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Australia's Regulatory Framework for the Decommissioning of Offshore Petroleum Projects: Reforms for a Low-Carbon Future by F. Cameron

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Australia's Regulatory Framework for the Decommissioning of Offshore Petroleum Projects: Reforms for a Low-Carbon Future

Fiona Cameron*

Summary

Australia is facing an upcoming wave of decommissioning of offshore petroleum projects. The current Australian regulatory regime envisages a 'base case' of complete removal of offshore oil and gas installations once they have reached the end of their useful life. However complete removal is costly, emissions and resource-intensive, and likely to be made more difficult by the changing climatic and ocean conditions associated with global warming.

Whilst it is possible under current legislation for titleholders to decommission using alternative, more climate-friendly methods, this article argues that issues of regulatory fragmentation and application of the 'base case' act as disincentives to adopting alternative methods of decommissioning within Australia. Drawing on the experience of other jurisdictions and interventions, the article suggests reforms which might be made to address these and other issues, and to enable the petroleum industry to decommission more effectively for a low-carbon future.

Introduction

In the next 25 years, some 100 petroleum installations in Australia's offshore territory will reach the end of their useful life and require decommissioning.¹ 'Decommissioning' is the taking out of service of an offshore petroleum installation, which may involve a variety of activities including plugging and abandoning a well and/or partially or completely removing and disposing of associated physical structures.² The anticipated requirements of decommissioning of offshore petroleum projects in the coming two decades are so significant that it has been flagged as 'the next Australian oil and gas boom',³ involving an anticipated cost in excess of AUD\$1.2 billion.⁴

Australia's current regulatory regime envisages a 'base case' for decommissioning which requires the complete removal of offshore oil and gas installations once they have reached the end of their useful life. However, the activities required to remove, transport, and break down these structures can be emissions and resource-intensive. It is therefore important to consider both how the upcoming wave of decommissioning activities associated with offshore oil and

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¹ S Barrymore and A Butler, 'Decommissioning facilities in Australia's Offshore Areas – Whose Responsibility?' (2015) AMPLA Yearbook 363, 364.

² E Techera and J Chandler, 'Offshore installations, decommissioning and artificial reefs: Do current legal frameworks best serve the marine environment?' (2015) 59 Marine Policy 53, 53-4. For a detailed discussion of the procedures involved in decommissioning, see Fam et al, 'A review of offshore decommissioning regulations in five countries – strengths and weaknesses' (2018) 160 Ocean Engineering 244, 246.

³ B Cullinane and S Gouvernec, 'Decommissioning – the next Australian oil and gas boom?' (2017) 57 The APPEA Journal 421.

⁴ Barrymore (n 1).

gas structures may impact upon Australia's ability to meet its significant and mounting responsibilities under the Paris Agreement,⁵ and how decommissioning activities themselves may be impacted by climate change.

Recent legislative, policy and scientific developments currently present an opportunity for decommissioning to be undertaken in Australia using alternative methods which may reduce the net emissions, environmental impact and vulnerability to climate change of the process. This may include by repurposing depleted formations and existing infrastructure for carbon capture and storage projects (CCS) and undertaking '*in situ*' decommissioning rather than completely removing structures. However, this article will argue that the current Australian regulatory framework is in need of further reform if it is to enable the petroleum industry to engage meaningfully with these alternatives in the interests of climate change mitigation and adaptation.

This article is structured as follows: Section one outlines the importance of climate outcomes to the oil and gas industry as a justification for seeking actively to involve the industry in measures designed to mitigate carbon emissions and adapt to climate change. Section two provides an overview of the international, national and State legislation relevant to the decommissioning of offshore petroleum assets within Australia, using Western Australia as a particular example. Section three highlights how issues of fragmentation and application of the 'base case' for decommissioning within the current framework act as disincentives to adopting alternative methods of decommissioning. The article concludes in section four by drawing on lessons and interventions from other jurisdictions to suggest improvements to the current legislation aimed at maximising the ability of industry stakeholders to undertake decommissioning in more environmentally-friendly ways.

1. The Imperative: Climate, Environment and Offshore Oil and Gas

The interactions between climate change and the petroleum industry are many and mutual, particularly in the context of offshore operations. On the one hand, the environmental and emissions impact of oil and gas production is well recognised: it is amongst the most emissions-intensive of all industries. Taking into account the emissions impacts of its products (that is, indirect emissions occurring both through the use of petroleum products and elsewhere in the value chain of petroleum extraction⁶), oil and gas production collectively accounts for around half of global carbon dioxide emissions.⁷ On the other hand, the industry faces significant climate risk.⁸ Because oil and gas operations are typically capital-intensive and require substantial upfront investment in fixed physical structures, they are generally required to operate over long periods in order to achieve profitability⁹ and face a very real

⁵ Australian Government, 'Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement' (August 2015); Conference of the Parties, United Nations Framework Convention on Climate Change, Paris Agreement, UN Doc FCCC/CP 2015/7 (12 December 2015) (**Paris Agreement**), Article 4.

⁶ These are defined as 'scope 2' and 'scope 3' emissions in Australia's National Greenhouse and Energy Reporting Scheme: Australian Government, Clean Energy Regulator, 'Greenhouse Gases and Energy', <<http://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/Greenhouse-gases-and-energy>> accessed 25 September 2018.

⁷ T Soliman et al, 'In the pipeline: Which oil and gas companies are preparing for the future?' (Report, November 2016), 3.

⁸ K Halsnæs et al, 'Socio-economic Impacts—Offshore Activities/Energy', in M Quante and F Colijn (eds), *North Sea Region Climate Change Assessment* (Springer, Cham 2016), 410.

⁹ M Smith, 'Assessing Climate Change Risks and Opportunities for Investors: Oil and Gas Sector' (Report, Investor Group on Climate Change, April 2016), 3.

practical vulnerability to worsening extreme weather events over time, which may damage physical assets and disrupt the supply chain.¹⁰ Damage to physical structures in the marine environment also comes with increased risk of chemical releases and oil spills.¹¹ In the particular context of decommissioning offshore petroleum structures, climate-related risks are predicted to cause increased difficulty through a variety of mechanisms. These include delays and physical damage to infrastructure due to extreme weather events, rising sea levels, and changes to ocean temperatures and acidity levels, and the increased challenge and cost of removing structures which have been reinforced to withstand these environmental changes during their operating lifespan.¹²

Political and economic factors associated with climate change are also likely to have an impact. For instance, it has been suggested that without commercially viable carbon capture and storage to reduce the emissions of the energy sector, the currently estimated asset values of oil and gas reserves are likely to be overstated in the context of a low-carbon future. This may potentially lead to more assets becoming 'stranded' within a reduced timeframe, which will require decommissioning.¹³ However, the industry has been slow to respond. In 2009, the advisory group Acclimatise observed that there was then no evidence from a review of published reports that oil and gas companies were assessing or reporting the impacts of changing climactic conditions on the decommissioning costs for their existing and planned assets.¹⁴ Aside from the corporate governance concerns this raises,¹⁵ it is symptomatic of a general historic failure at both industry and government levels to properly account for decommissioning requirements in a changing climate. This is particularly the case where environmental site protection and reinstatement plans agreed during the planning and licensing phase of the project cease to be appropriate in view of changes in surrounding ecology during the life of the project,¹⁶ which may be affected by changing ocean temperatures and acidity levels in connection with climate change. The economic, practical and regulatory considerations for decommissioning offshore oil and gas structures are closely linked to climate outcomes. One can therefore observe that the global interest in mitigating climate change is in many respects shared with the oil and gas industry, and multiple benefits may be created by actively engaging the industry in measures designed to reduce carbon emissions and environmental degradation, including in the particular context of meeting decommissioning obligations.¹⁷

Two particular alternative decommissioning options are considered for the purposes of this article. First, the repurposing of suitable depleted oil and gas fields into sites for CCS projects has been recognised as one way in which the petroleum industry may simultaneously

¹⁰ *ibid* 6.

¹¹ A Cruz, 'Vulnerability of oil and gas infrastructure to climate change and extreme weather events' (Article presented at Joint ICTP-IAEA Workshop on Vulnerability of Energy Systems to Climate Change and Extreme Events, Trieste, 19 - 23 April 2010).

¹² Smith (n 9), 3, 7.

¹³ *ibid* 10.

¹⁴ Acclimatise, 'Understanding the investment implications of adapting to climate change - oil and gas' (Briefing report for Henderson Global Investors, Insight Investment, Railpen Investments and Universities Superannuation Scheme, 2009), 17.

¹⁵ *ibid*.

¹⁶ *ibid*.

¹⁷ For a discussion of the benefits of addressing climate change at multiple scales see E Ostrom, 'A Polycentric Approach for Coping with Climate Change' (World Bank Policy Research Working Article No. 5095 prepared for the 2010 World Development Report on Climate Change, October 2009), 35.

improve both the economic and emissions outcomes of offshore projects.¹⁸ This process involves the distillation of carbon dioxide and its compression into a liquid-like state to enable it to be injected into microscopic pore spaces in stable underground geological formations for long-term storage.¹⁹ The technologies and infrastructure required to undertake CCS are to a large extent the same as those already developed and in use by the oil and gas industry. Operators and titleholders of petroleum projects are therefore well placed to implement it as part of their decommissioning strategy where suitable, including to enhance the quantity or rate of production from a field as it nears the end of its productive life.²⁰ As a climate change mitigation strategy, CCS has faced a number of technical, political and economic challenges, but is currently being put to the test in Australia as a key element of the Gorgon LNG project in Western Australia, where carbon dioxide is intended to be re-injected into underground reservoirs to assist in resource extraction and to reduce the emissions impact of the project.²¹ Second, there exists a possibility for decommissioning to be undertaken '*in situ*', that is, by making structures safe and leaving them in place to a greater or lesser extent. Compared to the base case of complete removal, *in situ* decommissioning may have the benefit of reducing the carbon emissions and resource use associated with decommissioning activities by reducing the need for specialised equipment and ships to remove, return to shore, and break down structures. Complete removal would presently require the larger of these structures to be shipped to Asia or other locations, as Australia does not have suitable onshore facilities for scrapping them.²² Removal can also potentially cause greater harm to the surrounding ecosystem than *in situ* decommissioning, as reefs may have formed around the structures in the interim. Considerable research is presently underway to demonstrate the potential for Australia to adopt a 'rigs to reefs' program, as has been in place in the US for over thirty years, which would enable structures decommissioned *in situ* to be used or modified as a habitat for marine biota.²³ However, in assessing the desirability of *in situ* decommissioning it is important to take into account the risk of damage from climate related events to physical infrastructure left *in situ*, and the potential expense, resources and environmental disruption required to adapt decommissioned structures to meet this risk.²⁴

The ability of industry operators and titleholders to adopt either or both of these measures in the context of decommissioning is dependent upon a range of technical, economic, environmental and political considerations, all of which interact to a significant extent with the legal requirements for the decommissioning process.

2. Domestic and International Regulatory Context

The Australian regulatory landscape concerning decommissioning obligations for offshore oil and gas is influenced by both Australia's international treaty obligations and a complex

¹⁸ S Haszeldine, 'Geological Factors in Framing Legislation to Enable and Regulate Storage of Carbon Dioxide Deep in the Ground', in I Havercroft et al (eds), *Carbon Capture and Storage: Emerging Legal and Regulatory Issues*, (Hart Publishing 2011), 7.

¹⁹ A Zahar et al, *Australian Climate Law in Global Context* (Cambridge 2012), 328.

²⁰ Smith (n 9), 13.

²¹ *ibid.*

²² M Goodwin and T van Merwyk, 'Decommissioning Offshore Petroleum Facilities in Australia' (Client guide, S2v Consulting and Freehills, 5 April 2016), 3.

²³ See generally S Gouvernec and D White, 'In situ decommissioning of subsea infrastructure' (Keynote for Conference on Maritime Energy, Decommissioning of Offshore Geotechnical Structures, Hamburg, Germany, 28-29 March 2017).

²⁴ Halsnæs (n 8), 414.

patchwork of domestic legislation. As most of Australia's petroleum resources are currently located in Commonwealth waters, and brought onshore via the coastal waters of the States and Northern Territory for processing, most offshore petroleum projects are subject to local, national and international requirements, including in their decommissioning phase.²⁵

A. International Requirements

Australia is a signatory to a number of conventions that influence the decommissioning requirements for structures in marine environments. The earliest in time is the *United Nations Convention on the Continental Shelf 1958 (Geneva Convention)*, which provided in article 5(5) that any installations which were abandoned or disused were required to be entirely removed from the continental shelf. Although this requirement was a reasonable one in 1958, when 'such offshore operations as existed were largely confined to relatively shallow waters close to the shore', complete removal became more challenging as technological capabilities advanced, permitting larger and more complex structures to be established in increasingly deeper waters.²⁶

Article 5(5) of the Geneva Convention was then superseded by the *United Nations Convention on the Law of the Sea 1982 (UNCLOS)*, ratified by Australia in 1994.²⁷ Articles 80 and 81 of UNCLOS provide that coastal States such as Australia have the exclusive right to construct, and authorise and regulate the construction, operation and use of installations and structures on the State's continental shelf (as defined in article 76), and to authorise and regulate drilling on the continental shelf for all purposes. Under articles 56 and 60, structures and installations may be constructed for the purposes of exploring, exploiting, conserving and managing 'the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil', and other economic purposes.

Of particular relevance, Article 60(3) provides that in the exclusive economic zone of a State:

'Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organization. Such removal shall also have due regard to fishing, the protection of the marine environment and the rights and duties of other States.'

Notably, article 60(3) omits the word 'entirely,' which had been included article 5(5) of the Geneva Convention to describe removal obligations, such that partial removal of structures may be possible under UNCLOS.

The scope for partial removal is expressly subject to having 'due regard to ... the protection of the marine environment', which is provided for in Section 5 of UNCLOS. In particular, article 208 provides that coastal States 'shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with seabed

²⁵ Australian Productivity Commission, 'Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector' (Research Report, 30 April 2009), 34.

²⁶ J Paterson, 'Decommissioning Offshore Installations: International, Regional and Domestic Legal Regimes in the Light of Emergent Commercial, Political, Environmental and Fiscal Concerns' (2015) AMPLA Yearbook 344, 345.

²⁷ United Nations Division for Ocean Affairs and Law of the Sea, 'Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements', <http://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm>, accessed 2 July 2018.

activities subject to their jurisdiction and from artificial islands, installations and structures under their jurisdiction, pursuant to articles 60 and 80', and shall 'endeavour to harmonize their policies in this connection at the appropriate regional level'. Similarly, article 210 requires signatory States to adopt measures to prevent, reduce and control pollution of the marine environment by dumping. Although neither of these provisions expressly requires the removal of subsea pipelines or other structures associated with offshore petroleum installations, the text of UNCLOS demonstrates a clear legislative policy in favour of removal of structures from the marine environment once they have reached the end of their useful life. This is so notwithstanding that 'taking into account any generally accepted international standards' would include the International Maritime Organisation's 1989 guidelines, which permit structures to be left in place on a case-by-case basis.²⁸

A similar policy based on adoption of the precautionary principle is evident in the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Dumping Convention)* and the *Protocol to the London Dumping Convention 1996 (London Protocol)*, implemented in Australia under the *Environment Protection (Sea Dumping) Act 1981 (Cth)*, as amended. Under article 1.4.1 of the London Protocol, dumping is defined to include 'any deliberate disposal into the sea of wastes ... or other man-made structures at sea', and specifically, 'any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal'. However, Article 1.4.2 of the London Protocol excludes from the definition of 'dumping' the placement of matter for a purpose other than disposal (such as, perhaps, the purpose of creating an artificial reef or enabling injection of liquefied carbon dioxide), and specifically, the disposal or storage of wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of seabed mineral resources. Based on these provisions, the London Dumping Convention and Protocol should not be understood as specifically restricting the decommissioning options available for offshore petroleum installations. In any event, following amendment of the London Protocol in 2006, CCS is one of a limited range of dumping activities which may occur subject to the grant of a permit by the relevant signatory State, although article 4 nonetheless requires particular attention to be given in the permit process to opportunities to 'avoid dumping in favour of environmentally preferable alternatives'. The progression over time of these instruments demonstrates a shifting approach to the management of waste materials in the marine environment, as the evidence-base supporting options such as CCS and *in situ* decommissioning has increased.

In addition to the instruments set out above, one must also take into account Australia's obligations as a signatory to agreements such as the *United Nations Framework Convention on Climate Change*²⁹ and other non-binding but nonetheless important instruments to which Australia is a party, such as the Rio Declaration.³⁰ These include the requirement to apply the precautionary approach to ensuring that activities in the exploitation of Australia's resources do not cause damage to the environment of other States or of areas beyond the limits of natural jurisdiction³¹ or the climate.³² Australia has also committed to reducing its

²⁸ S Gouvernec and E Techera, 'Rigs to reefs: is it better to leave disused oil platforms where they stand?' (*The Conversation*, 10 August 2016) < <https://theconversation.com/rigs-to-reefs-is-it-better-to-leave-disused-oil-platforms-where-they-stand-63670>>, accessed 2 July 2018. See also International Maritime Organisation, 'Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone' (1989).

²⁹ Opened for signature 4 June 1992, 1771 UNTS 107 (entered into force 21 March 1994) (UNFCCC).

³⁰ *United Nations Conference on Environment and Development, Rio Declaration on Environment and Development*, UN Doc A/CONF 151/26 (vol I) (13 June 1992) (**Rio Declaration**).

³¹ Rio Declaration, principles 2 and 15.

greenhouse gas emissions by 26 to 28 percent below 2005 levels by 2030 under the Paris Agreement.³³ Although not directly mandating requirements for decommissioning, these agreements have an important role in influencing Australia's domestic environmental and economic policy, particularly in the energy sector.

B. Domestic Requirements

The complexity of Australia's regulatory regime for offshore petroleum and CCS activities arises partly as an incident of Australia's federal structure of government, and partly due to a number of historical and political factors, which have resulted in amendments to the relevant Commonwealth, State and Territory legislation over time.

At Commonwealth level, the key piece of legislation impacting upon decommissioning requirements is the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) (**OPGGSA**), which was enacted to replace and modernise the *Petroleum (Submerged Lands) Act 1967* (Cth). The OPGGSA has as its objects the provision of an effective regulatory framework for both petroleum exploration and recovery and the injection and storage of greenhouse gas substances in offshore areas,³⁴ and so regulates both the decommissioning of offshore oil and gas structures and the implementation of offshore CCS.

The OPGGSA gives effect to the 'Offshore Constitutional Settlement', an agreement formed in 1979 between the Commonwealth of Australia, the States and the Northern Territory regarding the extent of the Commonwealth's legislative capacity in offshore waters. For the purposes of offshore petroleum legislation, the Commonwealth is permitted to regulate only areas beyond the outer limits of State and Northern Territory coastal waters, which are defined under the OPGGSA as being the offshore area of each State or the Northern Territory up to 3 nautical miles seaward from the baseline of the territorial sea.³⁵ Within this area, regulatory control is vested in the relevant State or Territory.³⁶ While the OPGGSA expresses the aim of having common principles, rules and practices between the Commonwealth and the States and Northern Territory for the regulation of offshore petroleum activities,³⁷ the reality of this division of legislative responsibility is that an industry stakeholder with a project located beyond State or Territory coastal waters will generally be required to obtain approvals and ensure compliance under both Commonwealth and State or Territory legislation and licensing processes.

Australia attempted to address this issue in a limited way in the OPGGSA (and its predecessor legislation) by the creation of the National Offshore Petroleum Safety Authority (**NOPSA**), tasked with supervision of the occupational health and safety aspects of offshore petroleum operations,³⁸ the National Offshore Petroleum Titles Administration (**NOPTA**), and a Joint Authority between the responsible Commonwealth Minister and each of their State or Northern Territory counterparts.³⁹ The Joint Authorities are the key decision-makers

³² UNFCCC, art 3.3.

³³ Paris Agreement, (n 5).

³⁴ OPGGSA, s 3.

³⁵ OPGGSA, s 5.

³⁶ OPGGSA, s 5(d).

³⁷ OPGGSA, s 5(e).

³⁸ Australian Government, 'Final Government Response to the Montara Commission of Inquiry' (2011), 3.

³⁹ Australian Government, Department of Industry, Innovation and Science, 'Guidelines for Offshore Petroleum Joint Authority Decision-Making Procedures: A Guideline in relation to the Offshore Petroleum and Greenhouse Gas Storage Act 2006' (1 January 2012).

in relation to a number of aspects of petroleum activities under the OPGGSA and corresponding State and Territory legislation, such as the granting of titles for projects in Commonwealth waters, and as such represent an important practical implementation of the Offshore Constitutional Settlement. The Joint Authorities are also responsible in certain instances for decisions relating to the setting of royalty rates and assessment of royalties payable (including the relative proportions in which they may be payable to the Commonwealth as opposed to the relevant State or Territory).

From 1 January 2012, NOPSA's functions were expanded to include environmental management, and it was accordingly rebadged as the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**).⁴⁰ This expanded responsibility was intended to create a single national regulatory body for offshore petroleum activities, and was a direct response to recommendations made by the Commission of Inquiry tasked with investigating the 2009 Montara incident, involving an uncontrolled oil and gas release at the Montara oil field located in the Timor Sea, north of Western Australia.⁴¹ While NOPSEMA has statutory responsibility for petroleum activities in Commonwealth waters including decommissioning, States and the Northern Territory are permitted, but not required, to delegate offshore petroleum management functions within their coastal waters to NOPSEMA.

The OPGGSA distinguishes between obligations imposed on 'titleholders', who hold a petroleum exploration permit, retention lease or production licence provided for by the Act, and on operators of petroleum facilities. Generally, titleholders are responsible for complying with obligations relating to the environmental impacts of projects including the provision of environmental management plans for the purposes of decommissioning activities, whereas operators must provide a safety case in relation to activities conducted on offshore petroleum facilities. Relevantly, under s 572(3) of the OPGGSA, a titleholder must remove from their title area all structures, equipment and other property that are no longer to be used in connection with the titleholder's permitted operations. This is known as the 'base case' decommissioning option of complete removal of redundant structures.

A number of subject-specific regulations have been created under the OPGGSA which are also relevant for these purposes, including the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (Cth) (**Environment Regulations**) and the *Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009* (Cth) (**Safety Regulations**). Section 10A of the Environment Regulations adopts as one of the key criteria for assessing proposed petroleum activities, including decommissioning, the standard of reducing associated environmental risks to a level which is 'as low as reasonably practicable' (**the ALARP principle**). The same standard applies in relation to hazards to human safety under the Safety Regulations. This principle introduces a degree of inherent flexibility into the OPGGSA, which may enable titleholders to point to safety or environmental risks to demonstrate that complete removal may not necessarily be the best decommissioning option. As a performance-based means of regulating activity, it is also intended to avoid the 'lowest common denominator' approach, which can be a feature of more prescriptive regulatory regimes.⁴²

⁴⁰ C Raper et al, 'Second Triennial Review of the Operational Effectiveness of the National Offshore Petroleum Safety Authority' (Report to the Australian Government, 29 November 2011).

⁴¹ Australian Government (n 38), 2.

⁴² *ibid*.

Beyond the OPGGSA, other relevant Commonwealth legislation includes the *Environment Protection (Sea Dumping) Act 1981* (Cth) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), which give effect to Australia's international obligations in respect of environmental protection. The requirements of this legislation are incorporated into the OPGGSA and its regulations by reference. Each State and the Northern Territory has its own further set of petroleum and environment-related legislation, which although generally consistent with the basic principles of the Commonwealth regime, exhibit some important differences and in any event greatly increase the scope of legislation with which a titleholder or operator must comply. In Western Australia, for instance, a titleholder whose project is located across both Commonwealth and Western Australian coastal waters will be required to take into account some sixteen separate State Acts and underlying regulations that may be involved in decommissioning activities, in addition to the Commonwealth legislation mentioned above.⁴³ The *Petroleum (Submerged Lands) Act 1982* (WA), similarly to the OPGGSA, provides in section 107 for the removal of property brought into a title area by the titleholder once their title ceases for any reason, or at any other time during the term of the title. However, rather than placing a first-instance positive obligation on the titleholder to decommission by removing structures, the legislation permits the relevant Minister to make directions in this regard, which 'may' include a direction to remove property.

The States, the Northern Territory and the Commonwealth have each produced guidelines for titleholders in relation to decommissioning activities, which aim to make sense of this 'labyrinth' of legislation.⁴⁴ The Commonwealth guidelines were updated in January 2018 'to clarify the application, operation and interaction between components of the Commonwealth regime for decommissioning offshore petroleum infrastructure in Commonwealth waters under the [OPGGSA], associated regulations and, where applicable, other Commonwealth laws'.⁴⁵ The guidelines now state that although the complete removal of infrastructure and the plugging and abandonment of wells is the default decommissioning requirement under Australian legislation, this is subject to other applicable laws, and options other than complete removal may be considered where the titleholder can demonstrate that the alternative decommissioning approach delivers equal or better environmental, safety and well integrity outcomes and complies with all other legislative and regulatory requirements.⁴⁶ Western Australia also recently updated its industry guidance, in the *Petroleum Decommissioning Guideline* published in late 2017. This guideline more explicitly contemplates alternative options to base case decommissioning, and notes in particular the possibility that 'in some circumstances, the removal of property may be shown to have a greater detrimental impact than leaving it in place', such that rigs to reefs programs of *in situ* decommissioning may be preferable, subject to there being 'in-depth research studies' in support.⁴⁷ Like the Commonwealth regulatory regime, the guideline draws on the ALARP principle, but provides that 'where multiple, alternative options for decommissioning are possible, a process of comparative risk assessment should be followed to determine the optimal outcome', and requires titleholders to have investigated prior to submitting a decommissioning plan any viable options for the enhanced recovery of remaining oil or gas

⁴³ Western Australian Government, 'Petroleum Decommissioning Guideline' (30 October 2017), 4.

⁴⁴ P Saraceni and S Chien, 'Decommissioning on the Rise' (Maritime Association of Australia and New Zealand, March 2018 Newsletter), <http://www.mlaanz.org/Uploads/Newsletter_Mar_2018/MLAANZMar2018-President.pdf>, accessed 2 July 2018.

⁴⁵ Australian Government Department of Industry, Innovation and Science, 'Offshore Petroleum Decommissioning Guideline' (17 January 2018), 3.

⁴⁶ *ibid* 4.

⁴⁷ Western Australian Government (n 43), 7.

reserves.⁴⁸ This might potentially include CCS, which is also expressly mentioned in the guideline as a possible re-use of depleted formations.⁴⁹ What is clear from the guideline is that although these alternative options for decommissioning are still considered a 'derogation' from the base case, the Western Australian regulator is pro-actively raising such alternatives for consideration 'on a case-by-case basis'.⁵⁰

3. Regulatory Disincentives to Alternative Methods of Decommissioning

Notwithstanding the significant increases in flexibility shown in the recent Commonwealth and Western Australian guidelines, the Australian regulatory scheme for decommissioning still gives rise to a number of disincentives, which may operate against titleholders seeking to adopt these alternatives to the base case. These include both the obvious issue of fragmentation of regulatory responsibility noted above, and the more nuanced issue of the legislation's approach to applying the base case and the ALARP principle. Australia was recently ranked as least competitive out of a group of 30 petroleum producing countries in respect of decommissioning and abandonment.⁵¹ This ranking was based on Australia's 'enormous future liability ... combined with a lack of substantial local decommissioning experience'.⁵² As the report noted, reducing complexity, duplication and "red tape" in Australia's regulatory response to the challenges of decommissioning will be an important step in reducing cost and timeframes for all participants.⁵³

Given the upcoming decommissioning wave, it is timely to consider these remaining issues.

A. Fragmentation as a Disincentive to Use of CCS or in situ Decommissioning

The issue of fragmentation in the Australian petroleum sector is not new, and was the subject of review by the Australian Productivity Commission in 2008.⁵⁴ The Council of Australian Governments directed the Productivity Commission to review the overlapping and potentially inconsistent regulations affecting the upstream petroleum sector, as a potential impediment to economic activity. The study considered 'opportunities for streamlining regulatory approvals, providing clear timeframes and removing duplication between jurisdictions'.⁵⁵ The Productivity Commission's resulting report posited that best-practice regulation 'imposes the least burden necessary to achieve the underlying policy goals, bringing the greatest possible net benefit to the community'.⁵⁶ Given the Productivity Commission's mandate, the net benefit was a purely economic one, however this definition can readily be extended to the benefits of mitigation of climate change. The report concluded that 'significant unnecessary costs from delays and uncertainties in obtaining approvals, duplication of compliance requirements, and inconsistent administration of regulatory processes'. The Productivity Commission recommended that these burdens be reduced through 'new institutional

⁴⁸ *ibid* 8.

⁴⁹ *ibid* 10.

⁵⁰ *ibid*.

⁵¹ NERA, 'Oil & Gas Industry Competitiveness Assessment, Report on the Framework, Baseline Score, Insights and Opportunities' (Report, National Energy Resources Australia, Australian Government Growth Centre, September 2016).

⁵² *ibid* 13.

⁵³ *ibid* 16.

⁵⁴ Australian Productivity Commission, 'Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector' (Research Report, 30 April 2009).

⁵⁵ *ibid* iv.

⁵⁶ *ibid* 34.

arrangements — principally the establishment of a national offshore regulator — as well as implementation of best practice regulatory principles in all jurisdictions'.

This recommendation was partly taken up, with the potential role of NOPSA/NOPSEMA being expanded as described above, and a degree of coordination between the Commonwealth and the States. However, and although at the time of writing South Australia, Tasmania, Queensland, Victoria and the Northern Territory have enacted legislation to confer structural (well) integrity functions and occupational health and safety functions on NOPSEMA, they have not conferred functions on NOPSEMA relating to environmental management.⁵⁷

New South Wales and Western Australia retain regulatory control over all offshore petroleum management functions in their coastal waters. In fact, in 2011 Western Australia opted to remove all references to NOPSEMA from the *Petroleum (Submerged Lands) Act 1982* (WA), and to revoke its functions for facilities in Western Australian waters.⁵⁸ This followed concerns raised by the Western Australian Government about the practical effectiveness of the amendments then proposed to the OPGGSA to expand NOPSEMA's role and that of the Joint Authorities, in particular that the amendments would not provide much needed reform to environmental and native title regulation in relation to offshore petroleum activities, nor would they enable the State's interests to be properly taken into account because of a lack of integration between these national bodies and the relevant State departments.⁵⁹ One practical outcome flagged by the Western Australian Government was that the proposed amendments would effectively preclude the State's involvement in decision-making regarding royalties flowing to Western Australia from the North West Shelf Project, representing a significant departure from the Offshore Constitutional Settlement.

Essentially, the complaint was that the regulatory scheme remained fragmented and ineffective, and would therefore result in a further duplication of functions between the Commonwealth and the State, rather than any greater efficiency. The issues identified by the Productivity Commission remained unresolved.

The fact that safety and environmental management functions remain divided between the majority of the States and the Commonwealth has particular significance in the context of considering whether to seek approval for alternative options to base-case decommissioning. There remains the possibility that with separate bodies responsible for assessing the safety and environmental impacts of different components of a proposed CCS or rigs-to-reefs project as part of a decommissioning strategy (i.e. where different components are located in State vs Commonwealth waters, or require both onshore and offshore activities), an operator may achieve approval for one component and not the other. Self evidently, this increases the uncertainty and transactional cost of such proposals, and may act as a deterrent to operators seeking to depart from the shared base-case between the two regimes of complete removal of installations. These are issues of significant concern to a state such as Western Australia

⁵⁷ See NOPSEMA, 'Legislation and Regulations', <<https://www.nopsema.gov.au/about/legislation-and-regulations/>>, accessed 30 June 2018.

⁵⁸ *Petroleum (Submerged Lands) Amendment Act 2011* (WA).

⁵⁹ Western Australian Government, Department of Mines and Petroleum, 'Submission to Senate Economics Legislation Committee Inquiry Into The Offshore Petroleum And Greenhouse Gas Storage Amendment (National Regulator) Bill 2011 And Associated Amendment Bill' (3 June 2011).

whose revenues in the last financial year from petroleum products totalled \$19.1 billion.⁶⁰ Perceptions of regulatory ease may have a direct effect on the desirability of states as locations for the very significant levels of investment required in petroleum projects,⁶¹ including in their decommissioning stages. Of course, achieving any kind of precise measurement of the operational and financial impacts of the current regulatory framework, as opposed to a unified system of regulation, is extraordinarily difficult,⁶² but it is clear from the experience of Western Australia described above that the perceived impacts, at least, are significant.

B. The Base-Case Assessment Process as a Disincentive to Use of CCS or in situ Decommissioning

As described in Section 2B above, the OPGGSA proceeds from the assumption that complete removal is a desirable default option, and applies as its key assessment criteria for approval of petroleum activities the ALARP principle which requires operators to demonstrate that the human safety and environmental risks associated with the proposed activities have been reduced to the lowest practicable level. Although the recent Commonwealth guidelines would appear to indicate that a more flexible approach may be taken, this does not displace the words of the legislation. Despite risk reduction in both of these areas being necessary, and indeed in keeping with the precautionary principle applicable under Australia's international obligations, it does not readily permit of an approval process which would enable a proposed decommissioning plan to be assessed based on its overall environmental benefits. For instance, both the risk and cost of a planned decommissioning process may be increased by the inclusion of a CCS project, because it in fact expands the scope of work and the immediate risk of harm to humans or the environment whilst being implemented, reducing the plan's ability to comply with the ALARP principle, whereas the contribution of such a project to reducing global atmospheric carbon dioxide levels is unlikely to be able to be taken into account as a corresponding reduction in environmental risk.

The OPGGSA simply does not provide for indirect risk reductions (such as reduced climate risk) to offset primary risk increases (such as increased operational risk) in considering the most appropriate decommissioning process, even where the two are directly linked as described in Section 1 of this article. For this reason alone it should be seriously considered whether the 'base case' remains the most appropriate standard against which decommissioning in Australia should be assessed, or whether a more flexible standard would produce better overall environmental and economic outcomes.

4. What can Australia Learn From other Jurisdictions and Interventions?

Decommissioning booms of even greater scale than that predicted for Australia are also imminent in the Asia Pacific and the North Sea, and already underway in the Gulf of Mexico. For example, the UK is expected to decommission some 146 platforms between 2019 and 2026, while the US decommissioned 210 structures in 2014 alone.⁶³ Consideration of what

⁶⁰ Western Australian Government, Department of Mines, Industry Regulation and Safety, 'Western Australian Mineral and Petroleum Statistics Digest 2016–17' (Report, December 2017), 20.

⁶¹ See Western Australia, Parliamentary Debates, Legislative Council, 23 November 2011, at 9635-6 (Hon Norman Moore, Minister for Mines and Petroleum).

⁶² J Chandler and T Daintith, 'Offshore petroleum regulation after Montara: the new regulatory style' (2015) 34(1) Australian Resources and Energy Law Journal 34, 35-36.

⁶³ Cullinane (n 3), 422.

Australia may learn from the experience of these and other jurisdictions in regulating the decommissioning of offshore petroleum structures must of course take into account their differing constitutional contexts, oceanic conditions and project architecture.⁶⁴ However, it is nonetheless a worthwhile exercise given the issues described in the previous section of this article, the relative maturity of the offshore petroleum industries in the Gulf of Mexico and the North Sea, and innovations that can be seen in emerging petroleum industries in South East Asia such as Thailand. We might also draw on lessons learned in other regulatory interventions concerning climate change to understand where gaps may arise in the current decommissioning framework. One notably deficient factor in the current Australian legislation is consideration for the input and interests of local indigenous groups who may be impacted by the decommissioning of offshore petroleum installations; a matter which has already been confronted in the context of both the Green Climate Fund established under the UNFCCC and the Reducing Emissions from Deforestation and Degradation initiative (**REDD**).

A. Decommissioning Regulations in the US, Norway and Thailand

As mentioned in Section 1 of this article, the US has for many years had in place a regulatory framework for rigs to reefs as a decommissioning strategy.⁶⁵ Generally this is not a true '*in situ*' decommissioning strategy, as it often involves the toppling and relocation of parts of a subsea structure to a common location with other decommissioned structures.⁶⁶ While relocating structures in this way does not necessarily achieve the aims of preserving marine biota which have developed around the structure while *in situ*, it does have the benefit of enabling US government authorities to monitor and manage the resulting artificial reefs more efficiently and may produce greater benefits in terms of productivity of fisheries. In countries such as the US and Australia where fields may be geographically very dispersed, it may be worth investigating whether such a relocation and rigs to reefs program might offer similar emissions and environmental benefits to *in situ* decommissioning, with a reduced regulatory burden in monitoring decommissioned structures once the title in respect of a petroleum project has reverted to the Commonwealth or the relevant State.

The UK and Norway are both parties to the Convention for the Protection of the Marine Environment of the North-East Atlantic,⁶⁷ which has been flagged as substantially restricting the options for decommissioning of offshore petroleum structures to complete removal.⁶⁸ However, under Norwegian law, titleholders must submit a decommissioning plan between two and five years before the end of production at an offshore facility.⁶⁹ Although under the Australian Commonwealth and State guidelines early planning for decommissioning is encouraged, there is no equivalent prescriptive timing requirement for submission of a decommissioning plan. As noted by the recent Western Australian guidelines:

⁶⁴ *ibid.*

⁶⁵ M Fam et al, 'A review of offshore decommissioning regulations in five countries – strengths and weaknesses' (2018) 160 *Ocean Engineering* 244, 249.

⁶⁶ *ibid.*

⁶⁷ Signed 22 September 1992, 2354 UNTS 67 (entered into force 25 March 1998). See <<https://www.ospar.org/organisation/contracting-parties>>, accessed 22 November 2018. This convention is typically referred to as 'OSPAR', referring to the original Oslo and Paris Conventions of 1972 and 1974 on which it is based.

⁶⁸ Fam (n 65).

⁶⁹ Saraceni (n 44), 2.

'It has to be recognised that early planning of a field's development should consider decommissioning options that can lead to considerable reductions in costs, and increased reserve recoveries. In reality, for a number of fields in Western Australia, decommissioning programs have only received comprehensive attention late in their life. As understanding becomes more focussed, the broad issues surrounding decommissioning are now being acknowledged and progressively assessed.'⁷⁰

This comment is particularly apt in the context of CCS, which in many cases serves to enhance rates of recovery of oil or gas and thus offsets the costs of its implementation, but may have a reduced positive economic impact if only implemented after the field has already been effectively exhausted. A more prescriptive requirement for early planning for decommissioning, as in the case of the Norwegian legislation, is desirable.

Thailand, although geographically and constitutionally very different to the Australian context, adopts a process of consideration of decommissioning options which takes into account both the precautionary principle and the broader principles of the Rio Declaration. This is achieved through a regional-based assessment of the impacts of decommissioning in offshore areas in the first instance.⁷¹ The resulting 'Regional Decommissioning Environmental Assessment' then informs decision-making in respect of the 'Best Practical Environmental Option' for specific projects.

A number of important features emerge from this approach. First, it enables improved environmental design and management at both the regional and project level.⁷² In contexts such as marine environmental management and climate change mitigation, the practical reality that local activities are likely to have regional or global impacts favours this cumulative approach to regulation. Second, it enables flexibility in respect of individual project decommissioning requirements, while ensuring that all projects meet performance-based objectives and contribute to overarching regional goals. This is achieved through the establishment of a number of assessment criteria against which the desirability of decommissioning options are measured, which specifically include the impact of the activity in terms of energy consumption, air emissions and ecology, and the secondary impact of the activity on public health.⁷³ The inclusion of these criteria would likely facilitate demonstrating the desirability of alternative decommissioning options such as CCS and *in situ* decommissioning, where suitable. Third, it avoids the fragmentation that is present in Australia's current framework, and so may ease the burden of compliance for both government and industry. Subject to cooperation between the State and Federal Governments, a similar dual-scale approach to assessment of the impacts of decommissioning would be a desirable outcome in Australia, which has not yet been achieved under the OPGGSA. The case-by-case approach adopted in Thailand has its own drawbacks, however, most notably in the difficulty it poses for industry operators to accurately estimate decommissioning costs in advance, since the requirements in respect of a particular project may not be readily predictable.

⁷⁰ Western Australian Government (n 43), 2.

⁷¹ Fam (n 65), 251-2.

⁷² *ibid.*

⁷³ *ibid* 253.

B. Lessons from GCF and REDD in Regulating for a Changing Climate

A further issue deserving of greater attention in Australia's decommissioning regulations is the role of indigenous groups in areas which may be impacted by decommissioning activities. Nowhere in the Commonwealth or the Western Australian legislation or guidelines does one find explicit reference to consultation with the traditional owners of land or sea areas adjacent to where decommissioning activities may occur, although both provide opportunities for general public consultation on decommissioning plans and for the 'public interest' to be taken into account. The lack of specific reference to indigenous groups in the legislation makes it unsurprising that such groups are presently significantly underrepresented as potential stakeholders in relation to decommissioning activities. A January 2018 review of stakeholder views and science priorities for decommissioning in Western Australia identified just one individual affiliated with an indigenous representative group, the Murujuga Land and Sea Unit of the Murujuga Aboriginal Corporation (MAC), among a survey group of over 120 individuals.⁷⁴ Not a single policy and management issue identified by the stakeholders consulted, and summarised by the researchers, specifically draws attention to the potential impact of decommissioning activities on local traditional owners.⁷⁵ Nonetheless, of the broader topics identified as potential policy issues, the MAC representative is identified as having considered environmental issues, 'case by case considerations', and the connectivity and interrelationships between environmental, social, cultural and economic impacts of decommissioning, as issues of primary relevance.⁷⁶

The experience of previous climate change related environmental management interventions has shown that such a general, high-level approach to public consultation is insufficient to protect the interests of indigenous groups who may be affected. The assumption that the interests of distinct indigenous minority groups may be adequately captured within the general 'public interest' fails to take into account that such groups often have identities and aspirations that are distinct from mainstream groups in national societies.⁷⁷ For this reason, and after observing the potentially negative interactions between measures adopted under the initial text of REDD and indigenous peoples living in or near forest areas, the initiative was revised to REDD+ in recognition of the importance of the added element of sustainable management of forests, including by local indigenous communities. REDD+ now includes specific recognition of 'full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities' as an important safeguard to be promoted and supported in implementing the initiative.⁷⁸ Similarly, the Indigenous Peoples Policy released in 2018 by the Green Climate Fund is specifically designed to enable the Fund 'to anticipate and avoid any adverse impacts its activities may have on indigenous peoples' rights, interests and well-being, and when avoidance is not possible to minimize, mitigate and/or compensate appropriately and equitably for such impacts'.⁷⁹ Each of these examples demonstrates just how significantly Australia's regulatory framework is lacking in not specifically providing for the input of traditional owners on proposed decommissioning plans, at minimum.

⁷⁴ JL Shaw, P Seares, SJ Newman, 'Decommissioning offshore infrastructure: a review of stakeholder views and science priorities' (Report, Western Australian Marine Science Institute, 2018), 13.

⁷⁵ *ibid* Appendix 8.

⁷⁶ *ibid* 16.

⁷⁷ UNFCCC, Green Climate Fund, 'Indigenous Peoples Policy' (2018), [3].

⁷⁸ M Young, 'REDD+ and interacting legal regimes', in C Voigt, (ed) *Research Handbook on REDD-plus and International Law* (Edward Elgar 2016), 89-125, 108.

⁷⁹ UNFCCC (n 79), [6].

Conclusion

Australia is presented with an opportunity in the coming decades to embark upon the 'decommissioning boom' with regulations in place that will enable this process to be undertaken in accordance with current global best-practice, and with Australia's stated goal to achieve significant emissions reductions by 2030. Attempts have already been made to harmonise the patchwork of national and State level legislation, and to improve regulatory flexibility to reflect emerging scientific and policy developments which in many cases favour *in situ* decommissioning and/or the re-use of depleted formations for CCS projects over complete removal, although largely through the promulgation of guidelines in individual jurisdictions over substantive reform. A great deal of work in improving Australia's regulatory framework remains to be done.

In rethinking decommissioning regulations in the context of a low-carbon future, we stand to learn much from the experience of other jurisdictions and interventions, particularly those which have made use of current evidence to generate innovative policies such as the assessment of regional-level and secondary environmental impacts of decommissioning in Thailand, and the implementation of policies which focus attention on the interests of indigenous peoples in REDD+. Drawing on these experiences will enable Australia and its petroleum industry to transition into the decommissioning phase in ways, which both promote compliance with Australia's international obligations, and optimise environmental, social and economic outcomes.