Chapter 4

Effects of oil and gas exploration and production in the Great Australian Bight

4.1 During the course of the inquiry, the committee received evidence of the impacts, both economic and environmental, of oil and gas exploration in the Great Australian Bight. The evidence, in the first instance, outlined the impacts arising during the exploration period and following production of oil and gas. More particularly, extensive evidence was received about the impacts in the event of an oil spill.

4.2 Matters related to impacts in the event of an oil spill are discussed in the next chapter. The discussion in this chapter canvasses the evidence received in relation to the regional and national economic effects which can result from exploration and production as well as possible mitigation of benefits as a result of current tax arrangements, including the Petroleum Resource Rent Tax arrangements. The chapter concludes with a discussion of environmental impacts arising during the exploration and production phases.

Economic impacts of oil and gas production

4.3 The committee received evidence that outlined the potential economic outcomes of oil and gas production in the Great Australian Bight. These included direct and indirect employment opportunities, remedying the widening trade deficit, and increasing Australia's energy security. Some witnesses challenged the extent to which these benefits could be realised.

4.4 Dr Malcolm Roberts, Chief Executive Officer of the Australian Petroleum Production and Exploration Association (APPEA), stated that 'there is a compelling economic case for Australia and South Australia to test the potential of the bight as an oil province'. Dr Roberts particularly noted the volume of oil imported and the costs associated with this.[1]

4.5 The contribution of new discoveries of commercially-viable oil supply to energy security was also noted by APPEA.[2] Ms Claire Fitzpatrick, BP Developments Australia, noted that under International Energy Agency rules, if oil is discovered,

1 Dr Malcolm Roberts, APPEA, *Committee Hansard*, 28 April 2016, p. 1. See also Dr Malcolm Roberts, APPEA, *Committee Hansard*, 16 November 2016, p. 56.

2 APPEA, *Submission 46*, p. 9.

'at the point those oil reserves become a project and they bring that forward, that would actually count towards your 90-day [energy] supply requirement'.[3]

4.6 The Department of Industry, Innovation and Science pointed to the size of the oil and gas industry:

> Over this time, Australia's offshore oil and gas resources and the underlying regulatory regime governing their management have been significant contributors to the Australian economy. In 2014–15 the oil and gas extraction industry (including onshore and offshore oil and gas) contributed around $31 billion to industry gross value added and employment of around 24,000 people.[4]

4.7 Dr Roberts also stated that the oil and gas industry is one of Australia's 'highest value-add industries' generating highly skilled jobs both directly in 'upstream exploration and production' and in 'downstream processing, engineering and other services'.[5] APPEA, in its submission to the committee, also detailed the results of a PwC report it commissioned in 2014 which found that the oil and gas sector generates significant value relative to its input. For every dollar of domestic production, the sector adds 70 cents to Australian output, compared to an average of 49 cents for all other industries. The report found that the total value-add of the petroleum sector was $32 billion and expected to rise to $67 billion by 2029–30.[6]

4.8 Dr David Moffat, General Manager, Exploration, Chevron Australia, outlined Chevron's operations in Australia and noted that significant economic benefit had arisen from these operations. Dr Moffat stated that Chevron had invested more than $80 billion in projects in Western Australia.[7]

4.9 Dr Moffat added that two seasons of seismic acquisition had been completed and they 'provide early but very promising evidence that the Bight represents a tremendous opportunity for both Australia and South Australia in particular, on a scale possibly akin to the Bass Strait or the North West Shelf'.[8]

4.10 The South Australian Government submitted that exploration in the Great Australian Bight was anticipated to bring with it 'investment into, and expenditure in South Australia through industry contracts, construction and suppliers'. It noted that

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3 Ms Claire Fitzpatrick, BP Developments Australia Pty Ltd, *Committee Hansard*, 28 April 2016, p. 50.

4 Department of Industry, Innovation and Science, *Submission 4*, p. 6.

5 Dr Malcolm Roberts, APPEA, *Committee Hansard*, 28 April 2016, p. 1.

6 APPEA, *Submission 46*, p. 10.

7 Dr David Moffat, General Manager, Exploration, Chevron Australia, *Committee Hansard*, 16 November 2016, p. 45.

8 Dr David Moffat, General Manager, Exploration, Chevron Australia, *Committee Hansard*, 16 November 2016, p. 43.

while the greatest scope for local investment lies in a future development and production phase, there have still been a number of opportunities in a range of services.[9]

4.11 Regional Development Australia Whyalla and Eyre Peninsula (RDAWEP) and the Eyre Peninsula Local Government Association (EPLGA) noted that oil and gas activity in the Great Australian Bight will create opportunities for the development of business capability and diversification though direct and indirect services provision. RDAWEP and EPLGA submitted that:

> Power, water and freight infrastructure in the region is generally antiquated and inadequate. Economic activity that creates additional demand for port infrastructure, standard gauge rail, improved roads, increased transmission capacity and cheaper and more abundant power and water in the region is most welcome if it leads to an improvement in the provision and efficiency of the relevant infrastructure.[10]

4.12 However, the RDAWEP and EPLGA acknowledged that the potential benefit to the region from oil and gas activities is unknown, and dependent upon the nature and extent of the oil and gas activity in the future.[11] They did however state that:

> GAB oil and gas activities have had a positive economic impact in the region to date.[12]

4.13 BP similarly noted that at the early stages of exploration, it is not possible to quantify precisely what economic benefits any future development would bring, but pointed to economic benefits arising from Bass Strait oil and gas operations and natural gas operations in Western Australia. BP stated that 'these potential outcomes are the prizes that motivate companies and governments in the pursuit of new oil and gas resources in the Great Australian Bight'.[13]

4.14 It also submitted that its exploration work had already created jobs and infrastructure for South Australia through initiatives such as upgrading Ceduna Airport to handle helicopter flights, and developing Port Adelaide to include a

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9 Government of South Australia, *Submission 44*, p. 12.

10 Regional Development Whyalla and Eyre Peninsula/Eyre Peninsula Local Government Association, *Submission 83*, p. 5.

11 Regional Development Whyalla and Eyre Peninsula/Eyre Peninsula Local Government Association, *Submission 83*, p. 5.

12 Regional Development Whyalla and Eyre Peninsula/Eyre Peninsula Local Government Association, *Submission 83*, p. 5.

13 BP Developments Australia Pty Ltd, *Submission 20*, p. 2.

dedicated oil and gas marine supply base.[14] The $8 million upgrade to Port Adelaide's bunkering facility provided more than 20 local jobs.[15]

4.15 However, some submitters challenged the economic benefits of offshore oil and gas ventures in the Great Australian Bight. Mr Peter Owen, Director, The Wilderness Society challenged the argument about the benefits of oil and gas to Australia's fuel security. Mr Owen commented that:

> I would suggest it is energy insecurity to continue to invest in the expansion of the fossil fuel industry when we know that it is not an option. We have to be investing in renewables, and investing in renewables rapidly, if we are serious about energy security…If we are going to talk about energy security, let us talk about it—for sure—but let us talk about it in real terms and acknowledge the reality that we are now facing: we have just signed the Paris Agreement. Australia cannot be seriously entertaining expanding the fossil fuel industry.[16]

4.16 Other submitters pointed to the high capital intensiveness of the oil and gas industry and questioned the employment benefits to the economy. For example, The Australia Institute described them as 'minimal'. It stated that:

> Such activities are highly capital intensive, so require relatively few workers. While eventual production would employ more people, in the context of the South Australian labour force, the impact would be minor.[17]

4.17 The Australia Institute also submitted that though offshore exploration and production in the Great Australian Bight would see a significant increase in oil and gas workers, it would only provide 'a very small increase in employment overall in South Australia'. It noted that due to the nature of the workforce, it expected that:

> …the majority of any future employees would be fly-in-fly-out (FIFO) workers who would be flown from around Australia to Adelaide and Ceduna and then to production rigs by helicopter. Many of these employees would not be from South Australia and would not reside in South Australia during their employment on the project.[18]

4.18 Similarly, the Australian Maritime Officers Union (AMOU) commented that the employment opportunities for its members in the exploration activities in the Great

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14 BP Developments Australia Pty Ltd, *Submission 20*, p. 33. See also Ms Claire Fitzpatrick, Managing Director, BP Development Australia, *Committee Hansard*, 28 April 2016, p. 44.

15 Infrastructure Magazine, 'Fueling South Australia's port infrastructure', 3 November 2016, http://infrastructuremagazine.com.au/2016/11/03/fueling-south-australias-port-infrastructure/, (accessed 20 February 2017).

16 Mr Peter Owen, Director, The Wilderness Society, *Committee Hansard*, 16 November 2016, pp. 23–24.

17 The Australia Institute, *Submission 37*, p. 1. See also Australian Youth Climate Coalition, *Submission 77*, p. 6.

18 The Australia Institute, *Submission 37*, pp. 5–6. See also Dr David Ellis, *Submission 30*, p. 77.

Australian Bight may be limited. The AMOU went on to state that it understood the bridge team of the Ocean GreatWhite would be predominantly workers on 457 visas (10 out of 12 mariners) and commented:

> We would expect that at the end of their swing the 457 visa holders would be helicoptered to the international airport at Adelaide and then flown home, never setting foot on the Australian mainland.[19]

4.19 The Aboriginal Lands Trust also expressed doubt in relation to the potential economic benefit to the Great Australian Bight region. It stated that:

> Whilst it's asserted that there will be economic benefit to the Region, the Trust is yet to see evidence of this although BP has identified that is has employed 4 Aboriginal people so far.[20]

4.20 It was also noted that there may be limited opportunity for the construction of oil and gas infrastructure in Australia with the Australia Institute noting that capital equipment such as the specialist rig Ocean GreatWhite is almost exclusively imported which provides little benefit to the Australian economy.[21]

4.21 In addition, The Australia Institute questioned the claims about the large multiplier benefit to the economy. Mr Roderick Campbell, Research Director, The Australia Institute, commented that:

> …what needs to be remembered is that the income of the employees being spent in local communities or at suppliers is usually not without some opportunity cost. It is not that the people or businesses would be sitting around unemployed in most cases. They would usually be doing something else. So claims of large multiplier benefit are generally rejected by economists…[22]

4.22 The committee was provided with evidence of costs to other industries as a consequence of oil and gas production. The South Australian Oyster Growers Association (SAOGA) provided its view of oil and gas activities in the Great Australian Bight. It submitted that it does not want to block the oil and gas industry from ventures, but it stated that the development of an oil industry in the Great Australian Bight poses a significant risk to the currently, pristine and unpolluted environment and its reputation as such. It highlighted that 'these are the features that the oyster industry's reputation and credentials in the market place are based upon, and have taken decades to establish and promote'.[23]

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19 Australian Maritime Officers Union, *Submission 75*, p. 7.

20 Aboriginal Lands Trust, *Submission 84*, p. 3.

21 The Australia Institute, *Submission 37*, p. 4.

22 Mr Roderick Campbell, Research Director, The Australia Institute, *Committee Hansard*, 28 April 2017, p. 10.

23 South Australian Oysters Growers Association, *Submission 82*, p. 1. See also South Australian Oyster Growers Association, *Submission 42*, p. 1.

4.23 SAOGA noted that Australia has a Quality Assurance Program that applies to all species of bivalve shellfish that are consumed in Australia or exported for consumption. This program is designed to ensure public health protections for consumers, and underpins sustainable development and consumer confidence. In addition, the South Australian Shellfish Quality Assurance Program (SASQAP) utilises a Risk Assessed Approach to monitoring with particular triggers determining levels of monitoring. According to SAOGA, oil and gas drilling activity in the Great Australian Bight would be a trigger for increased monitoring, and increased cost.[24] SAOGA stated that:

> As there are no natural seeps in the GAB, once drilling commences hydrocarbons or PAH will need to be added to SASQAP list of parameters for which to routinely test. This would add a significant additional cost to industry. Any further cost to SASQAP would be financially unsustainable for industry.[25]

4.24 SAOGA also highlighted that the South Australian Government has provided funding for the oyster industry to develop a code that certifies the quality and food safety of oysters, environmental sustainability and workplace safety. Quality assurance programs can be used to 'support marketing by a producer in particular markets to demonstrate attributes such as sustainability, biosecurity, [and] food safety'. SAOGA stated that 'activities in the GAB must not pose any threat to these kinds of credentialing programs and certifications which have been achieved through considerable energy, effort and cost'.[26]

Revenue and royalties

4.25 Submitters raised concern that existing taxation arrangements for offshore oil and gas projects may reduce the supposed economic benefits.[27] For example, The Australia Institute submitted that exploration drilling would be unlikely to yield royalties or tax to either the state or federal governments, and that in fact, expenses associated with exploration would likely be used as deductions from future income. It noted that the North West Shelf project required substantial investment—$8 billion up to 2009—from the Western Australian government in the form of infrastructure provision and subsidies before revenues were able to be collected.[28]

4.26 The Australia Institute warned that 'based on the Western Australian experience, if South Australia expects to develop an offshore gas industry, it must be

24 South Australian Oysters Growers Association, *Submission 82*, pp. 8–9.

25 South Australian Oysters Growers Association, *Submission 82*, p. 10.

26 South Australian Oysters Growers Association, *Submission 82*, p. 10.

27 See for example, Miss Rebecca Faulkner, *Submission 38*, p. 9.

28 Mr Roderick Campbell, Research Director, The Australia Institute, *Committee Hansard*, 28 April 2017, p. 12.

ready for potentially decades of subsidy before revenues are realised'.[29] It concluded that:

> …the economic impacts of oil production in the Great Australian Bight would be modest, particularly when seen in the context of the South Australian economy or the wider national economy.[30]

4.27 The South Australian Government also noted that should commercial quantities of petroleum be discovered and a production phase commenced, royalties in their entirety are paid to the Commonwealth. The South Australian Government does not receive any royalties on petroleum in Commonwealth licensed permits.[31]

4.28 Mr Campbell also commented on the need to put the benefits in context of the Australian economy and the timeframe of the projects:

> The idea that a range of projects can contribute hundreds of billions of dollars needs to be put in the context of the many, many years that they are over and the fact that it is the rest of the economy that is providing 99 per cent of the revenue to the Australian government and of the jobs in the economy. Let's not run around talking about the jobs that the gas industry or these projects might create without any context and without considering opportunity cost.[32]

4.29 The Wilderness Society submitted that 'the public simply should not subsidise such highly risky oil development activities'. [33] Mr Matthew Collis, IFAW, supported this view and stated that 'Australian taxpayers are subsidising offshore exploration in frontier areas like the Great Australian Bight by the concessions that are given to companies there'. He went to question whether Australian taxpayers should be undertaking that burden for what could potentially become stranded assets.[34]

4.30 Submitters were particularly critical of the subsidies available to titleholders under the Commonwealth *Petroleum Resources Rent Tax Assessment Act 1987* (PRRT Act). For example, The Wilderness Society noted that under PRRT Act, exploration activity that occurs in Designated Frontier Areas attracts subsidies. Under sections 36B and 36C, expenditure incurred by an oil or gas company during the exploration phase in a Designated Frontier Area is eligible to be deducted from the company's PRRT Act taxation liabilities at a rate of 150 per cent.[35] The Wilderness

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29 The Australia Institute, *Submission 37*, p. 8.

30 The Australia Institute, *Submission 37*, p. 5.

31 South Australian Government, *Submission 44*, p. 13.

32 Mr Roderick Campbell, Research Director, The Australia Institute, *Committee Hansard*, 28 April 2017, p. 13.

33 The Wilderness Society, *Submission 43*, p. 49.

34 Mr Matthew Collis, IFAW, *Committee Hansard*, 28 April 2017, p. 30.

35 The Wilderness Society, *Submission 43*, p. 49.

Society stated that three of the four permits held by BP would be eligible for such deductions.[36]

4.31 Ms Claire Fitzpatrick, Managing Director of BP Developments Australia explained the PRRT Act arrangements further. Ms Fitzpatrick told the committee that:

> …the 150 per cent for certain frontier exploration activities, would apply to three of our four permits. It applies to the PRRT tax regime, which only comes into force once your project has generated sufficient profit to trigger that. It is possible that in the future, if we are successful and there is a full-blown development and sufficient revenues have been generated to generate profit, that would be eligible under the current rules…No deductions in respect of that 150 per cent incentive have been charged or taken.[37]

4.32 The Department of Industry, Innovation and Science told the committee that the PRRT is 'designed to be—in a sense—a risk-sharing engagement' which encourages investment.[38] The Department also explained that BP would only be able to claim eligible portions of money spent on exploratory activity for deduction. In particular, it would only be able to claim money that has been spent rather than the entirety of its estimated work program of $538 million.[39] Under the PRRT, undeducted exploration expenditure for a project is also transferable to other projects with a taxable profit if, at the time the expenditure was incurred, the projects were held by the same entity. Similar rules apply in relation to the transfer of expenditure between projects held by companies in a company group.[40]

4.33 It should also be noted that expenses associated with clean-up activities necessary in the event of an oil spill during exploratory activities are considered 'exploration expenditure' for the purposes of the PRRT. The Australian Taxation Office, in answering a question taken on notice at the Senate Economics Legislation Committee Supplementary Budget Estimates hearing on 19 October 2016 stated:

> If there was a problem with an exploration well requiring remediation expenditure, to the extent that the expenditure had a close or quite direct connection with the physical activities of the petroleum project, it would be

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36 The Wilderness Society, *Submission 43*, p. 49.

37 Ms Claire Fitzpatrick, BP Developments Australia Pty Ltd, *Committee Hansard*, 28 April 2016, p. 46.

38 Mr Mike Lawson, Acting Deputy Secretary, Department of Industry, Innovation and Science, *Committee Hansard*, 8 February 2017, p. 9.

39 Ms Marie Illman, Manager, Offshore Exploration, Department of Industry, Innovation and Science, *Committee Hansard*, 8 February 2017, p. 5; Mr Mike Lawson, Acting Deputy Secretary, Department of Industry, Innovation and Science, *Committee Hansard*, 8 February 2017, p. 6.

40 For more information on the PRRT, see:https://www.industry.gov.au/resource/Enhancing/ResourcesTaxation/PetroleumResourceRentTax/Pages/default.aspx.

considered exploration expenditure for petroleum resource rent tax purposes and would be available to be carried forward and uplifted.[41]

4.34 In November 2016, the Treasurer, the Hon Scott Morrison, announced a review into the design and operation of the PRRT. The review is being led by independent expert Mr Michael Callaghan, with the support of a secretariat within The Treasury.[42] In addition, on 1 December 2016, the Senate Economics References Committee resolved to broaden the scope of its inquiry into corporate tax avoidance to include an examination of Australia's offshore oil and gas industry including the treatment and/or payment of royalties, the PRRT, deductions, and other taxes.[43]

Environmental impacts

4.35 Submitters pointed to a range of environmental impacts arising during exploration and production of oil and gas in the Great Australian Bight. Of particular concern were the impacts of seismic surveying on mammals and the effects of increased shipping on the marine environment of the Great Australian Bight.

Seismic surveying

4.36 Seismic surveying, both 2D and 3D, is used by the oil and gas industry to explore the sea bed for oil and gas deposits. It is considered to be the most reliable form of initial exploration and is essential in identifying geological features below the surface. It reduces the need for excess exploration and ensures the efficiency and safety of oil and gas operations.[44] For example, Murphy Australia Oil conducted seismic surveying in the Great Australian Bight in 2013–14.[45] The Department of Industry, Innovation and Science noted that this work has been done consistent with the legal requirements, which include not undertaking survey work during restricted periods to avoid whale migration seasons and other potential impacts.[46]

4.37 In offshore operations, specialised vessels tow a seismic streamer—a collection of cables with seismic sources and hydrophones attached. These seismic

41 Australian Taxation Office, Answers to Questions on Notice, Senate Economics Legislation Committee, Supplementary Budget Estimates 2016–2017, Question 250, 19 October 2016 (received 9 December 2016).

42 For more information on the review see: http://www.treasury.gov.au/ConsultationsandReviews/Reviews/2016/Review-of-the-Petroleum-Resource-Rent-Tax.

43 For more information see: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Corporatetax45th.

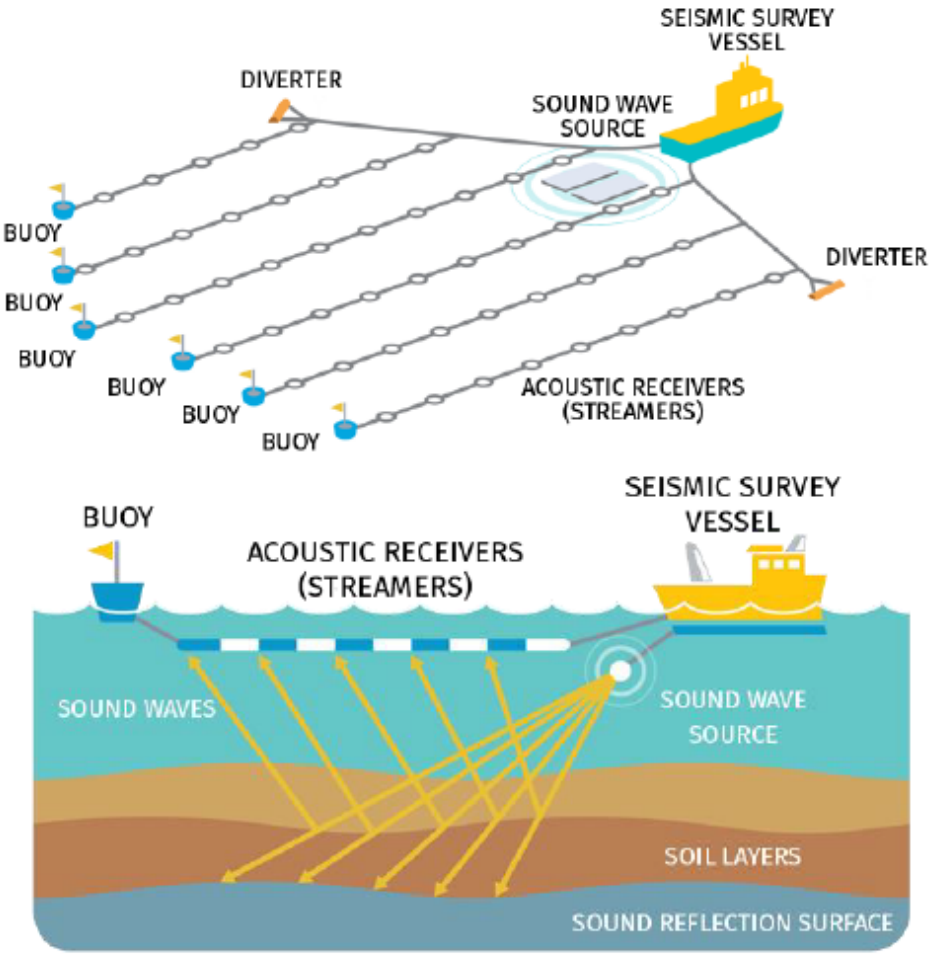
44 APPEA, *Submission 46*, p. 12.

45 Mr Derrick O'Keefe, Murphy Australia Oil, *Committee Hansard*, 28 April 2016, p. 62.

46 Mr Mike Lawson, Department of Industry, Innovation and Science, *Committee Hansard*, 8 February 2017, p. 3.

sources use compressed air to produce acoustic energy which bounces off rock formations on the seabed. The sound waves are reflected back to the surface where the hydrophones towed by the vessel capture them for analysis. This analysis provides information on the presence of gases or fluids in rock formations, and the type of rock present in the area.[47] The figure below illustrates the process of a seismic survey.

Figure 4.1 – Seismic survey process



Source: APPEA, Submission 46, p. 13.

4.38 Seismic surveys were the subject of some debate during the course of the inquiry with some submitters expressing concern that seismic surveying can have negative effects on cetaceans. Mr Matthew Collis, Policy and Campaigns Manager, IFAW, commented that seismic surveys introduce massive amounts of noise pollution into the marine environment which affect marine life, particularly whales. He added:

> As scientific knowledge improves, we are slowly beginning to understand the risks noise pollution entails for animals that rely on sound as their

47 APPEA, *Submission 46*, p. 13.

> primary sense and for every part of their life cycle. IFAW is concerned that neither the impacts of repeated seismic testing nor the wider cumulative impacts of multiple offshore projects are being properly taken into account under the current regulatory system.[48]

4.39 Greenpeace noted that a recent study had demonstrated that blue whales occur in 44 per cent of the areas of the Bight that have undergone seismic testing or where testing is planned and that whales are present during the months when testing occurs.[49] IFAW provided more information on the effects of noise on whales and submitted:

> Whales have a highly refined acoustic sense with which they monitor their surroundings. Whales use sound to navigate, locate prey and predators, attract mates, and for social interactions. Whales are extremely sensitive to man-made underwater noise pollution, including seismic surveys. Noise pollution can force whales away from important habitat, reduce feeding, cause stress, disorient them and inhibit their communication by masking their calls or forcing whales to call louder to be heard. At close range, loud noise can cause temporary or permanent damage to a whale's hearing, which has implications for their entire way of life.[50]

4.40 The Wilderness Society similarly noted that cetaceans use sound to communicate, navigate and feed, and submitted that 'a single seismic survey can cause endangered fin and humpback whales (both species rely on habitat in the Great Australian Bight) to stop vocalising—a behaviour essential to breeding and foraging—over an area at least 100,000 square nautical miles in size'.[51]

4.41 The AMCS submitted that there is scientific research which has concluded that:

> At least 37 marine species have been shown to be affected by seismic airgun noise. These impacts range from behavioural changes such as decreased foraging, avoidance of the noise, and changes in vocalizations through displacement from important habitat, stress, decreased egg viability and growth, and decreased catch rates, to hearing impairment, massive injuries, and even death by drowning or strandings. Seismic airgun noise must be considered a serious marine environmental pollutant.[52]

4.42 Some submitters, for example the South Australian Oyster Growers Association, also raised concern that there could be a connection between seismic

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48 Mr Matthew Collis, IFAW, *Committee Hansard*, 28 April 2016, p. 28.

49 Greenpeace Australia Pacific, *Submission 22*, p. 6.

50 International Fund for Animal Welfare, *Submission 29*, p. 7.

51 The Wilderness Society, *Submission 43*, p. 22.

52 Australian Marine Conservation Society, *Submission 19*, p. 6; see also Mr Matthew Collis, IFAW, *Committee Hansard*, 28 April 2016, p. 32; Humane Society International, *Submission 3*, p. 2.

surveying in the Great Australian Bight and a number of whale strandings in the area which occurred in 2014–2015.[53]

4.43 However, Ms Claire Charlton, the lead scientist on the long-term Great Australian Bight southern right whale study, told the committee that the causal link between seismic surveying and cetacean strandings and death remains in question. Ms Charlton stated:

> That is a big question in that the causal effect might be different in each case depending on what examples have been given. Certainly, underwater noise can potentially cause physiological impacts to a whale which could cause damage—although that would require the animal to be very close. Internationally, that is still a very big question…[54]

4.44 Ms Charlton also stated that the dataset for the Great Australian Bight southern right whale study begins in 1981, and does not indicate any population trends that have been attributed to seismic surveys.[55]

4.45 APPEA noted that 'the oil and gas industry continue to invest millions of dollars of extra research' into the effects of noise on marine life 'in order to improve understanding and industry practices'.[56] Ms Charlton noted that Murphy and Santos—oil and gas permit holders in the Great Australian Bight—currently sponsor both the long-term study of whales in the Great Australian Bight, and provide sponsorship for a three year PhD program.[57]

Acoustic noise and shipping

4.46 In addition to seismic surveys, submitters expressed concern with the impact on cetaceans from an increase in acoustic noise associated with drilling and shipping in the area, and an increase in the risk of vessel strikes.

4.47 Greenpeace Australia Pacific noted that globally, the risk to cetaceans from vessel strikes is such that it has been recognised by the International Whaling Commission (IWC), and included in the terms of reference for both the IWC Scientific and Conservation Committees.[58] Similarly, The Wilderness Society

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53 South Australian Oyster Growers Association, *Submission 42*, p. 2. See also Mr Jeff Hansen, Sea Shepherd Australia, *Committee Hansard*, 16 November 2016, p. 19.

54 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 3.

55 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 2.

56 APPEA, *Submission 46*, p. 13.

57 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, pp. 1–2.

58 Greenpeace Australia Pacific, *Submission 22*, p. 6.

highlighted that the *Conservation Management Plan for the Southern Right Whale* stated that although reported vessel strikes are low:

> …it is likely that this risk will increase as shipping traffic grows and the impact on an individual, especially in south-east Australia, is likely to have a significant, potentially population-scale effect, if further evidence confirms this as a small demographically discrete population.[59]

4.48 The AMCS submitted that an increase in shipping in the Great Australian Bight associated with oil and gas activity would 'increase risks associated with animal strike, pollution, biosecurity hazards and underwater noise'.[60] Similarly, Greenpeace Australia Pacific submitted that:

> ...while it is difficult to predict accurate figures for ship movements, should the permit areas currently released under acreage all be developed it can be assumed that an increase in shipping will be substantial. Quantifying the population level extent of ship strike mortality is notoriously difficult since collisions are frequently unnoticed, but it is believed ship strikes can jeopardise the viability of small populations.[61]

4.49 Ms Charlton told the committee that southern right whales are particularly prone to vessel strike, and that unless they have had previous interactions with vessels they do not necessarily know to move out of the way of a ship.[62] Ms Charlton stated that:

> The southern right whales are increasing, but even internationally we are just now seeing this 3,000 number. We are still in a sensitive time. The southern right whales might be more prone to ship strike. These whales have had very little exposure to anthropogenic impacts. There is a shipping already off the Great Australian Bight. I am well aware of that. I know that the increased shipping traffic might be relatively minor, but it is still a consideration. These whales are very protected and not exposed at the moment. Again, it is just important that it is done well and that we apply the right mitigation tools, because it is a sensitive, endangered species.[63]

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59 The Wilderness Society, *Submission 43*, p. 25. See also Department of Sustainability, Environment, Water, Population and Communities, *Conservation Management Plan for the Southern Right Whale 2011–2021*, 2012, pp. 33–34, http://www.environment.gov.au/system/files/resources/4b8c7f35-e132-401c-85be-6a34c61471dc/files/e-australis-2011-2021.pdf, (accessed 18 January 2016).

60 Australian Marine Conservation Society, *Submission 19*, p. 4. See also Greenpeace Australia Pacific, *Submission 22*, p. 1.

61 Greenpeace Australia Pacific, *Submission 22*, p. 6.

62 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 5.

63 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 5.

4.50 In addition to the increased risk of vessel strike, the noise associated with an increase in both ship and helicopter traffic was raised by some submitters as an issue of concern. For example, Mr Rodney Keogh, a whale tour operator from Fowlers Bay on the far west coast of the Eyre Peninsula told the committee that he was concerned about the impact of vessel traffic and helicopters on the migration of whales in the area. In particular, he noted that southern right whales are a species that 'moves away from noise and moves away from vessel traffic'.[64] Mr Keogh explained that he had already witnessed southern right whales leaving Fowlers Bay after an increase in vessel traffic. Mr Keogh stated:

> For the last two years I have seen it with increased vessel traffic at Fowlers Bay. I have seen the whales move completely out of the area…. It is all due to acoustic noise in the water. If the whales are not sure, they will disappear. They do not have to be on our coastline; they can be anywhere else. They do not have to be here; if they are getting hassled they will take off.[65]

4.51 The importance of natal site fidelity was also raised in discussions of the impact of drilling in the pathway of migrating cetaceans. Ms Charlton, told the committee that there are 13 calving aggregation areas along the southern coast and that female southern right whales have high natal site fidelity, however there is insufficient evidence to assess the impact of drilling occurring in the migration pathway. Ms Charlton stated:

> I think there are predominantly 13 calving aggregation areas along the southern coast. We also know from the biology of the animals that they have high natal site fidelity. Often the female will actually return to the site where she was given birth to then start to have her offspring and will return to the same location every three to four years to breed. There are some signs of animals that have redistributed their calving habitat. The science shows that it is likely that the animals would continue to return to the same areas. In terms of if they changed direction, it is a really big question because, at the moment, we really know very little about their offshore distribution and movements and migratory pathways.[66]

4.52 Ms Charlton highlighted that further research is needed to establish a baseline understanding of whale behaviour in the area so that the effects of vessel traffic and acoustic noise can be identified and monitored. Ms Charlton told the committee that research gaps include understanding the movements between coastal aggregation grounds (migration pathways), understanding the offshore distribution of the area's population, and whether population is increasing.[67] Ms Charlton also highlighted that:

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64 Mr Rodney Keogh, Fowlers Bay Eco Park, *Committee Hansard*, 16 November 2016, p. 65.

65 Mr Rodney Keogh, Fowlers Bay Eco Park, *Committee Hansard*, 16 November 2016, p. 66.

66 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 5.

67 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 6.

> …there is a real opportunity for conservation and industry to co-exist. It is really a matter of gathering the right amount of data, adopting the precautionary principle, finding out the information we need and seeing that those mitigation tools are in place.[68]

4.53 In response to questioning about the interaction of whales and turtles with the infrastructure of the oil and gas industries, Mr Russell Lagdon, Senior Environment Manager, Chevron Australia, pointed to North West Shelf oil and gas activities. He commented that the industry operates in offshore waters on the cetacean migration path and further, that the humpback population on the west coast has 'rebounded quite significantly'. Mr Lagdon added:

> Yet [humpbacks] migrate through waters where we drill and explore and where there are major shipping routes for iron ore and other natural resources. So it would seem that the activity is not significantly impacting their breeding rates.[69]

Greenhouse gas emissions

4.54 A number of submitters argued that increasing oil and gas production in Australia will negatively affect Australia's ability to meet its commitment to reduce greenhouse gas emissions by 2030. In particular, submitters made reference to the historic, global climate agreement made in Paris under the United Nations Framework Convention on Climate Change at the 21st Conference of the Parties (The Paris Agreement).

4.55 The Paris Agreement sets in place a durable and dynamic framework for all countries to take climate action from 2020, building on existing international efforts in the period up to 2020. The key outcomes of the Paris Agreement include a global goal to hold the average temperature increase to well below 2°C and to pursue efforts to keep warming below 1.5°C above pre-industrial levels.

4.56 The AMCS submitted that:

> Opening up the Bight for oil development goes completely against Australia's—and the world's—commitment to the Paris Agreement and the aim of limiting global warming to 1.5 degrees Celsius above pre-industrial levels.[70]

4.57 The Wilderness Society also submitted that research conducted by the University College London has identified that in order to maintain a reasonable

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68 Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 4.

69 Mr Russell Lagdon, Chevron Australia, *Committee Hansard*, 16 November 2016, p. 46.

70 Australian Marine Conservation Society, *Submission 19*; p. 6. See also Greenpeace Australia Pacific, *Submission 22*, p. 6; Professor Will Steffen, *Submission 27*, p. 1; Miss Rebecca Faulkner, *Submission 38*, p. 5; Conservation Council of South Australia, *Submission 13*, p. 2.

chance of complying with the aims of the Paris Agreement, only 49 per cent of existing oil reserves in the OECD Pacific region can be burnt. The Wilderness Society concluded that this would indicate that opening the Great Australian Bight for exploration would be inconsistent with this estimation, and would be in conflict with the Paris Climate Agreement.[71]

71 The Wilderness Society, *Submission 43*, p. 4.