products, Applications, and Systems. Contact: Prof. Tony Bridgwater, Bio-Energy Research Group, Aston University, Birmingham, B4 7ET, UK. Fax: +44 121 359 6814, Email: a.v.bridgwater@aston.ac.uk or ahrendtn@aston.ac.uk
- Internet Conference on 'Material Flow Analysis of Integrated Bio-Systems, March - October 2000. The Institute of Advanced Studies of the United Nations University (Tokyo) (<http://www.ias.unu.edu>) and the UNU/IAS Integrated Bio-Systems Network (<http://www.ias.unu.edu/proceedings/icibs/ibs/ibsnet>), in cooperation with other organisations are holding an internet conference. Scope is municipal biodegradable solid recycling and conversion systems; wastewater treatment and utilisation systems; integrated aquaculture systems; small farming systems; large plantations, farms and feedlots; constructed building complex, greenhouse and eco-house systems; industry and eco-industrial parks; resource utilisation and conservation in sustainable eco-systems; small islands, community villages and cities; global issues related to food security, environment and climate change; and tools and methodology for design and analysis of integrated bio-systems. Contact Mr Jacky Foo on email at foo@swipnet.se, fax: +46-8-314620.
- ISES 2001 Solar World Congress, Nov/Dec 2001, Adelaide. Web: <http://www.unisa.edu.au/ises2001congress>
- 15th Australian Biotechnology Association Conference, ABA2000, Brisbane 2-6 July 2000. Contact ABA2000 secretariat, tel 07 3369 0477, fax: 07 3369 1512. Web: www.aba2000.im.com.au.
- Global Energy Exposition and Energex 2000, 23-28 July 2000, Las Vegas, Nevada, USA. Web site: www.globex.com. Email: clydon@ntsdev.com.
- Australian Forest Growers 2000 Conference, 4-6 September 2000, Cairns, Queensland. Web: www.afg2000.com.
- Fifth International Conference on Greenhouse Gas Control Technologies, Cairns Convention Centre, 13-16 August, 2000. Contact Colin Paulson, tel: 02-9490 8790, fax: 02-9490 8819, email: c.paulson@det.csiro.au.
- 'II International Symposium on Anaerobic Digestion of Solid Waste (II ISAD-SW)', 15-18 June 2000, Barcelona, Spain. Contact: II-ISAD-SW, Apdo. Correos 30124, E-08080 Barcelona, Spain. Tel: + 34 929 920 591; Fax: + 34 919 751 180; Email: congres@waste.qui.ub.es Web: <http://www.II-ISAD-SW.ub.es>
- 'Woody Biomass as an Energy Source - Challenges in Europe', 25-27 September 2000, Joensuu, Finland. Contact: Ms. Brita Pajari, European Forest Institute, Torikatu 34, FIN-80100 Joensuu, Finland. Tel: +358 13 252 0223; Fax: +358 13 124 393; Email: brita.pajari@efi.fi; Web: www.efi.fi/events
- *From Fossils to Photons: Renewable Energy Transforming Business*, Solar 2000, 38th Annual Conference of the Australian and New Zealand Solar Energy Society, November 29 - 1 December 2000, Griffith University, Brisbane. <http://www.solar2000.aust.com/> Email: solar2000@icms.com.au . Covers all forms of renewable energy including biomass.
- Pacificchem, the 2000 International Chemical Congress of Pacific Basin Societies, will take place in Honolulu, Hawaii December 14-19, 2000. The sponsors are the American Chemical Society, Canadian Society for Chemistry, The Chemical Society of Japan, The Royal Australian Chemical Institute and The New Zealand Institute for Chemistry. Within the Program, there are four symposia concerned with biomass utilisation:
 - Utilization of Biomass for Production of Chemicals in the 21st Century
 - Chemical Modification, Properties and usage of LigninBioconversion of Lignocellulosics to Ethanol and Coproducts

- Lignocellulosics Science and Technology, from Laboratory to Market
Contributions to these Symposia are now solicited. Further information is on the web at:
<http://www.acs.org/meetings/pacific2000/>
 - Cogen Europe's 7th Annual Conference *The Quality of Energy Supply: Cogeneration's Role in Sustainable Development*, 18-20 October 2000, Europa Intercontinental Hotel, Brussels, Belgium. Email: info@cogen.org Web: www.cogen.org.
 - *Business and the Environment – Solutions for the New Millennium*, 20&21 July 2000, Sydney. Greenpeace and IBC Conferences Pty Ltd. Email: registration@informa.com.au , web: www.ibcoz.com.au , Tel: (02) 8325 5300.
 - The 9th Biennial Bioenergy Conference & Exhibition Hosted by the Northeast Regional Biomass Program. 15-19 October 2000, Buffalo, New York, USA. Web: www.nrbp.org/bio2000.htm , Email: nrbp@sso.org, Tel (0011 1) (202) 624 8464.
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Residues

- The Biomass Taskforce Manager, Stephen Schuck, delivered a presentation on biomass energy to the ESAA Renewable Energy for the New Millennium Conference in Sydney in March. Paper was entitled "Meeting the Market for Biomass Energy".
- Steve Schuck delivered a presentation at the Renewable Energy Generators of Australia's Forum 2000 on 15 June in Hobart, Tasmania. The presentation was entitled "Biomass Energy in Australia".
- Steve Schuck has been invited to give a paper at the AIC *Contracting in Plantation and Production Forestry* 3rd Annual Conference in Melbourne 4-5 September 2000. The working title of the paper is "Bioenergy Opportunities from Forestry Residues".
- The Biomass Taskforce should soon release its six page glossy brochure entitled *Biomass - Energy and Products* to inform a wider community what biomass is and what opportunity it affords. The brochure provides a general introduction on biomass, and covers biomass conversion technologies and the benefits of biomass energy. The brochure is being printed on behalf of the Biomass Taskforce by RIRDC and should be available soon.
- Australian Independent Power, the newsletter of the Australian Cogeneration Association, of which the Biomass Taskforce is a reciprocal member, reproduced two pages of the November 1999 Biomass Taskforce Newsletter in its January/February 2000 edition.
- The March edition of Australian Energy News carried a two page article on biomass and the Biomass Taskforce.
- The most recent issue of Solar Progress, the journal of the Australian and New Zealand Solar Energy Society, featured biomass and the Biomass Taskforce. Seven pages were dedicated to biomass.
- The former Energy Research and Development Corporation's (ERDC) reports are now available from the Environment Industries Development Network (EIDN). See web at <http://www.energypublications.com.au>.
- Britain's Millennium Dome in London will use green power from sewage gas delivered by the Renewable Energy Company. The company will make its 'Ecotricity' from wind, hydro, solar and biomass available to residential customers later this year (source- Trends in Renewable Energy)
- Regional Energy Resources Information Center (RERIC) of Bangkok has published a special edition of its Energy Journal on *Biomass As a Source of Energy in Selected Asian Countries*. The countries included are China, India, Pakistan, Nepal, Philippines and Sri Lanka. Any one interested may contact Dr. Lilia Austriaco of RERIC at the following address: enreric@ait.ac.th
- To provide background to the issues surrounding the Forests and Wood Products Action Agenda, the Steering Committee commissioned a consultancy report from Jaakko Poyry called "The need for Change - Positioning Australia's Forestry Industry for the Changes/Opportunities of Tomorrow". The report is on the internet at <http://www.ffa.gov.au/ffid/final-report.pdf>
It is expected that the Action Agenda will be officially launched in July 2000.

- The Federal Government's Forest and Wood Products Action Agenda is open for comment until 30 June 200. A copy of the paper and some background to the process is on AFFA's web-site at <http://www.affa.gov.au/affa/subjects/forestry.html#5> Contact: Clive Catton, Forests Division at AFFA, Tel (02) 6272 4191.
- Clearwater Atlantic, a Queensland based company reports that it, together with its joint venture partner Lee-Schuller International Ltd of the UK have been selected to build-own-operate a 72 MW municipal solid waste/waste tyre power station on the island of New Providence in the Bahamas. The power station will consist of four 18 MW gas turbines, four gasifiers and a baghouse filtration system. Putrecible waste will be separated from the waste stream and converted to biogas in an adjacent digester. This biogas will be used to pre-dry the MSW for the gasifiers. Contact: Hans Ahnland, Fax: (07) 3286 4292.
- The U.S. ethanol industry has been producing at an all time high, averaging 107,000 barrels per day, surpassing the previous record of 106,000 b/d in October 1999. This has resulted from the current high price of petrol and a record low price for corn.
- Recent articles added to the Biomass Information Resources Page at <http://www.me3.org/issues/biomass/> are:
 - New Process for Torrefied Wood Manufacturing - by James R. Arcate -Transnational Technology, appeared in Bioenergy Update, April 2000
 - General Bioenergy
 - Energy Power Resources Limited - UK
 - Microgy Cogeneration Systems Inc.
 - Ensyn
 - National Agroforestry Center - USDA
 - Salix Project - Willow Project in Wales
 - European Biomass Association
 - Italian Biomass Association
 - Swedish Bioenergy Association
 - Belgian Biomass Association
 - Biomass Pyrolysis Network - PyNe
 - BIOSEM (Biomass Socio-Economic Multiplier)
- World-wide sugar production for 1999 was 122 million tonnes. Bagasse (residue from crushing the sugarcane) amounted to 340 million tonnes, much of which is not used productively (e.g. for energy).
- AGORES (<http://www.agores.org>), the official EU website for renewable energy sources was launched in April. The new website aims to be the most extensive renewable energy knowledge centre and gateway for Europe. The website has been designed as a starting point when searching for information on renewable energy technologies, projects, companies, websites and funding opportunities.
- AusIndustry's Start Graduate Program pays for companies to develop R&D practices through employing graduates. The grants aim to encourage commercially-focused research to generate revenue both locally and internationally. Grants are given on a competitive basis to cover 50% of eligible project costs, including a salary, to a maximum of \$100,000. Applications are assessed throughout the year. Further information is available from web site: <http://www.ausindustry.gov.au/>
- Energy Developments Limited has restructured its emerging waste-to-energy business, including its investment in the US based BSC Holding Co. A joint venture has been formed and is now trading under the name 'Brightstar Environmental'. Paul Whiteman, executive director of Energy Developments has been appointed chief executive officer of Brightstar Environmental. Brightstar Environmental is a member of the Biomass Taskforce.
- A useful new brochure "Growing Carbon: A New Crop that Helps Agricultural Producers and the Climate Too" has been published by the USA Department of Agriculture's Natural Resources Conservation Service in cooperation with the USDA National Agroforestry Center and the Soil and Water Conservation Service and Environmental Defense. It may be downloaded from the web sites: http://www.swcs.org/docs/carbon_brochure.pdf
- Ensyn, a Canadian based biomass company produces 900 tonnes/month of bio-oils. From this it produces 20 chemical products as well as using the residual bio-oil as a fuel. It

- products include speciality chemicals, food flavourings, pre-polymers, resin ingredients and polymer chemicals. Ensyn is on the web at: <http://ensyn.com>.
- The Spanish utility Endesa is using olive residues as a renewable electricity source. For the past three years, Endesa has used olive oil production waste to power the small town of Benameji. The five million tonnes per year of olive pulp and skins produce about four times the town's energy needs. Endesa is about to build two more olive oil-powered plants and is moving to export its technology to other olive growing countries, such as Italy, Greece and Turkey.
 - Juniper Consultancy Services Limited of the UK has published two volumes on *Pyrolysis and Gasification- A Worldwide Review*. The two volumes are Vol 1 *Markets & Trends* and Vol 2 *Technologies and Processes*. The volumes sell for £750 each and for £1300 for both. For ordering details see web site: www.juniper.co.uk/publications/.
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Opportunities Corner

The Biomass Taskforce would like to assist and facilitate biomass and bioenergy projects 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.

- Sanjay Chatterjee is keen to link up with organisations to develop his 'Ozdiesel' concept into a national or regional industry, to provide vegetable oil based biodiesel to the Australian market. Interested parties are invited to contact Mr Chatterjee. Email: sanjay@idx.com.au Tel: 0416 113 687 or (02) 9683 5547.
 - Mark Willcocks, MD of Active Tree Services would welcome contact regarding new markets for biomass from tree lopping operations. His company generates approximately 10,000t/a timber waste. Location is at Terry Hills, NSW. Contact Mark Tel: (02) 9997 4422 or by email: markw@activetreasureservices.com.au
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Back Issues of Biomass Taskforce Newsletters – Downloadable from the Biomass Taskforce's homepage: <http://www.users.bigpond.com/steve.schuck/abt>

The Biomass Taskforce Newsletter is a complimentary service provided by the Biomass Taskforce 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: Steve.Schuck@bigpond.com) **of your email address.**

Editor: Dr. Stephen Schuck, Biomass Taskforce Manager

Any comments, suggestions, articles and feedback are welcome. The view expressed in this newsletter are not necessarily those of the member organisations. The Biomass Taskforce may be contacted at:

Biomass Taskforce
7 Grassmere Rd, Killara, NSW 2071
Phone/Fax: (02) 9416 9246
Email: Steve.Schuck@bigpond.com
Web: <http://www.users.bigpond.com/Steve.Schuck/ABT>