Public submission – Proposed Browse to North West Shelf Project & North West Shelf Project Extension

the BEELIAR GROUP

https://thebeeliargroup.com/

Prepared by the Beeliar Group of Professors for Environmental Responsibility. Our group of 35 Professors was formed in January 2017 out of concern over the process used to plan and implement the Perth Freight Link and Roe Highway Stage 8.

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Context for the Submission

1. This is a public submission to support the community consultation being undertaken on the proposed Browse to North West Shelf Project and the North West Shelf Project Extension. Those proposals are operated by Woodside Energy Ltd (Woodside) on behalf of their Joint Venture Partners.

2. The Beeliar Group supports the public submission made by Dr Sajni Gudka and the comments and recommendations made therein regarding the effects of the North West Shelf Project Extension on air quality and public health.

3. The Beeliar Group also supports the public submission made by the Friends of Australian Rock Art, and notes that the Australian Government recently lodged a submission for the Murujuga cultural landscape on Western Australia's Burrup Peninsula to be included on Australia's world heritage tentative list, which is the first formal step toward achieving global recognition for the 50,000-year-old gallery of more than one million petroglyphs.

4. We note the proposal description for the North West Shelf Project Extension provided on the website of the WA Environmental Protection Authority (EPA):

> Woodside Energy Ltd (Woodside) as Operator for and on behalf of the North West Shelf Joint Venture proposes the ongoing operation of the North West Shelf Project to enable the processing of third party gas and fluids through the North West Shelf Project facilities until around 2070.

5. We note that the proposal description for the proposed Browse to North West Shelf Project provided on the website of the WA Environmental Protection Authority (EPA):

> Woodside Energy Ltd (Woodside) as Operator for and on behalf of the Browse Joint Venture, is proposing to develop the Browse Development Area located approximately 425km north of Broome in the offshore Browse Basin.
>
> The Browse to North West Shelf (NWS) proposal in State waters surrounding Scott Reef

> involves drilling and completion, installation, commissioning, operation, well repair and workover, and decommissioning of up to 24 subsea wells and associated infrastructure located in Western Australian State waters.
>
> Development of the remaining proposal elements is subject to assessment by the Commonwealth and includes two Floating Production Storage and Offloading facilities (FPSO) connected to existing NWS infrastructure via a 900-kilometre trunk line.[1]

6. We recognise that the proposed Browse to North West Shelf Project action/proposal:
    a. spans State and Commonwealth jurisdictions; and
    b. is being independently assessed under both the *Environmental Protection Act 1986* (WA) (EP Act) (Public Environmental Review) and the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act).

7. For clarity, our submission relates to the State assessment for the North West Shelf Project Extension and to both the State and Commonwealth assessments for the proposed Browse to North West Shelf Project. Unless stated otherwise, the submissions refer generally to the assessments of both proposals. We refer specifically to the EP Act and the EPBC Act or to the State and Commonwealth assessments as relevant.

8. The term "assessment documentation" refers to the documents relating to the assessment of the two proposals under both Acts, including the North West Shelf Project Extension Environmental Review Document and the Draft EIS/ERD document for the Browse to North West Shelf Project.

9. We note that, for the assessment under the EPBC Act, the proposed action by Woodside is a controlled action, and requires assessment and approval under the EPBC Act before it can proceed. The relevant controlling provisions are:
    - National heritage values of a National Heritage place (ss 15B & 15C);
    - Listed threatened species and communities (s 18 & 18A);
    - Listed migratory species (ss 20 & 20A); and
    - Commonwealth marine area, the protected matter being the environment generally (ss 23 & 24A).

[1] http://www.epa.wa.gov.au/media-statements/woodside%E2%80%99s-browse-and-north-west-shelf-proposals-out-public-comment

Contents of Public Submission

1 Suggested outcomes from the State and Commonwealth assessments

Submission 1:

The State and Commonwealth decision-making authorities should find that:

(1) the two proposals will contribute to climate change; and
(2) the effects of that climate change will have significant impacts on the matters protected under the **EP Act** (the 'environment' of the State) and under the **EPBC Act** (the matters of national environmental significance for the four controlling provisions for the Browse to North West Shelf Project action).

Accordingly, the State and Commonwealth decision-making authorities should:

(1) refuse approval for the two proposals; or
(2) grant approval but impose substantive conditions on GHG emissions.

By "substantive" we mean avoidance, reduction, and/or offset measures that will result in much lower Scope 1 GHG emissions from the two projects than Woodside and the joint venture partners currently proposes.

2	**Woodside and the joint venture partners have failed to mitigate their companies' exposure to climate risk**

Submission 2:

Article 2(1)(c) of the Paris Agreement provides:

> This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:
> …
> **Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.** (emphasis added)

Investor and community pressures concerns about climate risk now occupy the heart of mainstream investing. Financiers are abandoning companies that fail to mitigate exposures to climate change risks.[2]

Submission 3:

1. Woodside and the joint venture partners fear that State regulatory controls on GHG emissions will harm their ability to obtain finance.

2. To use the framework for climate-related risk developed by the Task Force on Climate-related Financial Disclosures (TFCD),[3] Woodside and the joint venture partners argue that the climate-related risk for the two proposals is a "Policy" risk, associated with a change or evolution in the State regulatory approach for GHG emissions. Thus terms such as "policy shock" and ad hominem comments like "boffin" are used to disparage members of the EPA.

3. As regards their ability to obtain finance, the relevant climate-related risks for Woodside and the joint venture partners are:

a. litigation risk:
As Noel Hutley SC and Sebastian Hartford-Davis concluded in their March 2019 supplementary opinion on climate change and directors' duties: "the exposure of individual directors to 'climate change litigation' is increasing, probably exponentially, with time."[4]

b. market risk
Climate change and the transition to a lower carbon economy create vicissitudes in the supply and demand for products, including LNG.

[2] See, e.g., *The Green Swan: Central Banking and Financial Stability in the Age of Climate Change* (January 2020): https://www.bis.org/publ/othp31.pdf
[3] https://www.fsb-tcfd.org/publications/
[4] https://cpd.org.au/2019/03/directors-duties-2019/

c. reputational risk:
As the authors of the TFCD report note, climate change raises important issues of corporate social responsibility: "Climate change has been identified as a potential source of reputational risk tied to changing customer or community perceptions of an organization's contribution to or detraction from the transition to a lower-carbon economy."

4. We must reach net zero emissions by 2050. This outcome cannot be negotiable, it is a global agreement and the State must be part of this or else the focus of the world's financing institutions will turn on us.

5. Woodside and the joint venture partners are seeking to keep production increasing right through this period and even into 2070. They have no plan for phasing in Green Hydrogen.

6. Financiers will see the two proposals as risky not because of the regulatory controls being placed on them, but because the markets for LNG will be turning off and looking for Green Hydrogen not natural gas.

7. If Woodside and the joint venture partners can't produce a Plan for Natural Gas Phase-Out and Green Hydrogen Phase-In then they will not be attractive to the market.

8. Government processes need to support this transition. If not the industry will collapse as its markets fall away. This is not good economic planning as well as not good environmental planning.

3	**Decision-makers must consider the Paris Agreement mitigation objectives**

Submission 4:
Every emission of GHGs increases the concentration of GHGs in the atmosphere, and thus contributes to reaching the critical concentrations of 430 ppm (for a 1.5°C target) and 450 ppm (for a 2°C target).

Submission 5:
The limited remaining carbon budget for the 1.5°C target (430 ppm) and 2°C target (450 ppm) means that each failure to impose a reduction in GHG emissions now will require future reductions to be more stringent (and likely more costly and/or onerous to implement) to stay within the confines of an even more limited remaining carbon budget.

Submission 6:
Each reduction in GHG emissions makes the 1.5°C and 2°C targets more practicable to achieve, as the reduction leaves more of the remaining carbon budget unused. Just as every emission of GHGs increases the atmospheric concentration of GHGs, every reduction in GHGs keeps a portion of the carbon budget intact.

Comment

10. The 2018 IPCC *Special Report on Global Warming of 1.5°C*,[5] Paris Agreement-compatible global pathways to net zero CO_2 and greenhouse gas (GHG) emissions consistent with the Paris Agreement long term temperature goal entail a reduction of 45% by 2030 from 2010 levels.

11. The IPCC *Special Report on Global Warming of 1.5°C* report also shows clearly that delays in reducing emissions on this timescale will likely make meeting the Paris Agreement much more expensive and/or infeasible.

12. Downscaling these global energy scenarios to Australia indicates that domestic reductions by 2030 need be at least 44% from 2005 levels.

13. State and Commonwealth decision-makers must have regard to the mitigation objectives and actions expressed in Article 2 and Article 4 of the Paris Agreement, namely that:
    a. Limiting global warming to well below 2°C and striving to limit the temperature increase to 1.5°C will significantly reduce the risks and impacts of climate change (Article 2); and
    b. To achieve this temperature goal, greenhouse gas emissions must peak as soon as possible

[5] https://www.ipcc.ch/sr15/

and then reduce rapidly to achieve net zero greenhouse gas emissions by 2050, with developed countries leading with economy-wide absolute emissions reduction targets (Article 4).

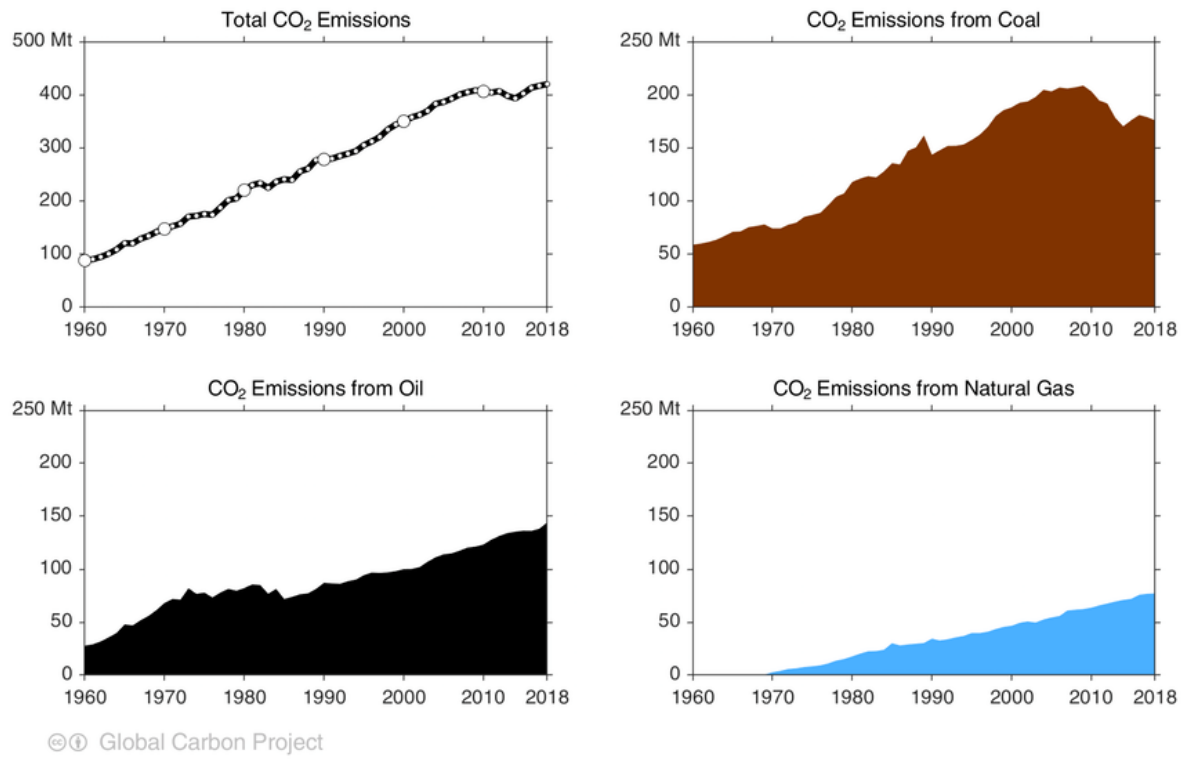
14. Emissions from oil and natural gas are increasing rapidly and are driving Australia's overall growth in fossil CO_2 emissions (Figure 1).

15. For Australia is to meet its emission reduction targets under the Paris Agreement, new natural gas developments must use carbon capture and storage.

Figure 1: CO_2 emissions from fossil fuels in Australia (in million tonnes)

Source: https://www.globalcarbonproject.org/carbonbudget/& https://theconversation.com/global-emissions-to-hit-36-8-billion-tonnes-beating-last-years-record-high-128113

Data Source: UNFCCC, CDIAC, BP, USGS



4 The proposals are not ecologically sustainable development

Submission 7:

The manner in which Woodside and the joint venture partners propose to develop the Browse reservoir and to operate the North West Shelf Project facilities will create residual GHG emissions that are significant in a State, national, and global context because the annual and cumulative emissions from the two projects combined will (inter alia):

a. consume substantial portions of the global carbon budgets for the 1.5°C and 2.0°C targets;
b. make the Browse to North West Shelf LNG value chain the largest, or near largest, source of GHG emissions of all Australian resource projects;
c. prevent Western Australia from achieving 1.5°C and 2.0°C-compatible pathways; and
d. consume a substantial portion of the carbon budget for Australia to achieve its current Nationally Determined Contribution (NDC) under the Paris Agreement.

Submission 8:

The cumulative emissions are therefore important, notable and of State, national, and international consequence in:

a. an absolute sense (the magnitude of GHG emissions) given relevant emissions reductions targets and carbon budgets;
b. the contribution they will make to climate change (as quantified by their Global Warming Potential (GWP) or other emission metric);
c. in terms of the partial responsibility that Australia (and Western Australia) have for climate change and for reducing GHG emissions;
d. the implications for international equity in a State and national context; and
e. the issues of fairness and equity they present because they will comprise such a substantial portion of State and Australia GHG emissions for several decades.

Submission 9:

The manner in which Woodside, and the joint venture partners for the two proposals, proposes to exploit the Browse reservoir and operate the North West Shelf Project facilities will not use, conserve and enhance the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

Submission 10:

The implementation of the two proposals in their current form will privatise the profits from the use of a community resource and socialise the associated environmental, cultural and public health costs.

Comment

16. The proposed Browse to North West Shelf Project addresses the decline in the North West Shelf Joint Venture's existing gas reserves by developing a new gas reserve with a high reservoir CO_2 content (Browse). The North West Shelf Project Extension extend and expands the operation of North West Shelf Project facilities.

17. The assessment documentation reports annual Scope 1 emissions of 4.8 mt CO_2–e/year (Browse to NWS - average year) and 7.7 mt CO_2–e/year (NWS Shelf Extension).[6]

18. The assessment documentation reports total annual emissions of 36.8 mt CO_2–e/year (average) (Scope 1 and 3) for the proposed Browse to North West Shelf Project and 87.89 mt CO_2–e/year (average) (Scope 1, 2, and 3) for the North West Shelf Project Extension.

19. The assessment documentation indicates an expected field life of 31 years and an extended field life of 44 years for proposed Browse to North West Shelf Project and that the North West Shelf Project Extension will operate until around 2050.

20. In accord with established principles of international law and Australia's obligations and commitments under international climate change agreements, Australia has partial responsibility for climate change and its impacts and must account for at least the Scope 1 GHG emissions from the two proposals.

21. It is the community – not Woodside and the joint venture partners – that will bear the burden of the consequences of the two proposals, which include contributions to climate change, reductions in air quality (and consequent impacts on human health and amenity), and impacts on Aboriginal cultural heritage (rock art).

[6] The assessment documentation leaves the actual Scope 1 position for the proposed Browse to North West Shelf Project unclear.

5	**The two proposals are inextricably linked and the separate assessments obscure the overall carbon footprint**

Submission 11:
The proposed Browse to North West Shelf Project, through the use of FPSO facilities in Commonwealth waters, effectively removes more than half of the action's Scope 1 emissions from State regulatory oversight.

Submission 12:
The two proposals are inextricably linked and, in examining the contributions that the two projects will make to climate change, the emissions from the two proposals should be considered together.

Comment

22. The proposed Browse to North West Shelf Project action moves offshore a portion of the processing that previously occurred on land and separates the emissions from the Browse reservoir supply chain across two Safeguard facilities.[7]

23. The emissions from Browse to North West Shelf Project Safeguard facility will nonetheless be attributable to Western Australia as the *National Greenhouse and Energy Reporting Act 2007* (Commonwealth) requires the emissions from a facility to be attributed to a State or Territory. This creates the unusual position where a State is nominally responsible for emissions that it has no regulatory control over.

[7] We presume the proposed Browse to North West Shelf Project will have its own Safeguard facility – the assessment documentation is unclear on this point.

6 Decision-makers must consider cumulative emissions

Submission 13:

1. For both proposals, the proper focus of the decision-making authorities should be on the proposal's cumulative greenhouse gas emissions, the potential for those cumulative emissions to contribute to climate change, and the consequences of climate change for the subject matters of interest.

2. Emissions of CO_2 accumulate in the atmosphere and long-term climate change reflects cumulative (cf annual) CO_2 emissions. Whether a project's emissions occur over 40 years or 4 years does not matter for 2075 climate change or eventual peak warming – it is the cumulative emissions not the timescale that is important.

Submission 14:

Decision-makers must grasp the size of the issue that the world and Australia faces from the next phase of development in the North West Shelf. The annual and cumulative Scope 1 and Scope emissions from the Browse to North West Shelf Project and North West Shelf Project proposals alone exceed those proposed for Carmichael Coal Mine project (Adani).

Submission 15:

1. The impact of a polluting project increases in significance as time goes on, even if annual emissions are held constant.

2. This is because the same annual emissions amount will consume a greater and greater fraction of the diminishing available global carbon budget every year.

3. The IPCC *Special Report on Global Warming of 1.5°C* and IEA 1.5°C Sustainable Development Goals based carbon budget shows that between 2025 and 2040 (the period of Browse major production) global natural gas production must decline and reduce in emissions intensity.

4. The magnitude and intensity of production from the two proposals is inconsistent with this. Nonetheless Woodside and the joint venture partners fail to mitigate the climate risk associated with their projects by (e.g.) applying carbon capture and storage technology or implementing full offsetting of residual GHG emissions.

Submission 16:

Particularly when cumulative emissions are taken into account, there is no proper basis for the assertions made in the assessment documentation that:

a. the residual emissions from the two proposals are inconsequential at a global scale; and
b. Browse-derived LNG, and North West Shelf Project-processed LNG generally, will reduce global GHG emissions.

Comment

24. Decision-makers must focus on cumulative emissions from a proposal because, particularly for long-lived GHGs, the impact of the physical effects associated with climate change (e.g. increased ocean temperature, ocean acidification, and more extreme weather events) on a subject matter can only be evaluated over time (c.f. focusing on a single, short-term event or circumstance).

25. It takes many hundreds of years to thousands of years for natural biophysical processes to remove CO_2 that human activities (e.g. combustion of fossil fuels) have added to the Earth's carbon cycle. Warming caused by CO_2 emissions is effectively irreversible over decadal to multi-century timescales.

7	**Decision-makers must recognise that all greenhouse gas emissions contribute to climate change**

Submission 17:
A basic premise of our current scientific and legal frameworks for the relationship between greenhouse gases and climate change is that all emissions of greenhouse gases contribute to global warming.

Submission 18:
A second premise is that all emissions can be traced to impacts because GHG emissions disperse throughout the atmosphere and have a relatively uniform effect.

Submission 19:
A third premise of our legal framework for the relationship between greenhouse gases and climate change is that the emissions contribution of a party can be used as a proxy for its contribution to an impact.

Comment

26. A basic premise of our current scientific understanding and legal frameworks for the relationship between greenhouse gases and climate change is that all emissions of greenhouse gases contribute to global warming.

27. A second premise is that all emissions can be traced to impacts because GHG emissions disperse throughout the atmosphere and have a relatively uniform effect.[8]

28. A third premise of our legal framework for the relationship between greenhouse gases and climate change is that the emissions contribution of a party can be used as a proxy for its contribution to an impact.[9]

29. "Greenhouse gases" like carbon dioxide (CO_2) and methane (CH_4) are gases that trap heat in the atmosphere. The contribution of a greenhouse gas to global warming depends on: the amount of the gas in the atmosphere (concentration); the length of time the gas stays in the atmosphere (lifetime); and the ability of the gas to absorb energy (radiative efficiency). Carbon dioxide and methane are "well-mixed" greenhouse gases meaning that they have lifetimes long enough to be relatively homogeneously mixed in the troposphere.

[8] Burger, M., Wentz, J., & Horton, R. (2020). The Law and Science of Climate Change Attribution. *Columbia Journal of Environmental Law*, 45(1). https://doi.org/10.7916/cjel.v45i1.4730; available at: https://journals.library.columbia.edu/index.php/cjel/article/view/4730

[9] Burger, M., Wentz, J., & Horton, R. (2020). The Law and Science of Climate Change Attribution. *Columbia Journal of Environmental Law*, 45(1). https://doi.org/10.7916/cjel.v45i1.4730; available at: https://journals.library.columbia.edu/index.php/cjel/article/view/4730

30. Emission metrics such as Global Warming Potential (GWP) can be used to quantify the relative and absolute contributions to climate change of emissions of different greenhouse gases and of emissions of greenhouse gases from different sources (e.g. countries, sectors, or facilities).[10]

31. The GWP of a greenhouse gas reflects its lifetime radiative efficiency, and is a measure of how much energy the emissions of 1 tonne of that gas will absorb over a chosen period of time, relative to the emissions of 1 tonne of carbon dioxide (which is the reference gas). Gases with a higher GWP absorb more energy, per unit of mass, than gases with a lower GWP, and thus contribute more to global warming.

32. GWPs are a basic methodological architecture for the Australia's National Greenhouse Accounts and for the Emissions and Energy Reporting System (EERS) under the *National Greenhouse and Energy Reporting Act 2007*. Section 2.02 of the *National Greenhouse and Energy Reporting Regulations 2008* (Commonwealth) provides that the GWP of carbon dioxide is 1 and that the GWP of methane is 25.

33. Courts, both in Australia and internationally, have recognised that all emissions of greenhouse gases contribute to global warming. In *Gloucester Resources Ltd v Minister for Planning* (2019) 234 LGERA 257, 370 [514], Justice Brian Preston (Chief Judge of the NSW Land and Environment Court) observed:

> **All GHG emissions contribute to climate change**
>
> All of the direct and indirect GHG emissions of the Rocky Hill Coal Project will impact on the environment. All anthropogenic GHG emissions contribute to climate change. As the IPCC found, most of the observed increase in global average temperatures is due to the observed increase in anthropogenic GHG concentrations in the atmosphere. The increased GHG concentrations in the atmosphere have already affected, and will continue to affect, the climate system.

34. The Scope 1 and Scope 3 GHG emissions from the two proposals increase concentrations of GHGs in the atmosphere and therefore well lead to positive radiative forcing and warming of Earth's surface, with consequent physical effects (e.g. particularly increased ocean temperature, ocean acidification, and more extreme weather events).

35. As regards Scope 3 emissions, we submit that the decision-making authorities can be satisfied that Scope 3 emissions will increase concentrations of GHGs in the atmosphere, and that it is practicable to estimate the amount of GHGs that will be emitted through the transport and combustion of Browse-derived LNG or LNG produced at the North West Shelf Project facilities in China, India, Japan, and elsewhere.

[10] Myhre, G., and others. (2013). 'Anthropogenic and Natural Radiative Forcing.' In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. [Stocker, T.F., and others (eds.)]. Cambridge University Press. Available at: https://www.ipcc.ch/report/ar5/wg1/

8	**For the Commonwealth assessment, the relevant events or circumstances for the Scope 1 and Scope 3 emissions are the physical effects associated with climate change**

Submission 20:
Relevant events or circumstances for the Scope 1 and Scope 3 emissions for the proposed Browse to North West Shelf action are the physical effects associated with climate change, particularly increased ocean temperature, ocean acidification, and more extreme weather events.[11] These physical effects affect biota, e.g. increased sea surface temperatures can cause coral to bleach. As discussed above, the impact of an action on matters of environmental significance should be assessed on the basis of the cumulative emissions from the action.

Comment

36. The meaning of "impact" is addressed in s 527E of the EPBC Act to include an "event or circumstance" which is a direct consequence of the action. An "event or circumstance" is not defined in the EPBC Act, so those words are to be given their ordinary meaning.

37. The phrase "significant impact" is also not defined in the EPBC Act but has been construed as meaning an "impact that is important, notable or of consequence having regard to its context or intensity": *Booth v Bosworth* (2001) 114 FCR 39 [90].

38. The term "impact" is defined by reference to whether an event or circumstance is an impact of an action and a distinction is drawn between an event or circumstance which is a direct consequence of an action as opposed to an event or circumstance that is an indirect consequence of an action. An event or circumstance that is an indirect consequence of an action will be an "impact", subject to s 527E(2), only if the action is "a substantial cause of that event or circumstance": s 527E(1)(b)).

39. If the Minister (or her delegate) has decided under Division 2 of Part 7 that an action is a controlled action, the relevant impacts of the action are the impacts that the action (a) has or will have or (b) is likely to have on the matter protected by each provision of Part 3 that the Minister has decided under that Division is a controlling provision for the action. The controlling provisions are indicated above.

40. Sub-section 527E(2) provides for when there is a primary action and a secondary action which is taken by a different person as a consequence of the primary action and when an event or circumstance consequential upon the secondary action is an impact of the primary action. For an event or circumstance to be an indirect consequence of an action, it must be

[11] See *Australian Conservation Foundation Incorporated v Minister for the Environment and Energy* [2017] FCAFC 134 [61] (25 August 2017) (Full Court of the Federal Court of Australia).

demonstrated that the action is a "substantial cause" of that event or circumstance (s 527E(1)(b)) and that the criteria prescribed by s 527E(2) are met.

41. Relevant events or circumstances for the Scope 1 and Scope 3 emissions for the proposed Browse to North West Shelf action are the physical effects associated with climate change, particularly increased ocean temperature, ocean acidification, and more extreme weather events.[12]

42. These physical effects affect biota, e.g. increased sea surface temperatures can cause coral to bleach. As discussed above, the impact of an action on matters of environmental significance should be assessed on the basis of the cumulative emissions from the action.

43. This is because the physical effects of climate change associated with emissions of a long-lived GHGs over the operational lifetime of the action will manifest in multiple events and circumstances over time and may cause persistent changes in the environment (e.g. in temperature and pH) that will exert cumulative and synergistic impacts on biota.

[12] See *Australian Conservation Foundation Incorporated v Minister for the Environment and Energy* [2017] FCAFC 134 [61] (25 August 2017) (Full Court of the Federal Court of Australia).

9	**Decision-makers should not apply a simple mechanistic notion of causation in assessing impacts and should consider Australia's partial responsibility for climate change**

Submission 21:

Australia is subject to its own independent obligations under international law and under international agreements to which it is a signatory (e.g. the United Nations Framework Convention on Climate Change, UNFCC). Those obligations oblige Australia to comply with its partial responsibility for climate change and to do its part to reduce GHG emissions and prevent harmful climate change.

Submission 22:

This partial responsibility extends to decision-making under Commonwealth and State legislation and requires decision-makers to evaluate the significance of GHG emissions within the national, regional or local context over which decision-makers have regulatory authority.

Submission 23:

The EPBC (Part 9) and the EP Act (Part IV) do not require decision-makers to apply a simple mechanistic notion of causation in assessing impacts.

When assessing a potential impact of climate change on a particular subject matter, decision-makers do not need to satisfy themselves as to a causal chain extending from the moment of emission through the process of radiative forcing to the manifestation of a specific event or circumstance associated with climate change (e.g. abnormally warm sea surface temperatures) and the consequence of that event or circumstance for the subject matter of interest (e.g. a coral bleaching event).

Submission 24:

The decision authorised by s 130 of the EPBC Act is a decision to allow, or not to allow a proposed action, which will, or is likely to, have a significant impact on a matter protected by a provision in Part 3 of the EPBC Act.

The matters relevant to the decision are prescribed (primarily in Part 9), but there is no particular matter of which the Minister must be satisfied. In making the decision, the Minister is not required to make intermediate decisions concerning "impacts" or the causes of impacts.[13]

Submission 25:

The assessment of a proposed action (or a proposal) must, within the relevant statutory framework, be responsive to the nature of the impacts that a proposed action (or proposal) will

[13] *Australian Conservation Foundation Incorporated v Minister for the Environment and Energy* [2017] FCAFC 134 [61] (25 August 2017) (Full Court of the Federal Court of Australia)

cause, or is likely to cause, on the subject matter of interest.

Failure to do so will render the law – principally Part 9 of the EPBC Act and Part IV of the EP Act – impotent to regulate the GHG emissions from proposed actions (and proposals), even where climate change is likely to have a serious, and in some cases catastrophic, impact of the subject matter in question.

10 A basis for evaluating the significance of a project's emissions

Comment

44. A basis by which the significance of the GHG emissions from the two projects can be evaluated is described in Table 1 below.

Table 1: Description of a basis by which to evaluate the significance of a project's emissions

(1) The emissions of long-lived GHGs from many emitters, including the project in question, disperse and commingle to a well-mixed state in the atmosphere.

(2) Emitters differ in their emission contributions (e.g. the suites of GHGs emitted and the amounts emitted).

(3) Emission metrics (e.g. Global Warming Potential, GWP) can quantify the relative and absolute contributions to climate change of these emission contributions.

(4) Radiative forcing from atmospheric GHGs leads to an event or circumstance (e.g. increased ocean temperature, ocean acidification, more extreme weather events) that negatively affects the environment (e.g. increased sea surface temperatures leads to coral bleaching and ultimately to coral mortality).

(5) The commingled emissions and the complex nature of climate change means that regulators have no feasible means by which to determine whether any individual emitter's emissions caused the event or circumstance.

(6) The regulator can therefore apply a presumption of indivisibility, and each of the emitters can be deemed to have partial responsibility for the event or circumstance, provided their emissions contribution exceeds some *de minimis* threshold.

(7) The project's emissions contribution, expressed quantitatively through an emission metric, can be used as a proxy for the scope of its partial responsibility for the event or circumstance.

(8) The regulator can assess the significance or importance of the project's partial responsibility for the event or circumstance by comparing the emissions contribution of the project with the emissions contributions of other emitters within a relevant context.

(9) The relevant context may include:

a. the statutory jurisdiction of the regulator (e.g. the State of Western Australia, including State waters);

b. the GHG emissions apportioned to a State or Territory (as indicated in the most recent *State and Territory Greenhouse Gas Inventories*) or to Australia as a whole (as indicated in the most recent *National Greenhouse Gas Inventory*);

c. a relevant emissions reduction target; or

d. a relevant carbon budget.

11	**Decision-makers should not accept Woodside's claims of emissions reductions because its LNG will displace coal in import countries and should instead accept Woodside's admission that the correct proposition is that gas has benefits over coal in generating electricity**

Submission 26:

Claims of emissions reductions from a coal-gas energy switch must be based on empirical studies across the entire natural gas value/supply chain (or chains), including upstream, midstream and downstream participants.[14]

There are at several areas of uncertainty that Woodside has not adequately addressed:

a. whether imported Woodside LNG will in fact displace coal in the import country;
b. whether desired emissions reductions will occur because of the complexity of LNG supply chains and thus the potential for emissions at multiple stages in the supply chain;
c. whether appropriate technologies (e.g. closed cycle gas turbine technology for high efficiency electricity generation) for minimising emissions will be used in import countries; and
d. whether suitable methodologies can be developed to measure and report reductions in emissions given the complexity of LNG supply chains and still-evolving frameworks for monitoring, reporting and verification (MRV) in China.

Submission 27:

Woodside correctly acknowledges that the uncertainty underlying its claim that natural gas has the potential to contribute significantly to the reduction in global greenhouse gas emissions and appropriately proposes that the claim be taken as the proposition that natural gas has benefits over the use of coal in generating electricity.

Submission 28:

1. Woodside LNG exported to Asian markets may reduce emissions if:
   (a) fugitive gas emissions are sufficiently low across the LNG value chain (and these emissions are accurately measured and estimated);
   (b) Woodside LNG is used in high efficiency electricity generation technology in destination markets[15]; and
   (c) if that electricity displaces generation that previously came from coal (i.e. an actual coal-gas switch) or is likely, in the circumstances, to have displaced generation that would otherwise came from coal (and not from some other energy source, including renewables).

2. However, the assessment information does not contain information capable of supporting an inference that Woodside LNG will, as a question of fact, reduce emissions from electricity generation in China, India, Japan, and other Asian markets.

[14] https://www.ccacoalition.org/en/resources/reducing-methane-emissions-across-natural-gas-value-chain-guiding-principles
[15] https://gisera.csiro.au/wp-content/uploads/2019/07/GISERA_G2_Final_Report-whole-of-life-GHG-assessment.pdf

3. The claim that Woodside LNG may reduce emissions is based on conjecture rather than empirical information about the use of Woodside LNG for electricity generation in China, India, Japan, and other Asian markets.

Submission 29:

Adequate support for a claim of emissions reduction from Woodside's LNG requires a study similar to the CSIRO GISERA project (published 2019[16]) which conducted a whole of life GHG emissions assessment for a gas supply chain, but which extends the geographic scope of the assessment to include LNG combusted for generation of electricity in China, India, and other Asian markets.

Submission 30:

1. A role for gas in facilitating the integration of renewables in Asian markets is a different claim that Woodside's claim of emissions reduction through coal-gas switching, and the assessment documentation provides no empirical information to support an inference that Woodside LNG would, as a question of fact, facilitate the integration of renewables in Asian markets.

2. This latter point is significant because the extent to which Woodside LNG would facilitate the integration of renewables depends on a range of factors, not least of which is that the cost of imported Woodside LNG may often be higher than domestic or imported gas from other sources (e.g. from gas pipelines).

Submission 31:

1. Claims of avoided emissions by coal-gas switching, and any inferences to be drawn from them for the purpose of the EPBC and EP Act assessments, must not overstate the conclusions reported in the studies on which those claims are based.

2. For example, Woodside relies on the IEA's estimate of 95 mt CO_2-e of avoided emissions in 2018 because of coal-to-gas switching. This IEA estimate is based on all forms of natural gas (not just LNG) and more than half of the avoided emissions occurred in the United States and Europe.

3. The claims must properly reflect the limitations of those studies and the uncertainties in their estimates of historical avoided emissions or predictions of future avoided emissions in particular scenarios.

Submission 32:

Claims of avoided emissions, and any inferences to be drawn from them for the purpose of the EPBC and EP Act assessments, must have proper regard to the inherent limitations of those

[16] https://gisera.csiro.au/wp-content/uploads/2019/07/GISERA_G2_Final_Report-whole-of-life-GHG-assessment.pdf

studies and the conclusions reported in them, including that:

- the conclusions reported in the studies are projections based on predictive modelling and scenario data;
- the predictive modelling was conducted at national and regional-level scales and was based on certain assumptions and scenario data that also had important limitations;
- the predictive modelling and scenario data was necessarily coarse in that the study was limited in its ability to include within-country information about (e.g.) the diversity and complexity of LNG supply chains within China, India, and other markets; the technology that would be used for electricity generation (and, specifically, whether high efficiency electricity generation would be used); and the prices (and price fluctuation) of Woodside LNG and other energy sources within China, India, and other markets and in Asian spot markets; and
- there are diverging opinions about the plausibility of scenarios modelled and the assumptions on which the studies were based.

Submission 33:

Realistic, evidence-based claims of avoided emissions for Woodside LNG must account for, among other things:

- competition with lower-cost domestic or imported gas in Asian markets, and the implications of increasing global competition to supply the Asian region with gas;
- the complexity of LNG supply chains, within and between countries, and in relation to LNG supplied through long-term supply contracts and through the spot market;
- the sensitivity of avoided emissions to fugitive emissions and the emissions intensities of supply chains for Woodside LNG generally;
- the range of technologies that would be used for electricity generation (and, specifically, whether high efficiency electricity generation would be used); and
- Woodside LNG displacing:
  (a) natural gas produced elsewhere (which would mean overall emissions would remain about the same or would increase because of the emissions intensities associated with Browse-derived LNG); or
  (b) renewables (which would increase overall emissions).

Submission 34:

1. Claims of avoided emissions based on the assumption that the total delivered volume of Browse LNG produced to 2040, supplied into the diverse and dynamic gas markets and supply chains in China, Japan, India, and other Asian countries (whether by long-term supply contracts or through the spot market or otherwise), will – in a straight MWh for MWh switch – displace electricity generated from coal and oil are implausible, and provide no rational basis for claims of emissions reductions.

2. In this regard, we support, the recent observations[17] from two ANU researchers in the Crawford School of Public Policy at ANU, Frank Jotzo and Salim Mazouz:

   In a statement accompanying the latest quarterly emissions figures, the Department of Environment and Energy stated:

[17] https://theconversation.com/australias-energy-exports-increase-global-greenhouse-emissions-not-decrease-them-118990

> *Australia's total LNG exports are estimated to have the potential to lower emissions in importing countries by around 148Mt CO_2-e [million tonnes of carbon dioxide equivalent] in 2018, if they displace coal consumption in those countries.*

In truth, the assumption that every unit of Australia's exported gas displaces coal is silly. The claim of a 148Mt saving is wrong and unfounded. The real number would be much smaller, and there could even be an increase in emissions as a result of LNG exports.

For the most part, exported gas probably displaces natural gas that would otherwise be produced elsewhere, leaving overall emissions roughly the same. Some smaller share may displace coal. But it could just as easily displace renewable or nuclear energy, in which case Australian gas exports would increase global emissions, not reduce them.

Submission 35:

The assessment documentation does not contain any evidence, drawn from life cycle assessments or other methodologies across the entire gas supply chain, including upstream, midstream and downstream components (e.g. combustion of gas by electricity producers in China, Japan, India, and other Asian markets), that describes GHG emissions from the North West Shelf Extension Project (including, specifically, from the Browse reservoirs) and is based on:

(a) existing data for supply chains associated with the North West Shelf Project; and also

(b) plausible future output scenarios of LNG production given probable future sales volumes of LNG into Asian markets, appropriate ranges of reservoir CO_2, and realistic assumptions about the technologies used for electricity generation and the proportion of LNG that displaces electricity produced by coal and oil combustion.

Implication:

The EPA and the relevant State and Commonwealth Ministers therefore do not have any reliable information on which to infer any reduction in Scope 3 emissions from the North West Shelf Extension Project or the proposed Browse to North West Shelf Project that are based on the assertion that electricity derived from the combustion of (i) gas from the Browse reservoirs or (ii) LNG produced by the North West Shelf Project will displace electricity derived from the combustion of coal or oil in China, Japan, India, and other Asian markets.

Submission 36:

The assessment documentation for both proposals does not contain any:

(1) **empirical evidence** that any electricity producer in China, Japan, Southeast Asia, and India has, as a question of fact, switched from using coal to using LNG that was supplied from the North West Shelf Extension Project (e.g. case studies of clients from long-term supply contracts);

(2) **information relating to the:**

a. the probability that any electricity producers in China, Japan, India, and other Asian markets will switch from using coal to using LNG supplied from the North West Shelf Extension Project (including, specifically, LNG derived from gas extracted from the Browse

reservoirs); or

b. the competiveness, in price (and other relevant market factors), of LNG supplied from the North West Shelf Extension Project (and specifically, also to LNG derived from Browse reservoir) against other energy options for energy producers in China, Japan, Southeast Asia, and India, including coal, natural gas from domestic or imported sources, and renewables.

Implication:

The EPA and the relevant State and Commonwealth Ministers therefore do not have any reliable information on which to infer any reduction in Scope 3 emissions from the North West Shelf Extension Project or the proposed Browse to North West Shelf Project on the basis that gas from reservoirs for the proposed Browse to North West Shelf Project or LNG produced by the Karratha Gas Plant will displace other high carbon fossil fuel energy sources (e.g. coal) in China, Japan, Southeast Asia, and India (e.g. through a coal-gas energy switch in those locations).

Comment

45. In the 'Quarterly Update of Australia's National Greenhouse Gas Inventory for March 2019', the Department of the Environment and Energy discussed a recent (July 2019) CSIRO report 'Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project in the Surat Basin, Queensland, Australia'.[18]

46. The Quarterly Update stated[19]:

> **Role of gas in the transition to cleaner, more efficient energy systems**
>
> Natural gas has a clear greenhouse gas benefit over coal when combusted. Natural gas produces around 52 kg CO_2-e per gigajoule compared to around 90 kg CO_2-e per gigajoule from black coal.
>
> There has been debate about whether the greenhouse gas emission benefit of gas over coal still holds when all emissions associated with gas production (for example fugitive emissions) are included. The CSIRO has recently released a report looking at this issue.
>
> The CSIRO undertook a comprehensive life cycle assessment of all greenhouse gas emissions associated with coal seam gas-LNG production, from those associated with upstream production at the well head through to liquefaction, including external emissions such as construction.
>
> The CSIRO report found that the use of coal seam gas from the Surat Basin to displace Queensland thermal coal for electricity generation produces a substantial greenhouse gas emission saving.

[18] https://gisera.csiro.au/wp-content/uploads/2019/07/GISERA_G2_Final_Report-whole-of-life-GHG-assessment.pdf
[19] Australia's emissions projections 2018 (Department of the Environment and Energy, 2018): https://www.environment.gov.au/climate-change/publications/emissions-projections-2018

> Use of coal seam gas from the Surat Basin in an open cycle gas turbine would give a reduction in emissions of 31 per cent and a reduction of 50 per cent for gas used in a closed cycle gas turbine when compared to generation from the use of Queensland thermal coal.
>
> The report also concludes that ensuring high efficiency electricity generation (for example via closed cycle gas turbine technology) is important in realising the potential climate benefits of natural gas where it replaces coal fired electricity generation.

47. The CSIRO report adds some necessary contextual information to what is presented in the Quarterly Update (emphasis added):

> In the present study, we cannot calculate directly the GHG emissions reduction of LNG exports from Curtis Island, Queensland, relative to coal-fired electricity generation in Asia because we do not know the proportion of gas used to displace what would have been produced from coal. However, we have estimated the efficiency of electricity production by natural gas based on Scope 1 unit processes from gas production in Australia as 6.0 MWh/tonne LNG and 8.16 MWh/tonne LNG for Open Cycle Gas Turbine (OCGT) and Closed Cycle Gas Turbine (CCGT) generation, respectively. These generation rates produced GHG intensities of 0.73 t CO_2-e/MWh (OCGT) and 0.53 t CO_2-e/MWh (CCGT). In Australia, if Surat Basin natural gas was used to displace domestic coal fired electricity generation, GHG emissions intensities would be 0.66 t CO_2-e/MWh (OCGT) or 0.48 t CO_2-e/MWh (CCGT) representing a reduction in emission compared with coal of 31% and 50%, respectively. These GHG emissions reductions following domestic use of natural gas occur because emissions associated with liquefaction, shipping and regasification are avoided (representing 9.9% of total life-cycle emission of electricity generation in Asia). It is clear from these results that ensuring high efficiency electricity generation (eg via CCGT technology) is important in realising the potential climate benefits of natural gas where it replaces coal fired electricity generation.

48. This contextual information and the rigorous whole of life greenhouse gas emissions assessment applied in the CSIRO study suggests that any claim of emissions reductions due to the displacement of coal in an import country must be substantiated through a comprehensive assessment of the whole life cycle (LNG supply chain) to ensure emissions throughout the entire supply chain are adequately measured and reported. For example, the analysis in the CSIRO study used two separate assessment methodologies (multi-regional input-output (MRIO) and life-cycle assessment (LCA)) to estimate emissions from different components of the gas supply chain, based on commercial-in-confidence data.

49. There are two basic areas of uncertainty for claims of emissions reductions because of coal displacement.

50. First, there is uncertainty as to whether imported Australian LNG would displace coal in the import country. Whether LNG-coal substitution occurs in the import country will depend on the prices of LNG and other energy sources in the import country, as well as other factors. Imported LNG can also displace renewable energy sources in the import country, leading to an increase in emissions, and delay the structural transition to renewable energy sources.

51. Second, other issues that create uncertainty are the complexity of LNG supply chains, the technology that would be used for electricity generation (and, specifically, whether high efficiency electricity generation would be used), and the methodologies that would be used to measure and report emissions.

52. It is preferable for claims for emissions reductions based on coal displacement to be founded on:
    a. a commercial agreement between an Australian LNG exporter and an electricity producer or energy company with an entire LNG supply chain in the import country; and
    b. an agreed methodology for how emissions reductions from the LNG-coal substitution arrangement would be accounted in terms of nationally determined contributions (NDCs) for the Paris Agreement, in accordance with Article 6.

12	**Failure to consider the IPCC Special Report on Global Warming of 1.5°C**

Submission 37:
The assessment documentation refers frequently to statements about natural gas in the IPCC 2014 Synthesis Report. However, the assessment documentation does not refer to the *Special Report on Global Warming of 1.5°C*, which supersedes and significantly changes the guidance around natural gas. For example, the share of primary energy from natural gas declines in mitigation pathways compatible with 1.5°C warming except in some pathways with widespread deployment of carbon capture and storage.

13	IEA perspectives on LNG & IEA scenarios

Submission 38:

In its *World Energy Outlook*[20], published 13 Nov 2019, the IEA stated:

> There is significant uncertainty as to the scale and durability of demand for imported LNG in developing markets around the world. LNG is a relatively high-cost fuel; investment in liquefaction, transportation and regasification adds a considerable premium to each delivered gas molecule. Competition from other fuels and technologies, whether in the form of coal or renewables, loom large in the backdrop of buyer sentiment and appetite to take volume or price risk.

Comment

53. Another 2019 IEA report, *The Role of Gas in Today's Energy Transitions*[21] (published July 2019), observed that in both India and China:

> …at the prevailing gas prices, new onshore wind and solar photovoltaic (PV) are much cheaper ways to generate electricity than new combined-cycle gas turbines (CCGTs). Under these circumstances, the major contribution of gas-fired generation to displacing coal is likely to be an indirect one, by aiding the integration of renewables. (page 12)

54. The 2019 IEA report, *The Role of Gas in Today's Energy Transitions*[22] (published July 2019), also states that:

> Beating coal on environmental grounds sets a low bar for natural gas, given there are lower-emissions and lower cost alternatives to both fuels. The falling cost of renewable technologies in the power sector is the clearest case in point. In many power markets, wind and solar PV are already among the cheapest options for new generation, and the role of gas is coming under pressure as a result. (page 16)

55. As regards the IEA Sustainable Development Scenario, the 2019 IEA report, *The Role of Gas in Today's Energy Transitions*[23] (published July 2019), states that:

> Renewable energy and efficiency measures are the most important drivers of the energy sector transition of the Sustainable Development Scenario – a scenario that is fully consistent with the Paris Agreement. Natural gas still plays a role in this scenario, although this varies by country, sector, and timeframe. (page 19)

[20] https://www.iea.org/reports/world-energy-outlook-2019
[21] https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions
[22] https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions
[23] https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions

14	Emission intensities for LNG derived from the Browse reservoir

Submission 39:

The emissions intensity of LNG derived from the proposed Browse to North West Shelf project depends critically on the emissions avoidance and reduction measures implemented in the gas production processes.

Comment

56. A life cycle assessment for the study of the Browse reservoir reported that upstream gas production processes accounted for 32% of the "electricity climate change results" for Browse-derived LNG combusted in China (based on the data, assumptions, and modelling approach applied in that study) (See figure below).[24]

Figures 5.2 & 5.3 from life cycle assessment for the study of the Browse reservoir[25]

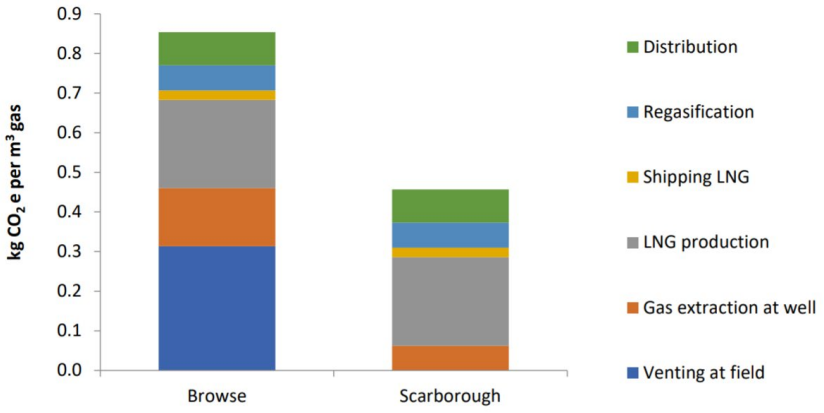


Figure 5-2 kg CO_2e for $1m^3$ from gas Distributed in China

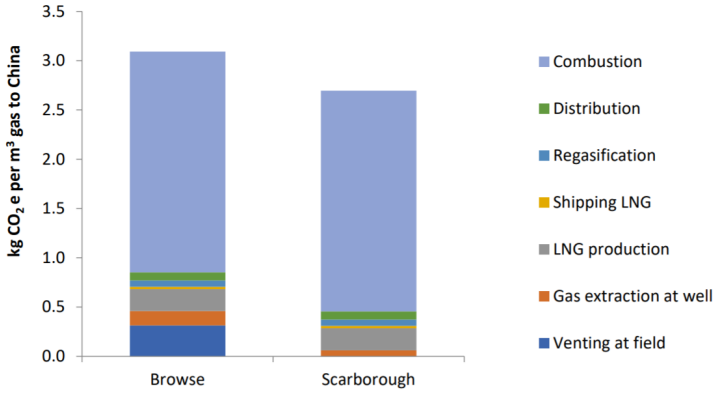


Figure 5-3 kg CO_2e per $1m^3$ of Gas Converted to Electricity in China from LNG Sourced from Scarborough and Browse Gas Fields, using Combined Cycle Gas Power Plant

[24] https://www.erm.com/contentassets/782dd692a5a546db8ea0c0fa052d4e70/woodside-energy-limited-life-cycle-assessment.pdf (page 24)
[25] Ibid.

15	**Inadequacy of measures to avoid and reduce greenhouse gas emissions** **Need for carbon capture and storage** **Inadequacy of offsets for residual greenhouse gas emissions**

Submission 40:

Woodside must take further action to decarbonise its LNG supply chains by, among other measures:

a. integrating renewables into upstream and downstream LNG infrastructure over which Woodside has operational control to reduce emissions from process energy requirements; and
b. equip its LNG infrastructure with carbon capture, storage and utilisation (CCUS) technologies to reduce emissions from upstream and downstream processes.

Submission 41:

Woodside has not proposed adequate measures to avoid and reduce GHG emissions from the proposed Browse to North West Shelf Project (EPBC assessment) and the North West Shelf Project Extension (EP Act assessment). Among other measures, Woodside should implement:

(a) carbon capture and storage; and
(b) an integrated energy solution that draws primarily upon power from renewable sources to meet process energy requirements at the Karratha Gas Plant (supplemented by dispatchable power from gas).

Submission 42:

Woodside has not proposed adequate measures to offset residual GHG emissions from the proposed Browse to North West Shelf Project (Commonwealth assessment) and the North West Shelf Project Extension (State assessment).

Submission 43:

Given the projected 50 year life of the North West Shelf Project, Woodside should implement electric drive systems to meet process energy requirements at the Karratha Gas Plant, with the electricity primarily obtained from renewable (wind and/or solar) sources, supplemented by dispatchable power from gas turbine generators to generate electricity.

Submission 44:

The Safeguard facility for the proposed Browse to North West Shelf Project, as a new facility from 2020, will need to need to operate from "benchmark" baseline, based on benchmark emissions intensities (that is, the best, least emissions intensive standard for production) and an independently audited forecast of production. The proposed avoidance and mitigation measures are far from least emissions intensive standard for production for this type of facility.

Comment

57. Fuel gas use for refrigerant compressor gas turbines (55%) and electricity generation (15%) account for 70% of CO_2-e emissions for the Karratha Gas Plant.[26] The Greenhouse Gas Greenhouse Gas Benchmarking Report notes that:
    a. typically the largest source of emissions at an LNG facility is from the fuel consumption associated with the operation of the refrigeration compressor and power generator drivers;
    b. there are two main options for selection and design of the drivers – direct drive and electric drive;
    c. electric drive systems use an electric motor to drive the compressors, which are less common, but can achieve higher efficiencies and hence lower GHG emissions; and
    d. if the electricity for the electric drive systems is from renewable sources, then this can offer a lower intensity method of driving the compressors.

58. Woodside has contemplated the partnering of gas with renewables.[27] For example, the North West Shelf Project Extension Greenhouse Gas Management Plan notes that natural gas "enables greater use of renewables by matching their intermittent nature with dispatchable power" and "partnering with renewables, as a dispatchable power source that can enable their greater use".

59. The Woodside Petroleum CDP Climate Change Questionnaire 2019,[28] published 20 November 2019, also describes, in section C2.4a, "opportunities for LNG to partner with renewables to provide integrated energy solutions" and notes the "models we are developing for integrated energy solutions in the Pilbara". It also states, in section C2.5 (Describe where and how the identified risks and opportunities have impacted your business.):

    > We are exploring opportunities for LNG to partner with renewables to provide integrated energy solutions. Renewables are well suited to providing off-grid power but they need a reliable and flexible backup, which LNG can provide. The models we are developing for integrated remote power generation in the Pilbara can also offer a reliable and sustainable source of power in non-OECD countries, supporting SDG 7 Affordable and Clean Energy.

60. Notwithstanding these statements and Woodside's obvious consideration of the integration of renewables, the assessment documentation for both proposals proposes no integrated energy solution combining renewables and gas for its North West Shelf Project facilities.

[26] Draft EIS/ERD: Appendix F North West Shelf Project Extension Greenhouse Gas Benchmarking Report
[27] https://thewest.com.au/business/energy/australasian-oil-and-gas-exhibition-and-conference-2019-woodside-eyes-solar-power-to-cut-lng-emissions-ng-b881136300z
[28] Available at https://www.woodside.com.au/sustainability/climate-change and https://www.cdp.net/en

16	**Woodside uses an internal carbon price to guide its decision-making and is well positioned to accommodate offset costs for all residual emissions**

Submission 45:
Woodside uses an internal carbon price to guide its decision-making[29] and is well positioned to accommodate annual offset costs for all residual emissions for both the proposed Browse to North West Shelf Project and the North West Shelf Project Extension.

Comment

61. The Woodside Petroleum CDP Climate Change Questionnaire 2019,[30] published 20 November 2019, identifies, in section C4.3c, an internal carbon price as a method that Woodside uses to drive investment in emissions reduction activities, and states:

> Woodside includes a carbon price in its major investments based on expectations of current and future prices. We also apply these where appropriate when making other financial and operational decisions. We consider a range of scenarios in major decisions and in some of these scenarios, regulatory carbon prices are not expected to be implemented, so do not affect the decision.

[29] The materials (slide pack) for Woodside's Investor Briefing Day 2019 refer to a carbon price of ~$40/t$CO_2$e and the Woodside Petroleum CDP Climate Change Questionnaire 2019 also refers to a internal carbon price (https://files.woodside/docs/default-source/sustainability-documents/transparency-documents/submissions/woodside---cdp-response-2018.pdf?sfvrsn=97e56785_4).

[30] Available at https://www.woodside.com.au/sustainability/climate-change and https://www.cdp.net/en

17	**The offsetting of all residual emissions is practicable**

Submission 46:
A condition that each proposal offsets all residual direct emissions, following best practice efforts to avoid and reduce emissions, accords with the approaches applied for previous proposals, including the Greenhouse Gas Abatement Program developed by Woodside Energy Ltd to meet the conditions imposed in Ministerial Statement 757 in relation to the Pluto Liquified Natural Gas Development.

18	Methane emissions & Methane Guiding Principles

Submission 47:

Woodside has failed to undertake studies to adequately understand methane and other GHG emissions across the whole natural gas supply chain, and to engage with downstream participants in export markets for that purpose.

To comply with Principle 2 of the Methane Guiding Principles, Woodside must undertake a study similar to the CSIRO GISERA project (published 2019[31]) which conducted a whole of life GHG emissions assessment for a gas supply chain, but which extends the geographic scope of the assessment to include LNG combusted for generation of electricity in China, India, and other Asian markets.

Comment

62. Methane emissions accounts for 1.0% (proportion of CO_2-e) of the Scope 1 emissions for the proposed Browse to North West Shelf project and about 4% of total operated emissions (CO_2-equivalent basis) for the North West Shelf Extension project.

63. The North West Shelf Project Extension Greenhouse Gas Management Plan notes that in April 2018 Woodside became a signatory to the Methane Guiding Principles.[32] A 'signatory' is defined as a company with direct responsibility for the management of methane within its business activities and which has signed the Methane Guiding Principles. A signatory is represented on the Steering Committee and Methane Guiding Principles Network.

64. The five Methane Guiding Principles are said to focus on priority areas for action along the natural gas supply chain, from production to the final consumer.[33] The signatories intend for them to be applied concurrently. In the context of Methane Guiding Principles, methane emissions refer to venting, fugitive (unintended) emissions, and incomplete combustion, including during flaring.

65. Principle 2 of the Methane Guiding Principles states, in part:

> **2. Advance strong performance across the gas supply chain**
>
> Given that it is necessary to understand methane emissions across the whole natural gas supply chain, we seek to engage with upstream, midstream and downstream participants to undertake studies to that end.

[31] https://gisera.csiro.au/wp-content/uploads/2019/07/GISERA_G2_Final_Report-whole-of-life-GHG-assessment.pdf
[32] https://methaneguidingprinciples.org/signatories-and-supporting-organisations/
[33] https://methaneguidingprinciples.org/methane-guiding-principles/

19	**LNG is a driver of a rise in greenhouse gas emissions in Australia and WA**

Submission 48:
LNG is a driver of a rise in greenhouse gas emissions in Australia and WA

Comment

66. The 'Quarterly Update of Australia's National Greenhouse Gas Inventory for March 2019'[34] included a Special Topic discussion of natural gas (at pages 23-26) which states (in part):

> Underlying recent trends in national emissions are trends in emissions from natural gas supply. Emissions occur during exploration, extraction, production, processing, and pipeline transmission and distribution. Emissions also occur from the final conversion of gas to LNG at liquefaction plants where gas is cooled to -161°C to become a liquid for export.
>
> Australia's annual gas production has increased over 100 billion cubic metres or nearly 500 per cent in the period 1990 to 2018. When compared to Australia's other primary fuel production, gas has outpaced oil, metallurgical coal and thermal coal.
>
> The underlying driver of Australia's gas growth in recent years has been the rapid expansion of the liquefied natural gas (LNG) export industry (Figure ST1). Australia is the world's second largest exporter of LNG and is forecast to overtake Qatar in 2020 to be become the largest.

67. Trends in greenhouse gas emissions for Western Australia differ from all other States and follow a similar trend to the Northern Territory. The 2017 State and Territory Greenhouse Gas Inventories reported that greenhouse gas emissions in Western Australia and the Northern Territory increased 23.4% and 25.5% from 2005 to 2017, respectively. In contrast, emissions in the other States declined from 2005 to 2017 (New South Wales: 18.2% decline, Victoria: 10.3% decline, Queensland: 13.6% decline, South Australia: 37.0% decline, Tasmania: 95.2% decline).

68. Oil and gas extraction was the highest emitting industry in WA for 2017-8.[35] In contrast, electricity supply was the highest emitting industry in NSW, Queensland, Victoria, and South Australia for 2017-8.

[34] http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/quarterly-update-australias-nggi-mar-2019

[35] National Greenhouse and Energy Reporting data for 2017–18 (Clean Energy Regulator - February 2019) (data for corporations) - http://www.cleanenergyregulator.gov.au/NGER/Pages/Published%20information/Data%20highlights/2017%E2%80%9318-published-data-highlights.aspx

69. The Clean Energy Regulator reported that, of Australia's top 10 greenhouse gas emitters (scope 1) for 2017-8, eight were electricity producers and two were LNG producers (Chevron Holdings Australia Pty Ltd, 12.0 million tonnes and Woodside Petroleum Ltd, 10.0 million tonnes).[36]

[36] Ibid.

20	**The current Commonwealth framework does not adequately constrain greenhouse gas emissions and is best seen as setting a floor for the regulation of large facilities**

Submission 49:
Based on current emissions trends and projections, Australia will not meet its current nationally determined contribution (NDC) under the Paris Agreement and will be constrained in the ambition of the new or revised NDCs the Australian Government must submit for 2020 (and then at 5-year intervals after that).

Submission 50:
The safeguard mechanism under the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* is best viewed as setting a floor for the regulation of emissions from facilities with direct Scope 1 emissions of more than 100,000 tonnes of CO_2-e, which the States can exceed through their own legislative and executive action.

Comment

70. As its NDC under the Paris Agreement, Australia committed to reducing emissions by between 26% and 28% below 2005 levels by 2030.

71. The Department of the Environment and Energy has reported that:
    a. total emissions in 2030 are projected to be 563 Mt CO_2-e, which is 7% below 2005 levels (605 Mt CO_2-e); and

    b. emissions to 2030 are projected to grow 4% above 2020 levels, driven by higher emissions from LNG production, increased transport activity, a declining forest sink in the LULUCF (land use, land use change and forestry) sector, and growth in agricultural activity after a return to average seasonal conditions.[37]

72. The intent of the Safeguard Mechanism is to ensure that emissions reductions achieved through the Emissions Reduction Fund are not cancelled out by increases in emissions above business-as-usual levels elsewhere (and, specifically, in the emissions from facilities with direct scope 1 emissions of more than 100,000 tonnes of CO_2-e).

73. The current Commonwealth regulatory framework will not effectively constrain greenhouse gas emissions to enable Australia to meet its current 2030 target.

74. Current settings allow for 'baseline creep' as – in the absence of any overall 'cap' or budget for emissions from large emitting facilities – companies are allowed to increase the

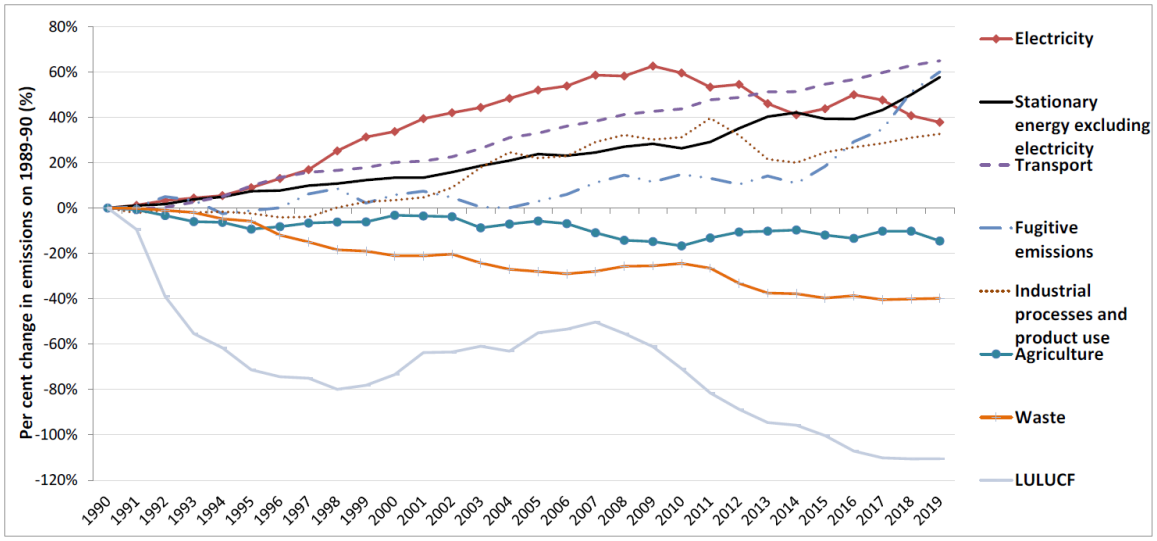
[37] Australia's emissions projections 2018 (Department of the Environment and Energy, 2018): https://www.environment.gov.au/climate-change/publications/emissions-projections-2018

baselines for facilities over time (e.g. because of production growth, natural emissions variability or other circumstances) and new facilities enter operation.

75. The effect of the added emissions from baseline creep at existing facilities and from the addition of new facilities over time is to entrench a 'business-as-normal' approach. This entrenchment is evident in ongoing increases in emissions from three key sectors – stationary energy excluding electricity, fugitive emissions, and industrial processes and product use (see the figure below).

Source: Department of the Environment and Energy, *Quarterly Update of Australia's National Greenhouse Gas Inventory for March 2019* (released August 2019): http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/quarterly-update-australias-nggi-mar-2019

Figure 5: Percentage change in emissions, by sector, since year to March 1990



Source: Department of the Environment and Energy

Queries & Contact Information

We welcome the opportunity to provide clarification or to discuss any queries, and may be contacted through Hugh Finn, by phone at (08) 9266 4553 or by email at h.finn@curtin.edu.au.

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