



Mr Keir Delaney
Secretary
Environment and Planning Committee
Legislative Council Parliament House
Spring Street
Melbourne VIC 3002

Dear Mr Delaney

Thank you for the invitation to provide a submission to the Environment and Planning Committee's inquiry (the inquiry) into *Unconventional Gas in Victoria*.

The Commonwealth Department of Industry and Science's (DOIS) vision is to enable growth and productivity for globally competitive industries. To help realise this vision, DOIS has four key objectives: supporting science and commercialisation, growing business investment and improving business capability, streamlining regulation and building a high performance organisation.

In relation to unconventional gas issues, DOIS draws on its science agencies' expertise to provide policy advice to the Australian Government. DOIS is also working with the state and territory governments through the Council of Australian Governments (COAG) Energy Council on gas market development.

Unconventional gas already plays a key role in meeting both domestic and growing global demand. Australia's potential unconventional gas resources are four to seven times larger than conventional reserves¹. Natural gas from coal seams now contributes more than 40 per cent of eastern Australian domestic gas supplies. Unconventional gas also contributes to a secure, sustainable and affordable supply whilst providing economic benefits for many regional communities. As the largest consumer of gas in Australia and the owner of unconventional gas reservoirs, Victoria stands to benefit from the responsible and safe development of this industry.

The potential environmental and social risks associated with the unconventional gas industry are not significantly greater than those of other extractive industries and DOIS considers that these can be managed through the existing jurisdictional statutory and policy frameworks.

DOIS would be pleased to provide further information on this submission as required.

Yours sincerely

John Ryan
Associate Secretary

¹ Eastern Australian Domestic Gas Market Study, p23

Overview

The terms of reference require the inquiry to focus on:

- the potential benefits of onshore unconventional gas as an energy source
- the potential risks, including risks to the environment, land productivity, agricultural industries and public health, and whether such risks can be managed
- the impact on the legal rights of property owners and existing land and water uses
- how this issue is managed in other Australian and international jurisdictions, and
- potential changes to our legislative and regulatory framework.

Australia has significant resources of natural gas from onshore unconventional gas reservoirs. The commercial production of unconventional gas in Queensland, specifically from coal seams, is well advanced, supplying approximately 80 per cent of the Queensland market² and is an important contributor to Queensland's GDP growth and employment³. Whilst progress has been made in other states and territories, most of the economic benefits from unconventional gas resources are yet to be realised.

Natural gas from unconventional reservoirs already plays a pivotal role in meeting both domestic and growing global demand. Australia's unconventional gas reserves are four to seven times larger than conventional reserves⁴ and offer significant economic opportunities. The production of natural gas from coal seams now contributes more than 40 per cent of eastern Australian domestic gas supplies.

The development of unconventional natural gas resources has rapidly transformed the North American economies. China has also recognised the benefits of unconventional gas and it is investing in its development. The commercialisation of unconventional gas in Australia will continue to provide a secure, sustainable and diversified energy supply while providing economic benefits for many regional communities and new revenues for government at all levels to invest in Australia's future.

Australia is projected to be the world's largest exporter of liquefied natural gas (LNG) by 2020. Around \$60 billion in capital has been invested in the three LNG projects in Queensland: Gladstone LNG, Queensland Curtis LNG and Australia Pacific LNG⁵. These projects will have a combined capacity of 25 million tonnes a year when fully operational⁶. This is larger than Australia's current total export capacity and more than double the existing eastern Australian gas market. These plants are also the first LNG export projects in the world to use coal seam gas (CSG) as their primary feedstock.

Like other extractive industries, the unconventional gas industry poses environmental and social risks that need to be carefully and proactively managed. Whilst acknowledging more needs to be done to secure community acceptance of the industry, DOIS considers that the potential environmental and social risks can be mitigated through existing jurisdictional statutory and policy frameworks.

DOIS also recognises the recent efforts made by the states and territory governments (the states) and industry stakeholders to ensure that the regulatory regimes are robust and enhance community confidence in the industry operations.

² Eastern Australian Domestic Gas Market Study, p27

³ The CSG and LNG industry contributed to 9.3% of Queensland's 2013-14 GDP.

⁴ Eastern Australian Domestic Gas Market Study, p23

⁵ Bureau of Resources and Energy Economics, Resources and Energy Major Projects (April 2013-May 2013)

⁶ Exports began in January 2015 and will continue to ramp up over 2015-16.

Australian Government Policy

It is Australian Government policy to support the responsible development of unconventional gas which is an industry that is contributing significantly to Australia's domestic gas supply and Australia's exports and has the potential to contribute substantially more.

The *Energy White Paper*⁷ enunciates the Australian Government's energy policy. It sets out the policy framework that will deliver competitively priced and reliable energy supplies by promoting competition in energy markets, increasing energy productivity and facilitating investment in energy and resources development. Securing long term domestic energy needs, maintaining international competitiveness and growing Australia's export base are fundamental to a strong economy.

On gas issues, the *Energy White Paper* was informed by DOIS's *Eastern Australian Domestic Gas Market Study*⁸, which was released last year and has been the basis for subsequent policy consultations with industry and community stakeholders. A component of this policy development process pointed to the need for specific reforms in relation to removing unnecessary impediments to responsible unconventional gas development. The recently released *Domestic Gas Strategy*⁹ is the next stage in this work.

The *Domestic Gas Strategy*, released in April 2015, articulates the Australian Government's role, science capabilities, and expectations of the states and industry. It identifies a role for governments to provide robust and transparent information so communities are confident in the evidence base being used in decision making. The Australian Government is assisting in this regard through the work of national science institutions such as the CSIRO, Geoscience Australia, and the Bureau of Meteorology.

The *Domestic Gas Strategy* also notes the Australian Government's commitment to continue to support farmers' rights through the *Agricultural Competitiveness White Paper* so that co-existence remains a fundamental aspect of gas development. The *Agricultural Competitiveness White Paper* articulates three co-existence principles for onshore gas development¹⁰. The *Domestic Gas Strategy* is also being used as the basis for engagement with the states to develop the Council of Australian Governments (COAG) Energy Council's gas supply strategy, which is part of the Australian Gas Market Development Plan.

The Commonwealth Department of the Environment also has specific portfolio responsibilities in relation to strengthening our understanding of the impacts of coal and Coal Seam Gas (CSG) developments on water resources and water-related assets. This includes support for the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC), and the funding of bioregional assessments, such as in the Gippsland Basin in south eastern Victoria.

In addition to the work being undertaken through the Commonwealth departments, CSIRO established the Gas Industry Social and Environmental Research Alliance (GISERA) in 2011 by partnering with Australia Pacific Liquefied Natural Gas (APLNG). QGC has since joined the Alliance. GISERA's partners have invested more than \$14 million over five years to research the environmental, social and economic impacts of the CSG industry. The membership is subject to

⁷ <http://ewp.industry.gov.au/sites/test.ewp.industry.gov.au/files/EnergyWhitePaper.pdf>

⁸ <http://industry.gov.au/Energy/EnergyMarkets/GasMarketDevelopment/Pages/EasternAustralianDomesticGasMarketStudy.aspx>

⁹ <http://www.industry.gov.au/domesticgasstrategy>

¹⁰ <https://agriculturalcompetitiveness.dpmc.gov.au>

governance arrangements that preclude the industry funders from having an influence on how the research is conducted. This ensures GISERA's research is fully independent. GISERA's main objective is to provide relevant scientific information to the Australian gas industry, government and community.

Roles of Government and the COAG Energy Council Agenda

The states have primary responsibility for regulating onshore minerals and petroleum exploration and production, including onshore gas. The Australian Government's environment regulator is involved in the decision making process where an activity is likely to have a significant impact on a matter of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act), including the protection of water resources from CSG and large coal mining development (the 'water trigger').

Further, the Australian Government has a strong leadership role to play in relation to the COAG Energy Council's resource development and energy agendas. In particular, DOIS considers that the collective ability of governments to increase community confidence in the extractive industries is of significant importance to the economy.

The COAG Energy Council is the principal mechanism by which the Australian Government engages with the states on energy regulatory issues. At the December 2014 meeting of the COAG Energy Council, all ministers agreed to take a leadership role in promoting community confidence and engagement in the extraction of energy resources and minerals, with a strong focus on:

- improving local community engagement, including through the promotion of leading practice approaches
- transparency of regulatory processes and data sharing
- facilitating the coexistence of resources and energy development and other land uses to encourage the growth of multi-industry regional communities, and
- improving public communications to address misinformation around the risks and impacts associated with resource development.

Work programs to support these commitments are currently being developed, which will build on previous regulatory reforms by the COAG Energy Council and its predecessors. This includes the following initiatives of relevance to onshore gas: the National Harmonised Regulatory Framework for Natural Gas from Coal Seams, the Multiple Land Use Framework, the Gas Market Vision and the Gas Market Development Plan. These are expanded upon below.

*National Harmonised Regulatory Framework for Natural Gas from Coal Seams*¹¹ (the Framework) - May 2013

The Framework delivers on a commitment by the states to put in place a suite of leading practice principles to guide regulators in the management of CSG. The Framework focuses on four key operation areas which cover the life cycle of CSG development: well integrity, water management and monitoring, hydraulic fracturing and chemical use. The Framework identifies 18 leading practices to mitigate the potential risks of CSG activities. This is intended to provide assurance for communities that any concerns in relation to protecting and managing underground and surface water resources are being addressed.

¹¹ <http://scer.govspace.gov.au/files/2013/06/National-Harmonised-Regulatory-Framework-for-Natural-Gas-from-Coal-Seams.pdf>

DOIS receives annual reports from the states on the Framework's implementation. These annual reports demonstrate the necessary regulation is largely already in place at the state level. The identified regulatory instruments in relation to CSG address:

- the impacts of CSG on ground water and aquifers
- the treatment and management of produced water from CSG production
- co-existence of CSG projects with existing activities such as agriculture
- the chemicals used in the hydraulic fracturing process and their potential impact
- environmental impact statements for each project, which assess the potential risk to the existing environment and mitigation measures for each of those risks if required.

Multiple Land Use Framework¹² (MLUF) - December 2013

The MLUF supports a balanced approach to multiple and sequential land access including negotiating access arrangements in good faith. It focuses on the overall principle that to maximise the social and economic benefit of land use for present and future generations, land should not be put to a single use purpose without considering other potential land uses.

The MLUF supports local and regional communities and governments to maximise land use in a flexible and environmentally sustainable manner over time. It enables communities, industries and governments to effectively meet land access challenges, expectations and opportunities, and advance Australia's sustainable development aspirations in agricultural production, resource development, biodiversity and heritage conservation.

The MLUF is designed to operate within established regulatory and policy frameworks relating to land ownership, usage and access. Each jurisdiction implements the MLUF in its own manner, to sit comfortably alongside existing processes and land rights.

DOIS notes that the states approaches to implementing access arrangements vary but they broadly cover the COAG Energy Council endorsed principles and include the following common features:

- the negotiation of an access agreement between the landholder and explorer determining the terms and conditions of access
- a requirement to notify the landholder prior to the commencement of activities
- compensation payable by the mining or exploration company for any loss arising from the activities, and
- mechanisms for arbitration and review.

Gas Market Vision and Gas Market Development Plan¹³ - December 2014

The Gas Market Vision for Australia's gas markets recognises the significant transformation occurring and the need for governments to guide gas market development and provide certainty for all stakeholders. Under the vision, the COAG Energy Council has updated its Gas Market Development Plan and is pursuing a number of actions including market reforms and cooperation on the development of a gas supply strategy, to help inform communities and facilitate the responsible development of gas resources.

¹² <https://scer.govspace.gov.au/workstreams/land-access/mluf/>

¹³ <https://scer.govspace.gov.au/workstreams/energy-market-reform/gas-market-development/>

Responses to Landholders and Community Concerns on Unconventional Gas

The Australian Government acknowledges that there are concerns in some sections of the community about unconventional gas development. Currently CSG is the main type of unconventional gas that has been developed in Australia.

DOIS notes that landholders and communities have benefited from CSG development. A review of the economic impacts of CSG in Queensland has shown that the industry provides a positive net benefit to Australia, Queensland and affected regions¹⁴. The Queensland experience shows it is possible to address landholder concerns and achieve co-existence through rigorous application of appropriate regulatory models.

DOIS also observes that community concerns may have been exacerbated by a lack of accessible information on the nature of the activities being undertaken and regulatory protections. DOIS also considers that international experiences of best practice can help inform Australia's regulatory frameworks.

In DOIS's view, the goal of achieving mutually beneficial outcomes has been hindered by the unnecessarily emotive response to hydraulic fracturing or "fracking". Hydraulic fracturing has been used in Australia by the oil and gas industry for over 40 years to enhance flows from both conventional and unconventional reservoirs with no observed or reportable adverse consequences¹⁵. The hydraulic fracturing technique is only used in approximately 20-40 per cent of CSG wells¹⁶ in Australia.

DOIS notes a number of inquiries and reviews have recently been completed, or are underway, to inform jurisdictional policy and regulatory regimes in relation to unconventional gas development and the use of hydraulic fracturing. Key recent reviews include:

- In February 2015, the Northern Territory (NT) Government released an independent inquiry into hydraulic fracturing.¹⁷ The Inquiry, conducted by Dr Allan Hawke AC, found that there is no justification for a hydraulic fracturing moratorium in the NT¹⁸. In response to this inquiry, the NT Government is undertaking a comprehensive review of the NT regulatory framework and it is in the process of introducing guiding principles for industry (including social and environmental requirements).
- In September 2014, the NSW Chief Scientist & Engineer published the *Final Report of the Independent Review of Coal Seam Gas Activities in NSW*¹⁹. The Independent Review of Coal Seam Gas Activities in NSW found that "the technical challenges and risks posed by the CSG industry can in general be managed through careful designation of areas appropriate for CSG extraction; high standards of engineering and professionalism in CSG companies; creation of a State-Whole-of-Environment Data Repository; comprehensive monitoring of CSG operations with ongoing scrutiny of collected data, a well-trained and certified workforce; and applying new technologies as they become available".

¹⁴ <http://www.industry.gov.au/industry/Office-of-the-Chief-Economist/Publications/Pages/Gas-market-report.aspx>

¹⁵ <http://www.statedevelopment.sa.gov.au/resources/the-facts/fracture-stimulation-in-south-australia;>
<http://www.dmp.wa.gov.au/15136.aspx>

¹⁶ <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/a-What-is-hydraulic-fracturing>

¹⁷ http://www.nt.gov.au/d/Minerals_Energy/onshoregas/

¹⁸ <http://www.hydraulicfracturinginquiry.nt.gov.au/docs/report-inquiry-into-hydraulic-fracturing-nt.pdf>

¹⁹ http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0005/56912/140930-CSG-Final-Report.pdf

The NSW Government has accepted all of the NSW Chief Scientist & Engineer's recommendations and is progressing implementation through its *NSW Gas Plan*²⁰. One of the five priorities²¹ of this plan is to ensure that landholders and communities share the benefits of gas development; to this end landholders will receive independent advice on benchmark compensation rates and a community fund and legislation will be introduced. The Independent Pricing and Regulatory Tribunal (IPART) has commenced a review on benchmark compensation rates.

In line with one of *NSW Gas Plan's* key actions, the NSW government commissioned an independent review of the land access arbitration process. This review proposed 31 recommendations to improve the land access framework. The NSW government also created the role of the NSW Land and Water Commissioner which is concerned with raising and responding to the voice of landholders.

- In July 2011 Dr Tina Hunter conducted a review of the Regulation of Shale, Coal Seam and Tight Gas Activities in Western Australia (WA). The report commended WA on its capacity to regulate this emerging industry and the Government responded by introducing a suite of reforms which have strengthened the WA regulatory framework. More recently, the WA Legislative Council commenced an inquiry into the implications for WA of hydraulic fracturing for unconventional gas²².
- To support the commercialisation of unconventional gas in South Australia (SA), the then Department for Manufacturing, Innovation, Trade, Resources and Energy convened a roundtable in 2010, focused on social and environmental outcomes. The roundtable has continued this focus, publishing the *Roadmap for Unconventional Gas Projects in SA* in 2012. The Parliament of SA Natural Resources Committee is currently undertaking an inquiry into potential risks and impacts in the use of hydraulic fracture simulation to produce gas in the south-east of SA²³.

Health and Environmental Concerns

The NSW Chief Scientist's report found that while there are some reports of health effects, the studies have been unable to find "any clear link between CSG and health impacts. Many of the studies have methodological problems including sample size and statistical power issues, and fundamental confounding and bias concerns. Further research is required on both mental and physical health impacts"²⁴.

One of the more detailed domestic assessments of health symptoms is a report produced by Queensland Department of Health. This review concluded that the symptoms reported in the Tara region might be attributable to transient exposure to airborne contaminants arising from CSG activity but there was "no clear link to the local CSG industry"²⁵. Noise and vibration complaints from CSG were found to be a source of annoyance, although these levels did not exceed environmental limits.

²⁰ <http://www.resourcesandenergy.nsw.gov.au/energy-supply-industry/legislation-and-policy/nsw-gas-plan>

²¹ Other priorities are: better science and information to deliver world's practice regulation, pause, reset and recommence gas exploration and securing NSW gas supply needs

²² <http://www.parliament.wa.gov.au>

²³ <https://www.parliament.sa.gov.au/Committees/Pages/Committees.aspx?CTId=5&CIId=175>

²⁴ http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0005/56912/140930-CSG-Final-Report.pdf

²⁵ <https://www.health.qld.gov.au/publications/csg/documents/report.pdf>

The Department of the Environment is leading research in respect to the National Assessment of Chemicals Associated with Coal Seam Gas Extraction in Australia. This work is expected to be completed in 2015.

CSIRO's report on *Field Measures of Fugitive Emissions from equipment and well casings in Australian Coal Seam Gas Production Facilities*²⁶ measured emissions in Queensland and NSW and found that "emissions rate were very low (in most cases less than 3 grams of methane per minute) and 20 times lower than the emissions reported in a study of US unconventional gas sites".

Water is central to the unconventional gas debate. On this issue, Professor O'Kane has said that "drinking water would not be contaminated if the right technology was used". The NSW review of Coal Seam Gas Activities also noted that Australia has developed significant water management capabilities through research carried out by national science institutions, such as CSIRO and the Bureau of Meteorology²⁷.

The UK peer reviewed Royal Society and the Royal Academy of Engineering's report found "that the health and safety and environmental risks associated with hydraulic fracturing as a means to extract shale gas can be managed in the UK as long as operational best practices are implemented and enforced through regulation. Hydraulic fracturing is an established technology that has been used for many decades"²⁸.

The Australian Academy of Technological Sciences and Engineering (ATSE) will be holding a conference in September 2015 covering both technical and social issues related to unconventional gas development. Conferences such as this contribute to the ongoing, science based, discussion on the future of Australia's unconventional gas industry.

In closing, DOIS is pleased to see that the inquiry's terms of reference target all the critical issues associated with unconventional gas development. DOIS encourages the taskforce to consider the advantages unconventional gas provides in terms of flexible, competitive and diversified gas markets that respond to gas demand changes, maintain energy affordability and unlock their economic potential.

Given the exploration and development of onshore gas in Victoria is in the early stages, the Victorian Government has an opportunity to develop unconventional gas resources responsibly by introducing leading regulatory and community engagement practices and developing policy based on the latest scientific research and learnings of other leading jurisdictions.

²⁶ <http://www.environment.gov.au/system/files/resources/57e4a9fd-56ea-428b-b995-f27c25822643/files/csg-fugitive-emissions-2014.pdf>

²⁷ <http://www.chiefscientist.nsw.gov.au/coal-seam-gas-review>

²⁸ <http://www.raeng.org.uk/publications/reports/shale-gas-extraction-in-the-uk>