REVIEW OF PETROLEUM RETENTION LEASE ARRANGEMENTS IN AUSTRALIAN JURISDICTIONS

Report for Department of Industry, Innovation and Science

Noetic Group

July 2018
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EXECUTIVE SUMMARY

The COAG Energy Council Upstream Petroleum Resources Working Group (UPR) contracted Noetic Solutions Pty Limited (Noetic) to conduct a review of the Petroleum Licencing Regulations across Australian jurisdictions. The intent of the review is to understand the effectiveness of Retention Lease regimes in driving the earliest commercial development of discovered gas resources as well as supporting exploration activity and expenditure. To undertake the review, Noetic engaged extensively with each jurisdiction and a wide range of industry representatives and other stakeholders.

The review sought to develop an understanding of each jurisdiction’s regime and to undertake a stocktake of titles (especially titles with multiple renewals). The latter task was somewhat hampered by short timeframes and limited access to the requisite information. Analysis of each regime was undertaken to understand policy approaches and settings. This analysis was complemented by three overseas cases studies which are used as points of comparison. These case studies included onshore and offshore jurisdictions in the United States of America and Norway. Based on the analysis of Australian and overseas regimes, together with an analysis of contemporary gas infrastructure and resource development projects, judgements were made on the overall effectiveness of Australia’s regimes. The final part of the review looked to identify reform options that could enhance and strengthen Australian regimes.

The review found that all regimes in Australia have the same fundamental policy objective, that is, to provide security of tenure over a discovered resource that is not currently commercial viable but may become so within 15 years. It was found that the differences between regimes was around the regulatory decision-making approaches applied by jurisdictions and specifically the different approaches to the use of incentives and obligations to develop discovered resources. Overall, these approaches are effective in supporting exploration and development, and provide sufficient flexibility to address the challenges of commercialisation presented by individual fields or resources.

The review notes that Retention Leases play an essential role in the development of Australia’s petroleum resources by providing security of tenure to discovered resources. For Australia, this is particularly important as limited infrastructure and infrastructure capacity (such as pipelines and conditioning plants) means that for a discovery to be commercially viable, it is likely that some resources will not be commercial until foundation infrastructure is in place. This is not the case in the overseas jurisdictions reviewed, where significant long-standing production, processing and pipeline infrastructure means that development of discoveries is readily expedited through brownfields expansions at a much lower capital cost.

On the data available to Noetic, approximately 89 percent of all Retention Leases have been renewed fewer than three times, with an average time held under retention of 10 years\(^1\). It is the review’s belief that given the scale and long-term nature of investment in a development, a positive investment decision will hinge on access to the necessary infrastructure and sufficient feedstock gas to maintain operations and deliver the return of and return on capital required by investors. Consequently, there appears to be no evidence that gas is being withheld (or warehoused) from development and production.

Notwithstanding this finding, the review does believe there are opportunities for reform of Australia’s regimes to enhance clarity, strengthen frameworks and improve the process of bringing discovered petroleum resources to production. Five broad reform options are presented for consideration by policy makers. The options presented are not comprehensive, providing only an overview, general explanation, advantages and disadvantages. After review by the COAG Energy Council Upstream Petroleum Resources Working Group, the options would require further development by agencies on cost/benefit analysis, consultation and implementation. Once fully developed, these options can be used by legislators to further strengthen and support Australia’s petroleum industry and the benefits it provides to the Australian community.

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\(^1\) Excludes 63 South Australian PRLs as insufficient information was available on renewals.
BACKGROUND

INTRODUCTION

The COAG Energy Council Upstream Petroleum Resources Working Group (UPR) contracted Noetic Solutions Pty Limited (Noetic) to conduct a review of the PetroleumLicencing Regimes across Australian jurisdictions. Noetic examined the effectiveness and management of policies nationwide relating to Retention Leases through a four-phase approach: conducting a stocktake of titles; examination of the policy settings which underpin regimes; stakeholder engagement, data collection and analysis; and development of reform options based on the analysis of the data collected.

This report outlines the individual jurisdiction Retention Lease regimes, an overview of the status of Retention Leases in each jurisdiction, and an estimate of petroleum resources under retention. It provides case studies of several international Retention Lease regimes to deliver a comparative analysis of overseas frameworks and how Australian frameworks align or differ.

To assess the effectiveness of the Retention Lease frameworks, Noetic undertook broad stakeholder consultation with industry and conducted a analysis of the results. In addition, an analysis of the Australian gas industry landscape, the economic context of the gas industry within Australia and the role of Retention Leases in incentivising exploration and development of petroleum resources was undertaken. These analyses informed five reform options for consideration by UPR.

CONTEXT

Australia’s ability to attract the large-scale investment required to support petroleum projects is underpinned by sound exploration, development and production regimes. The various regimes operating across Australia have delivered strong investment in the petroleum industry. Despite this significant investment, there exists community and some industry concern about the effectiveness of retention lease regimes to drive the earliest commercialisation of discovered resources.

The security and reliability of future gas supply in eastern Australia is affected by a range of factors including:

- significant demand from the three Gladstone LNG projects
- downturns in the commercial operating environment, for example low oil prices which reduced the incentive of some producers to explore for and develop new gas resources.

Accelerated commercialisation of gas resources is needed to ensure security of gas supply at prices that are sustainable over the long term for gas producers and users.

Concerns have been raised about the application of the Retention Lease provisions, which some large domestic gas users have argued can provide companies with a potential mechanism to schedule production for future export at the expense of domestic users. Further, concerns have been raised that gas that is currently commercial is being held under retention lease to tighten supply to the market, thereby increasing downstream gas prices - a practice commonly referred to as warehousing2. It is usual practice for gas producers to invest progressively in exploration, with its high cost and failure risk, to discover and develop a forward portfolio of gas reserves. These reserves can be brought to market via established gas processing facilities or factored into the cost of new or upgraded gas facilities. Global petroleum prices also influence the timing for investment in exploration and commercial development of gas fields.

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2 In this report ‘warehousing’ is defined as holding under Retention Lease and not actively developing commercial gas resources in order to influence supply/demand balances, and therefore price, in downstream markets. This is distinct from staging which collects gas required to support a positive investment decision on foundation infrastructure.
Petroleum licencing regulations are supported by a framework which allows discovered resources to be retained for a period by titleholders while commercial and technical matters are resolved. Petroleum ‘Retention Leases’\(^3\) operating onshore are implemented under state and territory frameworks. An exploration lease title holder can apply for a Retention Lease if petroleum is found but the resource requires further evaluation to determine potential commercial production and market opportunities. This process, when operating effectively, balances commercial needs with the timely development of resources.

**OBJECTIVES**

This review is intended to understand the effectiveness of Retention Lease regimes in driving the earliest commercial development of discovered gas resources and supporting exploration activity and expenditure, consistent with the following objectives:

- understand and compare existing Retention Lease policies/frameworks for onshore and offshore resource developments
- understand and analyse Retention Leases currently in force
- identify opportunities to strengthen regulatory frameworks
- consider whether a nationally consistent stricter ‘use it or lose it’, other contestability test(s) or other mechanisms are required to help address barriers to the commercial development of gas fields
- identify opportunities to accelerate exploration and gas resources development.

**METHOD**

Noetic used a four (4) phase approach.

**Phase I: Initial engagement and stocktake of titles**

In this phase, Noetic engaged with each state/territory’s relevant titles administrators (face-to-face where possible) to discuss and understand current Retention Lease frameworks and policy settings, as well as to gather more nuanced information on decision making in each jurisdiction.

Noetic intended to examine all Retention Leases within State, Territory and Commonwealth jurisdictions and review these to identify the titles that have been renewed on multiple occasions, as well as their grounds for renewal and the contingent resources held under them. Unfortunately, not all the requisite information was made available to conduct this analysis.

**Phase II: Examination of policy settings**

Based on engagement in Phase I, Noetic undertook a desktop review of the policy settings underpinning Retention Lease regimes. This included the policy framework for Retention Leases as well as enabling policy, legislative and regulatory frameworks. This work informed the state summaries and provided insights on how the regime’s operations are managed, and consideration of possible reform areas.

**Phase III: Data collection and analysis**

Noetic engaged with a sample of companies (face-to-face where possible) set out in the list of stakeholders (Annex E) in order to test their experience of the regimes. The sample was chosen to reflect different size companies, with experience in and exposure to different regimes. Of key interest in discussions was the regime’s effectiveness, strengths and weaknesses, and how any policy changes may affect exploration and development plans.

Noetic also reviewed three overseas jurisdictions – the United States of America (U.S.) state of Texas, the U.S. Gulf of Mexico and Norway (through overseas offices) in order to understand how those regimes incentivised the development of discovered resources. These three jurisdictions were chosen because they cover onshore and offshore resources in addition to having distinctly different regimes to those in Australia.

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\(^3\) While referred to as ‘Retention Lease’ for the purposes of this document, in state and territory regimes they are referred to by different titles.
The desktop review of Australian regime policy settings, review of overseas regimes and engagement with jurisdictions and industry informed Noetic’s analysis of Australian regimes. This analysis supported the development of an informed view of principles that enable regimes to incentivise exploration and the earliest commercial development of resources. Draft options for reform were developed using the analysis. Further information on the analysis is in Annex B.

**Phase IV: Development of reform options**

Using the output of the analysis from Phase III, Noetic engaged with a broader set of stakeholders, using a survey questionnaire (see Annex A) to seek feedback by email from 14 industry participants, broader business stakeholder groups and associations, seeking their insights and input to the review. The stakeholders who received this questionnaire are listed in Annex E.

The reform options developed in Phase II and Phase III were then refined based on the feedback and analysis undertaken in the latter stages of Phase III and early Phase IV. A set of integrated reform options were developed that would strengthen existing regulatory and policy mechanisms.

Key stakeholders reviewed the draft report and the feedback is incorporated into this final report.
SUMMARY OF RETENTION LEASES IN AUSTRALIAN JURISDICTIONS

The following summary sets out the policy intent and key decision frameworks of Retention Lease regimes and equivalents across Australian jurisdictions.

WESTERN AUSTRALIA

Western Australia has nine active Retention Leases: three in territorial waters and six onshore.

Two state Acts are relevant to petroleum Retention Leases: the Petroleum and Geothermal Energy Resources Act 1967 which is responsible for all onshore areas of Western Australia and the Petroleum (Submerged Lands) Act 1982, which applies to resources located within three nautical miles of Western Australia’s coastline.

Retention Leases serve as a stepping stone between exploration and production, enabling the rights holder time to conduct work to progress the resource towards commercialisation. The holder of the rights to a declared location can apply for a Retention Lease if the resource is not currently commercial but may become so within 15 years.

The permit holder has two years after the Declaration of Location in which to apply for either a Retention Lease or Production Licence. This period may be extended for a further two years at the discretion of the Minister. Within this period the permit holder selects from the ‘Location’ the blocks to be included in a Production Licence or Retention Lease.

If the holder decides to seek a Retention Lease, the holder must assess whether the discovery meets the criteria for a Retention Lease, and a preliminary meeting with the Department of Mines and Petroleum (Petroleum Division) must take place to present justification for the non-commerciality of the site.

To apply for a Retention Lease, a registered holder of an exploration permit or drilling reservation must:

- nominate the location of the area that will be under Retention Lease application
- assess whether the resource meets the criteria of a Retention Lease
- meet with the Department to present rationale for non-commerciality, and provide additional relevant information as requested
- the registered holder must have Native Title approval
- maintain the underlying exploration permit or drilling reservation
- provide a five-year work program outlining what activities will be taken in the Retention Lease period to develop commercial viability.

If satisfied all conditions and criteria are met, the Minister can advise the applicant in writing of the granting of the lease. The Minister can also attach conditions and outcomes to the Retention Lease to ensure development of the resource is occurring and to minimise impact on other land users. The applicant is given the opportunity to comment on the work program conditions. The applicant is also given the opportunity to comment if the Retention Lease application is denied.

At any time over the term of the lease, the Minister may request a re-evaluation of the commercial viability of the resource. If commerciality is identified, the Retention Lease must be converted to a Production Licence.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># of RLs</th>
<th># of renewals/extensions</th>
<th>First Granted</th>
<th>Current RL</th>
<th>Estimated Recoverable Resource</th>
<th>Basin/field</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Australia</td>
<td>4 nearshore</td>
<td>Between 1 and 3</td>
<td>Between 2001 and 2003</td>
<td>Between 2020 and 2022</td>
<td>17,675 Bcf</td>
<td>Browse and Northern Carnarvon Basins</td>
<td></td>
</tr>
<tr>
<td>5 onshore</td>
<td>Between 0 and 2</td>
<td>Between 2003 and 2014</td>
<td>Between 2020 and 2022</td>
<td>17,675 Bcf</td>
<td>Canning, Browse and Northern Carnarvon Basins</td>
<td></td>
<td></td>
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**SOUTH AUSTRALIA**

There are currently approximately 63 Petroleum Retention Licences (PRLs) over gas discoveries within South Australia as of March 2018. The state legislation relevant to PRLs is the Petroleum and Geothermal Energy Act 2000, covering all onshore areas of the state, including islands and any submerged lands internal to the state. The Petroleum (Submerged Lands) Act 1982 provides for offshore petroleum production and management of the territorial sea of South Australia.

The Roadmap for Unconventional Gas Projects in South Australia (released in 2012) was developed by the roundtable for Unconventional Gas in South Australia (now roundtable for Oil and Gas) and describes the implementation pathway for the environmentally sustainable development of South Australia’s unconventional gas reservoirs. The top priority action item requested by Roundtable members was that Exploration, Retention and Production Licences need to have terms (in years), area and conditions that take account of the life-cycle for finding, appraising, developing and producing unconventional petroleum. South Australia’s PRL scheme was developed to deliver this for both conventional and unconventional resources.

South Australia applies two broad approaches to the granting and management of PRLs. South Australia retains the option to offer/grant PRLs over yet-to-be deemed probably economic (2P) area around discovered fields and requires an agreed relevant minimum work program. This is similar to other jurisdictions. The work programs are typically restricted to ‘studies to progress towards commercialising’ a resource. South Australia has issued such PRLs in the Cooper-Eromanga and the Otway basins, mostly in areas that are less mature from an exploration perspective.

South Australia also offers grouped PRLs where the PRL would cover the extent of a proven play (e.g. more than a single discovered field). To date, South Australia has only deployed Grouped PRLs in the Cooper-Eromanga basins. The grouped PRL approach differs in that it uses a minimum annual expenditure requirement to offset an obligation to surrender acreage at five-year intervals. It does this in the absence of a resource-specific work program or set commerciality review.

The prescribed minimum expenditure is set at $7,000 and $4,500 per Km² per annum for gas and oil respectively. These benchmarks are based on recent commercial arrangements (including farm-ins) for gas and the average value of Petroleum Exploration Licence work programs from competitive tender processes that

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4 The total of all P50 in-place petroleum volumes held under retention leases in the WA onshore and nearshore in the WA jurisdiction. In-place volumes in WA fields that extend into the Commonwealth territory have been prorated according to the apportionment agreements in place with the Commonwealth.
have led to the grant of Petroleum Exploration Licences over oil play trends. A failure to meet agreed expenditure levels requires a proportionate surrender of PRL areas at the end of each five-year term for grouped PRLs. The aggregate minimum expenditure requirement applying to a PRL (defined in dollars per Km² per annum) is determined by the extent to which the acreage falls within a set of ‘play’ boundaries. The minimum expenditure requirement can be met with exploration and appraisal investment anywhere within the group of PRLs that fall within the same expenditure per Km² band. This allows companies flexibility to allocate investment to the best prospects regardless of where the best prospects are located within grouped PRLs. The approach assumes that the companies will include earliest commercialisation as an assessment criterion for this expenditure.

The underpinning policy intent of the South Australian PRL scheme is to facilitate proper evaluation of the productive potential of a resource discovery and, if necessary, carry out work to bring the discovery to commerciality. This ensures the title holder’s right to explore the resource further and assess commercial viability. The overall aim of the PRLs is to convert the title to a production licence when commercially viable and to begin production of the resource within two years.

To apply for a Retention Lease, a registered holder of an exploration licence or a production licence must:

- prove the existence of the regulated resource in the area under application by the drilling of at least one well
- hold the appropriate exploration or production licence for the regulated resource of the relevant kind
- supply a detailed work program and associated expenditure of operations to be carried out for the PRL duration
- provide all information reasonably required to enable the Minister to assess whether a regulated resource that has been discovered in the licence area can be brought to commerciality within 15 years, including a risk assessment of predicted outcomes
- supply further information to the relevant Department upon request.

If the Minister is satisfied that the production of the regulated resource is not currently commercially feasible but likely to become so within 15 years, the Minister can grant the PRL.

The area of the proposed PRL must not be larger than 100 km² or be twice the area under which (according to reasonable estimates) the discovery is likely to extend. PRL terms in South Australia are five years, with options to renew for a further five years. There is no limit on the number of renewal terms allowed.

As described above, once a PRL is granted, the PRL holder must undertake either a specified work program (where applicable) or more commonly an accelerated level of exploration and appraisal expenditure. If expenditure requirements are not met, a mandatory relinquishment of land commensurate with the proportional shortfall in expenditure occurs.

The SA PRL regime provides for a review or re-evaluation of the commerciality status of a PRL upon any application to renew the PRL at five-year intervals, although the relevant Minister can request commerciality information and data at any time during the PRL period. Title holders are required to provide annual reports to the relevant South Australian Department, serving as a form of tracking progress on the work program.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># of PRLs</th>
<th># of renewals/extensions</th>
<th>First Granted</th>
<th>Current RL Expiry</th>
<th>Estimated Recoverable Resource</th>
<th>Basin/field</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Australia</td>
<td>63</td>
<td>4 renewed</td>
<td></td>
<td></td>
<td></td>
<td>Cooper/Eromanga and Otway basins</td>
<td>Some data unavailable</td>
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</table>
VICTORIA

Victoria has three current Retention Lease titles – two of which are onshore. The offshore Retention Lease has an estimated contingent gas resource at P90 of 18.5 PJ, and P50 of 31.5 PJ. The title has been renewed six times since first being granted in 1992.

Onshore Retention Leases are subject to the Resources Legislation Amendment (Fracking Ban) Act 2017, which places a moratorium on onshore hydraulic fracturing until 30 June 2020. The moratorium provides time for delivery of the Victorian Gas Program, a program that will examine Victoria’s gas prospects, the issues and factors associated with gas exploration and development, and inform future decisions on gas development within the state.


There have been no applications for either onshore or offshore Retention Leases in the past five years.

The underlying policy intent of the Victoria Retention Lease regime is to enable a discoverer of a resource that is not yet commercially viable a time frame of up to 15 years to take steps to develop the infrastructure, technology or adapt to market conditions so that the development becomes economically feasible. The Retention Lease scheme in Victoria serves as a mid-step between exploration and production, with the intention of Retention Leases to be converted to Production Leases before or upon expiry.

In Victoria, the holder of a Petroleum Exploration Permit can apply for a Retention Lease only after discovering petroleum, and within the permit area. They must:

- provide details of the area of which the Retention Lease is sought
- supply information regarding the commercial viability of extracting petroleum at the time of application
- provide details of the future commercial viability of extracting petroleum from the proposed area
- continue to comply with the conditions of the Petroleum Exploration Permit
- provide a work program detailing activities that will be undertaken in the Retention Lease area to move the field towards commerciality
- provide any additional information upon request.

If the Minister is satisfied that the extraction of petroleum within the proposed area at the time of application is not commercially viable, but will become so in the next 15 years, they may grant the Retention Lease. The term of an onshore Retention Lease in Victoria is 15 years, with no option for renewal.

The Minister may request that a lessee re-evaluate the commercial viability of petroleum production at any time during the term of the lease. Subsequently, if the Minister believes extraction of the petroleum is commercially viable, the Minister may direct the lessee to apply for a Production Licence for the purpose of extraction of petroleum.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># of RLs</th>
<th># of renewals/extensions</th>
<th>First Granted</th>
<th>Current RL Expiry</th>
<th>Estimated Recoverable Resource</th>
<th>Basin/field</th>
<th>Comment</th>
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<tr>
<td>Victoria</td>
<td>PRL2 &amp; PRL3</td>
<td>0</td>
<td>2007</td>
<td>2018 &amp; 2019</td>
<td>18.5 Bcf</td>
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NEW SOUTH WALES

NSW currently has one offshore title (PEP 11) and there is only one Petroleum Assessment Lease (PAL) onshore in NSW. It was granted in 2007 and was due to expire in 2013. A renewal application was submitted prior to the expiry date, but is currently pending.

The onshore PALS are covered by one state Act, the Petroleum (Onshore) Act 1991, and one supporting regulation, the Petroleum (Onshore) Regulation 2016.

The policy intent underlying the NSW PALS is to allow retention of rights over an area in which a significant petroleum deposit has been identified, if producing from the deposit is not commercially viable in the short term but there is a reasonable prospect that it will be in the longer term.

The lease holder does not need to commit to further on-ground exploration, although it is permissible, but must continue other activities to further assess the commercial viability of producing the resource.

A PAL caters for situations between exploration and production. An assessment lease may be appropriate where:

- a resource is proven and the feasibility of production established but the project is not currently viable, although it has potential to be developed in the foreseeable future; or
- there are areas of potential which are natural extensions to existing operations or projects, but it is currently impractical to apply for a production lease.

Upon applying for a PAL, the title holder must:

- provide public notice of the application of the PAL (before, or within 21 days of lodging the application) with appropriate information
- apply to the Minister in writing to conduct activities, such as assessable prospecting operations, within the lease area
- prove that the resource meets discovery criteria (and can be defined as a 1C, 2C or 3C resource)
- provide a work program that includes activities for progressing the resource of a 1P, 2P or 3P resource. The work program must also provide for additional work or project planning that demonstrates the title holder or operating is continually trying to commercialise the resource.
- satisfy requirements set out in the document "Minimum Standards and Merit Assessment Procedure (Incorporating the Use It or Lose It Policy)", under the Petroleum (Onshore) Act 1991.

PALS in NSW can be granted for terms of two to six years. The maximum renewal term is six years. The renewal application is scrutinised to ensure that the owner of the lease is using the PAL effectively. The holder must apply to the Minister in writing to conduct activities (such as assessable prospecting operations) within the lease area.

The Minister may at any time direct the holder of a PAL to apply for a production lease within a specified timeframe if the Minister believes the status of the lease has become commercially viable. If the holder does not do so within the specified timeframe, the Minister may cancel the lease.
NSW

<table>
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<th>State</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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<td>NSW</td>
<td>1</td>
<td>0</td>
<td>2007</td>
<td>2013 (renewal pending)</td>
<td>403 Bcf</td>
</tr>
</tbody>
</table>

NSW advises that the PAL covers an area about 25% of Narrabri Gas Project and estimates 350 to 500 PJ of gas in place.

QUEENSLAND

Declarations of Potential Commercial Areas (PCAs) exist to enable companies to retain areas of land within Authority to Prospect (ATP) areas where a resource is identified as potentially commercially viable but production of that resource is not currently so. The PCA is not a Retention Lease, or tenure per se, but rather an Authority over an area within an underlying ATP.

The policy intent behind the establishment of PCAs in Queensland was to enable for the staged development of projects and to recognise issues affecting commerciality.

The prerequisite for a PCA is an ATP. Environmental approvals, and all Native Title requirements must be met prior to granting an ATP, which in turn affects the granting of a PCA. The maximum term of an ATP is 12 years, while the maximum term of a PCA is 15 years. If the ATP expires, but still has a PCA declared over some of the area, the PCA remains in force for the declared area until the term concludes. There is no mechanism to renew PCA declarations, but a new PCA declaration can be made if an extension for the area is required. A PCA can only be declared over an ATP licence, not a production permit.

To declare a PCA, the following statutory criteria must be satisfied:

- that the area is not more than needed, and must form a single parcel of land
- that the resource in the declaration area is not currently (and will not be in the near future) commercially viable but is likely to become so within 15 years
- an evaluation program must detail the activities to overcome factors inhibiting commercial viability of the area
- compliance information relating to the conditions of the underlying ATP.

A PCA may be declared for a maximum of 15 years, or for a shorter period (which can be renewed up to a total of 15 years) depending on when a petroleum discovery was made, and the nature of the factors impacting the commercial viability of the identified resource. These factors must be addressed in a commercial viability report that must accompany the application for a PCA. Examples include:

- no viable markets have been identified for the resource
- a lack of infrastructure necessary to commercially develop the resource
- commercial recovery is dependent on technology under development
- current and forecast economic conditions are not supportive of a commercially viable project.

Every five years the Queensland government performs an assessment of the evaluation program with the view ensuring the holder of the ATP is progressing activities to overcome the factors inhibiting the production or storage of petroleum within the PCA.

Queensland currently has 67 declared PCAs.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># of RLs</th>
<th># of renewals/extensions</th>
<th>First Granted</th>
<th>Current RL Expiry</th>
<th>Estimated Recoverable Resource</th>
<th>Basin/field</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland</td>
<td>67 PCAs</td>
<td>0</td>
<td>2017 (five year term)</td>
<td>13 PCAS expire in 2022</td>
<td>7,769 Bcf (estimate)</td>
<td></td>
<td>Most PCAs have been declared for 15 years. Some have been declared for five years</td>
</tr>
</tbody>
</table>

**NORTHERN TERRITORY**

The Northern Territory holds three current Retention Licences (RLs) – RL(1), RL(3) and RL(4). RL(1) was initially granted in 1990, the oldest of the current RLs, and has been renewed four times. The current renewal expiry for RL(1) is 2018. RL(3) and RL(4) (located in the Ooraminna Field) are currently within the first term. An independent expert report indicates that both leases hold approximately 106 PJ of contingent resources (2C). Currently, the Ooraminna field is not considered commercially viable.

Two pieces of legislation underpin the NT’s Retention Lease scheme – the Petroleum Act 1984 NT and the Petroleum (Submerged Lands) ACT (NT) 1982, covering onshore state petroleum resources and offshore resources respectively.

Up until March 2018, a moratorium was in effect in the Northern Territory on unconventional gas exploration (fracking), reducing the amount of activity and Retention Lease applications in the state.

The policy intent underlying the Northern Territory Retention Lease scheme mirrors the Commonwealth legislation – to enable companies and discoverers of resources to retain rights over the field if not currently commercially viable. However, there is no timeframe limit in the NT Petroleum Act to commercialize onshore RLs. This is currently under consideration by government. While the policy considers technical issues and demand constraints, it does not look at access to third party infrastructure.

Retention leases have a five-year term. Further five-year terms are allowed. There is no limit on the number of renewals allowed provided the criteria for granting are met.

Once commerciality is established, the lessee must apply for a production licence or provide reasonable justification if they do not.

Before applying for Retention Licenses, an exploration permit holder must have notified the Minister of the discovery of petroleum in the permit area. To do this, they must:

- notify the Minister of discovery in writing within three days
- provide a detailed discovery report within three months of the date of discovery
- provide an economic assessment of the resource in the discovery.

After providing this information, if the Minister is satisfied that the discovery is not currently commercially viable but has the potential to become commercially viable within 15 years, the exploration permit holder may apply for a Retention Lease. Applications for Retention Leases must include:

- the mapped area and location for the resource under application
- the proven presence of petroleum in the area under application
- evidence that production of the resource is not currently commercially viable, but has the potential to become so
- a work programme accounting for the exploration, appraisal and development of the resource within the application area
- evidence of the technical and financial capacity of the applicant to carry out proposed work programme.

The Minister may also request any further information from the applicant.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># of RTs</th>
<th># of renewals/extensions</th>
<th>First Granted</th>
<th>Current RL Expiry</th>
<th>Estimated Recoverable Resource</th>
<th>Basin/field</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Territory</td>
<td>1 nearshore</td>
<td>5</td>
<td>1990</td>
<td>2018</td>
<td>11.5 Bcf</td>
<td>Weaber</td>
<td>RL holder is pursuing a major market opportunity in the vicinity of the field.</td>
</tr>
<tr>
<td></td>
<td>2 onshore</td>
<td>0</td>
<td>2013</td>
<td>2018</td>
<td>100.5 Bcf</td>
<td>Ooraminna Field</td>
<td>Lack of knowledge of the field, high uncertainty on resource estimates and a lack of a viable market in the vicinity of the field.</td>
</tr>
</tbody>
</table>

**COMMONWEALTH**

Offshore Retention Leases are covered under Commonwealth legislation, the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*. Offshore titles are also subject to the minimum expectations of the Joint Authority⁵. Currently, the Commonwealth has 93 Retention Leases active within its jurisdiction.

The underlying policy intent of the Commonwealth regime is to protect the rights of the title holder if a resource is discovered that is not currently commercial but has the potential to become commercially viable within 15 years.

The aim of the offshore Retention Lease regime is to provide a bridging lease between exploration and production to continue rights for title holders.

Criteria for granting an offshore Retention Lease are:
- the area under consideration contains petroleum

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⁵ The Joint Authority is defined in Section 56 of the *Offshore Petroleum and Greenhouse Gas Act (2006)*. The Joint Authority, or their delegate are the decision-makers on titles located in the Commonwealth offshore territory. The decision-makers are the responsible Commonwealth Minister and the responsible Minister in the state or territory adjacent to the relevant Commonwealth offshore territory. The definition, processes and functions relating to the Joint Authority are set out in in sections 56 to 69 of the *Offshore Petroleum and Greenhouse Gas Act (2006)*.
- the recovery of the petroleum at the time of application is not commercially viable
- the recovery of the petroleum from that area is likely to become commercially viable within 15 years.

The Joint Authority’s approach to determine viability consists of analysing existing knowledge of the field, prevailing market conditions, the technology available within the industry, and an acceptable internal rate of return for the type of project.

To apply for an offshore Retention Lease, the holder of an exploration permit must provide:
- the location must have been declared for a Retention Lease application to be made
- supply a work program and expenditure proposal for the area under consideration
- provide the current commercial viability of the recovery of petroleum from the area
- provide the possible future commercial viability of recovery of petroleum from the area
- submit the application within two years from the date of declaration of location.

The work program supplied by the applicant must be detailed. It should identify the primary constraints to development, key decision points of activities and how they contribute to the commercialisation of the resource, standalone work programs for separate leases even if they are held over the same field by the same applicant and identify areas where further information is needed. A strategy for assessing prospective reservoirs is required, as well as annual reporting of the activities carried out in the lease area by the lease holder.

Offshore retention licences have a term of five years and are renewable. Once commerciality is established, the Joint Authority can direct the licence holder to apply for a Petroleum Production Licence.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># of RLs</th>
<th># of renewals/extensions</th>
<th>First Granted</th>
<th>Current RL Expiry</th>
<th>Estimated Recoverable Resource</th>
<th>Basin/field</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth OPGSA (offshore)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cwlth (WA)</td>
<td>Total 66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>0</td>
<td>2012-2018</td>
<td>2018-2023</td>
<td>Carnarvon; Nth Carnarvon; Nth Browse; Carnarvon</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>1</td>
<td>2011; 2012</td>
<td>2021-2023</td>
<td>Bonaparte; Carnarvon</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>2</td>
<td>2003; 2004; 2006</td>
<td>2019; 2020; 2022</td>
<td>Carnarvon; Nth Browse; Bonaparte</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>2000; 2001</td>
<td>2021</td>
<td>Carnarvon</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>1991; 1994; 1995</td>
<td>2020; 2022</td>
<td>Bonaparte; Carnarvon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jurisdiction</td>
<td># of RLs</td>
<td># of renewals/extensions</td>
<td>First Granted</td>
<td>Current RL Expiry</td>
<td>Estimated Recoverable Resource</td>
<td>Basin/field</td>
<td>Comment</td>
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<td>------------------------------</td>
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<td>-------------------------------</td>
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</tr>
<tr>
<td>Commonwealth OPGGSA (offshore)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cwlth (Vic)</td>
<td>Total 7</td>
<td></td>
<td></td>
<td></td>
<td>500 Bcf</td>
<td>8 fields</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0</td>
<td>2012</td>
<td>2017 (pending renewal)</td>
<td>2021</td>
<td>Gippsland</td>
<td>Otway</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>1992</td>
<td>2016 (pending renewal)</td>
<td>1995</td>
<td>Gippsland</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cwlth (Tas)</td>
<td>Total 4</td>
<td></td>
<td></td>
<td></td>
<td>350 Bcf</td>
<td>4 fields</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0</td>
<td>2015</td>
<td>2020</td>
<td></td>
<td>Bass basin</td>
<td></td>
</tr>
<tr>
<td>Cwlth (NT)</td>
<td>Total 7</td>
<td></td>
<td></td>
<td></td>
<td>19,000 Bcf</td>
<td>6 fields</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>2014; 2016</td>
<td>2019; 2021</td>
<td>Bonaparte</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>2012; 2013</td>
<td>2022; 2023</td>
<td>Bonaparte</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>2007</td>
<td>2022</td>
<td>Bonaparte</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
<td>1994; 1996</td>
<td>2022</td>
<td>Bonaparte</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SUMMARY AND OBSERVATIONS

All regimes in Australia have the same fundamental policy objective: To provide security of tenure over a discovered resource that is not currently commercial but may become so within 15 years. This bridging title enables the lease holder the time required to undertake activities required to identify development pathways for the commercialisation of the resource.

The material differences between the regimes can be grouped around their regulatory approach. Most regimes set incentives and obligations through regulatory requirements that are specific to development and commercialisation. The type and structure of obligations (including work-programs, conditions, reporting milestones), as well as review and compliance requirements, will shape the extent to which the regulatory mechanisms are prescriptive or objective based in nature, and increase or decrease the flexibility of their application and specificity of their impact.

Most regimes use a work program obligation and commerciality review (either at renewal or during the term of a lease) coupled with the flexibility to shape and reshape the work-program to drive and monitor activities that will progress the resource along a development pathway.

While this approach is still available over yet-to-be deemed probably economic (2P) areas, South Australia has adopted different requirements for grouped PRLs to achieve outcomes by removing explicit commerciality reviews (although the Minister can request information on commerciality). Instead, it uses an accelerated level of exploration and appraisal expenditure (in dollars per km² per annum) for the work program over the entirety of the grouped PRL areas. If this expenditure requirement is not met, a mandatory relinquishment of land commensurate with the shortfall in expenditure occurs every five-years.

A table further summarising the Retention Lease schemes throughout Australia can be found in Annex F.
# Table 1. SUMMARY OF RETENTION LEASE RENEWALS AND GAS RESOURCES ACROSS JURISDICTION

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Times renewed / number of Retention Leases</th>
<th>Estimated gas under RL</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0/</td>
<td>1/</td>
<td>2/</td>
</tr>
<tr>
<td>Cwlth (WA) RLs</td>
<td>38</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cwlth (Vic) RLs</td>
<td>5</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cwlth (Tas) RLs</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cwlth (NT) RLs</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Times renewed / number of Retention Leases</td>
<td>Estimated gas under RL</td>
<td>Comment</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------------------</td>
<td>------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cwlth (Ashmore Cartier Territory) RLs</td>
<td>2/1/2/4/1</td>
<td>6,500 Bcf</td>
<td>10 fields from 90 to 3,500 Bcf Basin: Bonaparte</td>
</tr>
<tr>
<td>WA RLs</td>
<td>1/3/4/1/0/0</td>
<td>17,675 Bcf</td>
<td></td>
</tr>
<tr>
<td>SA PRLs (63)</td>
<td>4 renewed 60 extensions</td>
<td>No data</td>
<td>Insufficient data</td>
</tr>
<tr>
<td>VIC RLs</td>
<td>2/1</td>
<td>33.5 Bcf</td>
<td>Gas estimate related to RL in Golden Beach field with 6 renewals</td>
</tr>
<tr>
<td>NSW RLs</td>
<td>1/1</td>
<td>403 Bcf</td>
<td>midrange estimate</td>
</tr>
<tr>
<td>Qld PCAs</td>
<td>67/</td>
<td>7,769 Bcf</td>
<td>Note: PCAs can have declaration terms of up to 15 years. The majority currently have 15 year terms, a few have five year terms.</td>
</tr>
<tr>
<td>NT RLs</td>
<td>2/1</td>
<td>112 Bcf</td>
<td>Ooraminna and Weaber fields.</td>
</tr>
</tbody>
</table>
GLOBAL CASE STUDIES

Three international regimes were selected for inclusion in the review. The chosen case studies were developed to understand how these regimes deal with the retention of rights to a discovery and the application of incentives to expedite commercialisation of a resource.

Texas was selected to explore a regime operating onshore across conventional and unconventional resources. The Gulf of Mexico, because it reflects similar resource conditions near shore and offshore, and because its regulatory framework is significantly different to that in Australia. Norway was selected because it also has a significantly different approach to regulation, but with some aspects which align with elements of Australian regimes.

TEXAS

The U.S. state of Texas is a major oil and gas producer, producing more than a third of the country’s crude oil and a quarter of its natural gas. Both oil and gas come from conventional and unconventional sources. Like the U.S. federal government, Texas does not use Retention Leases in its regulatory framework.

Texas uses a leasing system to grant both exploration and production rights. A feature of Texas’s leasing system is to expedite exploration activity. Leases are generally given with primary terms averaging between three to five years. After the first year of the initial lease period, companies pay an annual rent to hold the lease unless they are carrying out development activities.

To extend the lease beyond the initial term, companies must have developed a well that is productive, submit a shut-in affidavit, and pay an annual fee (called a shut-in royalty) equal to double the annual rental, but not less than AUD$1600 a year for each well. As the administering agency, the General Land Office (GLO), may grant a lease extension for a maximum of five years.

Although Texas doesn’t require a development plan to extend the initial lease term, it provides companies with incentives to develop resources by imposing a shut-in royalty. Texas’s regulatory framework is typical across the U.S. Of note, some states provide more lenient terms for companies. For instance, the state of Oklahoma will allow companies to retain a lease even if they fail to pay the annual fee on time.

UNITED STATES (GULF OF MEXICO OUTER CONTINENTAL SHELF REGION)

The Gulf of Mexico federal offshore region has been a significant producer since offshore production started in the 1930s with the first platform in shallow water. Today the region produces approximately 17% of U.S. total crude oil and 5% of natural gas production each year. The Gulf of Mexico Outer Continental Shelf Region is regulated by the U.S. federal government. In comparison to Australian jurisdictions, the U.S government does not use Retention Leases as part of its regulatory framework.

Federal oil and gas leases have a primary term of five, eight, or ten years, depending upon water depth. Leases cover both exploration and production activities.

Companies usually do not have commitments or deadlines for conducting exploratory or development activities. To extend the lease without actual production, oil companies may request a Suspension of

6 Except leases issued with a primary term of eight years
Production (SOP). To attain a SOP, companies must have a well in the lease determined to “be capable of producing oil and gas in paying quantities” and have prepared a development and production plan.

During the suspension period, oil companies also pay annual rentals which are currently AUD$1,649 per km². The Bureau of Safety and Environment Enforcement (BSEE) generally grants a SOP for one year or less. Failure to commence actual production within the time allowed by BSEE will result in termination of the lease.

To further accelerate production activity, the U.S. Congress passed The Responsible Federal Oil and Gas Lease Act 2008, which prohibits oil companies from acquiring new leases unless they have diligently developed the resources, and/or relinquished non-productive leases.

The U.S. operates a significantly different offshore titles regime compared to Australia. While companies are not obliged to develop resources during the initial lease, mechanisms are in place to ensure that production is encouraged and resource cannot be held for long periods of time without development.

**NORWAY**

Norway is the world’s third largest exporter of natural gas and the tenth largest exporter of oil, with all production activities being offshore. Norway is a mature market with an internationally regarded regulatory framework. In comparison to Australian jurisdictions, Norway does not use Retention Leases as part of its regulatory framework.

Like most jurisdictions, Norway requires companies to obtain discrete licenses (or concessions) to conduct exploration and production activities. A key feature of the Norwegian regulatory regime is that it is designed to encourage companies to rapidly exploit discovered resources. This includes allowing relinquished leases to be quickly reassigned to other companies.

Prior to 1996, companies could retain acreage for long periods of time (for up to decades) after a production license was granted without undertaking development work. This was acceptable at the time, as the industry was going through a period of exceptional expansion. However, it became apparent that this approach was no longer in the best interests of Norway and it was changed with the introduction of the Petroleum Activities Act (1996).

Since 1996, companies who hold production license are required to commit to the mandatory work program, and there are financial costs associated with holding acreage covered by production license without a development plan after the initial license period. The Petroleum Activities Regulations 1997 requires companies to pay area fees for areas that are not being actively explored or where there is no production until they submit a Plan for Development and Operation (PDO). The current rates for area fees are AUD$5,631 per km² for the first year, AUD$11,262 per km² for the second year and AUD$22,690 per km² each year thereafter until the production license expires. After the license expires, companies must return the area to the Ministry of Petroleum and Energy (MPE) or apply for another lease extension. The MPE reserves the right to terminate the rights of the company throughout this process.

While Norway does not use a Retention Lease system, companies are able to hold acreage under the terms of a production licence for relatively short periods of time to enable them to prepare and finalise the PDO (which might include technical preparation, making arrangements to access infrastructure or the like). This approach recognises that companies will sometimes need time to plan for development but puts financial costs (through the annual km² fee) in place to help ensure that this occurs as quickly as possible.

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7 30 C.F.R. § 250.17d4.
8 “Paying quantities” means production of “sufficient to yield a reasonable profit after payment of all the day-to-day costs incurred after the initial drilling and equipping of the well, that is, the costs of operating the well, including workovers and maintenance, rendering the oil or gas marketable, and transporting and marketing that product.”
9 BSEE may issue SOP for periods of up to five years and may also grant subsequent consecutive periods.
SUMMARY AND OBSERVATIONS

All three international case studies have different regimes to those developed in Australia. There are some elements that are similar, notably the use of financial elements of the regulatory regime and the balance between general and specific focus on commerciality. In SA there has been a change of focus away from specific commerciality reviews to a financial expenditure obligation, on the basis that this provides an incentive or motivator to develop the resource as soon as possible. A question remains over whether the new arrangements have slowed down development of gas under retention lease in the Cooper/Eromanga basin. That can only be answered with a more focussed study of the SA regime and the influence of ullage (if any) in the Moomba and supporting infrastructure on individual PRLs.

The Gulf of Mexico regime is prescriptive and inflexible in comparison to Australian regimes, introducing a risk to tenure if production does not occur within the term of a SOP authority, and imposing a prohibition on acquiring new leases until they have developed the resources, and/or relinquished non-productive leases.

The primary difference between the three international regimes and those in Australia is the underlying technical characteristics of the resources, access to infrastructure and markets, and development costs. Decades of investment in oil and gas infrastructure in the North Sea, the Gulf of Mexico and onshore in Texas has left a legacy of infrastructure with ullage and brownfields expansion opportunities, resulting in lower commercialisation costs and faster development timelines.

Australia’s resources are often geotechnically and technically difficult, and geographically remote from markets and infrastructure. The opportunities for access to ullage and brownfields expansion are fewer, but when they are available the capital efficiency benefits are more significant in their ability to expedite the commerciality of a project. This is because a greater part of the development costs in Australia are associated with pipeline and processing infrastructure. Consequently, the international regimes reviewed are less focussed on supporting exploration and development than those in Australia.

Managing infrastructure costs remains a significant hurdle for the development of petroleum resources in Australia. This is particularly the case where the size of the resources held under retention lease are smaller and they are further from available infrastructure (with ullage). This situation rarely exists in the international jurisdictions considered, where the well-developed network of infrastructure provides new developments with the opportunity to reduce capital costs through shared infrastructure.
ANALYSIS

Natural gas has played an integral role in Australia’s energy portfolio since it was first commercially developed as a large-scale operation over 50 years ago in the Cooper basin region. Since then, Australia’s oil and gas sector has developed rapidly to become a major export industry and domestic energy supplier.

The Liquidified Natural Gas (LNG) investment boom that began with the development of the North-West Shelf (NWS) infrastructure in WA, commissioned in 1989, has accelerated over the past 15 years to now include over 10 projects with a capital expenditure of well over $300 billion. LNG export facilities are now operational in Queensland, the Northern Territory and Western Australia. In the NT and WA they are foundation projects supported by significant conventional resources. In QLD, the LNG production facilities relied on the development of unconventional gas resources.

In the case of offshore resources (WA and NT) investment has established foundation infrastructure projects. That infrastructure investment has helped de-risk further exploration and development by providing future access and thereby reducing the cost of developing additional local resources.

AUSTRALIA’S RESOURCES AND RESERVES

Exploration in some of Australia’s 70 sedimentary basins has seen a rapid rise in identified and prospective resources. Geoscience Australia’s Australian Energy Resource Assessment (2018 update) estimates identified and prospective resources at 257 trillion cubic feet (tcf) and 11,337 tcf respectively. By way of comparison, Australia’s production of natural gas in 2017 (including exports) was around 3.9 tcf or 4,100PJ.

Identified and prospective resources in Australia

<table>
<thead>
<tr>
<th>Resource category</th>
<th>Conventional gas</th>
<th>CSG</th>
<th>Tight gas</th>
<th>Shale gas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PJ</td>
<td>tcf</td>
<td>PJ</td>
<td>tcf</td>
<td>PJ</td>
</tr>
<tr>
<td>Reserves</td>
<td>77,253</td>
<td>70</td>
<td>45,895</td>
<td>39</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Contingent resources</td>
<td>108,982</td>
<td>99</td>
<td>33,555</td>
<td>1,709</td>
<td>2</td>
</tr>
<tr>
<td>All identified resources</td>
<td>186,235</td>
<td>169</td>
<td>79,450</td>
<td>1,748</td>
<td>2</td>
</tr>
</tbody>
</table>

13 In AERA, petroleum resources are reported at 50 per cent confidence levels for each category of proven reserves (2P), contingent resources (2C) and best estimates of prospective resources.
The gas reserves alone are equal to approximately 47 years\(^{14}\) of gas at current production rates. If domestic supply and exports are to continue to drive economic growth and support prosperity, further investment is required:

- in exploration to maintain prospective and contingent resource levels
- in development and production infrastructure, to grow reserves and bring them to production.

With well-structured policy settings, this will mean that Australia has sufficient gas reserves to support domestic and export demand into the future. The challenge is to enable the earliest commercial development of discovered reserves at a cost that supports the long term sustainable supply of gas, and at a price that supports domestic economic growth and expansion of exports.

**ECONOMICS OF RESOURCE DEVELOPMENT PROJECTS**

Australia’s challenge now is ensuring that it is well placed to deliver competitively priced gas to domestic markets and the next increment of gas supply for domestic and export markets. To do so, it will need to overcome a significant project cost advantage held by other global producers such as the U.S. and West Africa.\(^{15}\)

The medium-term outlook for LNG suggests that the market will tighten from late 2022 based on strong demand growth in Asia and Europe. Global capacity will peak at 396MMtpa in 2021. Projects with total capacity of 118MMtpa will probably reach final investment decisions in 2018–20 if global demand growth of more than 4 percent per year to 490MMtpa by 2030, is to be supplied.\(^{16}\)

The relatively advantaged economics of brownfield and expansion projects and the decoupling of upstream and liquefaction in the U.S. are resetting capex and project financing expectations – departing from the old paradigm of integrated mega-projects. The existing cost advantage the U.S. (and West Africa) have over Australian projects will be stretched further if Australia is not able to realise greater capital efficiency in the development of its resources.

The size, location and geographic distance from infrastructure (and the coast) means it is highly improbable that domestic demand will be capable of supporting the cost of development for large resources such as the Scarborough field (often used as an example of a warehoused field). It could not be developed at a price that delivers the return on and of capital required by investors and at a long term sustainable price for domestic consumers. This is because the cashflow required to support the investment would result in either an uneconomic price per unit to the domestic market or a volume of gas that the domestic market could not absorb. In addition, reductions in the capital costs of offshore projects are required if the potential to develop these resources off the back of global LNG demand is to be realised in the current cycle.


There is evidence that the high cost of developing offshore resources, and competition for project capital more broadly, is changing the approach to resource development planning. Development planning for the Browse and Scarborough projects provide insights to the search for opportunities to leverage off existing infrastructure (identify ullage and opportunities for brownfields expansions). In effect the commerciality factors for gas resources under Retention Leases have changed. The focus is now on the cost of the supporting pipeline and processing infrastructure and how capital efficiency opportunities can be harnessed to improve project economics in the competition for investment capital.

Some jurisdictions and industry participants have noted that the same change in approach has occurred for gas development projects that are near shore and onshore and well suited to stand-alone developments to supply the domestic market. The cost challenges associated with developing the resource remain the same. Processing and pipeline infrastructure costs need to be managed to make the overall economics of the project work. The Internal Rate of Return must meet the expectations of the project sponsors for a positive Final Investment Decision. Bringing forward the earliest commercial development of a resource means reducing the capex costs relative to the expected revenues of the development.

Optimising the planning of and investment in pipeline infrastructure, processing and production capacity provides the strongest opportunity to develop Australia’s significant offshore and onshore reserves. The basin-wide strategic commerciality reviews and the flexibility inherent in some Retention Lease regimes have a role to play in assisting this process.

THE ROLE OF RETENTION LEASES IN INCENTIVISING EXPLORATION AND DEVELOPMENT

The ability to commercialise gas discoveries is affected by several factors, including gas prices, supply/demand balance, geographic proximity to markets, reservoir characteristics and project costs. The Retention Lease system was designed and instituted by Australian jurisdictions to increase the commercial potential of petroleum resources and to provide security of tenure on discovered and stranded resources.

When the offshore retention regime was introduced in 1985 the purpose of the legislation was described as:

“Retention leases will allow explorers to retain tenure over discoveries until they have become commercial and should provide an additional measure of encouragement for companies exploring in deep water or gas prone areas...”

This addressed a deficiency in the title system where there was a gap between exploration and production tenure. This bridging title “provides security of title for petroleum resources that are not currently commercially viable but which have genuine development potential (i.e. development is likely to be commercially viable within 15 years)”.

The tenure (or rights) regime, including Retention Leases and their equivalents, therefore plays an important role in the incentive to explore, develop and produce resources in Australia. Any decrease in tenure certainty erodes the value added to any permit through exploration or development by de-incentivising these activities because of the increased risk that a ‘rights holder’ will not be able to develop and commercialise the discovery.

Since its establishment in various Australian petroleum regimes, the Retention Lease regime has helped support Australia’s transition from a country with a high resource potential, to a global supplier of LNG with a significant resource base and growing domestic market for natural gas. It has done so by providing a mechanism to maintain and protect the expected market value of a permit (or right) generated through exploration expenditure, where a discovery is not yet commercial but may become so within 15 years.

This role is common across all Australian petroleum regimes. The design and implementation may vary from regime to regime, but all recognise that commercial incentives to explore for, and develop resources are driven

by the potential revenues arising from economic development and commercial production – not by the
discovery of the resource itself.

The continued development and supply of Australia’s gas resources at long term sustainable costs (and
therefore prices) is best achieved through an economic regulatory regime that is informed, flexible and
focussed on economic efficiency to drive the earliest commercial development of those resources. Ensuring
administrative efficiency more broadly will further assist efficient investment.

The flexibility inherent in the Retention Lease frameworks has allowed the emergence of a regime that
supports pursuit of capital efficiency to drive earliest commercial development. It has done so accommodating
changes in approach, encouraging alternative development paths and looking for opportunities to optimise
investment to bring forward commercial development.

WAREHOUSING OF GAS

The debate on warehousing has its Australian origin in the Western Australian domestic gas market. This
market experienced a period of tight supply between 2005 and 2015, despite successive WA governments
maintaining a domestic gas reservation policy which reserves 15 percent of gas production for domestic use.

The development and commissioning of several LNG projects (including Gorgon and Wheatstone) have since
seen the WA domestic supply consistently exceed demand\(^{19}\) and it is expected to continue to do so through to
2020. Nevertheless, the tight supply period, and consequential higher prices prompted claims that gas
resources were commercial to develop for the domestic market but were being warehoused and reserved for
LNG production\(^{20}\). This message is not unique to Australia. Manufacturers called for gas export bans to protect
the competitive (price) advantage that the then oversupplied U.S. gas market provided\(^{21}\). Several bills were
introduced to and debated in the U.S Senate designed to ban or limit exports and accelerate the development
of resources through a use-it-or-lose-it policy.\(^{22,23}\) Those same arguments have been proffered in Australia by
major gas users.\(^{24}\). The fundamental message was that gas resources should be developed and maintained to
drive a competitive (price) advantage for domestic consumers by forcing the development of discovered fields.

The tightening of east coast gas markets through 2015, 2016 and 2017 saw the messaging and reasoning
prosecuted in Western Australia and the U.S. picked up by commentators and applied as the raison d’être for
increasing prices in eastern markets\(^{25,26}\) (see also Annex D). This is despite the significant differences between
the gas reserves and economic conditions surrounding their development in each of the U.S., Western
Australian and east coast gas markets.

There are two concepts that should be defined for the purposes of this analysis. First, warehousing is defined
as storing commercial resources in order to maximise value for the holder of the resource. Second, staging


\(^{22}\) March 2011 US industry Assoc http://www.noia.org/use-it-or-lose-it-is-a-solution-in-search-of-a-problem/

\(^{23}\) March 2011 USA http://www.exxonmobilperspectives.com/2011/03/17/lose-the-use-it-or-lose-it-rhetoric-2/


\(^{26}\) Dissenting Report to the Select Committee into the Resilience of Electricity Infrastructure in a Warming World, Senator Xenophon Apr 2017:
feedstock gas to support a positive investment decision in relation to a resource development infrastructure project. The Gorgon foundation infrastructure project, for example, reported to have cost $60 billion and expected to run for about 40 years, relied on the certainty of feedstock gas to reduce the project risk for a positive investment decision.

Not all gas fields are equal. Fields vary in gas composition (impurities and liquids content), size, location and geological complexity. Each of these factors changes the capital cost and therefore the scale (volume of throughput required) and timing of cashflows. This makes some fields not commercially viable for domestic gas production and delays the commercial development of others for the domestic market.

The impact of gas composition and small fields located at distance from demand can be seen in the mature basins in Victoria. The delaying impact on commercialisation can also be seen where fields rely on significant pipeline or trunkline infrastructure to enable a development to access demand – such as the challenges faced in identifying and progressing development paths for the Weaber field in the NT.

Scarborough field highlights the case against the development of a large offshore field for a comparatively small domestic market. Scarborough is a large dry gas (removing an early revenue stream associated with liquids) field with very few impurities. Its distance from shore and size means that production, compression and pipeline infrastructure requires cashflows underpinned by a level of throughput to support the investment in development infrastructure. Current development plans for the Scarborough field have seven wells producing 2.1 Bcf or 2215 terajoules per day to be potentially viable. To develop Scarborough to domestic production the domestic market in WA would need to economically absorb 2215 terajoules per day. Gas demand in the WA domestic market is currently oversupplied and sits at just over 1050 terajoules per day. It would be economically impossible to develop Scarborough for the domestic market alone.

The consideration of issues of scale, liquids content, gas quality, and infrastructure requirements – together with the risk-adjusted cost of capital and the time value of money – is often missed in analysis relied on by commentators to justify claims that commercial resources are being warehoused.27

There is no evidence of the misuse or abuse of Retention Leases (such as warehousing of gas), and no evidence that Retention Leases are holding back or allowing a delay to the earliest commercial development of resources. Public commentary, which has claimed ‘warehousing’ and abuse of the Retention Lease system, is either misunderstanding the commercial and economic considerations underpinning a petroleum resource development project or seemingly motivated to drive supply into a market within which they are customers.

APPLYING A USE-IT-OR-LOSE-IT POLICY TO INFLUENCE DOWNSTREAM MARKET OUTCOMES

Some in industry are concerned that recent Retention Lease decisions by jurisdictions are responding to calls to accelerate the development of resources,28 broadening their economic scope beyond the commerciality of the resource to include influence over the economic conditions in downstream energy markets. Such an approach seeks to distort the investment signals in the downstream market over the short to medium term to prioritise downstream customers over the commercial viability of upstream investment in production and related infrastructure.

27 Fortescue Metals Group Western Australia Gas Sector Analysis, Deloitte Access Economics May 2014
The unintended consequences of doing so include a supply side delay to future additions of supply until the market price rises to reflect the new risk adjusted Internal Rate of Return required by investors. It reduces the incentive to invest and increases the future cost of capital to do so.

These concerns are shared by the Productivity Commission which, in its March 2015 report *Examining Barriers to More Efficient Gas Markets*, noted that:

- **Policies that seek to counteract the pressures from structural adjustment arising from the opening of the export market, such as domestic gas reservation, could distort important signals for adjustment and are unlikely to be efficient or effective in the long run.**

- Governments should be mindful that policies that interfere with market signals could undermine investment incentives, including incentives to bring on new sources of gas supply.

- The mechanisms for allocating gas exploration and production rights should seek the optimal level and timing of such activities by companies that can perform them most efficiently.

- Policies designed to accelerate production, such as use it or lose it mechanisms, risk bringing forward gas production in a way that reduces the benefits received by the community from the gas resource.29

Further, there is a difference between economic regulation that determines the commerciality or otherwise of an infrastructure project (retention lease commerciality assessment), and one that regulates the price of a product (the intent of the warehousing debate is to influence the downstream gas market in favour of consumers). In no Australian regulatory regime (economic or otherwise) has a power to force a company to make an investment been implemented. Using the Retention Lease regulatory power to drive a downstream market outcome changes the purpose and objective of the regulation.

Investment in gas production, processing and transport infrastructure is required to develop the gas resource to production. If that investment could be achieved at a risk adjusted rate of return that is acceptable to investors there is no reason for the resource owner not to do so. The time value of money associated with capital intensive infrastructure projects makes it prohibitive to do so.30

To apply a use-it-or-lose-it policy to deliver downstream objectives risks longer term investment distortions and higher prices. Australian gas consumers and the Australian community are best served by the efficient commercial development of Australia’s resources and a transparent market in which prices support the long-term sustainability of producers and consumers.

**OUTCOME OF ANALYSIS**

In an environment of increasing domestic energy prices and growing resource development costs the availability of new sources of supply becomes a sensitive point between customers and suppliers. Governments get drawn into debates on the efficacy of the market and questions of market power or manipulation.

In these circumstances, there is a risk that regulations and policies that have successfully delivered their objective may be viewed from a different vantage point. Policies changed without consideration of the potential unintended consequences have broader implications for stakeholders who rely on the settings to justify significant investment in exploration, development and commercialisation of Australia’s resources.

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30 The time value of money is the concept that money available at the present time is worth more than the identical sum in the future due to its potential earning capacity. This core principle of finance holds that, provided money can earn interest, any amount of money is worth more the sooner it is received. The time value of an investment of $10 billion applying an interest rate of 8 percent is $80 million in year 1.
It is important that the review process, in consultation with stakeholders, reconsiders the objectives of a policy, highlight any inconsistency between the current debate and the policy objectives, tests its effectiveness and proposes changes that improve its alignment with its primary policy objective.

Australian Retention Lease regimes have performed extremely well, supporting investment of over AUD$400 billion in exploration and the development of foundation infrastructure (a critical hurdle for Australian projects) and related oil and gas resources in offshore, near shore and onshore basins over the past 15 years.

In Queensland, the mechanism is not a form of tenure, but rather a statutory declaration allowing retention of an area beyond the term of the underlying exploration lease. In Norway, the policy intent is delivered through greater flexibility in the Production Licence arrangements coupled with financial incentives (rents or financial penalties) to drive earliest commercial development and production (elements of this approach are also a feature of the SA regime). Nevertheless, every regime applies regulatory mechanisms in which the practical purpose and intended outcome are the same.

Perhaps the most important and subtle difference between Australian regimes is how they are administered. That is, the degree to which their administration delivers an integrated, flexible and strategic approach to decision-making focussing on the well-defined economic objectives of the regime and the pathway to commercialisation but imposing a clear threat to tenure where that is not supported by the rights holder. A detailed review of the commerciality of a resource is undertaken by the regulator at least once during every term of a retention lease in all Australian regimes except SA.

There is evidence of some resources being uneconomic or not commercial to develop until supporting infrastructure or technology advancements reduce the capital cost of the development concept. The cost of development can be significantly impacted by the cost of pipeline and processing infrastructure both onshore and offshore. There is evidence that development costs have increased significantly over the decade to 2014, in part due to increasing distances between infrastructure and the discovered resources. This increase in development costs has meant that a higher return per unit is needed to meet the Internal Rate of Return required for investment signoff.

Further, where the primary cost of a potential development is in the infrastructure (with its set maximum efficient throughput capacity), the life of field, or feed-gas, supplying that infrastructure becomes the most significant variable. In these circumstances, the challenge becomes ensuring there is sufficient feed-gas available to support the long term commercial viability of the project, a key parameter of any development project investment decision. Staging of feed-gas fields can be required to support long lived projects with significant processing and pipeline infrastructure cost components, particularly where those long-lived projects deliver ‘foundation infrastructure investments’.

In a number of jurisdictions there is some evidence that the regulatory obligations and incentives are structured to less specifically target development, instead relying on the incentive of regulated expenditure to drive an outcome which generates revenue and thereby delivers an incentive to develop a resource to avoid cost. It is the view of Noetic that a strong regulatory focus on commercialisation activities and commerciality reviews, together with a flexible and strategic approach to co-ordinated investment in supporting infrastructure will more specifically drive earliest commercial development. The alternative, using more diffuse regulatory obligations and incentives with a less specific focus on commercialisation paths and resource commerciality will be weaker in this regard.

Risk and uncertainty are key challenges for investors. Risk and uncertainty increase the hurdle rate required for investment sign-off across exploration, development and production. Just as the Retention Lease regime supports exploration expenditure by providing some security of tenure over a discovery, the ability of the regime to support rights to the feed-gas required for a project is critical to a positive investment decision. In the same way, flexibility, stability, clarity and celerity in the approach to, and basis of, regulatory decisions creates a supportive climate for decision-making in exploration and development investment.

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31 Offshore South East Australia Future Gas Supply Study, DIIS, November 2017
This review of Retention Lease regimes in Australia has not found any fundamental flaw or failure. Overall, the regimes continue to be effective in supporting exploration and development and are sufficiently flexible to address the challenges of commercialisation presented by individual fields or resources. There is no evidence of their misuse or abuse (such as warehousing of gas), and no evidence that Retention Leases are holding back or allowing a delay to the earliest commercial development of resources. However, the review has identified that there are a range of adjustments that could be applied in different degrees nationally which will strengthen the ability of individual regimes to:

- support positive investment decisions on major infrastructure investment by providing provisional tenure to feed gas allocated to a project separate to that provided by the Retention Lease (or equivalent) regime
- drive optimisation of investment in, and utilisation of, infrastructure required to develop resources (Industry has identified the cost of supporting infrastructure [pipelines and processing] as the most frequent challenge to the commercial development of a resource. The ability to co-ordinate the timing, type and size of infrastructure investment during the Retention Lease phase of a resource is likely to increase capital efficiency and bring forward the commercial development of resources in the vicinity)
- reduce the administrative burden and timeframes for broader approvals and agreements associated with the development of a resource and its related infrastructure
- ensure that decisions relevant to the commerciality or otherwise of a resource are framed within the economic scope of the Retention Lease regime
- ensure administrative streamlining and flexibility.
REFORM OPTIONS

The consultation feedback and the analysis undertaken as part of this review suggests that Retention Lease frameworks across all Australian jurisdictions are broadly aligned and generally effective, with a similar policy intent and regulatory framework.

There are, however, differences across Australian regimes (and between Australian and international regimes) in terms of clarity and flexibility in decision-making and administrative efficiency, how they support co-ordination across other relevant government agencies, their ability to steer co-operation across titleholders (guided by a more strategic, basin-wide view), and the differentiation between the various forms of tenure. Further, and importantly, some regimes differentiate tenure arrangements between mature, well understood basins with light or moderate supporting infrastructure cover and those considered lightly explored or frontier where infrastructure is sparse or non-existent and development is technically more difficult and costly.

These differences highlight the potential areas of focus for further improvements. The proposed options can be used to enhance aspects of the regimes in a way that helps address the geotechnical, technical, commercial and economic characteristics of Australia’s onshore, nearshore and offshore resources.

The proposed options are broad, and further work and consultation will be required to design reforms that minimise the unintended consequences while maximising the effectiveness of their intent. For example, this review has not had the scope to explore the taxation implications of reform option five.

REFORM OPTION 1: PROJECT-SPECIFIC PRODUCTION LICENCE

This reform option is based on the establishment of a new type of Production Licence (PL) that is tied to a development project as well as a resource. Such a Production Licence could hold resources agreed to be developed and produced through the specified project in line with a specified schedule.

A Project-Specific Production Licence (PSPL) would nominate a primary or foundation resource to be developed into production and tie the development of that resource to a specified project or infrastructure, consistent with the requirements of any PL. In addition, it would enable the linking or attachment of further resources to that PSPL, with the approval of the titles regulator, provided:

- they are identified as a resource supporting the baseline commerciality of the project, and scheduled for development in the project operations plan. The schedule would link back to the required timeframe for ‘production of petroleum’ (a PL in most regimes requires petroleum recovery operations within any continuous five-year period of the title)
- where the resources are not commercial to develop through an alternative project at the time of inclusion in the PSPL
- they remain ‘foundation fields’ for that project in future five-year PSPL reviews and any basin-wide commerciality reviews (see Reform Options 2 and 3).

The provisions of a PSPL should allow a resource to return to an RL if the titles regulator determines that the conditions of the PSPL are not met.

The conditions of a PSPL, and its review, are most effective where informed by a broad strategic understanding of resources and infrastructure development options in a basin. Several regimes in Australian jurisdictions have moved in this direction, implementing a strategic, basin-wide review of resources and paths to commercialisation. The effectiveness of a strategic basin-wide review, its integration with Retention Lease commerciality and other title reviews will increase where there is access to relevant commercial information (see Reform Option 2).

Discussion

Retention Leases have been used to give investment decision-makers a degree of certainty of tenure over gas resources which are required to support the economics of a proposed development.
Industry notes that securing tenure over discovered resources is an important part of a successful petroleum value chain. Tenure supports the incentive to explore and provides the basis for the commercial development of discovered resources. In relation to the commercial development of a resource, it would be highly unlikely that a positive Final Investment Decision would be taken on any development without at least some rights to the feedstock required to support the return on and of capital for the project.

The value of a resource will only be realised where it is developed (field development and access to production and processing infrastructure) and production monetised at a revenue stream that delivers return on and return on invested capital.

Narrowing the scope of factors to be considered in regulatory decisions (reform options 1 and 4) while improving the depth and quality of the information (reform option 2), increases the quality of decisions and reduces the risk of unintended consequences. In this way, the regulatory framework of Retention Leases is more clearly defined as economic regulation driving optimal investment in exploration and the earliest commercial development of resources.

**Advantages**

- The PSPL more directly links the development of a resource to the broader project investment process. In jurisdictions where basin wide and resource specific commerciality reviews are conducted, there is the opportunity to better articulate the ‘strategic plan’ to ensure resources are developed as quickly as commercially feasible.
- It enables the application and administration of RLs to be undertaken more precisely within their scope without limiting flexibility.
- It recognises that an investment decision must include investment in all infrastructure required to produce a saleable product, including subsurface, pipeline, conditioning and processing plant, and the feed-stock gas supporting that infrastructure.
- It helps government and industry co-ordinate efficient investment in and utilisation of pipeline, processing and conditioning infrastructure (efficient timing, size and type of infrastructure) by harnessing commercial information available at a project and basin wide level. The PSPL is most effective in immature basins and high cost environments where the cost of development continues to be underwritten by foundation projects.
- It helps clarify the intent of the Retention Lease by removing its use to stage resources required to underpin a project investment.

**Disadvantages**

- It adds a further tenure level to the current titling systems in-place across Australian jurisdictions.
- It may be possible to amend the existing PL framework to enable it to accommodate the nuances of a PSPL. However, this could lead to an increase in the complexity of the titling system.
- It may not fully address calls from commentators that resources that are commercial to develop now are being held or ‘warehoused’ by the industry under the current tenure arrangements.

**REFORM OPTION 2: OPTIMISING INVESTMENT ACROSS A BASIN - ACCESS TO COMMERCIAL INFORMATION**

Implement a statutory requirement for the provision of information relevant to the assessment of the commerciality of a discovered resource, including the pathways to development, timing, size and type of supporting infrastructure, and associated infrastructure costs.

The information must be held in confidence by the titles administrator and would be used to guide the development of a strategic basin development plan and the planning and work programs associated with resource development activities under Retention Leases and other title instruments.
Discussion

Some industry participants flagged the importance of the basin-wide commerciality review work commenced by NOPTA in 2017. It was noted that having a clear strategic view of the timing, size and type of development pathways for resources within a basin was critical if co-ordination was to enable the earliest commercial development of the resources at least cost.

Internationally, many regimes in established petroleum and gas provinces already have significant integrated and interwoven pipeline and production infrastructure – the consequence of many decades of investment in standalone and duplicated infrastructure resulting from a lack of co-ordination and sharing. The web of pipeline and production related infrastructure off the coasts of Norway and the UK in the North Sea, the Gulf of Mexico and onshore in the US are examples of duplicative investment in infrastructure driven by competition and a lack of co-ordination. Interestingly, the governments of each of these jurisdictions are currently active participants in the dialogue around development decision-making.

Facilitation of a co-ordinated approach is more challenging than simply requiring discussion between parties. It requires an integration of several layers of information and engagement and feedback between title-holders and the title administrator on an ongoing basis. Information gained in dialogues on individual resources are drawn into a dynamic picture of the whole basin, the strategic and commercial insights of which inform the confidential dialogue between title holder and title administrator and the formal work program attached to Retention Leases and their equivalents. A high-level characterisation is set out below.

- Develop a basin wide macro-picture, including the location, size, and characteristics of developed resources and associated infrastructure and ullage, discovered resources and areas of prospectivity.
- Overlay an understanding of the development plans for each resource, how the costs are structured (i.e. subsurface, resource or reservoir specific, pipeline and raw gas transportation, gas processing and conditioning).
- Overlay the capacity and utilisation of existing infrastructure and estimated timeframes to the emergence of ullage.
- Explore the optimisation of project plans, new and existing infrastructure across a basin. Use work programs and title reviews to encourage dialogue with and between project proponents to realise the potential optimisation of developments.
- Recognising the link between infrastructure development (and ullage) and the incentive to explore where there is prospectivity (because of the cost advantages of developing a resource near existing infrastructure), use the strategic basin-wide view to inform future acreage releases.

Improving the depth and quality of the information (reform option 2), while narrowing the scope of factors to be considered in regulatory decisions (reform options 1 and 4), increases the quality of decisions and reduces the risk of unintended consequences. In this way, the regulatory framework of Retention Leases is more clearly defined as economic regulation driving optimal investment in exploration and the earliest commercial development of resources.

An argument may be made that this approach has the potential to increase government involvement and prescription in free markets – in contrast to free market approaches and objective-based regulation in many jurisdictions. This case can only be made where the regulator uses the macro-picture as the outcome blueprint rather than a mechanism to guide the work-program of the titleholder and the regulator’s assessment of a field’s commerciality. The analysis in this review has highlighted the need to ensure capital efficiency through the timing, size, type and location of infrastructure investment in relation to all resources in a basin rather than on a resource by resource basis. The potential to do otherwise risks stranding resources that could otherwise be developed sooner and more cost efficiently. It also places resource development projects at a disadvantage in competition for capital with other international projects.

A further question is whether it is the government’s role to guide the development of a strategic basin development plan or whether government should instead encourage the title holders to share information to guide them how to develop their resources. Industry has noted the challenges to sharing commercial information that is inherent in most, if not all Joint Venture Agreements. It is likely that these limitations would
quickly create a legal constraint to collaboration between participants. A statutory obligation to the regulator or titles administrator would cut through this limitation and assist the regulator in managing both the individual titles and the broader strategic basin wide analysis.

It is understood that several regimes in Australian jurisdictions already conduct basin wide reviews and encourage industry to co-ordinate infrastructure planning. Access to information and a strategic approach to its use in the administration of the Retention Lease (or equivalent) regime is central to optimisation.

Industry has indicated that the basin wide and resource specific commerciality reviews conducted in some regimes adds significantly to the flexibility and effectiveness of the Retention Lease regimes. However, access to information, an integrated approach to titles administration and a focus on co-operation and co-ordination will strengthen the potential for optimised development of infrastructure and resources.

Arguments that suggest flexibility in the Retention Regime weakens rather than strengthens a regime’s ability to drive efficient investment and development outcomes misunderstand how the regime drives investment incentives. There are two over-riding incentives in the regime. First, the value of a resource comes from its commercial development. Second, the regime imposes a risk to the rights of the resource unless it is developed. The Regime will drive solutions to these incentives where there is flexibility to find a development path that is commercially viable. The key to earliest commercialisation of a resource, in order of efficiency and impact, is:

- the reduction of costs through co-ordination, which assists commerciality for industry but also results in an earlier development and royalty stream
- efficient administration and approvals
- subsidisation of supporting infrastructure
- subsidisation of sub-commercial projects

The confidentiality requirements within some commercial structures (i.e. JV arrangements) makes it difficult to share some of the information that would be useful to commerciality reviews and optimisation. A statutory obligation to provide the titles administrator with the information it requires to conduct the commerciality reviews, coupled with an obligation on the titles administrator to maintain the confidentiality of that information, should be inserted where relevant.

Further, a strategic basin-wide commerciality review process, should inform and be informed by a titles review process and the structure and outcome of any Retention Lease or Production Licence related work programs or development plans.

**Advantages**

- Enables access to information relevant to capital optimisation across a basin by circumventing the commercial resistance to shared planning and co-ordination.
- Supports optimisation of resource development and infrastructure investment by ensuring RL specific development planning is conducted within a basin-wide economic context.
- Recognises the importance of capital efficiency in realising the earliest commercial development of resources.
- Supports the role of the titles administrator in ensuring an integrated, strategic approach to development and investment in infrastructure.
- Ensures that Retention Leases are effective in driving efficient development outcomes and the earliest commercialisation of resources.
- Informs other parts of the petroleum value chain and regulatory framework, and enables more focussed:
  + acreage release and exploration
  + production planning
  + information to other service providers and downstream markets
- provides a basis for co-operative partnership with industry without requiring government to be a financial shareholder in each project.
- Relies on co-operation rather than direction (although there is a degree of direction available using work programs and conditions)

**Disadvantages**
- Exposes the titles administrator to reputational damage should commercial information be unintentionally disclosed.
- Relies on a strategic, co-operative and flexible approach to the administration of titles and breaks down where a more rigid and directive approach is adopted.
- Is potentially open to criticism where flexibility is viewed as a weakness rather than the strengthening of a regime’s ability to drive efficient investment and development outcomes.
- In some regimes this may mean that additional expertise in commercial project development will be required.
- Risks a more prescriptive approach to the regulation and management of Retention Leases.

**REFORM OPTION 3: IMPLEMENTING A FACILITATION FUNCTION TO CO-ORDINATE APPROVALS AND AGREEMENTS**

Consider establishing a resources project facilitation function within government to co-ordinate and manage the range of non-title approvals and agreements. Focus on those approvals required before a petroleum project takes a positive Final Investment Decision and, following that decision, prior to commissioning.

The function should be independent of any regulatory or other approval required for the project and act as a co-ordination function specialising in resources sector projects.

**Discussion**

Some jurisdictions have allocated a responsibility to a co-ordinating department (i.e. Department of State Development) or established a ‘one window into government’ specialised department to regulate and facilitate major or significant upstream petroleum projects. The facilitation function provides a range of services which vary between jurisdictions. These extend from the identification and mapping of project related government approvals, to whole of government coordination and facilitation of the project and project related government approvals.

Industry has indicated that, even with the facilitation function, a significant period can be required to negotiate government agreements and ancillary approvals. In some instances, negotiations and approvals can take up to two years to finalise.

Industry operating in onshore environments have noted the myriad of often overlapping and sometimes inconsistent approvals and assessment processes ancillary to the titles system itself. These include the range of infrastructure, local government, planning, and environmental approvals, and the negotiation of state and other agreements required. Industry noted that the timeframes to get these approvals were at times so long that the delay needed to be managed by postponing a move from a Retention Lease to a Production Licence. Some participants noted that the delays had a calculable cost, primarily time value costs, and that these delays had a calculable cost, primarily time value costs.

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33 A $1 billion project delayed by 1 year at a discount rate of 8 percent would incur a time value cost of $80 million. Delayed by 2 years the time value cost would be $166,400,000. While these costs may not appear significant when viewed against the project’s overall capital cost, a petroleum project that has an Internal Rate of Return of 10 percent or less is already marginal. In all likelihood, the project’s Internal Rate of Return has already been reduced by cost increases since board approval. In an April 2017 report for APPEA on Proposed Fiscal Changes in Australia, Specialist Oil and Gas consultants, Wood Mackenzie notes that Qatari projects generally had much higher Internal Rates of Return than many
impacted on the commerciality of the project. There may be significant opportunity to accelerate the development of resources where a more streamlined ancillary approvals co-ordination function is established which specialised in petroleum developments and focussed on the co-ordination and facilitation of all government approvals and required assessment processes.

To ensure it has the technical expertise to understand the nuances of the sector, consideration should be given to how the function is established. Options include a team established in the Department of State Development or equivalent agency and resourced from key departments with responsibility for the sector, or a function attached to the Resources related department.

**Advantages**
- Enables a title holder to navigate and complete the multitude of ancillary approvals and agreements required for a development during the investment approval; engineering design, construction and commissioning phases of a project.
- Potentially reduces the time required for approvals, enabling an earlier move from Retention Lease or equivalent to a Production Licence.

**Disadvantages**
- May erode the incentive to map and streamline approvals processes across a jurisdiction.
- The ‘State Development’ coordinating department may lack necessary specialised upstream petroleum knowledge and expertise.
- May impose costs on government and industry without benefit if not effective in shortening approvals and agreement timeframes.
- Similar benefit could potentially be achieved (by streamlining and removing layered, duplicative and inconsistent process and approval points) if specific resources project expertise is not held within the co-ordinating unit.

**REFORM OPTION 4: PROCESS CLARITY – RELEVANT MINISTER/S DECISION-MAKING ON TITLES**

This option would narrow the range of factors that are considered in the decision on a Retention Lease to those that are directly related to the economic regulation of Retention Leases. It would ensure that decisions are based on economic and commercial considerations and those factors directly relevant to the administration of titles consistent with the intent of the obligations in the Act. Alternatively, narrow the considerations in each jurisdictions’ Act to explicitly exclude consideration of social, environmental and downstream economic impact of market prices.

**Discussion**

Industry have indicated that there is often a significant delay, for example, between the submission of an application for the renewal of a Retention Lease and the Ministers’ decision. While the roles and timeframes of the titles administrator, as well as industry’s scope for, and opportunity to engage with them is well understood, this is not the case when the administrator’s advice goes to the Minister/s or the delegated decision-maker for decision. There appear to be two concerns within this broadly framed issue.

First, industry is concerned that there is a lack of consistency emerging in decision-making, with decisions increasingly reflecting political tension-points rather than the economic policy objectives of the regime. The concern is that other, political factors, are being considered when balancing the economic interests of the resource owners (governments as custodians of the resource) and the commercial interests of the rights owners (the titleholders). These other political factors should potentially be considered separately to the

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economic decisions on tenure, in the same way that land access, native title and environment are considered under separate processes.

Forcing expedited development of not yet commercial resources, or arbitrarily decreasing the certainty of tenure over a resource can impact on the petroleum value chain. Forcing expedited development does this in two ways:

- It undermines the incentive to explore, by reducing the expected value of the permit. It does this by reducing the potential to commercialise any discovery. This will lead to a slowdown in the discovery of potentially commercial resources.
- It increases the investment hurdle rate (Internal Rate of Return) required for any development to compensate for the increased risk to the portfolio of titles and potential projects held. This leads to a delay to investment approval, until capital or operating costs can be reduced or the long-term market price rises to a level that supports a positive Final Investment Decision.

A similar argument, that public commentary distorts investment incentives, can be made in relation to gas reservation policies, which are distortionary by design. If not well designed, reservation policies undermine the market incentive for smaller (or junior) explorers to explore for and develop fields that larger participants are not commercially interested in. This may have the effect of removing a layer of participants and small discoveries.

The fundamental principle should be: downstream market prices provide an input to commerciality assessments. Upstream decisions by governments should not be used to deliver downstream price outcomes.

Narrowing the scope of factors to be considered in regulatory decisions (reform options 1 and 4) while improving the depth and quality of the information (reform option 2), increases the quality of decisions and reduces the risk of unintended consequences. In this way, the regulatory framework of Retention Leases is more clearly defined as economic regulation with the primary objective of driving optimal investment in exploration and the earliest commercial development of discovered resources.

Clarifying the policy objective and designing the regulatory mechanism to deliver that objective, rather than on how the outcome might contribute to another policy objective in a separate sector, will lead to more effective outcomes in all regulatory regimes whether economic or not. While the retention lease regime is economic regulation, its objective is different to market regulation as it does not have an objective in relation to the regulation of price or quantity. The National Electricity Market regulatory framework ensures the efficient operation of the market, but does not mandate or direct participants to invest in supply capacity. Similarly, the economic regulation of electricity networks, pipelines, railway lines and other infrastructure does not mandate or direct participants to invest in supply capacity.

Second, engagement in processes for titles administrators such as NOPTA, are well understood accepted and viewed as valuable. However, the processes and protocols for dealing with Ministers on the rationale for a decision on a title are unclear to industry.

For example, industry view the process between the submission of the technical assessment of an application by NOPTA, to the point of decision by either the delegate or the Minister as a black box. They have noted that it is difficult to understand what factors are introduced and considered by the decision-maker during this time.

Nothing currently prevents a title-holder seeking a meeting with the Minister/decision-maker to discuss the title in question and set out the circumstances of the title that support the decision they are seeking. Similarly, it is the prerogative of the Minister/decision-maker to accept or set aside arguments put to them by any party with an interest in the decision.

**Advantages**

- Narrows the risk of unintended consequences, including the risk that a decision:
  - inadvertently delays the commercialisation of a field
  - undermines the view of and trust in the regime
  - distorts other markets.
Disadvantages

- May invite ongoing challenges that the Retention Lease regime is not supporting the broader domestic energy affordability agenda.

REFORM OPTION 5: STREAMLINING TITLES HELD BY A SINGLE TITLEHOLDER AND ISSUED OVER A SINGLE FORMATION

The legislation should enable the merging of multiple Retention Leases held by a single entity over a single structure into a single title. It should also enable splitting of leases, and accumulations, where a lease area is sufficiently large to allow two leases complying with minimum size requirements.34

Discussion

Historically, the pattern of exploration, declaration and grant of Retention Leases (or the acquisition of titles) has resulted in instances where multiple Retention Leases have been granted over accumulations in the same formation and/or in close geographic proximity.

Industry has pointed out that this circumstance has meant that a lease holder with several Retention Leases or authorities over a single formation is likely to have different expiry dates, work-program commitments and conditions, creating unnecessary administrative burden.

Industry has noted that the reverse is also true where there is no flexibility to allow gas deposits to be developed separately, particularly where the non-commerciality of one or several gas deposits undermines the commerciality of another or others. In this situation the commercial conditions dictate staged developments. As an example, a single Retention Lease (or equivalent) which includes a commercially viable primary accumulation and several non-commercial satellite accumulations, may, together make the entire accumulation uncommercial. The accumulations could be split on the proviso that the primary accumulation is established under a PL while the remaining area is retained as an RL with an appropriate work program and conditions attached to make it commercial within the term of a Retention Lease or authority.

From an economic policy perspective, there is little to be gained in requiring the development of all fields in the RL or authority if this delays the commercial development of any of them. Indeed, the development of the commercial resource may well bring forward the development of the uncommercial pools as ullage becomes available in the associated infrastructure, or other development costs are reduced.

Consequently, the earliest commercial development of a resource would be better achieved where the Retention Lease framework is sufficiently flexible to recognise and accommodate the individual characteristics of gas fields and accumulations across a geological structure.

Further consideration of the tax implications of splitting and merging titles is required before this reform option is implemented.

Advantages

- Reduces administrative burden and simplifies titles management
- Increases the capacity to view the accumulations as a whole and develop an integrated work program across all accumulations in a formation.
- Allows for the more practical administration of projects.

Disadvantages

- Risks viewing the whole title without considering the intricacies of the individual accumulations.

34 While this option was developed as a result of discussions with industry participants, it is noted that a similar reform was canvassed in the 2015 interim Offshore Petroleum Resources Management Review, Action 4.19.
- Increases the importance of flexibility and consistency in titles decision-making to avoid decision-making rigidity undermining the ability to separate and progress the development of accumulations which are commercial.

- May require complex reforms in some regimes. The benefits of this approach need to be considered before implementation.
SUMMARY AND CONCLUSIONS

Australia has substantial gas resources and reserves. Gas reserves alone are equal to approximately 47 years of gas at current production rates (meeting domestic and export demand). If domestic supply and exports are to continue to drive economic growth and support prosperity, further investment is required in exploration, pipeline and production infrastructure.

Retention Leases have played an important part in enabling the exploration, development and production of gas resources across Australia. Providing a bridging tenure between Exploration Leases and Production Licences by providing a certainty of tenure to title holders while they work to identify pathways to commercialisation of the resource.

The high cost of development has changed the industry’s approach to development both on and offshore. While the downturn in oil prices and investment in supply capacity has reduced some costs globally, this reduction has not closed the gap between development costs in Australia and those in countries such as the U.S., Qatar and Canada with whom Australia competes for development capital. The existing infrastructure capacity from previous investment in those countries gives them a significant capital efficiency advantage. The cost challenges associated with developing the resource remain the same. Processing and pipeline infrastructure costs need to be managed to make the overall economics of the project work. The Internal Rate of Return must meet the expectations of the project sponsors for a positive Final Investment Decision. Bringing forward the earliest commercial development of a resource means reducing the capital costs relative to the expected revenues of the development.

This review of Retention Lease regimes in Australia has not found any fundamental flaw or failure. The data available indicates that more than 89 percent of active Retention Leases have been renewed two or less times since grant, and the average time held under retention is 10 years. The earliest grant of a currently active Retention Lease was in 1987 (Commonwealth territory off WA) followed by one in 1990 the (NT); one in 1991 (Commonwealth territory off WA); two in 1992 (Vic and Commonwealth territory off Vic); three in 1994 (Commonwealth territory off WA); two in 1995 (Commonwealth territory off NT and off WA); and one in 1996 (Commonwealth territory off NT). This highlights the rise in exploration activity following the introduction of the offshore retention lease regime in 1985.

In the specific resources and basins analysed (and using the available data), the weight of evidence is that the cost of supporting infrastructure (pipelines, conditioning, compression and processing plant), coupled with the technical challenges of the resource (i.e. complex geology, small reserve, lack of liquids, gas composition) are undermining the commercial viability of resource development. There is no evidence of warehousing or misuse of the titling system.

However, the review concludes that there are a range of adjustments that could be applied in different degrees nationally which will strengthen the ability of individual regimes to:

- drive optimisation of investment in and utilisation of infrastructure required to develop resources. The cost of supporting infrastructure (pipelines and processing) is the most frequent challenge to the commercial development of a resource. A stronger insight to the commerciality of a resource and the ability to assist cooperation across industry provides an opportunity to bring forward the commercial development of resources.
- reduce the administrative burden and timeframes for broader approvals and agreements associated with the development of a resource and its related infrastructure.
- ensure that decisions relevant to the commerciality or otherwise of a resource are framed within the scope of and consistent with the objective of the Retention Lease regime while maintaining its flexibility to be able to respond to the individual conditions of each resource.


36 Excludes SA PRLs as the information on the number of renewals for each PRL was not available.
ensure administrative streamlining and flexibility.

With well-structured policy settings, this will mean that Retention Lease regimes in Australia will support and enable the earliest commercial development of discovered reserves at a cost that supports the long term sustainable supply of gas, and at a price that supports domestic economic growth and expansion of our exports. The reform options, when implemented collectively, have been developed to strengthen the capacity of Retention Lease regimes to drive the earliest commercialisation of resources by ensuring projects fully explore opportunities for capital efficiency when identifying potential pathways to development. The reforms build on the existing capacity of the regime to ‘encourage’ co-operation to drive optimal investment outcomes while maintaining loss of title as a credible threat where performance is lacking.

The alternative, adopting a tougher ‘use it or lose it’ policy will undermine the investment signals for exploration and development by increasing the risk to tenure. This will delay the point at which a resource is commercial by increasing the Internal Rate of Return and, as a consequence, the price of delivered gas required to make it a commercial development.
ANNEX A

SURVEY QUESTIONS PROVIDED TO STAKEHOLDERS

- With which jurisdictions have you engaged in relation to Retention Leases? (or Potential Commercial Areas/Petroleum Assessment Leases etc)
  + WA – Retention Leases
  + NT – Retention Leases (RLs)
  + QLD – Potential Commercial Areas (PCAs)
  + NSW – Petroleum Assessment Leases (PALs)
  + VIC – Retention Leases
  + SA – Retention Leases
  + Commonwealth – Retention Leases (Offshore)

- What do you believe is the policy intent behind the RL/PCA/PAL scheme?
  + Does your experience of the Retention Lease scheme match your interpretation of the policy intent?

- Do you believe the regulatory and legislative frameworks for Retention Leases allow for a clear process and the implementation of the current policy intent?
  + Are you able to operate effectively in the jurisdiction/s?
  + Are there clear decision points?
  + Is there clarity over the process and decisions?

- If you have worked across multiple jurisdictions, what worked/didn’t work in different regimes?

- What are the commercial drivers and other relevant issues that influence company decisions to seek Retention Leases?

- From your perspective, how do governments critically examine commerciality of the proposed development pathways for the resource?

- What do you consider are the best mechanisms governments can bring forward the commercial development of a resource? What are the potential risks, benefits or cost for each option?

- What other interests are impacting on the effectiveness or otherwise of Retention Lease frameworks?
  + Multiple land use issues
  + infrastructure availability/cost issues
  + technology issues
  + access to market
  + Should, and if so how should these issues be taken into account with the Retention Lease framework?

- Do you believe warehousing occurs with the Retention Lease regime? (warehousing being defined as a resource that is commercially viable now being held under RL/PCA/PAL)

- Is warehousing different from project staging? Why/why not?

- How could warehousing/staging be better managed?

- Would you like your input considered in-confidence?

- Are there any other aspects of the Retention Lease regimes across jurisdictions that should be changed?
ANNEX B

ANALYSIS – RETENTION LEASES, DEVELOPMENT AND INFRASTRUCTURE

Victoria

This analysis reviewed three offshore basins in Victoria: the Gippsland Basin off eastern Victoria; the Otway Basin off south western Victoria and South Australia; the Bass Basin in between Victoria and Tasmania.

There are currently 11 Commonwealth petroleum retention leases, of which ten contain gas resources. There are also one production licence, one retention lease and three exploration permits in Victorian coastal waters.

Noetic’s analysis suggests that earlier implementation of a basin wide approach that considers an integrated plan of upstream pipeline and processing infrastructure would have assisted in increasing capital efficiency of developments in Victoria’s mature basins today. Given the maturity of the basins, and the relative increase in development costs associated with decreasing field size and quality, it is unlikely that significant capital efficiency benefits could be realised from the shared development of remaining offshore resources. However, some opportunities may arise as ullage becomes available in gas conditioning plant and pipelines. This will likely maintain supply volumes rather than add capacity to the market.

Gippsland Basin

The five existing retention leases in the basin are located at the margins of the Central Deep (Figure 3). Two of these are held by the Gippsland JV (VIC/RL1 and VIC/RL4) over Mulloway (oil), part of Golden Beach (gas—mostly in Victorian coastal waters), as well as Sunfish and Remora fields (gas). The Golden Beach gas field, under VIC/RL1(V), is the only retention lease in Victoria’s coastal waters within the offshore Gippsland Basin. An application for the renewal of VIC/RL4 is currently being considered by the Commonwealth-Victoria Offshore Petroleum Joint Authority. A renewal of VIC/RL1 was granted on the 7th of May 2018.

Cooper Energy Ltd holds the remaining three retention leases (VIC/RL13, VIC/RL14 and VIC/RL15) over the Manta, Basker and Gummy fields. These fields were previously held under production licences and developed as an oil project. At the end of commercial oil production applications were received for retention leases over the remaining gas resources. The retention leases were granted in April 2017.

It is noted that Cooper Energy is considering development pathways that include pipeline options from the Manta, Basker and Gummy fields direct to the Orbost Gas Plant or to Cooper Energy’s Patricia-Baleen production facilities and pipeline. This may well be the most economic and earliest pathway for the development of the fields. Noetic was unable to determine the degree to which the regulatory system ‘encouraged’ discussion on shared infrastructure investment or the use of any potential ullage in nearby ‘third-party’ infrastructure.

Figure VIC1- Gippsland Basin Retention Leases and pipeline Infrastructure
**Bass Basin**

The Bass Basin has four retention leases (T/RL2, T/RL3, T/RL4 and T/RL5), all operated by Lattice Energy. Alternatives are being considered for the development of the four retention leases as backfill to the existing production at the Yolla Field, with backfill potential sources including White Ibis, Bass, Trefoil and Rockhopper fields (Figure 4).

Using ullage in the Bass Gas pipeline, if available, would reduce the cost of development for the White Ibis, Bass, Trefoil and Rockhopper fields, bringing forward their commercial development. The challenge with adding capacity to trunkline infrastructure is that it would simply shift any supply constraint to downstream infrastructure, most likely to the Lang Lang gas processing plant. Further, the cost of establishing stand alone pipeline infrastructure for the development of the White Ibis, Bass, Trefoil and Rockhopper fields may make their development uneconomic at current domestic gas prices.

Figure VIC2 – Bass Basin Retention Leases and pipeline Infrastructure
Otway Basin

Two offshore retention leases (VIC/RL11 and VIC/RL12) exist in the nearshore area over the Black Watch and Martha fields, with the former also straddling Victorian coastal waters. These retention leases are held by Cooper Energy. Martha is close to shore but relatively small and while La Bella is larger, it is approximately 50 km from shore and contains higher CO2, increasing the cost of pipeline and processing infrastructure.

Figure VIC3 – Otway Basin Retention Leases and pipeline infrastructure
There are currently seven Commonwealth petroleum retention leases in the offshore Bonaparte basin. There are also three retention leases in the NT, RL1 (the Weaber field in the onshore Bonaparte basin) and RL3 and RL4 (the Ooraminna field in the Amadeus basin). A map showing the location of RL1, RL3 and RL4 relative to infrastructure is at Figure NT1.

Noetic’s analysis suggests that the cost of infrastructure and access to infrastructure enabling access to demand are key issues in the earliest commercial development of resources onshore as well as offshore. Accessing capacity in existing easements or ullage in existing pipelines is important in enabling earliest commercialization which facilitate supply of demand at commercially sustainable prices.

**Bonaparte Basin**

The seven Commonwealth Retention Leases managed by the Commonwealth and NT Joint Authority are held over 6 individual fields, ranging in size from 200 to 7,500 Bcf and are located between 300 and 500 km offshore. In total it is estimated that the 7 RLs cover approximately 19,000 Bcf, with a wide range in gas composition.

The NT Retention Lease (RL1) in the Bonaparte is over the Weaber gas field, estimated to hold 11.5 Bcf at 2C. Challenges faced in its commercial development revolve around access to market, and Advent Energy continues to look for local demand or access to transport infrastructure (pipeline or roads for CNG processing and transportation). Analysis suggests that the constraint to commercialisation remains access to infrastructure enabling supply of demand at commercially sustainable prices.
Amadeus Basin

NT Retention Leases RL3 and RL4 are held by Central Petroleum are currently in their first term. NT advises that Ooraminna field holds approximately 106 PJ (100.5 Bcf) of gas at 2C. According to Central Petroleum the Ooraminna field is not commercial at this stage for two reasons:

First, there is a high degree of uncertainty around the resource estimates driven by a lack of knowledge of the field. This makes it difficult to consider the economics of any development pathway.

Second, the lack of demand in the vicinity of the field, together with limited, if any, current ullage in the pipeline network giving access to demand elsewhere, continues to challenge the commercial viability of development pathways.

Figure NT1 – Onshore Retention Leases and Pipeline Infrastructure

Commonwealth Offshore

There is an increasing realisation that standalone, greenfields infrastructure projects in offshore Australia are likely to struggle for investment support given their costs relative to other projects around the world.

Industry leaders are flagging that a collaborative approach was needed between all gas resource holders and developers to build a more efficient gas system off the WA coast. This would improve the competitiveness of local LNG projects against projects seeking investment funding elsewhere in the world. Industry has pointed to examples of such collaboration in the sector in the North Sea, Canada and in the Appalachian shale basin in Pennsylvania.

Chevron and Woodside are amongst other industry participants who note that the U.S. LNG projects were racing ahead with innovative ways to lower capital costs and shorten development times. Shared infrastructure in areas where the cost of infrastructure is a significant proportion of the cost of development would reduce duplication and cost and maximise value for all users. It would also help develop stranded gas resources and keep LNG and gas processing plants full for longer.

Chevron and Woodside are actively pursuing engagement on shared infrastructure. There is value in ensuring a strategic, basin wide perspective is considered in the development plans of each retention lease. The regulator or titles administrator is best placed to ensure individual projects inform and are informed by a basin wide strategic view of infrastructure development timing, type and size.

Scarborough

First discovered in 1979, the resource has been held under retention lease since 1987. The current retention lease is the fifth renewal and will expire in November 2020. This has prompted claims that the field was being warehoused.

The Scarborough field is located in the Carnarvon Basin, north-west of Exmouth approximately 300km off the Western Australian coast in average water depths of 950m. The field has a contingent reserve of 7.3 Tcf of dry gas (at 2C). Scarborough’s dry gas (almost no liquids to support an earlier revenue stream), coupled with the remoteness of the field and deep water, the economic (capital cost) and technical challenges to developing the field are a major hurdle.

The water depth at the resource, its lack of liquids to support early revenue streams from any development and its distance from shore meant that the capital cost of greenfields supporting infrastructure was so large that it could not meet the Internal Rate of Return required for investment signoff. A step change in capital efficiency would be required to bring forward the commercialisation of the resource.

The advent of Floating LNG (FLNG) technology brought forward a revised development path for Scarborough with the technology avoiding the cost of a greenfields investment in a 400km pipeline and an onshore LNG processing facility. FLNG technology remained the preferred development concept through 2017 with its capital cost advantage over a greenfields pipeline and onshore processing plant.
In late 2017 a further development concept was proposed. This concept enables risks and costs to be reduced further through a combination of an offshore pipeline and the utilisation of ullage in existing onshore processing plant and staged brownfields expansion of that capacity\textsuperscript{37}.

The offshore component involves:

- 12 subsea, high-rate gas wells tied back to a semi-submersible platform moored in 900 m of water. The ~20,000 tonne topside has processing facilities for gas dehydration and compression to transport the gas through a ~400 km pipeline to the Woodside-operated Pluto LNG facility.
- The proposed carbon steel trunkline will be ~400 km long, significantly shorter than recently constructed offshore gas pipelines in the region. Woodside’s ongoing subsea development programs in the North West Shelf and Exmouth area provide contemporary analogues for cost and execution schedule estimates. The seabed transition zone from the deep water to the North West Shelf is well known to Woodside after previous successful projects in the area. Pluto LNG has already constructed a shore crossing for a second trunkline in preparation for future expansion.

The onshore component involves:

- A brownfield expansion of the existing Woodside operated Pluto LNG facility. LNG expansion projects have traditionally provided cost competitive new LNG capacity into the market. Extensive onshore development studies for Pluto LNG expansion were undertaken in 2010/11, including a complete front-end engineering and design phase for a second LNG train at Pluto.
- The composition of the Scarborough gas itself is well suited to the Pluto LNG plant which is designed for lean gas and nitrogen removal. Pre-investment in the Pluto LNG site for future expansion and existing environmental approvals for a second LNG train further de-risks the project.

Cost estimate:

- The cost estimate of $8.5 – $9.7 billion (100% project) is a real terms 2018, Class 0, pre-concept select phase cost estimate and includes a 25% contingency. Activities prior to final investment decision are expected to cost approximately $0.5 billion (100% project).

The Scarborough joint venture will now be focused on finalising the development concept prior to entering FEED and positioning for Final Investment Decision in 2020.

\textit{Browse}

The history of the Browse fields provides a clear articulation of how the resource development process competes for capital globally and prioritises those projects based on their Internal Rate of Return. The competition for Australian projects remains those in countries such as the USA, Qatar and Canada where in-place infrastructure provides a significant capital advantage over greenfields investment or the use of new technology such as Floating LNG production.

The Browse resources are located in the Browse Basin, located offshore approximately 425 km north of Broome in Western Australia. There are three primary fields Torosa, Brecknock and Calliance collectively a contingent resource of 16 Trillion cubic feet (Tcf) and 466 million barrels of condensate.

There are seven petroleum retention leases over Torosa, Brecknock and Calliance under the Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth) (OPPGSA), the Petroleum (Submerged Lands) Act 1982 (WA) and the Petroleum and Geothermal Energy Resources Act 1967 (WA).

Torosa, Brecknock and Calliance were discovered in 1971, 1979 and 2000 respectively. They have been under Retention Lease since 2003 with two renewals.

In 2013 a development path piping gas from Browse onshore to an LNG processing plant at James Price Point, a capital investment reported at ~$80 billion, was set aside on the basis that the project would not deliver the

returns needed to support the investment\textsuperscript{38}. Estimates for the project before Front End Engineering and Design (FEED) studies had been reported at half this amount at $45 billion.

Work was then commenced on an alternative development concept using Shell’s floating LNG technology (FLNG). On 22 March 2016 following the completion of FEED studies, the BJV participants decided not to progress further with the floating LNG development concept which was selected at FEED entry in June 2015. The capital cost of a development using FLNG technology was reportedly $40 billion (although there are suggestions that the capital cost estimate arising from the FEED work were considerably higher), again making this development path uneconomic\textsuperscript{39}.

The Browse Joint Venture are now exploring a brownfields development option and are undertaking technical studies on the feasibility of a “1000 km pipeline taking 10 to 12 million tonnes per annum to the existing North-West-Shelf production facilities and potentially extending their utilisation at capacity by 10 to 15 years\textsuperscript{40}. While much of the concept analysis is yet to be done, estimates drawn from similar studies suggests the capital costs could be “$20 billion, highlighting the capital cost advantages of brownfields development.

South Australia

As of March 2018, there are 63 PRLs over gas discoveries within South Australia extending across the Cooper/Eromanga (60 PRLs) and Otway basins (3 PRLs). The size of the gas resource held under these PRLs is collectively estimated at not currently available. This analysis has primarily considered the PRLs in the Cooper/Eromanga basin.

Understanding the focus of the South Australian regime has included reading a cross-section of the PRL annual reports\textsuperscript{41} and licence Registers\textsuperscript{42}.

South Australia applies two approaches to the granting and management of PRLs. South Australia retains the option to offer/grant PRLs restricted to 2x the yet-to-be deemed probably economic (2P) area around discovered fields - with a relevant minimum work program. This is similar to other jurisdictions. The work programs are typically restricted to ‘studies to progress towards commercialising’ a resource. South Australia has issued such PRLs in the Cooper-Eromanga and the Otway basins.

In addition, South Australia offers Grouped PRLs where the PRL would cover the extent of a proven play (e.g. more than a single discovered field). To date, South Australia has only deployed Grouped PRLs in the Cooper-Eromanga basins. The grouped PRL approach differs in that it uses a minimum annual expenditure requirement to offset an obligation to surrender acreage at five-year intervals. It does this in the absence of a resource-specific work program or set commerciality review.

Noetic’s analysis suggests that a financial incentive may not drive optimum commercial development where it is the primary regulatory obligation/incentive to drive activity towards commercialisation. It also potentially risks disadvantaging smaller operators with lower cashflow and longer lead times in favour of those with stronger cashflow.

*Cooper/Euromanga*

60 of the 63 PRLs in SA are located in the Cooper/Euromanga basin, which is considered a mature basin. It is worth noting that the gas PRLs (highlighted on Figure SA1) circle the vast majority of production licences (PPLs) which themselves are mostly located around the Moomba hub and related infrastructure.

\textsuperscript{40} https://www.pesa.com.au/woodside-reveals-thinking-browse-project/
\textsuperscript{41} http://petroleum.statedevelopment.sa.gov.au/legislation_and_compliance/annual_reports
\textsuperscript{42} http://petroleum.statedevelopment.sa.gov.au/licensing_and_land_accessregisters#PRL%20100
Without a more detailed review of the individual PRLs and the reasons for their current lack of commerciality, it is difficult to assess the extent to which the regulatory obligations and incentives in SA are driving the earliest commercial development of the resources held under PRL.

Figure SA1

ANNEX C

DOCUMENTS CONSULTED

- WA Petroleum and Geothermal Guidelines for Grant and Administration of a Retention Lease, Government of Western Australia, Department of Mines and Petroleum, Petroleum Division.


- The Petroleum Act 1984

- The Petroleum (Submerged Lands) Act 1982

- The Offshore Petroleum and Greenhouse Gas Storage Act

- Petroleum and Gas (Production and Safety) Act 2004 (QLD)


- Nation Builder: How the North West Shelf Project has driven economic transformation in Australia, ACIL Tasman, October 2009.


- Chandler, J., 2016. ‘How are onshore licensing regimes in Australia dealing with the challenges of petroleum in shale and other tight rocks?’ Australian Resources and Energy Law Journal, 34 (3).


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ANNEX D

MENTIONS OF WAREHOUSING


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ANNEX E

LIST OF STAKEHOLDERS

**Jurisdiction Representatives**
- Western Australia
- Northern Territory
- Queensland
- New South Wales
- Victoria
- South Australia
- Commonwealth

**Industry**

**Face to Face:**
- Chevron Australia
- Shell Australia
- Woodside
- Beach Energy
- Santos
- Senex
- Exxon Mobil
- Australian Petroleum Production and Exploration Association (APPEA)

**Email Survey:**
- Australian Energy Market Operator (AEMO)
- Arrow Energy
- Strike Energy
- Bridgeport Energy
- Cooper Energy
- Australian Chamber of Commerce and Industry (ACCI)
- Australian Pipeline and Gas Association (APGA)
- Buru Energy
- Origin Energy
- Central Petroleum
- Pangaea
- Squadron Energy
## ANNEX F

### SUMMARY OF RETENTION LEASES, GAS RESOURCES AND RENEWALS

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Number of RLs</th>
<th>Number of renewals/extensions</th>
<th>First Granted</th>
<th>Expiry of current RL</th>
<th>Reserve/Contingent resource</th>
<th>Basin/ field</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Australia</td>
<td>4 nearshore</td>
<td>Between 1 and 3</td>
<td>Between 2001 and 2009</td>
<td>Between 2020 and 2022</td>
<td>Collectively 500.5 Gm³ or 17,675 Bcf</td>
<td>Browse and Northern Carnarvon Basins</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 onshore</td>
<td>Between 0 and 2</td>
<td>Between 2003 and 2014</td>
<td>Between 2020 and 2022</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Australia</td>
<td>63</td>
<td>4 renewals</td>
<td>(2) 2018</td>
<td></td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>compartments</td>
<td>Rounds (2018 &amp; 2019)</td>
<td>2013 (renewal pending)</td>
<td>resource estimate (Bcf)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>--------------</td>
<td>-----------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victoria</td>
<td>2 (PRL2 &amp; PRL3)</td>
<td>0</td>
<td>2007</td>
<td>Collectively 50 Bcf (P50)</td>
<td></td>
<td></td>
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<tr>
<td>Petroleum Act 1998</td>
<td>RL1(V)</td>
<td>6</td>
<td>1992</td>
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<td></td>
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<tr>
<td>NSW</td>
<td>1</td>
<td>0</td>
<td>2007</td>
<td>403 Bcf (NSW estimate)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Queensland</td>
<td>67 PCAs</td>
<td>PCAs not renewable</td>
<td></td>
<td>7,769 Bcf (2C)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Northern Territory</td>
<td>1 nearshore</td>
<td>5</td>
<td>1990</td>
<td>11.5 Bcf (2C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 onshore</td>
<td>0</td>
<td>2013</td>
<td>100.5 Bcf (2C)</td>
<td></td>
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</tbody>
</table>

Weaber: RL holder is vigorously pursuing a major market opportunity in the vicinity of the field.

Ooraminna Field: Lack of knowledge of the field, high uncertainty on resource estimates and a lack of a viable market in the vicinity of the field.
<table>
<thead>
<tr>
<th>Commonwealth OPGGSA (offshore)</th>
<th>Cwlth (WA)</th>
<th>Cwlth (Vic)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total 66</strong></td>
<td></td>
<td><strong>Total 7</strong></td>
</tr>
<tr>
<td>38</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Carnarvon; Nth Carnarvon;</td>
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<td>Gippsland</td>
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<tr>
<td>Browse; Bonaparte;</td>
<td></td>
<td>Otway</td>
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<tr>
<td>Individual fields range from 5 to 11,000 Bcf.</td>
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<tr>
<td>7</td>
<td>1</td>
<td>0</td>
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<tr>
<td>2011; 2012</td>
<td>2021-2023</td>
<td>2016</td>
</tr>
<tr>
<td>Bonaparte; Carnarvon</td>
<td></td>
<td>2017 (pending renewal)</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>2017 (pending renewal)</td>
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<tr>
<td>2003;2004;2006</td>
<td>2019; 2020;2022</td>
<td>2021</td>
</tr>
<tr>
<td>Carnarvon; Browse; Bonaparte</td>
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<td>Carnarvon</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2000; 2001</td>
</tr>
<tr>
<td>2001</td>
<td>2021</td>
<td>1987</td>
</tr>
<tr>
<td>Carnarvon</td>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2019</td>
</tr>
<tr>
<td>1991; 1994; 1995</td>
<td>2020;2022</td>
<td>Carnarvon;</td>
</tr>
<tr>
<td>Bonaparte; Carnarvon</td>
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<td>Carnarvon</td>
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<tr>
<td>1</td>
<td>5</td>
<td>2017</td>
</tr>
<tr>
<td>1987</td>
<td>2020</td>
<td>Carnarvon</td>
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<tr>
<td>Individual fields range from 9 to 230 Bcf</td>
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<tr>
<td></td>
<td>Field Count</td>
<td>Year 1</td>
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<tr>
<td><strong>Cwlth (Tas)</strong></td>
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</tr>
<tr>
<td>Total 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2015</td>
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<tr>
<td><strong>Cwlth (NT)</strong></td>
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<tr>
<td>Total 7</td>
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<td></td>
<td>2</td>
<td>2014; 2016</td>
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<td>1</td>
<td>2007</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1994; 1996</td>
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<tr>
<td><strong>Cwlth (Ashmore Cartier Territory)</strong></td>
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<tr>
<td>Total 9</td>
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<td>2x2006</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>1994</td>
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</table>
AUTHORS

PETER MURPHY
Principal Consultant
Mobile 0416 064 464 (+1 202 664 6828)
Phone 02 6234 7777
Email Peter.Murphy@noeticgroup.com

DEMUS KING
Lead Consultant
Mobile 0416 207 273
Email Demus.King@noeticgroup.com
Demus@ConsiliumConsulting.net

KATHRYN VINCENT
Supporting Consultant
Phone 02 6234 7777
Email Kathryn.Vincent@noeticgroup.com