



Biomass Taskforce

January 1999

Biomass Taskforce Membership¹ Further Expanded

The Biomass Taskforce membership has increased to 16 organisations, with recent new members being the NSW Sustainable Energy Development Authority (SEDA), Southern Pacific Petroleum/Central Pacific Minerals N.L., Forestry Tasmania, State Forests of NSW and Western Power Corporation. Following recent changes to Government departments, the Department of Industry, Science and Resources has taken over the membership of the former Department of Primary Industries and Energy (DPIE).

IEA Bioenergy – Australian Participation

As previously related in this newsletter, the Biomass Taskforce sees much merit in Australia participating in the International Energy Agency's Bioenergy program. This international collaborative information exchange program operates on a three year cycle, with the current Tasks being for 1998-2000. There are now 13 Tasks in all, with member countries able to choose the Tasks in which they participate. The current Tasks are:

- Technology assessment studies for the conversion of cellulosic materials to ethanol in Sweden
- Short Rotation Crops for Bioenergy (including short rotation forestry)
- Conventional Forestry Systems for Bioenergy
- Biomass Combustion (including co-firing)
- Thermal Gasification of Biomass
- Pyrolysis of Biomass
- Techno-Economic Assessments for Bioenergy Applications
- Energy from Thermal Conversion of MSW and RDF
- Energy from Biological Conversion of Organic Waste
- Greenhouse Gas Balances of Bioenergy Systems
- Biotechnology for the Conversion of Lignocellulosics to Ethanol
- Liquid Fuels from Biomass
- Solid Biomass Fuels Standardisation and Classification

The Biomass Taskforce has agreed to pay the fixed national contribution to the Executive Committee to facilitate the formation of participating consortia.

First Participation Group Formed: The Biomass Taskforce has been successful in an application to the Joint Venture Agroforestry Program to secure funding for participation in IEA Bioenergy Task 17, *Short Rotation Crops for Bioenergy*. A group consisting of the Western Australian Department of Conservation and Land Management, Victoria's Centre for

¹ Founding members: ERDC (replaced by DISR), RIRDC, Environment Australia (now Australian Greenhouse Office), GRDC, BRS. Membership now also includes CSIRO Div of Energy Technology, FPA of NSW, Pacific Power, Delta Electricity, Macquarie Generation, Waste Service NSW, EDL, SEDA, SPM/CPM, Forestry Tasmania, State Forests of NSW and Western Power Corporation.

Forest Tree Technology (Department of Natural Resources and the Environment), Forest Products Association of NSW, CSIRO Division of Forestry and Forest Products, State Forests of NSW and Queensland's Department of Primary Industry and convened by the Biomass Taskforce will participate in this program from 1999.

To further advance membership of IEA Bioenergy, Stephen Schuck attended the IEA Bioenergy Executive Committee meeting in Christchurch New Zealand as an observer. An invitation for Australian participation was issued at the meeting.

A future step is to gain support for participation in a number of other Tasks of IEA Bioenergy. To this end a proposal is being developed.

Should you wish to obtain information on this program and the Biomass Taskforce's effort to enable Australian participation in other Tasks, please contact Steve Schuck on tel/fax: 02-9416-9246, or email Steve.Schuck@bigpond.com. The IEA Bioenergy has its home page at URL: <http://www.fri.cri.nz/ieabioenergy/home.htm>

IEA Bioenergy Strategic Plan Released

IEA Bioenergy has published its four page Strategic Plan for 1998- 2002. The plan has seven Objectives, with a number of Actions supporting each of these Objectives. The Objectives are:

1. To promote the utilisation of technologies and systems for enhanced sustainable energy production from biomass.
2. To actively encourage the maintenance and development of networks of participants involved in research, development, demonstration and deployment, and to provide for the effective exchange of information on bioenergy markets.
3. To improve the involvement of industry in IEA Bioenergy.
4. To increase membership with emphasis on countries with large biomass resources and R&D infrastructure.
5. To increase interaction with other global, multilateral energy implementation programs.
6. To ensure mutual IEA Bioenergy and IEA Renewable Energy Working Party goals are met.
7. To continue to seek efficiencies and cost effectiveness in the operation of IEA Bioenergy.

Copies of this IEA Bioenergy Strategic Plan are available from Steve Schuck, the Biomass Taskforce Manager. Phone/fax: 02 9416 9246, email: Steve.Schuck@bigpond.com

Biomass Taskforce Submission for NSW Greenhouse Gas Methodology Review

Retail electricity producers in New South Wales are required by the Electricity Supply Act 1995 to plan and report annually on greenhouse gas emissions arising from electricity supplied to customers in NSW in accordance with a methodology approved by the NSW Minister for Energy. The current methodology was released in August 1997 and is now subject to a review by a Methodology Working Group chaired by Dr David Hemming of the NSW Department of Energy. The Biomass Taskforce Manager responded to an Issues Paper which is also available on the Internet at www.doe.nsw.gov.au.

The thrust of the Biomass Taskforce's submission related to co-firing biomass with coal in power station boilers. Under the current methodology, the resulting greenhouse gas benefits from plants over 30 MW are distributed to the 'pool' and are seen to diminish the incentive for individual retailers to invest in co-firing projects which could produce power in excess of this level.

Renewable Energy Showcase Projects Announced

The Federal Government announced the \$10 million Renewable Energy Showcase Grants on 22 December 1998. Two of the five projects for this one-off program were for biomass energy. Two solar thermal projects and a wind energy project were also successful. The successful biomass energy projects are:

- The Rocky Point Green Energy Corporation Pty Ltd received a grant of \$3 million to install a 30 MWe biomass cogeneration plant at the Rocky Point Sugar Mill, south of Brisbane. The plant will operate year-round using locally sourced wood waste outside the normal 20 week crushing season to provide green energy to the Queensland grid. This grant follows the report in the last newsletter that the Rocky Point Sugar Mill received \$350,000 from the Federal Government to demonstrate the feasibility of using cogeneration plant at the sugar mill for electricity generation outside the cane crushing season using a variety of locally sourced biomass as a fuel source. Contact: David Heck, Tel: 07 5546 2422.
- Energy Developments Ltd received \$2 million to design and install a solid waste energy and recycling facility (SWERF) at a municipal waste facility near Wollongong, south of Sydney. The facility will recover reusable and recyclable resources prior to the conversion of the organic components into gas and then electricity. EDL is an Associate Member of the Biomass Taskforce. Contact: Richard Edwards, Finance Director, EDL, 03 9823 9824.

The two successful solar thermal projects were:

- A consortium comprising ANUTECH Pty Ltd, Pacific Power and Transfield Pty Ltd for an 18 'Big Dish', 2.3 MWe solar thermal collector array at Eraring Power Station near Lake Macquarie, NSW. Grant is for \$2 million.
- Austa Energy Corporation Ltd and Stanwell Corporation Ltd received \$2 million to build a 5 MWe solar thermal linear array at Stanwell Power station near Rockhampton, Queensland.

Both solar thermal projects will be integrated into the existing power station infrastructure to provide green energy to their electricity grids.

- Western Power Corporation and Powercorp Pty Ltd received \$1 million to install an additional wind generator and energy storage system at Denham, Western Australia.
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Bioenergy '98 Conference

The Australian Biomass Taskforce was represented at Bioenergy '98 by Dr Stephen Schuck, the Biomass Taskforce Manager. Bioenergy '98 was held 4-8 October in Madison, Wisconsin, USA and was hosted by the Great Lakes Regional Biomass Energy Program, one of five US Federally funded programs with the goal to increase the production and use of bioenergy resources.

Conference Program

The theme of the conference was *Exploring New Partnerships* with each day of the conference having sub-themes of *Vision and Business*, *Business and Power*, *Biofuels and Resources* and *Criteria for Success*. An integral part of this major biomass energy conference, attended by 570 delegates was a trade exhibition, 46 poster presentations in the exhibition area, and technical tours to biomass energy facilities in the area. The technical program consisted of a number of keynote addresses, panel discussions and six concurrent sessions with up to five parallel sessions in each concurrent session. A total of 170 papers were delivered at the conference. Technical session topics in the program were:

- Green House Gas Mitigation
- Energy Policy
- Project Financing
- Direct Combustion
- Environmental Impacts of Biomass Production and Collection
- Green Marketing
- Biodiesel Market Opportunities
- Near Term Commercial Gasification
- Fuel Cell Technology
- Landfill Gas
- U.S. Department of Energy's Biopower Program
- Advanced Concepts in Energy Conversion
- Biomass Co-Firing I
- Biomass Resource Development
- Biodiesel Production and Use
- Ethanol Production
- DOE Small Modular Biopower Systems Initiative
- State and Local Governments as Bioenergy Markets and Strategic Partners
- Farm Digesters
- Bioenergy Resource Assessment
- Energy System Residue Mitigation
- Ethanol Utilization
- Power Marketing Opportunities
- Gasification Research and Development
- Biomass Co-Firing II
- Small Gasification for Biogas Power
- Biomass Microturbine Development

Proceedings of the conference (1350 pages) were provided on CD-ROM. The conference provided a choice of technical tours to inspect:

- Co-firing/Small industrial wood burning/Biogas
- U.S. Forest Products Laboratory/Energy Crops/University of Wisconsin Arboretum
- Ethanol Production and Wood Fired Energy/Co-burning and Anaerobic Digestion

2% Renewable Energy Target Workshops

The Australian Greenhouse Office held a series of workshops between 9–12 November to progress the implementation of an additional 2% renewable energy in Australia by 2010. Participants at the workshops were from the States and Territories, retailers, large electricity users, the renewable energy industry, the Electricity Supply Association, the National Electricity Market Management Company (NEMMCO), and the Renewable Target Working Group. Dr Stephen Schuck represented the Biomass Taskforce. Session topics were: Coverage; Australian Renewable Energy Industry Development, Treatment of Existing Renewables, Displacement Sources; Financial Impacts and International Competitiveness; Contracting Arrangements; Implementation Options – Individual Liability, Implementation Options – Centralised Liability, and a Synthesis Session. The workshop papers and summary of outcomes are contained on the Web Site:

http://www.greenhouse.gov.au/markets/2percent_ren/workshop/

For further information email: energy.markets@greenhouse.gov.au

Renewable Energy Commercialisation Program

An announcement of successful projects under round 1 of the Australian Greenhouse Office's \$30 million program is expected by March 1999.

Round 2 of this program opens on 2 March 1999 and closes on 13 April. Grants under RECP are normally expected to be in the range of \$100,000 - \$1 million. The Australian Greenhouse Office is encouraging intending applicants to contact the Renewable Energy Team and to submit draft applications prior to making formal submissions. The new application form should be installed on the AGO's web site www.greenhouse.gov.au by mid February.

Round 3 will open on 7 September 1999 and close on 19 October 1999.

Further information is available from the Australian Greenhouse Office. Contact Gillian McDonald, Program Manager, Renewable Energy Section, telephone 02 6274 1376.

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 earlier issues of the Biomass Taskforce newsletters. These lists are all being consolidated on the Biomass Taskforce's web page.

Australian Biomass Taskforce

<http://www.users.bigpond.com/Steve.Schuck/ABT>

Australian Greenhouse Office

<http://www.greenhouse.gov.au/>

AGO's 2 Percent Renewables Workshops

http://www.greenhouse.gov.au/markets/2percent_ren/workshop/

Greenhouse Challenge Vegetation Sinks Workbook Summary (23 pages, 507 kb)

<http://www.greenhouse.gov.au/pubs/sinks.pdf>

Forbes Magazine article on 'Supertrees' (Forbio – Brisbane company)

<http://www.global.forbes.com/forbes/98/0810/0109052a.htm>

Energy Developments Ltd

www.edl.com.au

Australian Emission Trading Forum

<http://www.aetf.net.au>

Western Sydney Waste Board

<http://www.wswaste.nsw.gov.au>

Australian CLIVAR Plan (Climate research)

<http://www.science.org.au/internat/natcomm/pubs.htm>

FAO Regional Wood Energy Development Program (SE Asia)

<http://www.cogen.rwedp.org>

Camp Lejeune Energy from Wood Project

<http://www.epa.gov/appcdwww/crb/apb/crppage/clew.htm>

US Energy Information Administration Page on Renewable Fuels

<http://www.eia.doe.gov/fuelrenewable.html>

US Energy Information Administration Publications

<http://www.eia.doe.gov/bookshelf.html>

The US EPA's Landfill Gas Outreach Program is contained in:

<http://www.epa.gov>
University of Tropical Agriculture Foundation (sustainable use of natural resources in integrated farming systems)
<http://ourworld.compuserve.com/homepages/utaf>
Communique from World Energy Council's 17th Congress
<http://www.wec98Congress.org/>
Gasifier Pictures (Fluidyne archive)
<http://powerlink.co.nz/~graeme/dougpictures.html>
Northern Research and Engineering Corp (mico-turbines)
<http://www.nrec.com>
MSW, Industrial and Biogas Anaerobic Digester sites
<http://www.kruger.dk>
<http://ww.invitec.dk>
<http://www.folkecentre.dk>
<http://www.adi.ca/sys/>
<http://www.usfilterenvirex.com/>
<http://www.infilcodegremont.com/>
<http://www.whessoevarec.com>
<http://www.cipav.org.co/lrrd/lrrdhome.html>
Aracruz News No. 11 (article on eucalyptus power in Brazil)
<http://www.aracruz.com.br/news/a-news/nr11/energy.htm>
Charcoal for Co-firing – economics
<http://www.techtp.com/economics.htm>
<http://www.techtp.com/projects/aes-hawa.htm>
Hawaii Natural Energy Institute (charcoal)
http://www.mic.hawaii.edu/dev_tech/engineer/charcoal.html
http://www.soest.hawaii.edu/HNEI/hnei_biomass.html
University of Melbourne Paper On Wood Carbonisation (Connor, Viljoen)
<http://info.metla.fi/iufro95abs/d5pap105.htm>
HBC Solid Fuel Online Catalogue (solid biomass boiler systems)
<http://www.thomasregister.com/olc/hurstboiler/wood.htm>
Power Magazine
<http://www.powermag.com/>
Lurgi (gasification and combustion plant)
<http://www.lurgi.com/englisch/index1.html>
CADDET Renewable Energy Technical Brochures (downloadable in PDF)
<http://www.caddet-re.org/html/techlist.htm>
Hungary –EU Energy Centre
<http://www.energycentre.hu>
Norwegian National Technology Program
http://www.cmr.no/klimatek/kl_uk.html
UNFCCC (Framework Convention on Climate Change)
<http://www.unfccc.de>
MSW Gasification
<http://news.soldiwaste.com/industry-news/19980925-6691.html>
World Watch Institute
<http://www.worldwatch.org>
Activated Carbon Research Institute
<http://www.acrl.org>
Activated Carbon
<http://www.scientificcarbons.com>
NREL/Regional Biomass Energy Program
<http://rrdec.nrel.gov/biomass/doe/rbep/biblio.html>
Carbon Sequestration and Benefit of Selective Cuts (paper)
<http://www.wood-heat.com/forest.htm>

Bioenergy '98 Luncheon Address by David Morris on the Carbohydrate Economy
<http://www.ilsr.org/carbo/>

Pyrolysis of MSW (French- English summary)
<http://www.ic.be/incin/leignon.htm>

Carbon Dioxide Science
<http://www.co2science.org>

Information Links for Renewables (2,600 links under comprehensive heading list)
<http://hgea01.hgea.org/~daver/>

Canadian Association for Renewable Energy
<http://www.renewables.ca>

Canadian Earth Energy Association
<http://www.earthenergy.org>

Ethanol from Garbage Article; New York Times
<http://www.nytimes.com/yr/mo/day/news/national/la-garbage-refinery.html>

Shell Renewables
<http://www.shell.com/about/directory/0,1372,1369,00.html>
 & <http://www.shell.com/about/content/0,1369,1506-3090,00.html>

Wartsila Engines
<http://www.wartsila-nsd.com/index2.htm>

Jenbacher Engines
<http://www.jenbacher.com/>

Literature Review for Biofuel Research
<http://seweb.ga.nrcse.usda.gov/vawq/biorept.htm>

Photos of Low Cost Biodigesters
<http://www.ias.unu.edu/proceedings/icibs/rodriguez/picture5.gif>
<http://www.ias.unu.edu/proceedings/icibs/rodriguez/picture6.gif>
<http://www.ias.unu.edu/proceedings/icibs/rodriguez/picture7.gif>

Article - The Business of Biomass Cash Crops Yield New Generation Options
<http://news.poweronline.com/steve/19981103-1749.html>

Institute of Paper Science and Technology (black liquor gasification)
<http://www.ipst.edu>

TAPPI (black liquor gasification)
<http://www.tappi.org>

California Renewable Energy Information
<http://www.calbiopower.org>

Anaerobic Digestion
<http://www.ad-net.org>
<http://segate.sunet.se/archives/et-w10.html>

Details on 120 Cubic Metre Anaerobic Digester (DeMontfort University School of Agriculture)
<http://www.dmu.ac.uk/ln/itc/ad.htm>

Steam Dryers
<http://www.dryers-airless.mcmail.com>

Solid Waste Association of North America
<http://www.swana.org/>

BIOEN
<http://sunce.eihp.hr/english/bioen/bioen.htm>

Finnish Bioenergy
http://www.finbioenergy.fi/bio/bioweben/bioenergy_in_finland/index.html

Hotrox Fire Logs (WA)
<http://www.wantree.com.au/~hotrox>

Primenergy
<http://www.primenergy.com> and <http://www.primenergy.com>

Ethanol from Bagasse News Release
<http://www.eren.doe.gov/golden/waste.html>

Data on Biomass Fuels

http://edv1.vt.tuwien.ac.at/ag_hofba/biobib/all.htm

TNO Institute of Environmental Sciences (Netherlands)

www.mep.tno.nl

Australian Sustainable Energy Related Web Sites (from UNSW)

<http://ee.unsw.edu.au/~p2139851/alten-au.html>

Greenhouse Gases from Small-Scale Combustion Devices in Developing Countries

<http://www.energy.demon.nl/GHG/Kilns.htm> (summary report)

ENERGIA

<http://www.ENERGIA.org>

Anaerobic Digestion of Livestock Manures: A Current Opportunities Casebook

This Casebook prepared by the US National Renewable Energy Laboratory and sponsored by the US Department of Energy examines the treatment of livestock manures using anaerobic digesters and concludes that in the US setting that anaerobic digestion is a commercially-available bioconversion technology with considerable potential for providing profitable co-products, including renewable energy. Drivers for installing anaerobic digesters include odour control, stabilising nutrients, and pathogen reduction.

The report is currently available free of charge. Contact Philip Lusk, Resource Development Associates, email: plusk@pipeline.com

Renewable Energy Project Analysis Software - RETScreen

The Canadian Energy Diversification Research Laboratory of Natural Resources Canada has developed RETScreen, which is designed to identify the best opportunities for cost-effective implementation of renewable energy projects, including biomass. The software is said to have 1,700 users in over 80 countries. Users include electric utilities, independent power producers, governments and development agencies. RETScreen can be downloaded free-of-charge from the Web site: <http://retscreen.gc.ca>. For more information email: rets@nrca.gc.ca

Biomass-to-Gas Plant in the Netherlands

Lurgi Nederland B.V., a subsidiary of Lurgi Umwelt GmbH, has been commissioned by N.V. Elektriciteits-Produktiemaatschappij Zuid-Nederland, EPZ, with the construction of a plant for the production and cleaning of fuel gas from CO₂-neutral fuels (wood) at the Amercentrale location in Geertruidenberg. A joint venture of EPZ and its parent company PNEM/MEGA Groep is to manage and operate the plant. The contract value for Lurgi is DM 45 million. The new gas production plant is due to start commercial operation in early 2000. The project has the feature in that the gas production is coupled with an existing power plant and displaces CO₂ from bituminous coal. The gas production unit uses a Circulating Fluid Bed (CFB).

US Postal Service purchasing flexible fuel trucks

The US Postal Service is to buy 10,000 new trucks that can be power by ethanol, a renewable fuel derived from biomass. These vehicles are designed to use either petrol or ethanol. The

Ford Motor Company won the US \$206.4 million contract to supply the new trucks, starting this coming US spring. (Source Associated Press)

BioFacts: Water Content And The Heating Value Of Wood

The water composition of biomass fuels can vary widely, and this needs to be taken into account when specifying the heating value of wood fuels. In Europe it is usual to quote lower heating values (lhv) of fuels, while it is Australian practice to use higher heating values (hhv). Higher heating values include the energy released from forming water from the hydrogen content in the fuel dry matter (approximately 6 percent). Coupled to the above, heating values could be quoted for the dry matter, or the fuel as delivered. Formulae for the conversion to hhv from lhv is as follows:

$$\text{hhv (dry matter)} = \text{lhv (dry matter)} + 8.94 * r * h \quad \text{MJ/kg}$$

where 'h' is the hydrogen content and 8.94 kg of water is formed for each kg of hydrogen. Variable 'r' is a function of temperature but can be approximated as 2.454 MJ/kg.

$$\text{hhv (fuel)} = \text{lhv (fuel)} + r * (F + 8.94 * h * (1 - F)) \quad \text{MJ/kg}$$

where 'F' is the fraction of water in the fuel, (1-F) is the fraction of dry matter in the fuel. (Source Gasification CREST email list)

Biomass Gasification Technology Wins R&D 100 Award

The biomass gasification technology developed by the Future Energy Research Corporation (FERCO) has been recognised as one of the most important scientific advances of the year by *R&D Magazine*. The technology is now being demonstrated at the Joseph McNeil Power Station in Burlington, Vermont.

Scientific and Technical Opportunities to Reduce Australian Greenhouse Gas Emissions (Storage) Report

The former Bureau of Resource Sciences (now reorganised into new organisations under new government arrangements) conducted a study to identify how emission reductions might be achieved and to identify where the best options for reductions may lie. This report summarises options for greenhouse gas emission reductions on the basis of assessment of technical, environmental and comparative cost feasibility. The report examines over 175 candidate options for reducing greenhouse gas emissions under Australian conditions. Preferred options were selected under the following groupings:

- energy efficiency
- fuel switching to less carbon intensive or renewable fuels
- biomass and waste/landfill gas to energy
- plantation forestry
- reduced land use change; and
- revised agricultural management methods.

The report authored by D. Rossiter and I. Lambert is available from the Australian Geological Survey Office Sales Centre. Cost is \$25 plus \$5 postage (\$15 overseas). Contact <http://www.agso.gov.au/> or tel: 02 6249 9519.

Forthcoming Events

Fourth Biomass Conference of the Americas. *Biomass: A Growth Opportunity In Green Energy and Value Added Products*. August 29-September 2 1999. Oakland Marriott City Center, Oakland, California. Web <http://www.nrel.gov/bioam>.

World Renewable Energy Congress on “*Renewable Energy Technologies and Policies for Sustainable Development*”, Murdoch University, Perth, 10-13 February 1999. Contact Jessica Ryan, Tel: 08 9360 2896, Fax: 08 9310 4997.

ESAA Residential School in Power Production. 31 January -13 February, Monash University, Victoria. Contact Associate Professor Terry Bereen, Tel 03 9905 1825.

Australian Cogeneration Association National Conference, 24-25 March 1999, Star City, Sydney. Contact: 03 9530 6526.

2nd Olle Lindstrom Symposium on Renewable Energy, Bioenergy 9-11 June 1999, Royal Institute of Technology, Stockholm, Sweden. Internet site:
http://www.ket.kth.se/O_L_Symposium.html

Second International Symposium on Anaerobic Digestion of Solid Waste, Barcelona, Spain, 15-18 June 1999. Information from <http://www.II-ISAD-SW.ub.es>

Residues

- Dr Stephen Schuck, the Biomass Taskforce Manager presented a paper on behalf of the Biomass Taskforce at the IBC ‘Rethinking Greenhouse Gas Reduction Strategies’ Conference, 7&8 December 1998 in Sydney. The title of the paper was ‘Biomass Energy Opportunities in Australia’.
- Australia disposed of nearly 27 million tonnes of solid, sludge and liquid waste in 1996-97 at a cost of just over \$2 billion, according to a first-time survey by the Australian Bureau of Statistics (ABS). The survey included businesses whose main activity was the collection, transport and/or disposal of refuse as well as local government authorities. (Source Engineering and Technology Review, Dec 98)
- A 21,000 t/a charcoal plant has operated at the Silicon Metal Complex (SIMCOA) at Kemerton, near Bunbury Western Australia since late 1989. The feed stock is jarrah wood. A comprehensive 8 page overview of the charcoal process and project is at URL: <http://www.lurgi.com/englisch/index1.html>.
- HRL Technology Pty Ltd operates a 10 MW-scale, pressurised fluidised-bed gasifier with a nominal fuel throughput of around 240 tonnes per day. The unit was used for testing HRL’s Integrated Drying Gasification Combined Cycle technology which is designed to handle high moisture fuels. The air-blown gasifier operates at 25 bar and includes a 5 MW gas turbine. Further information from Web address: www.hrl.com.au.
- Micro- turbines are an emerging technology with prospects for gasified biomass and biogas. The following are US manufacturing companies:
 - Capstone Turbine, fax 1 818 774 0228. Contact Tim Veale, Product Manager.
 - Elliott Energy Systems, fax 1 561 219 9448. Contact Richard Sanders, V.P. Sales.
 - Northern Research and Engineering Corp., fax 1 781 935 9052. Contact: James Watt, Marketing Manager.

- HBC, a US Biomass company has built over 400 biomass systems in the past 17 years for the US market and is seeking markets in the Asia Pacific area. The company has recently signed distribution agreements for China, Singapore, Hong Kong, Vietnam, Thailand, Bangladesh and Russia. Systems operate in Israel, Canada, Bolivia, Mexico and Singapore. The HBC catalogue is at URL:
<http://www.thomasregister.com/olc/hurstboiler/wood.htm>. Contact: Gene Zebley on email: boilrmkr@surfsouth.com
- Klimatek is a \$110 million, 5 year Norwegian National Technology Program which aims to promote technology for reducing greenhouse gas emissions. The Norwegian Research Council launched Klimatek in 1997 and projects range from CO₂ sequestration to direct biological fixation of CO₂. Further information:
www.cmr.no/klimatek/kl_uk.html
- Lumpin County, Georgia, USA is reported to be in the process of obtaining a plasma torch pyrolysis vitrification facility for destroying its municipal waste. If realised, the facility imputably would be the first commercial plant of its kind in the US. Source URL: <http://news.solidwaste.com/industry-news/19980925-6691.html>
- BP plans to pledge on reducing its greenhouse gas emissions by 10 percent below 1990 levels (ie 4 Mt reduction) within 12 years. The company's chairman, John Browne is reported by the Washington Post to say that BP would call on its 90 business units worldwide to reduce emissions by energy efficiency, new technology and trading emissions. A similar direction has also been made by Shell – see Web URL: <http://195.12.29.164/shellspeech/article.cfm?id=149>. (Source Convertech).
- Construction has commenced at Jennings, Louisiana on the USA's first commercial ethanol from cellulose plant. The plant, owned by BC International of Dedham, Mass. will use bagasse as the feedstock and produce 25 million gallons of ethanol per year. BCI's proprietary technology will be used and is based on a genetically engineered organism patented by Dr Lonnie Ingram of the University of Florida.
- The NSW Sustainable Energy Research and Development Fund, administered by the NSW Department of Energy, called for applications for \$2 million funding for renewable energy projects at the end of 1998. The successful projects are expected to be announced in February 1999.
- SPM/CPM are to be joined by Suncor Energy of Canada in a trail reforestation project in Central Queensland. The project involves planting 180,000 native trees and a project cost of \$3.5 million over four years. The trees will be a carbon sink to partially offset greenhouse gas emissions from planned future oil shale development near Gladstone, Queensland.
- A description of the principles, design and operation of fluidised bed combustors can be found at URL: <http://www.wrfound.org.uk/wrftbfbc.html>
- It is reported that construction has begun on the 10 MW ARable Biomass Renewable Energy plant (ARBRE) in Eggborough, North Yorkshire. The fuel will be forestry wastes and purpose grown willow and poplars harvested in a three-year cycle. Part of the funding comes from the European Union which aims to increase renewable energy sources from five to twelve percent by 2010. (Source Green Energy News).
- *Australian Energy News* featured an article *Bioenergy '98 Report* in its December 1998 issue. Information on the conference was provided by Steve Schuck for the AEN article. (see conference report on page 3).
- Need to convert units? Try Web Site <http://calc.entissoft.com/scripts/unitscgi.exe>
- Looking for a Periodic Table? Try
<http://www.shef.ac.uk/chemistry/web-elements/index-fr.html>

Opportunities Corner

