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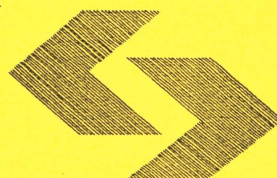
Research Report

**Materiały Międzynarodowego
Seminarium „Strategia
rozwoju obszarów wiejskich”
Cz. II**

W. Ciechanowicz, Z. Uhrynowski

**Instytut Badań Systemowych
Polska Akademia Nauk**

**Systems Research Institute
Polish Academy of Sciences**



POLSKA AKADEMIA NAUK

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Kierownik Pracowni zgłaszający pracę:
Dr inż. Piotr Holnicki

Warszawa 2002

BIOENERGIA NA RZECZ ROZWOJU WSI

Materiały

**Międzynarodowego Seminarium
poświęconego
Strategii Rozwoju Obszarów Wiejskich**

**Warszawa, Pałac Staszica
4 października, 2002**

**Zorganizowanego przez
Wydział IV Nauk Technicznych PAN
przy udziale
Konsorcjum „Bioenergia na Rzecz Rozwoju Wsi” oraz Instytutu Badań Systemowych PAN**

**Opracowanie
Wiesław Ciechanowicz, Zygmunt Uhrynowski**

**Autorzy
Barney Foran, Wiesław Ciechanowicz,
Stefan Szczukowski, Zygmunt Uhrynowski**

**Temat:
Strategia Rozwoju Obszarów Wiejskich
Perspektywy Przejścia do Gospodarki Opartej na Bioenergii**

**IBS PAN
Warszawa, październik 2002**

CSIRO
Commonwealth Scientific Industrial
Research Organisation

by

Barney Foran
CSIRO Resource Futures, Australia

Presented on
International Seminar on Bioenergy Strategies for Rural Development

Printed Matters

Warsaw, Palais of Staszic,
October 4, 2002

Organized by

Department IV of Technical Sciences
of Polish Academy of Sciences
together with
Consortium „ Bioenergy for Rural Development”
and
Systems Research Institute

Warsaw, 2002

CSIRO

Commonwealth Scientific Industrial Research Organisation

Who We Are, What We Do

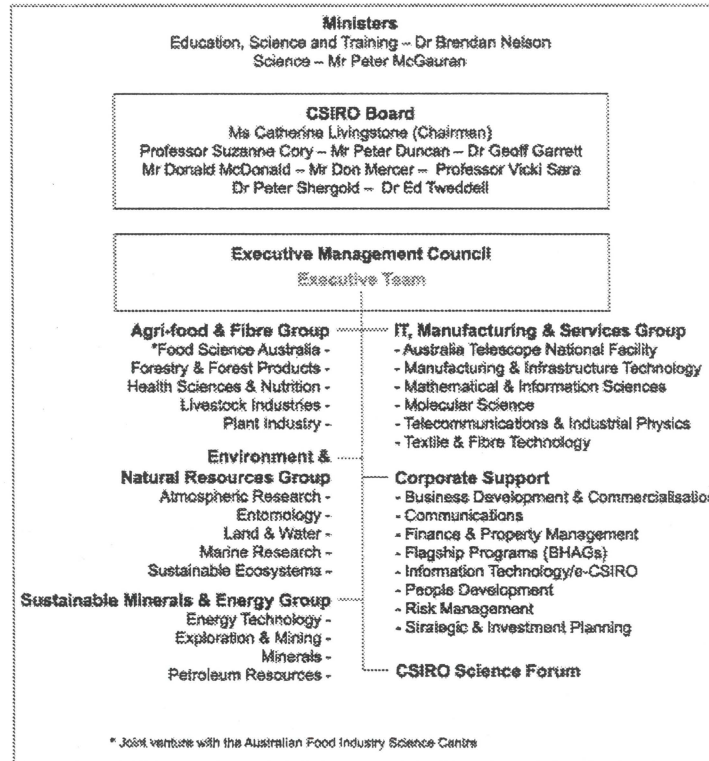
CSIRO is Australia's Commonwealth Scientific and Industrial Research Organisation.

We are one of the world's largest and most diverse scientific research institutions. Our work touches just about every aspect of Australian life: everything from the molecules of life to the molecules in space - finding ways to improve our quality of life and economic performance.

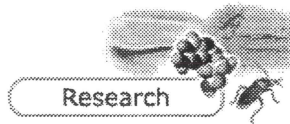
Our 6500 staff perform research and development over a broad range of areas of economic and social value including:

- agriculture
- minerals and energy
- manufacturing
- communications
- construction
- health
- the environment.

CSIRO Organisational Structure



Separate Business Units: Divisions = 21

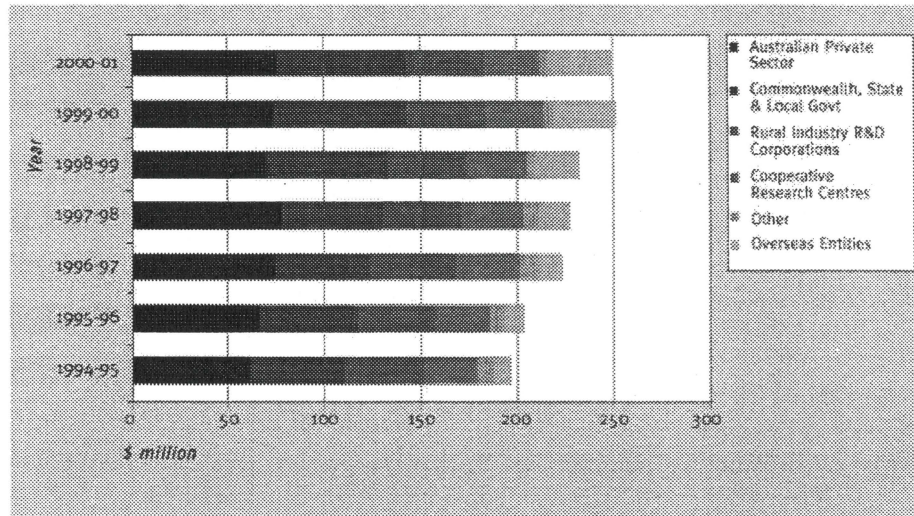


- Atmospheric Research
- Australia Telescope National Facility
- Building, Construction and Engineering
- Energy Technology
- Entomology
- Exploration and Mining
- Food Science Australia
- Forestry and Forest Products
- Health Sciences and Nutrition
- Land and Water
- Livestock Industries
- Manufacturing Science and Technology
- Marine Research
- Mathematical and Information Sciences
- Minerals
- Molecular Science
- Petroleum Resources
- Plant Industry
- Sustainable Ecosystems
- Telecommunications and Industrial Physics
- Textile and Fibre Technology

Our Five Year Mission

Where are we going, and what do we want to achieve?'

We will grow our business by 50 per cent to \$1.3 billion over the next five years.



New Directions (1)

- Information and communication technologies to build and enhance national performance in the sector;
- Biotechnology to drive pharmaceutical and agribusiness developments;
- Sustainable natural resource industries and the building of world-class knowledge services based upon them;
- Practical solutions to major environmental challenges and safeguarding our biodiversity;

New Directions (2)

- New and transforming manufacturing industries;
- New companies to take Australian knowledge products to the world;
- Science and technology to help Australians live longer, healthier, more productive lives enriched by scientific discoveries; and
- Technology to overcome the disadvantages that remote Australia suffers in communications, health and education.

Energy Flagship Project

ENERGY TRANSFORMED

Solutions to Australia's Energy Greenhouse Challenge

2020 Vision and Goals:

- Double the efficiency by which fuel is utilised for energy, thereby reducing the supply side requirements.
- Halve energy losses in end-use processes, thereby reducing the projected growth in energy demand.
- Double fuel efficiency and greatly expand the use of gas (including hydrogen) in vehicles, further reducing energy demand, and also oil imports.

The achievement of these goals will have additional national outcomes:

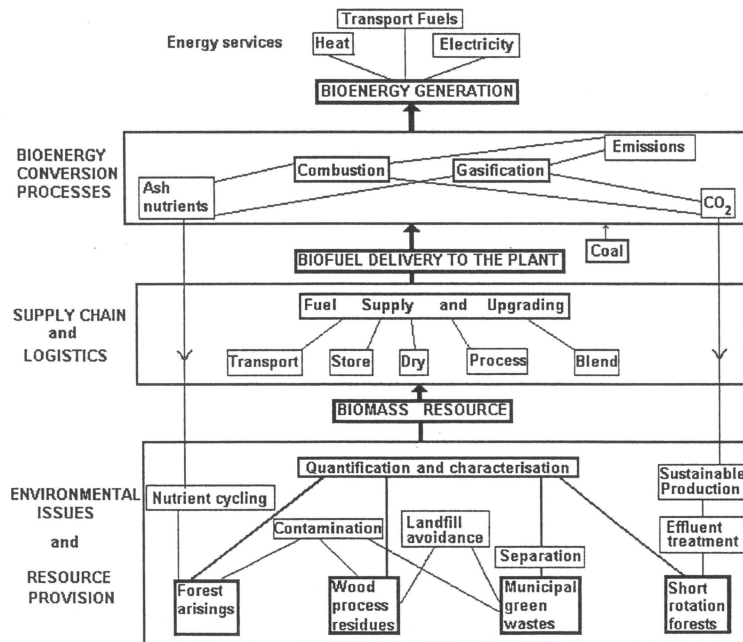
- Halving of projected greenhouse gas emissions from stationary energy and transport
- Halving exposure to urban air pollution with consequent community health benefits
- Establishment of new technology and service businesses with skilled job creation and value-added exports
- Initiation of the hydrogen economy

Energy Flagship Project

The Plan	The Science
<p>Distributed Energy & Power (DEP)</p> <ul style="list-style-type: none">• Individual technologies• Integrated applications• Total systems <p>Efficient Energy Use (EEU)</p> <ul style="list-style-type: none">• Buildings• Industrial processes <p>New Generation Transport (NGT)</p> <ul style="list-style-type: none">• Hybrid vehicles• E-Transport/ITS <p>Modelling</p> <ul style="list-style-type: none">• Energy systems• Greenhouse• Environmental• Economic• Social <p>Leadership and Management</p>	<ul style="list-style-type: none">• Hydrogen-based technologies• Gas combustion fundamentals• Advanced electrochemistry• Power switching/conditioning• Systems analysis• Network interaction/control <p>Plus links to CSIRO emerging science areas:</p> <ul style="list-style-type: none">• Complex Systems• Socio-Economic Integration• ICT – Adaptive Infrastructure and Networks of Embedded Devices• Nanotechnology

Energy Flagship Project

Conceptual Design



CSIRO Energy Technology



ENERGY • TECHNOLOGY

Energy Technology moves to Newcastle in 2003

CSIRO Postgraduate Scholarships

about the division

research

recruitment

publications

what's new

about csiro

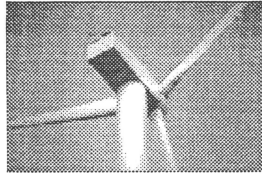
feedback

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related sites

<http://www.det.csiro.au/>

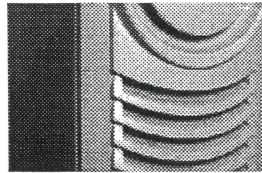
The 'new' Energy Technology Building



Wind power

A wind turbine system of 160 kW will consist of a mix of small and large wind turbines located around the site. The arrangement will make the best use of wind in all directions.

[Back to top](#)



Dark Green Energy

Microturbines are freestanding energy generation units about the size of refrigerators. As consumers move from using main grid electricity to locally produced energy and power, microturbines could provide much of the power for commercial buildings and small industry.

[Back to top](#)

Microturbines are fuelled by a mixture of natural gas and air, which expand to drive a turbine and an electricity generator. Their very low production of greenhouse emissions has resulted in this form of energy being dubbed "dark green energy". It's the next best thing to "green energy", or renewable energy.

In CSIRO's Energy Centre, two units will produce 150 kW. To reduce the Centre's energy costs and the demand on the grid, the turbines will be scheduled to run when demand is at its peak.



[Back to top](#)

PEM Fuel Cells

The building has been designed for the future installation of developing fuel cell technology. It will house four 25 kW Polymer Electrolyte Membrane (PEM) fuel cells. Fuel cells convert the energy of a fuel, generally hydrogen, into useable electricity and heat. The only "waste" is water.



<http://www.det.csiro.au/energycentre/html/power.htm#PEM>

Centre for Distributed Energy and Power



Centre for Distributed Energy and Power

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A radical new way of looking at energy and power

Many countries around the world are thinking about imaginative and cost effective ways to generate electricity in their cities, rural areas and homes. There is a global trend towards generating power, heat and cooling locally, using emerging gas technologies and integrating with selected renewables and traditional generation.



The term "distributed energy" refers to decentralised generation and use of energy. A process can be as sophisticated as heating, cooling and powering a commercial building using a combination of solar panels, microturbines, fuel cells and electricity from the main grid. It can be as simple as a Vietnamese villager using the gas produced from animal dung for cooking.



CenDEP is an alliance of organisations, joining with CSIRO to help put distributed energy on the map in Australia. We will do this by working with technology developers and users to evaluate the cost, environmental impact and applicability to various market situations. At the same time, we will seek to influence policy and regulatory controls.



CSIRO is taking the issues of sustainable energy generation and greenhouse gas emissions very seriously. It has identified Energy Transformed as one of its major national flagship research programs that are attracting increased investment.

This site is being reviewed. In the meantime, some of the menu links won't work. Sorry!

CenDEP's one day seminar, *Distributed Generation: Technology, Markets and Opportunities*, was very successful. Here are some of the presentations:

[Moving energy generation into the urban environment - air quality issues.](#) By John Carron.

[Grid connection, the challenges.](#) By Ted Spooner.

[Economics and distributed generation.](#) By Dorothy Renner.

[DG and demand side participation.](#) By Steffen White.

[Policy and regulation hurdles.](#) By Hugh Dufred.

[Gas cooling: renovation opportunity for Australia.](#) By Glen Wiett.

[Energy storage in distributed generation.](#) By Tony Vesaliti.

[Reciprocating Engines.](#) By David Moore.

[Market Penetration in the US and Asia Pacific Region.](#) By Ben Toby.

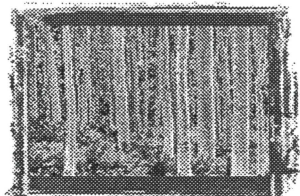
<http://www.cendep.csiro.au/>

CSIRO Forests and Forest products



To increase the economic and environmental benefit to Australia by improving the management and productivity of the nation's forests, and the quality and value of forest products

forestry and forest products



- Who and where we are
- What we do
- Help yourself
- How we can help
- Who we work with

Research Highlights

Forest growers' kit solves greenhouse puzzles

Australia's private foresters will now be able to make more informed plantation management decisions simply by utilising a new kit developed by CSIRO.

Previous highlights

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CSIRO Forests and Forest products



CSIROonline 

Commonwealth Scientific & Industrial Research Organisation

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Media Release - Ref 2002/166 - Aug 26, 2002

Forestry, wood and Paper Industries - Media Release

Search all CSIRO

Forest growers' kit solves greenhouse puzzles

Search this site only

[Search Help](#)

Australia's private foresters will now be able to make more informed plantation management decisions simply by utilising a new kit developed by CSIRO.

The *Greenhouse Resource Kit for Private Forest Growers* provides clear answers to questions about how the 'greenhouse effect' impacts on foresters' businesses.

According to the head of CSIRO Forestry and Forest Products, Dr Paul Cotterill, questions such as: 'How can I maximise carbon uptake?' and; 'What potential exists to generate income from carbon trading?' need to be dealt with on the basis of the latest available information.

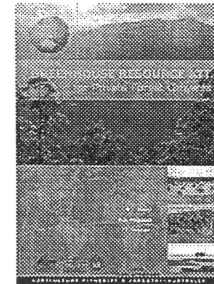
"Greenhouse is a complex issue covering a diverse range of industries," Dr Cotterill says.

"Keeping track of new policies and international agreements relevant to private forestry requires significant effort for growers."

Developed by CSIRO on behalf of the Department of Agriculture, Fisheries and Forestry, Australia, the kit was launched recently by Federal Forestry and Conservation Minister, Senator Ian Macdonald.

The leader of the project team responsible for compiling the kit, Dr Philip Polglase, says it deals with issues such as:

- methods of carbon accounting (measuring carbon sequestration) in forests
- possible emissions trading systems
- the economics of forest-based carbon sequestration projects, particularly in low-rainfall zones
- methods and processes for independent verification and accountability
- policy overview, including the potential of carbon sinks to contribute to greenhouse solutions
- links to sustainability, particularly salinity mitigation.



<http://www.csiro.au/index.asp?type=mediaRelease&id=ForestGrowersKit>

CSIRO Forest and Forest Products

- } **Micro gasification turbine genset development for electricity generation**
- } **Continuous production of charcoal and energy**
- } **Basic properties of various wood species for fuelwood**
- } **Co-firing of treated wood waste and forest industry residues with coal**
- } **Pollution control of wood combustion processes**
- } **Evaluation of wood species for metallurgical carbon**
- } **Evaluation of performance of activated carbons from forest biomass**
- } **Development of new carbon products**

Dr Paul Fung

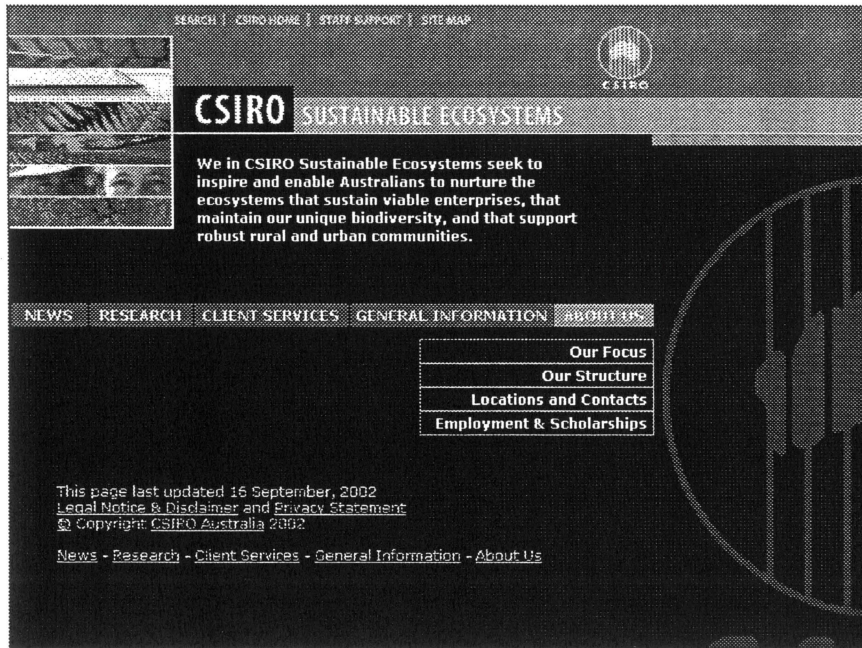
CSIRO Forestry and Forest Products

Private Bag 10, Clayton South Vic 3169

Phone: + 613 (03) 9545 2487. Fax: + 613 (03) 9545 2448

Email: Paul.Fung@csiro.au

CSIRO Sustainable Ecosystems



SEARCH | CSIRO HOME | STAFF SUPPORT | SITE MAP

CSIRO SUSTAINABLE ECOSYSTEMS

We in CSIRO Sustainable Ecosystems seek to inspire and enable Australians to nurture the ecosystems that sustain viable enterprises, that maintain our unique biodiversity, and that support robust rural and urban communities.

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<http://www.cse.csiro.au/>

Agricultural Systems Modelling

APSIM

Agricultural Production Systems Simulator

Friday, 20 September

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What is APSIM?
Information Update
APSIM Software
APSIM Documentation
Help Desk Support

- submit defect report
- submit change request
- science issues

Software Engineering Group
The Links Page

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User Details

APSIM Support Services

NEW Latest News

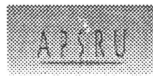
Welcome to the APSIM Support web site. This site is dedicated to delivering reliable and timely information to APSIM users.

It is important to note that this site can only be viewed properly with Netscape 4+ or Microsoft Internet Explorer 4+.

Tip of the day

Increased numerical precision for output data.

Want more precision for your output data? Use the CSV file format for output with the APSIM report module and have your information recorded using the full numerical precision. Data is recorded in normal scientific notation and is readily interpreted by spreadsheet and graphical packages. See the report module documentation for more details.

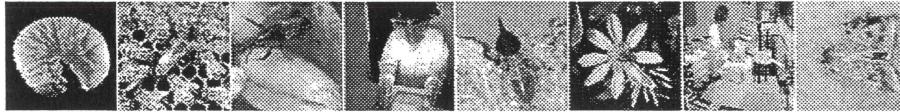


<http://www.apsim-help.tag.csiro.au/>

CSIRO Entomology

CSIRO ENTOMOLOGY

Friday September 20, 2002



insects
our focus, your future


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[about insects](#)
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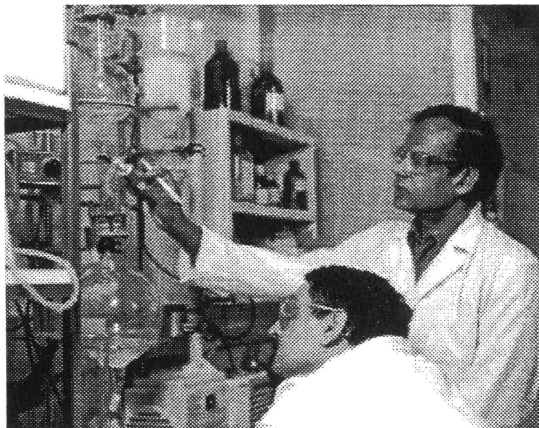
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<http://www.ento.csiro.au/>

CSIRO Molecular Science

Molecular Science

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- [Research Areas](#)
- [Outlook, Activities & Outcomes](#)
- [People](#)
- [What Our Customers Say](#)
- [Information Sheets](#)
- [Media Releases](#)
- [Doing Business With Molecular Science](#)



CSIRO Molecular Science is a centre of excellence for chemical and biological discovery.

Our aim is to generate benefits for Australia by assisting the development of industries in the chemicals and plastics and pharmaceutical and human health sectors of the economy.

There are also smaller but significant contributions to the built environment and the mineral processing sectors.

<http://www.csiro.au/index.asp?type=division&id=Molecular%20Science&style=division>

CSIRO Molecular Science

Research Areas

Research Areas

Applied Chemistry

There are two major elements of this program: (1) the design and synthesis of polymers, composites and engineered resins, including advanced materials for the aeronautical and automotive industries, and (2) the development of improved medical devices and implantable materials, including artificial corneas and vascular prostheses.

Molecular Biotechnology

Cancer is a primary disease focus of this program, with the aim of developing new diagnostic and therapeutic methods. Other projects include improved drug targeting and delivery methods, and gene therapeutics.

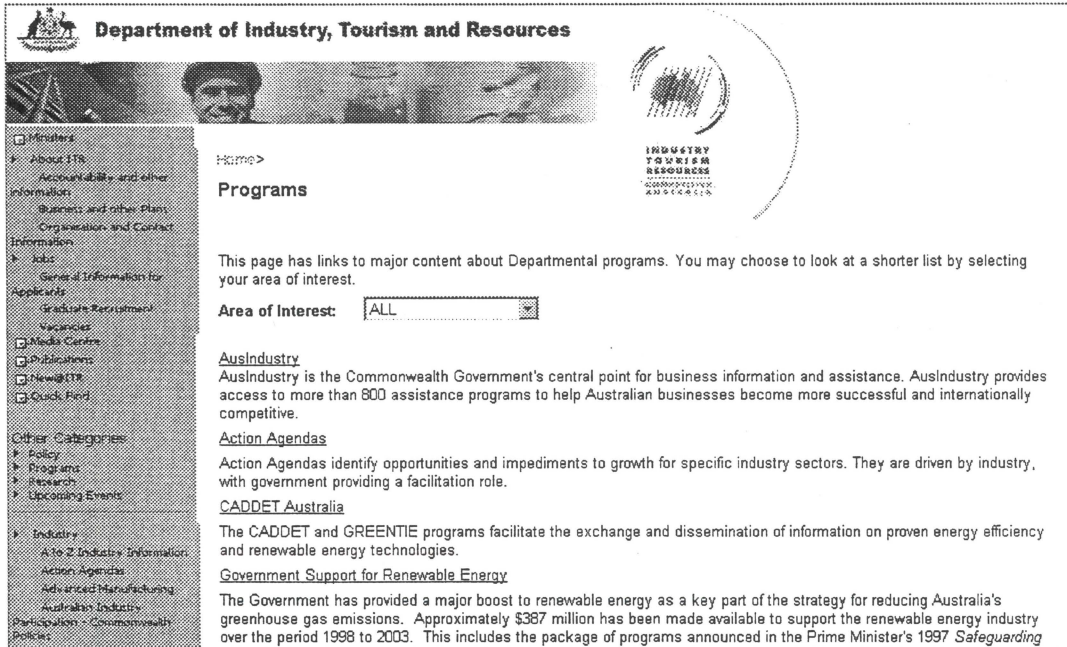
Molecular Engineering

Synthetic organic chemistry capabilities are applied in the areas of new pharmaceuticals, veterinary antiparasitic chemicals, environmentally safe crop protection chemicals and new chemical synthesis. In addition, the program offers skills in transformation of laboratory-scale chemical processes to prototypes and pilot plants, and in bioprocessing technologies including downstream processing and purification.

Total: 3 Research Programs

Page 1 of 1

Industry Programmes



Department of Industry, Tourism and Resources

Home >

Programs

This page has links to major content about Departmental programs. You may choose to look at a shorter list by selecting your area of interest.

Area of Interest:

[AusIndustry](#)
AusIndustry is the Commonwealth Government's central point for business information and assistance. AusIndustry provides access to more than 800 assistance programs to help Australian businesses become more successful and internationally competitive.

[Action Agendas](#)
Action Agendas identify opportunities and impediments to growth for specific industry sectors. They are driven by industry, with government providing a facilitation role.

[CADET Australia](#)
The CADET and GREENTIE programs facilitate the exchange and dissemination of information on proven energy efficiency and renewable energy technologies.

[Government Support for Renewable Energy](#)
The Government has provided a major boost to renewable energy as a key part of the strategy for reducing Australia's greenhouse gas emissions. Approximately \$387 million has been made available to support the renewable energy industry over the period 1998 to 2003. This includes the package of programs announced in the Prime Minister's 1997 *Safeguarding*

Department of Industry, Tourism and Resources

INDUSTRY TOURISM RESOURCES

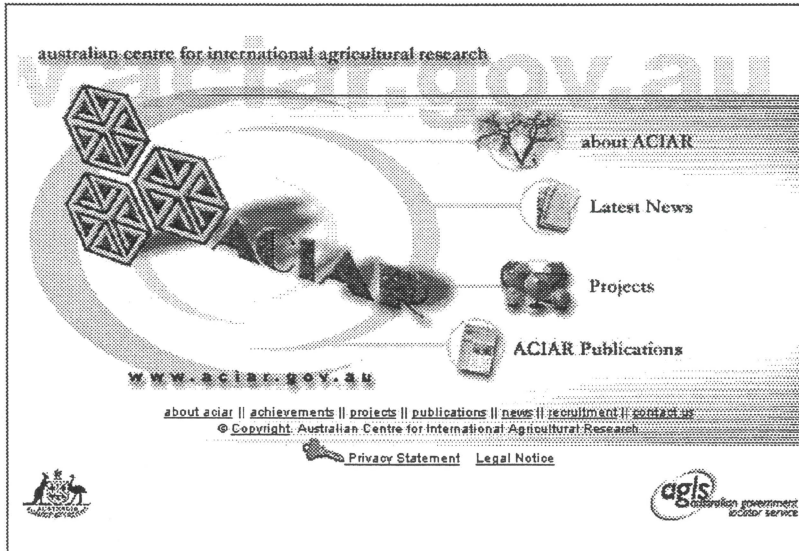
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 - Action Agendas
 - Advanced Manufacturing
 - Australian Industry
 - Participation in Commonwealth Policy

<http://www.industry.gov.au/content/programs.cfm>

FUNDS (1)

ACIAR

Australian Centre for International Agricultural Research



The image is a screenshot of the ACIAR website homepage. At the top left, it says "australian centre for international agricultural research" with the URL "www.aciar.gov.au" below it. The main visual is a globe with the word "ACIAR" written across it. To the right of the globe are four navigation links: "about ACIAR" (with a tree icon), "Latest News" (with a book icon), "Projects" (with a person icon), and "ACIAR Publications" (with a document icon). Below the globe is the URL "www.aciar.gov.au". At the bottom, there is a navigation bar with links: "about aciar", "achievements", "projects", "publications", "news", "recruitment", and "contact us". Below this is the copyright notice: "© Copyright: Australian Centre for International Agricultural Research". At the bottom left is the Australian Coat of Arms, and at the bottom right is the "agis" logo with the text "australian government sector service".

australian centre for international agricultural research
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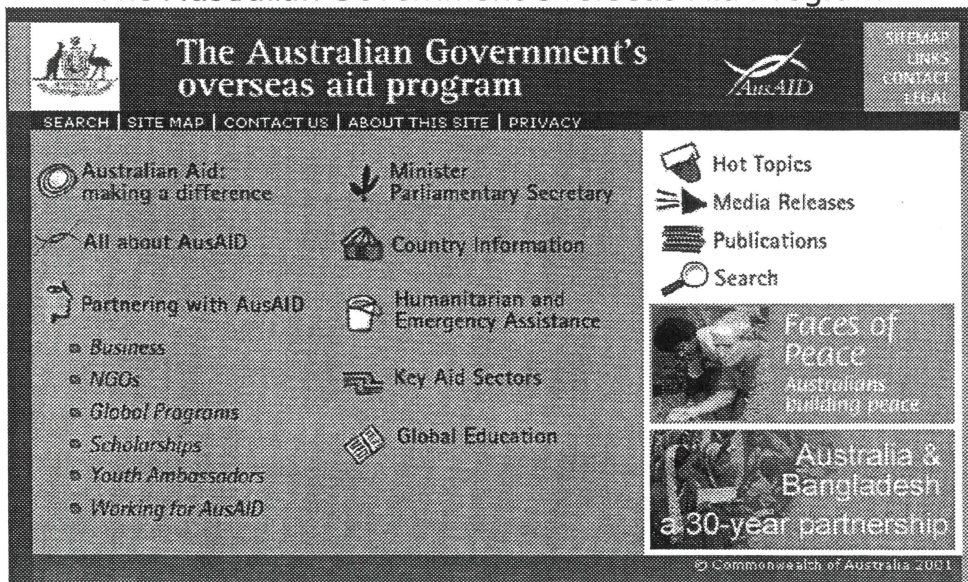
agis
australian government
sector service

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

FUNDS (2)

AUSAID


The Australian Government Overseas Aid Program



The screenshot shows the homepage of the Australian Government's overseas aid program website. At the top, there is a navigation bar with the Australian coat of arms on the left, the title "The Australian Government's overseas aid program" in the center, the AusAID logo on the right, and a box with "SITEMAP", "LINKS", "CONTACT", and "LEGAL". Below this is a secondary navigation bar with "SEARCH", "SITE MAP", "CONTACT US", "ABOUT THIS SITE", and "PRIVACY". The main content area is divided into several sections: "Australian Aid: making a difference" with a target icon; "All about AusAID" with a leaf icon; "Partnering with AusAID" with a hand icon, containing a list of categories: Business, NGOs, Global Programs, Scholarships, Youth Ambassadors, and Working for AusAID; "Minister Parliamentary Secretary" with a leaf icon; "Country Information" with a house icon; "Humanitarian and Emergency Assistance" with a bucket icon; "Key Aid Sectors" with a hand icon; "Global Education" with a book icon; "Hot Topics" with a megaphone icon; "Media Releases" with a play button icon; "Publications" with a book icon; and "Search" with a magnifying glass icon. On the right side, there are two featured images: "Faces of Peace: Australians building peace" and "Australia & Bangladesh: a 30-year partnership". At the bottom right, there is a copyright notice: "© Commonwealth of Australia 2001".

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

European Union Sixth Framework Programme



CORDIS Research and Technology Development beyond 2002 **RTD 2002**

Home Page > FP activities

Integrating research | Research areas | Cross-cutting | Structuring ERA | Strengthening ERA

Activities **Instruments**

As stressed in the Commission's January 2000 Communication "Towards a European Research Area", the EU's framework programme for Research and Technological Development (RTD) needs to be thoroughly re-thought out in the light of the ERA project. The Sixth Framework programme will be one of the most important instruments to implement the "European Research Area".

The Commission proposals for the Sixth Framework programme follow on from the Guidelines of the Commission's 2000 communication and are based on the preliminary conclusions of the debate in the European Parliament, the Council and other institutions, taking also into account the views expressed by the Member States, the scientific community and industry. The Sixth framework programme will be restructured around three targets:


- Integrating Research - these activities will represent the bulk of the efforts deployed under the framework programme and are intended to integrate research efforts and activities on a European scale, and develop our knowledge and understanding. They will be carried out in a limited number of priority thematic areas, as well as in areas covering a wider field of research in the form of certain specific needs of EU policies or new emerging needs;
- Structuring the European Research Area - defining the various activities in such a way as to enable them to exert a more structuring effect on the research activities conducted in Europe thanks to a stronger link with national, regional and other European initiatives;
- Strengthening the foundations of the European Research Area - simplifying and streamlining the implementation arrangements, on the basis of the intervention methods defined and the decentralised management procedures envisaged.

These pages provide details of the various papers and positions emerging from the main stakeholders on the different areas of activities proposed for the Sixth Framework programme.

Search:

About
Background
European Research Area
Sixth Framework Programme
ERA developments
FP6 activities
Related EU policies
News
Interviews/speeches

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<http://www.cordis.lu/rtd2002/fp-activities/activities.htm>

Seven Priority Areas (3% of GDP)

- Genomics and biotechnology for health;
- Information Society technologies;
- Nanotechnologies, intelligent materials, and new production processes;
- Aeronautics and space;
- Food safety and health risks;
- Sustainable development;
- Citizens and governance in an open European knowledge-based society.

Bioenergy Australia

The screenshot shows a web browser window displaying the Bioenergy Australia website. The page has a dark background with a light-colored navigation sidebar on the left. The main content area features a banner with the text 'BIOENERGY Australia' and 'Home' in the center, flanked by two house icons. Below the banner is a link to the 'Bioenergy Australia 2002 Conference Program and Registration Details'. The footer contains a paragraph of text describing the organization's formation and membership.

[Home](#)

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This site has been created, and is maintained, by Adon's Computing Services.

Last Modified on: 6/9/02

13496

BIOENERGY Australia

Home

[Bioenergy Australia 2002 Conference Program and Registration Details](#)

Bioenergy Australia

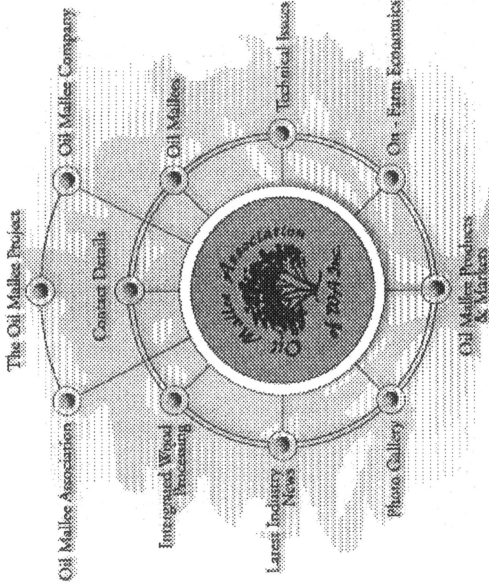
Formed in July 1997 by the Energy Research and Development Corporation, in collaboration with RIRDC and the Australian Greenhouse Office. Membership now also includes DISR, BRS, CSIRO Div of Energy Technology & Div of Forestry and Forest Products, FPA of NSW, Pacific Power, Delta Electricity, Macquarie Generation, Waste Service NSW, Brightstar Environmental & BEST, SEDA, SPM/CFM, Forestry Tasmania, State Forests of NSW, Western Power Corporation, Alstom Power, Western Sydney Waste Board, Stanwell Corporation, CS Energy, NRE -Forest's Service, the Northern Sydney Waste Board, AFFA, Tarong Energy, Great Southern Energy, Rio Tinto R&TD, QFRI, Babcock and Brown, CVC REEF, ForestrySA, Renewable Energy Corp Ltd, CALM, Auspine Ltd, Gurns Forest Products, CSIRO Sustainable Ecosystems, Carter Holt Harvey, Metasource, Primergy, Sugar Research Institute, Queensland EPA (Sustainable Industries), Enecon Pty Ltd, BioForest Ltd, Forest Products Commission of WA.

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

Oil Mallee and Bio-Electricity



Charcoal produced from the first stage of processing the woody mallee feedstock can then be further activated by steam to produce activated carbon (a high value product).



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

Oil Mallee: Scaling Up and Practical Problems



The first prototype harvester in action at Timorin. The mallee is cut off just above ground level and fed back into a drum and chipper.

The harvester will go up one row in the hedge and down the next, thus the tree rows need to be 1.5 - 2m apart.

Oil Mallee: Integrated Farming Systems



In Conclusion

- The 'carbohydrate economy' concept
- Science philosophies
- Government or business support ?
- Funding opportunities
- How to make effective linkages
- The next conference ?

