



Australian Government

Australian Greenhouse Office

Renewable Energy Technology Programs in Australia

Presentation to Fourteenth Asia Pacific Seminar on Climate Change

Sydney , Australia

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Australian Government Support for Renewable Energy

Government financial support provided for development of renewable energy and low emission technology in Australia

Provides CO₂ abatement and builds capacity for future abatement

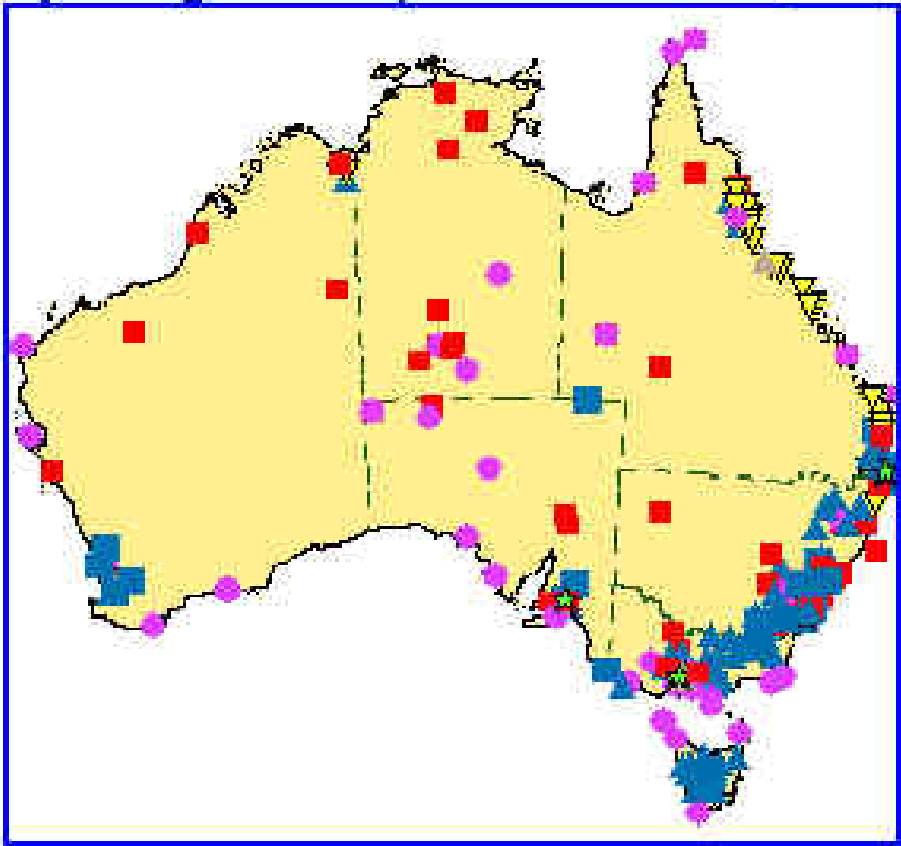
Renewable energy programs managed by the AGO

Close cooperation with other Government Departments and Industry



Australian Renewable Energy

- Operating Electricity Generation Sites



- ▼ Bagasse
- ★ Landfill Methane
- Solar
- ▲ Water
- Wind
- ▲ Sewage Methane
- Other

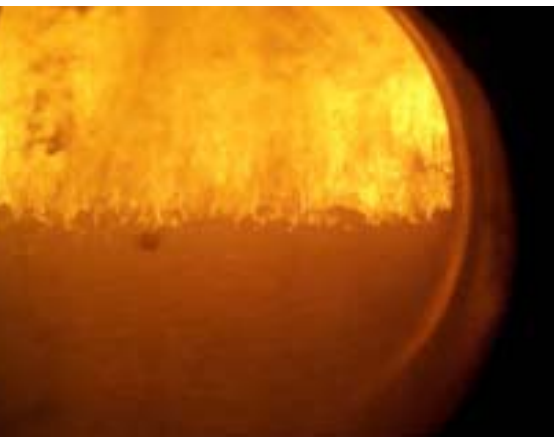


Renewables - 3 Approaches

- Commercialisation
 - link from R&D to widespread adoption
 - innovation and Intellectual Property
- Deployment
 - putting established technology on the ground
 - establish familiarity and experience
- Industry development
 - develop the capacities of the RE industry
 - avoid boom/bust
 - benefit from Mandated Target



Overview of Renewable Energy Technologies



- **Renewable energy is a key element of Australia's greenhouse response**
- **A range of renewable energy solutions are emerging**
- **Key technologies:**
 - **Biomass (waste to energy, energy crops)**
 - **Wind**
 - **Solar (Photovoltaic and thermal)**
 - **Small scale hydropower**
 - **Tidal**
 - **Wave**
 - **Geothermal (including hot dry rock technology)**



Achievements - building projects



APPING SOLAR ENERGY * CUTTING GREENHOUSE EMISSIONS * REDUCING SALINITY

RMIT UNIVERSITY
GEO-ENG
SOLAR ENERGY RESEARCH CENTRE



Biomass



Photo courtesy Brightstar Environmental

Solid Waste & Energy Recycling Facility SWERF Plant was awarded a \$2 M Showcase grant - turning 30,000 t pa of municipal waste into renewable electricity (Wollongong NSW)



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Solar Photovoltaics



- **Australian innovation in solar PV has been supported by several RECP grants to improve process technology and reduce costs**
- **Grants have been offered to Pacific Solar, BP Solar and Origin Energy for a range of commercialisation projects.**



Solar Photovoltaics (cont'd)



Photo courtesy Solar Systems



Photo courtesy Western Power / Anutech

- **Concentrating PV technologies - generating more power by collecting and focusing solar energy with mirrors**
- **\$1 M grant to the Pitjantjatjara Council to implement solar power station using concentrating technology for an Aboriginal community**



Solar Transport



Photo courtesy Solar Sailor Holdings

- **Solar Sailor - World first renewable water transport using solar and wind**
- **Commercial prototype developed with the assistance of a \$1 M RECP grant**



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Wave Power



Photo courtesy Energetech

- Energetech proposed 500 kW Wave Power Generator - ocean waves are a reliable, high energy density renewable power source
- \$750,000 RECP grant assisting commercialisation of the technology



Wind Power

- RECP grant of \$220,000 is supporting the commercialisation of the 25 kW Westwind cyclone proof wind turbine

- Other grants have been offered to support wind-diesel control systems and energy storage technologies



Solar Thermal

Australian innovation using solar thermal pond for industrial process heat - Pyramid Hill, Victoria (supported by a \$550,000 RECP grant)



Photo courtesy RMIT



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Renewable Energy Deployment - Key Measures

- Mandated Renewable Energy Target (MRET)
- Renewable Remote Power Generation Program (RRPGP)
- Photovoltaic Rebate Program (PVRP)
- Some Greenhouse Gas Abatement Program (GGAP) projects for renewable transport fuels



Renewable Remote Power Generation Program



Payment from Government to Remote Owners to reduce the consumption of diesel fuel by using renewable energy.



Bushlight Project



- Industry development & indigenous communities support with Bushlight



Bushlight Project



<p>WASHING CLOTHES</p> <p>DEPENDS ON BATTERIES</p> <p>OR</p>	<p>ENTERTAINMENT</p> <p>2 hours</p> <p>10 hours</p> <p>3 hours</p> <p>3 hours</p>	<p>COOKING</p> <p>gas burner</p>	<p>HAIR CLIPPERS</p> <p>20 minutes per day</p> <p>HEATING</p> <p>NEBULISER</p> <p>30 minutes per day</p>
<p>COOLING HOUSE</p> <p>Bedroom 1</p> <p>8 hours</p> <p>Bedroom 2</p> <p>8 hours</p> <p>Bedroom 3</p> <p>8 hours</p> <p>4 hours</p>	<p>FOOD COOL</p>	<p>LIGHTS</p> <p>Bedroom 3x1 hour</p> <p>Veranda 1x3 hour / 1x2 hour</p> <p>Kitchen 1x12 hour / 1x2 hour</p> <p>Main hall 2x6 hour</p> <p>toilet bathroom 2x20 minutes</p>	<p>CHRISTMAS LIGHTS</p> <p>4 hours per day</p> <p>KEY BOARD</p> <p>1 hour per day</p> <p>SEWING MACHINE</p> <p>20 minutes per day</p> <p>POWER TOOLS</p>



Photovoltaic Rebate Program (PVRP)



Payment from Government to Home Owners to reduce the cost of putting PV on roof

Photo courtesy Citipower



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Industry Development Programs

Funding under

- Industry Development Program (REID)
- Remote Power Program (RRPGP)
- Benefits industry as a whole, not individual projects or companies

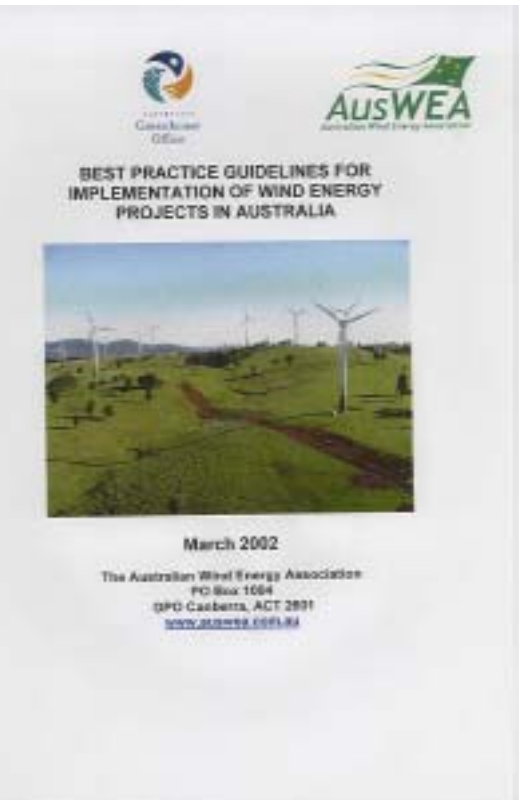


Guided by Renewable Energy Action Agenda

Five overarching strategies by Government and Industry

- Market development
- Building community commitment
- Building industry capability
- Setting the policy framework
- Encouraging a culture of innovation

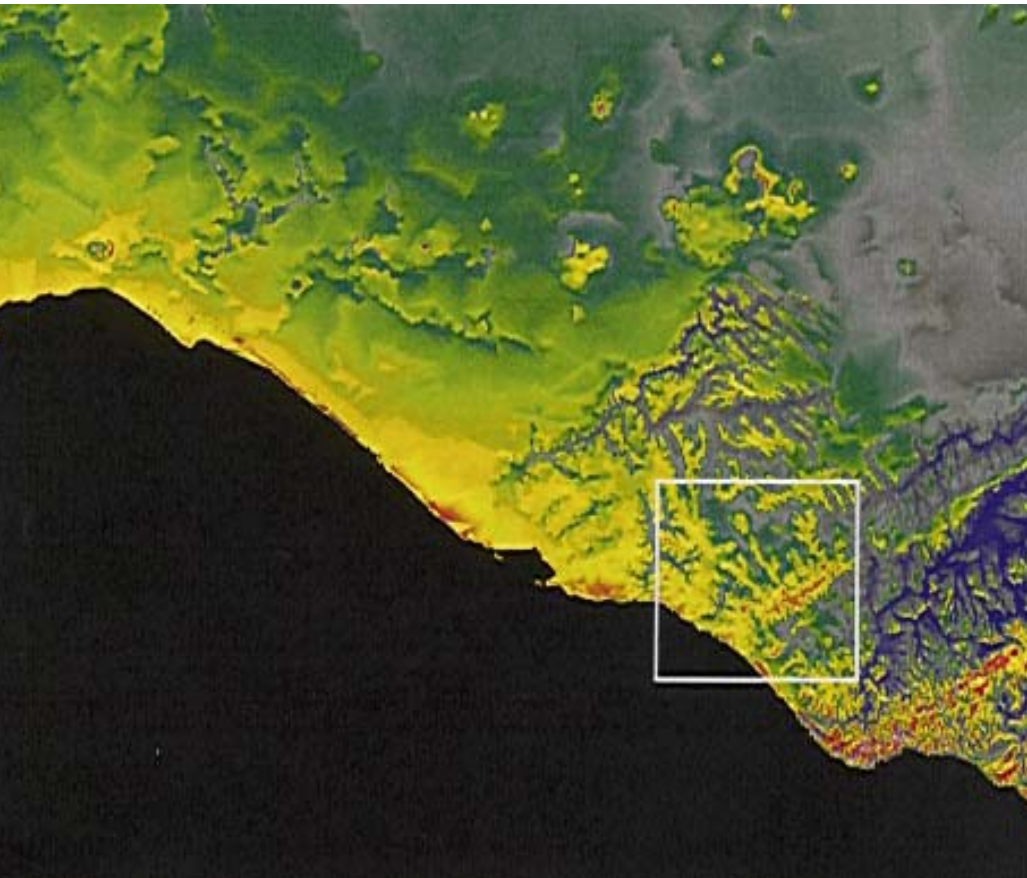
Best Practice Guidelines



- Implementation of Wind Energy Projects in Australia
- Waste to Energy
- Connection to the Grid
- Renewable Energy for Local Government
- Building Integrated PV



Resource Assessment and Mapping



- Wind Resource Assessment in Australia – A Planner’s Guide
- Australian Bioenergy Atlas
- Biofuels Database
- Solar Radiation Handbook



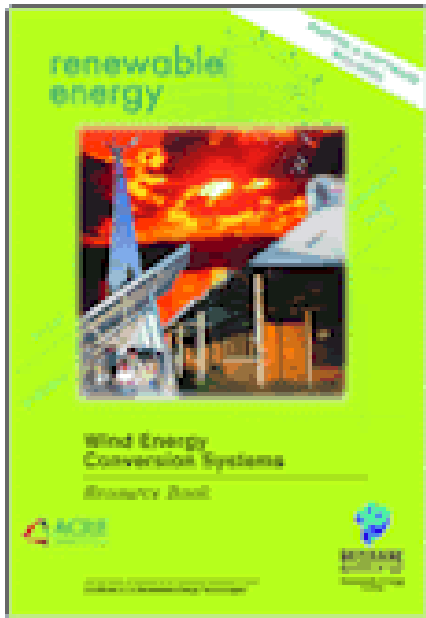
Accreditation of designers and installers



- PV installations
- Small wind projects
- Hybrid RAPS installations under RPPGP
- Accreditation through Australian Business Council for Sustainable Energy



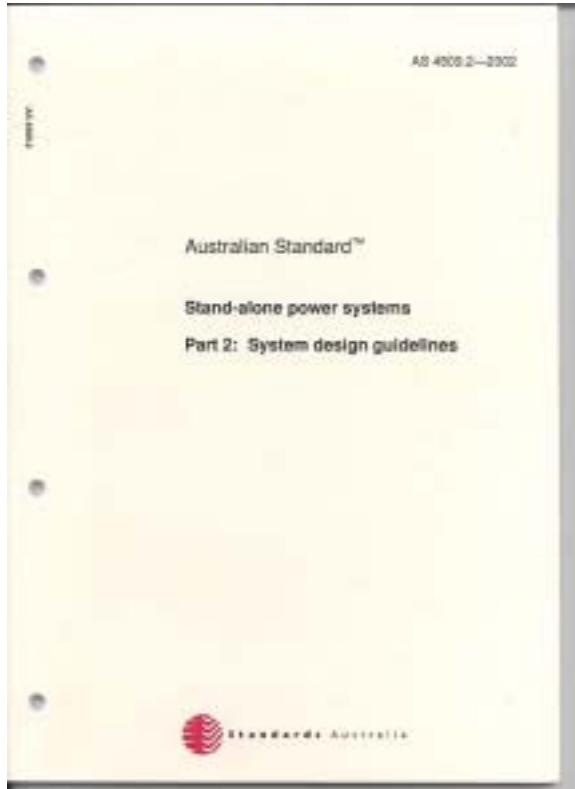
Renewable Energy Training



- National Electrotechnology Training Package for use in TAFE Colleges
- Teaching and classroom resource material
- Specific courses for remote power



Australian Standards



- AS 4509.2-Stand-alone power systems
- AS 4777 Grid connected inverters
- Draft standard for PV Arrays
- Draft standard for Stand-alone inverters
- Testing facilities and procedures at RESLab in Perth



Encouraging export of renewable energy products and services



- Trade show exhibits
- Australian Renewable Energy Export Network
- Climate Action Partnerships
- Other government agreements



Bilateral Climate Action Partnerships

Australian Government has agreements with a range of countries

- for practical action to reduce greenhouse emissions
- Involving energy technology

Climate Action partnerships

- US, China, NZ



Plurilateral Programs and Agreements

Australia also participates in energy related cooperative work, such as

- APEC Energy Working Group
- IEA Photovoltaic Power Systems Programme
 - PV Services for Developing Countries
- Renewable Energy and Energy Efficiency Program



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