



CSIRO Submission 08/280

Garnaut Climate Change Review  
Issues Paper 4  
Research and Development:  
Low Emissions Energy Technologies

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## CSIRO and Low Emissions Technologies

The overall vision driving CSIRO's Energy portfolio is "a clean, secure and wealth-creating Australian and regional energy future, founded on Australian energy and technology". CSIRO has a wide ranging research program addressing this vision.

Some specific areas where CSIRO is undertaking RD&D in low emissions technologies include:

- post-combustion capture: PCC
- geological storage (with the CO2CRC)
- energy storage: UltraBattery
- gasification (with the CRC for Coal in Sustainable Development [CCSD])
- syngas processing (with the Centre for Low Emissions Technologies [cLET])
- renewables: solar, wind, geothermal
- remote and unconventional gas (with the WA Energy Research Alliance [WA:ERA] and the Australian Gas Centre [AusGas])
- alternative fuels: biofuels, gas-to-liquids, coal-to-liquids
- energy efficiency and demand management (with the Centre for Distributed Energy and Power [CenDEP])

A number of these programs have the direct support of the Federal Department of Resources, Energy and Tourism, State Governments and/or industry.

Given the uncertainty and rapid evolution of our energy future, CSIRO pursues a diverse portfolio of energy research, although with a very strong focus on unique Australian challenges and opportunities. Our portfolio is guided by CSIRO's Science Investment Process with its dual foci of Relevance and Likely Impact. Programs and projects are subject to regular internal and external review. Portfolio management also includes a "fast fail" process to stop less prospective work over time to allow increased scale in key areas.

CSIRO's energy portfolio follows a multi-disciplinary, integrated, full-cycle approach with strong collaboration between R&D institutions and industry both nationally and internationally. CSIRO's multi-disciplinary research breadth and national footprint enables capabilities to be effectively inter-linked geographically across Australia and across the overall energy sector. CSIRO draws on this diversity of capabilities to help solve the technological challenges of both clean energy and energy security that are most relevant and beneficial to Australia.

The nature of the energy challenges and opportunities that Australia and the region now face is such that urgent and large-scale responses are required. Coordination and collaboration nationally and internationally around priority initiatives is thus critical. CSIRO can play an important role in encouraging this coordination. It is CSIRO's view that strong partnerships between Governments, Industry and R&D providers are extremely beneficial to help deliver new technologies for our energy future, particularly as we move from laboratory-scale to pilot, demonstration and commercialisation, and particularly in assisting to deliver these technologies into the Asia-Pacific region. Government and Industry leadership has great value in encouraging true collaboration and coordination across the R&D sector to bring the required scale and urgency to bear. There is scope to enhance coordination and cross-fertilisation further across the national and international innovation system while reducing the bureaucracy of multiple overlapping governance mechanisms.

On the general issue of ensuring optimal value for funding RD&D to help Australia meet the energy challenge, it is CSIRO's position that a number of issues need to be considered:

- It is important to efficiently use our comparatively limited support and resources (both funding and expertise)
- Focus will need to be on Australian problems and opportunities, as well as our technical competitive advantages (capitalise on our opportunities)
- To achieve and even accelerate large-scale GHG emissions cuts there will be a need to achieve a balanced approach on the energy supply and economic growth fronts whilst paving the way for a smooth transition into a low emissions energy regime.
- Furtherance of international connections to access technology developments overseas.

Given that it is necessary to significantly accelerate technological developments and their deployment, it is important to avoid unnecessary duplication within our relatively small RD&D community. It will also be important for Australia to maintain a fairly diverse energy portfolio but within the context of Australian

opportunities, which will also require addressing Australia-specific problems. In order for Australia to meet these challenges, a nationally co-ordinated strategy (ie. a 'team-Australia' working together approach) is required to effectively focus investments from research bodies, governments (States and Federal) and industry whilst drawing on leading-edge expertise around the country as well as international partners.

CSIRO recently published a comprehensive report of potential costs of low emissions technologies in Australia in coming decades ("*The Heat is On*"). While capital costs of power plant have increased substantially in the intervening period, the report provides a good summary of relative costs which are the principal barrier to the introduction low emissions technology.

#### **Participation in Garnaut Review**

CSIRO has participated in a variety of ways in the Garnaut review. CSIRO has had the opportunity to contribute through Public Forums and lectures and in industry and R&D roundtables at the request of the Garnaut Secretariat. A number of CSIRO scientists have provided information, analysis and opinions to the Review in their areas of expertise. Interactions relevant to this Issues Paper include those with Dr Beverley Ronalds (Group Executive, Energy), Dr Steve Hatfield Dodds (Sustainable Ecosystems), Mr Paul Graham and Mr Terry Jones (both Energy Transformed Flagship). We have also provided input to submissions from bodies with which we are affiliated.

CSIRO's Energy focus is primarily on the development and improvement of new technologies and techno-economic modelling, and we are not well placed to comment on policy issues.

CSIRO would be very pleased to expand on any of the activities mentioned above, give a presentation to the Review committee or provide any other assistance to the Review process. We would also welcome further opportunities to work with Governments and their Departments on these important issues.