

Please direct all responses/queries to: **Peter Metcalfe** Vice President Climate and Sustainability

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Climate Change Authority
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By email: consultation@climatechangeauthority.gov.au

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Dear Review Team,

RE: TARGETS, PATHWAYS AND PROGRESS ISSUES PAPER

Woodside Energy Limited ('Woodside') welcomes the opportunity to comment on the Australian Climate Change Authority (CCA) Targets, Pathways and Progress Issues Paper ('the CCA Paper'). Woodside supports efforts to reduce global emissions in order to meet the goals of the Paris Agreement, and Australian climate and energy policy that is scientifically based, stable, effective, incentivises abatement and enhances international competitiveness.

The key recommendations of our submission, detailed in Attachment 1, are that:

- Target setting should be in alignment with the Paris Agreement and underpinned by a whole of economy approach to decarbonisation pathways which are technology neutral, economically efficient and protect Australia's international competitiveness.
- The role of Australian resource exports in supporting c our trading partners' respective policies to achieve emissions reductions and energy security needs to be considered when determining domestic targets and the strategies to meet those targets.
- The Government has a critical role to play in supporting the investment required for the global transition by providing policy support for decarbonisation (including CCS), fiscal stability, timely approvals, and coordination between federal and state levels of government.

Our view is that the energy transition should allow for the provision of energy that is secure, affordable, and reliable while meeting emissions reductions goals.

About Woodside

We believe our business contributes to the energy transition in two ways:

- Firstly, we are reducing the net equity Scope 1 and 2 greenhouse gas emissions that are associated with our business operations. As a consequence, we have experience in the identification, evaluation and implementation of abatement opportunities at our facilities, as well as the origination, acquisition and integrity assessment of carbon credits for utilisation as offsets; and
- Secondly, we are investing in products and services for the energy transition. In particular, our Liquefied Natural Gas (LNG) can help countries, especially in Asia, to decarbonise by replacing coal, supporting renewables, and maintaining energy security through the transition. Moreover, we are investing in the development of new products and services, such as hydrogen (and hydrogen derivatives such as ammonia) and carbon capture, utilisation and storage (CCUS), which can help us and our customers reduce their emissions.

We believe that both of these priorities for our business give us a strong basis for providing input to the CCA, as it formulates its advice to the Australian Government. We also note the Government's Future Gas Strategy makes it clear that gas is needed to 2050 and beyond, and that future investment is required for our energy system to be reliable and reach net zero. The Strategy also highlights the important role that Australian LNG plays for our key trading partners as part of their energy and decarbonisation plans.

Woodside has provided input into the submissions of the Australian Industry Greenhouse Network (AIGN), the Chamber of Minerals and Energy of Western Australia (CME) and the Australian Energy Producers (AEP). We request that CCA also consider these submissions in the formulation of their advice.

We would welcome the opportunity to meet with the CCA in the future to discuss this feedback in detail.

Yours sincerely

Peter Metcalfe

Peter Metcalfe

Vice President - Climate and Sustainability

Attachment 1: Woodside Issues Paper Response

Question 1	How should the authority take account of climate science and Australia's international obligations in considering possible emissions reductions targets for 2035?
Q1 Woodside Response	Australia's national target is a matter for the Australian Government. We do not have a specific recommended target other than to note that the target should be based on the best science available and constructed in a manner that supports the continued competitiveness of the Australian economy.
Question 2	How should the authority weight the goals of ambition and achievability in considering possible emissions reductions targets for 2035?
Q2 Woodside	Woodside believes the following factors should be considered when weighing ambition and achievability.
Response	Global context In formulating its target, we believe that the Government should have regard to: (a) The Paris Agreement temperature goal to hold the increase in global average temperature levels to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, noting that signatories to the Paris Agreement have underscored their resolve to pursue the 1.5°C ambition in subsequent Conferences of the Parties (such as COP-28); 1.2 (b) The latest climate science as synthesised in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report, finalised and published in March 2023; 3 (c) The Paris Agreement's guidance by the principles of the United Nations Framework Convention on Climate Change, "including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances" (Paris Agreement, Preamble); 4 and (d) That climate change is a global challenge, which arises from increased concentration of greenhouse gases in the atmosphere, which in turn is the consequence of the "anthropogenic emissions by sources and removals by sinks of greenhouse gases." The Paris Agreement seeks to achieve a balance between these "in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty" (Paris Agreement, Article 4.1).5
	Australia's national circumstances The challenge of national target setting is more complex than the simple adoption of global average trajectories. In considering the contribution of Australia to meeting the global goals of the Paris Agreement in this context, the CCA should have regard to Australia's renewable energy resources and the economic capacity to deliver these efficiently to the market, which inform its capability to reduce emissions associated with domestic consumption. However, it should also have regard to its role as a mineral and energy exporter, which informs its ability to support the emissions reduction choices of other countries, and the way in which those countries also weight ambition and achievability. This is particularly important given the Australian Government's policy preference for increased processing of critical minerals within Australia which may have implications for overall mining and related sector emissions. Given the global nature of climate change, Australia's ability to impact the emissions reduction of other nations is significant and should be central to the CCA's analysis, alongside its attention to reducing emissions from domestic consumption. It is important to note that the emissions arising

UNFCCC, 2015. "Paris Agreement", Article 2. https://unfccc.int/sites/default/files/english_paris_agreement.pdf

UNFCCC, 2023. "Outcome of the first global stocktake" (Advance unedited version). https://unfccc.int/documents/636584

IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)].

IPCC, Geneva, Switzerland, 184 pp., doi: 10.59327/IPCC/AR6-9789291691647.

UNFCCC, 2015. "Paris Agreement", Preamble. https://unfccc.int/sites/default/files/english_paris_agreement.pdf

UNFCCC, 2015. "Paris Agreement", Article 4.1. https://unfccc.int/sites/default/files/english_paris_agreement.pdf

in Australia from production by exporting industries require careful and separate consideration to ensure that Australia's target does not drive unintended consequences in export markets.

Target setting 'bottom up' from opportunity evaluation

Finally, when considering targets, the CCA should consider a "bottom-up" calculation of Australia's decarbonisation opportunities underpinned by technology deployment, in addition to any "top-down" determination of a carbon budget for Australia. Within its own business, Woodside has found it effective to build an asset-by-asset portfolio of decarbonisation opportunities to inform its approach to decarbonisation in practice.

Australia's sector-by-sector opportunities can be analysed in the same way. Beyond 2030, key Australian opportunities are likely to include:

- Further electricity grid decarbonisation, to complete or extend beyond the current 82% renewables target;
- Grid expansion, for example to accommodate electrification of the light passenger vehicle fleet; and
- Application of CCUS, or Carbon Capture and Storage (CCS), to emissions, especially those in the industrial sector, which are hard to abate (and/or which do not offer as much emissions reduction per unit of renewable electricity as the first two opportunities).

Australia's next target can be more ambitious, but will require policy settings that support this. Access to affordable supplies of natural gas to support the replacement of coal by renewables at scale in the power sector, and support for the deployment of CCS at scale in the industrial and oil and gas sectors, are both policies that could enable a greater level of ambition in target setting – and which would benefit from unambiguous expressions of support from the CCA and the Australian Government, backed by policy.

Question 3

How can Australia further support other countries to decarbonise and develop sustainably?

Q3 Woodside Response

Australia should reaffirm its commitment to understanding and respecting the chosen decarbonisation and energy security pathways of its key trading partners, especially in the Asia Pacific region, noting that countries in the region will have different national circumstances to Australia and that it is their responsibility, not Australia's, to select their own pathway.

Reliable supplier into export markets

Moreover, Australia should reaffirm its commitment to supplying other countries with the products and services they need as they manage their own transition plans, maximising Australia's market share, through being a reliable and competitive supplier. This will support Australia's prosperity, and can also contribute to global emissions reduction, both where our products and services are required by countries to implement their climate measures, but also because the production of our exports will occur under the emissions reduction requirements of the Safeguard Mechanism.

Moreover, as referenced in responses to questions 1 and 2, the CCA should apply separate consideration to the component of Australia's greenhouse gas inventory that arise from these exporting industries, as distinct from the component associated with domestic consumption. To expand this point, the CCA Paper notes that "If other countries set strong targets, green economy exports can be expected to prosper, while emissions-intensive export industries may falter." This risks an oversimplification, because of differences in emissions intensity along the value chain. Australian emissions may increase due to demand for products which have lower life cycle intensity overall, but for which the production phase of the value chain in Australia is emissions intensive.

Supplier of LNG

For example, we expect demand for natural gas to be sustained and potentially grow (see call-out box, next page). However, Australia's part in Asia's natural gas value chain is centred upon the liquefaction of gas for export (LNG production), which is relatively emissions intensive. The CCA should recognise that if countries set strong targets, there will be increased demand for products and services that reduce emissions from their

end-use, but the production of these resources will generate emission in Australia in the course of supplying these necessary resources to support decarbonisation: this should be supported, provided the global emissions impact is downwards overall.

CCS as an Australian opportunity

In 2023, the IPCC concluded its Sixth Assessment Report.⁶ It found that there are many pathways that can limit warming to within the goals of the Paris Agreement. Demand for oil and gas remains through the remainder of this century in all of these pathways, but to varying degrees. Pathways with higher gas use, typically also have higher uses of carbon capture utilisation and storage (CCUS).⁷ In the AR6-WG3 report, the IPCC found that the "technical geological CO₂ storage capacity is estimated to be on the order of 1000 GtCO₂, which is more than the CO₂ storage requirements through 2100 to limit global warming to 1.5°C, although the regional availability of geological storage could be a limiting factor."⁸ Furthermore "Currently, global rates of CCS deployment are far below those in modelled pathways limiting global warming to 1.5°C or 2°C. Enabling conditions such as policy instruments, greater public support and technological innovation could reduce these barriers."

Not all major industrial emitters in the Asia-Pacific have access to CCS sites or facilities of appropriate size and scale. Japan, Korea, and Singapore may be looking for regionally based solutions to support their decarbonisation efforts. As well as its potential to reduce Australian emissions, CCS is an opportunity for Australia to support regional decarbonisation by offering CCS as a service. The aggregation of volumes from both domestic and international customers will help scale transport and storage solutions and reduce customer costs that may otherwise be prohibitive.

Australia is well positioned to host a number of large-scale CCS projects, leveraging subsurface understanding obtained over decades of oil and gas exploration and production. CCS has a role in enabling the production of lower-carbon energy/products for domestic consumption and export, in providing a pathway for regional partners to decarbonise their emissions, and more broadly can support emissions reductions in other hard-to-abate industries. We appreciate the steps already taken by Government and Parliament to facilitate the offer of CCS as a service internationally, by implementing changes to the ratification of the London Protocol. However other elements of the regulatory regime, both domestically and internationally, remain unfinished. We recommend that the CCA strongly supports Australian Government efforts to progress the relevant administrative arrangements with other countries, particularly our largest export customers, to support trade in CO₂.

Call Out Box: Why demand for Australia's LNG in Asia could increase as Asia decarbonises

In North America, there has been significant switching from coal-fired generation to gas-fired generation, and coal use in the power sector has fallen overall. This has supported emissions reduction, alongside and in addition to the growth of renewables. The International Energy Agency (IEA) found that in 2023 "coal-to-gas switching was the largest driver behind emissions reduction in the US electricity sector".

In Asia, by contrast, coal use in power generation has continued to grow strongly. "Coal demand in emerging market and developing economies was the biggest driver in global emissions growth" in 2023, according to the IEA.¹⁰

By maintaining, or even increasing, its supply of LNG to Asia, Australia has the potential to contribute to replicating in Asia, the empirically observable reduction in greenhouse gas emissions that has arisen from coal-to-gas switching in North America. Conversely, restricting

⁶ IPCC, 2023. "Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change", [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, doi: 10.59327/IPCC/AR6-9789291691647, https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf

IPCC 2022. "Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change". Summary for Policymakers paragraph C.3.2

⁸ IPCC, 2022. "Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change", pg 28.

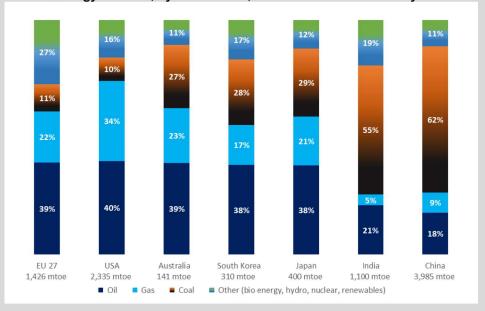
https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf

BEA, 2024. "CO2 Emissions in 2023", pg. 14. https://www.iea.org/reports/co2-emissions-in-2023

¹⁰ IEA, 2024. "CO2 Emissions in 2023", pg. 18 .https://www.iea.org/reports/co2-emissions-in-2023

Australian LNG to below the level that it would otherwise be competitive to supply would be counterproductive from a climate perspective – either by forcing Asian countries to utilise more coal, or at best to source LNG from other, potentially less well regulated suppliers. The size of this potential displacement opportunity via coal to gas switching is illustrated below

2023 Total Energy Demand, by Fuel Source, for Australia and Other Key Countries¹¹:



Question 4

What technologies are important for each sector's pathway to net zero and why?

Q4 Woodside Response

The resources technology table in Appendix 3 of the Issues paper broadly addresses technology opportunities for oil and gas extraction however we wish to note the following:

- (a) **Percentage of sector scope 1 emissions**: The reported percentages do not reflect our experience. The assumed 19% fugitive emissions allocated to oil and gas extraction and processing and LNG production vs the 22% allocated to fuel combustion in oil and gas extraction and processing and LNG production, implies an almost 50:50 split in the emissions opportunity in the oil and gas sector. This will not apply to all operations, and the risks overstate (or understate) the technology opportunities. In our view, opportunities to abate reservoir CO2 are well understood and common place in industry, while technology to abate fuel combustion is less common place, more expensive to retrofit, and therefore a bigger opportunity for government enablement.
- (b) **Alternative fuelling**: Alternative fuelling is missing from the table, and it may be preferential to electric drives in retro fit applications due to space and cost. Alternative fuels may include hydrogen, ammonia and biofuel.

¹¹ Source: Wood Mackenzie Energy Transition. Data extracted 20 May 2024.

- (c) **Fugitive vs flaring**: Fugitive emissions (methane leaks) vs flaring (incomplete combustion) require two different technological solutions and the table oversimplifies by combining these. In our experience methane accounts for a small proportion (4%) of our equity gross Scope 1 and 2 emissions.
- (d) **Costs**: while in general not outside the range, the costs in the table represent an optimistic (low end) of estimates, and brown field retrofits are significantly more costly than greenfield applications

Question 5

How can governments use mandates, rules, and standards to accelerate Australia's decarbonisation? Is more planning by governments needed? If so, how should this be coordinated and how can this be done while making the transition inclusive, adaptive, and innovative?

Q5 Woodside Response

We believe the CCA should consider the following:

- (a) SGM reform to incentivise low carbon power imports from grid: The current Safeguard Mechanism (SGM) production variables disincentivise opportunities to drive emissions reductions through import of renewable or lower-carbon electricity from a separate facility. This disincentive occurs because these opportunities reduce emissions as well as the facility's baseline, due to a reduction in electricity production at the facility. Reducing site-based electrical emissions could provide significant opportunities for decarbonising and should continue to be incentivised in order to promote all opportunities for decarbonisation. An example of a potential opportunity to reduce site-based electrical emissions at an LNG site, would be to implement changes to existing plant and equipment to cease use of internal gas turbines for electricity generation (to run the plant,) and import renewable power under a long-term power agreement, or construction of a separate renewable power facility. In this example, there are significant capital and operational costs associated with the emissions reduction activity, however, there is also reduced external incentive via the SGM to undertake this activity. This is because any reduction in emissions associated with electricity results in a corresponding reduction in the facility's baseline (the baseline reduction occurs because electricity production is a production variable used to calculate the baseline of the LNG facility). Future reforms could address this by expanding safeguard facility boundary definitions to include geographically or commercially distinct facilities that provide lower-carbon electricity to a separate facility, or other changes to the net emissions, or crediting mechanics to allow the overall impact of lower-carbon electricity to be recognised.
- (b) **Technology neutral incentives**: In the context of developing a hydrogen industry, policies and incentives will be most impactful if they are method-agnostic, as flexibility on production methods enables customers to pursue options that more closely align with their drivers and preferences, which could include cost, emissions intensity and specific carbon management methods. Incentives that target an overall lifecycle intensity of the product, rather than focusing on a specific technologies to the exclusion of others, would further stimulate industry development. Hydrogen from steam methane reformation with CCS represents a lower cost and low-carbon development pathway for establishing a hydrogen industry at scale than focusing on electrolysis alone.
- (c) CCS domestically and as an export service: The Australian government has a critical role to play in reducing regulatory barriers that may prevent emissions reduction options domestically and in our trading partners jurisdictions, and support the efforts being undertaken to streamline regulatory frameworks. Consideration should also be given to the support required for the creation of decarbonisation hubs to deploy CCS and access to firmed lower carbon power for hard-to-abate industries. This could allow reduced costs and timeframes for implementing CCS based on common-user infrastructure, support regional economic activity and job creation, and assist hard-to-abate sectors in transitioning to net zero. The oil and gas industry can play a key role in helping hard-to-abate sectors reduce emissions by providing technology and expertise in solutions like CCS. Due to the cross sectoral decarbonisation potential of CCS, government support of this technology would be a key enabler.
- (d) **Investment climate and the importance of timely approvals and fiscal stability:** The energy transition is an enormous investment opportunity for Australian businesses. However, its direction is uncertain, and lack of certainty inhibits investment. Improving legislation to ensure approvals are provided in a timely manner and with certainty is a key enabler of Australia's energy transition, by providing a framework

	to streamline the approvals process required for renewable energy projects, the transmission network, and the energy and critical minerals sectors. A stable fiscal environment is also an essential ingredient to investment confidence.
	(e) Role Clarity: The CCA has the opportunity to provide clear advice on the relative roles of the Commonwealth Government, the States and Territories, and their respective environmental regulators. As sub-national governments try to establish their own levels of ambition, coordination will be essential to ensure consistency and avoidance of duplicative and inefficient efforts.
Question 6	How can governments stimulate private finance needed for the net zero transition – are there innovative instruments that could be
Question 0	deployed or new business models that governments could support? Is there a bigger role for governments to play in coordinating the investment needed to transition the economy?
Q6 Woodside	Woodside reiterates its support for consistent, clear and science-based policy, along with appropriate approvals processes, to facilitate private
Response	sector investment and financing of necessary technologies (on a technology neutral basis) for the transition.
Question 7	How can governments better support markets, including carbon markets, to deliver emissions reduction outcomes?
Q7 Woodside	Government should continue to ensure that the public and businesses can have confidence in the role and practical application of carbon
Response	crediting. This includes:
	(a) maintaining robust carbon credit project methodologies that strike the balance between ensuring the integrity of carbon credits, and ease of adoption and implementation of the relevant emissions reduction activities, in order to incentivise abatement;
	(b) stable Government policy supported by measured transition for any necessary changes;
	(c) alignment with international carbon market practices (such as governance and transparency) and initiatives (such as the Core Carbon Principles);
	(d) engagement with key export industries' customer nations on mutually acceptable carbon crediting standards and international trade (corresponding adjustments);
	(e) in relation to the ACCU scheme, specifically where the Government plays a key role in market supply and demand, an increasing focus on equal access to market information, including price, volume and credit quality, to support an efficient market response to the emissions
	reduction imperative; and
	(f) Enabling market scrutiny of project level implementation of ACCU scheme methods, to increase confidence in the integrity of GHG abatement being achieved. This would include the adoption of governance processes and publication of project documentation (such as offset reports), in line with other carbon markets and the Core Carbon Principles.
	The Government's progress towards enabling the use of international credits under Article 6 of the Paris Agreement should be expediated. Countries with robust carbon credit mechanisms and where projects can be established at scale should be prioritised, rather than particular development zones or regions.
Question 8	What further actions can be taken by governments (e.g. through public funding), the private sector and households to accelerate emissions reductions, including in relation to the deployment of technologies and access to new opportunities in the transition to net zero? What barriers stand in the way and how could they be overcome?
Q8 Woodside	Natural gas reforming combined with CCS is currently the most affordable pathway to low-carbon hydrogen production. Under the IEA's Net Zero
Response	by 2050 scenario, over a quarter of hydrogen supply in 2050 will come from natural gas with CCS. 12 Moreover, hydrogen from this production

nethod can support the investment in required distribution infrastructure and equipment, accelerating its roll out, and building a hydrogen market or future conversion to electrolysis-originated hydrogen.
However, significant policy bias exists against hydrogen from natural gas with CCS, both in terms of a lack of support for CCS) and locking out of certain hydrogen technologies from current climate and energy policy. The legislated moratorium on financial support for CCS projects under the Clean Energy Finance Corporation Act remains a significant barrier to Australia meeting its legislated emissions reduction targets. Similarly, the Government's National Hydrogen Strategy and Hydrogen HeadStart programs focus exclusively on hydrogen originated from electrolysis paired with renewables. A technology-neutral approach to unlocking Australia's low-emission hydrogen industry is needed if Australia is to become a global leader in hydrogen production.
low should governments decide upon the appropriate allocation of resources towards reducing emissions, removing carbon from the atmosphere, and adapting to climate change impacts?
Voodside reiterates its support for consistent, clear and science-based policy, along with appropriate approvals processes, to facilitate private sector investment and financing of necessary technologies (on a technology neutral basis) for the transition.
low can governments, businesses and people, including First Nations people, help ensure the benefits and burdens of the net zero ransition are equitably shared?
Government could consider how benefits of the net zero transition are equitably shared via:
Timely, transparent communication and consultation processes. Stakeholders and communities must have access to information and have the opportunity to be fully informed;
Agreement-making with First Nations rightsholders, which acknowledges and compensates for land and sea access; Best practice frameworks, such as co-design with communities and stakeholders to ensure genuine buy-in to the energy transition; and
Explore partnership models, which could include equity sharing that supports local and regional economies. The beneficial approach negates most of the burdens associated with a 'just' transition. Government and businesses will also benefit from past essons (positive and negative) associated with previous resource industry boom and bust cycles.
How can governments better ensure First Nations people are empowered to play a leading role in the development and mplementation of climate change policies and actions, including as they relate to the ongoing curation of the Indigenous estate?
Refer to Q10 response (above). Additionally, Government must invest in First Nations capacity, strong governance, and resourcing support for
heir communities. There is a further opportunity to engage and learn from First Nations groups on how to sustainably manage and protect local environments, and to benefit from their knowledge.
low can Australian governments support the wellbeing of workers, communities and regions as the nation decarbonises, including in elation to cost of living, workforce and industry transition and access to low emissions technologies and services?
Refer to Q10 and Q11 responses (above). Government should lead the support for designing and implementing principles and programs that
acilitate a 'just' transition. This includes the introduction of alternative/new economies (e.g. new training/re-training for alternative employment). Government should support co-design solutions and commit to genuine community and business collaborations.
low can governments help Australians prepare for and respond to the impacts of climate change?
Ve refer to the Australian Industry Greenhouse Network (AIGN) submissions on the National Adaptation Plan Issues Paper.
CONTRACTOR TO THE TRACTOR AS THE