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Committee Secretary
Senate Standing Committees on Environment and Communications
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CANBERRA ACT 2600

Senate Inquiry: Landholders' Right to Refuse (Gas and Coal) Bill 2015

The Australian Petroleum Production & Exploration Association (APPEA) is the peak national body that represents companies engaged in petroleum exploration and production operations in Australia.

The *Landholder's Right to Refuse (Gas and Coal) Bill 2015* (the Bill) was introduced into the Senate on 4 March 2015. The Bill disappointingly ignores existing legislation, approval processes and long established jurisdictional rights. APPEA is concerned that ongoing attempts to politicise important issues, such as landholder rights and environmental regulation, risks undermining the efforts being made by the vast majority of stakeholders to find meaningful and workable outcomes for both the agriculture and resources sectors.

The Bill largely duplicates the *Landholder's Right to Refuse (Gas and Coal) Bill 2013,* which was overwhelmingly defeated in the Senate in 2014. APPEA can see no reason for this bill to be recycled in 2015. There is no systemic issue that requires the Australian Government to take regulatory action and override State laws. There is ample evidence showing that farming and gas extraction can and does co-exist through responsible cooperation – and this is already demonstrated by the vast majority of oil and gas operations across the country. Further, science and operational evidence shows that responsible hydraulic fracturing presents no greater risk to the environment than other industrial processes.

Access to resources

APPEA strongly supports policies that foster coexistence. The approach of working together to establish a framework that supports ongoing development in both the agriculture and resources sectors, and of education and mutual understanding of the needs of all parties, has proven successful and will continue to be the most effective way to manage land access in Australia.

Experience shows that petroleum companies have been able to successfully negotiate thousands of land access agreements and compensation arrangements with farmers. Over 4,700 landholder access agreements have been successfully negotiated in Queensland alone. Demonstrably therefore, land access can be and is being successfully managed.

The Australian Government's Multiple Land Use Framework (MLUF) is an established position between the Australian and State / Territory governments on co-existence and is supported by APPEA. The MLUF states that:

> "*rights of all land users and the potential of all regulated land uses should be acknowledged and respected, while ensuring that regulated land is not restricted to a sole use without considering the implications or consequences for other potential land uses, and the broader benefits to all Australians.*"[1]

Australia is also fortunate to have a well-established and orderly system of access for all resources and we should be cautious in considering a Bill that would radically alter a system that has served us well since federation.

In Australia, the Crown owns the mineral resources and the State is responsible for allocating permits to explore and licences to produce. Before petroleum companies seek access to properties to explore for Crown resources in onshore areas, they carry out extensive consultation with landholders and farmers. Companies bid for development rights and when producing, pay royalties and other taxes to governments which are used to improve the wealth of the local communities, the State and the nation.

There has been a growing debate in Australia about the question of third party access to private land for public purposes. Most people identify public purposes as roads, power lines, water pipelines, and telecommunications cables, but resource extraction is also a public purpose because, as noted, resources are owned by the Crown.

Just as power lines, roads, and water pipelines cannot have a gap in the middle, gas extraction cannot take place in a patchwork. Voluntary negotiation is clearly the best way to obtain third party access to land for all necessary economic infrastructure. However, there needs to be a means of independent arbitration when the best of endeavors fail.

Although the Bill attempts to distinguish between transferring ownership of the resource, and transferring the right to refuse access to the resource, in reality the two are inextricably linked. There is no benefit to the community if the State maintains ownership of the resource (for the benefit of all) but is unable to ensure its development. Fundamentally, this is an issue of first principles. When the State owns the resource, the right to ensure its development rests with the State.

We support the approach of working with all stakeholders in each jurisdiction to develop nuanced land access regimes that balance the interests of all stakeholders including individual landholders, resource proponents, and the community as a whole. This is a proven approach and will continue to be the most effective way to manage these issues rather than the blunt tool offered the Bill.

[1] www.scer.gov.au/workstreams/land-access/mluf.

Ban on hydraulic fracturing

The Bill makes it an offence to conduct hydraulic fracturing for unconventional gas, including coal seam gas, shale gas and tight gas. This ban is not based on science or evidence and therefore should be rejected.

Impacts of hydraulic fracturing in relation to health, cumulative impacts, seismicity, fugitive emissions, social impacts, groundwater contamination and best practice regulation for onshore natural gas have been considered extensively in the existing literature and other government-initiated and inquiries by respected institutions within Australia and overseas.

The Australian Government, every state and the Northern Territory have undertaken reviews of unconventional gas, hydraulic fracturing or both. Every scientific and government review in Australia has so far reached the same conclusion – with a robust regulatory regime in place, the environmental risks associated with onshore gas operations, including hydraulic fracturing, can be managed effectively.

As an example, the *Report of the Inquiry into Hydraulic Fracturing in the Northern Territory* (or Hawke Report), was released in late February.[2] It found (on page x) that: *"Consistent with other Australian and international reviews, the environmental risks associated with hydraulic fracturing can be managed effectively subject to the creation of a robust regulatory regime."* Hydraulic fracturing can be used to develop the Territory's shale gas resources, estimated to be one of the largest in the world.

As the Hawke Report stated (on page x): "*The substantive weight of agreed expert opinion leads the Inquiry to find that there is no justification whatsoever for the imposition of a moratorium of hydraulic fracturing in the Northern Territory."*

The 2013 Australian Council of Learned Academies (ACOLA) review[3] found that shale gas was no different to any other development of the landscape. Fracing is a well-established, tightly regulated technology that has been used safely for more than 65 years in about 2.5 million wells worldwide and more than 1 million in the US alone[4].

The 2013 New South Wales Independent Review into Coal Seam Gas by the NSW Chief Scientist and Engineer found that the technical challenges and risks posed by the industry can in general be safely managed.[5]

The Hawke, ACOLA and O'Kane reports and reports from other states are robust documents. They have reached their conclusions using science, evidence from oil and gas operations, and risk mitigation assessments (refer attachment 3). However, the findings of these reviews appear to have been overlooked or ignored by the authors of the Bill.

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[2] Hawke, *(2014) Report of the Inquiry into Hydraulic Fracturing in the NT,* www.hydraulicfracturinginquiry.nt.gov.au.
[3] Cook, P, Beck, V, Brereton, D, Clark, R, Fisher, B, Kentish, S, Toomey, J and Williams, J (2013). *'Engineering Energy: Unconventional Gas Production.'* Australian Council of Learned Academies (ACOLA), www.acola.org.au.
[4] King, George E (2012), *Hydraulic fracturing 101*, Society of Petroleum Engineers, Paper 152596.
[5] O'Kane (2013) New South Wales Independent Review into Coal Seam Gas, http://www.chiefscientist.nsw.gov.au/coal-seam-gas-review/final-report-september-2014

Reliable and competitively priced energy is crucial to Australian industry, communities and households. It underpins Australia's economy and industrial structure. The onshore petroleum industry will continue to be active in communities for the benefit of future generations. There is ample evidence that agriculture and the natural gas industry can and do co-exist.

The *Landholder's Right to Refuse (Gas and Coal) Bill 2015* is unnecessary and contrary to good public policy. APPEA urges the Committee to consider the risks of introducing legislation that ignores established science and represents a thinly veiled attempt to hamper the growth of an industry that generates significant benefits to all Australians.

Further information is attached for your consideration. The contact in APPEA in relation to this matter is Mr Keld Knudsen, Policy Director – Access, email kknudsen@appea.com.au.

Yours sincerely

Paul Fennelly
Acting Chief Executive

Enc.

Attachment 1

Additional Comment on Land Access

Duplication of existing land access provisions and regulation

Given the existing State-based legislation dealing with access to land by resource companies, further regulation of this issue at a national level is unnecessary. For example, development of the onshore gas industry in Queensland has been supported by extensive regulations that protect the rights of all parties to an agreement, including landholders.

Queensland's *Petroleum and Gas (Production and Safety) Act 2004 (Qld)* (P&G Act) requires that resource companies enter into access agreements or 'Conduct and Compensation Agreements' (CCAs) with owners and occupiers of private land, prior to carrying out 'advanced activities' (e.g. construction of wells and other infrastructure) on their land (subject to a range of exemptions).

The P&G Act sets out a framework for petroleum authority holders to gain access to land and gives landholders the ability to negotiate on terms and conditions of the access to their land, as well as the level of compensation to be paid by a petroleum authority holder for this access. While the CCA is being negotiated, landholders may choose to seek independent legal advice. Resource companies are required to meet the landholders' reasonable and necessary legal, valuation and accounting costs associated with the negotiation of a CCA.

In the event that agreement on a CCA cannot be reached, the parties to the negotiations may attend a conference before Queensland's Department of Natural Resources and Mines or engage in an Alternative Dispute Resolution process, which may include mediation. If agreement is still unable to be reached, either party may apply to the Land Court to make a decision.

Provisions in legislation (such as the P&G Act) make additional Commonwealth legislation unnecessary. **Attachment 2** outlines a comparison of land access provisions across six states. The table illustrates the existing similarities in the protection of negotiation and compensation rights for landholders.

Lack of balance – landholder vs resource company rights

Under the Bill, it is proposed that individual landholders could effectively 'veto' access to land by resource companies (by withholding consent to access). Although the State would retain ownership of mineral resources – and resource companies would still be granted rights by the State to develop those resources – individuals who fall within a very broadly defined category of persons with 'ownership interests' (Part 1 Section 5) could exercise a significant degree of control over how, when and where those resources are developed and exploited.

Further, unlike the existing land access regime under the P&G Act, the Bill does not provide a legislative pathway through which resource companies can further negotiate to secure access to land, where consent is withheld by those with ownership interests.

Although the Bill attempts to distinguish between transferring ownership of the resource, and transferring the right to refuse access to the resource, in reality the two are inextricably linked. There is no benefit to the community if the State maintains ownership of the resource (for the benefit of all) but is unable to ensure its development. Fundamentally, this is an issue of first principles. When the State owns the resource, the right to ensure its development rests with the State.

Financial impacts

The Bill introduces the potential for an individual landholder to prevent a resource company from exercising the rights they have been granted to explore for, and develop resources. This will have significant financial implications for the State and Federal governments, resource companies, landholders and the wider community.

Consequences for landholders and the community

For a resource company, the inability to access certain areas to carry out activities due to blocked access are likely to have a number of run-on consequences for the broader community (including other landholders with proposed resource development on their properties). For example, where access to certain areas is blocked, resource companies may choose not to pursue development in surrounding areas. Consequently, other landholders may not receive the benefit of compensation that would otherwise have been paid in respect of the resource activities proposed to be carried out on their land.

Consequences for the State and Federal Government

Reduction in resource development would result in a reduction in royalty payments made to the State. In Queensland, total resource royalties paid to the State are valued at $3.8 billion in 2015/16 rising to $4.5 billion in 2017/18[6].

In situations where resource companies elect to proceed with development in areas surrounding those where access has been denied, production capacity of that resource may decrease as a result of lack of access to key reserves. The value of that resource to the State would also be significantly reduced, which in turn would mean fewer benefits to the community.

In addition to the reduction in royalties paid to the State, restricting access to resource development will have a negative impact on gas supply. It is imperative for Australia's energy security that gas supply meets demand. The Australian Government's Energy White Paper 2015 identified that issues related to gas availability and pricing can be responded to by increasing supply[7]. Further restrictions on land access could sterilise valuable resources and reduce the availability of this resource in the market.

[6] Table 3.1 General Government Revenue in Budget Strategy and Outlook Budget Paper No 2 2014/15
[7] Department of Industry and Science. *Energy White Paper – At a Glance* April 2015 (Page 2)

Cost of compulsory acquisition of the rights to resources

Resource companies in Australia make significant investment decisions on the development of resources projects based on legislation in place at the time an investment decision is made. Further, these resources projects are carried out in reliance on, and in accordance with, rights and authorities granted by various State and Commonwealth departments and regulatory bodies; for example, petroleum authorities granted by the Department of Natural Resources of Mines on behalf of the State of Queensland authorising the carrying out of petroleum activities to exploit State-owned petroleum resources. It is important to note that, although a parcel of land may be owned by or leased to an individual, the State retains the rights to any petroleum and minerals in the land and therefore the ability to grant licences to third parties to develop those resources.

The Bill diminishes the rights validly granted by the State to resource companies to appropriately develop resources by giving private landholders the ability to prevent access to their land. The Bill also does not provide resource companies with statutory recourse to obtain the required access rights, where a landholder prevents access (as can be seen in the Queensland-based petroleum legislation, for example).

Therefore, the Bill could be perceived as an effective acquisition of the State-based rights granted to resource companies by the Commonwealth. As a result of the inability to appropriately exercise the rights granted to them and fully develop sanctioned resources projects, the affected companies would likely incur significant financial losses.

Those companies may then look to the Commonwealth to be compensated for those losses. Further, if enacted the Bill could lead to decreased investment activity in the resources sector due to the removal of the certainty previously available to companies in terms of the ability to exercise their rights to develop resources. This would most likely have further implications for the broader Australian economy.

<u>Precedence for other industries</u>

The Bill raises significant questions for future use of land for various purposes - including other activities undertaken by the private sector which may have public benefits. For example, if similar legislation was passed with respect to the development of linear infrastructure (roads, rail, power lines, pipelines and irrigation infrastructure), a single landholder could effectively prevent projects and development that are necessary for the nation. The Bill fails to recognise the consequences which will arise in a number of areas by allowing an individual to prevent development which would benefit the whole community. It would be difficult to argue why some industries which create a public benefit should be singled out by government, and others which also require access to land to create a public benefit should not be.

Loss of agricultural land and coexistence of rural land use and resource development

The Bill potentially creates a perverse situation where large areas of land are acquired (either by Government or the resource developer) for projects to proceed. As such, the Bill could unintentionally create a market in which agricultural properties are bought as a means of obtaining access to resources and are effectively removed from productive agricultural activity.

Furthermore, the Bill would create an environment where companies may be encouraged to purchase properties from the outset, in order to increase their chances of successful access. These purchases would remove that land from agricultural production (if resource companies did not continue the agricultural use of that land). In addition to the loss of agricultural land, this scenario could also result in the displacement of communities as primary producers move off the land. This could lead to a reduction in regional populations and have a negative impact on state development.

In Queensland, significant effort has been made by government, industry and landholders to create coexistence measures that allow resource development and farming to occur simultaneously. Landholders are able to continue farming and living on their land, and are compensated in a manner that may assist them to do so (eg. by providing a source of non-agricultural income during drought periods which may provide working capital for their properties).

We recommend that government policy continues to favour opportunities for coexistence, rather than encouraging the buy-out of agricultural land.

Attachment 2

Comparison of state protections for access to private land for exploration

Adapted from Productivity Commission Inquiry Report Mineral and Energy Resource Exploration No 65 27 September 2013.[8]

Protection	NSW	VIC	QLD	WA	SA	TAS
Land access arrangement agreed to with land holder before the explorer can access land	**Yes**	**Yes**	**Yes**	**Yes**	**No~**	**No#**
Compensation available to land holder for loss or damage arising from exploration activity	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Compensation for legal costs incurred by land holders in negotiating access agreements	**Yes**	**No^**	**Yes**	**Yes**	**Yes**	**No^**
Compensation for other costs associated with negotiating access agreements	**No**	**No^**	**Yes***	**Yes****	**Yes*****	**No^**
Exploration prohibited within specific distances of buildings and other improvements	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Land holder veto over exploration on agricultural land	**No**	**No^^**	**No**	**Yes^^^**	**Yes+**	**No**

Note: The Northern Territory is not included as most private land is restricted to cities and towns. Outside of the urban areas, around half of all land is Aboriginal land and the other half is Crown land under pastoral lease.
~ Authorisation to enter private land can be provided through the written consent of the land holder or by serving the land holder a statutory form (Notice of entry on land) under the Mining Act 1971 (SA).
No formal agreement is required between the land holder and the explorer before exploration commences. However, where exploration involves ground disturbance, officers from the Department of Infrastructure, Energy and Resources are generally involved in the oversight of exploration activities to ensure that these activities adhere to the work plan.
^ Although there is no specific reference to compensation for legal, or other, costs incurred by land holders in negotiations with explorers, the legislation does not 'rule out' the provision of such compensation.
*The Queensland Land Access Code provides for the compensation of reasonable accounting and land valuation costs incurred by the landholder.
**The Western Australian Mining Act 1978 provides for reasonable legal or other costs of negotiation for private land under cultivation.
***The South Australian guidelines make specific reference to compensation for legal costs and the South Australian Mining Act 1971 provides for the reasonable costs incurred by the land holder in connection with negotiations.
^^ The Minister can have agricultural land excised from the licence where the economic benefit of continuing to use that land for agricultural purposes is greater than the work proposed in the licence.
^^^ This applies to mineral tenements, but not to oil and gas tenements.
+ Exploration on cultivated land requires land holder consent. Where agreement cannot be reached, the explorer has the option of seeking a determination through the courts.

8 Productivity Commission (2013), *Mineral and Energy Resource Exploration* http://www.pc.gov.au/inquiries/completed/resource-exploration

Attachment 3

Additional comments on Hydraulic Fracturing

Hydraulic Fracturing operations

The Bill offers no scientific basis for seeking a ban on hydraulic fracturing.

Hydraulic fracturing is a process that has been used around the world – including Queensland – for more than 50 years in more than a million wells, without any significant environmental or health impact.

There are numerous recent reports covering the practice of hydraulic fracturing from both Australia and overseas. The safety of hydraulic fracturing operations is assured by the quality of the work and of the well casing and completion, and like many industries, the techniques used to manage the safe handling of chemicals.

Report of the Independent Inquiry into Hydraulic Fracturing In the Northern Territory (November 2014)

Although this report focussed largely on gas production from shale reservoirs, it made two recommendations that generically dealt with hydraulic fracturing operations. These were:

- *"This Inquiry's major recommendation, consistent with other Australian and International reviews, is that the environmental risks associated with hydraulic fracturing can be managed effectively subject to the creation of a robust regulatory regime."*[9]
- *"The substantive weight of agreed expert opinion leads the Inquiry to find that there is no justification whatsoever for the imposition of a moratorium of hydraulic fracturing in the NT".*[10]

This report also notes that reports in New South Wales and Victoria relating to the development of natural gas and the application of hydraulic fracturing techniques reached very similar conclusions.

Final Report of the Independent Review of Coal Seam Gas Activities in NSW (September 2014)

The NSW Chief Scientist and Engineer made several findings in relation to the technology applied to the development of natural gas. It similarly found that:

- *"The Review studied the risks associated with the CSG industry in depth and concludes that – provided drilling is allowed only in areas where the geology and hydrogeology can be characterised adequately, and provided that appropriate engineering and scientific solutions are in place to manage the storage, transport, reuse or disposal of produced water and salts – the risks associated with CSG exploration and production can be managed."*[11]

[9] Letter transmitting the Report of the Independent Inquiry into Hydraulic Fracturing in the Northern Territory.
[10] Ibid
[11] NSW Chief Scientist and Engineer "Final Report – Independent Review of Coal Seam Gas Activities in NSW" Page 10.

Extract from Final Report of the Independent Review of Coal Seam Gas Activities in NSW (pages 9 – 11) [12].

CSG extraction and related technologies are mature and Australia is well equipped to manage their application

- *Unconventional gas production is now a major industry especially in North America where, on balance, it is generally highly valued because of the energy security it provides. On the back of this, there is now considerable investment and experience in the development and refinement of technologies to maximise production while minimising adverse impacts. In Australia related technologies have now been extensively deployed successfully for some years (including at Camden in NSW). The independent petroleum engineering, geological and geophysical experts advising the Review consider that such technologies (including fracture stimulation and horizontal drilling technologies), with appropriate safeguards, are suitable for use in many parts of the sedimentary basins in NSW, noting that drilling in any new location is, to an extent, a learning-by-doing activity as there will always be local geological attributes specific to an individual resource development. These activities can and should be guided by companies investing in geophysics and other characterisation techniques to inform the best drilling and extraction approaches to take.*

- *There is a long history of working in the subsurface in Australia for the extraction of resources such as minerals, coal, gas, oil, water and, to a lesser extent, geothermal heat. This has led to a good understanding by Australian governments of what is needed to regulate subsurface activities for the purposes of safety, health, minimising environmental impact and protecting high-priority resources such as water. As a consequence Australia has built up high-quality expertise and knowledge of subsurface activities. In the public sector it has government agencies such as Geoscience Australia and State resources departments; research-intensive Earth Science and Mining Engineering departments in universities; publicly funded research agencies such as CSIRO and ANSTO; various collaborative research centres; and relevant national collaborative research infrastructure. In the private sector Australian resources companies have reputations as leading in the applications of world best practice. With Australia heavily invested in resources development, most of the global resources industry service companies have a major presence here. Australia also has a well-educated workforce.*

- *Australia has a strong track record in water technology innovation and management. Water is a key issue for Australia so we have developed significant capabilities in water management. This includes water treatment, operations and infrastructure for water and fluids management, management of by-products such as salts, waste disposal, 10 remediation and rehabilitation. These activities are backed by considerable research and science expertise especially in government agencies, universities, CSIRO, the Bureau of Meteorology and various Cooperative Research Centres. This means that*

[12] New South Wales Chief Scientist & Engineer. *Final Report of the Independent Review of Coal Seam Gas Activities in NSW*. September 2014. (Pages 9-11) http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0005/56912/140930-CSG-Final-Report.pdf

Australia is in a good position to rise to the challenge of managing the various water issues associated with CSG production.

There are things we need to know more about

- *While Australia has a long history of working in the subsurface, there is still considerable uncertainty associated with the development of any new resource province. Currently CSG activities tend to be considered mainly at a site-specific level. A better understanding of the industry impacts at scale and over time is needed. To enable better planning decisions and better management of cumulative impacts, it will be necessary that industry collects and provides to Government significantly more data than at present including data from a wider range of sources. With a diverse range of resources, including coal, CSG and underground water, hosted in our sedimentary basins, there is a need to understand better how the different resources and their development regimes interact. More detailed knowledge of the structure and composition (especially regarding hydrogeology) of the sedimentary basins is needed to enhance productivity for the CSG industry through more precise resource characterisation and better subsurface and surface environmental management.*

- *There is a need to understand better the nature of risk of pollution or other potential short- or long-term environmental damage from CSG and related operations, and the capacity and cost of mitigation and/or remediation and whether there are adequate financial mechanisms in place to deal with these issues. This requires an investigation of insurance and environmental risk coverage, security deposits, and the possibility of establishing an environmental rehabilitation fund. Doing this is essential to ensure that the costs and impacts from this industry are not a burden for the community.*

- *Legacy issues, including better understanding of inappropriately abandoned wells, need attention.*

Risks can be managed

- *Management of potential risks associated with CSG, as with other industries, requires effective controls; high levels of industry professionalism; systems to predict, assess, monitor and act on risks at appropriate threshold conditions; legislation; regulation; research; and commitment to rapid remediation, continuous improvement and specialist training. The Review studied the risks associated with the CSG industry in depth and concludes that – provided drilling is allowed only in areas where the geology and hydrogeology can be characterised adequately, and provided that appropriate engineering and scientific solutions are in place to manage the storage, transport, reuse or disposal of produced water and salts – the risks associated with CSG exploration and production can be managed. That said, current risk management needs improvement to reach best practice.*

- *In particularly sensitive areas, such as in and near drinking water catchments, risk management needs to be of a high order with particularly stringent requirements on companies operating there in terms of management, data provision, insurance cover, and incident-response times.*

New knowledge and technologies are becoming available but need to be harnessed to make CSG extraction safer and more productive

- *Rapid advances in knowledge and technologies in a wide range of fields (especially in information and communication technologies; numerical modelling; geology, geophysics and petroleum engineering; and new materials) are occurring and can be harnessed to improve CSG production efficiency and to minimise adverse impacts.*

  Some of the most notable recent developments include:
  - *Data technologies especially in the area of big data, data analytics and data fusion. These technologies use very large amounts of data from diverse sources to enable better understanding of complex earth systems with an improved grasp of the uncertainties in modelling for purposes such as characterising CSG resources and predicting groundwater impacts. For these powerful technologies to be effective, significantly more data from a wider range of sources need to be collected*
  - *Visualisation technologies that allow for detailed inspection of data. These include using 3D and movie techniques which are often particularly useful in allowing experts from a wide range of disciplines to inspect and analyse large amounts of complex data easily and quickly. They are also used for training and testing responses to hazardous situations*
  - *Sensor and monitoring technologies – both in-line and remote monitoring technologies – are becoming very cheap and are increasingly integrated with onboard signal processing and communications technologies. This means that the very large amounts of surveillance data they produce can be pre-processed locally then rapidly sent to a central data repository*
  - *artificial intelligence techniques that allow for intelligent, real-time interrogation of monitoring data with alerts when anomalies are detected*
  - *developments in petroleum engineering that allow for better matching of combinations of appropriate technologies for particular geological situations*
  - *developments in new materials.*

- *In order to speed the beneficial uptake of new technology developments for an industry as contentious as CSG, the Review concludes that Government needs access to such expertise on a permanent basis, such as by creation of a standing committee comprising top experts from relevant disciplines, to advise it when to act on new technology developments as they become available.*

There are no guarantees

- *All industries have risks and, like any other, it is inevitable that the CSG industry will have some unintended consequences, including as the result of accidents, human error, and natural disasters. Industry, Government and the community need to work together to plan adequately to mitigate such risks, and be prepared to respond to problems if they occur.*