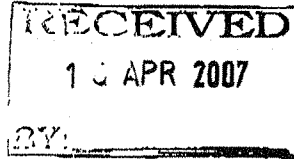


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**Queensland
Government**

**Premier of Queensland
and Minister for Trade**

For reply please quote: 131130/NL01/ECP

29 MAR 2007

The Honourable Petro Georgiou MP
Chair
Standing Committee on Science and Innovation
House of Representatives
PO Box 6021
Parliament House
CANBERRA ACT 2600

Dear Petro

I refer to the Inquiry into Geosequestration Technology (the Inquiry) being undertaken by the Standing Committee on Science and Innovation, and would like to take this opportunity to make a submission on behalf of the Queensland Government.

The coal industry is fundamental to the State's economy and will continue to be so for the foreseeable future. The Queensland Government is investing heavily in finding solutions to greenhouse emissions from coal, including a commitment of up to \$350 million to clean coal technology (CCT) research and development, the formation of a CCT Project Board to ensure Queensland leads in the development and deployment of CCT, and establishment of a Climate Change Centre of Excellence to assist Queensland to better understand and prepare for climate change.

Three internationally significant low emission technology projects are proposed for Queensland, including ZeroGen. The ZeroGen project is the first of its kind, involving coal gasification and sequestration. Ownership of the project was recently transferred to the Government and construction is scheduled to commence in the first quarter of 2009. CCT could become the norm for all new power stations in Queensland by 2020.

The Queensland Government is also working closely with other States and Territories to ensure an effective national legislative framework that minimises and properly manages risks associated with underground storage of carbon dioxide. This Government is aiming to have comprehensive new legislation in place by 2008.

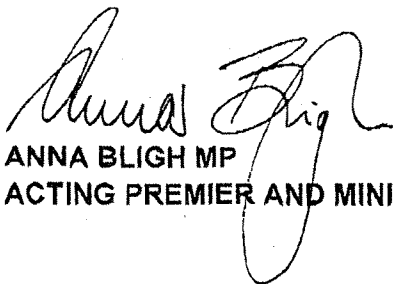
The attached Submission outlines in more detail some of the key achievements and commitments of this Government towards the development of CCT and sequestration.

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Thank you for the opportunity to provide a Submission to the Inquiry.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Anna Bligh', written in a cursive style.

**ANNA BLIGH MP
ACTING PREMIER AND MINISTER FOR TRADE**

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QUEENSLAND GOVERNMENT SUBMISSION: INQUIRY INTO GEOSEQUESTRATION TECHNOLOGY

Carbon capture and storage (CCS), also known as geosequestration, is considered one of the options for reducing atmospheric emissions of CO₂, a major greenhouse gas (GHG), produced from stationary energy plants, for example, coal-fired electricity generation plants. This technology is of significant interest to Queensland as coal-fired power is a major component of the State's electricity mix and coal mining is a key component of Queensland's economy.

The Queensland government is committed to significantly reducing greenhouse gas emissions whilst maintaining economic and social development through a number of initiatives and policies. This is evidenced by the research and development, cooperative and partnership programs, information, project support, climate modelling, financial incentives, funding and regulation.

Queensland's Perspective

The Queensland Government recognises that the commercial development of CCS technology is fundamental to meeting the twin challenges of significantly reducing GHG emissions, whilst sustaining economic development that is underpinned by the State's abundant coal resources. As such, the Queensland Government is leading Australia in the promotion of clean coal technology (CCT) and associated CCS as a key response to GHG induced climate change.

The Queensland Government is undertaking a coordinated approach to address climate change and make a cleaner energy future a reality through a number of initiatives and policies. For example, the Queensland Government:

- has allocated \$300 million from the *Queensland Future Growth Fund* to support the continued sustainable development of CCT; and
- established a *Sustainable Energy Innovation Fund* to promote innovation in energy efficiency and renewable energy technologies and practices - since 1999, eight rounds of funding have been awarded, with completed projects generating \$6 million in sales of sustainable energy products, leveraging more than \$2 million in other government funding, and attracting nearly \$6 million of private sector investment;
- released the *Queensland Energy Policy - a Cleaner Energy Strategy* in May 2000 to encourage the establishment of a competitive market for gas and the development of other sustainable energy options to reduce the growth in GHG emissions, which has facilitated a sharp increase in the contribution of gas to the State's energy mix under the 13% Gas Scheme;
- released the *Queensland Greenhouse Gas Strategy* in May 2004 to address the diversity of factors influencing the State's GHG emissions through research and development, cooperative and partnership programs, information, climate modelling, financial incentives and regulation;

- created a *Clean Coal Technology Project Board* in July 2006 under the *State Development and Public Works Organisation Act 1971* to foster the development of, and investment in CCT;
- put in place a regulatory framework to allow the testing of CCS technology.

CCT RESEARCH & DEVELOPMENT

Queensland is playing a leading role in the Research and Development (R&D) of CCT.

The Queensland Government is developing a *Clean Coal Technology R&D Framework* to foster an environment that is conducive to the development of new technology and the associated technology transfer to ensure that Queensland has a sustainable, productive and internationally competitive coal industry. The Framework focuses on the development of new knowledge intensive products of CCT for application in Australia and potential export to international markets. The draft Framework identifies five strategic areas for action, including: infrastructure, communication, strategic alliances, skills and expertise, and regulation.

In addition, the Queensland Government is contributing directly to a number of leading research projects in the field of CCT, including:

- The Centre for Low Emission Technology (cLET) – a joint venture between the Queensland Government, CSIRO, the University of Queensland, Tarong Energy, Stanwell Corporation and the Australian Coal Research Association that focuses research on the development of improved gas cleaning, separation and conditioning technologies, with a fund of \$26 million over 4 years;
- The Cooperative Research Centre for Coal in Sustainable Development - a joint venture between the Queensland Government and CSIRO and other research organisations, and coal mining and power generation companies in an \$18 million program that seeks to optimise the use of coal in a sustainable future through collaborative research; and
- the University of Queensland research of CO₂ and Flue Gas Sequestration in Coal Measures – a collaborative R&D program with Aachen University in Germany and other coal and power industry companies and research organisations.

For an emerging industry, Australia needs a strong R&D base, strong support to pilot and demonstrate emerging technologies and strategies to support the commercialisation of the new technologies. Australia, and in particular Queensland, has established an internationally recognised capability in the mining services, coal and electricity generation industries, with technologies that are sold world-wide. There is a major opportunity to capitalise on this expertise by marketing emerging CCT overseas, particularly in China and India.

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Further, Stanwell Corporation and several of the coal mining companies that operate in Queensland are core participants in the Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC). Part of the R&D program includes a study of potential geological sites in Australia, including the Bowen and Surat Basins in Queensland that might be suitable for injection and long-term secure storage of CO₂.

PILOT AND DEMONSTRATION PROJECTS

Queensland is leading Australia in the development of pilot and demonstration-scale projects for CCT. These include the following:

ZeroGen Smarter Cleaner Power Project

ZeroGen Pty Ltd, is undertaking a study to develop a commercial-scale demonstration plant that integrates gasification of coal with CCS to generate base-load electricity with associated deep cuts in GHG emissions. ZeroGen P/L proposes to develop an integrated gasification combined cycle (IGCC) power plant with a capacity of up to 100MW adjacent to the existing Stanwell power station near Rockhampton. The captured CO₂ would be transported by pipeline approximately 220km to the northern Denison Trough for injection and safe storage in deep saline reservoirs. A test drilling program to evaluate the viability of the area for safe long-term geosequestration of CO₂ commenced in June 2006.

The ZeroGen project would be a world-first demonstration scale project to integrate existing technologies from the petrochemical and oil and gas industries. Subject to successful completion of the geosequestration test work, feasibility study and project approval, it is expected that the project would commence the demonstration program in 2011 and run it for ten years.

The Queensland Government has announced that it will provide funding support for the project from its Future Growth Fund. Ownership of ZeroGen was recently transferred from Stanwell Corporation to the Queensland Government to maximise the opportunities to accelerate the development of this key CCT project.

Shell, a global leader in CO₂ sequestration technology, is providing technical advice for the ZeroGen project and has an option to acquire 10% equity in the project.

The World Coal Institute has rated the ZeroGen Project at the top of a list of international projects to be the first CCS demonstration project to be operating at commercial scale in the world (ECoal Newsletter, October 2006).

Oxy-Fuel Combustion & Sequestration Project

CS Energy is leading an Australian-Japanese consortium to develop a demonstration-scale oxy-fuel coal-fired power station and post combustion capture of CO₂. The plant would be retro-fitted to the existing 30MW Callide A power station at Biloela in Central Queensland. The captured CO₂ would be stored in deep saline reservoirs in the northern Denison Trough. The project could sequester up to 150,000 tonnes per annum (tpa) of CO₂ during the demonstration program.

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The Australian Government will provide \$50 million from the Low Emission Technology Development Fund (LETDF) to support the project, which would be a world-first oxy-fuel demonstration project. If successful, the technology could be retro-fitted to standard pulverised coal-fired boilers and applied to new coal-fired power plants to significantly reduce GHG and other air emissions.

There will also be scope for potential co-operation with a demonstration project in Germany.

Zero Carbon Power from Coal Seams Project

A consortium of Australian companies, government-owned corporations and research organisations led by Santos is investigating the development of a commercial-scale demonstration project to use coal bed methane to generate electricity and capture the CO₂ and inject it back into the coal seam for safe storage.

The Zero Carbon Power from Coal Seams demonstration project will be located at the Fairview coal bed methane field at Injune near Roma. The project is targeting deep coal seams. The gas-fired power station would have a capacity of 100MW, with at least 100,000tpa of CO₂ sequestered during the proposed demonstration period. The injected CO₂ could be used to enhance the coal bed methane recovery.

The Australian Government will provide \$75 million from the LETDF to support the project.

National Low Emissions Gasification Test Facility

A pilot scale coal gasification R&D facility is being developed through cLET. This facility aims to bridge the research gap between the small-scale gasification test facility located at the Queensland Centre for Advanced Technologies and commercial-scale coal gasification plants. The proposed national test facility would enable key gaps in gasification technologies to be addressed, at the same time supporting low-emission technology uptake.

COMMERCIALISATION

A power plant with carbon sequestration will have a higher cost of electricity than a power plant without carbon sequestration. The gap in the cost of electricity between plants with and without capture will ultimately need to be financed through some mechanism that places a price on CO₂ emissions.

In the absence of a policy that delivers economic incentives, technologies such as the IGCC, oxy-firing combustion, post-combustion capture and in-situ gasification are unlikely to form a significant part of Australia and Queensland's greenhouse mitigation strategy. In addition, project proponents and potential national and international industry partners are unlikely to commit to investing in a Queensland-based demonstration project without an appropriate policy environment conducive to emerging low-emission technologies.

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While there are currently no commercial drivers for pursuing the capture of GHG emissions from power generators, the Queensland Government has endorsed the release of a discussion paper by the National Emissions Trading Taskforce (NETT) to develop a national emissions trading scheme, and together with other States and Territories, has committed to introducing an emissions trading scheme if the Commonwealth refuses to commit to introducing a scheme. Such a scheme could provide a mechanism for the Australian economy to transition to a carbon constrained future by accelerating the adoption of existing and new low emission technologies.

It is recognised that investing in the next available technology such as super-critical pulverised fuel combustion will result in marginal thermal efficiency improvements, however it will not bring about the magnitude of greenhouse emissions reduction needed. The integration of CCS with coal-based power generation can potentially remove between 85-95% of CO₂ emitted at the source. It is important that the Commonwealth invests more in the development of these technologies to ensure that Australia is well positioned in the event of a carbon constrained future. Investment in these technologies is a strategic priority underpinned by the need to maintain the role of coal in both the Australian and Queensland energy mix, and in terms of meeting increasing energy demand whilst lowering emissions.

Given the long lead times for new power generation investment decisions and the capital-intensive nature of these types of projects, appropriate policy and regulatory frameworks will also need to be considered to enable low-emission technology investment decisions to be made to meet Australia's future additional capacity requirements.

Queensland has world-class mining, coal mining, petroleum and electricity generation industries. These industries employ the core skills required for geosequestration. The core skills required are engineers, geologists and geophysicists. The key challenge is to increase the quantity of people available with these skills. In particular, there is a need to review the incentives to encourage the uptake of tertiary studies in engineering, geology and geophysics.

REGULATORY & APPROVAL ISSUES

The Ministerial Council on Mineral and Petroleum Resources (MCMPR) established the Carbon Dioxide Geosequestration Regulatory Working Group in 2003 to progress the issue of regulation for possible future CCS projects.

The MCMPR endorsed the Regulatory Guiding Principles for Carbon Dioxide Capture and Storage on 25 November 2005. Queensland is committed to using these regulatory guiding principles in the development of CCS legislation.

Queensland CCS Legislation

The Minister for Mines and Energy is responsible for the administration of mining and petroleum legislation in Queensland. The environmental regulation of mining and petroleum activities is administered by the Queensland Environmental Protection Agency (EPA).

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The *Petroleum and Gas (Production and Safety) Regulation 2004* was amended in December 2005 to enable the evaluation of natural underground reservoirs for CO₂ storage.

The *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act) currently provides for the transportation of CO₂, a prescribed storage gas, by pipeline and storage by a 'petroleum lease holder', of CO₂ in underground reservoirs.

The intention to amend the P&G Act to allow for storage of CO₂ in natural underground reservoirs was to facilitate research and development and pilot projects. It is seen as an interim measure only. Work has commenced on development of a regulatory framework for CCS activities and it is anticipated this will be in place well before the commencement of any projects.

The EPA considers CCS to be a petroleum activity for which an Environmental Authority is required under the *Environmental Protection Act 1994* (EP Act). CCS test-work being undertaken as part of the ZeroGen project has been approved under the EP Act.