2022

Woodside Energy

CLIMATE REPORT

Acknowledging country

Woodside recognises Aboriginal and Torres Strait Islander peoples as Australia's first peoples. We acknowledge the unique connection that First Nations peoples have to land, waters and the environment. We extend this recognition and respect to First Nations peoples and communities around the world.

On the cover

The cover features the coastline of Murujuga in Western Australia, also known as the Burrup Peninsula.

About this report

This Climate Report 2022 summarises Woodside's climate-related plans, activities, progress and climate-related data for the period 1 January 2022 to 31 December 2022.

This report has been structured to align with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations framework. It aims to provide a balance of disclosures that meet the recommendations of the TCFD, while avoiding overwhelming readers with information. Woodside considers that this report contains disclosures consistent with TCFD's four recommendations and eleven recommended disclosures, noting its Guidance for all Sectors and Guidance for Non-Financial Groups.[1,2] Woodside is a supporter of the TCFD.

The report has also been prepared with reference to selected relevant metrics from the Sustainable Accounting Standards Board (SASB) Oil and Gas Exploration and Production Standard.[3]

See page 62 for an index which cross-references content in the report to these recommendations.

Woodside Energy Group Ltd (ABN 55 004 898 962) is the ultimate holding company of the Woodside group of companies. In this report, unless otherwise stated, references to "Woodside", "our", "us" or "we" refer to Woodside Energy Group Ltd and its controlled entities.

On 1 June 2022, the merger of Woodside with BHP Group Limited's (BHP) oil and gas portfolio (BHP's petroleum business) was completed. This report contains information relevant for the period 1 January to 31 May 2022 for the heritage Woodside entity and from 1 June to 31 December 2022 for the post-merger Woodside entity.[4]

Further detail regarding the scope of this report including a disclaimer, risks, emissions data and other important information is contained on pages 63-64.

All dollar figures are expressed in US currency, Woodside share, unless otherwise stated.

Annual Report 2022 and Sustainable Development Report 2022

Our Annual Report 2022 provides a summary of Woodside's operations and activities for the 12 month period ended 31 December 2022 and Woodside's financial position as at 31 December 2022.

Our Sustainable Development Report 2022 provides a summary of Woodside's sustainability approach, health and safety performance and other information for the 12 month period ended 31 December 2022.

The Annual Report 2022, Sustainable Development Report 2022 and Climate Report 2022 together provide a complementary review of Woodside's business.

The reports are available on our website at woodside.com

Report feedback

We welcome feedback on our reports via companyinfo@woodside.com

External assurance

Selected greenhouse gas emissions data is assured by GHD. Please refer to page 65-66 for more information on the scope of assurance.

Green Reports

FSC www.fsc.org MIX Paper | Supporting responsible forestry FSC® C113956

greenreports

We are working with Green Reports™ on an initiative to ensure that communications minimise environmental impact and create a more sustainable future for the community.

1 Financial Stability Board (2017). "Recommendations of the Task Force on Climate-related Financial Disclosures. Final Report." Figure 4, page 14. Some elements of the TCFD's four recommendations and eleven recommended disclosure have been presented in different order to enhance readability. A cross reference between the TCFD and this report is provided on page 62.
2 Financial Stability Board (2021). "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures."
3 SASB (2018). "Oil & Gas – Exploration and Production. Sustainability Accounting Standard. Version 2018-10." Table 1, page 6.
4 Heritage Woodside refers to Woodside's assets prior to the merger with BHP's petroleum business. Heritage BHP refers to the assets acquired through the merger with BHP's petroleum business.

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Coastline of Murujuga in Western Australia, also known as Burrup Peninsula.

Contents

SECTION 1.1

Message from the Chair

Richard Goyder AO

Woodside is proud to be a global energy company, producing oil and gas whilst working to develop new energy products and services. For us, climate change is a complex and important issue that significantly influences our strategy.

Woodside is committed to playing its part. We are reducing our net equity Scope 1 and 2 greenhouse gas emissions towards our targets, and progressing investment in new energy products and lower carbon services alongside existing and potential new oil and gas opportunities.

The Board is confident in our strategy and our response to climate change, which is outlined in this Climate Report 2022. Last year's Climate Report 2021 was adopted by 51% of our shareholders at the 2022 AGM. During 2022 we have been engaging and listening to our shareholders to further understand their expectations about our climate-related strategy and disclosures.

Shareholders have told us that they would like to understand more about how we plan to reduce emissions from our operations, and about how we manage our use of carbon credits appropriately. We also heard that they would like to understand how we consider our future investment options in oil, gas and new energy in the context of climate change. Some shareholders have also asked us to consider setting Scope 3 greenhouse gas emissions targets.

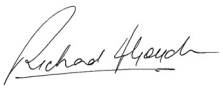
These matters, and other climate-related factors, have been discussed by the Board and its Committees throughout the year. We have addressed them in this report, explaining what we can and cannot do, and why.

Not surprisingly on an issue of the magnitude and complexity of climate change, there is uncertainty and a broad range of views in the community about how to proceed.

The Board intends to navigate this uncertainty on behalf of shareholders by building a low cost, lower carbon,[1] resilient, diversified and profitable portfolio, supporting our capability to adapt to the choices made by our customers, as they too navigate through an uncertain transition.

Our intention in this report has been to explain why we believe that accepting uncertainty and responding to it with resilience and flexibility is not only in the interests of our shareholders, but is also more likely to contribute to successful global emissions goals.

Much of this report is similar to our Climate Report 2021 because our understanding and strategy remains consistent. With this in mind, the Board will continue to engage with and listen to shareholders about how they would best like to receive information and provide feedback about our climate strategy and progress in future years.



Richard Goyder AO
Chair of the Board
27 February 2023

1 Please see glossary for a definition of how Woodside uses the term lower carbon portfolio.

SECTION 1.2

Introduction from the Chief Executive Officer

Meg O'Neill.

In 2022, the world faced what the International Energy Agency called "the first truly global energy crisis", with supply disruptions and high prices impacting people's lives and livelihoods around the world.

It had roots in under-investment in energy supply over the preceding decade and came into sharp focus after Russia's invasion of Ukraine.

This has been a wake-up call about the importance of energy security and affordability as we progress along the pathway to net zero. It is also a reminder that the future is uncertain and unforeseen events can impact energy transitions.

As we have seen in the wake of the invasion of Ukraine, significant volumes of gas and other fossil fuels cannot simply be removed from our energy systems without consequence, let alone be switched off altogether overnight.

We need all options on the table if we are to successfully change the way we produce and consume energy and limit global temperature rise.

Energy security and the energy transition therefore should not be seen as alternatives. It is increasingly clear that they both require effective management and substantial investment.

In the Asia Pacific region, major economies such as Japan remain clear that they need Australia to continue as a secure, affordable supplier of energy, including liquefied natural gas (LNG). Investment in new LNG supply can help meet demand at affordable prices. And LNG can help Asia to decarbonise, for example by replacing coal, supporting renewables, and in hard-to-abate uses.

There have been reasons for optimism during 2022. The energy crisis has not deflected the world's resolve to meet the goals of the Paris Agreement, which were reaffirmed at the Sharm el-Sheikh climate summit in November. Major economies introduced supportive new policies, such as the United States' Inflation Reduction Act, and Australia legislated its climate targets.

But this is not uniform. The public discourse on the energy transition can be polarised and ideological, particularly in Australia. We believe this is to the detriment of careful analysis of climate science and delivery of practical solutions. We seek to rebalance this through this report and our broader advocacy.

This report provides updates on how we made progress in 2022 on reducing Woodside's net equity Scope 1 and 2 greenhouse gas emissions towards the targets that we announced in 2020. And also how we progressed projects across oil, gas and new energy which have the potential to help our customers secure their energy needs whilst they reduce their own emissions.

Reflecting the fact that our merger with BHP's petroleum business took place part way through the year, some elements of this report are partial. Climate-related data reflects the heritage Woodside entity for 1 January to 31 May 2022, and the merged entity for the remaining seven months of the year since the merger took effect. Some of our climate-related actions, such as the development of asset decarbonisation plans, are still being extended to our new assets.

I hope that you find this report useful and informative, and a contribution to constructive dialogue.

Meg O'Neill
Chief Executive Officer and Managing Director
27 February 2023

SECTION 1.3

Executive summary

Woodside aims to thrive through the energy transition by building a low cost, lower carbon, profitable, resilient and diversified portfolio.[1] Our climate strategy has two key elements: reducing our net equity scope 1 and 2 greenhouse gas emissions and investing in the products and services that our customers need as they secure their energy needs and reduce their emissions.

SCOPE 1 AND 2 GREENHOUSE GAS EMISSIONS

15% **by 2025**

30% **by 2030**

Net equity emissions reduction targets with an aspiration of net zero by 2050 or sooner.[2]

2022 highlight: Achieved 11% reduction compared to starting base.

SCOPE 3 GREENHOUSE GAS EMISSIONS

US$5 billion

Targeted investment in new energy products and lower carbon services by 2030.[3]

2022 highlight: Progressed a suite of potential opportunities with $100m spent to date.

Global efforts to reduce greenhouse gas emissions in order to meet climate goals are changing the way the world produces and consumes energy. This energy transition is uncertain and there is a wide range of potential demand for oil, gas and new energy including in pathways consistent with limiting global temperature rise.

Today, Woodside has a portfolio of oil and gas assets. We are also developing a portfolio of new energy products and lower carbon services. Across our portfolio we seek to match the pace, scale and needs of our customers as they determine their own decarbonisation pathways.

We see an ongoing role for natural gas to support our customers plans to secure their energy needs, while they reduce their emissions. Woodside's existing LNG supplies as well as projects such as the Scarborough development can contribute to natural gas supply.

We have set near- and medium-term targets to reduce net equity Scope 1 and 2 greenhouse gas emissions. We have three ways to achieve these targets: avoiding emissions through design; reducing them through efficient operations; and offsetting the remainder. Avoiding and reducing emissions are our first priority. Offsetting emissions by retiring carbon credits also has an important role.

In 2022, Woodside's net equity Scope 1 and 2 greenhouse gas emissions were 11% below the starting base, which has been adjusted to include the assets acquired due to the merger with BHP's petroleum business.

Methane emissions were around 0.1% of our production by volume, and during 2022 Woodside became a signatory to the Aiming for Zero Methane Emissions initiative.

Asset decarbonisation plans have been completed at heritage Woodside operated assets and during 2023 are targeted to be extended to include heritage BHP operated assets.

We test the financial resilience of our existing portfolio of producing assets and sanctioned products using scenario analysis. Investment decisions as we grow and diversify our portfolio are informed by market analysis and a disciplined capital allocation framework, including climate-related considerations.

During 2022, Woodside progressed a developing portfolio of new energy products and lower carbon services. These include proposed hydrogen and ammonia production facilities in the United States, Australia and New Zealand, assessment of carbon capture and storage opportunities in Australia, and investments in carbon to products technologies.

1 For Woodside, a lower carbon portfolio is one from which the net equity scope 1 and 2 greenhouse gas emissions, which includes the use of offsets, are being reduced towards targets, and into which new energy products and lower carbon services are planned to be introduced as a complement to existing and new investments in oil and gas. Our Climate Policy sets out the principles that we believe will assist us achieve this aim.

2 Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base representative of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with a final investment decision prior to 2021. Please refer to the Glossary starting on page 59 and the section on decarbonisation strategy starting on page 28 for further information on the definition and calculation of Scope 1 and 2 net equity greenhouse gas emissions.

3 Individual investment decisions are subject to Woodside's investment targets. Not guidance. Potentially includes both organic and inorganic investment.

SECTION 1.4

Our climate policy

WOODSIDE POLICY

Woodside Energy

BACKGROUND

The Intergovernmental Panel on Climate Change has stated that "it is unequivocal that human influence has warmed the atmosphere, ocean and land". An objective of the Paris Agreement is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and to pursue "efforts to limit the temperature increase to 1.5°C". Many countries have set targets to reduce greenhouse gas emissions, including by changing the way they produce and consume energy.

OBJECTIVE

Woodside's objective is to thrive in this energy transition as a low cost, lower carbon energy provider.

PRINCIPLES

Woodside aims to achieve the objective by:

- Setting science-based[1] near, mid, and long-term net emissions reduction targets that are consistent with Paris-aligned[2] scenarios, covering equity scope 1 and 2 emissions, both operated and non-operated.[3]
- Developing and operating oil and gas projects in a manner that is consistent with these targets. This includes the deployment of lower-emission technologies (Design Out), supporting efficient operations (Operate Out) and use of robust offsets (Offset) as methods to reduce and offset greenhouse gas emissions.
- Investing in new energy products and lower carbon services to reduce customers' emissions (part of Woodside's Scope 3 emissions), including but not limited to hydrogen, ammonia and carbon capture, utilisation and storage.
- Publishing transparent climate-related disclosures aligned to the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) or other recognised global reporting standards.
- Aligning our advocacy to the principles of this Climate Policy.

APPLICABILITY

Responsibility for the application of this Policy rests with all Woodside employees, contractors and joint venture participants engaged in activities under Woodside operational control. Woodside managers are also responsible for promotion of this Policy in non-operated joint ventures.

This Policy will be reviewed regularly and updated as required.

Reviewed by the Woodside Energy Group Ltd Board in December 2022

1 Woodside is using the draft Prototype IFRS Sustainability Disclosure Standard definition of "science-based" (published 2021) which states "targets are considered 'science-based' if they are in line with what the most recent climate science sets out is necessary to meet the goals of the Paris Agreement—limiting global warming to below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit warming to 1.5 degrees Celsius.". See https://www.ifrs.org/content/dam/ifrs/groups/trwg/trwg-climate-related-disclosures- prototype.pdf (Appendix A).

2 Woodside is using the draft Prototype IFRS Sustainability Disclosure Standard definition of "Paris-aligned scenarios" (published 2021) which states "scenarios consistent with limiting global warming to below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit warming to 1.5 degrees Celsius." See https://www.ifrs.org/content/dam/ifrs/groups/trwg/trwg-climate-related-disclosures- prototype.pdf (Appendix A).

3 Equity emissions means the share of the total emissions arising from an activity that are attributable to Woodside in proportion to Woodside's ownership interest in the activity, irrespective of whether Woodside operates the activity. Operated emissions are the total emissions arising from an activity that Woodside operates, irrespective of Woodside's ownership interest.

SECTION 2.1

Climate change

Climate science is a rapidly evolving field in which new observations continue to improve our understanding of the current and potential impacts of global warming, and the possible pathways for mitigating and adapting to it.

Climate change science

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. Its reports provide a synthesis of current science that is broad based, robust and supported by statements of scientific confidence.

In 2022, the IPCC published two new reports: *Climate Change 2022: Impacts, Adaptation and Vulnerability*[1] and *Climate Change 2022: Mitigation of Climate Change*.[2] These reports are respectively the contributions of Working Group II and Working Group III to the IPCC's Sixth Assessment Report (the AR6-WG2 and AR6-WG3 reports), and follow the 2021 report from Working Group I *Climate Change 2021: The Physical Science Basis* (AR6-WG1).[3] A final synthesis report is expected to be completed in 2023.

The AR6-WG1 report stated that it is unequivocal that there is human-induced warming. It also stated that increased atmospheric carbon dioxide (CO_2) levels, generated by human activity, are the largest driver of warming over the longer term, and that there are a range of factors, including emissions of methane, which increase warming in the short-term.

The AR6-WG2 report stated that human-induced climate change, including more frequent and intense extreme events, has caused widespread adverse impacts and related losses and damages to nature and people, beyond natural climate variability. It stated that global warming, reaching 1.5°C in the near-term, would cause unavoidable increases in multiple climate hazards and present multiple risks to ecosystems and humans.

The report noted that societal choices and actions implemented in the next decade will determine the extent to which medium- and long-term pathways will deliver climate resilient development.

The AR6-WG3 report provided an updated global assessment of climate change mitigation progress and pledges, and examined the sources of global emissions. It explained developments in emissions reduction and mitigation efforts, and assessed the impact of national climate pledges in relation to long-term emissions goals. More than 2,000 quantitative emissions pathways were submitted to the IPCC, of which 1,202 scenarios included sufficient information for assessing the associated warming.

The report found that there are many pathways in the literature that likely limit global warming to 2°C with no overshoot, or to 1.5°C with limited overshoot.[4] These pathways vary, sometimes widely, across global indicators including different sources of primary energy. These variations occur because, while climate science is able to calculate a "carbon budget" of net emissions before any particular temperature outcome is reached, the allocation of this budget between different human activities requires additional judgements about for example technology, economics, consumer preferences and policy choices.

1 IPCC 2022. "Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change" [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.

2 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" [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.

3 IPCC, 2021. "Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change" [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, doi:10.1017/9781009157896.

4 Overshoot means the temporary exceedance of a specified level of global warming, such as 1.5°C. Overshoot implies a peak followed by a decline in global warming, achieved through anthropogenic removal of CO_2 exceeding remaining CO_2 emissions globally.

The energy transition

The use of fossil fuels for energy accounts for around three quarters of total anthropogenic greenhouse gas emissions.[1] This means that efforts to meet climate change goals must include changes to the way that the world produces and consumes energy. These changes are referred to as the "energy transition".

The precise shape and pace of the energy transition is uncertain. It is expected to vary in different countries because they have different starting points, development requirements, resources and capabilities. However, the scale of the transition is clearer. It will take many trillions of dollars, invested over decades. The International Renewable Energy Agency (IRENA) estimates it will require $115 trillion of cumulative investment by 2050.[2]

GLASGOW CLIMATE PACT

At the 26th UN Climate Change Conference of the Parties (COP-26) in Glasgow in November 2021, world governments reaffirmed "*the Paris Agreement temperature goal of holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels*". They also recognised "*that the impacts of climate change will be much lower at the temperature increase of 1.5°C compared with 2°C*" and resolved "*to pursue efforts to limit the temperature increase to 1.5°C.*"[3]

This was reconfirmed at the 2022 COP-27 Summit in Sharm el-Sheikh, Egypt.[4]

Energy security

During 2022, the world experienced what the International Energy Agency (IEA) has called the "first truly global energy crisis".[5]

This crisis has seen higher energy prices and in some cases constraints on access to energy supply, impacting upon both businesses and households.

The energy crisis has led to a renewed focus on energy security and has reconfirmed that the energy transition needs to be carefully managed if it is to be fair, inclusive and ultimately successful.

In Woodside's view, a stable energy transition will be one in which energy is affordable and reliable, as well as lower carbon. This is likely to lead to significant investment in new supply of oil, gas and new energy, as we explain in the coming pages of this report.

> "*The combination of the Covid pandemic and the current energy crisis means that 70 million people who recently gained access to electricity will likely lose the ability to afford that access — and 100 million people may no longer be able to cook with clean fuels, returning to unhealthy and unsafe means of cooking. That is a global tragedy.*"
> – IEA World Energy Outlook 2022[6]

1 IEA 2021. "Net Zero – a Roadmap for the Global Energy Sector". All rights reserved.
2 IRENA 2022. "World Energy Transitions Outlook 2022: 1.5°C pathway". International Renewable Energy Agency, Abu Dhabi. Page 31.
3 UNFCCC 2021. "Glasgow Climate Pact" paragraphs 20-21. Accessed at unfccc.int.
4 UNFCCC 2022. "Sharm el-Sheikh Implementation Plan". Accessed at unfccc.int.
5 IEA 2022. World Energy Outlook 2022. All rights reserved.
6 IEA 2022. World Energy Outlook 2022. Page 3. All rights reserved.

SECTION 2.2

Oil and gas in the energy transition

In this section of the Climate Report 2022, we consider the potential global use of oil and gas through the energy transition.

To do so, we review literature from the IPCC, the IEA, the Nationally Determined Contributions in key markets as submitted to the United Nations, and also provide a case study of decarbonising power grids in Australia's National Electricity Market.

The analysis provided here is global in nature. In subsequent sections of the report, we make observations about Woodside's specific portfolio of assets and potential investment opportunities, and how we expect our global analysis to impact upon our strategy, business and financial planning.

Oil and gas in Paris-aligned climate scenarios

Climate science has drawn a robust link between cumulative emissions of greenhouse gases and global temperature levels.[1]

The link between cumulative emissions and temperature levels allows a carbon budget to be calculated. This is the remaining amount of net emissions (i.e. all global sources of emissions minus all global sinks[2] of emissions) that can occur before today's concentration of greenhouse gases increases to the concentration associated with potential temperature outcomes.

However, the distribution of this carbon budget across different human activities requires additional judgements about a wider range of social, economic and technological factors and consumer and policy choices. Strategies to achieve emissions reductions include transitioning from fossil fuels without CCS to very low- or zero-carbon energy sources, such as renewables or fossil fuels with CCS, demand side measures and improving efficiency, reducing non-CO_2 emissions, and deploying carbon dioxide removal (CDR) methods to counterbalance residual greenhouse gas emissions. Pathways to limit warming therefore show different combinations of sectoral mitigation strategies consistent with a given warming level.

As a result the demand for oil and gas in climate-related scenarios that could limit global warming to 1.5°C or 2°C is uncertain. For example in the AR6-WG3 report, the IPCC stated that in pathways that limit warming to 1.5°C (with a greater than 50% probability and with no or limited overshoot) the potential global use of gas in 2050 ranges from 30% above 2019 levels to 85% below them with a median 45% decline.

The AR6-WG3 also provides ranges and median declines for oil and for coal and says that "*as indicated by the ranges, choices in one sector can be compensated for by choices in another sector while being consistent with assessed warming levels*".[3] Additional insight into the subsets within the range was provided by the IPCC in their 2018 Special Report on Global Warming of 1.5°C (AR6-SR1.5).[4]

The AR6-SR1.5 report grouped the scenarios that are consistent with limiting warming to 1.5°C into four illustrative pathways, respectively P1, P2, P3 and P4. Of these, only P1, P2 and P3 limit warming to 1.5°C with no or limited overshoot, whereas P4 does so with high overshoot.

The pathways vary in key respects. These variables include:

- Estimates of future energy demand
- The distribution of that energy demand between different supply sources such as renewables, nuclear, coal, oil and gas
- The rate of scale-up of technologies such as carbon capture and storage (CCS)
- Emissions from outside the energy sector, such as methane emissions from agriculture.

Of these pathways, the pathway with the lowest levels of gas use (which is P1) is also characterised by lower overall energy demand and deeper cuts in agricultural methane emissions prior to 2030. The pathway with the highest gas use in 2050 (which is P3) is associated with maintenance of historical patterns of demand, coupled with significant use of energy technologies such as CCS.

These pathways do not vary in all respects. The level of energy delivered by renewables, and the level of overall emissions reduction is similar in both pathways. The page opposite provides further information on P1 and P3. Drawing upon historical and current data as well as future projections, Woodside also provides observations on signposts associated with these pathways.

The AR6-SR1.5 report forms part of the IPCC's Sixth Assessment Cycle and its findings may be updated in their Synthesis Report for this cycle, which is expected to be published in 2023.

1 IPCC, 2021. "Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change".
2 Carbon sinks are forests and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting CO_2 emissions. (Definition taken from European Commission "Climate change: glossary of common terms and acronyms" https://www.eea.europa.eu/help/glossary/eea-glossary/carbon-sink).
3 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.
4 IPCC 2018. "Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty." [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis,E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. See Page 14, pathways P1 and P3.

FIGURE 1: SELECTED GLOBAL INDICATORS OF 1.5°C PATHWAYS[1]

Indicator	P1	P3	Woodside observations
Primary energy from gas in 2050 (% relative to 2010)	-74%	+21%	There is a wide variation in natural gas use between these two modelled pathways.
Temperature outcome	>50% probability of limiting warming to 1.5°C with no or limited overshoot		Despite the divergent levels of gas use, both the P1 and P3 pathways have the same potential temperature outcome.
CO_2 emission change in 2050 (% relative to 2010)	-93%	-91%	They are not materially differentiated by CO_2 emissions change or by the takeup of renewable energy. In fact, the takeup of renewable energy is greater in the higher gas pathway.
Primary energy from non-biomass renewables in 2050 (% relative to 2010)	+833%	+878%	
Final energy demand in 2050 (% relative to 2010)	-32%	+21%	The pathways are differentiated in other factors. For example, the lower gas pathway (P1) also includes absolute reductions in final energy demand and deeper cuts in agricultural methane in the near term.
Cumulative CCS until 2100 (Gt CO_2)	0	687	Conversely the higher gas pathway (P3) includes a marked increase in the takeup of CCS.
Agricultural methane emissions in 2030 (% relative to 2010)	-24%	+1%	

Signposts

The IPCC provides several indicators which contribute to the emissions and temperature outcomes in its pathways, including the selected indicators provided in figure 1.

All the indicators can inform judgments about the viability of the pathways and should not be viewed in isolation of each other. This includes indicators that are directly relevant to the level of natural gas e.g., final energy demand, as well as those that are not linked e.g., agricultural methane emissions.

Of these indicators, levels of CCS development are growing and receiving government support, such as the Inflation Reduction Act in the United States. However, they are not yet close to achieving the cumulative quantities consistent with P3. The Global CCS Institute states that "ambition must now translate to urgent, broad and large scale action".[4]

Similarly, other indicators are not currently consistent with achieving the P1 pathway. For example, figures 2 and 3 show the historical values for final energy demand and for emissions from agriculture respectively. They also show the future values projected in each of the P1 and P3 pathways. Neither indicator is currently consistent with achieving the pathways, but P3 is closer to the current trajectory than P1.

In Woodside's view, this means that the IPCC P3 pathway, which involves relatively higher levels of natural gas together with a marked increase in levels of CCS, should continue to be considered by policy makers and by energy companies when assessing options to limit global warming to 1.5°C.

P3 is described by the IPCC as "a middle of the road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy products are produced, and to a lesser degree by reductions in demand."

FIGURE 2: GLOBAL FINAL ENERGY DEMAND[2]

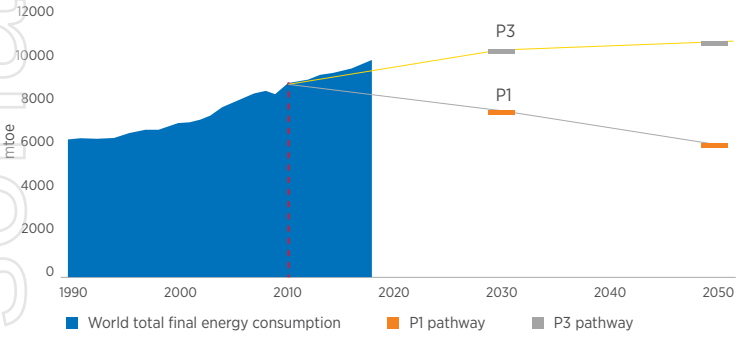
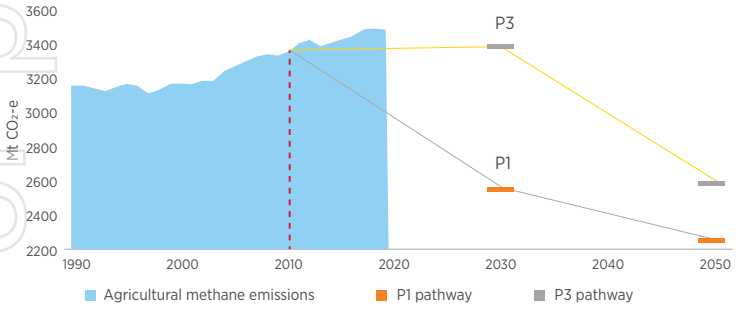


FIGURE 3: GLOBAL EMISSIONS OF METHANE FROM AGRICULTURE[3]



1 IPCC 2018. "Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty." The Woodside analysis on this page explores variables in natural gas use because natural gas is the dominant product in Woodside's portfolio. Woodside has focused on P1 and P3 pathways because they include the two ends of the range of natural gas use from the IPCC AR6-SR1.5. The AR6-SR1.5 also includes two other pathways, P2, in which global gas use is between the values of P1 and P3, and P4 which is a pathway to limiting warming to 1.5°C but which, unlike pathways P1-P3, has higher overshoot.

2 International Energy Agency, accessed online January 2023 at https://www.iea.org/data-and-statistics/charts/world-total-final-consumption-by-source-1973-2018. Note the values for separate fuel types provided by the IEA have been totalled by Woodside. 2030 and 2050 values have been added by Woodside using data from the IPCC AR6-SR1.5.

3 World Bank, accessed online January 2023 at https://data.worldbank.org/indicator/EN.ATM.METH.AG.KT.CE. 2030 and 2050 values have been added by Woodside using data from the AR6-SR1.5.

4 Global CCS Institute 2022. 2022 Status Report. https://status22.globalccsinstitute.com/2022-status-report/global-status-of-ccs/.

CASE STUDY:
ARE NEW OIL AND GAS FIELDS NEEDED IN SCENARIOS WHICH ACHIEVE NET ZERO?

In 2021, the International Energy Agency (IEA) published its Net Zero by 2050: A Roadmap for the Global Energy Sector report (the NZE scenario).[1]

Although the report is clear that "the route mapped out here is a path, not necessarily the path…", the report's finding that "no new oil and gas fields" are needed has, for some stakeholders, become a singular litmus test of climate alignment and an objective to be pursued as a matter of policy.

Woodside considers the IEA NZE scenario in the scenario analysis on page 24-25 of this report. However, we also recognise that this is just one scenario among many, and we also consider the range of pathways considered by the IPCC.

The levels of oil and gas usage in the NZE are plotted against the range of oil and gas usage in 1.5°C pathways from the IPCC's AR6-WG3 report in the charts on page 13. All of these pathways have a greater than 50% probability of limiting warming to 1.5°C with no or limited overshoot. The NZE scenario correlates within the lowest quartile of the IPCC range, meaning that 75% of the 1.5°C pathways included in the IPCC AR6-WG3 report entail more oil and gas usage than the NZE.

Moreover, "no new oil and gas fields" does not mean "no oil and gas investment". In fact, the IEA estimated the need for an average of $365 billion of upstream oil and gas investment every year to 2030, and $171 billion every year thereafter to 2050 is required in its NZE scenario.[2] This is because output from existing fields will decline as they are depleted, so investment is needed to sustain and replace them in all scenarios. In the NZE scenario, this investment is achieved wholly at existing fields, rather than initiating new ones.

The IEA further cautions that: "*The fact that no new oil and natural gas fields are required in the NZE does not mean that limiting investment in new fields will lead to the energy transition outcomes in the NZE. If demand remains at higher levels, reduced investment would result in a shortfall in supply in the years ahead, and this would lead to higher and more volatile prices*".

To avoid an energy shortfall, the IEA's NZE requires investment in clean energy to reach $5 trillion annually by 2030.[3] It is currently tracked by the IEA at $1.2 trillion and expected to reach $2 trillion following the passage of measures such as the United States Inflation Reduction Act.

Lastly, the IEA's report provides a spotlight on key uncertainties by highlighting the differences between NZE and other net zero scenarios considered by the IPCC.[4]

For example:

- The IPCC scenario range envisages total final energy consumption ranging from 300-550 EJ in 2050. The NZE has final energy consumption of 340 EJ in 2050.
- The IPCC scenario range envisages between 3.5-16 Gt of carbon dioxide removals (CDR) in 2050, whereas NZE envisages 1.9 Gt.
- The IPCC scenario range envisages a median use of bioenergy 200 EJ in 2050, whereas NZE envisages 100 EJ.
- The IPCC scenario range envisages a median of 18 EJ total final hydrogen consumption and NZE envisages 33 EJ.

These differences do not mean that the NZE is incorrect: rather, that it is simply one point on a wide range of potential future pathways that could successfully limit global warming.

1 IEA 2021. "Net Zero by 2050. A Roadmap for the global energy sector". All rights reserved.
2 IEA 2021. World Energy Outlook 2021. All rights reserved. Table 6.1, page 278.
3 The IEA defines clean energy as including "renewables, energy efficiency, low carbon fuels, nuclear power, battery storage and carbon capture, utilisation and storage."
4 IEA 2021. "Net Zero by 2050. A Roadmap for the global energy sector". All rights reserved. Pages 62-64.

The IEA's NZE scenario projects a single data point for oil and gas use in 2050. In figure 4 this has been superimposed on the IPCC range of oil and gas use from the AR6-WG3 report, for scenarios that have a 50% or greater probability of limiting warming to 1.5°C with no or limited overshoot.

Figures 5, 6 and 7 compare the IEA Net Zero Roadmap value for total final energy consumption, adoption of carbon dioxide removals (CDR) technologies, and take up of hydrogen with the respective ranges from the IPCC for scenarios that limit warming to 1.5°C including with overshoot.

FIGURE 4: OIL AND GAS USAGE[1]

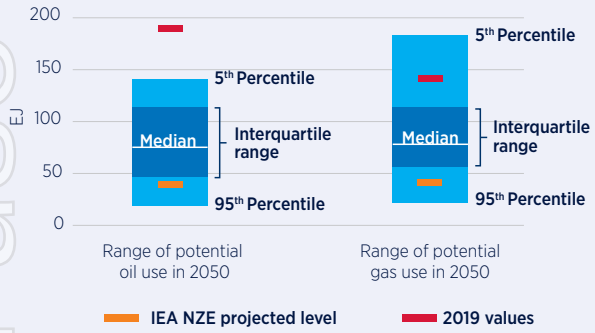


FIGURE 5: TOTAL FINAL ENERGY CONSUMPTION[1,2]

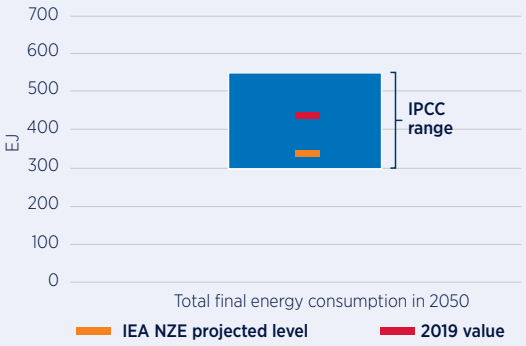


FIGURE 6: ENERGY RELATED CO_2 REMOVALS[1,2]

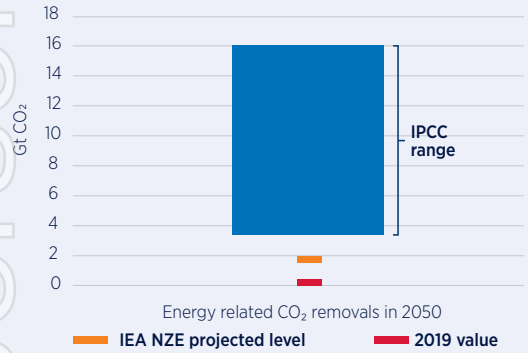
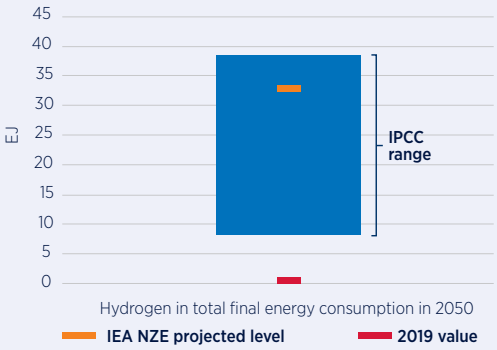
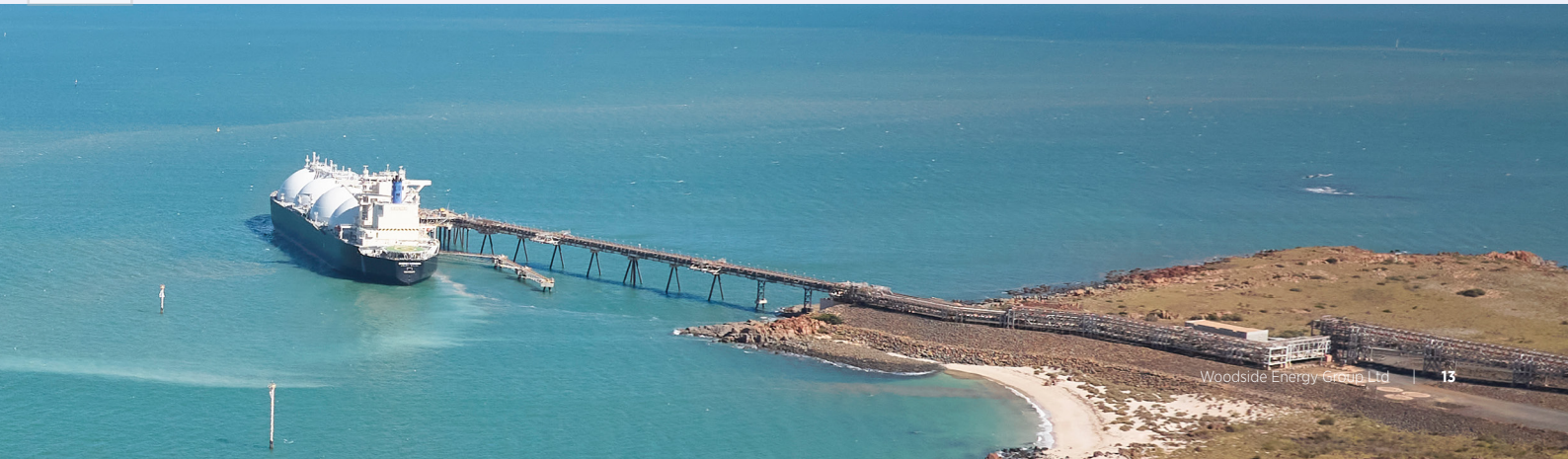


FIGURE 7: HYDROGEN CONSUMPTION[1,2]



1 Data in Figures 4-7 is drawn from a number of publicly available sources and consequently has some differences arising from the format of data in those sources. Chart 4 utilises the IPCC's range for potential percentage change in oil and gas usage (both with and without CCS), in scenarios that have a 50% or greater probability of limiting warming to 1.5°C with no or limited overshoot from AR6-WG3. It applies this range to the 2019 actual values from the IEA's WEO 2021. The IEA NZE 2050 value is drawn from the IEA's WEO 2022, the most recent published update of this value. In Charts 5-7, the IPCC range is as presented in the IEA's 2020 Net Zero Roadmap report (pages 62-64). This includes 53 scenarios with no or limited overshoot and 37 scenarios with a higher temperature overshoot. The 2019 value in Charts 5, 6 and 7 is taken from the IEA's WEO 2021, noting that this contains a nil value for CO_2 removals and hydrogen. In Figure 6 the IEA data refers to CO_2 removals from bioenergy with CCS and direct air capture with CCS only.

2 IEA 2021. "Net Zero by 2050. A Roadmap for the global energy sector". All rights reserved. Pages 62-64.



CASE STUDY:
NATURAL GAS IN DECARBONISING POWER GRIDS: THE AUSTRALIAN CASE STUDY

Australia's National Electricity Market (NEM) provides a case study for the challenge facing the electricity system. The Australian Energy Market Operator (AEMO) describes this challenge as a "double transformation: electrification of the economy while switching to firmed renewables" as the source of power generation.[1]

Electrification of the economy will increase demand on the grid and require the scaling up of the electricity system as more energy uses, such as passenger vehicles, switch over to electricity.

Switching to firmed renewables requires both replacing existing fossil-fuel generation (today, substantially coal fired), and also increasing the firming capacity that can keep power supply stable through renewable intermittency.

The AEMO's Integrated System Plan (ISP) published in 2022 estimates that a doubling of total electricity delivered and a nine fold increase in utility scale variable renewable electricity (VRE) will be needed by 2050, in its most likely "Step Change" scenario. The Step Change scenario is aligned with delivering Australia's net zero commitments.[2]

This is a multi-decade task: the AEMO concludes that "*by the mid-2040s, [NEM] electricity supply is expected to be generated almost exclusively from renewable resources, with energy storages helping to manage their seasonality and intermittency, and peaking gas-fired generation providing firming support.*"[3]

In addition to firming services, natural gas-fired power generation has the potential to accelerate the decarbonisation of the power system, from today. Figure 8 shows the 12 month average mix of fuels used to generate electricity, in the four Australian mainland states connected to the NEM.[4]

They show some stark differences with implications for the greenhouse gas emissions arising from the power system:

- Power generators located in South Australia used no coal. Around two thirds of power generation was sourced from renewables, with the remainder overwhelmingly from gas (batteries provided around 1%).
- The power systems in Victoria, NSW and Queensland sourced most of their electricity from coal-fired generation, with less than half the share of renewables and less than a third the share of natural gas than South Australia.

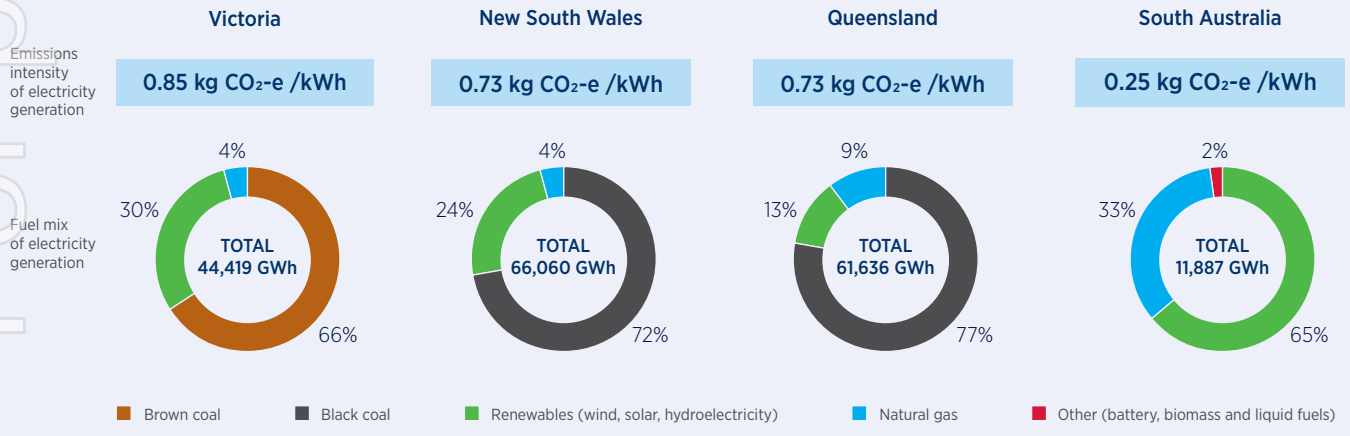
The South Australian system benefits, not only because of the higher share of renewables but also because of the share of natural gas-fired generation, which typically emits half the emissions of coal-fired generation.[5]

These examples highlight the twin potential of natural gas in decarbonising power, i.e gas can both supplement renewables (potentially enabling faster elimination of coal-fired power generation) as well as firm them.

This is why Woodside sees the potential for the use of gas for power generation in the decades ahead, as the power system grows, decarbonises and remains stable.

In the longer term, renewables could also substitute for natural gas use in power generation, with both hydrogen and batteries providing stabilisation and storage. However, this implies peak renewables capacity which is greater than 100% of demand, so that the excess power generation can be used to recharge batteries and hydrogen storage for use at off-peak times.

FIGURE 8: EMISSIONS INTENSITIES AND FUEL MIXES IN THE NATIONAL ELECTRICITY MARKET[4,6,7]



1 AEMO 2022: 2022 Integrated System Plan. © 2022 Australian Energy Market Operator Limited. Page 9.
2 AEMO 2022: 2022 Integrated System Plan. © 2022 Australian Energy Market Operator Limited. Page 23.
3 AEMO 2022: 2022 Integrated System Plan. © 2022 Australian Energy Market Operator Limited. Page 45.
4 Fuel mix percentages accessed online https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/data-dashboard-nem on 31 January 2023.
5 IEA (2019). "The Role of Gas in Today's Energy Transitions". Page 4. All rights reserved.
6 Australian Department of Climate Change, Energy, the Environment and Water 2022. "Australian National Greenhouse Gas Factors." Electricity generation emissions intensities have been sourced from the emission factors in Table 1, pages 7-8. These factors represent the emissions from the consumption of electricity purchased from a grid.
7 Total electricity generated is sourced from the "Greenhouse and energy information by designated generation facility 2020-21" www.cleanenergyregulator.gov.au. On-grid only.

SECTION 2.3

Market decarbonisation plans

In addition to analysis of the range of oil, gas and new energy demand estimated in climate-related scenarios, Woodside also assesses the actual policies and plans being implemented in the jurisdictions that are relevant to its business. Selected examples of these, drawn from countries' Nationally Determined Contributions (NDC) to the goals of the Paris Agreement and from other policy documents, are provided here.

Australia

In June 2022 Australia increased the ambition of its 2030 target, committing to reduce greenhouse gas emissions 43% below 2005 levels by 2030. Australia also reaffirmed its target to achieve net zero emissions by 2050. The Australian Government is implementing a suite of new policies across the economy, including a Powering the Regions Fund (to support the development of new clean energy industries and the decarbonisation priorities of existing industry) and the introduction of declining emissions baselines for Australia's major emitters under the existing Safeguard Mechanism.

United States

In July 2021 the United States set an economy-wide target of reducing its net greenhouse gas emissions by 50-52% below 2005 levels in 2030. Signed in 2022, the Inflation Reduction Act aims to unlock $370 billion in climate and energy investment and is expected to reduce carbon emissions by roughly 40% by 2030.[1]

Europe

In December 2020, the EU updated its NDC and committed to an economy-wide net domestic reduction of at least 55% in greenhouse gas emissions by 2030 compared to 1990. The REPowerEU Plan, put forward by the European Commission in May 2022, is a plan for "saving energy; producing clean energy; and diversifying our energy supplies."[2]

Japan

Japan updated its First NDC on 22 October 2021. It states: "Japan aims to reduce its greenhouse gas emissions by 46 percent in fiscal year 2030 from its fiscal year 2013 levels, setting an ambitious target which is aligned with the long-term goal of achieving net zero by 2050. Furthermore, Japan will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emission by 50 percent."

Japan also published an "Outline of Strategic Energy Plan" in October 2021.[3] This plan assumes that LNG, while reducing from 37% in 2019, still makes up 20% of Japan's electricity generation mix in 2030. Renewables double from 18% to 36-38% and nuclear power increases from 6% to 20-22%. Outside the electricity sector it says in respect of heating "We will pursue the shift to natural gas on demand side and decarbonisation of gas through methanation and other means, which play a significant role in decarbonising heat demand. We will also work to further strengthen the resilience of gas."

China

The People's Republic of China updated its First NDC on 28 October 2021. It states: "On September 22, 2020, President Xi Jinping declared, at the General Debate of the 75th Session of the United Nations General Assembly, that China would scale up its NDCs by adopting more vigorous policies and measures, and aims to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060."

"China will stringently curb coal-powered projects, set strict limitation on the increase in coal consumption over the 14th FYP period and to phase it down in the 15th FYP period.[4] The large scale development of wind and solar power will be accelerated, hydro power in accordance with local condition will be developed, nuclear power will be advanced in an ordered manner with the premise of ensured safety, and peaking power including energy storage and gas-powered electricity will be stepped up rapidly."

"China will push forward technological breakthroughs in various fields to support the green and low-carbon transition, such as renewable energy, hydrogen energy, smart grid and energy storage, CCUS, circular economy, low-carbon transportation and smart cities, climate change impact and risk assessment."

Republic of Korea

The Republic of Korea updated its First NDC on 23 December 2021. It states: "The Republic of Korea declared to move towards the goal of carbon neutrality by 2050 in December 2020 and has finalized its 2050 carbon-neutrality scenarios as a follow-up measure."

"The Republic of Korea is seeking to dramatically phase down coal-fired power generation while ramping up renewable power. Aged coal power plants will be shut down or shift their fuels from coal to Liquefied Natural Gas (LNG). The uptake of solar and wind power will be scaled up as well."

"The Republic of Korea has markedly raised its 2030 target on the deployment of zero-emission vehicles such as the ones powered by electricity and hydrogen."

Refer to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat at unfccc.int.

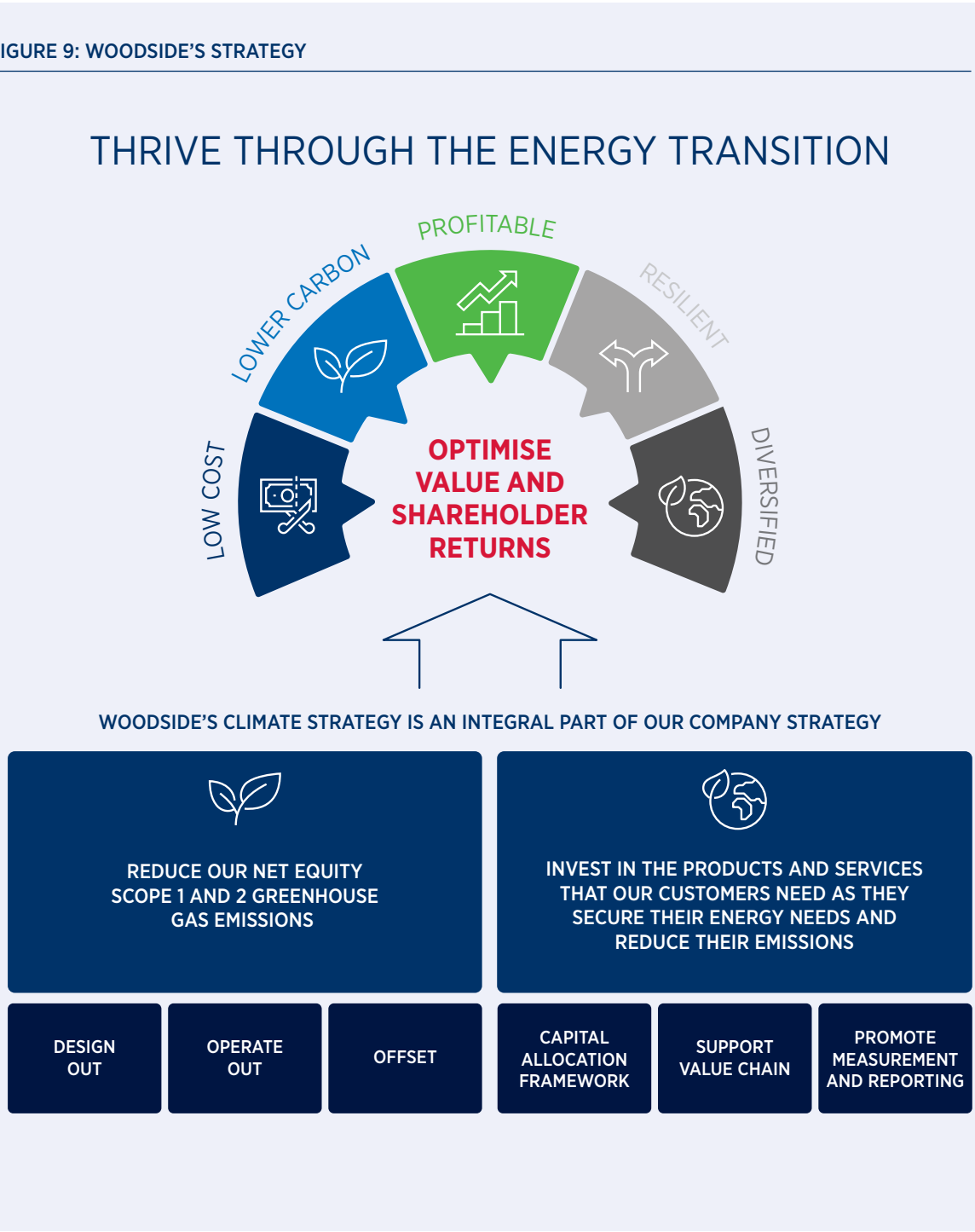
1 The White House 2023. "Building a clean energy economy: A guidebook to the Inflation Reduction Act's Investments in clean energy and climate action". Version 2. Pages 5 and 6.
2 Accessed online https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en on 01 February 2023.
3 Government of Japan, Agency for Natural Resources and Energy (METI) 2021. "Sixth Strategic Energy Plan."
4 FYP is an abbreviation of Five Year Plan.

SECTION 3.1

Woodside's climate strategy

Our climate strategy is an integral part of our company strategy. It has two key elements: reducing our net equity Scope 1 and 2 greenhouse gas emissions, and investing in the products and services that our customers need as they secure their energy needs and reduce their emissions.

FIGURE 9: WOODSIDE'S STRATEGY



Reducing net equity Scope 1 and 2 greenhouse gas emissions is a challenge that we share with many businesses, organisations and households in society.

Our decarbonisation strategy explains how we plan to achieve our targets, and is described on pages 28-39 of this report. Our progress in 2022 is summarised in the Metrics and Targets on pages 40-47 of this report.

We recognise that as society reduces Scope 1 and 2 greenhouse gas emissions, our customers will likely change the way they purchase and use energy.

Woodside therefore aims to invest in products and services so that our portfolio meets evolving demand for oil, gas, new energy products and lower carbon services.

Our current portfolio is described on pages 18-25 and our capital allocation framework is described on pages 26-27 of this report.

The uncertainty surrounding the pace and shape of the energy transition creates both risk and opportunity for Woodside's strategy, business and financial planning in the short-, medium- and long-term.

Our risk management process is described on pages 54-57. We have identified potential climate-related risks and opportunities for our strategy, business and financial planning.

On 1 June 2022, Woodside completed its merger with BHP's petroleum business. The merger is expected to have improved Woodside's ability to navigate the energy transition in several respects.

These include:

- The merged entity has stronger cashflows, which can support its investment in the transition. For example, Woodside's target to invest US$5 billion in new energy products and lower carbon services by 2030 was conditional upon completion of the merger.[1]
- The merged entity's portfolio is more diversified by geography and product mix, containing a balance of LNG, pipeline gas and oil. Each of these products has different characteristics and different risk/reward profiles, improving resilience to uncertainty in the energy transition.

Woodside's net equity Scope 1 and 2 greenhouse gas emissions reduction targets have been extended to the assets acquired from the merger with BHP's petroleum business.[2] See page 40 for more information.

1 Individual investment decisions are subject to Woodside's investment hurdles. Not guidance. Potentially includes both organic and inorganic investment.
2 Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base representative of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with a final investment decision prior to 2021.

SECTION 3.2

Our portfolio today

Woodside has a portfolio of oil and gas assets that provide the foundation to deliver new growth opportunities. We are also developing a portfolio of new energy projects.[1] These projects have the potential for significant future growth as customer demand increases and technology reduces the cost of supply.

Natural gas in our portfolio

Natural gas is the dominant product in Woodside's portfolio, representing approximately 75% of equity production in 2022. Following the merger between Woodside and BHP's petroleum business, Woodside increased its exposure to Australian pipeline gas markets. However, most of our natural gas continues to be sold as LNG.

Gas projects typically generate long-term cash flows and tend to be resilient through the commodity price cycle. We target an internal rate of return (IRR) greater than 12% and payback within seven years.[2] The business case for the Scarborough project, approved in 2021, exceeded these investment hurdles.

We see an ongoing role for Woodside's LNG and pipeline gas to support our customers' plans to secure their energy needs, while they reduce their emissions.

Some relevant attributes of natural gas are:

- When used to generate electricity, natural gas emits around half the life cycle emissions of coal.[3]
- The IEA advises that while renewable, nuclear and other low carbon power sources are expected to meet most additional power demand, gas and coal are expected to compete with each other to fill the gap.[4]
- More than half of the world's natural gas supply is used in sectors other than power generation, such as in industrial applications and fertiliser manufacturing. Some of these have lower emissions intensity than power generation,[5] and may be considered hard-to-abate.
- In the form of LNG, natural gas is transportable and flexible between destinations, which is an advantage during an uncertain and potentially volatile energy transition.[6]
- While energy storage technologies (such as batteries) continue to improve, natural gas in the meantime enables cost-effective and reliable conversion of power grids to renewable electricity because of its ability to "firm" intermittent generation.[7]
- Natural gas is also used for hydrogen manufacture by reforming. This process, including carbon capture and storage (CCS), is predicted by the IEA to represent almost half of hydrogen production in 2030 in their Net Zero Emissions by 2050 Scenario (NZE).[8]

To achieve global net zero emissions, the greenhouse gas emissions from natural gas usage will need to be abated, using technologies such as carbon capture utilisation and storage (CCUS).

1 For definition of New Energy, see glossary.
2 Payback refers to ready for start-up (RFSU) + x years.
3 IEA 2019. "The Role of Gas in Today's Energy Transitions". Page 4. All rights reserved.
4 IEA 2022. "Coal 2022 - Analysis and Forecast to 2024". Pages 11, 14 and 26-30. All rights reserved.
5 IEA 2022. "World Energy Outlook 2022". Page 46. All rights reserved.
6 IEA 2020. Website accessed 2022. https://www.iea.org/commentaries/record-year-for-gasliquefaction-investment-lights-a-path-towards-market-flexibility. All rights reserved.
7 Wood, T. and Ha, J. (2021). "Go for Net Zero". Grattan Institute. Page 30. (Firming means to support intermittent renewable generation by quickly ramping up or down to support stable supply).
8 IEA 2021. "Net Zero 2050 – A Roadmap for the Global Energy Sector", page 76. All rights reserved.

Key challenge

The contribution of natural gas to the energy transition will be influenced by whether it is sufficiently competitively priced. In 2022, the IEA reported that higher gas prices (emerging due to the Russian invasion of Ukraine) were testing the traditional arguments for the role of gas in the energy transition.

For example, the IEA noted that in India and Southeast Asia a challenging environment for domestic gas production between 2010 and 2021 meant natural gas became less competitive with coal. The result was around 30 bcm of natural gas demand lost to gas-to-coal switching, leading to a 50 Mt CO_2 increase in emissions which would have been avoided if natural gas had been used instead.[1]

Woodside's existing LNG supplies and projects such as Scarborough can contribute to increasing natural gas supply.

"Although the prospects for coal-to-gas switching have been adversely affected by higher gas prices, it would be technically possible, for example, for one third of coal-fired power output in Southeast Asia to be substituted by existing gas-fired power capacity... Doing this would avoid around 120 Mt CO_2 emissions, equivalent to 22% of emissions from coal-fired power plants in South East Asia."[2]
- IEA World Energy Outlook 2022

Oil in our portfolio

Oil plays an important part in Woodside's portfolio and is expected to continue to do so. Oil projects typically have shorter payback periods than LNG projects, which is expected to make them more resilient to unexpected rates of change in demand through the transition. They also typically generate strong cash flow, so we expect them to be an important part of funding Woodside's investment in new energy and lower carbon services.

Further oil exploration has the potential to discover new oil resources which could prove to be more competitive than existing discovered resources, including in demand pathways which are consistent with limiting global temperature rise.

We expect that oil demand will be increasingly substituted out of the relatively easy-to-abate sectors such as power generation and road passenger vehicle transportation, but remain stronger for hard-to-abate and non-combustion uses such as aviation and synthetic materials.[3]

In 2021, around 17% of global oil supply was produced for non-energy uses, and even in the IEA's NZE scenario, the volume consumed for these purposes is expected to remain similar in 2050.[4]

On average, the Scope 1 and 2 greenhouse gas emissions arising from conventional offshore oil production are lower than from the production of LNG, but when combusted, the Scope 3 emissions from using the product are higher.[5,6]

For future oil developments we target an IRR greater than 15% and payback within five years.[7]

1 IEA 2022. "World Energy Outlook 2022". All rights reserved. Page 408.
2 IEA 2022. "World Energy Outlook 2022". All rights reserved. Page 405.
3 IEA 2021. "Net Zero by 2050 — A Roadmap for the Global Energy Sector". Pages 45 and 102. All rights reserved.
4 IEA 2022. "World Energy Outlook 2022", page 445. All rights reserved.
5 Wood MacKenzie 2019. Website accessed 2022. https://www.woodmac.com/news/opinion/greener-lng-is-vital-to-asias-sustainable-development/.
6 IEA 2017. Website accessed in 2022. https://www.iea.org/commentaries/the-environmental-case-for-natural-gas. All rights reserved.
7 Payback refers to ready for start-up (RFSU) + x years.

New energy in our portfolio

As the energy transition progresses, we expect demand to increase for new energy products such as hydrogen and ammonia, and lower carbon services such as CCS and carbon capture and utilisation (CCU), collectively CCUS. Woodside is investing to add these new products and services to our portfolio, seeking to match the pace, scale and needs of our customers as they determine their own decarbonisation pathways. There are inherent uncertainties in this pace and scale.

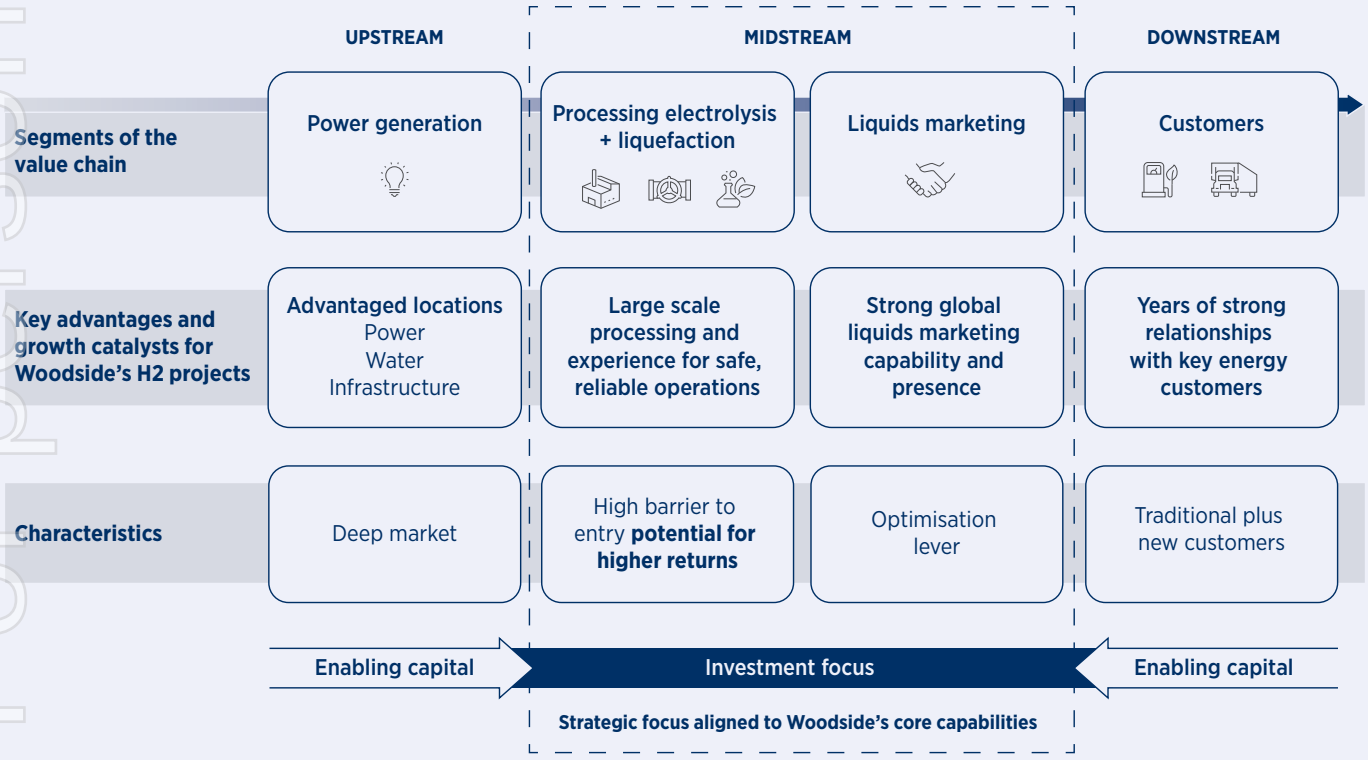
We expect the development of new energy markets to be similar to the development of the LNG industry many years ago, such as in the need for government support and opportunities for collaboration. Like then, we are building relationships across the value chain and aligning solutions to customers with options to match the scale and pace of the energy transition.

Woodside capabilities in the new energy value chain

The oil and gas value chain is typically described in three segments: upstream, midstream and downstream. We think of the new energy value chain in similar segments (see figure 10).

- **Upstream** is about the location for power, water and other infrastructure. We target our facilities in locations that have advantaged access to low cost renewables and enabling infrastructure.
- **Midstream** is similar to our existing core capabilities in the LNG business and is our focus. We believe we can leverage our experience as a safe and reliable energy producer, supplying industrial scale volumes to customers, and that this will be a differentiating characteristic that is not easily attained. We see a competitive advantage for Woodside in the processing, electrolysis and liquefaction segments of the value chain.[1]
- **Downstream** is about customer relationships which we have been investing in for decades with our traditional LNG buyers and we are extending that to new and emerging customers in new energy.

FIGURE 10: NEW ENERGY VALUE CHAIN



1 Hydrogen and ammonia can be manufactured in different ways including electrolysis of water and by reforming natural gas. Where the manufacturing method leads to greenhouse gas emissions these can be abated, for example with CCS.

End-use markets for hydrogen and ammonia

Hydrogen has been recognised as a key option to realise the net zero greenhouse gas emissions commitments that governments have announced in recent years. Ammonia can be used as a carrier for hydrogen, either to be used directly (as feedstock for chemicals or as a fuel for power generation and maritime transportation) or to be reconverted to hydrogen. They both offer the potential for decarbonising parts of the energy system where other measures such as direct electrification are more difficult or expensive, including sections of heavy industry and long-distance transport.

Woodside sees potential in the following end-use markets:

- **Heavy duty transport:** Liquid hydrogen is a potential substitute for diesel in trucking fleets, utilising fuel cells that need liquid hydrogen for fuel. Woodside believes that with the support of policies like the Inflation Reduction Act in the United States there can be line of sight to cost parity with diesel for the fuel supply, and that fuel cells will offer operational benefits over battery-electric trucks.
- **Power generation:** Ammonia can be blended into the fuel used for existing coal-fired power generation. This has the benefit of diversifying primary energy supply and reducing greenhouse gas emissions from existing generation assets including the longer term substitution of natural gas-fired power generation. Woodside is participating in a joint feasibility study on a potential ammonia supply chain from Australia to Japan.[1]
- **Shipping and marine fuels:** Ammonia as a marine fuel could reduce emissions relative to the use of conventional fuels for bulk carriers. Woodside is exploring opportunities with potential partners and original equipment manufacturers.
- **Industrials and chemicals:** Hydrogen and ammonia are used as industrial and chemical feedstocks today, and are primarily manufactured from fossil fuels without carbon management. This creates the potential for the same products to be manufactured, but through renewable electrolysis or fossil fuels with CCS.

Carbon solutions in our portfolio

Some technologies can abate emissions from conventional processes, by capturing greenhouse gases and durably storing them out of the atmosphere.

Carbon capture and storage

Carbon capture and storage has the potential to offer significant abatement volumes for Woodside and its customers. The capabilities required to identify reservoirs suitable for CCS and to safely inject and store the CO_2 are analogous to those employed in our hydrocarbon business.

Woodside, as a participant in various joint ventures, was recently awarded three greenhouse gas licenses across Australia to progress CCS. Woodside is also a participant in the Gippsland Basin Joint Venture, which is progressing a feasibility study into the development of a south-east Australian carbon capture and storage hub.

Carbon to products

Woodside is investing in technology advancement to convert carbon into useful products at the point source of the carbon generation. Potential products include fuels, proteins and bulk materials for use in the construction sector. This is an emerging technology and Woodside has been collaborating with several companies to drive the development of these CCU products.

Offsets

Woodside is developing a portfolio of carbon credits to contribute to the achievement of its net equity Scope 1 and 2 greenhouse gas emissions targets. These also have the potential to be bundled with product sales if customer demand is present, at a scale which is able to be supported. For more information about offsets, see pages 34-35.

2022 progress

For progress made in advancing CCS and technology to convert carbon into useful products, please see page 47.

> *"CO_2 capture and subsurface injection is a mature technology for gas processing and enhanced oil recovery. In contrast to the oil and gas sector, CCS is less mature in the power sector, as well as in cement and chemicals production, where it is a critical mitigation option. The technical geological CO_2 storage capacity is estimated to be in the order of 1,000 gigatonnes of CO_2, which is more than the CO_2 storage requirements through 2100 to limit global warming to 1.5°C, although the regional availability of geological storage could be a limiting factor. If the geological storage site is appropriately selected and managed, it is estimated that the CO_2 can be permanently isolated from the atmosphere. Implementation of CCS currently faces technological, economic, institutional ecological-environmental and socio-cultural barriers. 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."*[2]
> – IPCC AR6-WG3 report

1 Woodside is participating in a joint feasibility study on a potential ammonia supply chain from Australia to Japan with Japan Oil, Gas and Metals National Corporation (JOGMNC), Marubeni, Hokuriki Electric, Kansai Electric, Tohoku Electric and Hokkaido Electric.

2 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.4.6.

Managing physical risks to our portfolio

Climate change creates potential risks and opportunities for Woodside's strategy, business and financial planning. Our process for identifying and managing risks, and a summary of potential climate-related risks and opportunities is provided on pages 56-57.

For illustrative purposes, a focus is provided here on one of the categories for climate-related risks in the TCFD framework, which is physical risks. Physical risks can arise from both event driven (acute) and longer-term shifts (chronic) in climate patterns. These physical risks may have financial implications for organisations.

For example, in the oil and gas industry, this might include harsh weather or ocean conditions that can damage or disrupt the ability to safely operate offshore facilities, shipping and onshore processing plants. Woodside has decades of experience designing and operating facilities located in harsh environments. Woodside's facilities are subject to oceanic conditions and are located in regions that experience tropical cyclones, hurricanes and high ambient temperatures.

Physical risks could also impact emerging new businesses in new energy products and lower carbon services. For example, this could include bushfire or drought risk for nature-based carbon credit development projects, or access to water for use in electrolysis.

Design of Woodside's facilities

Each Woodside facility is built in accordance with a basis of design (BOD). This details, amongst other things, the climatic conditions that facilities need to withstand. Each BOD is reviewed against updates to climatic conditions and, where required, actions are taken to update procedures or replace/refurbish equipment to withstand the revised conditions.

The requirements for maximum air temperature and sea level in the BODs are aligned to IPCC Shared Socioeconomic Pathway 2-4.5 (the SSP 2-4.5) in which global temperatures rise by 2.7°C by the end of the century.[1] Design sensitivities are also performed against SSP 5-8.5 pathway in which global temperatures rise by 4.4°C. (Note that the BOD is intended to describe harsh environmental conditions that a facility may need to withstand, hence the alignment with and sensitivities for higher temperature outcomes by 2100 rather than 2°C or 1.5°C global temperature rise outcomes).[2]

Woodside's assets are designed to withstand extreme weather events that occur in the range of 1 in 1,000 years to 1 in 10,000 years. This is also specified in each BOD.

Woodside's capability

Woodside has specialised teams that support the safe and reliable design and operation of our facilities. Some relevant teams within the Woodside organisation include:

Meteorology and Oceanography (Metocean)	Metocean specialists quantify the potential impact and effect of meteorological and oceanographic conditions on Woodside's facilities. This includes waves, climate variability, tropical cyclones, hurricanes, air temperature and rainfall. This analysis is used to define technical requirements for existing and new facilities.
Health, Safety and Environment	Health, safety and environment specialists support the business by providing guidelines on safe operating conditions. Examples include the wellbeing of people working in high ambient temperature environments and maintenance of safety critical systems and equipment.
Asset Management	Asset management teams are responsible for managing asset specific risks, such as structural integrity risks from weather related events and risks to production forecasts from weather related outages. Regular risk governance meetings are held to review the management of these risks.
Emergency Management	Emergency management specialists support the business in the development of emergency response plans and capabilities and with response to any emergency events. This includes preparation for and response to tropical cyclones and hurricanes.

1 This is based on outputs from the Coupled Model Intercomparison Project (CMIP). CMIP coordinates climate model simulations worldwide under the World Climate Research Program (WCRP). CMIP supports the IPCC Shared Socioeconomic Pathways. These Shared Socioeconomic Pathways explore the implications of future socioeconomic development on climate change mitigation, adaptation and land use.

2 The approach to using IPCC SSPs in this paragraph has historically been used at heritage Woodside assets, and will be incorporated across the merged portfolio over time.

Examples of physical risk management

CYCLONES OR HURRICANES

Climate change is expected to lead to more frequent and/or more severe cyclones or hurricanes. These have the potential to damage equipment, cause increased production outages and/or reduce asset life.

Woodside has assets that have operated in cyclone or hurricane affected regions for decades. These onshore and offshore assets are designed and maintained for safe operations in extreme conditions.

Procedures are in place for pre-cyclone/hurricane season readiness, for preparations immediately prior to a tropical cyclone, and for disconnection and demobilisation to keep people and assets safe during cyclonic events.

The design and maintenance of assets and the emergency response procedures were tested during the severe Tropical Cyclone Damien in the North West of Australia in February 2020 and during Hurricane Ida in the Gulf of Mexico in August 2021. No major damage occurred and production was resumed following these events.

Production planning and forecasting includes assumptions for cyclones/hurricanes and severe swells. These assumptions are informed by data from previous seasons along with forecasts for upcoming El Niño and La Niña cycles.

RAINFALL OR FLOODING

Climate change is expected to lead to changes in rainfall volume and intensity. This could cause flooding or drought, which might impact Woodside's facilities and/or carbon origination projects.

Drainage systems on Woodside's facilities are designed to meet relevant international and Australian standards. In regions impacted by cyclones, drainage and containment systems are also inspected prior to cyclone season, as there may be intense rainfall or flooding during this season.

Exposure to drought risk and flooding in our carbon origination projects is managed by holding a diverse geographic distribution of projects.

BUSHFIRES

Climate change is expected to lead to increased frequency and/or severity of bushfires due to hotter and/or drier climates.

Where Woodside operates oil and gas producing assets located in bushfire-prone areas, it incorporates bushfire preparation as a standard part of emergency response planning. In addition, the geographical location of many of our oil and gas producing assets have inherently lower exposure to bushfire risk, for example, because they are surrounded by shrubs/rock or are offshore.

Woodside's carbon origination portfolio includes planting trees. Diversity in tree planting locations reduces the potential impacts of bushfire risk on the portfolio.

WARMER AMBIENT TEMPERATURES

Climate change is increasing ambient temperatures. This could create hotter working conditions, impacting the wellbeing of our people and the operability of some equipment.

The health and wellbeing of our people is inherent in our culture and operational practices. For example, sun protection and hydration are regularly included as topics in site communications and safety briefings. Facilities in the North West of Australia experience high ambient temperatures. Major maintenance campaigns, where the number of people on site is significantly increased, are targeted for execution in the cooler months to minimise exposure to heat stress.

Production planning and forecasting includes assumptions for ambient temperature, recognising that higher ambient temperatures can reduce plant performance.

RISING SEA LEVELS AND STORM SURGE

Climate change is resulting in an increase in sea levels with the potential to impact offshore and coastal facilities.

Woodside's facilities are designed in accordance with BODs, which include sea level assumptions where relevant for the facility. An allowance for sea level rise is included in the calculations of extreme total water level (the combination of sea level, tidal elevation, storm surge and wave crest elevation). The assumptions for sea level in the BOD documents are based on IPCC Shared Socioeconomic Pathways.[1,2]

Storm surges in the Karratha region in the North West of Australia are also included in cyclone preparation plans.

1 The IPCC Shared Socioeconomic Pathways explore the implications of future socioeconomic development on climate change mitigation, adaptation and land use.
2 The approach to using IPCC SSPs in this paragraph has historically been used at heritage Woodside assets, and will be incorporated across the merged portfolio over time.

SECTION 3.3

Financial resilience testing of our portfolio

Woodside uses a range of climate scenarios to inform its strategy and planning and to test the financial resilience of our portfolio of producing assets and sanctioned projects. In this section, we describe the potential impact of the three scenarios published in the IEA's 2022 World Energy Outlook (WEO). The IEA scenarios were selected for the analysis presented here because they are publicly available, and provide a wide range of potential energy transition pathways linked to different climate outcomes (see figure 11).

This analysis estimates the impact of each IEA scenario on Woodside potential average annual free cash flow (FCF).

A summary of insights from the scenario analysis is:

- FCF is positive in all tested scenarios, including in NZE and the IEA Announced Pledges Scenario (APS) that are aligned with the Paris Agreement outcomes.
- FCF from 2023 to 2026 is lower than 2027-2031 due to high capital expenditure during this period for Scarborough, Pluto Train 2 and the Sangomar Field Development Phase 1.[1]
- FCF generation increases from the mid 2020s after Scarborough start up, and then declines due to the natural field decline of older assets in our portfolio. Note that potential new investments are discussed in the capital allocation framework section of this report on pages 26-27.
- Oil and gas prices are the key value drivers and have a greater impact on FCF through to 2040 than carbon pricing.

Scenario analysis methodology

Average annual FCF is used as a financial indicator in this analysis because it identifies the cash available to inform future capital allocation decisions prior to the application of accounting treatment.

The analysis is performed by substituting the IEA's commodity pricing (including carbon price) scenarios from its 2022 WEO into Woodside's existing portfolio economic model, which is otherwise unchanged. The commodity and carbon price assumptions used in the analysis are provided in figure 12.

The analysis applies a price on carbon for all emissions that exceed the profile created by our regulatory obligations, our net equity Scope 1 and 2 greenhouse gas emissions reduction targets of 15% by 2025 and 30% by 2030, and our aspiration for net zero equity Scope 1 and 2 greenhouse gas emissions by 2050.[2] Carbon pricing is not applied to Scope 3 emissions as this is accounted for in the demand (and therefore the oil price calculated) in each scenario by the IEA's World Energy Model.[3]

Limitations of the analysis

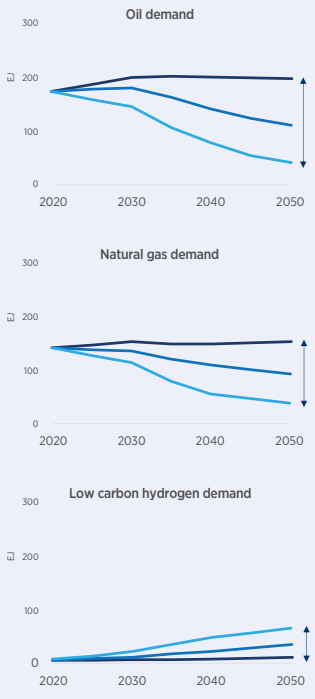
Scenario analysis has limitations and is based on a wide range of assumptions. It involves interpreting each scenario to generate annual average price points (see figure 12). It further requires isolating all variables except for commodity pricing (including carbon price) to enable examination of climate-related factors.

IEA scenarios have been used to enhance independence and comparability of scenario analysis outcomes and do not represent the outcomes of any internal assessment Woodside has undertaken in relation to possible future commodity and carbon pricing.

The scenario analysis, therefore, does not include other macroeconomic and geopolitical factors that could influence commodity pricing. Nor does it include decisions Woodside could make in response, such as acquisitions, divestments or cost reduction. It also does not include the potential impact of new Woodside investment decisions, which are discussed in the capital allocation framework section starting on page 26-27.

This analysis must therefore not be interpreted as Woodside investment guidance. These are scenarios not forecasts and no likelihood is assigned to any of these scenarios eventuating.

FIGURE 11: OIL, GAS AND HYDROGEN DEMAND IN IEA SCENARIOS



Demand for oil and gas is modelled to continue through 2050 in all scenarios but to varying degrees. Hydrogen demand is also modelled to vary. It grows in the NZE and APS scenarios in particular.

FIGURE 12: MODELLED IMPACT OF CLIMATE SCENARIOS ON POTENTIAL AVERAGE ANNUAL FREE CASH FLOW FROM CURRENT PRODUCING AND SANCTIONED ASSETS (NOT GUIDANCE)

Oil price (US$/bbl, Brent)[4], North Asian LNG price (US$/MMBtu)[4] and Carbon price (US$/tCO₂-e)[5] average real 2022

IEA NZE	59	18	100	38	6	135	33	6	169	31	6	199
IEA APS	88	20	98	70	9	130	65	9	154	65	9	172
IEA STEPS	92	21	80	85	11	80	85	11	80	88	11	80

* 2018-2022 average real terms 2022 Brent price was US$73/bbl.

Description of the IEA scenarios used

The IEA's WEO explores three main scenarios.[6] These scenarios are not predictions. The IEA does not have a single view on the future of the energy system. In contrast to the 2021 edition of the WEO, they do not vary the assumptions about public health and economic recovery implications across the scenarios. A summary of the scenarios is as follows:

The **Net Zero Emissions by 2050 (NZE) Scenario** shows a narrow but achievable pathway for the global energy sector to achieve net zero CO_2 emissions by 2050, with advanced economies reaching net zero emissions in advance of the other scenarios. It is consistent with limiting the global temperature rise to 1.5°C without a temperature overshoot (with a 50% probability).

The **Announced Pledges Scenario (APS)** takes account of all the climate commitments made by governments around the world including Nationally Determined Contributions as well as longer term net zero emissions targets, and assumes that they will be met in full and on time. In the APS, emissions peak in the mid-2020s and fall to 12 Gt in 2050, resulting in a projected global median temperature rise in 2100 of 1.7°C.

The **Stated Policies Scenario (STEPS)** explores where the energy system might go without additional policy implementation. In the STEPS, energy-related CO_2 emissions reach a plateau around 37 Gt before falling slowly to 32 Gt in 2050, a trajectory that would lead to a 2.5°C rise in global average temperatures by 2100.

1 Modelled based on current equity assumptions within portfolio: Sangomar 82%, Scarborough 100% and Pluto Train 2 51%.
2 Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base representative of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with a final investment decision prior to 2021.
3 IEA 2022. "World Energy Model Documentation". All rights reserved.
4 Based on data from IEA 2022. "World Energy Outlook 2022" as modified by Woodside analysis. Woodside used interpolation techniques to estimate Brent annual price points in between the years that the IEA disclose prices for. For gas pricing assumptions all non-contracted LNG volumes were assessed at IEA's Japan import price, as a proxy for North Asian LNG spot price. Woodside used interpolation techniques to estimate annual gas price points in between the years that the IEA disclose prices for. For oil linked LNG contracts, prices are derived from the Brent forecasts and the terms of the contracts.
5 Based on data from IEA 2022. "World Energy Outlook 2022" as modified by Woodside analysis. The IEA only provide carbon prices from 2030 onwards. As a result, Woodside used a starting point of US$80/tCO₂-e consistent with internal carbon pricing. Woodside used the 2022 starting price point and the IEA's published 2030 and 2040 carbon prices for each scenario to interpolate annual price points through to 2040.
6 IEA 2022. "World Energy Outlook 2022". All rights reserved.

SECTION 3.4

Capital allocation framework

Woodside aims to thrive through the energy transition by working to build a low cost, lower carbon, profitable, resilient and diversified portfolio of oil, gas and new energy assets.[1]

On pages 10-15 of this report, we described the potential role of oil, gas and new energy through the transition. On pages 18-25 we described our current portfolio. In this section, we describe how we incorporate our assessment of climate-related factors into our consideration of new investments in oil, gas and new energy, and our assessment of how climate-related factors might impact our strategy, business and financial planning.

Future growth of our portfolio through new projects and investments is assessed according to market analysis and a disciplined capital allocation framework, including climate-related considerations.

Our capital allocation framework sets target investment criteria for oil, gas and new energy opportunities. Not all energy investments are the same, and these three investment types are fundamentally different in nature and have different risk/return profiles. This capital allocation framework guides our efforts to create a diversified and flexible portfolio which is responsive to changes in demand for our products.

The Scope 1 and 2 greenhouse gas emissions from projects in all capital allocation categories need to be managed to meet our net equity emissions reduction target of 30% by 2030 and a net zero aspiration by 2050 or sooner.[2]

FIGURE 13: CAPITAL ALLOCATION FRAMEWORK

	OIL	GAS		NEW ENERGY
	OFFSHORE	PIPELINE	LNG	DIVERSIFIED
Focus	Generate high returns to fund diversified growth, focusing on high quality resources	Leveraging infrastructure to monetise undeveloped gas, including optionality for hydrogen		New energy products and lower carbon services to reduce customers' emissions; hydrogen, ammonia, CCUS
Characteristics	High cash generation Shorter payback period Quick to market	Stable long-term cash flow profile Resilient to commodity pricing	Long-term cash flow Strong forecast demand Upside potential	Developing market Lower capital requirement Lower risk profile
Opportunity targets	IRR > 15% Payback within 5 years[3]	IRR > 12% Payback within 7 years[3]		IRR > 10% Payback within 10 years[3]
Emissions reduction	30% net emissions reduction by 2030, net zero aspiration by 2050 or sooner[2]			

1 Please see glossary for a definition of how Woodside uses the term lower carbon portfolio.
2 Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base representative of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with a final investment decision prior to 2021.
3 Payback refers to RFSU + X years.

How we incorporate climate-related factors into oil and gas investment decisions

Woodside uses market analysis and a disciplined capital allocation framework to inform investment decisions as we grow and diversify our portfolio. In addition to the risk and reward balance described in our capital allocation framework, for future investment decisions Woodside's consideration of climate-related factors may include those described below.

None of these individual factors is sufficient on its own to provide a definitive answer to the impact of climate-related factors on investment opportunities. However, together they can inform a broad-based consideration of risks, opportunities, competitiveness and resilience, and contribute to understanding the potential impact of climate-related risks on our strategy, business and financial planning.

Scope 1 and 2 greenhouse gas emissions

Commercial analysis to support investment decisions includes the application of an internal carbon price to all emissions that exceed the profile created by our regulatory obligations and our net equity Scope 1 and 2 greenhouse gas emissions targets and aspirations.

Asset decarbonisation plans are developed by all projects, including options to abate emissions as well as an estimate of any residual offset demand. Asset decarbonisation plans are further described on page 29.

Analysis using a range of economic assumptions

Assumptions about macroeconomic variables are considered in the business case. These assumptions are informed by a wide range of externally published scenarios, such as those from the IEA, and are also informed by the judgment of Woodside management about the range of credible future scenarios, including both Paris-aligned and non-Paris-aligned outcomes.

Testing resilience across a range of pathways to 1.5°C and 2°C outcomes

The range of oil and gas use levels in pathways that can limit warming is large and is described in the section on oil and gas in the energy transition, see pages 10-14. Woodside intends to build a portfolio which is, among other things, low cost, lower carbon and resilient to the widest range of outcomes. Scope 1 and 2 greenhouse gas emissions intensity is included in this analysis.

Portfolio life cycle intensity of production

Woodside's life cycle intensity of production (measured as Scope 1, 2 and 3 emissions divided by energy sold) was 63 gCO_2-e/MJ in 2022.[1]

When considering a new investment decision, we can evaluate how that particular investment could change this metric. This can give Woodside a broad view of how new investments could affect our long-term carbon footprint, and allow comparison with other companies.

Cashflow scenario analysis

Woodside considers climate-related scenario analysis (see page 24-25 of this report). This analysis considers how the FCF of Woodside's portfolio of producing assets and sanctioned projects could vary over time, using the three scenarios published in the IEA's WEO.

For future investment decisions about major projects, we have the opportunity to evaluate how the investment decision could change the outcome of a similar analysis. This can give Woodside a view on the resilience of its portfolio to different climate-related scenarios, including the risk of investing in assets that could be stranded.

Climate-related risks and opportunities

Woodside uses the framework proposed by the TCFD to understand the risks (transition and physical) and opportunities arising from the energy transition. A summary of this assessment for Woodside's current portfolio of producing assets and sanctioned projects is on pages 56-57 of this report.

When considering a new investment decision, we can consider how that investment could change this assessment. This can give Woodside a view of how our aggregate exposure to climate-related risks and opportunities could change with a new investment, and therefore whether that investment could take Woodside beyond its risk appetite.

1 For discussion of Woodside's Scope 3 emissions including the challenges to reporting them, see page 36-39. Emissions intensity is calculated based on net equity Scope 1 and 2 greenhouse gas emission as well as equity Scope 3 (use of sold product) and Woodside's equity production. Metric excludes emissions and production related to traded hydrocarbons.

SECTION 3.5

Decarbonisation strategy

As well as investing in the products and services our customers need, the second key element of Woodside's climate strategy is to reduce its net equity Scope 1 and 2 greenhouse gas emissions. To pursue this, we have developed a decarbonisation strategy.[1]

In 2020, Woodside announced targets for near- and medium-term emissions reduction below the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020.

These targets are to reduce net equity Scope 1 and 2 greenhouse gas emissions by:

- 15% by 2025[2]
- 30% by 2030[3]

below a starting base representative of annual average gross equity emissions for 2016-2020. Woodside also announced an aspiration of net zero equity Scope 1 and 2 greenhouse gas emissions by 2050 or sooner.[4]

Woodside's targets are absolute reduction targets from an historically established starting base, aiming to deliver net emissions reduction even as Woodside grows its business and makes new investment decisions.

Greenhouse gas emissions, energy values and global warming potentials are estimated in accordance with the relevant reporting regulations in the jurisdiction where the emissions occur (e.g. Australian National Greenhouse and Energy Reporting (NGER), US EPA Greenhouse Gas Reporting Program (GHGRP)). Australian regulatory reporting principles have been used for emissions in jurisdictions where regulations do not yet exist.

Equity share is calculated in accordance with the GHG Protocol's Corporate Accounting and Reporting Standard: "*Under the equity share approach, a company accounts for GHG emissions from operations according to its share of equity in the operation. The equity share reflects economic interest, which is the extent of rights a company has to the risks and rewards flowing from an operation*".[5]

Woodside plans to achieve our net equity Scope 1 and 2 greenhouse gas emissions reduction targets in three ways:

- Avoiding greenhouse gas emissions through the way we **design** our assets
- Reducing greenhouse gas emissions through the way we **operate** our assets
- Originating and acquiring carbon credits to use as **offsets** for the remainder.

Avoiding and reducing emissions are our priority. We can reduce the risks of future price and availability constraints in carbon markets if we prioritise emissions reduction at our facilities. However, subject to appropriate integrity, a tonne of emissions avoided through an offset has an equivalent greenhouse impact to a tonne that has been avoided at our facilities.

The principal way that we prioritise avoiding and reducing emissions is to pursue opportunities in the design and operation of our assets that are economically viable when assessed using an internal long-term cost of carbon, currently US$80/t$CO_2$-e (real terms 2022). This exceeds the current market price of carbon credits. The generic ACCU spot price was around A$30/t (approximately US$20/t) in the most recent Quarterly Carbon Market report from the Clean Energy Regulator.[6]

SCOPE 1 AND 2 TARGETS

15% by 2025[2]

30% by 2030[3]

1 For definition of decarbonisation, see glossary.
2 This means net equity emissions for the 12-month period ending 31 December 2025 are targeted to be 15% lower than the starting base.
3 This means net equity emissions for the 12-month period ending 31 December 2030 are targeted to be 30% lower than the starting base.
4 Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base representative of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with a final investment decision prior to 2021.
5 World Resources Institute and World Business Council for Sustainable Development 2014. "GHG Protocol: a corporate accounting and reporting standard." Page 17.
6 www.cleanenergyregulator.com.au. Quarterly Carbon Market Report September Quarter 2022, published 17 November 2022.

Operational practices

Near-term emissions reduction can be achieved at our existing facilities through changes to operating practices. Environmental and emissions performance has formed part of Woodside's focus on safe, reliable and cost-competitive operations for many years. This means that many of the simpler operate out improvements to reduce greenhouse gas emissions have already been implemented through changes to operating practices.

Decarbonisation actions differ depending on each asset's life cycle and context. Pluto has focused on activities targeting reliability. The North West Shelf (NWS) has prioritised efficiency and debottlenecking at Karratha Gas Plant (KGP) as NWS production declines. The Australian floating production storage and offloading (FPSO) facilities have focused their activities on reducing flare and fuel usage and delivering reliability improvements.

Woodside continues to explore potential further changes to its operating practices that can reduce its Scope 1 and 2 greenhouse gas emissions. Activities led by asset teams through 2022 are forecast to deliver approximately 25 kt CO_2-e/year ongoing equity Scope 1 and 2 greenhouse gas reductions.[1]

Asset decarbonisation plans

During 2022, Woodside developed asset decarbonisation plans for each operated asset and project in the heritage Woodside portfolio to identify opportunities to be pursued, including further technology to be developed where needed.

The plans identify potential decarbonisation opportunities prior to the application of technology or cost constraints. The individual asset and project decarbonisation plans were then rolled together to create an integrated portfolio view. This was used to rank and select cost effective priorities for decarbonisation investment and planning on an enterprise wide basis.

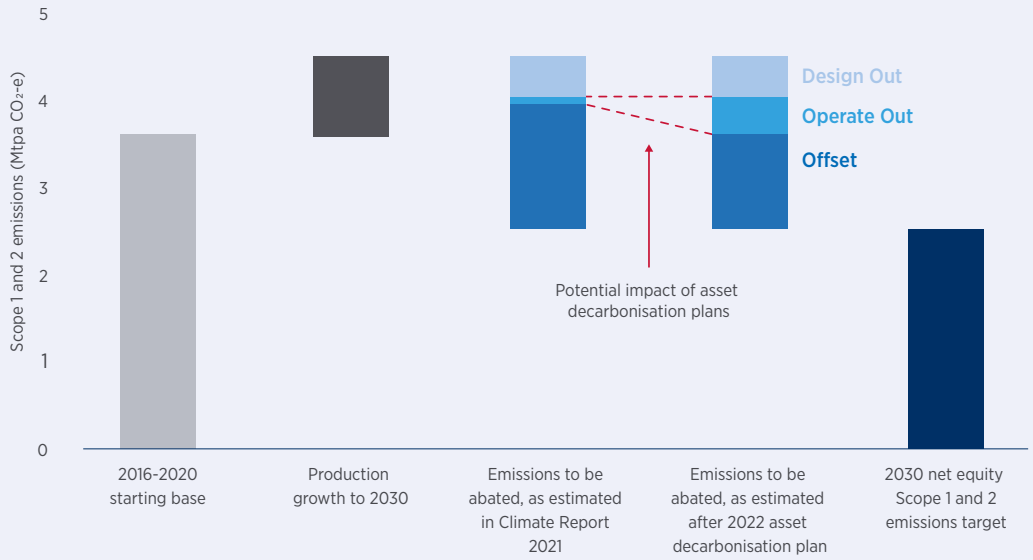
In the 2022 asset decarbonisation planning cycle, Woodside selected around 30 decarbonisation opportunities, including energy efficiency projects, equipment modifications, lower carbon power and process optimisation. These opportunities are not certain to proceed but they are now included in asset level work programs, in order to mature cost and engineering definition.

If implemented in full, Woodside estimates this activity set could realise approximately 10 Mt CO_2-e abatement (cumulative) prior to 2050 and could result in a 300 kt CO_2-e reduction in emissions in 2030, compared to the equivalent plan at the time of the 2021 Climate Report (see figure 14).[2]

These plans are targeted to be extended during 2023 to cover heritage BHP operated assets, and are expected to identify additional cost efficient decarbonisation opportunities.

The asset decarbonisation plans will be reviewed annually in line with asset strategic planning processes to maintain their currency and to continue to identify opportunities as costs and technologies improve. We will also work with our joint venture participants and operators to understand and quantify decarbonisation opportunities at non-operated assets.

FIGURE 14: POTENTIAL IMPACT OF 2022 ASSET DECARBONISATION PLAN[2]



1 Greenhouse gas savings are estimated using engineering judgment by appropriately skilled and experienced Woodside engineers. Emissions quoted are equity share reductions across Australian operations.

2 Indicative only, not guidance. Potential impact of opportunities identified in Australian Operations asset decarbonisation plans assuming all opportunities identified in the 2022 asset decarbonisation plan progress to execution. Heritage Woodside portfolio and working interest prior to the merger.

Beyond 2030: Technology decarbonisation plan

The asset decarbonisation plans developed during 2022 also identified emissions reduction opportunities that could not be prioritised for further development, either because they are not technically mature or because they are not currently commercially viable when assessed using Woodside's long-term cost of carbon assumption of $80/tCO₂-e (real terms 2022).

However, with further development these opportunities have the potential to offer abatement on a scale that would deliver a step-change in emissions reduction, in particular beyond 2030.

Because of their enterprise wide nature, these technology opportunities are pursued through a portfolio level technology decarbonisation plan rather than through asset level planning and engineering processes.

These opportunities include:

- Integrated carbon solutions, such as capturing carbon dioxide so that it can either be durably stored in geological reservoirs (CCS) or converted into useful products (CCU). Different existing emissions sources vary in the concentration of their emissions, with the higher concentrations potentially offering earlier viable opportunities.
- Switching of existing uses of electricity to lower carbon power (for example, renewables or gas with CCUS), potentially with energy storage technologies to stabilise supply.
- Electrification of operating facilities. The opportunity for retrofitting electrification will vary across different facility types (for example, offshore platforms have different power requirements to liquefaction facilities), as well as their ages and expected remaining asset life.

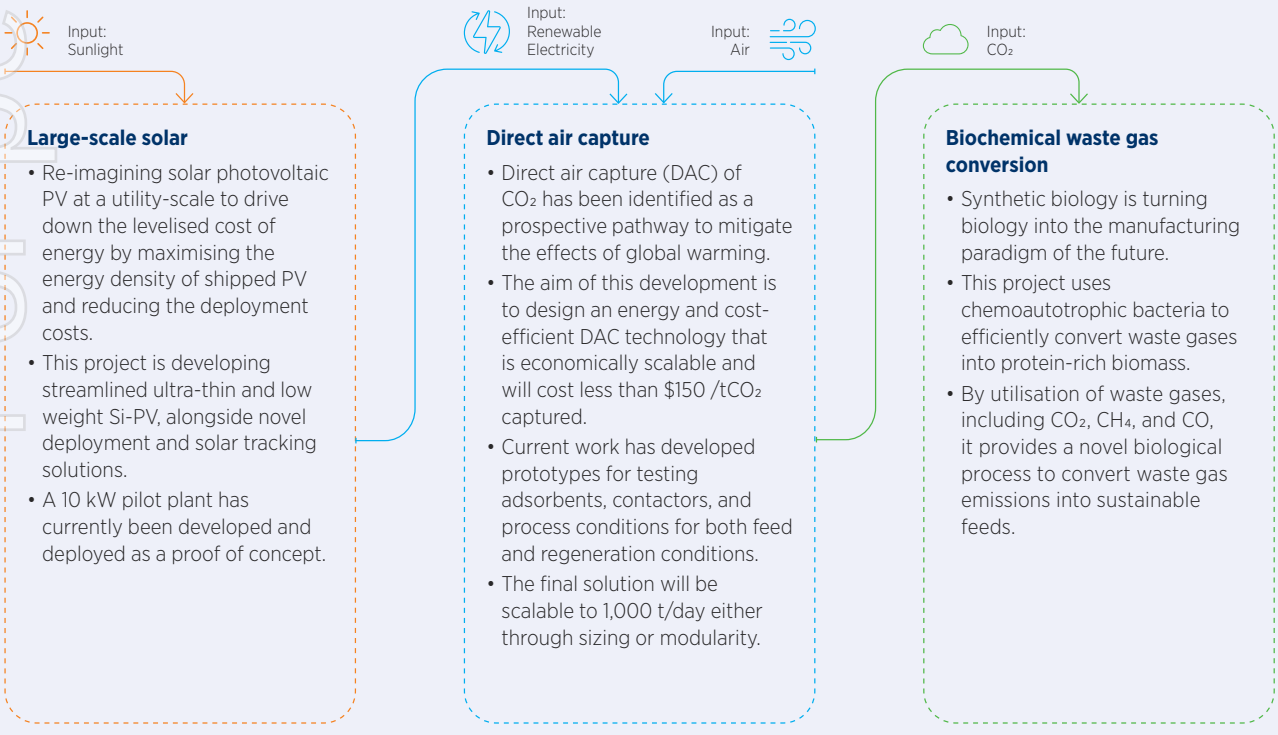
Note that some of these opportunities are alternatives to each other. For example, 67% of Woodside's emissions in 2022 arose from fuel combustion to power our assets. These emissions can be abated either by CCUS, or by electrification. However by pursuing multiple technologies we expect to increase the potential for a successful outcome that could enable adoption.

The technology decarbonisation plan draws on inputs such as a research partnership with Monash University. The Woodside Monash Energy Partnership has been extended for 2023-2025 at a cost of A$11 million and is summarised in figure 15 below.

Industry partnerships also include a memorandum of understanding on cooperation entered into with Baker Hughes in 2022 to pursue development of technologies and opportunities for decarbonisation, including revenue generation and enablement of growth.

FIGURE 15: WOODSIDE MONASH ENERGY PARTNERSHIP

The pilot programs of the Woodside Energy Monash Energy Partnership are designed to complement Woodside Energy's strategy by partnering with expertise and infrastructure at Monash University in the following fields:



Methane emissions

After carbon dioxide, methane has made the second largest contribution to human induced climate change and is believed to have contributed to around 30% of the global temperature rise to date.[1]

The Global Methane Initiative estimated that in 2020 about 24% of global human induced methane emissions came from the oil and gas sector. Other sources include agriculture, coal mines, municipal solid waste and wastewater.[2]

A Global Methane Pledge was launched at the Glasgow Climate Summit, and stated that rapidly reducing methane emissions from energy, agriculture and waste can achieve near-term gains this decade and is regarded as the single most effective strategy to keep the goal of limiting warming to 1.5°C within reach. Countries signing the Pledge agree to take voluntary actions to contribute to a collective effort to reduce global methane emissions at least 30% from 2020 levels by 2030, which could eliminate over 0.2°C warming by 2050.[3] Australia signed the Pledge in 2022.

This is a global target. The UN Environment Programme's Global Methane Assessment has stated, "*The mitigation potential in different sectors varies between countries and regions. The largest potential in Europe and India is in the waste sector; in China from coal production followed by livestock; in Africa from livestock followed by oil and gas; in the Asia-Pacific region, excluding China and India, it is coal and waste; in the Middle East, North America and Russia/Former Soviet Union it is from oil and gas; and in Latin America it is from the livestock subsector.*"[4]

Woodside's current methane emissions performance

Minimising methane emissions is a priority for Woodside because if leaked at significant levels, methane could create a safety risk on our assets and/or result in a loss of production. Because of the emphasis we have had on containing methane effectively, our methane emissions are around 0.1% of our production by volume. This is already well below the Oil and Gas Climate Initiative (OGCI) 2025 methane intensity target of below 0.2%, and we continue to strive for further reductions.[5]

The quantification of methane is challenging and inherently includes a degree of uncertainty and underlying assumptions. Woodside's inventories are reported in accordance with the relevant reporting regulations in the jurisdiction where the emissions occur such as Australia's National Greenhouse and Energy Reporting (NGER) and the USA's Greenhouse Gas Reporting Program (GHGRP).

Methane emissions reduction plan

Methane emissions are a part of Woodside's total greenhouse gas emissions, so reductions in methane emissions contribute to our net equity Scope 1 and 2 greenhouse gas emissions reduction targets. To help this, a methane emissions reduction plan has been developed and is summarised on page 32. It is a subset of our decarbonisation strategy.

In September 2022, Woodside became the first Australasian company to join the OGCI's Aiming for Zero Methane Emissions Initiative.[6] The signatories to the Initiative state that they believe virtually all methane emissions from the industry can and should be avoided.

In 2022, Woodside's methane emissions reduction plan won a Game Changer Award from the Energy Club of Western Australia. This is awarded for an outstanding contribution to innovative thinking, policy or procedural advancement, energy industry leadership, development in technological innovation, engineering design, or outstanding idea generation which has resulted in significant advancement of the industry's knowledge and capability within the last two years.

1 IEA 2021. "Curtailing methane emissions from fossil fuel operations - Pathways to a 75% cut by 2030." Page 7. All rights reserved.
2 Global Methane Initiative factsheet "Global Methane Emissions and Mitigation Opportunities" at www.globalmethane.org/documents/gmi-mitigation-factsheet.pdf. Page 1.
3 Global Methane Pledge: https://www.globalmethanepledge.org/.
4 United Nations Environment Programme and Climate and Clean Air Coalition (2021). "Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions". Nairobi: United Nations Environment Programme. Page 10.
5 https://www.ogci.com/action-and-engagement/reducing-methane-emissions/#methane-target.
6 https://aimingforzero.ogci.com/.

Summary of methane emissions reduction plan

Woodside's methane emissions reduction plan has four pillars.

Report emissions data to stakeholders	Woodside reports its absolute methane emissions on an operated and equity basis in accordance with the regulatory framework of the country of origin. We also calculate and report methane intensity on an operated and equity basis.
Develop a comprehensive, high integrity methane emissions dataset	Inventory measurement helps us to identify the highest priority methane emissions reduction opportunities. In 2022, we commenced development of source level, bottom-up methane inventories for our assets utilising internationally recognised methods. The accuracy and completeness of these inventories is informed via top-down or whole of facility measurement technologies as well as direct measurement campaigns on our material sources. We aim to have a comprehensive data set, along with action plans to reduce methane emissions, finalised in 2023.
Lead, advocate and collaborate	We believe that by leading, advocating and collaborating with our external stakeholders, regulators and joint venture participants there is scope to further reduce methane emissions by sharing opportunities to decarbonise key emission sources. In 2021, Woodside commenced non-operated joint venture (NOJV) workshops to share methane-related learnings and enhance mitigation in Western Australia's natural gas value chain. In 2022, these engagements were continued to support the sharing of methane-related knowledge. We aim to extend the reach of these technical workshops in 2023 through our membership of the Methane Guiding Principles.
Striving for "near zero" methane emissions	Once identified, methane emissions abatement opportunities can be integrated into our asset decarbonisation plans, described on page 29. Given the short-term nature of methane as a greenhouse gas compared to CO_2, Woodside assesses methane abatement opportunities using a 20-year global warming potential rather than the IPCC standard 100 year potential. This means that we apply a multiple of 84 to our long-term cost of carbon US$80 t/$CO_2$-e (real terms 2022), i.e. an effective price of $6,720 t/$CH_4$ (real terms 2022). Opportunities to identify, assess and potentially abate methane emissions from our facilities include: • Conducting methane slip measurement studies of sources at our LNG facilities • Using optical gas imaging and drone surveys to identify fugitive emissions that can be addressed • Including fixed methane detection cameras in new facility design • Implementing seal oil vent vapor recovery on wet seals at LNG trains • Retrofitting dry seals on compressors and minimising use of high emitting compressors • Minimising flaring, and monitoring flare destruction efficiency.

Woodside is a signatory to the Methane Guiding Principles and the OGCI's Aiming for Zero Methane Emissions Initiative. Another initiative is the Oil and Gas Methane Partnership (OGMP 2.0), a measurement-based reporting framework, which Woodside has not joined. Instead, we have focussed on developing our methane emissions reduction plan which includes measurement and reporting but also prioritises emissions reduction and advocacy. Membership of OGMP 2.0 will be reviewed by Woodside as part of existing annual processes.

CASE STUDY:
METHANE SURVEYS

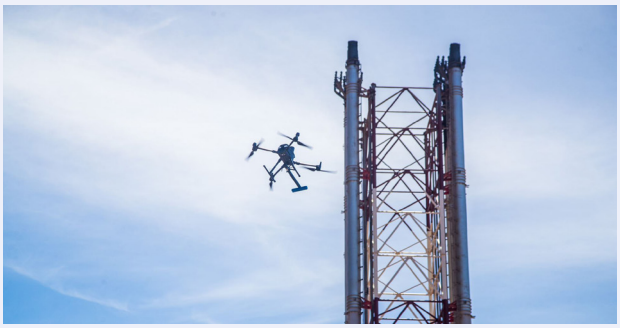
In 2022, Woodside undertook several different types of methane survey. These included a drone-based methane measurement quantification campaign, targeted equipment surveys, and flare performance monitoring via what we believe to be the first trial of the Providence Photonics video imaging spectro-radiometry (VISR) in Australia.

The drone-based facility measurements were conducted at several of Woodside's offshore and onshore facilities in Australia and the Gulf of Mexico. These were at FPSOs (Okha, Ngujima Yin, and Pyrenees), offshore platforms (Goodwyn, North Rankin, Shenzi, and Ruby/Angostura), and the Macedon onshore gas processing facility. They complement prior methane surveys undertaken during 2020 at Pluto LNG and the Karratha Gas Plant.

Use of drone-based technology is intended to enhance location and quantification of key methane emission sources, enabling the prioritisation of mitigation projects in our asset decarbonisation plans. Prior to the surveys, validation trials were undertaken in Perth, including training of local personnel.

By partnering with local third-party service providers, Woodside's intent was to support ongoing methane emissions measurement campaigns within Western Australia, across the natural gas supply chain and for use by other industries.

The VISR survey focused on flare performance at Pluto LNG. The survey also presented the opportunity to trial the Mantis Lite™, a flare monitoring device which uses video imaging spectro-radiometry (a more accessible pre-production unit based on the well-established Mantis™). This trial could lead to the use of this technology more broadly across Woodside's portfolio.



SECTION 3.6

Offsets

Avoiding and reducing our emissions are our first priorities for meeting our net equity emissions reduction targets. However, offsetting emissions allows Woodside more flexibility to meet these targets, while asset and technology decarbonisation plans are matured and implemented. In the longer term, where emissions prove to be hard-to-abate, any such residual emissions would also need to be offset using carbon credits in order to achieve our net zero aspiration.

Offsetting emissions is achieved by retiring (or surrendering) carbon credits. A carbon credit is a tradable financial instrument that is issued by a carbon-crediting program and represents a greenhouse gas emission reduction to, or removal from, the atmosphere. Where a company retires a carbon credit (in order to permanently remove the carbon credit from circulation) it can use the retirement to offset an emission from its own operations.

The key characteristics underpinning credible carbon credits are that they represent certified greenhouse gas abatement from projects that are additional, permanent, measurable, transparent, independently audited and registered in a publicly transparent register. An activity is 'additional' if it would not have occurred in the absence of the incentive created by carbon credit revenues.[1]

A wide range of activities can generate carbon credits. These activities can be categorised into avoidance/reduction or removal activities. Some examples are provided in figure 16.

Today, emissions avoidance and reduction activities play a role in maintaining carbon sinks[2] and accelerating emissions reductions, which both contribute to preserving the world's carbon budget. However, in the longer term, the ability for these activities to generate carbon credits could decrease for example if activities become commercially viable or mandated by regulation, and therefore unable to demonstrate additionality.

As the world progresses towards a global balance between emissions by sources and removals by sinks (global net zero), carbon dioxide removals (CDR), which take CO_2 out of the atmosphere and store it, are expected to be increasingly important. Examples of potential CDR activities include reforestation and direct air capture projects. CDR activities may be able to continue to meet the requirements to generate carbon credits in the long-term.

Today, many removal-type carbon credits are nature-based. Other CDR technologies such as direct air capture are receiving significant technology investment and policy support, but the rate of take up remains uncertain and estimates of future costs vary widely.

FIGURE 16: TYPES OF ABATEMENT ACTIVITIES THAT CAN GENERATE CARBON CREDITS

Avoidance / Reduction	Renewable energy projects Landfill gas capture Industrial efficiency Prevention of deforestation Carbon capture and storage
Removal	Reforestation Direct air capture and storage (DACS) Bioenergy with carbon capture and storage (BECCS)

Key challenge

Woodside recognises that, notwithstanding the integrity of the carbon credits that it originates and acquires, some stakeholders question the validity of offsetting emissions as part of decarbonisation strategies. Woodside's view is that the use of offsets is inherently consistent with balancing sources and sinks of emissions (i.e. the "net" in "net zero") and that its participation in carbon markets can enhance investment flows and integrity.

1 Integrity Council for the Voluntary Carbon Market (2022). "Core carbon principles, assessment framework and assessment procedure. Draft for public consultation." Part 2, page 3.
2 Carbon sinks are forests and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting CO_2 emissions. (Definition taken from European Commission "Climate change: glossary of common terms and acronyms" https://www.eea.europa.eu/help/glossary/eea-glossary/carbon-sink).

Woodside's carbon business

Woodside established a carbon business in 2018 to develop a carbon credits portfolio.

We retire carbon credits from this portfolio annually to meet our net equity Scope 1 and 2 greenhouse gas emissions reduction targets and regulatory obligations. We acquire these carbon credits through market purchases and through the development of our own carbon origination projects.

We currently use a mix of avoidance, reduction and removal type carbon credits, as illustrated in the details of our retirements for 2022 on page 41.

Woodside's current plan is to shift our portfolio balance towards removal type offsets, for example through the carbon origination described below. We are also investing in new technology that could capture and durably store greenhouse gases or convert them into useful products (see page 47). However, the rate of technology maturation is challenging to predict, and not all such activities may generate carbon credits.

Carbon origination

Developing our own projects strengthens our internal capability and improves our ability to assess the integrity of carbon credits we purchase. It also helps us to directly manage the cost and volume of a portion of the carbon credits portfolio that we hold.

An example of our carbon origination projects is Woodside's Native Reforestation Project, which is expected to sequester approximately 1,100 kt CO_2-e over 25 years. The Australian Carbon Credit Units (ACCUs) generated from this project could then be used to offset Woodside's Scope 1 and 2 greenhouse gas emissions.

Participation in carbon markets

Acquiring carbon credits allows Woodside to supplement its origination projects with additional credits. Origination projects take time to generate credits, whereas acquisition of additional credits in carbon markets allows access to supply that is available now. Acquiring credits via carbon markets provides investment to help them develop and scale, and Woodside's participation can help to improve the robustness of methodologies and accounting techniques.

We recognise that, in the absence of consistent global regulation, there is the potential for carbon credits with varying integrity to be available on the market. If Woodside was to purchase and retire carbon credits that were perceived to lack integrity, this would have the potential to undermine the role of offsets in our decarbonisation strategy.

To assess the integrity of carbon credits acquired through carbon market purchases, Woodside has established a due diligence process. This process assesses both greenhouse gas abatement integrity and broader environment, social and governance (ESG) integrity. The greenhouse gas abatement integrity assessment includes factors such as additionality and permanence. The ESG integrity assessment considers factors such as human rights, social impact, environmental impact, and anti-bribery and corruption. As part of the due diligence process, the impact on Woodside's overall portfolio is assessed, including a review of portfolio diversification across vintage, methodology and geography.

Woodside has participated in both the Australian compliance market and the voluntary market for carbon credits. Woodside holds carbon credits from the following carbon credit programs:

- Emissions Reduction Fund, which is established and governed by the Clean Energy Regulator (CER). The CER issues ACCUs and administers their trade on the Australian National Registry of Emissions Units.
- Verified Carbon Standard (VCS), under which Verified Carbon Units (VCUs) are issued, is established and governed by the non-government organisation Verra.
- Gold Standard, under which Verified Emissions Reductions (VERs) are issued, is established and governed by the non-government organisation Gold Standard.

Woodside also subscribes to emerging independent carbon credit rating platforms that assess carbon credit quality. We monitor the evolution of integrity assessment frameworks and standards developed by independent organisations so that we can continuously improve our due diligence process.

CASE STUDY: NATIVE REFORESTATION PROJECT

In 2020, Woodside commenced the first phase of the Native Reforestation Project, which aims to create biodiverse carbon plantings in Western Australia, planting approximately 5,200 hectares of mixed native species to date.

In 2022, we planted more than one million native seedlings at Woodside owned properties near Moora, approximately 200 km north of Perth in Western Australia. Aiming to revegetate and restore the land, we partnered with Perth-based Nativ Carbon to ensure a diverse range of species were planted. Through the reforestation of the property, we anticipate that the fully grown trees will allow for increased habitat connectivity through restored landscape linkages. The project also provided employment opportunities for the local community.

SECTION 3.7

Scope 3 emissions

Scope 3 emissions are the greenhouse gas emissions that occur in a company's value chain, other than those included in Scope 1 emissions (direct emissions from owned or controlled sources) and Scope 2 emissions (indirect emissions from the generation of purchased energy consumed by the reporting company).

For example, Scope 3 emissions include the emissions that arise when the products we sell are transported to customers and consumed, or when the goods and services that we buy get created. Importantly, Woodside's Scope 3 greenhouse gas emissions are also a different entity's Scope 1 emissions.

Figure 17, modified from the Greenhouse Gas Protocol's "*Corporate Value Chain (Scope 3) Accounting and Reporting Standard*", provides an overview of the three Greenhouse Gas Protocol scopes and selected categories of Scope 3 emissions.[1]

For Woodside, the largest source of Scope 3 emissions is from the use of oil and gas by our customers or "use of sold product". Therefore, the key focus of our Scope 3 emissions plan is on investing in the development of new energy products, such as hydrogen and ammonia, and lower carbon services such as CCS, that can significantly reduce these end-use emissions.

Other sources of Scope 3 emissions for Woodside include waste, business travel, the purchase of goods and services, and the shipping of our products. Although these are a smaller proportion of emissions than those arising from the use of our product, these emissions may be easier to measure and influence. Part of our Scope 3 emissions plan is therefore to seek ways to support our customers and suppliers in their emissions reduction journey.

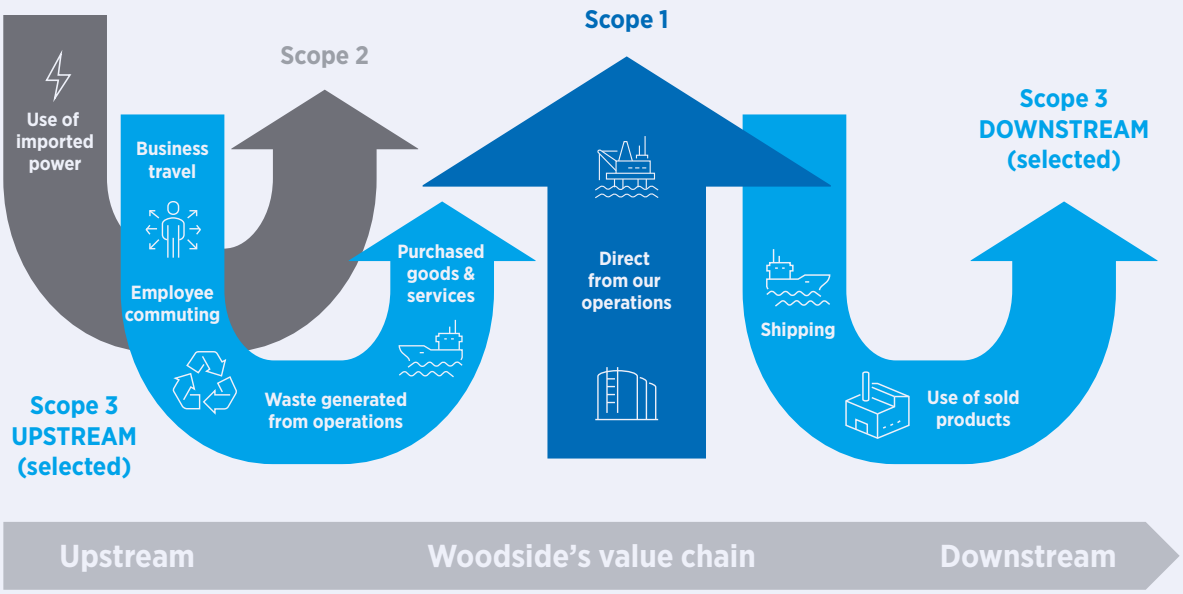
Challenges to robust Scope 3 emissions reporting include inconsistent reporting regimes across the global value chain of our products and services, boundaries that ignore the real world emissions reduction impact of offsets and coal-to-gas switching, and average end use emissions factors that fail to identify differences in end use emissions between customers. This inhibits the ability to set targets, focus our actions and report our progress. Our Scope 3 emissions reporting is currently based on estimates rather than actual measurements.

Woodside's Scope 3 emissions plan includes contributing to finding solutions to address these issues. Over time, we believe reporting regimes may evolve to better support global decarbonisation across value chains and the successful implementation of global carbon markets, but this will require collaboration across many sectors and countries.

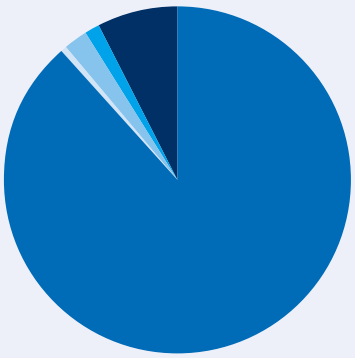
1 World Resources Institute and World Business Council for Sustainable Development (2011). "Corporate Value Chain (Scope 3) Accounting and Reporting Standard". Page 5.

Scope 3 emissions for Woodside include the purchase of goods and services e.g. offshore support vessels.

FIGURE 17: WOODSIDE SCOPE 1, 2 AND 3 EMISSIONS[1,2]



Estimated Woodside Scope 3 emissions, 2022



- **87.6%** Use of sold product - Woodside production
- **7.9%** Use of sold product - Traded hydrocarbons
- **1.7%** Purchased Goods and Services - Traded hydrocarbons
- **0.4%** Selected other upstream[3]
- **2.4%** Downstream transportation and distribution[4]

1 Data supporting these categories is provided in the climate-related data table on page 58.
2 From 2021, Woodside has reported estimated Scope 3 emissions associated with our traded volumes of LNG as well as our own production and in 2022 expanded this reporting to include traded oil and pipeline gas noting that this will result in some double counting of Scope 3 emissions with the original producer of these traded hydrocarbons.
3 Selected upstream emissions from GHG Protocol Categories 1 (purchased goods and services, not including production of purchased hydrocarbon); 5 (waste generated in operations); 6 (business travel); and 7 (employee commuting). Includes equity emissions associated with Woodside employees and Woodside operated facilities only.
4 Includes emissions associated with the downstream transport (GHG Protocol Category 9) of Woodside's equity share of hydrocarbon sales. No adjustment has been made for combustion of sold product during transport (e.g. LNG combusted by LNG ships, pipeline gas used in transmission compressor stations) and therefore could be double counted.

Scope 3 emissions plan and 2022 activities

Woodside announced a Scope 3 emissions plan in 2021, which has three key elements:

Invest

New energy products and lower carbon services

Woodside expects increasing demand for new energy products such as hydrogen and ammonia, and lower carbon services such as CCUS. These can reduce the emissions arising when our customers consume energy compared to unabated use of fossil fuels.

Woodside is investing to add these new products and services to our portfolio, seeking to match the pace, scale and needs of our customers as they determine their own decarbonisation pathways.

In December 2021, Woodside announced a US$5 billion investment target in new energy products and lower carbon services by 2030.[1] The US$5 billion is intended for investments that help our customers decarbonise by using these products and services. It is not used to fund reductions of Woodside's net equity Scope 1 and 2 emissions which are managed separately through asset decarbonisation plans.

At the end of 2022, Woodside had spent more than $100 million towards its $5 billion target. This spend includes electrolysers and liquefaction equipment for the H2OK hydrogen project proposed in Oklahoma, the Heliogen pilot project, as well as progressing an investment in String Bio, a company developing carbon to products technology.

Further updates on Woodside's progress are included on page 46-47.

Support

Customer and supplier emissions reduction

Woodside can support our customers and suppliers by identifying opportunities to collaborate on their decarbonisation pathways.

Embedding climate expectations and emissions reporting is now a standard practice for new contracts awarded by Woodside that have a material Scope 3 emissions profile. We intend to track and report where our suppliers have identified emissions reductions achieved while providing us with goods and services.

In 2022 activities included:

- Joined the Getting to Zero maritime coalition
- Joined the Qantas' Sustainable Aviation Fuels (SAF) coalition
- Signed binding agreement for more fuel-efficient LNG carriers
- Announced a feasibility study for ammonia supply chain to Japan.

In addition, Woodside and the Japan Bank for International Cooperation (JBIC) signed a memorandum of understanding (MOU) on 1 November 2022, which is aimed at securing a stable supply of energy for Japan and to assist in achieving its decarbonisation goals.

In addition to its main offices in Australia and the United States, Woodside maintains permanent offices in key locations including Japan, Korea, China, and Singapore.

This enables Woodside to routinely engage with customers and other important stakeholders in these key locations, including to understand their needs and priorities through the energy transition.

Promote

Global measurement and reporting

Woodside is actively participating in industry collaboration initiatives to mature, harmonise and advocate for accurate and transparent measurement and reporting.

In 2022, examples include participating in

- Ipieca's Scope 3 Taskforce[2]
- The Climate Leaders Coalition Scope 3 roadmap[3]
- Working with expert external parties to assess reporting standards for adoption in Woodside's business in areas such as maritime decarbonisation.

QANTAS' SUSTAINABLE AVIATION FUEL COALITION

Emissions from business air travel are a category of Scope 3 greenhouse gas emissions. In November 2022, Woodside became a member of Qantas' Sustainable Aviation Fuels (SAF) Coalition along with Australia Post, Boston Consulting Group, KPMG Australia and Macquarie Group. The coalition supports the purchase by Qantas of SAF, reducing around 900 tCO_2-e per annum for each member of the coalition. SAF procured by Qantas will be made from International Sustainability and Carbon Certification certified feedstock and will be audited on a limited assurance basis to confirm no double counting. The additional benefits include:

- Emissions reporting for all Woodside employees' business travel with Qantas
- Promotion of SAF production both globally and within Australia
- Opportunities to further develop the SAF Coalition with Qantas to potentially include other suppliers and partnerships Woodside are involved in.

Qantas SAF Coalition Member

QANTAS FUTURE PLANET | SUSTAINABLE AVIATION FUEL COALITION

1 Individual investment decisions are subject to Woodside's investment targets. Not guidance. Potentially includes both organic and inorganic investment.
2 https://www.ipieca.org/our-work/climate/.
3 https://www.climateleaders.org.au/publications/scope-3-roadmap/.

Scope 3 emissions targets

Woodside's Scope 3 target is to invest $5 billion in new energy products and lower carbon services by 2030.[1] We recognise that some stakeholders, including some investors, have requested that Woodside also set Scope 3 emissions reduction targets. The Board and the Executive Leadership Team continue to carefully consider options for such targets, the viability of which may change over time as reporting standards improve.

Some options for Scope 3 targets are described below. In addition to the challenges to robust Scope 3 emissions reporting described on page 36, the rationale for why Woodside has not chosen to adopt them at this time is are also given:

Target	Rationale for not adopting at this time
Absolute emissions reduction targets	"Use of sold product" is the largest category of Scope 3 emissions for Woodside. These emissions therefore correlate to the volume and mix of products we sell, unless the subsequent use of those products is abated. Absolute targets to reduce this category of Scope 3 emissions can be achieved either by: • Selling less (or different) products • Relying on customers to abate the emissions associated with their use of our product after the point of sale • Divesting producing assets to others, which does not directly reduce global greenhouse gas emissions. As articulated on pages 16-17 of this report, Woodside intends to supply the energy products that our customers need to secure their energy supplies as they reduce their emissions, and an absolute reduction target does not reflect this. This is because customers may continue to choose a wide range of oil, gas and new energy products during their decarbonisation transition, and an absolute target would constrain Woodside's ability to supply these products. Further information on oil and gas in the energy transition and the net zero goals and decarbonisation plans in our key LNG markets is provided on pages 10-15. Further, while the use of oil and gas products may be subject to post-sales abatement by the customer, there are currently no adequate systems to track and measure this, which we consider a prerequisite to setting a target.
Intensity-based emissions reduction targets	An intensity-based emissions reduction target would enable Woodside to maintain or expand its supply of energy products to meet customer demand, while diversifying its portfolio to include new energy products and lower carbon services. While this is consistent with Woodside's strategy, the pace of customer take up of the supply of new energy products and lower carbon services remains difficult to predict, and so is the ability to predict and record post-sales abatement. Therefore, Woodside reports its actual emissions intensity (see data table on page 58), but has not set a forward-looking target.
Supply chain emissions targets	Woodside has considered whether a target could be set for other sources of Scope 3 emissions, such as business travel, supply of goods and services, and waste. Data on the baseline emissions in these categories is estimated rather than measured. This inhibits the ability to set a percentage target, because the baseline is uncertain and it may change as knowledge improves. Instead, we work with our suppliers to track additional actions identified by them to reduce emissions. The development of this tracking and reporting capability may in future facilitate the consideration of a goal for this category of emissions.

1 Individual investment decisions are subject to Woodside's investment targets. Not guidance. Potentially includes both organic and inorganic investment.

SECTION 4.1

Targets: 2022 progress

Woodside's targets to reduce net equity Scope 1 and 2 greenhouse gas emissions are:

- 15% by 2025[1]
- 30% by 2030[2]

relative to a starting base representative of gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020. Woodside has also announced an aspiration of net zero equity Scope 1 and 2 greenhouse gas emissions by 2050 or sooner.[3]

Following the merger, this starting base was re-established as 6.32 Mt CO_2-e representing the 2016-2020 gross annual average for the merged entity.[4]

For 2022 performance only, in which the merger was effective for seven out of 12 months, the effective starting base has been adjusted to 5.19 Mt CO_2-e.

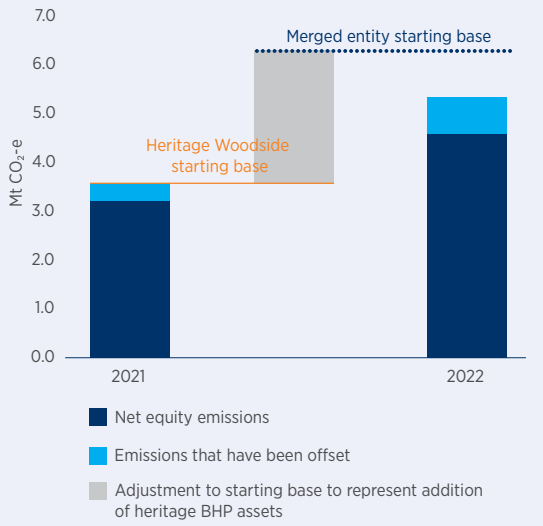
Net equity Scope 1 and 2 greenhouse gas emissions performance in 2022

Woodside's net equity Scope 1 and 2 greenhouse gas emissions totalled 4,615 kt CO_2-e in 2022, which was 11% below the starting base. To achieve this, 754 kt CO_2-e of carbon credits were retired, as set out in figure 19. Gross equity emissions (prior to the retirement of carbon credits as offsets) were 5,369 kt CO_2-e.

In 2022, 67% of Woodside's equity Scope 1 greenhouse gas emissions were from fuel combustion to power our assets, 20% came from venting of which the majority is associated with removal of reservoir CO_2 as part of the LNG process, and 13% from flaring.

Woodside's net equity Scope 1 and 2 greenhouse gas emissions for 2022, and the amount of carbon credits retired as offsets are shown below and in the data table on page 58. Because the 2022 data includes seven months of the merged entity, it is not directly comparable to either the 2021 data, or to the starting base for the merged entity, for which the first full year reporting period will be calendar year 2023. The level of carbon credits retired in respect of 2022 emissions has been selected to deliver an 11% reduction from an adjusted starting base reflecting five months of pre merger starting base and seven months of post merger starting base.

FIGURE 18: SCOPE 1 AND 2 GREENHOUSE GAS EMISSIONS



Assets operated by Woodside accounted for 79% of these emissions, and the remainder came from assets in which Woodside has a share of ownership but not direct operational control.

1 This means net equity emissions for the 12 month period ending 31 December 2025 are targeted to be 15% lower than the starting base.
2 This means net equity emissions for the 12 month period ending 31 December 2030 are targeted to be 30% lower than the starting base.
3 Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base representative of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with an FID prior to 2021.
4 The starting base has been calculated as 6.32 million tonnes CO_2-e. This is intended to be representative of the gross average annual equity emissions over the period 2016-2020 for both Woodside and also the assets acquired through the merger with BHP's petroleum business.

FIGURE 19: SOURCES OF CARBON CREDITS RETIRED IN RESPECT OF 2022 EMISSIONS

In respect of 2022 net equity Scope 1 and 2 greenhouse gas emissions, Woodside has retired international carbon credits accredited by two independent non-government organisations, Verra and Gold Standard. Verra and Gold Standard have been reviewed by the Australian Government and are included as eligible carbon credits under the Climate Active Carbon Neutral Standard for Organisations.[1] The carbon credits retired are described in the table below.

Project name	Project ID	Project developer	Project type	Method	Country	Vintage
Antai Group Waste Gas Recovery for Power Generation Project	Gold Standard GS 605	South Pole Carbon Asset Management Limited	Energy Efficiency — Industrial	ACM0012: Waste energy recovery	China	2017
Genneia Wind Projects in Argentina	Verra VCS 1987	Genneia S.A.	Energy industries (renewable/non-renewable sources)	ACM0002: Consolidated methodology for grid-connected electricity generation from renewable sources	Argentina	2018
Hyundai Steel Waste Energy Cogeneration Project	Verra VCS 786	Hyundai Green Power and CERPD	Energy Efficiency — Industrial	ACM0012: Waste energy recovery	Republic of Korea	2017
Katingan Peatland Restoration and Conservation Project	Verra VCS 1477	PT. Rimba Makmur Utama (PT. RMU)	Agriculture Forestry and Other Land Use	VM0007: REDD Methodology Modules	Indonesia	2018

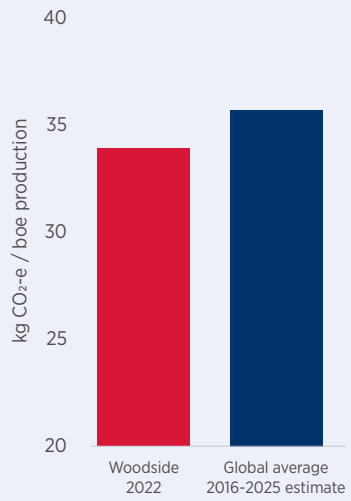
1 Commonwealth of Australia 2020. "Climate Active Carbon Neutral Standard for Organisations, Commonwealth of Australia 2020."

SECTION 4.2

Metrics

Additional metrics to describe Woodside's 2022 performance in the context of our industry are included below. It has not been feasible to accurately present comparable historical data due to the merger with BHP's petroleum business.

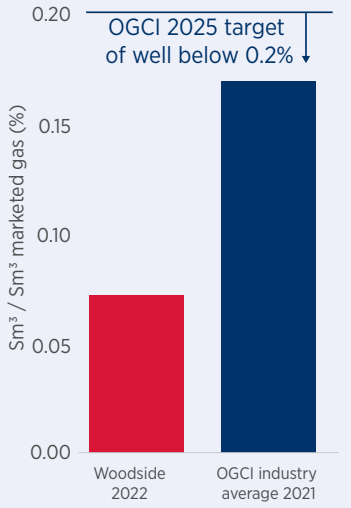
FIGURE 20: SCOPE 1 AND 2 GROSS INTENSITY[1]



Scope 1 and 2 gross emissions intensity

This is a measure of the efficiency of our production, before the application of offsets. It is one way to demonstrate that Woodside is appropriately prioritising avoiding and reducing emissions at our facilities relative to the use of carbon credits as offsets, consistent with our strategy. Woodside has a lower (better) gross emissions intensity than the global average of a comparable portfolio of LNG, conventional shelf and deepwater assets (as calculated by Wood Mackenzie[1]) demonstrating the impact of actions taken to avoid and reduce emissions from our operations.

FIGURE 21: METHANE EMISSIONS INTENSITY[2,3]



Methane intensity

Woodside currently has a lower (better) equity methane emissions intensity than industry (OGCI) targets, but nevertheless has an action plan to further improve and strive for near zero methane emissions.

Woodside's methane emissions performance and methane emissions reduction plan is described on pages 31-33. Methane emissions contribute to Woodside's Scope 1 emissions, but receive specific focus because of their near-term importance to achieving global climate goals.

1 Woodside analysis, based on Woodside Scope 1 and 2 emissions data for 2022 relative to a comparable portfolio of LNG, conventional shelf and deepwater assets, as estimated by Wood Mackenzie. https://www.woodmac.com/news/opinion/portfolio-composition-is-key-to-emissions-intensity/.

2 Woodside methane emissions data, relative to OGCI average and targets. https://www.ogci.com/action-and-engagement/reducing-methane-emissions/#methane-target.

3 Greenhouse gas emissions, energy values and global warming potentials are estimated in accordance with the relevant reporting regulations in the jurisdiction where the emissions occur (e.g. Australian National Greenhouse and Energy Reporting (NGER), US EPA Greenhouse Gas Reporting Program (GHGRP)). Australian regulatory reporting principles have been used for emissions in jurisdictions where regulations do not yet exist.

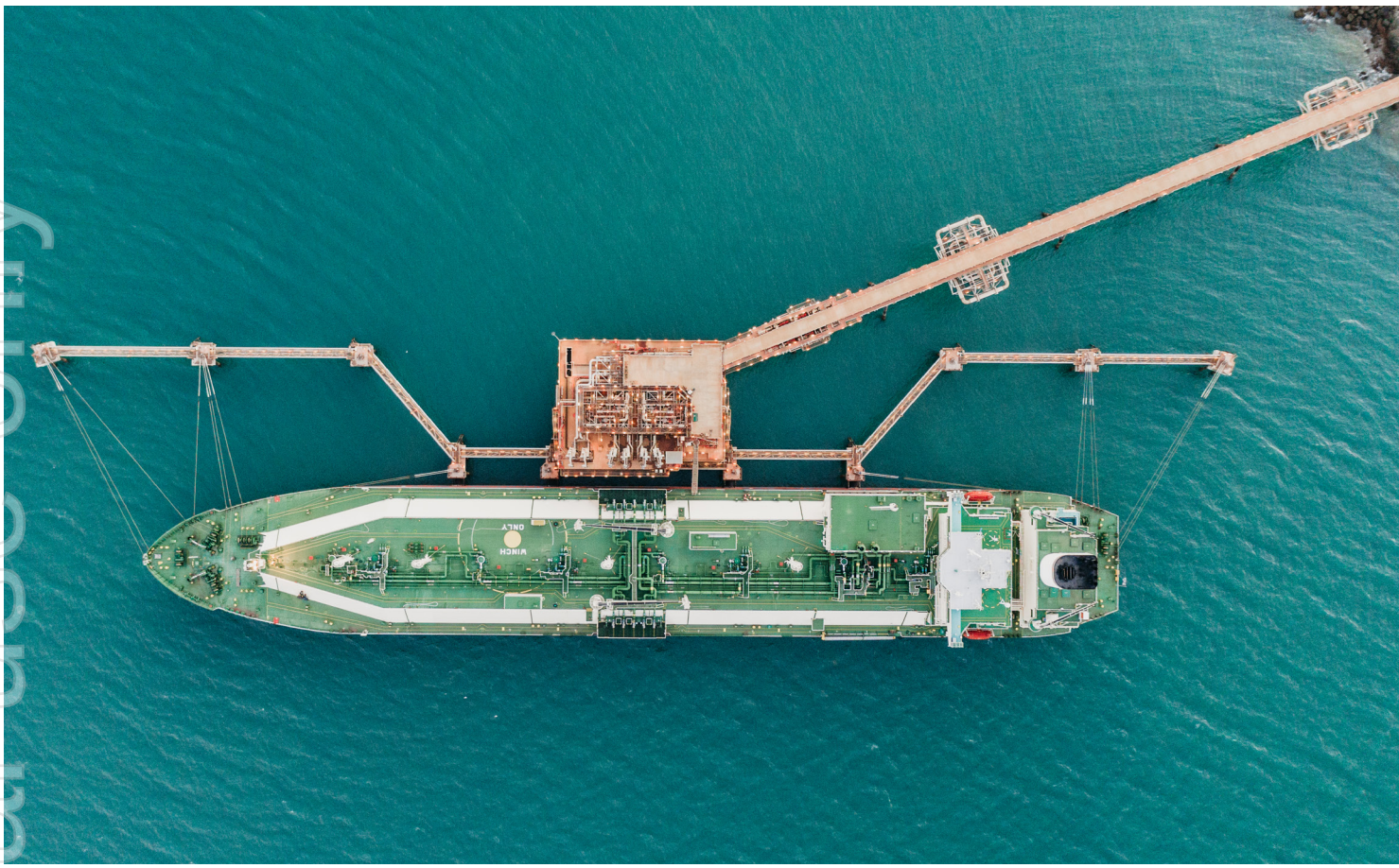
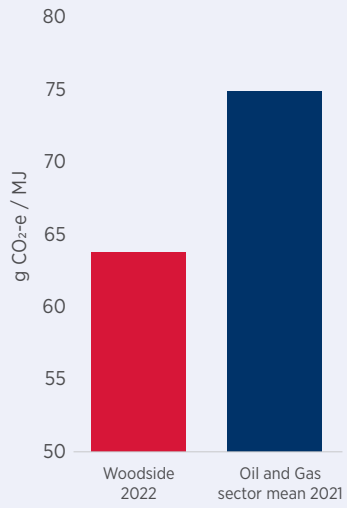


FIGURE 22: SCOPE 1, 2, 3 LIFE CYCLE INTENSITY[1]



Portfolio life cycle intensity of production

Portfolio life cycle intensity of production is a measure of the Scope 1, 2 and 3 greenhouse gas emissions, per unit (megajoule) of energy that we produce and sell. It therefore provides a measure of the carbon intensity from both the production and the use of our portfolio of products.

Woodside's intensity is currently lower than the 2021 oil and gas sector mean as calculated by the Transition Pathway Initiative because our portfolio is weighted towards natural gas, which has a lower life cycle intensity than oil.

Additional data on 2022 performance is also provided in the Climate-related data on page 58 of this report and in the Sustainable Development Report, which also contains information relating to water, energy and waste management. For metrics associated with executive remuneration, refer to the Governance section. For considerations utilised in investment decision making, refer to the Capital Allocation Framework section on pages 26-27.

1 Woodside analysis, based on Woodside Scope 1, 2 and 3 emissions data for 2022 relative to the Transition Pathway Initiative oil and gas sector mean. https://www.transitionpathwayinitiative.org/companies/woodside-petroleum, assessment date 01 August 2022.

Strategy in action: delivering on emissions reductions in 2022

Avoiding emissions in design:

Pluto expansion project

Decarbonisation activities for the Pluto Expansion project, encompassing both the new Train (T2) and modification to the existing Train (T1), focussed on improving emission intensity and minimising flaring during both routine operations and startup of the new Train. Key work streams included the below.

Flashing Liquid Expander (FLE): Following study work through 2022, installation of tie-ins to support future installation of an FLE is being considered for incorporation into the base project scope. FLE operation recovers energy by expanding the refrigerant stream to produce electricity which can be used in the refrigerant compressors, reducing fuel gas usage and improving emissions intensity.

Integrated System Flaring: A detailed review of the integrated Pluto T1/T2 Boil Off Gas (BOG) system was held in 2022 to develop an operating philosophy that minimises system flaring during LNG loading. Opportunities for optimisation of integrated Scarborough commissioning and start-up are also planned through 2023.

Study work on implementation of Advanced Process Control across both T2 and T1 will be completed in 2023 to enable early implementation after start-up, maximising efficiency and reliability.

Scarborough offshore design

A nitrogen flare purge has been included in the design of the Scarborough floating production unit (FPU). For process safety requirements, flare systems require a continuous purge. This can be achieved with the use of a fuel gas purge. The Scarborough FPU has developed a modified design for the high pressure flare using primarily nitrogen instead. This reduces estimated flaring emissions by approximately 800 tCO_2-e/year.[1]

Gas can be used to prevent damage between the inner and outer sheath of the flexible riser which connects the FPU to the subsea production and gathering system. This riser annulus gas, which is mainly diffused methane, is normally monitored and vented directly to the atmosphere. However, in the Scarborough design this gas is routed to the flare system for combustion. This saves approximately 600 tCO_2-e/year in emissions.[1]

The FPU design has been optimised to reduce fuel gas usage by compressors. The reduction in fuel gas usage from this work results in an estimated annual saving of approximately 3,200 tCO_2-e/year.[1]

After completion, wells are flowed to a mobile offshore drilling unit (MODU) for a period of approximately 24 hours during which resulting gas is flared. The activity is performed to reduce the amount of solids and drilling fluids in the production system once it is connected. Through well completion and drilling fluid selection, along with additional data analysis, the activity has been removed from the Scarborough well commissioning scope. Not flaring reservoir gas and reducing fuel uses on the MODU has reduced emissions by approximately 17,000 tCO_2-e, noting that these are Scope 3 emissions for Woodside and Scope 1 for the drilling contractor.[1]

Trion offshore design

During project definition, engineers at the Trion project have adopted several measures which would reduce the potential emissions from the project, should it proceed to a final investment decision. These include tank vapour recovery, use of nitrogen as the primary flare purge, waste heat recovery, selection of electric drives for major turbines and minimisation of spinning reserve. These projects are focused on reducing emissions and improving emissions intensity.

1 The estimated GHG savings quoted in each example on pages 44 and 45 are estimated using engineering judgment by appropriately skilled and experienced Woodside engineers. Emissions quoted are total project share, not equity share. Not all savings will be recurrent on an annual basis. For illustration 1,000 tCO_2-e is approximately 0.02% of Woodside's 2022 gross equity Scope 1 and 2 greenhouse gas emissions.

Reducing emissions in operations:

Karratha Gas Plant: LNG Train 1 compressor seal vent recovery

The four main refrigerant compressors on LNG train 1 have been retrofitted with a seal vent recovery system. This recovers, treats and re-directs hydrocarbons back into the compressor thus reducing atmospheric emissions from the plant. The project is estimated to reduce emissions by approximately 8,000 tCO_2-e.[1]

Karratha Gas Plant: energy efficiency improvements through advanced process control

New advanced process control applications have been deployed in both the power generation and liquefaction plants to optimise energy consumption. The application of advanced process control into a power generation control system is novel in application and approach. It actively shifts power load between generators of different turbine types and favours the most efficient machines, reducing overall emissions from gas turbines. For the liquefaction plants, the inclusion of energy efficiency calculations in the advanced process control reduces overall emissions from gas turbines. Emissions reductions are estimated to range between 55,000-130,000 tCO_2-e.[1]

Macedon: metering station emissions reduction project

In June 2022, 61kW of solar photovoltaic (PV) panels and 170kWh of battery energy storage were installed at the Macedon Metering Station. The project objective is to displace the requirement to operate a 50 kVA gas engine alternator and reduce up to 133 tCO_2-e/year.[1]

Karratha Gas Plant, Pluto LNG and North Rankin Complex: gas turbine inlet air filters

Gas turbine inlet air filters have been upgraded at KGP, Pluto LNG and the North Rankin Complex, improving production efficiency and reducing emissions intensity. Emissions reductions are estimated at approximately 18,700 tCO_2-e.[1]

Pluto LNG: air cooler upgrades

Air cooler upgrades were trialled at Pluto LNG to support more effective cooling, and reduce the power intensity of LNG production. The trial resulted in an increased airflow, with upgrades to be progressively rolled out to other coolers over the next five years. Following upgrades to the remaining coolers, emissions reductions are estimated at approximately 4,400 tCO_2-e.[1]

FPSOs: optimisation activities

FPSO optimisation activities included reducing flaring and fuel usage where possible. This was achieved through improved equipment reliability, introduction of tools to support emissions based operational decision-making, and through optimisation of spinning reserves for rotating equipment. Emission reductions are estimated at 12,700 tCO_2-e.[1]

"The journey towards a more sustainable future begins with education and understanding. The Woodside Energy Climate Awareness Network (WECAN) held a series of events during 2022 which helped us gain a deeper understanding of the challenges and opportunities ahead."
- Sam (WECAN).

"Having opportunities to continue to strengthen our relationships with our suppliers while collaborating on opportunities to support them to address our Scope 3 greenhouse gas emissions has been rewarding."
– Logan (Supply Manager)

"It's satisfying to be involved with delivering a project that's not only good for the business in terms of cost and safety, but also reduces our emissions footprint."
– Tom (Completions Engineering)

"I feel empowered to take emissions reduction opportunities into my own hands. Its exciting to see the passion and innovation driving individuals and teams to make positive change."
– Jacinta (Environmental Engineer)

1 The estimated GHG savings quoted in each example on pages 44 and 45 are estimated using engineering judgment by appropriately skilled and experienced Woodside engineers. Emissions quoted are total project share, not equity share. Not all savings will be recurrent on an annual basis. For illustration 1,000 tCO_2-e is approximately 0.02% of Woodside's 2022 gross equity Scope 1 and 2 greenhouse gas emissions.

Strategy in action: new energy products and lower carbon services in 2022

During 2022 Woodside progressed the following opportunities as part of a developing portfolio of new energy products and lower carbon services, supported by our $5 billion investment target by 2030. These projects are in development and so do not yet generate revenue. They remain subject to final investment decision and regulatory approvals.

H2OK

H2OK is a proposed liquid hydrogen project to be located in Ardmore, Oklahoma with a maximum design capacity of 90 tonnes per day (tpd) of liquid hydrogen through electrolysis, initially targeting the heavy transport sector.

Woodside completed front-end engineering design activities in 2022 which have matured the facility design, cost and schedule. In October 2022, Woodside awarded a contract to supply 160MW of alkaline electrolyser equipment and in December 2022 awarded a contract for liquefaction units with a capacity of 60tpd.

Woodside is operator and holds a 100% participating interest.

H2Perth

H2Perth is a proposed hydrogen and ammonia production facility to be located in Perth, Western Australia. Phase 1 of the project is targeting up to 2,700 tpd of ammonia produced through both gas reforming and electrolysis. It is targeting supply to local industry and international users. Subsequent phases have the potential to expand to 8,900 tpd by increasing the electrolysis component. Pre front-end engineering design commenced in May 2022.

Woodside is operator and holds a 100% participating interest.

Hydrogen Refueller @H2Perth

In 2022, Woodside announced plans for a proposed self-contained hydrogen production, storage and refuelling station located adjacent to H2Perth, named the Hydrogen Refueller @H2Perth. Initially, Woodside is targeting production of 0.2 tpd of hydrogen, with the potential to scale up to a targeted 0.8 tpd. Woodside is targeting the supply of hydrogen to industrial customers and the public.

Woodside is operator and holds a 100% participating interest.

Southern Green Hydrogen

Woodside has been selected as the preferred partner for the Southern Green Hydrogen project, a proposed hydrogen and ammonia facility to be located in Southland, New Zealand. The proposal is targeting up to 1,400 tpd of ammonia. Southern Green Hydrogen is expected to utilise renewable power to produce hydrogen and ammonia for export and domestic supply.

H2TAS

Woodside has a proposed renewable ammonia and hydrogen production facility in the Bell Bay area of Tasmania. H2TAS is planned to be a phased development, targeting an initial capacity of up to 550 tpd of ammonia. Ammonia would be produced through electrolysis, utilising a combination of wind and hydroelectric power. Woodside continues to evaluate the cost and schedule impacts of the renewable power solutions that would enable the project to progress.

Woodside is operator and holds a 100% participating interest.

Heliogen

Woodside and Heliogen entered into a project agreement in 2022 to deploy a 5 MW module of Heliogen's artificial intelligence-enabled concentrated solar energy technology in California. In addition, Heliogen and Woodside have signed a collaboration agreement to jointly market Heliogen's renewable energy technology in Australia.

Woodside Solar

Woodside is progressing the proposed Woodside Solar project, a facility which would initially generate electricity from a solar photovoltaic farm approximately 15 km south-west of Karratha in Western Australia, complemented by a battery energy storage system. The facility is expected to supply up to 100 MW of solar energy with potential expansion to a maximum of 500 MW. It could supply Pluto LNG (potentially reducing Woodside's Scope 1 emissions) as well as other customers located near Karratha that are connected to the North West Interconnected System (NWIS).

In 2022, Woodside entered a bilateral Indigenous Land Use Agreement and a modern benefit sharing agreement with the Ngarluma Aboriginal Corporation, which holds the native title rights on behalf of the Ngarluma people, for the land where Woodside Solar is proposed. Woodside also executed options to lease associated land within the Maitland Industrial Estate with Development WA and has been progressing NWIS connection and transmission access arrangements.

Woodside is operator and holds a 100% participating interest.

Carbon capture and storage

Woodside, as a participant in various joint ventures, was awarded three greenhouse gas assessment permits in 2022. These permits enable carbon capture and storage assessments in the Browse Basin (operated), Northern Carnarvon Basin (operated) and Bonaparte Basin (non-operated).

One of these permits covers the depleted Angel gas field, which could provide a storage reservoir for a multi-user carbon capture and storage (CCS) project near Karratha in Western Australia. This could be ideally located to aggregate emissions from various existing industrial emissions sources on the Burrup Peninsula. It could also have the potential to facilitate the development of new industries, such as the production of hydrogen and ammonia, by providing a local solution for emissions. The size of the potential CCS facility is subject to the completion of additional technical, regulatory and commercial studies, but could have a processing capacity of up to 5 million tonnes of carbon dioxide per annum.

Woodside is also a participant in the Gippsland Basin Joint Venture, which is progressing a feasibility study into the development of a south-east Australian carbon capture and storage hub. This aims to utilise existing infrastructure to capture and store CO_2 in the depleted Bream reservoir located offshore Victoria.

Carbon to products

In 2022, Woodside launched a carbon capture and utilisation (CCU) collaboration with United States based technology developers ReCarbon and LanzaTech to assess the viability of a proposed CCU pilot facility in Perth, Western Australia. The proposed pilot CCU facility would convert greenhouse gases into ethanol.

Woodside and LanzaTech also entered into a strategic framework agreement, under which Woodside will collaborate with LanzaTech to design, construct, own, maintain and operate pilot facilities utilising LanzaTech's CCU technologies. LanzaTech's skillset is in the fields of synthetic biology, bioinformatics, artificial intelligence, and machine learning coupled with engineering.

Woodside also announced an investment of US$9.9 million in String Bio Private Limited (String Bio), the developer of a patented process for recycling greenhouse gases into products such as livestock feed. Woodside and String Bio entered a strategic development agreement to explore opportunities for the potential commercial scale up of String Bio's technology.

—
H2Perth (Conceptual image only.)

SECTION 5.1

The Board's oversight of climate-related risks and opportunities

Climate change is a complex and important issue that significantly influences our strategy. Woodside's response is directly overseen by its Board, with the support of its committees. During 2022, climate change was considered at each Sustainability Committee meeting (or Board meeting where the Sustainability Committee did not concurrently meet).

The Board also engages with shareholders to ensure that they understand and have the opportunity to provide feedback on Woodside's approach to climate change.

This occurs through a range of formal and informal channels, such as the annual general meeting (AGM) and routine engagements with major investors. In 2022, Woodside conducted 47 investor engagements which included discussion of climate change.

The chart below describes the relationship between the Board, its committees and the executive team.

On the next page, examples are given of the Board and its committees' consideration of climate-related factors in the course of their review of major plans of action, risk management policies, annual budgets and business plans, and when overseeing major capital expenditure.

Board skills and diversity

The Board considers that collectively the directors represent the skills, knowledge and experience necessary and desirable to direct the company, including in relation to their oversight of climate-related risks and opportunities.

The non-executive directors contribute diverse operational and international experience, an understanding of the industry in which Woodside operates, knowledge of financial markets and an understanding of the health, safety, environmental, community and other sustainability matters that are important to Woodside.

The Board supplements its climate change awareness by seeking the input of executives and external advisers to further inform its decisions.

Executive renumeration

Woodside's approach to executive remuneration is detailed in our Annual Report 2022. Woodside's 2022 Corporate Scorecard included five equally weighted measures, including material sustainability issues. This included Woodside's year-end gross equity greenhouse gas emissions. The CEO was also assessed against individual metrics including advancing the company's strategy to transform the way we work in response to the energy transition and progressing our portfolio of new energy investments.

Refer to the remuneration report in the Annual Report 2022 for details of the Corporate Scorecard outcomes, and the individual performance of the CEO and senior executives and their remuneration outcomes for 2022.

FIGURE 23: BOARD AND EXECUTIVE RELATIONSHIP

1 See page 50 for information about this role.
2 In addition to Strategy and Climate the Woodside business groups are Exploration and development; Projects; Australian operations; International operations; New energy; Marketing and trading; Technical services, Corporate services, and Finance.

Board of directors	The Board meets at least six times a year and its responsibilities include review of systems of risk management, compliance and control. In 2022, discussions at Board meetings included updates on progress towards Woodside's net equity Scope 1 and 2 greenhouse gas emissions reduction targets including year to date and year end outlook. Other updates related to asset decarbonisation plans, the methane emissions reduction plan, Scope 3 emissions plan, progress of new energy and carbon management opportunities, and external engagements and news. Climate-related topics were also included in the review of Woodside's strategic risk profile as a result of the merger with BHP's petroleum business.
Sustainability Committee	The role of the Sustainability Committee is to assist the Board to meet its oversight responsibilities in relation to Woodside's sustainability policies and practices. Climate change is a standing item on the agenda for each meeting which is scheduled at least four times a year. In 2022, updates to the Sustainability Committee included information about our performance against targets, asset decarbonisation plans, employee engagement, external policy developments, and investor expectations of climate-related disclosures. As well as receiving regular updates from the Executive Vice President Strategy and Climate, the Committee uses its meetings to provide feedback to the executive team on the development of climate-related initiatives prior to their formal presentation to the Board.
Audit & Risk Committee	The role of the Audit & Risk Committee is to assist the Board to meet its oversight responsibilities in relation to Woodside's financial reporting, compliance with legal and regulatory requirements, internal control structure, risk management and insurance procedures and the internal and external audit functions. Climate change risk is one of Woodside's strategic risks. In 2022, the Audit & Risk Committee formally reviewed this once, in addition to the Board's review of Woodside's strategic risk profile as part of the merger. The Committee also considers the inclusion of climate-related risks within Woodside's internal audit program and the appropriateness of disclosures on climate-related risk within the consolidated financial statements.
Human Resources & Compensation Committee	The role of the Human Resources & Compensation Committee is to assist the Board in establishing human resources and compensation policies and practices that are aligned with Woodside's strategy and the expectations of shareholders. This includes reviewing and making recommendations to the Board on executive and other employee remuneration. In 2022, Woodside adopted a specific measure for gross equity Scope 1 and 2 greenhouse gas emissions in the Corporate Scorecard, which is used to determine performance-based remuneration for all staff.[1]
Nominations & Governance Committee	The role of the Nominations & Governance Committee is to assist the Board to review Board composition, performance and succession planning. This includes identifying, evaluating and recommending candidates for the Board, taking into account the factors discussed under Board skills and diversity on page 48.

1 Gross equity emissions are calculated prior to retirement of carbon credits as offsets, focusing the organisational priorities on avoiding and reducing emissions.

SECTION 5.2

Management's role in assessing and managing climate-related risks and opportunities

Following the completion of the merger between Woodside and BHP's petroleum business on 1 June 2022, Woodside created a new Strategy and Climate Group. Led by an Executive Vice President (EVP) who reports directly to the Chief Executive Officer, the new group integrates climate strategy with the company's corporate strategy and external economic analysis.

The purpose of this group is to understand and anticipate the rapidly changing world around us and the expectations of our stakeholders, form a view on the path to create long-term value in areas of comparative advantage, communicate the value and contribution of our company, and nurture and sustain relationships that create the foundation for success beyond the energy transition.

The climate-related part of the group has three parts:

1. **A climate strategy and policy team** responsible for recommending Woodside's strategy and targets to the Board, articulating them through clear disclosures, and engaging with interested stakeholders
2. **A decarbonisation team** responsible for operationalising Woodside's strategy and targets, by equipping assets and functions with the right tools, procedures and leadership culture
3. **An emissions accounting team** that forecasts and aggregates emissions at the portfolio level for reporting purposes and to inform strategic decision-making.

This group receives information on climate-related issues from a variety of sources including publications, subscription services and external advisors.

The EVP of Strategy and Climate is a member of the Executive Leadership Team. The Executive Leadership Team meets regularly and, in addition to the perspective brought to its meetings by the EVP of Strategy and Climate, periodically receives specific climate-related updates from the business. In 2022, these included topics such as the methane emissions reduction plan, asset decarbonisation plans and technology decarbonisation plan.

Culture

Minimising emissions is a focus area for operators, maintainers, engineers and management. It is a priority for all operated sites, along with maintaining safe and cost-efficient operations, and is embedded into daily activities such as including a methane check box on daily SAFE (See, Assess, Fix, Encourage) cards to support operational find and fix behaviours. Reward and recognition is also linked to emissions reduction activities.

Activities were undertaken in 2022 to educate and inform key personnel to further encourage action. For example, a statement was included in performance metrics for key personnel in 2022 to build understanding of the emissions footprint of their role and how they can influence outcomes.

Woodside also has a staff-led community network, Woodside Energy Climate Awareness Network (WECAN), which encourages employees to share knowledge and contribute to Woodside's objective to thrive in the energy transition as a low cost, lower carbon energy provider.[1] WECAN has more than 400 members. BHP's petroleum business had an existing employee network called SPARK. WECAN and SPARK have worked together to provide opportunities for all staff members to engage with and learn about Woodside's approach to climate change. This included a WECAN for Climate forum timed to coincide with the COP-27 global summit in Egypt in November 2022, which included team discussions, internal and external keynote speakers, and technical drop in sessions for staff to talk to Woodside's subject matter experts about aspects of our climate and sustainability plans.

Advocacy

Woodside regularly engages with governments of countries where we are active in support of our business strategy, to exchange information, and to inform policy development and decision making. This engagement is undertaken both directly and by working with industry associations.

Woodside's participation in government consultations related to climate change is summarised on the next page. Woodside also participates in a number of industry associations and our approach to this is explained in our Industry Association Climate Alignment Review.

During 2022, Woodside engaged with a range of Australian State and Commonwealth members of parliament to understand their interests and to communicate information about our activities.

For more information on our industry associations please see our website.

1 Please see glossary for a definition of how Woodside uses the term lower carbon energy provider.

In addition, Woodside has:

- Co-chaired the Low Emissions Pathways/Net Zero Taskforce of the International Petroleum Industry Environment and Conservation Association (Ipieca)
- Participated in a range of representative groups, including the steering committee of the Australian Energy Transition Initiative, the Climate Leaders Coalition, the Ipieca Scope 3 Taskforce, the Chamber of Minerals and Energy's Energy Transition Working Group and the Western Australian Government's LNG Jobs Taskforce on topics related to CCS and decarbonising the LNG sector.

Woodside is aware that the Science Based Targets Initiative (SBTi) is considering a methodology for the oil and gas sector. The methodology is not yet complete. Woodside has discussed technical matters with SBTi in respect of the methodology that need to be resolved for it to be applicable for consideration by Woodside. Woodside also monitors and, if appropriate, engages with the Transition Pathway Initiative, Climate Action 100+, Carbon Tracker and Influencemap.

Climate-related advocacy undertaken by Woodside in 2022

The Safeguard Mechanism Reforms consultation

Woodside responded to various Australian Government consultations relating to its Safeguard Mechanism. A fair, robust and transparent Safeguard Mechanism can support a reduction in Australian emissions, as well as encourage businesses and industries to further innovate and adopt smarter practices and technologies in line with our collective emissions reduction targets. Woodside also welcomed the Australian Government's legislation of its 43% emissions reduction target.

IFRS Foundation's International Sustainability Standards Board exposure drafts

Woodside supports the harmonisation of global standards around transparent emissions reporting. We made a submission on the International Sustainability Standards Board's (ISSB) proposed standards welcoming the ISSB consultation process and the intent to produce globally applicable sustainability reporting standards. We believe that, if properly implemented, there is the potential that both reporters and users of reports will benefit from harmonisation of standards and a common understanding of the key concepts, terms and the purposes for which disclosures can be relied upon.

Green energy superpower

The Australian Parliament's Joint Standing Committee on Trade and Investment Growth held an inquiry into Australia's transition to a green energy superpower. Woodside's response noted the potential role of Australia's natural gas resources and also included suggestions on how the government could incentivise the supply and demand for new energy products and lower carbon services.

Corporate Emissions Reduction Transparency scheme (CERT)

Woodside submitted data in March 2022 on our 2021 activity to support the Clean Energy Regulator's (CER) pilot release of the Corporate Emissions Reduction Transparency scheme (CERT). The CER independently confirmed a 10% reduction in Scope 1 and 2 net equity greenhouse gas emissions from Woodside's baseline in 2021, or 62% progress towards Woodside's 2025 Scope 1 and 2 net equity greenhouse gas emissions target. Woodside has continued to engage with the CER on enhancing the process for the 2023 CERT report.

Western Australian Environmental Protection Authority Greenhouse Gas Emissions Factor Guidelines

Woodside supported its industry associations, in particular the Chamber of Minerals and Energy (CME) of Western Australia, in preparing submissions regarding the proposed guidance from the Western Australian Environmental Protection Authority (EPA) on project specific emissions reduction planning.

Hydrogen Guarantee of Origin

Woodside supports the CER initiative to establish emissions intensity certification of the production of hydrogen. To inform the development of a Guarantee of Origin scheme for hydrogen, the CER is undertaking trials, including the proposed H2Perth and H2TAS projects. The trials are running collaboratively with the Department of Climate Change, Energy, the Environment and Water, which is responsible for wider consultation. The scheme will be co-designed with industry and key stakeholders.

Gas price caps

Woodside expressed concerns related to the Australian Government's *Treasury Laws Amendment (Energy Price Relief Plan) Act* (Cth) 2022 due to its potential impact on the east coast energy market. Woodside is concerned the legislation may discourage investment in domestic gas supply and undermine the fair operation of the market, potentially inhibiting the role that gas can play in decarbonising the economy as described in this report.

Climate Change Authority (CCA) review of international offsets

Woodside produced a submission that supports the use of international offsets that:

- Are scientifically verified and accurately accounted for using robust methodologies
- Would be effective under an operationalised Article 6 of the Paris Agreement
- Have effective corresponding adjustments for countries' Nationally Determined Contributions.

Independent Review of ACCUs

Woodside believes that carbon credits such as ACCUs play an important role in greenhouse gas emissions reduction. At the same time, we recognise that the Government's Emissions Reduction Fund (ERF) scheme needs to be considered at regular intervals to retain and build confidence in markets and we welcomed the Independent Review. Our submission to the review had three recommendations on transparency of standards, delivery of Article 6 of the Paris Agreement, and on the need for open and transparent stakeholder engagement ahead of implementing any change.

SECTION 5.3

Just transition

The Paris Agreement emphasises "*the intrinsic relationship that climate change actions, responses and impacts have with equitable access to sustainable development and eradication of poverty*". It also takes into account "*the imperatives of a just transition of the workforce and the creation of decent work and quality jobs*".[1]

Some governments, organisations, and communities have begun work to understand and plan for a transition which is equitable and inclusive. For example the IEA's Global Commission for People-centred Clean Energy Transitions reported in 2021 that "*People-centred clean energy transitions require a focus on skills, decent jobs and worker protection; social and economic development; equity, social inclusion and fairness; and engaging people as active participants.*"[2]

When we consider Woodside's contribution towards a just transition we primarily consider our investment in supplying the products and services that our customers need as they secure their energy needs and reduce their emissions.

Our broader contribution to society is outlined in the United Nations Sustainable Development Goals section of the Sustainable Development Report 2022. It includes but is not limited to:

- Provision of decent work. Please also see the People and culture section of the Sustainable Development Report 2022 for more information.
- Our approach to the inclusion of local content in the procurement of goods and services. Please see the Supply chain and local content section of the Sustainable Development Report 2022 for more information.
- Payments to government including taxes. Please see the Tax transparency section of the Sustainable Development Report 2022 for more information.
- Social contribution and stakeholder engagement including amongst others, employee engagement, partnering with communities and social investment. Please see the Social section of the Sustainable Development Report 2022 for more information.
- Research programs and contributions towards scientific research and studies. Please see the Environment and biodiversity section of the Sustainable Development Report 2022 for more information.

Collaboration

The scale of the change required to achieve a just transition will require commitment and collaboration between governments, industry, investors and communities. Our approach is informed by our membership of Ipieca's Just Transition Task Force that aims to support collaboration and sharing of good practice as companies develop their decarbonisation plans. Woodside is also a member of various international forums that encourage information sharing and collaboration across industry.

1 UNFCCC 2016. The Paris Agreement, preamble.
2 IEA (2021), "Recommendations of the Global Commission on People-Centred Clean Energy Transitions", IEA, Paris, All rights reserved.

SECTION 6.1

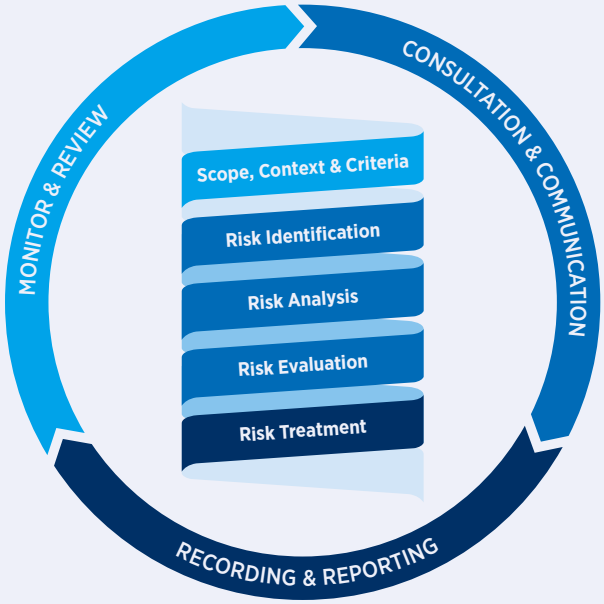
Risk management framework

Woodside is committed to managing risks in a proactive and effective manner. We apply a structured and comprehensive approach to the identification, assessment and treatment of current risks and in response to emerging risks.

Our approach to risk management aims to enable us to take risk in return for reward, protect us against negative impacts and improve our resilience to emerging risks. Woodside recognises that risk is inherent in our business and the effective management of risk is vital to deliver our strategic objectives, continued growth and success.

Our framework is aligned with the overarching principles of the International Standard ISO31000 for risk management, providing line of sight of risk at appropriate levels of the organisation, including the executive team and the Board, based on defined materiality thresholds.

FIGURE 24: RISK MANAGEMENT PROCESS



A key objective of our approach to risk management is to provide a single consolidated view of risks across the company to quantify our full risk exposure and prioritise risk management and governance. Our assessment of risk considers both financial and non-financial exposures, including health and safety; environment; finance; reputation and brand; legal and compliance; social and culture. This assessment is performed against a risk matrix that supports consistent judgement of materiality across the business and defines materiality thresholds that trigger communication of the risk to the relevant level of management. The risk matrix guides the assessment of consequence and likelihood which enables prioritisation of the risk.

The framework requires a twice-yearly review by the executive team and the Board to evaluate the strategic risk profile, the effectiveness of the management of the material current risks and our resilience to emerging risks. In 2022, the Board reviewed and confirmed that our risk management framework is sound, and that Woodside is operating with due regard to the risk appetite endorsed by the Board.

Climate change is one of the seven strategic risks identified within Woodside's strategic risk profile. It is therefore a key risk to our strategy and our business, alongside the other six strategic risks described in our Annual Report 2022. This means that the risk management framework described on these pages is specifically applied to consideration of climate-related risks and opportunities. This includes the evaluation of climate-related risk, and communication of this evaluation to senior management and the Board.

Refer to Annual Report 2022 section 3.8 for information.

The identified potential key climate-related risks and opportunities are described on pages 56-57 and a focus on physical risks is on pages 22-23.

The risk management framework helps to provide an integrated and coordinated approach to the management of climate change across the business and that the risks posed by the transition to a lower carbon economy are recognised, including changes in policy, regulation or social expectations in current or future markets.

Risk appetite

In 2020, the Board endorsed Woodside's Risk Appetite Statement. This is a set of principles-based, qualitative statements that presents a collective and aligned view of the Board's appetite to take and accept risk, in pursuit of our strategic objectives. It provides guidance to the executive team on the type and amount of risk that is acceptable and is intended to encourage conscious engagement and informed decision making, consistent with other company policies, including our Climate Policy. The Risk Appetite Statement remains valid post merger.

Our risk and compliance behaviours

Woodside recognises that when faced with challenge and uncertainty, it is the actions, behaviours and responses of our leaders at all levels that shapes our culture. In 2021, Woodside released an 'Our Risk and Compliance Behaviours' framework to provide further guidance on the positive behaviours that promote a strong risk and compliance culture.

These behaviours recognise that the world we live and work in is constantly changing and we need to adapt in order to thrive as a business. They recognise the need to confront and embrace risk, challenge our conventional ways of working and make courageous decisions, while keeping each other safe, complying with the law and maintaining our social licence to operate.

Risk register

Woodside prioritises risk management actions and governance through use of risk register tools. In 2023, Woodside will merge the existing heritage Woodside and heritage BHP registers to form a single risk register. The functionality within the register provides transparency and enhances the ability of senior leaders to effectively manage and govern climate-related risks, including checking that identified actions to address or manage risk have been closed out.

Key climate-related risks and opportunities

This table describes the potential for climate-related risks and opportunities to impact Woodside's business, strategy, and financial planning, including potential financial impacts and potential mitigations. This does not necessarily mean that the risks have materialised in practice or that the mitigations are currently being pursued. This is presented using the TCFD framework.

***Timeframe:**[1]
S: now to 2025 (short)
M: 2026-2035 (medium)
L: 2036 and beyond (long)

	Timeframe*			Type of potential impact	Potential financial impacts	Potential mitigations
	S	M	L			
Transition risks The global transition to a lower carbon economy may entail extensive policy, legal, technology and market changes in order for the world to address mitigation and adaptation requirements relating to climate change.				**Policy and legal risks**		
	✓	✓	✓	Exposure to litigation	• Increased operating costs • Deferred revenue from project startups due to delays to, or failure to obtain, regulatory approvals • Asset valuation changes • Legal costs and fines • Increased decommissioning costs • Shareholder divestment • Access to capital	• Adopt and deliver targets for net equity emissions reduction • Report in alignment with TCFD recommendations and emerging standards • Build a diverse carbon credits portfolio • Engage regulators and stakeholders • Monitor global policy and legal developments • Diversity of geographical footprint
	✓	✓	✓	Delays to, or failure to obtain, project approvals		
	✓	✓	✓	Increased pricing or other regulatory control of emissions		
		✓	✓	Mandates or controls on hydrocarbon product use or access to growth acreage		
	✓	✓	✓	Increased emissions reporting requirements		
				Technology		
	✓	✓	✓	Unsuccessful investment in new technologies	• Loss of research and development expenditure • Increased operating costs • Impact on revenue	• Technology collaboration and partnerships • Opportunity management process • Maintain internal capability with proven track record • Jurisdictional diversity for leveraging legislative incentives
		✓	✓	Higher than expected costs of transition to new technologies		
	✓	✓	✓	Overreliance on policy support to support commerciality		
		✓	✓	Technology disruption		
		✓	✓	Inability to develop at scale due to competition for resources, people or technology		
				Market		
		✓	✓	Faster than expected substitution of hydrocarbon products	• Lower demand for hydrocarbon, new energy or lower carbon services relative to investment case • Natural gas crowded out of carbon budget by coal and/or unable to achieve attractive pricing • Under or over investment in product portfolio components • Modified and unstable tax and fiscal settings • Stranded assets	• Implement strategy to be a low cost and lower carbon energy company • Scope 3 emissions plan • Capital allocation framework • Customer and market engagement • Scenario analysis • Portfolio and market diversity • Carbon border adjustment mechanisms or related policy
		✓	✓	Slower than expected adoption of new energy and lower carbon services		
	✓	✓	✓	Slower than expected phase-out of coal		
		✓	✓	Uncertainty/regional variation in transition pathways		
		✓	✓	Demand destruction due to disorderly transition or being an unpreferred provider		
				Reputation		
	✓	✓		Increased stakeholder concern	• Increased operating costs • Increased capital costs • Exacerbated policy and legal risks • Impact on revenue • Inhibited growth • Shareholder divestment	• Adopt and deliver targets for net equity emissions reduction • Report in alignment with TCFD recommendations and emerging standards • Engage regulators and stakeholders • ESG planning and engagement
	✓	✓		Targets fail to meet stakeholder expectations		
	✓	✓		Stigmatisation of hydrocarbon energy sector		
	✓	✓		Constrained access to talent		
	✓	✓		Constrained access to capital		
	✓	✓		Inability to pursue range of climate-related pathways		
	✓	✓		Targeted extreme activism		

1 Woodside has selected these short, medium and long term timeframes reflecting the nature of its business. The short term period can impact its current producing assets and sanctioned projects; the medium term timeframe could impact on these current assets and sanctioned projects as well as opportunities under active evaluation but not yet subject to a final investment decision; and the long term timeframe could impact on both these categories of asset and project as well as opportunities beyond current consideration.

	Timeframe*			Type of potential impact	Potential financial impacts	Potential mitigations
	S	M	L			
Physical risks Physical risks from climate change may have financial implications for organisations such as direct damage to assets and indirect impacts from supply chain disruption.						
Acute						
	✓	✓	✓	Increased frequency, severity and/or duration of extreme weather events, such as tropical cyclones, hurricanes, rainfall, flooding, storm surge, lightning, squalls, bushfires and/or heat waves	• Damage to assets/reduced asset life (Stranded assets) • Decreases in production • Increases in emergency response-related costs • Supply chain and logistics disruptions and/or cost increases • Decreased workforce productivity • Underperformance of tree planting	• Design of facilities to withstand harsh operating environments • Equipment redundancy/sparing • Maintenance of safety critical equipment and control systems • Business and performance planning • HSE culture and procedures • Emergency response plans and procedures • Supplier relationship frameworks and diversification • Annual preventative bushfire maintenance and geographic diversity in carbon offset origination portfolio
Chronic						
		✓	✓	Longer-term shifts in climate patterns, such as warmer ambient temperatures, rising sea levels, coastal erosion, reduced water availability, and lower rainfall in tree planting areas	• Decreased production • Decreased workforce productivity • Increased operating and capital cost required to maintain current performance • Underperformance of tree planting	• Design of facilities to withstand harsh operating environments • Equipment redundancy/sparing • Maintenance of safety critical equipment and control systems • HSE culture and procedures • Geographic diversity in carbon offset origination portfolio • Desalination as technology option for access to water
Opportunities Efforts to mitigate and adapt to climate change also produce opportunities for organisations.						
Resource efficiency						
	✓	✓	✓	Fuel gas savings diverted to sales gas	• Increased sales revenue • New revenue streams • Reduced operating costs	• Asset decarbonisation plans • Optimisation reference plans • Scope 3 emissions plan influencing suppliers
	✓	✓	✓	More efficient shipping fleet		
	✓	✓	✓	More efficient building stock		
	✓	✓	✓	Recycling of decommissioned materials		
Energy source						
	✓	✓	✓	Use of renewable energy generation	• Increased production • Reduced operating costs • Reduced exposure to carbon costs	• Develop a new energy business • Design out emissions • Asset decarbonisation plans
	✓	✓	✓	Use of efficient technologies		
	✓	✓	✓	Use of energy storage		
Products and services						
	✓	✓	✓	Diverse portfolio of products and services including natural gas in decarbonisation pathways	• Reduced demand side risk • Ability to achieve attractive pricing • Lower operating costs	• Capital allocation framework • Technology collaboration and partnerships • Portfolio diversity • Customer and market engagement
	✓	✓	✓	Development of new business lines		
	✓	✓	✓	New technologies for forecasting physical risk		
Markets						
	✓	✓	✓	Use of public sector incentives	• Reduced development costs	• Engage regulators and stakeholders • Climate-related advocacy
	✓	✓	✓	Collaborative partnership with customers, research institutions and broader industry organisations		
	✓	✓	✓	Access to new markets		
Resilience						
	✓	✓	✓	Broader portfolio inclusive of oil, gas and new energy opportunities	• Diverse revenue streams • Better competitive position to reflect shifting consumer preferences	• Capital allocation framework • Scope 3 emissions plan
	✓	✓	✓	Access to sustainable finance		
	✓	✓	✓	Decrease climate risk in the supply chain		
	✓	✓	✓	Capital allocations strategy to flex between product streams		

SECTION 7.1

Climate-related data

Metric*	Unit of measure	2022	2021
Hydrocarbon production			
Total – equity[1,2]	kt	18,752	10,522
Total – operated[1,3]	kt	30,361	25,807
Sales (including Traded Hydrocarbons) – equity[4]	kt	20,261	12,977
Global Scope 1 and 2 greenhouse gas emissions[5]			
Scope 1 and 2 emissions – equity (net)[2,6]	kt CO_2-e	4,615	3,235
Scope 1 emissions – equity (gross)	kt CO_2-e	5,357	3,541
Scope 2 emissions – equity (gross)	kt CO_2-e	13	6
Equity offsets retired in respect of 2021 emissions	kt CO_2-e	754	312
Scope 1 and 2 emissions – operated (gross)[3]	kt CO_2-e	9,573	8,908
Scope 1 emissions – operated (gross)	kt CO_2-e	9,565	8,901
Scope 2 emissions – operated (gross)	kt CO_2-e	8	8
Percentage of equity Scope 1 and 2 emissions covered under emissions limiting regulations[7]	%	95	99.5
Sources of Scope 1 greenhouse gas emissions			
Fuel combustion	kt CO_2-e	3,612	2,412
Flare	kt CO_2-e	688	461
Venting	kt CO_2-e	1,057	667
Other	kt CO_2-e	0	0.2
Methane			
Methane emissions (greenhouse equivalent) - equity	kt CO_2-e	193	133
Percentage of equity gross Scope 1 and 2 emissions that are methane	%	4	3.7
Methane intensity – equity	t CH_4 / kt total production	0.42	0.45
Methane intensity – equity (Sm^3 / Sm^3 marketed gas)[8]	%	0.072	0.064
Methane emissions (greenhouse equivalent) – operated	kt CO_2-e	273	326
Methane intensity – operated	t CH_4 / kt total production	0.32	0.45
Methane intensity – operated (Sm^3 / Sm^3 marketed gas)[8]	%	0.054	0.064
Global Scope 3 greenhouse gas emissions estimates			
Scope 3 emissions – equity, total	kt CO_2-e	60,699	37,186
Scope 3 emissions – purchased goods and services, related to Traded Hydrocarbon – equity	kt CO_2-e	1,011	1,375
Scope 3 emissions – selected other upstream – equity[9]	kt CO_2-e	256	200
Scope 3 emissions – downstream transportation and distribution – equity[10,11]	kt CO_2-e	1,477	819
Scope 3 emissions – use of sold product, related to Woodside production – equity	kt CO_2-e	53,188	27,906
Scope 3 emissions – use of sold product, related to Traded Hydrocarbon – equity[12]	kt CO_2-e	4,768	6,886
Greenhouse gas emissions intensity			
Scope 1 and 2 emissions intensity – equity (net)	kt CO_2-e / kt	0.25	0.31
Scope 1 and 2 emissions intensity - operated (gross)	kt CO_2-e / kt	0.32	0.34
Scope 1, 2, 3 emissions intensity of production[13]	g CO_2-e / MJ	63	58

* The amounts in this report have been rounded to the nearest unit of measure. Small differences are due to rounding.

1 Hydrocarbon production includes exportable hydrocarbons only and comprises of LNG, pipeline gas, crude oil, condensate and natural gas liquids (NGLs). Traded hydrocarbons are excluded.

2 The equity portion of greenhouse gas emissions, flare, fuel and production values include data from non-operated ventures where Woodside owns an equity portion. Where data has been provided by third parties it has been used. Where data is not available estimates have been used based on extrapolation of historic data.

3 Operated greenhouse gas emissions, flare, fuel and production values are for Woodside operated production assets only, 100% share.

4 Traded hydrocarbons means the purchase and/or sale of spot and/or strip of LNG cargoes, crude oil or pipeline gas.

5 Greenhouse gas emissions, energy values and global warming potentials are estimated in accordance with the relevant reporting regulations in the jurisdiction where the emissions occur (e.g. Australian National Greenhouse and Energy Reporting (NGER), US EPA Greenhouse Gas Reporting Program (GHGRP)). Australian regulatory reporting principles have been used for emissions in jurisdictions where regulations do not yet exist.

6 Equity emissions are based on the GHG Protocol Corporate Standard and the Ipieca Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions 2nd Edition, May 2011. Equity emissions from non-hydrocarbon producing subsidiary companies (e.g. shipping companies) are excluded.

7 Remaining 5% is due to international assets and Australian assets with emissions below the Safeguard Mechanism legislation threshold.

8 Methane intensity is calculated as the volume of methane emissions divided by the volume of marketed gas inclusive of LNG, pipeline gas and natural gas liquids.

9 Selected upstream emissions from GHG Protocol Categories 1 (purchased goods and services, not including production of purchased hydrocarbon); 5 (waste generated in operations); 6 (business travel); and 7 (employee commuting). Includes equity emissions associated with Woodside employees and Woodside operated facilities only.

10 Includes emissions associated with the downstream transport (GHG Protocol Category 9) of Woodside's equity share of hydrocarbon sales. No adjustment has been made for combustion of sold product during transport (e.g. LNG combusted by LNG ships, pipeline gas used in transmission compressor stations) and therefore could be double counted.

11 2021 reported value only includes downstream transportation of Woodside equity LNG. 2022 reported number includes downstream transportation of all Woodside equity production.

12 2021 reported value only includes traded LNG.

13 Emissions intensity is calculated based on net equity Scope 1 and 2 greenhouse gas emission as well as equity Scope 3 (use of sold product) and Woodside's equity production. Metric excludes emissions and production related to traded hydrocarbons.

SECTION 7.2

Glossary

Abate / abatement	Reduction of an amount of carbon dioxide or equivalent.[1]
AR6-WG1	IPCC (2021). "Climate Change 2021 – the Physical Science Basis. Summary for Policymakers. Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change".
AR6-WG2	IPCC (2022). "Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change"
AR6-WG3	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"
Aspiration	Woodside uses this term to describe an aspiration to seek the achievement of an outcome but where achievement of the outcome is subject to material uncertainties and contingencies such that Woodside considers there is not yet a suitable defined plan or pathway to achieve that outcome.
Board	The Board of Directors of Woodside Energy Group Ltd.
Carbon credit	A tradable financial instrument that is issued by a carbon-crediting program. A carbon credit represents a greenhouse gas emission reduction to, or removal from, the atmosphere equivalent to 1 tCO_2-e, calculated as the difference in emissions from a baseline scenario to a project scenario. Carbon credits are uniquely serialised, issued, tracked and retired or administratively cancelled by means of an electronic registry operated by an administrative body, such as a carbon-crediting program.
Carbon sinks	Carbon sinks are forests and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting CO_2 emissions. (Definition taken from European Commission "Climate change: glossary of common terms and acronyms". https://www.eea.europa.eu/help/glossary/eea-glossary/carbon-sink)
CCS	Carbon capture and storage
CCU	Carbon capture and utilisation
CCUS	Carbon capture utilisation and storage
CH_4	Methane
CO_2	Carbon dioxide
CO_2-e	CO_2 equivalent. The universal unit of measurement to indicate the global warming potential of each of the seven greenhouse gases, expressed in terms of the global warming potential of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) any greenhouse gas against a common basis.[2]
COP-26	The 26th Conference of the Parties to the United Nations Framework Convention on Climate Change, meeting in Glasgow, Scotland, November 2021.
COP-27	The 27th Conference of the Parties to the United Nations Framework Convention on Climate Change, meeting in Sharm el-Sheikh, Egypt, November 2022.
Decarbonisation	Woodside uses this term to describe activities or pathways that have the effect of moving towards a state that is lower carbon, as defined in this glossary.
Equity greenhouse gas emissions	Woodside sets its Scope 1 and 2 greenhouse gas emissions reduction targets on an equity basis. This ensures that the scope of its emissions reduction targets is aligned with its economic interest in its investments. Equity emissions reflect the greenhouse gas emissions from operations according to Woodside's share of equity in the operation. Its equity share of an operation reflects its economic interest in the operation, which is the extent of rights it has to the risks and rewards flowing from the operation.[3]
FID	Final investment decision
GHG or greenhouse gas	The seven greenhouse gases listed in the Kyoto Protocol are: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_20); hydrofluorocarbons (HFCs); nitrogen trifluoride (NF_3); perfluorocarbons (PFCs); and sulphur hexafluoride (SF_6).[2]
Goal	Woodside uses this term to broadly encompass its targets and aspirations.
IRR	Internal rate of return
LNG	Liquefied natural gas
Lower carbon	Woodside uses this term to describe the characteristic of having lower levels of associated potential GHG emissions when compared to historical and/or current conventions or analogues, for example relating to an otherwise similar resource, process, production facility, product or service, or activity.
Lower carbon economy	A lower carbon economy is an economy that produces lower levels of greenhouse gas emissions relative to today's economy.
Lower carbon energy provider	Woodside uses this term to describe its aspiration to develop a lower carbon portfolio.

*All footnotes related to this table are displayed at the end of the glossary.

Lower carbon portfolio	For Woodside, a lower carbon portfolio is one from which the net equity scope 1 and 2 greenhouse gas emissions, which includes the use of offsets, are being reduced towards targets, and into which new energy products and lower carbon services are planned to be introduced as a complement to existing and new investments in oil and gas. Our Climate Policy sets out the principles that we believe will assist us achieve this aim.
Lower carbon power	Lower carbon power comes from processes or technologies that produce electricity with a lower greenhouse gas emissions intensity relative to electricity produced from a higher emissions intensity source.
Lower carbon services	Woodside uses this term to describe technologies, such as CCUS or offsets that could be used by customers to reduce their net greenhouse gas emissions.
LNG	Liquefied natural gas
Net equity greenhouse gas emissions	Woodside's equity share of net greenhouse gas emissions.
Net greenhouse gas emissions	Woodside has set its Scope 1 and 2 greenhouse gas emissions reduction targets on a net basis, allowing for both direct emissions reductions from its operations and emissions reductions achieved from the use of offsets. Net greenhouse gas emissions are equal to an entity's gross greenhouse gas emissions reduced by the number of retired carbon credits.
Net zero	Net zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period. Where multiple greenhouse gases are involved, the quantification of net zero emissions depends on the climate metric chosen to compare emissions of different gases (such as global warming potential, global temperature change potential, and others, as well as the chosen time horizon).[4]
New energy	Woodside uses this term to describe energy technologies, such as hydrogen or ammonia, that are emerging in scale but which are expected to grow during the energy transition due to having lower greenhouse gas emissions at the point of use than conventional fossil fuels.
NGL	Natural gas liquids
Offsets	The compensation for an entity's greenhouse gas emissions within its scope by achieving an equivalent amount of emission reductions or removals outside the boundary or value chain of that entity.
Operator, Operated and non-operated	Oil and gas joint venture participants will typically appoint one company as the operator, which will hold the contractual authority to manage joint venture activities on behalf of the joint venture participants. Where Woodside is the operator of a joint venture in which it holds an equity share, this report refers to that joint venture as being operated. Where another company is the operator of a joint venture in which Woodside holds an equity share, this report refers to that joint venture as being non-operated.
Paris aligned scenarios	Consistent with limiting global warming to below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.[2]
Retirement	The transfer of a carbon credit to a registry account that permanently removes the carbon credit from circulation. The term retirement applies to the use of the carbon credit by an entity to meet voluntary commitments or compliance obligations.
SASB	Sustainability Accounting Standards Board
Science-based targets	Targets are considered science-based if they are in line with what the most recent climate science sets out is necessary to meet the goals of the Paris Agreement — limiting global warming to below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.[2]
Short-, medium- and long-term	This report refers to ranges of time as follows: short-term means from now until 2025; medium-term means 2026-2035; long-term means 2036 and beyond. Woodside also refers to "near-term" and "medium-term" in the specific context of its net equity Scope 1 and 2 greenhouse gas emissions reduction targets. In this context, near-term refers to the 2025 as a point in time, and medium term refers to 2030 as a point in time, being the years to which the targets relate.
Scope 1 GHG emissions	Direct GHG emissions. These occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment. Woodside estimates greenhouse gas emissions, energy values and global warming potentials are estimated in accordance with the relevant reporting regulations in the jurisdiction where the emissions occur (e.g. Australian National Greenhouse and Energy Reporting (NGER), US EPA Greenhouse Gas Reporting Program (GHGRP)). Australian regulatory reporting principles have been used for emissions in jurisdictions where regulations do not yet exist.[3]
Scope 2 GHG emissions	Electricity indirect GHG emissions. Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated. Woodside estimates greenhouse gas emissions, energy values and global warming potentials are estimated in accordance with the relevant reporting regulations in the jurisdiction where the emissions occur (e.g. Australian National Greenhouse and Energy Reporting (NGER), US EPA Greenhouse Gas Reporting Program (GHGRP)). Australian regulatory reporting principles have been used for emissions in jurisdictions where regulations do not yet exist.[3]
Scope 3 GHG emissions	Other indirect GHG emissions. Scope 3 is a reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of Scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services. Please refer to the data table on page 58 for further information on the Scope 3 emissions categories reported by Woodside.[3]

*All footnotes related to this table are displayed at the end of the glossary.

Stranded assets	Stranded assets can be broadly defined as assets which 'suffer from unanticipated or premature write-offs, downward revaluations or conversion to liabilities'.
Target	Woodside uses this term to describe an intention to seek the achievement of an outcome, where Woodside considers that it has developed a suitably defined plan or pathway to achieve that outcome.
TCFD	Taskforce on Climate-related Financial Disclosures.

Units of measure

bcm	billion cubic metres
EJ	Exajoule
g	Gram
GJ	Gigajoule
GW	Gigawatt
GWh	Gigawatt hour
kW	Kilowatt
MJ	Megajoule
Mt	Million tonnes
Mtpa	Million tonnes per annum
MW	Megawatt
MWh	Megawatt hour
Sm³	Standard cubic metre
Tonnes (t and kt)	In this report, "t" means tonne and "kt" means kilotonne, being one thousand tonnes.
tpd	Tonnes per day

1 Definition as per the Australian Government Climate Change Authority. https://www.climatechangeauthority.gov.au/sites/default/files/2022-08/Review%20of%20International%20Offsets%20-%20Report%20-%20August%202022.pdf.

2 See IFRS Foundation 2021: Climate Related Disclosures Prototype. Appendix A. The IFRS published a further consultation document subsequent to the 2021 prototype. As it did not contain a updated definition of Paris-Aligned scenarios Woodside has retained use of the previous edition.

3 World Resources Institute and World Business Council for Sustainable Development 2004. "GHG Protocol: a corporate accounting and reporting standard".

4 IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. Page 555.

SECTION 7.3

Index

INDEX TO TCFD RECOMMENDATIONS AND SUPPORTED RECOMMENDED DISCLOSURES[1]

Governance: Disclose the organization's governance around climate-related risks and opportunities.	
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Describe management's role in assessing and managing climate-related risks and opportunities.	Pages 50-57
Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	
Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Pages 56-57
Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	Pages 8-39
Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Pages 24-25
Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks.	
Describe the organization's processes for identifying and assessing climate-related risks.	Pages 54-55
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Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	Pages 54-55
Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material	
Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Pages 40-47
Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Pages 56-58
Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Pages 28-47

INDEX TO SELECTED RELEVANT SASB METRICS[2]

EM-EP-110a.1 Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations	Page 58
EM-EP-110a.2 Amount of gross global Scope 1 emissions from: (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions, and (5) fugitive emissions	Page 58
EM-EP-110a.3 Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Pages 8-47

1 Financial Stability Board 2017. "Recommendations of the Task Force on Climate-related Financial Disclosures. Final Report." Figure 4, Page 14.
2 Sustainability Accounting Standards Board 2018. "Oil & Gas – Exploration and Production . Sustainability Accounting Standard. Version 2018-10." Table 1, Page 6.

SECTION 7.4

Disclaimer, risks, emissions data and other important information

1. This report has been prepared to provide our investors and potential investors with information on our plan to help us achieve our strategic aim to thrive through the energy transition and how we are progressing against that strategic aim.
2. This report has been structured to align with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations framework. It aims to provide a balance of disclosures that meet the recommendations of the TCFD, while avoiding overwhelming readers with information. Woodside considers that it addresses TCFD's four recommendations and eleven recommended disclosures, having had regard to the Guidance for all Sectors and Guidance for Non-Financial Groups.
3. This report has not been prepared as financial or investment advice or to provide any guidance in relation to our future performance. It should be read in conjunction with our periodic reporting and other announcements made to the Australian Securities Exchange, New York Stock Exchange and London Stock Exchange.
4. Given the focus of this report, it is necessarily oriented towards future events and contains forward looking information regarding the plans, strategies, objectives, targets, aspirations and the like of Woodside in relation to climate change. Neither our plan to help us achieve our strategic aim, nor the content of this report more generally, is a statement, guarantee or prediction that future events will or are likely to occur.
5. The information in this report provides a level of insight into how we currently intend to direct the management of our assets and to deploy our capital, to help us achieve our strategic aim. The matters disclosed in this report are a 'point in time' disclosure and reflect management's expectations, judgments, assessments, assumptions, estimates and other information available at the date of this report and/or the date of our planning processes. We operate in a dynamic and uncertain market and external environment. Plans and strategies can and must adapt in response to dynamic market conditions, joint venture decisions, new opportunities that might arise or other changing circumstances. Investors should not assume that our plan to achieve our strategic aim is locked in and will not evolve and be updated as time passes. Additionally, a number of aspects of our plan involve developments or strategies that are complex and may be delayed, more costly than anticipated or unsuccessful for many reasons, including reasons that are outside of Woodside's control.
6. This report contains forward looking statements that are subject to known and unknown risk factors and uncertainties, including those associated with oil and gas businesses and the global transition to a lower carbon economy.
7. Those forward looking statements are not guidance, forecasts, guarantees or predictions of future events or performance. No representation or warranty, express or implied, is given as to the accuracy, completeness or correctness, likelihood of achievement or reasonableness of any forward-looking information contained in this report.
8. Actual performance against Woodside's targets (including items that are described as a target) and aspirations or goals may be affected by various risks associated with the Woodside business, the uncertainty as to how the global energy transition to a lower carbon economy will evolve, and physical risks associated with climate change, many of which are beyond Woodside's control. Further detail on certain of these risks can be found in the Risk Management section of this report and the risk factors section of our Annual Report 2022. These risks include, but are not limited to:
   - The risk that a transition to a lower carbon economy may impact demand (and pricing) for oil and liquids, LNG and its substitute in our portfolio, the policy and legal environment for its production, our reputation and our operating environment. Further, the imposition of further regulation and the availability and cost of emission allowances or carbon offsets could adversely impact costs of operations;
   - The potential for higher than expected costs of transition to new technologies, and poor efficacy of new technologies that could adversely impact the costs of operations and reduce demand for hydrocarbon products, new energy or lower carbon services; and
   - The decarbonisation plans of other countries.
9. Readers, including investors and prospective investors, should review and have regard to these risks and the other risks identified in this report when considering the information contained in this report. Readers should also note that the high degree of uncertainty around the nature, timing and magnitude of climate-related risks, and the uncertainty as to how the energy transition will evolve, makes it difficult to determine and disclose the risks and their potential impacts with precision. Readers are cautioned not to place undue reliance on any forward looking statements contained in this report, particularly in light of the long-time horizon which this report discusses and the inherent uncertainty in possible policy, market and technological developments in the future.

10. The forward looking information contained in this report may be affected by a variety of variables and changes in underlying assumptions which could cause actual results to differ materially from those expressed in the statements contained in this report. In addition to the risks referenced above, these include price fluctuations, actual demand, currency fluctuations, drilling and production results, reserve estimates, loss of market, industry competition, environmental risks, transition risks, physical risks, legislative, policy, fiscal and regulatory developments, changes in accounting standards, economic and financial market conditions in various countries and regions, political risks, abatement able to be delivered through engineering or operational changes, project delay or advancement, approvals and cost estimates. Some matters are subject to approval of joint venture participants. The targets, aspirations and opportunities described in this report might also change materially if Woodside changes its strategic aim set out in this report.
11. There are inherent limitations with scenario analysis, including the limitations set out on page 16 of this report, and it is difficult to predict which, if any, of the scenarios might eventuate. Scenario analysis relies on assumptions that may or may not be, or prove to be, correct and that may or may not eventuate and scenarios may also be impacted by additional factors to the assumptions disclosed. As part of its scenario analysis, Woodside has used climate scenarios published in the IEA's 2022 World Energy Outlook and the TCFD Guidance on Scenario Analysis for Non-Financial Companies (page 66 describes limitations and uncertainties associated with the use of the IEA scenarios).[1]
12. Woodside does not undertake to provide ongoing market updates on forward looking information, including the plan to achieve its strategic aim or targets, or on performance against the plan or targets, except to the extent it has a legal obligation to do so. Past performance cannot be relied on as a guide to future performance.
13. Subject to any terms implied by law which cannot be excluded, Woodside accepts no responsibility for any loss, damage, cost or expense (whether direct or indirect) incurred by you as a result of any error, omission or misrepresentation in information in this report.
14. This report does not include any express or implied prices at which Woodside will buy or sell financial products.
15. This report is not intended to, and does not constitute, form part of, or contain an offer or invitation to sell to Woodside (or any other person) or a solicitation of an offer from Woodside (or any other person) in any jurisdiction.
16. This report may contain industry, market and competitive position data that is based on industry publications and studies conducted by third parties as well as Woodside's internal estimates and research. While Woodside believes that each of these publications and third party studies is reliable and has been prepared by a reputable source, Woodside has not independently verified the market and industry data obtained from these third party sources and cannot guarantee the completeness or accuracy of such data. Undue reliance should not be placed on any of the industry, market or competitive position data contained in this report.
17. Certain other information contained in this report may be based on information prepared by third parties. Woodside does not make any representation or guarantee that this third party material is accurate, complete or up-to-date.
18. All greenhouse gas emissions data in this report are estimates, due to the inherent uncertainty and limitations in measuring or quantifying greenhouse gas emissions, including those uncertainties set out in the GHD Assurance Statement.
19. Further information regarding the calculation of Woodside's greenhouse gas emissions is contained in the supporting table of climate-related data provided on page 58 of this report.
20. There may be differences in the way third parties calculate or report greenhouse gas emissions compared to Woodside, which means third party data may not be comparable to Woodside's data.

1 The Task Force on Climate-related Financial Disclosures (2020). "Guidance on Scenario Analysis for Non-Financial Companies".

GHD assurance statement

Independent Assurance Statement on Woodside Energy Group Ltd's Greenhouse Gas (GHG) Statement – Climate Report 2022

To the Management of Woodside Energy Group Ltd (Woodside);

We have undertaken a reasonable assurance engagement of Woodside's:

Scope	Metrics
Reasonable Assurance Scope Heritage Woodside assets And Heritage BHP assets (Operated) **Limited Assurance Scope** Heritage BHP assets (non-operated)	**Hydrocarbon production** – Total - equity (kt) – Total - operated (kt) – Sales (including LNG produced by third parties) - equity (kt) **Global Scope 1 and 2 greenhouse gas emissions** – Scope 1 and 2 emissions – equity (net) (kt CO_2-e) – Scope 1 and 2 emissions – equity (gross) (kt CO_2-e) – Equity offsets surrendered in respect of 2022 emissions (kt CO_2-e) – Scope 1 and 2 emissions intensity – equity (net) (kt CO_2-e / kt) – Scope 1 and 2 emissions – operated (gross) (kt CO_2-e) – Scope 1 and 2 emissions intensity - operated (gross) (kt CO_2-e / kt) – Percentage of equity Scope 1 and 2 emissions covered by regulation (%) **Sources of scope 1 and 2 greenhouse gas emissions** – Fuel combustion (kt CO_2-e) – Flare (kt CO_2-e) – Venting (kt CO_2-e) – Other (kt CO_2-e) **Methane** – Methane emissions (greenhouse equivalent) - equity (kt CO_2-e) – Percentage of equity gross Scope 1 and 2 emissions that are methane (%) – Methane intensity – equity (t CH_4 / kt total production) – Methane intensity – equity (Sm^3 / Sm^3 marketed gas) – Methane emissions (greenhouse equivalent) - operated (kt CO_2-e) – Methane intensity – operated (t CH_4 / kt total production) – Methane intensity – operated (Sm^3 / Sm^3 marketed gas)
Limited Assurance Scope All assets	**Global Scope 3 greenhouse gas emissions estimates** – Scope 3 emissions – equity, total (kt CO_2-e) – Scope 3 emissions – purchased goods and services, relating to traded LNG (kt CO_2-e) – Scope 3 emissions – selected other upstream (assured on aggregate, including: purchased goods and services, waste generated in operations, business travel and employee commuting) (kt CO_2-e) – Scope 3 emissions – downstream transportation and distribution (kt CO_2-e) – Scope 3 emissions – use of sold product, relating to produced and traded LNG (kt CO_2-e) **Greenhouse gas emissions intensity** – Scope 1, 2, 3 emissions intensity of production (grams CO_2-e / MJ)

for the year ending 31 December 2022, comprising the 2022 values shown in the supporting data table of Woodside's Climate Report (the subject matter referred to hereafter as Woodside's greenhouse gas (GHG) statement). A multidisciplinary team including assurance practitioners and engineers conducted this engagement. Note, assurance was not provided over any Task Force on Climate Related Financial Disclosures (TCFD) or requirements.

Woodside's responsibility for subject matter

Woodside is responsible for preparing the GHG Statement comprising the values shown in the supporting data table. This includes the design, implementation and maintenance of internal control relevant to the preparation of a GHG Statement that is free from material misstatement, whether due to fraud or error.

Our independence and quality control

We have complied with the relevant ethical requirements relating to assurance engagements, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. The firm applied Auditing Standard ASQC 1 *Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, and Other Assurance Engagements*, and accordingly GHD maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Our responsibility

Our responsibility is to express an opinion on the GHG Statement based on evidence obtained. We conducted the reasonable assurance engagement in accordance with Australian Standard on Assurance Engagements ASAE 3410

→ **The Power of Commitment** 1

Assurance Engagements on Greenhouse Gas Statements (ASAE 3410). This requires that we plan and perform the engagement to obtain reasonable assurance about whether the GHG Statement is free from material misstatement.

A reasonable assurance engagement in accordance with ASAE 3410 involves performing procedures to obtain evidence about the quantification of emissions. The nature, timing and extent of procedures selected depend on the assurance practitioner's judgement, including the assessment of the risks of material misstatement, whether due to fraud or error, in the GHG Statement. In making those risk assessments, GHD considered internal control relevant to Woodside's preparation of the subject matter. A reasonable assurance engagement also includes:

– Assessing the suitability of Woodside's use of the reporting criteria for the GHG Statement, as the basis for preparing the GHG statement.
– Evaluating the appropriateness of quantification methods and reporting policies used, and the reasonableness of estimates made by Woodside.
– Evaluating the completeness and accuracy of recording, aggregation, and transcription of source data.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Use of our statement

This statement has been prepared for Woodside in accordance with our engagement terms dated 25 November 2022. GHD disclaim any assumption of responsibility for any reliance on this statement for any purpose other than that for which it was prepared being the reporting on our reasonable assurance audit.

Our agreed engagement only included the metrics described in this assurance statement for the year ended 31 December 2022. Accordingly, we have not provided assurance over any other GHG data or statements presented elsewhere or any other data or statements contained within Woodside's Climate Report 2022.

Whilst our assurance procedures included reviewing information contained on Woodside's website at the date of this assurance statement, our opinion does not extend to statements, data or information presented therein. It is noted that greenhouse gas emissions quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

Inherent limitations

There are inherent limitations in performing assurance—for example, assurance engagements are based on selective testing of the information being examined—and because of this, it is possible that fraud or error may occur and not be detected. An assurance engagement is not designed to detect all misstatements, as an assurance engagement is not performed continuously throughout the period that is the subject of the engagement and the procedures are performed on a test basis. The opinion expressed in our Independent Assurance Statement has been formed on the above basis.

Further Limitations

This report has been prepared by GHD for Woodside Energy Group Ltd and may only be used and relied on by Woodside Energy Group Ltd for the purpose of reporting on the GHG Statement presented in Woodside's 2022 Climate Report. GHD otherwise disclaims responsibility to any person other than Woodside Energy Group Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible. The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

Reasonable Assurance Opinion

In our opinion, the metrics in Woodside's GHG Statement for the year ended 31 December 2022 comprising the values presented in the data table of Woodside's Climate Report 2022 (over which we have provided reasonable assurance), have been prepared correctly, in all material respects.

Limited Assurance Opinion

Nothing has come to our attention to suggest that the metrics in Woodside's GHG Statement for the year ended 31 December 2022 comprising the values presented in the data table of Woodside's Climate Report 2022 (over which we have provided limited assurance), have not been prepared correctly in all material respects.

Tom Young

Lead Greenhouse Gas Auditor, RGEA Category 2, GHD Pty Ltd

22 February 2023

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