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THE BASIS OF THE ENVIRONMENTAL JUSTICE REQUEST FOR RECONSIDERATION OF APPROVALS

PECAN and the *Beyond Gas Network* believes that the extensive material submitted to the Minister by Environmental Justice Australia presents new information not previously available, both in terms of information in respect of climate change and also the impacts climate change is having on World Heritage properties, National Heritage sites and the other Matters of National Environment Significance (MNES) as defined in the EPBC Act. The material in Annexure 1, from authorities including the IPCC, UNEP, IEA, CSIRO and Bureau of Meteorology, the Royal Commission into National Natural Disaster Arrangements, and expert commentators and scientists Professors Lesley Hughes, David Karoly together with others, represent information not available when earlier approvals were granted. Of the 12 reports and documents used as the basis for this intervention, 3 are from late 2020, 4 from 2021, and the remaining 5 from 2022. Together they constitute the most up to date research on climate change and its potential impacts, and show the impacts the 18 projects under review will have or are likely to have on the thousands of MNES sites, species and ecological communities identified as vulnerable to increasing warming as a result of combusting of coal and gas.

The Physical Science Basis

The following section deals with the physical science basis produced by Working Group 1 (WG1) of the IPCC Sixth Report. Global temperatures have increased by 1.1C since the pre- industrial period; for Australia, over land temperatures have increased by 1.4C between 1910 and 2019, and sea surface temperatures by 1.0C from 1900 – 2019. Very high monthly maximum or minimum temps that occurred around 2% of the time in the period between 1960 and 1989, occurred at 11 or 12% between 2005 and 2019. In 2019, there were 33 days when the temperature exceeded 33C, more than the total number in the 58 years between 1960 and 2018 combined.

Importantly, the relationship between temperature and CO₂ levels is nearly linear, so that each 1,000 Gts of anthropogenic CO₂ approximates a temperature increase of 0.45C.

WG1 modelled a range of emissions futures, with 1) very high GHG emissions at roughly double current levels; 2) intermediate emissions levels at around current levels until 2050, and 3) very low emissions levels declining to net zero by 2050, and thereafter negative emissions. Only scenario 3 provided the possibility of limiting temperature to 1.5C; the high emissions scenario is “estimated to result in a drastic long-term increase in global temperature by 4.4°C”¹.

¹ EJA Sub'n par 9



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Given the linear relationship between emissions levels and temperature increase it is critical that in order to stabilize global temperature a condition of net zero emissions must be reached.

Mitigation of Climate Change

Global GHG emissions keep growing: average GHG emissions between 2010 and 2019 were higher than in any previous decade. Emissions growth continued across all sectors but by 2019 the largest growth came from fossil fuels and industry, with 34% coming from energy supply.

WG111 modelled global emissions pathways based on nationally determined contributions announced before COP 26 and found that warming will exceed 1.5C this century and will make it harder after 2030 to remain within 1,5C. If current operating parameters are continued without additional abatement, emissions from existing fossil fuel infrastructure from 2018 to lifetime end are estimated to be 660Gt CO₂. If currently planned infrastructure is added under the same unabated conditions, that figure is estimated to grow to 850Gt. To remain within a 1.5C limit, cumulative global emissions from all sectors are required to not exceed 510Gt, and for a 2.0C ceiling, the estimate is 890Gt. On our current trajectory emissions rising after 2025 are estimated to result in a median temperature of 3.2C by 2100. Importantly, all pathways to either 1.5 or 2.0C require rapid and deep, mostly immediate emissions reductions across all sectors.

Importantly, and with direct relevance to the current review, the Working Group points out that the continued installation of new fossil fuel infrastructure which is unabated has direct significance for the task ahead, for it will add to the amount of future emissions. The modeling showed that to remain within 1.5C parameters the global consumption of coal, oil and gas needs to decline by median values of 95%, 60% and 45% respectively compared to 2019; without CCS, these reductions become 100%, 60% and 70% by 2050. For a 2.0C outcome those values become 85%, 30% and 15% compared to 2019.

In the real world we are moving in the opposite direction to that which is necessary. To have a 50% probability of limiting warming to 1.5C nearly 60% of oil and methane gas and 90% of coal reserves must remain in the ground by 2050. For Australia, these figures become 40% of oil, 29% for methane gas and 90% of coal to limit warming to 1.5C.²

The UNEP Production Gap: 2021 report showed that governments planned to produce twice as much fossil fuels in 2030 than is consistent with the 1.5C target, and 45% more than for 2.0C. By 2040 the report estimated that plans indicated production of 190% more than required to meet the 1.5C limit, and 89% more than for 2.0C.³

² Welsby et al, Nature,

³ UNEP, Production Gap: 2021 Report



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The physical effects of climate change in Australia

Widespread and severe impacts on terrestrial and freshwater ecosystems and species are evident and will become more pronounced with continuing warming. Every additional 0.5C of warming will bring identifiable extremes of hot weather, precipitation and agricultural and ecological droughts.

WG11 identified the following effects of climate change on Bushfires, Ocean Heatwaves and Acidification, Drought, and Rainfall Extremes and Flooding

Bushfires

More extreme fire weather days are being experienced, especially in the south and the east of the continent, and particularly in spring and summer. The severely damaging fires of 2019/20 were at least 30% more likely due to climate change, and extreme weather days are projected to increase in frequency, severity and duration. Fire was present in every State and Territory in 2019. In eastern Australia these fires burnt between 5.8 and 8.1 m hectares, displacing nearly 3bn vertebrate animals; 114 threatened species lost at least 50% of their habitat and 49 listed threatened species lost at least 80% of their habitat.

In southern Australia it is projected that some forest ecosystems will transition to a new state or collapse due to hotter or drier conditions with more bushfires.

Ocean Heatwaves and Acidification

Marine heatwaves have been experienced near Western Australia, the Great Barrier Reef and in the Tasman Sea. Due to absorption of CO₂ the average pH of surface waters has decreased by 0.1, representing a 30% increase in acidification, causing a reduction in coral calcification and growth rates on the Great Barrier Reef. The current rate of change in acidification is ten times faster than at any time in the last 300 million years. The WG11 projects acidification to increase more substantially by 2090. Already heat stress is leading to increased occurrence of disease, toxins and mortality. Already habitat forming organisms – corals, kelps, seagrasses and mangroves are impacted on over 45% of the Australian coastline.

Droughts

WG11 predicts with high confidence more droughts in southern and Eastern Australia. A 2020 paper by Kirono et al projects that without global curbing of emissions temperatures by 2100 will increase by between 2.6 and 4.8C. Australian can anticipate more periods of drought, longer durations of droughts, and more severe droughts, particularly affecting south-west and eastern Australia.



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Rainfall Extremes and Flooding

Hourly extreme rainfall increased by 10 – 20% in many locations between 1966 – 1989 and 1990 – 2013. Daily rainfall with thunderstorms increased by 13 – 24% from 1979- 2016, particularly in northern Australia. Daily rainfall intensity increased in the north-west from 1950 – 2005 and in the east from 1911 – 2014, and decreased in the south– west and Tasmania from 1911-2010. WG11 predicts increased rainfall intensity, fewer tropical cyclones and a greater proportion of severe cyclones. Extreme rainfall is projected to become more intense; modelling studies project increases in flood magnitude in northern and eastern Australia, as we are experiencing at present.

Likely Impact of Climate Change on Matters of National Environmental Significance

The EPBC Act protects particular animals, plants, habitats or places, collectively known as ‘protected matters’.

The nine Matters of National Environmental Significance are as follows:

- listed threatened species and ecological communities
- migratory species protected under international agreements
- Ramsar wetlands of international importance
- the Commonwealth marine environment
- World Heritage properties
- National Heritage places
- Great Barrier Reef Marine Park
- nuclear actions, and
- a water resource, in relation to coal seam gas development and large coal mining development.

A complex methodology was developed to align the most up to date and relevant data against the first seven of the MNES, with the following outcomes:

Impacts on World Heritage Properties

Of the 20 properties currently listed, 17 were reviewed in detail; the documentation demonstrated that climate change is likely to impact the World Heritage values of each of them. The EJA submission used Kakadu National Park, Shark Bay and the Wet Tropics of Queensland to illustrate the ‘irresistible inferences’⁴ leading to that conclusion.

⁴ EJA Submission, par 76



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Impacts on National Heritage Places

Of the 119 World Heritage places on the Commonwealth Heritage List comprising natural, indigenous and historic places, detailed reviews focused on 19 natural places, six of which are also World Heritage properties. More detailed discussion to illustrate the impact of climate change was provided for the Australian Alps National Parks and Reserves, and the Grampians Greater Gariwerd National Park.

Impacts on Great Barrier Reef National Park

Strong concerns about the impact of climate change on the Reef have been repeatedly expressed by the Australian Government, the Great Barrier Reef Marine Park Authority and the International Union for the Conservation of Nature (IUCN). In 2019 the Australian Government report to the World Heritage Committee stated that accelerated action to mitigate climate change was essential. The Marine Park Authority's Outlook reports in 2014 and 2019 stated that climate change represented the most serious threat to the Reef. From its 2019 Position Statement: Climate change is the greatest threat to the Great Barrier Reef. Only the strongest and fastest possible actions to decrease global greenhouse gas emissions will reduce the risks and limit the impacts of climate change on the Reef. Further impacts can be minimised by limiting global temperature increase to the maximum extent possible and fast-tracking actions to build Reef resilience. The IUCN Conservation Outlook 2020 identified climate change as the strongest threat to the conservation of the Reef and its Outstanding Universal Value. Ocean acidification, temperature extremes and storms/flooding were identified as a "very high threat".

Coral bleaching is expected to continue twice each decade from 2035 and annually after 2044 under RCP8.5 and annually after 2051 under RCP4.5. Limiting warming to 1.5C would not prevent frequent mass bleaching, but could reduce their occurrence. And projected increases in cyclone activity are anticipated to accelerate reef degradation.

Impacts on Ramsar Wetlands

Australia has 66 Ramsar Wetlands on the List of Wetlands of International Importance. Data collection and analysis of 53 Wetlands identified 51 of them as likely to be impacted by climate change.

Climate change is expected to bring reduced rainfall and higher temperatures, producing reduced flooding, decreased runoff, and higher evaporation which will affect groundwater levels and salinity, in turn affecting fauna and vegetation communities and habitat.



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Impact on Species and Ecological Communities

Amongst WG11's findings are widespread and severe climate change impacts on ecosystems and species now evident across Australia, reflecting both ongoing climate change and the impact of individual extreme weather events. Fundamental shifts have occurred in the structure and composition of some ecosystems with impacts on species including local and global extinctions, severe regional population declines and phenotype changes. In terrestrial and freshwater ecosystems land use changes are interacting with climate change, affecting ecosystem structure, composition and function, with catastrophic consequences for wildlife in some cases, a particular case being the 2019/20 bushfires.

In southern and south Western Australia drought- induced canopy dieback is evident, with the replacement of dominant canopy tree species by woody shrubs. For the Australian Alps and Tasmanian alpine zones a decline in grasses and increase in shrub cover is evident. Mass mortality has affected some species – several flying fox species, together with several freshwater fish species.

Climate change is projected to become a dominant stressor on biodiversity, with some ecosystems experiencing irreversible composition and structure changes, causing extinction of some threatened species.

Impacts on Listed Threatened Species - Fauna

In March 2022 Australia had 1,839 species of fauna and flora listed as threatened under Sec 178. 1,605 were reviewed; of 401 fauna, 366 were identified as likely to be affected by climate change. The Leadbeater possum is directly affected by bushfires, which also result in fewer tree hollows.

Similarly, the koala is listed as endangered in Queensland, NSW and the ACT. Climate change impacts, leading to drought, high temperatures and bushfires have reduced the size of available habitat, with projections showing further large losses by 2070. Using a 2011 baseline, projections to 2030 show climate suitable koala distribution declining by 17-78% in Queensland, 8-19% in NSW, and 10% in the ACT.

Impacts on Listed Threatened Species – Flora

In March 22 1,204 flora were listed as threatened; 1,084 were identified as likely to be impacted by climate change. Two examples, the critically endangered Macquarie cushion and Maxwell's Grevillea are discussed, with Conservation Advice identifying climate change as a direct threat; the Conservation Advice for Maxwell's Grevillea identifies drought and fire as key threats, with drought reducing flowering, seed set and population recruitment.



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Impacts on Ecological Communities

In March 2022 there were 91 threatened ecological communities listed under s181, excluding those categorized as ‘vulnerable’. The data collating process reviewed 77 of these, of which 74 were classified as likely to be impacted by climate change. Two examples are discussed, the critically endangered Eastern Suburbs Banksia Scrub of the Sydney region, and the endangered Coastal Swamp Sclerophyll Forest of NSW and South East Queensland.

The Conservation Advice for the Banksia Scrub projects higher average and maximum temperatures, substantially declining rainfall, and more extreme events combining drought, heat waves and an increase in the number of days of fire danger, causing losses of large areas of native vegetation.

For the Coastal Swamp Sclerophyll Forest the Conservation Advice identified climate change as instrumental in the following impacts : habitat loss; hotter and drier conditions and increasing fires, with more drought increasing fire impacts; significant reduction in freshwater runoff to coastal rivers and streams, and less water availability; intensified droughts; major flood events, damaging to many flora and fauna; salinization of freshwater supplies as result of sea level rise and changing vegetation structure; heat waves affecting functionally important fauna species like Flying Foxes which are key seed and pollen dispersers; and invasive weeds and fauna.

Impacts on Listed Migratory Species

In February 2022 there were 165 migratory species listed under s209; data was collated for 154 species of which 133 were identified as likely to be impacted by climate change. The single example discussed is that of the Leatherback Turtle, with climate change identified by the IUCN Red List as a threat to the species. The Conservation Advice identifies threats of increased air temperature of over 30C as likely to affect embryo development, and sea level rise affecting nesting beach stability and foraging ground distribution.

Impacts on Commonwealth Marine Areas

The Commonwealth marine areas are constituted by six marine parks – North, North-west, South-west South-east, Temperate East and Coral Sea. Data collation for five of these parks shows that each of them has been impacted by climate change.

The Temperate East Marine Region is used as an exemplar, with the Marine Bioregional Plan for this Region identifying climate change and associated large scale effects, like shifts in major currents, sea level rise, ocean acidification, and changes in variability and extremes of climatic features – sea temperature, winds, and storms. Changes in sea temperature and ocean acidification as a result of climate change have been identified as of concern to the Elizabeth and Middleton Reefs.



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The Commonwealth Marine Environment Report Card for Temperate East Marine Region rates sea level rise caused by climate change as of potential concern for Elizabeth and Middleton Reefs. Rapid sea level rise may affect coral growths and shallow reef systems and dependent species such as seabirds and turtles. Changing sea temperature is of concern for Elizabeth and Middleton Reefs and potential concern to the remaining seven key ecological features of the region. Those that support marine life and biodiversity near the sea surface are vulnerable, with some species forced to move further south to find more suitable habitat. Ocean acidification is of concern to the Elizabeth and Middleton Reefs and potential concern to the Tasmantid and Lord Howe seamount chains together with Norfolk Ridge. Acidification affects capacity to form skeletal structures and will affect coral growth rates, and is likely to affect the species dependent on them for food and shelter.



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ADDITIONAL CONSIDERATIONS

The North West Shelf Extension

This project involves extension of the existing offshore LNG production until 2070. If approved it would produce 3.2GtCo2e of scope 3 emissions, in addition to those already approved, which together with its Scope 1 emissions would be comparable to Australia's Scope 1 emissions.⁵ Clearly this proposal is inconsistent with the Paris agreement, the IPCC AR6, and the IEA.⁶

It is uncertain as to how much gas can or will be produced as current fields will be exhausted by 2036 and no information has been provided to the regulator as to sourcing new supply. In these circumstances the regulator should not have approved the current proposal.

Emissions appear to have been overstated by 1MtCO2e pa over the life of the proposal, allowing the proponents to claim non-existent reductions.

The proposal to use significant levels of offsets are flawed – the world cannot meet future targets through biological offsets

Approval has been provided for the operation to continue until 2070 by which time the plant will be 86 years old. No information has been provided as to infrastructure renewal. In addition no information has been provided about decommissioning, an area in which the proponent has previously been found wanting.⁷

The project will produce quantities of benzene, toluene, ethylbenzene and xylene. The Karatha Gas plant is also the largest producer of nitrous oxide on the Burrup Peninsula; together with zylene this is injurious to the more than 1million World Heritage nominated rock art paintings of Murujuga.

No approval has been sought from the Traditional Owners.

The proposal does not provide information about reducing its own emissions impacts to As Low As Reasonably Practical (ALARP)

The project's proponents have provided misleading information about the economic benefits accruing to Australia. Previous NWSJV claims of economic benefits have been systematically exaggerated: The vast majority of the NWS is owned by overseas investors, so only a small fraction of profits are retained by Australians.⁸

⁵ ACCR, Appeal against the North West Shelf Extension, July2022

⁶ IEA, Net Zero by 2050, May 2021

⁷ Ibid

⁸ Ibid



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STATE OF THE CLIMATE 2022

The biennial joint publication by the CSIRO and the Bureau of Meteorology has just been released and its somber conclusions are consistent with the IPCC AR6, UNEP's reports, the IEA and other authorities cited in the EJA reconsideration request.

Australia on-land temperature has increased by 1.47C since 1010, and ocean temperatures have increased by just over 1.0C

Broadly, there has been an increase in the number of extreme heat events, intense heavy rainfall, longer fire seasons and sea level rise.

Greenhouse gas levels are higher than at any time in the last two million years.

There is continuing warming and acidification of the oceans around Australia, leading to longer and more frequent heatwaves. Mass coral bleaching is occurring more frequently and this year has seen the first bleaching event in a La Nina Year.

There are contrasting rainfall trends across the north and the south of the continent, with southern Australia experiencing an overall decline in rainfall between April and October while it has increased in northern Australia.

Eastern Australia has experienced one of its most significant flood periods in 2021/22. Heavy rainfall has become more intense and the number of short duration heavy rainfall events is projected to increase.

Fire seasons are projected to be longer in the south and east of the continent with an increased number of fire danger days.

Sea level rise is uneven around Australia's coastline, with the most significant increases occurring in the north and south east.

GREENWASHING – OFFSETS, CCS AND UKRAINE

Net zero by 2050 has become a mantra for the energy companies, but in many cases no clear pathway to net zero has been developed, and offsets and CCS are invoked as essential measures which will be adopted when they become necessary, which is not yet. ACCUs are under review, appropriately, but overseas offsets are also in use, often without adequate integrity assurances in place. Use of offsets is backed up by recourse to CCS, without clear understanding of the complexity, costs and capacity issues which CCS has run up against in every application to date, as Chevron has discovered at Gorgon, and Santos may discover at Moomba and other locations. As pointed out in the Australian Centre of Corporate Responsibility's appeal against the NWS approval, CCS should only be utilized in the case of difficult-to-abate applications, not as a shield for what are now routine operations for the gas companies.



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Bruce Robinson and Milad Mousavian⁹ provide a new comprehensive evaluation of CCS which shows that, apart from two unique applications in Norway, CCS projects have failed, some with catastrophic consequences. Further, they also point out even if CCS projects were technically possible (and we should reiterate this is highly unlikely) they would not mitigate the vast quantities of greenhouse gases when coal or gas is burnt. This *new* information refutes the claims of fossil fuel companies that greenhouse gas emissions will not impact the MNES values on the grounds that those emissions can be captured. The precautionary principle that governs EPBC evaluations should mean that until such time that greenhouse gas emission can be shown to not cause harm, they should not be allowed to impact MNES values. The newly recognised understanding is that a hitherto failed technology will work in future to mitigate greenhouse gas emissions is in fact an unfulfillable promise. This should be grounds for disallowing fossil fuel projects which base their proposal for increased emissions on this empty promise.

With respect to carbon offsets, the *new* revelations of Professor McIntosh¹⁰ describing the Australian carbon market as a fraud, also refutes the claims that there is an existing regime for offsetting devastating greenhouse emissions impacting MNES values. Again, the precautionary principle means that the burden of proof falls on claimants that offsets can work. Until such time that offsets are shown to work to produce net zero emissions, the promise that they will one day work cannot be grounds for allowing fossil fuel projects which base their emission reductions on these promises, to be approved.

The other relevant issue in the present situation is the way the energy companies have seized on the current energy crisis caused by the Ukraine war, and are using it as a pretext for opening or expanding new gas fields and prolonging the use of a fuel which should over time only be in use as a firming mechanism.

MEASURING THE PROPOSALS' EMISSIONS

Below we have tabulated the information submitted to the EPBC review from the Environment Justice Australia to highlight the emissions from each of the fossil fuel projects under review by the minister. While we recognise that each project's emissions and impacts are the basis for EPBC evaluation, nevertheless it is worth pointing out the total emissions of these projects, amounting close to 40 times Australia's existing annual emissions at a time when keeping the world to a 1.5 degree temperature increase require an 8% annual *reduction* in emissions, would be devastating on MNES values.

⁹ Robertson, B and Mousavian, M, 2022, [The Carbon Capture Crux: Lessons learned](#), Institute for Energy Economics and Financial Analysis,

¹⁰ Macintosh, A, et al, 2022, [Fixing the Integrity Problems with Australia's Carbon Market](#), ANU.



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	Project	Fossil Fuel	IPCC Annual Aust Emissions - Mtpa CO2	Life Time Years	Life Time Global Emissions Mt CO2	Notes
1	NWS - Woodside LNG	LNG	7.7	50	4,395	Estimate
2	Narrabri	Coal	Not included	13	246	
3	Alpha North	Coal	Not included	30	5,832	
4	APLNG	LNG/NG	Not included	Not included	Not included	
5	Glencore/Valeria	Coal	Not included	35	1,360	
6	Stanmore/Range	Coal	0.3	26	450	Estimate
7	Ensham	Coal	1.0	9	101	
8	Baralaba South	Coal	Not included	30 to 40	225	Estimate
9	Spur Hill	Coal	Not included	25	262	
10	China Stone	Coal	Not included	50	4,617	
11	Moorlands	Coal	Not included	30	124	
12	Saraji East	Coal	Not included	25 to 30	578	
13	Winchester South	Coal	0.5	30	547	
14	Lake Vermont M/brook	Coal	Not included	25	334	
15	Mount Pleasant	Coal	Not included	22	924	Estimate
16	Boggabri	Coal	Not included	6	Not included	
17	Meandu	Coal	Not included	15	255	
18	Caval Ridge	Coal	Not included	30	440	
19	Styx	Coal	Not included	20 to 25	124	
Total			8.5		20,814	

CONCLUSION

We agree that the material provided by the Environmental Justice Australia is new information about the impacts of the fossil fuel projects on MNES values under part three of the EPBC Act. We also believe that there is new information putting into question a ground for previously allowing these projects to proceed, namely the promise that CCS and Offsets will work. There is now mounting evidence that challenges this promise. Finally, while we recognise that each



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project is assessed on its individual environmental impact, we also point out the total emissions from these projects would have devastating impacts on all MNES values.