Bioenergy set for growth in Australia

Guest Editorial by Dr Stephen Schuck, Member for Australia

Bioenergy is relatively well established in some sectors in Australia. The installed electricity generating capacity at Australia's 30 sugar mills, using bagasse, totals 369 MW. Australia is a leader in capturing and using landfill gas. Some 29 projects across Australia, up to 13 MW in size, have a total installed capacity of close to 100 MW. There are also 11 wastewater treatment plants around Australia which capture biogas for producing 24 MW of electricity. In addition, 6 to 7 million tonnes of firewood are used in Australia every year.

In recent years there has been increased interest in the development of bioenergy to meet government greenhouse gas reduction targets. In April 2001, Australia's Mandatory Renewable Energy Target (MRET) came into force. The Target requires an additional 9,500 GWh of new renewable electricity to be generated per year from sources such as bioenergy. It is set to raise Australia's renewable energy proportion from 10.5% in 1997 to approximately 12.5% percent by 2010.

The MRET has provided a stimulus for bioenergy in Australia. For instance Australia's oldest sugar mill, the Rocky Point Mill in South Eastern Queensland, has been upgraded to 30 MWe for year-round operation, using wood waste in the non-crushing season. Australia's first large-scale anaerobic digester (82,000 tonnes per year) fed by food and other organic wastes is currently being commissioned near Sydney. This will generate 3 MW of electricity, enabling it to acquire Renewable Energy Certificates (RECs) under MRET. Co-firing biomass with coal has also become a commercial proposition at a number of power stations.

Bioenergy is also geared up to help address one of Australia's major environmental challenges – dryland salinity caused by rising water tables from earlier land clearing. This is being dealt with in part by the planting of deep-rooted oil mallee *Eucalyptus* trees. Some 22 million oil mallees have recently been planted in Western Australia. A pilot plant is under construction to convert coppiced oil mallee to eucalyptus oil (as an industrial solvent), activated carbon and renewable electricity.

Dryland salinity, Western Australia. Courtesy Ian Nicholas

Australia also has fledgling ethanol and biodiesel industries. It produces approximately 60 ML per year of ethanol from wheat and sugar production waste streams and the first 40 ML per year biodiesel plant has been opened in New South Wales.

Bioenergy Australia, an alliance of some 50 organisations from government and industry, is the principal forum for fostering bioenergy in Australia. It is also the vehicle for Australia's participation in IEA Bioenergy.
For more information please visit
www.users.bigpond.net.au/bioenergyaustralia

Contents

IEA Bioenergy News

Volume 15 • Number 1 June 2003

IEA Bioenergy

Rocky Point Sugar Mill, South East Queensland, Australia. Courtesy Stanwell Corporation

From the Secretariat

John Tustin

ExCo51 Sydney, Australia

The 51st meeting of the Executive Committee was held in Sydney, Australia on 30 April – 1 May 2003, with Björn Telenius as Chairman and John Tustin as Secretary. The meeting was hosted by Bioenergy Australia. The Chairman expressed the appreciation of the ExCo to Steve Schuck for the excellent meeting and study tour arrangements. Some of the outcomes of the meeting are detailed below.

Rocky Point Sugar Mill, South East Queensland, Australia. Courtesy Stanwell Corporation

Changes in the Executive Committee

New faces in the Executive Committee are: Member for The Netherlands – Mr Erik Wissema; and Alternate Members for Sweden – Mr Karl Christiansson and Ireland – Mr Morgan Bazilian.

Dr Raymond Costello

The ExCo was very sad to learn that Ray Costello, the Member for USA, died on 24 April 2003. The meeting paid tribute to Ray's long and fruitful contribution to bioenergy globally. An obituary appears on page 5.

Extension of the Implementing Agreement

At the meeting the ExCo unanimously approved that the IA be extended to 31 December 2009. This provides the mandate for the Secretary to prepare a report for the REWP/CERT committees to seek formal approval of this extension.

Planning for the Next Triennium

The meeting reviewed draft Task proposals for the upcoming triennium and began the process of gauging which Contracting Parties would participate in the various Tasks. The Chairman made particular mention that the Task Leaders should contact those Contracting Parties not present at the meeting to get input to the work programme and information about their possible participation. As a result of the review Task Leaders will be requested to amend the draft versions of their proposals to specifically emphasize linkages and synergy with the new IEA Bioenergy Strategic Plan. Final versions of the new Task proposals should be received by the Secretary no later than mid September 2003. These will be the versions for discussion and approval at ExCo52.

Developing IEA Bioenergy's Strategic Role

A special item was a paper presented by the Chairman titled 'Developing IEA Bioenergy's Policy Advising and Strategic Role'. It identified two challenges for the Agreement. Firstly, at ExCo level the need to more actively draw conclusions and define priorities and secondly, for the Agreement to increase its outwardly directed work and to support policy and market structures with unbiased expert conclusions. He said that to achieve these changes Task activities must be defined from the IA's objectives, not vice versa, ie a shift in balance from the current 'bottom up' approach. The work programmes must generate more value outside of the Tasks. This would mean more involvement from the ExCo with associated demands on time and financial resources.

SWERF Plant, Wollongong, Australia. Courtesy Brightstar Environmental

He presented some alternative scenarios for discussion. The ExCo decided to continue with its current way of working for the immediate future, but to ask the Tasks to draw more conclusions, produce more synthesis work, and to aim for deliverables of value to policy oriented structures. In the medium term the ExCo decided to evolve to a more proactive and strategic stance with increased time and budgetary resources.

Olav Gislerud (left), the Member for Norway with Jim Richardson, Leader of Task 31

Report on Statements of National Priorities

Josef Spitzer presented a report on 'Statements of National Priorities' which had been prepared by all 20 of the Contracting Parties. The aim was to provide guidance to the ExCo on the topics and priorities for future Tasks. The main conclusion from this exercise was that the current set of Tasks seems to cover very well the priority areas for bioenergy RD&D in the Member countries. It was pleasing to the ExCo to see evidence of consistency between national policies and Task participation.

ExCo51 Study Tour

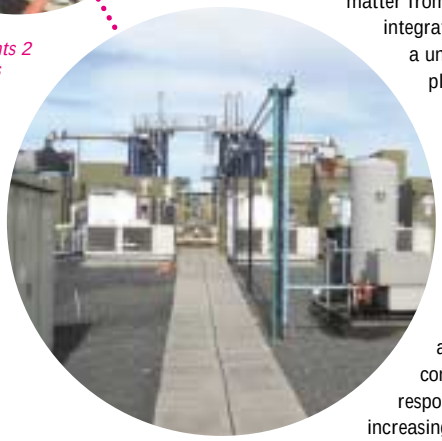
In conjunction with ExCo51, 14 people participated in a study tour of Australian 'waste-to-energy' projects in the Sydney area. The first stop was the Malabar Sewage Treatment Plant operated by Sydney Water and commissioned to full capacity in 1975. This is the largest plant of its type in Australia, treating the equivalent waste of 1.8 million people. Each day 480 million litres of primary treated waste is discharged out to sea through a 3.6 km underwater tunnel. Results from ongoing monitoring programmes indicate the ocean outfall is performing very well and shoreline conditions have improved dramatically. This monitoring will continue to ensure longterm protection of both shore and marine environments. Of particular interest were the anaerobic digesters which produce methane for a cogeneration plant at the site.

Cogeneration plant at the Malabar sewage treatment facility

Lucas Heights 2 Landfill Gas power plant

The next stop was the Lucas Heights 2 Landfill Gas 12.6 MW power plant - Australia's largest landfill gas plant - where the group was shown the gas collection and power generation operations.

A visit was then made to Brightstar Environmental's SWERF plant near Wollongong, which was opened in February 2001. A result of 10 years of R&D, the facility converts household organic matter from municipal waste into synthetic fuel gas and then green electricity. It integrates waste processing, recycling, thermal gasification and power generation in a unique design. Brightstar Environmental believe that at full capacity this plant can provide electricity for around 20,000 homes, while achieving a 90% reduction in waste going to landfill. SWERF technology not only offers a major opportunity to reduce the quantity of waste to landfill but it also mitigates greenhouse gas emissions at the same time.



The final stop was at EarthPower Technologies Pty Ltd who have designed and constructed a state-of-the-art facility that will recycle up to 82,000 tonnes per year of industrial and commercial food and other biomass wastes. This turnkey project, now in the commissioning phase, cost around A$40 million to build. Biomass will be treated using anaerobic digestion to produce biogas and a liquid effluent stream containing solids (raw fertiliser). The facility will enable waste producers to respond to increasing regulatory and public pressure to find waste disposal methods other than landfills, in order to reduce greenhouse gas emissions and the escape of leachates that cause soil and ground-water pollution. It will also enable producers of food biomass wastes to save on disposal costs which are escalating at landfills. The biogas will be used in gas engines to generate electricity for sale either into the grid or direct to the host site. Enough biogas will be produced to enable the facility to achieve 3 MW of electricity generating capacity. In addition, the raw sludge produced will be dried and treated to produce a fertiliser. This stop completed a most interesting and enjoyable study tour.

ExCo51 study tour group at the SWERF Plant, Wollongong, Australia

Next ExCo Meeting

ExCo52 will be held in Campinas (near Sao Paulo), Brazil on Wednesday 29 October and Thursday 30 October 2003. There will be two study tours associated with the meeting. The first will be on Tuesday 28 October to see biomass forestry at International Paper and the second will be on Friday 31 October to see energy from sugarcane at Coopersucar.

The meeting will be held at the Royal Palm Plaza Hotel, Rua Commendador Dr Jose Cesar, 200 Jd Do Lago, Campinas, 13051024, Brazil. This is a resort hotel built in Spanish colonial style with modern facilities. For more information please visit www.hotelbook.com/static/welcome_60801.html As part of their travel plans, attendees should check carefully for any Brazilian tourist visa requirements. The post-out deadline for agenda material sent by the Secretary will be 12 September 2003. For more details contact the Secretary at jrtustin@xtra.co.nz

Task Focus

Task 38. Greenhouse gas balances of biomass and bioenergy systems

Task 38 brings together the work of national research programmes in 13 participating countries on Greenhouse Gas (GHG) balances for a wide range of biomass systems, bioenergy technologies and terrestrial carbon sequestration. The focus is on the application of methodologies to GHG mitigation projects and programmes. The main Task outputs are:

Country reports that summarise, for each of the participating countries:

- Background information on the energy system and related GHG emissions, on bioenergy use, and on the GHG aspects of land use (eg. forestry);
- Policies and measures to foster bioenergy and carbon sequestration at national, regional and local levels;
- Implementation projects and research programmes related to bioenergy and carbon sequestration.

Case studies of the application of the GHG balances methodologies developed by the Task to different bioenergy and carbon sequestration projects. The goal is to assess and compare the GHG balances of such projects; to increase experience in implementation of mitigation projects and programmes, and to make recommendations for the optimization of these systems. The case studies include:

- *Australia:* GHG balance of a co-firing system of biomass and a wood-fired conversion facility, both based on conventional hardwood plantation forestry;
- *Canada:* GHG balance of a small pyrolysis plant using both sawmill residues and thinnings from a juvenile spacing program to produce bio-oil, used either in a pulp mill limekiln or for export of biofuel;
- *Croatia:* Assessment of the GHG emissions reduction potential of biodiesel production;
- *Finland and Sweden:* GHG balances of bioenergy and carbon sequestration projects with links between increased use of construction wood and the use of biomass-fired cogeneration plants to replace fossil fuels;
- *Ireland:* GHG budgets of using peat for energy;
- *The Netherlands:* Bestride-import to The Netherlands of wood pellets from Canada and of palm kernel shells from Malaysia for green energy production;
- *New Zealand:* Assessment of the GHG balance of a cogeneration plant based on the use of sawmill residues;
- *United Kingdom:* GHG balances of *miscanthus* fuelled biomass projects;
- *USA:* GHG emission reduction potential associated with anaerobic digestion of organic wastes in Ventura, California.

Further information on Task 38 can be found at: www.joanneum.at/iea-bioenergy-task38 or contact Susanne Woess-Gallasch at susanne.woess@joanneum.at

Task 37. Energy from biogas and landfill gas

The main objectives of Task 37 are:
- to review and exchange information on anaerobic digestion (AD),
- to produce, upgrade and utilise biogas as an energy source and digestate (compost) as an organic fertiliser, and
- to include anaerobic degradation as a stage in the wastewater treatment process.

Anaerobic degradation of organic wastes and waste waters is controlled treatment in the absence of air in fully engineered vessels (digesters). During this biological process, the organic compounds are reduced and two products are formed:

- A stabilised solid product (digestate) which is an excellent fertiliser comparable to compost, and
- Biogas, an excellent source of renewable energy comparable to natural gas.

Small scale solid waste digester, Kompogas

As AD is a relatively new process and not very well known, Task 37 works to ensure that information is available to governmental agencies, potential operators and consultants.

Biogas is created 'naturally' in landfills. In most of the world's landfills, the methane produced is released into and pollutes the atmosphere. Task 37 aims firstly to reduce the amount of organic material added to landfills by improving waste management practices, and secondly to optimise the operation of landfills.

Biogas is currently the only renewable energy available in quantity which can be used to produce heat and steam in boilers, electricity in combustion engines, turbines or fuel cells, or as a fuel to run cars and trucks. The energy use of biogas is one of the Task's major focal points. New biogas engines and vehicle designs are being promoted in collaboration with the gas industry and the European Natural Gas Vehicle Association (ENGVA).

Thanks to the work of the IEA Tasks and other networks on AD, it has become one of the standard technologies in the treatment of organic waste in Europe. A total of 115 plants have been identified in Europe, with a treatment capacity of 1.5 Million TPY of organic solid waste.

Globally, over 1000 high rate digesters for the treatment of industrial waste water have been built. However, there is still a long way to go. The technology has yet to be introduced in the USA and Canada, the countries with the highest waste production per capita. AD could also offer a viable technology for developing countries which suffer from uncontrolled dumping of waste.

For further information email Arthur Wellinger arthur.wellinger@novaenergie.ch or refer to www.novaenergie.ch/ /iea-bioenergy-task37/index.htm

Notice Board

Task 31. Conventional forestry systems for sustainable production of bioenergy

IEA Bioenergy aims to promote the building of knowledge and fostering of international collaboration to permit more efficient development of sustainable bioenergy sources. Task 31 focuses on realizing the potential of biomass from conventional forestry systems. This source of biomass is one of the most important potential suppliers of raw materials to the bioenergy industry. An important way to achieve its potential is the integration of biomass production and forest fuel harvesting into conventional forestry practices. It is essential that this be done in a sustainable manner.

Task 31 synthesizes and transfers to stakeholders knowledge and new technical information concerning conventional forestry systems for sustainable production of bioenergy. These systems include managed natural forests and single-stem plantations which can provide a source of biomass for energy but which do not have energy as the primary objective of management. The scope is worldwide, including boreal, temperate, sub-tropical and tropical forest regions. The emphasis is on an integrated approach to biological, economic, environmental and social components of forestry systems.

The Task focuses on three distinct aspects of biomass production for energy from conventional forestry systems:

- The growing and cultural treatment of forest stands and plantations. Silvicultural systems can be developed to incorporate production of biomass for energy as an integral part of conventional forest management.
- The recovery of biomass for energy through forest operations. Operations, including intermediate stand treatments and harvesting, can be designed to enable the cost-efficient and environmentally acceptable recovery of biomass for energy as well as conventional forest products.
- Consideration of questions of environmental sustainability of biofuel production. These sustainability issues include nutrient management, carbon sequestration, stand productivity and soil and water conservation.

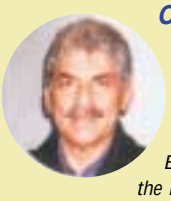
Annual workshops and field study tours provide a forum for the sharing and synthesis of scientific and technical information. This knowledge is published in peer-reviewed proceedings. It is also transferred to stakeholders through industry days and technical seminars which include oral presentations, field visits and demonstrations. A web-based electronic information system is being developed to provide an innovative, interactive, practical tool for improved technology transfer.

For further information email Jim Richardson jrichardson@on.aibn.com

Eucalyptus *plantation grown for charcoal production, Belo Horizonte State, Brazil*

Charcoal kiln, V & M Co., Belo Horizonte, Brazil

Obituary - Dr Raymond Costello



A native of New York, Ray grew up in the Bronx attending Aviation High School. He graduated from the University of Connecticut, where he received a doctorate in environmental engineering. He worked for Boeing Aerospace for a short period and then served in the Marine Corps during the Vietnam War.

In 1979 he settled in the Washington area and worked briefly for Combustion Engineering, a consulting firm, before joining the US Department of Energy. From the early 1980s he was a leader for technology development in the Biomass Fuels and Power programmes and as part of his brief was the Member for USA on the IEA Bioenergy Executive Committee. He was particularly enthusiastic about his role in IEA Bioenergy and did an excellent job in representing the interests of USA.

Ray attended his first ExCo meeting (ExCo18) in Vienna in October 1986. He was Vice Chairman for three years from 1991 to 1993 and then Chairman from 1994 to 1996. He also served on a number of IEA Bioenergy strategic planning committees. In total he attended 26 ExCo meetings, the most recent being ExCo50 in Helsinki.

Ray did much more than represent US interests in the Agreement. He had a truly global perspective of the energy problem and believed strongly in the value of global cooperation. An example of his ability to see the big picture was his proposal to join European and American Biomass Conferences for a 'world millennium conference' in 2000. The idea was taken up enthusiastically but it still took some lobbying to get the high level commitment necessary for the very successful 'First World Conference on Biomass for Energy' in Seville, which was attended by 1200 participants from 61 countries.

He was able to use his experience as a long serving Member of the Committee and ex-Chairman, to act as a sounding board when Members wanted to test ideas or resolve a critical situation. He would frequently and effectively work behind the scene to achieve progress. He was always strongly focused on industrial application and deployment from the international RD&D collaboration. His positive attitude and sense of humour were widely recognised. Most of all Ray was a dear friend and colleague to his international network and will be sorely missed.

Ray died of cancer at Inova Fairfax Hospital on 24 April 2003. He was buried with full military honours in Arlington National Cemetery, Washington DC on Tuesday, 13 May. He is survived by his son, mother and two sisters.

Task 29. Socio-economic drivers in implementing bioenergy community projects

Proceedings of the Task 29 workshop 'Socio-Economic Aspects of Bioenergy Systems', held in Cavtat, Dubrovnik on 18-21 September 2002, were published in March 2003. Copies are available from Velimir Segon at: vsegon@eihp.hr

Task 30. Short rotation crops for bioenergy systems

Visit the new Task 30 website at www.shortrotationcrops.com. This site contains the latest Task newsletter (April 2003) and details of forthcoming meetings.

Task 34. Pyrolysis of biomass

The March issue of the Task 34 'Pyne' newsletter can be downloaded at www.pyne.co.uk or contact Claire Humphreys at c.l.humphreys@aston.ac.uk

Task 37. Energy from biogas and landfill gas

Task 37 and the City of Vienna held an important seminar on 'Digestion of biogenic wastes in Vienna' from 22 - 23 May 2003. 150 participants from Austria, Switzerland and Poland attended presentations by Task Members and Vienna's Departments of Waste and of the Environment, on waste collection, source separation and anaerobic composting. The seminar was followed by visits to the Wels and Salzburg anaerobic digestion plants.

The proceedings of the seminar can be downloaded from the Task 37 website at: www.novaenergie.ch/iea-bioenergy-task37/index.htm

Publications

2002 Annual Report

The 2002 Annual Report was distributed in April. It contains a special colour feature 'Socio-economic aspects of bioenergy systems' which was written by Julije Domac and Keith Richards. This has also been printed as a separate booklet, available from members of Task 29. The Annual Report is available on the IEA Bioenergy website, or hard copies can be obtained from the Secretary.

Sustainable Production of Woody Biomass for Energy

The goal of producing policy orientated statements that could facilitate discussion and assist energy policy development in the Member Countries has made substantial progress. This Position Paper has been prepared for IEA Bioenergy by an editorial group of ExCo and Task Members. It looks at biomass production and its sustainability from economic, environmental and social perspectives. Copies of the paper may be obtained from the Secretary or downloaded from the Website.

Upgrading and Utilisation of Biogas

Alternative fuels, particularly in the transport sector, might help considerably to reduce the greenhouse effect. Biogas is the cleanest fuel available today and it is used for electricity generation and as a petrol substitute in ignition engines or fuel cells. This brochure by the former Task 24 describes the treatments of raw gas and discusses possible applications. It may be ordered from Arthur Wellinger at arthur.wellinger@novaenergie.ch or downloaded as a pdf from www.novaenergie.ch/iea-bioenergy-task37

Danish Institute of Agricultural Sciences (DIAS) Report, Plant Production No. 86

Printed in January 2003, this report is the proceedings of the first meeting of Task 30, which took place in Denmark from 22-25 September 2001.

Renewable Energy... into the Mainstream

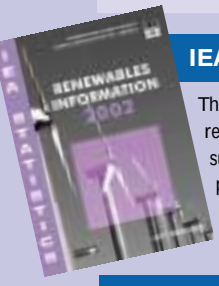
Renewable energy today is at a critical stage of development: renewable technologies are maturing, and costs for some technologies are in the competitive range. Beyond the energy they produce, renewable energy technologies offer a variety of other benefits towards the achievement of sustainable development goals. This promise has led all IEA governments to support their greater development. But, while renewables markets are growing strongly, additional steps must be taken to accelerate the achievement of sustainable, large-scale markets. This report by the IEA's Renewable Energy Working Party outlines those steps, and the benefits of moving renewable energy into the mainstream. For more information, look at www.iea.org

Renewables in Global Energy Supply: An IEA Fact Sheet

This pamphlet presents the main elements of the current renewables energy situation. The IEA believes that it can help to facilitate the debate on the past, current and future place and role of renewables in total energy supply. Visit www.iea.org for more information.

Toward Solutions: Sustainable Development in the Energy Sector

Economic growth and thus social improvement are sustainable only if there is a reliable, uninterrupted supply of energy in a form that does not threaten the environment. This publication looks at the areas where action is needed to ensure sustainability, including energy security, improving energy efficiency, using more renewable energy and technology. To download a copy, visit www.iea.org/envissu/johannesburg/towchapt.htm

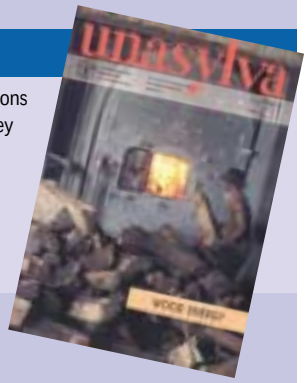


IEA Statistics: Renewables Information 2002

This is the first issue of the IEA's annual publication of comprehensive information on the use of renewables and waste in the OECD region. It contains an analysis of renewables and wastes energy supply, electricity production and installed electricity generating capacity in OECD countries, and provides detailed statistical tables for each of the thirty countries. This report is available free of charge from the IEA Bookshop at: books@iea.org A pdf version can be downloaded at: www.iea.org/stats/files/Ren2002.pdf

Publications from FAO

The FAO Wood Energy Programme has recently produced three interesting publications which were distributed to Members of the IEA Bioenergy Executive Committee. They were: a special issue of unasylva on 'Wood Energy' (No. 211, 2002); 'Economic Analysis of Wood Energy Systems' (2002) and 'A Guide for Woodfuel Surveys' (2002).
Further information on these publications may be obtained from the FAO Website: www.fao.org/forestry/index.jsp



Networking

CO_2 Sequestration Project Database

For over ten years, the IEA Greenhouse Gas R&D Programme has been examining the potential of CO_2 sequestration to achieve reductions in CO_2 emissions. It has an established website which answers basic questions about the technology. A recent development to the site has been the inclusion of a searchable database of more than eighty practical research and demonstration projects around the world. Take a look at www.co2sequestration.info

Dealing with Climate Change

This new IEA website includes searchable access to data on energy-related policies, and measures taken or planned by IEA Member countries to reduce greenhouse gas emissions. It contains over 800 records from 1999 – 2002. Please visit www.iea.org/envissu/pamsdb/index.html

Renewable Energy Policies and Measures in IEA Countries

Another new IEA website provides details of more than 120 legislative acts that support the development and market uptake of renewable energy sources. Please visit //library.iea.org/renewables/index.asp

IEA Technology Collaboration Fair

IEA Bioenergy participated in the IEA Technology Collaboration Fair at the IEA 2003 Ministerial, held at the Hotel Le Meridien Étoile, Paris from 28-29 April 2003. The Fair was a showcase for the collaborative work done by the IEA Implementing Agreements. The IEA Bioenergy display consisted of four new posters and a wide range of reports and publications. The Fair was reportedly very successful, particularly in the impact it had on the perception of energy technology collaboration amongst high-level government officials and the media.

Calendar of Events

IEA Bioenergy Meetings

Task 30's End of Task Meeting will take place on 27 Nov 2003 in New Zealand. This will follow a Bioenergy Workshop 'Environmental Benefits of Short Rotation Crops' in conjunction with the Bioenergy Association of New Zealand (25-27 Nov 2003). Contact Theo Verwijst, Task Leader
Email: theo.verwijst@lto.slu.se

Task 31 will hold its next workshop 'Sustainable Production Systems for Bioenergy: Impacts on Forest Resources and Utilization of Wood for Energy' from 5-10 October 2003 in Flagstaff, Arizona, USA. There will be optional pre- and post-workshop tours to Phoenix and the Grand Canyon. Contact Jim Richardson, Task Leader
Email: jrichardson@on.aibn.com

Task 32 is planning a seminar on waste wood combustion for Sweden in autumn 2003. Contact Sjaak van Loo, Task Leader
Email: s.vanloo@mep.tno.nl

Tasks 32, 33 and **36** will be holding a joint Task Meeting in Yokohama, Japan from 27-31 October 2003. Contact Suresh Babu, Task Leader (T33)
Email: suresh.babu@gastechnology.org

Task 35 will hold its next meeting in Quebec, Canada from 3-5 September 2003. It will include site visits to a municipal solid waste, pretreatment and gasification plant, and to a wastewood pelletizing plant. Contact Yrjö Solantausta, Task Leader
Email: yrjo.solantausta@vtt.fi

Task 38 will be holding its next meeting 'Efficient use of biomass for greenhouse gas mitigation' from 30 September to 1 October 2003 in Östersund, Sweden. An internal Task 38 workshop will be held on 29 September 2003. Contact Susanne Woess-Gallasch
Email: susanne.woess@joanneum.at

ExCo52 will be held in Campinas, near Sao Paulo, Brazil on 29-30 October 2003.

ExCo53 will be held in Switzerland in May 2004.

ExCo54 will be held in Canada around October 2004.

ExCo55 will be held in Denmark around May 2005.

Other Events

11th International Rapeseed Congress
6-10 July 2003, Copenhagen, Denmark
Contact: Anette Palm
Tel: +49 6307 401103
Fax: +49 6307 401104
Email: palmmail@convservices.de
Web: www.kemi.kvl.dk/gcirc-congress/

7th International Conference on Energy for a Clean Environment
7-10 July 2003, Lisbon, Portugal
Contact: Maria Fernanda Afonso
Tel: +351 21 8417378/8417186
Fax: +351 21 8475545
Email: cleanair@esoterica.pt

Biomasse Energie 2003
25-28 July 2003, Libramont, Belgium
Contact: Alain Pierre
Tel: +33 3 8 447 81 07
Email: alain.pierre@itebe.org
Web: www.itebe.org/portail/affiche.asp?arbo=2&num=233

Southwest Renewable Energy Fair and Conference
7–10 August 2003, Flagstaff, Arizona, USA
Contact: Amanda Ormond
Tel: +1 480 491 3305
Fax: +1 480 491 0265
Email: asormond@msn.com
Web: www.swrec.org/default.asp

Energy 2003
17-20 August 2003, Lake Buena Vista, Florida, USA
Tel: +1 800 395 8574
Fax: +1 321 638 1010
Email: energy2003@fsec.ucf.edu
Web: www.energy2003.ee.doe.gov/

2nd Annual Renewable Energy Conference
18-22 August 2003, Sydney, Australia
Contact: James Matthews
Tel: +61 2 9005 0729
Fax: +61 2 9281 5517
Email: james.matthews@terrapinn.com
Web: www.powergenerationworld.com

Bioenergy 2003: International Nordic Bioenergy Conference and Exhibition
2-5 September 2003, Jyväskylä, Finland
Contact: Ms Mia Savolainen
Tel: +358 14 445 1115
Fax: +358 14 445 1199
Email: bioenergia@jsp.fi
Web: www.finbioenergy.fi

Exhibition for Renewable Resources, Technologies and Products
11-13 September 2003, Erfurt, Germany
Contact: Dr Katrin Vogel
Tel: +49 361 400 1810
Fax: +49 361 400 1112
Email: info@narotech.de
Web: www.narotech.de/englisch/index_engl.html

HolzEnergie 2003 - IHE International Trade Fair and Conference for Wood Energy
18-21 September 2003, Augsburg, Germany
Tel: +49 7121 3016 – 0
Fax: +49 7121 3016 – 100
Email: redaktion@energie-server.de
Web: www.holz-energie.de

Envirenergy Yorkshire & Humberside
25 September 2003, Leeds, UK
Tel: +44 1257 276176
Fax: +44 1257 276655
Email: envirenergy@washingtondowling.com
Web: www.envirenergy.org.uk/Yorkshire%20&%20Humberside.html

Sustainable Energy Expo & Conference
1-3 October 2003, Los Angeles, USA
Contact: Melanie Bekowitz
Tel: + 1 646 432 1114
Email: mberkowitz@iir-x.com
Web: www.sustainableexpo.com

GreenHeat Conference 2003
1-4 October 2003, Aberystwyth and Machynlleth, UK
Tel: +44 1650 511483
Email: conference@powysenergy.org.uk
Web: www.cat.org.uk/greenheat/conference/

2003 Shanghai International Conference on Renewable Energies
10-12 October 2003, Shanghai, China
Contact: Sylvia Chen
Tel: +8621 5234 0646
Fax: +8621 5234 0649
Email: weszhou@online.sh.cn

Sustainable Energy Expo 2003 - Exhibition & Conference
21-23 October 2003, London, UK
Contact: Nicky Mason
Tel: +44 20 8995 7979
Fax: +44 20 8995 7008
Email: nicky.mason@sextant.eu.com
Web: www.energy-expo.info/page.cfm/Link=8/t=m/goSection=3

Sustainable Energy Asia
18-19 November 2003, Singapore
Contact: Christina English
Tel: +65 6227 6252
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Web: www.energyasiaexpo.com

Bois-Energie 2003
20-23 November 2003, Cahors, France
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Email: alain.pierre@itebe.org
Web: www.itebe.org/portail/affiche.asp?num=319&arbo=1

Bois-Energie 2004
1-4 April 2004, Lons le Saunier, France
Contact: Alain Pierre
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2nd World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection
10-14 May 2004, Rome, Italy
Contact: Christine Lyon, ETA - Renewable Energies
Tel: +39 055 5002174
Fax: +39 055 573425
Email: eta.fi@etaflorence.it
Web: www.conference-biomass.com/

World Bioenergy Conference & Exhibition
2-4 June 2004, Jönköping, Sweden
Contact: Karin Haara, Svebio
Tel: +46 8 441 7084
Email: karin.haara@svebio.se
Web: www.svebio.se/worldbioenergy

19th World Energy Congress and Exhibition
5-9 September 2004, Sydney, Australia
Contact: 19th World Energy Congress Managers
Tel: +61 2 9248 0800
Fax: +61 2 9248 0894
Email: energy2004@tourhosts.com.au
Web: www.tourhosts.com.au/energy2004

IEA Bioenergy News

Objectives of IEA Bioenergy

IEA Bioenergy is an international collaborative agreement set up in 1978 by the International Energy Agency (IEA) to improve international cooperation and information exchange between national bioenergy RD&D programmes. IEA Bioenergy aims to accelerate the use of environmentally sound and cost-competitive bioenergy on a sustainable basis, and thereby achieve a substantial contribution to future energy demands.

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Tasks

Task 29: Socio-economic drivers in implementing bioenergy community projects
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Task 30: Short rotation crops for bioenergy systems
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Task 31: Conventional forestry systems for sustainable production of bioenergy
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Task 33: Thermal gasification of biomass
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Task 34: Pyrolysis of biomass
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Task 35: Techno-economic assessments for bioenergy applications
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Task 36: Energy from integrated solid waste management systems
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Task 37: Energy from biogas and landfill gas
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Task 38: Greenhouse gas balances of biomass and bioenergy systems
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