

30 March 2022

Release of 2022 Climate Change Report

Santos has today released its 2022 Climate Change Report which sets out our climate transition strategy and action plan to become a net-zero emissions¹ energy and fuels business by 2040.

The Climate Change Report features the following milestones for Santos' journey to becoming Net Zero:

- New 2030 targets of a 30 per cent reduction in absolute emissions¹, a 40 per cent reduction in emissions intensity¹ and a Scope 3 target to reduce customer emissions by 1.5 million tonnes of CO₂e per annum
- A commitment to only selling our products to customers from countries that have a net-zero commitment or that are signatories to the Paris Agreement
- A Climate Transition Action Plan, including phased, value-accretive, Paris-aligned capital investment
- A final investment decision on the Moomba carbon capture and storage (CCS) project which is expected to store 1.7 million tonnes of carbon dioxide per annum, making it one of the world's biggest CCS projects
- 100 million tonnes of CO₂ storage capacity booked in South Australia's Cooper Basin, one of the first such bookings in the world
- Final investment decisions on new offshore greenfield projects from 2025 will require abatement or offset of reservoir CO₂ emissions

In step with the goals of the Paris Agreement on climate change and aligned with international reporting standards, the 2022 Climate Change Report affirms that Santos is well placed to manage the risks of climate change, continue to drive sustainable shareholder returns from long-life, low-cost natural gas assets and seize the opportunities associated with the global transition to provide cleaner energy and clean fuels over coming decades.

Santos Managing Director and Chief Executive Officer Kevin Gallagher said Santos is well positioned to decarbonise its natural gas business and generate new revenue streams through carbon solutions such as carbon capture and storage utilising existing infrastructure and depleted natural gas reservoirs, providing a platform to develop clean fuels such as hydrogen as customer demand evolves over time.

"With a strong, low-cost base business supplying natural gas to meet ongoing customer demand and a clear action plan to develop cleaner energy and clean fuels, Santos remains resilient, value accretive and at the leading edge of the energy transition to a low-carbon future," Mr Gallagher said.

¹ Equity Scope 1 and Scope 2

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“Last week, at the International Energy Agency’s invitation, I participated in the 2022 IEA Ministerial meeting. This important event, involving energy ministers of member countries and around 30 global business leaders focused on accelerating global action on clean energy without compromising energy security.

“This year’s Climate Change Report comes as countries around the world are finding that energy and fuel price stability and supply security risks, remain critical considerations on the journey to Net Zero. With natural gas playing a central role in decarbonising energy markets and balancing renewable energy, more investment is needed to ensure supply can keep pace with demand and to diversify supply sources.

“This is a great opportunity for our projects in Australia, Papua New Guinea and Timor-Leste.

“It is vitally important that new supply investment happens in a sustainable way. Companies like Santos, which are publicly listed, subject to ESG scrutiny by their investors and which report transparently on carbon emissions and their climate transition plans, are best placed to supply critical fuels such as oil and gas more sustainably, striving for lower emissions intensity and better environmental outcomes. Divesting assets and driving investment in new supply to less transparent producers will not reduce global emissions or advance the transition to Net Zero.

“A just transition that focuses on reliability, affordability and decarbonisation is critical to ensuring broad global support for the huge task ahead of us as we reach our net-zero targets.”

Last year Santos announced our intention to provide shareholders with a non-binding advisory vote on the company’s Climate Change Report at the 2022 Annual General Meeting. In this year’s report we set out our Climate Transition Action Plan and seek the support of our shareholders for our climate transition approach at our forthcoming Annual General Meeting.

We will continue to publish an annual Climate Change Report including our progress towards our targets and action plan.

The 2022 Climate Change report is available at www.santos.com.

Ends.

This ASX announcement was approved and authorised for release by Kevin Gallagher, Managing Director and Chief Executive Officer.

Santos

Supplying critical fuels more sustainably

2022 Climate Change Report



Acknowledgement

We acknowledge the Traditional Owners of the land where we operate and work. We recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

Context

In December 2021, a merger between Santos Limited and Oil Search Limited was completed. This report covers the merged entity's climate-related strategy, governance, material risks and opportunities, targets and metrics. Where possible, relevant data from the former Oil Search Limited operations have been included in this report, including 2020-21 greenhouse gas emissions data.

Disclaimer and forward-looking statements

This report contains forward-looking statements that are subject to risk factors associated with the oil and gas industry. It is believed that the expectations reflected in these statements are reasonable, but they may be affected by a range of variables which could cause actual results or trends to differ materially, including but not limited to: price fluctuations, actual demand, currency fluctuations, geotechnical factors, drilling and production results, gas commercialisation, development progress, operating results, engineering estimates, reserves and resource estimates, loss of market, industry competition, environmental risks, carbon emissions reduction and associated technology risks, physical risks, legislative, fiscal and regulatory developments, economic and financial market conditions in various countries, approvals, conduct of joint venture participants and contractual counterparties and cost estimates.

The forward-looking information in this report is based on management's current expectations and reflects judgements, assumptions, estimates and other information available as at the date of this document and/or the date of Santos' planning processes. There are inherent limitations with scenario analysis. Scenarios do not constitute definitive outcomes. Assumptions may or may not be, or prove to be, correct and may or may not eventuate, and scenarios may be impacted by factors other than assumptions made. Except as required by applicable regulations or by law, Santos does not undertake any obligation to publicly update or review any forward-looking statements, whether as a result of new information or future events. Forward-looking statements speak only as of the date of this report or the date planning process assumptions were adopted, as relevant. Our strategies and targets will adapt given the dynamic conditions in which we operate; it should not be assumed that any particular strategies, targets or implementation measures are inflexible or frozen in time.

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. Forward-looking statements do not represent guarantees or predictions of future performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond Santos' control, and which may cause actual results to differ materially from those expressed in the statements contained in this report.

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Task Force on Climate-related Financial Disclosures

This is Santos' fifth Climate Change Report aligned with the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) recommendations.

Previous climate change reports are published on our website, www.santos.com.

The report addresses the four TCFD disclosure topics below. A guide to the detailed TCFD disclosure recommendations and where they are addressed in the report is provided on pages 57 to 60. Assurance has been undertaken by Ernst & Young (EY) and the assurance statement is provided on pages 63 to 64.

Governance:

The organisation's governance around climate-related risks and opportunities.

Strategy:

The actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning.

Risk management:

The processes used by the organisation to identify, assess and manage climate-related risks.

Metrics and targets:

The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

Highlights



Strategy

Transform, build, grow

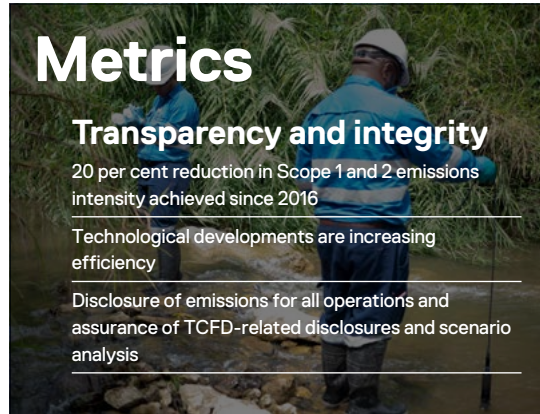
Santos aims to deliver superior shareholder returns whilst being a global leader in the transition providing cleaner energy and clean fuels that are affordable and sustainable as we help the world decarbonise to achieve Net Zero

We will transform to become a cleaner energy and clean fuels business, build around our existing infrastructure by developing natural gas for backfill to meet ongoing customer demand and grow through developing clean fuels projects such as hydrogen. Where possible, we will combine natural gas developments with Carbon Capture and Storage (CCS) projects to reduce carbon emissions from our own production, and create a carbon solutions business, help third parties, including our customers, to reduce their emissions and enable future hydrogen and other clean fuels projects

Santos' Climate Transition Action Plan provides a clear decarbonisation pathway

Emissions reduction targets:¹

- + Net-zero Scope 1 and 2 emissions by 2040
- + 30 per cent reduction in Scope 1 and 2 emissions by 2030
- + 40 per cent reduction in Scope 1 and 2 emissions intensity by 2030
- + Use CCS technology to accelerate the economic feasibility of hydrogen and deliver a step change in emissions reduction by 2030
- + Reduce customers' emissions by at least 1.5 million tonnes per annum of CO₂e from the supply of clean fuels



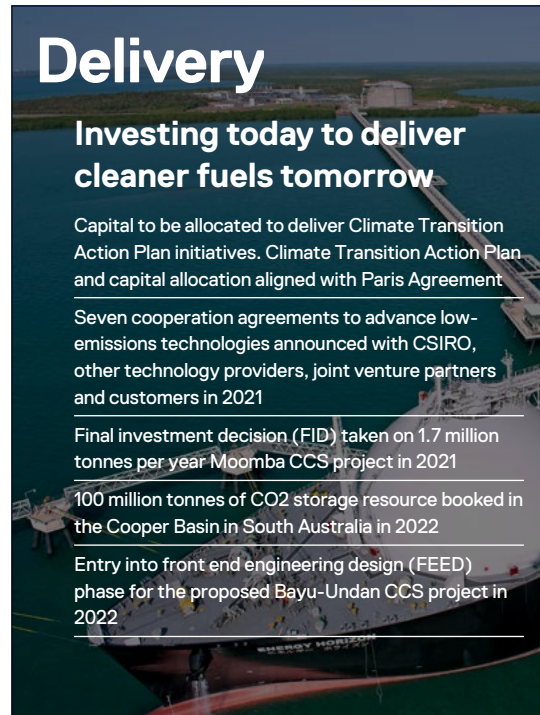
Metrics

Transparency and integrity

20 per cent reduction in Scope 1 and 2 emissions intensity achieved since 2016

Technological developments are increasing efficiency

Disclosure of emissions for all operations and assurance of TCFD-related disclosures and scenario analysis



Delivery

Investing today to deliver cleaner fuels tomorrow

Capital to be allocated to deliver Climate Transition Action Plan initiatives. Climate Transition Action Plan and capital allocation aligned with Paris Agreement

Seven cooperation agreements to advance low-emissions technologies announced with CSIRO, other technology providers, joint venture partners and customers in 2021

Final investment decision (FID) taken on 1.7 million tonnes per year Moomba CCS project in 2021

100 million tonnes of CO₂ storage resource booked in the Cooper Basin in South Australia in 2022

Entry into front end engineering design (FEED) phase for the proposed Bayu-Undan CCS project in 2022

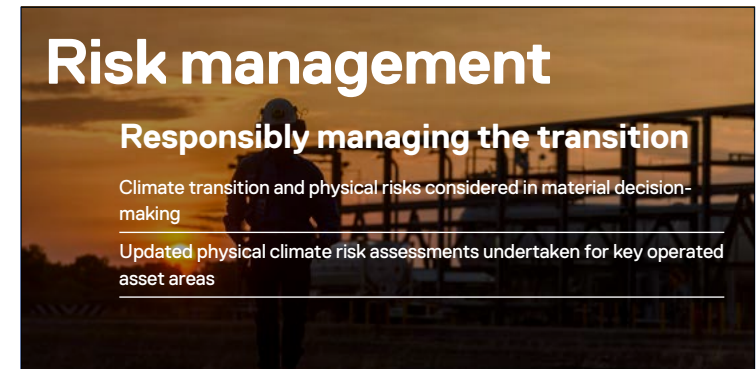


Scenarios

Resilient through the transition

Two IEA World Economic Outlook 2021 scenarios and two 1.5 degrees Celsius scenarios analysed to inform strategy

Investment in climate transition initiatives is subject to Santos' disciplined investment criteria and in line with our low-cost operating model

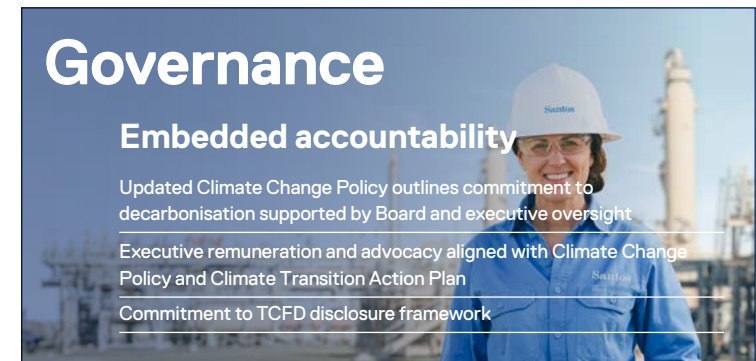


Risk management

Responsibly managing the transition

Climate transition and physical risks considered in material decision-making

Updated physical climate risk assessments undertaken for key operated asset areas



Governance

Embedded accountability

Updated Climate Change Policy outlines commitment to decarbonisation supported by Board and executive oversight

Executive remuneration and advocacy aligned with Climate Change Policy and Climate Transition Action Plan

Commitment to TCFD disclosure framework

¹ 30 per cent absolute reduction is from the Santos and Oil Search combined 2019-20 equity Scope 1 and 2 emissions baseline of 5.9 MtCO₂e and 40 per cent intensity reduction is Santos' equity Scope 1 and 2 emissions intensity from a 2019-20 baseline of 55 ktCO₂e/mmboe

Introduction

Supplying critical fuels more sustainably

[Chair's message](#)

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Chair's message

“ This report, our fifth annual publication aligned with TCFD recommendations on climate-related financial disclosures, confirms once again that Santos is well placed to address the risks and seize the opportunities of the global transition to cleaner energy and clean fuels over coming decades.

At Santos, we aim to deliver superior shareholder returns whilst being a global leader in the transition providing cleaner energy and clean fuels that are affordable and sustainable as we help the world decarbonise to achieve Net Zero.

The 2022 Climate Change Report describes Santos' climate transition strategy and action plan as we work to become a net-zero emissions energy and fuels business by 2040, in step with the goal of the UN Paris Agreement on climate change.

Your Directors see a strategic opportunity in being an early mover to net-zero emissions by 2040 to capture the advantage of a leading position and share in emerging cleaner energy, clean fuels and carbon markets. In doing so we believe we will be contributing to better environmental, social and economic outcomes for the most vulnerable global communities where the burning of wood, charcoal and other biomass causes air pollution and the lack of access to modern energy sources constrains social and economic development.

At the same time we recognise that the transition to Net Zero must ensure continued access to reliable and affordable energy supplies. Over the past year we have seen that a focus only on limiting supply of fossil fuels drives up energy prices, often for the most vulnerable in our society.² These price rises also undermine the world's climate goals. In 2021, instead of continuing to switch away from coal to cleaner energy such as natural gas, coal-fired electricity generation increased by nine per cent to a global all-time high.³ A just transition that focuses on reliability, affordability and decarbonisation is therefore critical to ensure broad global support for the huge task ahead of us.

This report, our fifth annual publication aligned with TCFD recommendations on climate-related financial disclosures, confirms once again that Santos is well placed to address the risks and seize the opportunities of the global transition to cleaner energy and clean fuels over coming decades.

At a time when energy security and affordability is a major issue in economies across Europe, America and Asia, Santos is a leading supplier of critical fuels such as liquefied natural gas (LNG), contributing to energy security as well as climate goals through displacement of higher-emissions coal in power generation and direct heating.

Over time, Santos aims to meet evolving customer demand for cleaner energy through the development of Carbon Capture and Storage (CCS) projects, production of new clean fuels such as hydrogen and high-quality nature-based offsets for residual carbon emissions that can't otherwise be abated. Santos plans to generate excess carbon credits from these technologies to develop a carbon solutions business, creating new revenue streams and helping reduce customer emissions.

Last year we announced our intention to provide shareholders with a non-binding advisory vote on the company's Climate Change Report at the 2022 Annual General Meeting. In this year's report we set out our Climate Transition Action Plan and we hope to gain your support for the climate transition approach described herein.

We will continue to publish an annual Climate Change Report including our progress towards our targets and action plan. We invite your continued feedback ahead of the annual publication of the Climate Change Report and every three years we will provide shareholders with a non-binding advisory vote to express your views on whether our approach remains reasonable as technology, science, markets, policy and experience evolve over time.

Your Directors recognise their responsibility to set the company's strategy. We are not asking shareholders to take responsibility for formally approving or objecting to Santos' climate transition strategy. That is a legal responsibility of the Santos Board and Management.

The support of our shareholders is important to us in striving to become a net-zero emissions business by 2040, in step with society. The Board recommends that you vote in favour of the non-binding advisory resolution on the 2022 Climate Change Report at the 2022 Annual General Meeting, supporting the climate transition approach described in this publication. The resolution can be found in the 2022 Notice of Meeting.

Keith Spence
Chair

² IEA, What is behind soaring energy prices and what happens next? <https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next>

³ IEA, Coal 2021: Analysis and forecast to 2024. <https://iea.blob.core.windows.net/assets/f1d724d4-a753-4336-9f6e-64679fa23bbf/Coal2021.pdf>



Chief Executive Officer's introduction

With a strong, low-cost base business supplying natural gas to meet ongoing customer demand and a clear action plan to develop cleaner energy and clean fuels, Santos remains resilient, value accretive and at the leading edge of the energy transition to a low-carbon future.

2021 brought global energy security into the spotlight with skyrocketing fuel prices and a supply crunch in the wake of a low level of investment since 2015, exacerbated by the pandemic demand crisis.⁴ With global fuel markets and supply chains increasingly integrated, this threatens to impact natural gas, oil, coal and electricity markets across Europe, America and Asia, putting a fragile global economic recovery at risk and perpetuating energy poverty for the most vulnerable people in our global community. At Santos we are focused on supplying critical fuels more sustainably to meet society's demand as the world works toward decarbonisation and other human development goals.

Unlike the oil crises of the 1970s, today's energy security crisis is centred on natural gas with robust demand for both pipeline gas and LNG now causing record high prices. Especially in the developed economies of Europe and America, where electricity firming is increasingly dependent on natural gas to support renewables, there is nowhere else for consumers to turn. Therefore, while we work with customers to build market demand for clean fuels such as hydrogen, Santos is focused on supplying natural gas to meet ongoing demand in a way that minimises carbon emissions. That is why we are focused on developing CCS projects, and for residual emissions, high-quality offsets.

Countries around the world are re-evaluating energy and fuel price stability and supply security risks, finding they remain critical considerations on the journey to Net Zero. With natural gas playing a central role in decarbonising energy markets and balancing renewable energy,⁵ and with the European Commission and Korea both moving recently to recognise gas in their taxonomies of economic activities for sustainable energy, more investment is needed to ensure supply can keep pace with demand.

It is vitally important that new supply investment happens in a sustainable way. Companies like Santos, which are publicly listed, subject to ESG scrutiny by their investors and which report transparently on carbon emissions and their climate transition plans, are best placed to supply critical fuels more sustainably, striving for lower emissions intensity and better environmental outcomes. Divesting assets and driving investment in new supply to less transparent producers will not reduce global emissions or advance the transition to Net Zero.

Our 2022 Climate Change Report describes our approach to managing the risks and opportunities associated with climate change and our action plan to achieve net-zero emissions by 2040 and play a global leadership role in the energy transition.

I am personally proud of our progress in 2021. Our final investment decision on the 1.7 million tonnes per year Moomba CCS project in South Australia's Cooper Basin will deliver one of the world's biggest CCS projects. We are also one of the first companies globally to book CO₂ storage resource – 100 million tonnes in the Cooper Basin. Santos sees CO₂ storage capacity as a strategic competitive advantage in evolving cleaner energy, clean fuels and carbon markets with CCS a critical technology for the world to achieve its climate goals. International Energy Agency (IEA) chief Fatih Birol has said that reaching net-zero goals without CCS will be almost impossible.⁶

Moomba is the first of a series of CCS hubs that Santos plans to develop around our existing infrastructure. These hubs will deliver new revenue streams and a step change in our ability to reduce carbon emissions from our production, store carbon emissions from third parties including customers, develop new clean fuels such as hydrogen and deploy new emerging technologies like post-combustion and direct air capture.

In addition, last year saw us continue to take concrete steps to improve our operational efficiency and reduce emissions, including reducing fuel use, ongoing electrification of our facilities and deployment of more renewable energy.

In December, we completed our merger with Oil Search, adding to our diversified portfolio of high quality, long-life, low-cost producing natural gas assets across Australia, Timor-Leste and Papua New Guinea. The merger also lowers the emissions intensity of our portfolio production and provides Santos with the scale and financial capability to invest in our Climate Transition Action Plan.

With a strong, low-cost base business supplying natural gas to meet ongoing customer demand and a clear action plan to develop cleaner energy and clean fuels, Santos remains resilient, value accretive and at the leading edge of the energy transition to a low-carbon future.

Kevin Gallagher
Managing Director and Chief Executive Officer

⁴ IEA, Gas Market Report, Q1 2022: <https://www.iea.org/reports/gas-market-report-q1-2022>

⁵ IEA, The Role of Gas in Today's Energy Transitions 2019: <https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions>

⁶ IEA Energy Technology Perspectives 2020, Special Report on Carbon Capture Utilisation and Storage in Clean Energy Transitions: https://iea.blob.core.windows.net/assets/181b48b4-323f-454d-96fb-0bb1889d96a9/CCUS_in_clean_energy_transitions.pdf

Our approach to climate change

Focus

Santos' strategic focus is on five core, long-life producing natural gas assets across Australia, Papua New Guinea and Timor-Leste. We are a low-cost producer of natural gas committed to a just and orderly, demand-led transition to cleaner energy and clean fuels. Santos has been supplying reliable, affordable energy to Australia and the Asia-Pacific region for over 50 years.

In December 2021, we completed a merger with Oil Search Limited (Oil Search), making us one of the top 20 global oil and gas companies and a top 20 ASX-listed company.

Santos recognises the scientific consensus on climate change and supports the objective of the Paris Agreement to limit global temperature rise by 2100 to less than 2 degrees Celsius and pursue efforts to limit the temperature rise to 1.5 degrees Celsius above pre-industrial levels.

At the same time, we recognise the importance of energy security and price stability, especially for the most vulnerable in our global community.

The world has an insatiable demand for energy because it fuels human development, improving living standards and economic prosperity. Access to affordable and clean energy is one the United Nations' Sustainable Development Goals. But almost two billion people, more than 25 per cent of the world's population, still live in poverty on less than US\$3.20 per day.⁷ Over 750 million people still have no electricity and another billion have access to unreliable electricity.⁸ This energy poverty reduces opportunities and adversely affects human health. More than 40 per cent of the world's people still rely on polluting and unhealthy fuels for cooking.⁹ The World Health Organization estimates that around seven million premature deaths are attributable to the joint effects of ambient and household air pollution.¹⁰

Approximately 88 per cent of Santos' production is natural gas, with oil and condensate making up the remainder. Natural gas is expected to remain an important part of the energy mix out to 2050 and oil will also still be part of the energy mix. Even in the IEA's Net Zero by 2050 scenario, global investment of US\$10 trillion in oil and gas supply would be needed to meet the world's energy needs between now and 2050. Oil consumption would still

be about 26 per cent of 2020 levels and gas consumption would decline more slowly to about 45 per cent of 2020 levels. Half the natural gas produced in 2050 would be used to make hydrogen (with CCS attached) and around 40 per cent of hydrogen produced would be made from natural gas.¹¹

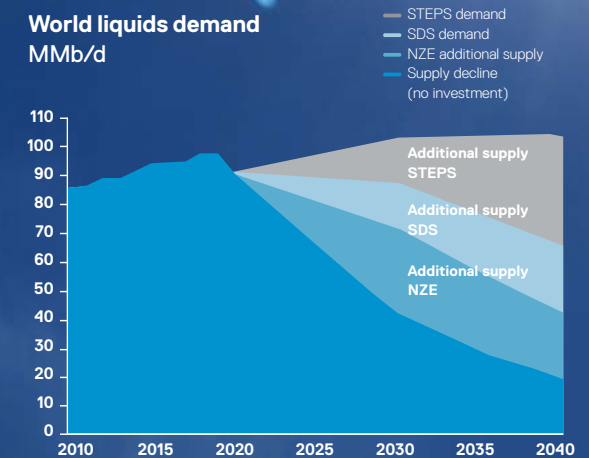
In Santos' key international markets, coal represents 30-64 per cent of power generation, providing significant scope for coal to gas switching over time.¹² In the period 2010 to 2018, coal-to-gas switching globally saved around 500 million tonnes of CO₂ – an effect equivalent to putting an extra 200 million electric vehicles running on zero-carbon electricity on the road over the same period.¹³

Natural gas will also continue to play a critical role in sectors of the economy where demand is growing but electricity is unable to meet energy needs today. This includes heavy industry as well as long-distance transportation and manufacturing feedstocks to make fertilisers and polymers. Polymers are the building blocks for myriad everyday products including packaging, more than 60 per cent of the world's clothing fibres and the gloves, masks, gowns, face shields, hand sanitisers, injection vials and medical devices so vital during the global coronavirus pandemic. In fact, more than half the world's natural gas supply is used in sectors other than power generation.¹⁴

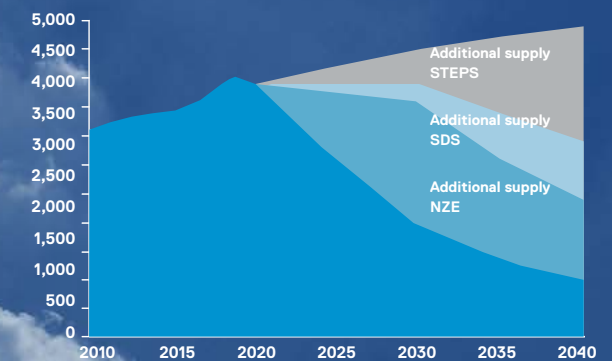
Santos is committed to supplying critical fuels such as natural gas in a more sustainable way to meet ongoing customer demand, at the same time investing today to deliver cleaner fuels tomorrow. The world continues to rely on hydrocarbon fuels for around 80 per cent of its primary energy and they will remain in demand for decades to come.¹⁵ Therefore, making these fuels progressively cleaner is essential to meet global climate goals.

Demand to 2040 for hydrocarbon liquids and gas under IEA World Energy Outlook 2021 Stated Policies scenario (STEPS), Sustainable Development scenario (SDS) and Net Zero by 2050 scenario (NZE)¹⁶

World liquids demand MMb/d



World gas demand bcm/yr



7 World Bank Poverty and Shared Prosperity 2020: <https://www.worldbank.org/en/publication/poverty-and-shared-prosperity>
 8 Tracking SDG7 The Energy Process Report 2021 IEA and IRENA: <https://www.irena.org/publications/2021/Jun/Tracking-SDG-7-2021>
 9 United Nations, Sustainable Development Goal 7: <https://unstats.un.org/sdgs/report/2016/goal-07>
 10 World Health Organization: <https://www.who.int/health-topics/air-pollution>
 11 IEA, Net Zero by 2050, A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>
 12 IEA, Electricity Information 2021: <https://www.iea.org/data-and-statistics/data-product/electricity-information>
 13 IEA, The Role of Gas in Today's Energy Transitions 2019: <https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions>

14 IEA, Global natural gas demand per sector, 2007-2025: <https://www.iea.org/data-and-statistics/charts/global-natural-gas-demand-per-sector-2007-2025>

15 IEA, Net Zero by 2050, A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>

16 IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021> and IEA, Net Zero by 2050 - A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>

Our goal is to achieve net-zero Scope 1 and 2 emissions by 2040

Targets

By 2030:

- + Reduce absolute Scope 1 and 2 emissions by 30 per cent¹⁷
- + Reduce Scope 1 and 2 emissions intensity by 40 per cent¹⁸
- + Use CCS technology to accelerate the economic feasibility of hydrogen and deliver a step change in emissions reduction
- + Reduce customers' emissions by at least 1.5 million tonnes per annum of CO₂e from the supply of clean fuels

By 2040:

- + Net-zero Scope 1 and 2 emissions

Climate Transition Action Plan¹⁹

Santos will maintain a disciplined approach to capital management through the energy transition by sustaining our existing long-life natural gas assets to meet ongoing customer demand, building around our existing infrastructure and growing our investment in decarbonisation and clean fuels where we have a competitive advantage. Climate transition investments will meet our disciplined investment criteria, be demand led by our customers and consistent with our low-cost operating model.

Capital will be allocated to fund delivery of our climate transition initiatives. Potential capital investment in the period 2022 to 2030 includes US\$110 million for the sanctioned Moomba CCS project, a cumulative US\$400 million for a series of proposed energy efficiency projects, and potentially US\$3.1 billion to US\$5 billion for other CCS and clean fuels hubs (depending on final equity interest, customer demand and value accretion).²⁰ The potential capital investment in initiatives included in our Climate Transition Action Plan is consistent with Paris-aligned pathways.²¹

Over time we will increasingly focus on developing natural gas to sustain our existing infrastructure and growth through decarbonisation, including CCS carbon solutions and clean fuels projects. This will enable us to reduce our own emissions and potentially those of third parties, including our customers, as well as build new revenue streams from carbon solutions and clean fuels.

¹⁷ From the Santos and Oil Search combined 2019-20 equity Scope 1 and 2 baseline of 5.9 MtCO₂e, representing a reduction to 4.1 MtCO₂e or lower by 2030

¹⁸ From Santos' 2019-20 equity Scope 1 and 2 baseline of 55 ktCO₂e/mmboe, representing a reduction to 33 ktCO₂e/mmboe or lower by 2030

¹⁹ The Climate Transition Action Plan includes current forecasts that are necessarily based on assumptions, contingencies and commercial judgement. The estimates included do not take into account customer demand or any future sell-downs, partnering arrangements and infrastructure funding. The Climate Transition Action Plan is over a forward-looking period of approximately 20 years. It is important to recognise that markets are dynamic, emerging and still evolving based on factors including developments in technology, science, markets, policy and experience over time. Please refer to page 21 for more detail in relation to the Climate Transition Action Plan

²⁰ Subject to the considerations outlined on page 21 of this report

²¹ Refer to the detail set out on page 33 of this report

Climate Transition Action Plan summary

Categories	Climate transition initiatives
Operational efficiencies	Implement initiatives to reduce Santos' operational Scope 1 and 2 emissions including electrification, integration of renewables and minimisation of flaring, venting, fuel use and fugitive emissions
Carbon Capture and Storage	Step-change technology that will reduce Scope 1 and 2 emissions, provide carbon management solutions for customers and pave the way for new revenue streams from clean fuels and carbon solutions
Carbon solutions	Nature-based solutions, direct air capture, post-combustion capture and other low-emissions technologies to reduce carbon emissions and generate offsets for Santos and customers
Clean fuels hubs	Leverage CCS hubs as a pathway to generating clean fuels such as hydrogen – will be demand led
Supply chain collaboration	Work with customers to displace higher-emitting fuels and cultivate demand for lower-carbon fuels
Efficient capital allocation aligned with climate transition initiatives	
Supporting a sustainable and just transition to a low-carbon future	

A track record of action on climate change

Timeline to 2021

2004	2007	2008	2013	2016	2017	2018	2019	2020	2021	2022
<ul style="list-style-type: none"> + Set emissions intensity reduction target of 20 per cent by 2008 from 2002 levels 	<ul style="list-style-type: none"> + Darwin LNG project supports the development of the West Arnhem Land savanna burning project, which has generated over 1.8 million Australian Carbon Credit Units (ACCU) since 2014 and supported more than 250 Indigenous jobs 	<ul style="list-style-type: none"> + Met emissions intensity target set in 2004 and published Climate Change Policy 	<ul style="list-style-type: none"> + Collaborated with CSIRO in a study to measure fugitive emissions from wells in Queensland 	<ul style="list-style-type: none"> + Set aspiration to achieve net-zero emissions by 2050 + Energy Solutions group set up to pursue emissions reduction across portfolio and pursue low-emissions technologies 	<ul style="list-style-type: none"> + Release of key climate policy positions in relation to alignment of strategy with Paris Agreement goals, commitment to ongoing sustainability disclosures, and reporting on impacts and management of climate change + Updated Climate Change Policy, including support for limiting global temperature rise to less than 2 degrees Celsius and commitment to transparent reporting on climate change governance, strategy, risk management, targets and metrics 	<ul style="list-style-type: none"> + Santos and Oil Search are leaders in publishing TCFD-aligned Climate Change Reports + Set 2025 climate targets including commitments to reduce emissions from Cooper Basin and Queensland operations by 5 per cent and invest in CCS as a step-change emissions reduction technology + Implemented emissions reduction initiatives at Gladstone LNG, Fairview, Roma and Moomba + First award of ACCUs for Chinchilla White Gum plantation in Queensland 	<ul style="list-style-type: none"> + Established a ten-year fugitive emissions assessment collaboration with the CSIRO + Emissions targets included in performance-based executive remuneration + Implemented emissions reduction initiatives in Cooper/Eromanga basins and at Port Bonython 	<ul style="list-style-type: none"> + Successfully injected approximately 100 tonnes of CO2 into depleted gas reservoirs to confirm technical feasibility of the Moomba CCS project + Published first review of industry associations' alignment to the company's climate and energy policy positions 	<ul style="list-style-type: none"> + Set new greenhouse gas emissions reduction targets: <ul style="list-style-type: none"> - Net-zero Scope 1 and 2 emissions by 2040 - 26-30 per cent reduction in absolute Scope 1 and 2 emissions and emissions intensity by 2030²² + Final investment decision (FID) taken on Moomba CCS project + Updated Climate Change Policy to support the goals of the Paris Agreement, reduce flaring to as low as reasonably practical for safe operations, identify cost-effective opportunities to sequester carbon, integrate new technologies and offset our greenhouse gas emissions to pursue our emissions reduction targets + Adopted advisory 'say on climate' vote in 2022 for shareholders 	<ul style="list-style-type: none"> + Booked 100 million tonnes of CO2 storage resource in the Cooper Basin in South Australia in accordance with the international system for CO2 Storage Resource Management²³ + Front end engineering design (FEED) phase commenced for Bayu-Undan CCS project + New 2030 emissions reduction, emissions intensity and clean fuels targets set: <ul style="list-style-type: none"> - 30 per cent reduction in absolute Scope 1 and 2 emissions by 2030²⁴ - 40 per cent reduction in Scope 1 and 2 emissions intensity by 2030²⁵ - At least 1.5 MtCO2e of customer Scope 1 and 2 emissions reduced by supply of clean fuels

²² Targets based on 2019-20 equity Scope 1 and 2 emissions and emissions intensity, adjusted to include increased interest in the Bayu-Undan for the full financial year

²³ Society of Petroleum Engineers CO2 Storage Resources Management System (SRMS): <https://p.widencdn.net/2ckusw/SRMS>

²⁴ 30 per cent absolute reduction is from the Santos and Oil Search combined 2019-20 equity Scope 1 and 2 emissions baseline of 5.9 MtCO2e, representing a reduction to 4.1 MtCO2e or lower by 2030

²⁵ 40 per cent intensity reduction is equity share of Santos Scope 1 and 2 emissions intensity from a 2019-20 baseline of 55 ktCO2e/mmboe, representing a reduction to 33 ktCO2e/mmboe or lower by 2030

Climate Change Policy

Our Commitment

Santos recognises the scientific consensus of climate change assessed by the Intergovernmental Panel on Climate Change. We support the objective of the Paris Agreement to limit global temperature rise to less than 2 degrees Celsius and pursue efforts to limit the temperature rise to 1.5 degrees Celsius.

We believe that access to reliable and affordable energy is critical to meeting sustainable development goals and improving living standards and economic prosperity in developed and developing nations.

Santos is committed to being part of the solution by supporting the twin objectives of limiting greenhouse gas emissions and providing cleaner fuels to domestic and global markets.

Santos has a target of net-zero Scope 1 and 2 greenhouse gas emissions by 2040. Our strategy focuses on natural gas as a reliable transition fuel source and the development of technologies such as Carbon Capture and Storage and clean fuels, such as hydrogen, as foundations for our decarbonisation pathway.



Our Actions

We will:

- + Work with governments and stakeholders in the design of climate change regulation and policies in support of low-cost abatement and incentivising innovation and investment in emissions reduction in an equitable manner
- + Factor carbon pricing and greenhouse gas emissions into all material business decision-making
- + Set greenhouse gas emission targets consistent with the objective of limiting global temperature rise to less than 2 degrees Celsius and in pursuit of 1.5 degrees Celsius
- + Identify and pursue opportunities to reduce greenhouse gas emissions within our operations and through the supply chain
- + Work with our customers to reduce their greenhouse gas emissions and sell the products we generate only to customers from countries that have a net-zero commitment or are signatories to the Paris Agreement
- + Avoid any unnecessary flaring from our activities and reduce flaring required for the safe conduct of our operations to as low as reasonably practicable
- + Make Final Investment Decision for new offshore greenfield projects from 2025 only if they abate and/or offset reservoir carbon dioxide emissions
- + Identify and implement cost-effective opportunities to sequester carbon, integrate new technologies and offset greenhouse gas emissions, in pursuit of our emission reduction targets
- + Identify, manage and mitigate climate change risks for our activities and in doing so, continue to adapt and develop our operational, financial and strategic resilience
- + Report annually on the company's climate change governance, strategy, risk management and targets and metrics in a transparent manner in alignment with recommendations of the Task Force on Climate-related Financial Disclosures
- + Provide our shareholders with an advisory vote, known as a 'Say on Climate' at regular intervals

Strategy

Transform, build, grow

Our journey to net-zero emissions by 2040

Combining with Oil Search

Our targets

Our journey to net-zero emissions by 2040

Santos aims to deliver superior shareholder returns whilst being a global leader in the transition, providing cleaner energy and clean fuels that are affordable and sustainable as we help the world decarbonise to achieve Net Zero.

We will transform to become a cleaner energy and clean fuels business, build around our existing infrastructure by developing natural gas for backfill to meet ongoing customer demand and grow through developing clean fuels projects such as hydrogen. Where possible, we will combine natural gas developments with CCS projects to reduce carbon emissions from our own production and create a carbon solutions business, help third parties, including our customers, to reduce their emissions and enable future clean fuels projects.

We will:

- 1 **Supply natural gas to meet customer demand for critical feedstocks** for a wide range of manufactured goods including polymers and fertilisers, direct heating for households and industries such as steel and aluminium, and to displace coal and firm renewables in electricity generation, helping our customers reduce their emissions.
- 2 **Reduce our own emissions through innovation in low-emissions technologies**, energy efficiency, integrating renewables, deploying CCS, and investing in high-quality nature-based carbon offset projects. While not the primary means of reducing our carbon intensity, offsets may be needed to help us achieve our net-zero goal. We will generate credits that are real, measurable and verifiable, and as customer demand grows, we aim to establish a portfolio of offsets to enable carbon-neutral sales of our energy products and potentially create a new revenue stream.
- 3 **Invest today to deliver cleaner fuels tomorrow**, leveraging existing infrastructure and developing CCS, direct air capture, new low-emissions technologies and hydrogen production to enable large-scale emissions reduction in our own business and help third parties, including customers, to reduce their emissions.
- 4 **Work with customers, investors, technology developers and governments to help build new cleaner energy, clean fuels and carbon markets**. Santos will work with our stakeholders to advocate for regulatory frameworks that drive demand shifts, set standards for clean fuels and carbon markets, and enable the economic development of carbon abatement and affordable, reliable, lower-emissions energy and fuels on the supply side.

Santos has set a target of net-zero Scope 1 and 2 emissions by 2040. By 2030, we aim to reduce Scope 1 and 2 emissions by 30 per cent and the emissions intensity of our production by 40 per cent.²⁶ Emissions intensity is an important metric because it will allow the company to build around our existing infrastructure by developing natural gas for backfill to meet ongoing customer demand as well as grow through investments in decarbonisation projects and clean fuels production.

Our **Climate Transition Action Plan** details the plans we have to meet our emissions reduction targets and progressively deliver cleaner energy and clean fuels in the future.

Capital will be allocated to fund delivery of our climate transition initiatives. Potential capital investment in the period 2022 to 2030 includes US\$110 million for the sanctioned Moomba CCS project, a cumulative US\$400 million for a series of proposed energy efficiency projects, and potentially a total of US\$3.6 billion to US\$5.5 billion when other CCS and clean fuels hubs are included (depending on final equity interest, customer demand and value accretion).²⁷

We are committed to ensuring a sustainable and just transition for our workforce and the communities where we operate. By leveraging our existing infrastructure and the skills and experience of our people built over decades of oil and gas production, we will extend the life of our assets, making them more sustainable, providing ongoing jobs and business opportunities, and building new capability in decarbonisation, cleaner energy and clean fuels.

The risks associated with climate change are integrated into our short and long-term strategic and financial decision making. Our strategy is informed by scenario analysis that looks at the potential impact of emerging trends and changes in the future energy mix, market conditions, technology, consumer behaviour and policy settings. In 2021, our portfolio analysis was expanded to include two climate scenarios focused on limiting global temperature increase to 1.5 degrees Celsius by 2100. This analysis demonstrates Santos is positioned well to deliver ongoing value for shareholders across a wide range of potential macroeconomic circumstances. Importantly, the company is resilient through the energy transition with potential for significantly higher value outcomes compared to the benchmark portfolio case.

Our climate transition strategy and action plan are underpinned with robust governance. Accountability for management of climate change risks and opportunities is embedded in our organisational governance, starting with the company's Board and Management. We are committed to transparent annual reporting of our carbon emissions and performance against our targets. Every three years we will provide shareholders with a non-binding advisory vote on whether our approach remains reasonable as technology, science, markets, policy and experience evolve over time.

²⁶ 30 per cent absolute reduction is from the Santos and Oil Search combined 2019-20 equity Scope 1 and 2 emissions baseline of 5.9 MtCO₂e and 40 per cent intensity reduction is Santos' equity Scope 1 and 2 emissions intensity from a 2019-20 baseline of 55 ktCO₂e/mmmboe

²⁷ Subject to the considerations outlined on page 21 of this report

Combining with Oil Search

Adding low-cost and low emissions intensity natural gas assets

Santos' 2021 merger with Oil Search adds to our diversified portfolio of core high-quality, long-life, low-cost, producing natural gas assets across Australia, Papua New Guinea and Timor-Leste. It also brings a diversified, low-cost, low emissions-intensity backfill portfolio and a stronger investment-grade balance sheet with more than US\$5.6 billion of liquidity that will support the company's ability to fund climate transition initiatives.²⁸

In 2018, an Oil Search and Wood Mackenzie analysis determined that Papua LNG is one of the most resilient LNG projects in a carbon-constrained and Paris-aligned world. This expansion of LNG production near Port Moresby will leverage existing downstream infrastructure at PNG LNG, minimising capital and operational investment, breakeven cost of supply and environmental footprint. It sits low on the global cost curve for LNG projects and planned capital expenditure is consistent with the climate goals of the Paris Agreement. Santos is also screening the feasibility of a CCS project to support our PNG assets.

The merger also resulted in Santos acquiring a 51 per cent interest in the Pikka project located in the oil-producing North Slope region of Alaska. Pikka is a low carbon-intensity oil project in development stage and is not a producing asset. Santos' equity investment level is currently under review.

While the merger with Oil Search increases Santos' absolute emissions, Santos is committed to a 30 per cent emissions reduction across the portfolio by 2030 and net-zero Scope 1 and 2 emissions by 2040. Importantly, the merger is consistent with Santos' efforts to reduce the emissions intensity of our business as we increase production of critical fuels to meet ongoing global demand more sustainably.



²⁸ Santos 2021 Full-year results: <https://www.santos.com/news/2021-full-year-results/>

Our targets

2040

Net-zero Scope 1 and 2 emissions

2030

Scope 1 and 2 targets for absolute emissions and emissions intensity



Santos is focused on achieving net-zero Scope 1 and 2 emissions by 2040

Kevin Gallagher
Managing Director and Chief Executive Officer

Emissions from our operations

- + 30 per cent absolute emissions reduction by 2030 from the combined Santos and Oil Search 2019-20 financial year baseline²⁹
- + 40 per cent emissions intensity reduction by 2030 from Santos' 2019-20 financial year baseline³⁰

Step-change technology

Santos will use CCS technology to accelerate the economic feasibility of hydrogen and deliver a step change in emissions reduction by 2030.

Clean fuels

Santos will reduce customer emissions by at least 1.5 million tonnes of CO₂e per annum by 2030 from the supply of clean fuels.

Post-merger updates to 2030 climate-related targets

Following the merger of Santos and Oil Search, the climate-related targets of both companies have been reviewed. Santos remains committed to our target of net-zero Scope 1 and 2 emissions by 2040. In addition, the Board has set new 2030 targets that reflect Santos' corporate strategy and the company's merged portfolio, building on Santos' previous targets.

The company's previous absolute Scope 1 and 2 emissions reduction target of 26-30 per cent by 2030 has been changed to 30 per cent and the baseline has been updated to include the Oil Search portfolio. The company's previous emissions intensity target has increased from 26-30 per cent to 40 per cent and remains a target against Santos' 2019-20 baseline. Targeted corporate activity such as the merger with Oil Search is one way in which our company has achieved emissions intensity reduction across our portfolio.

In addition, our target to help customers reduce their Scope 1 and 2 emissions by 2030 has been increased from at least one million tonnes per annum, to 1.5 million tonnes CO₂e per annum, through the supply of clean fuels.

²⁹ 30 per cent absolute reduction is from the Santos and Oil Search combined 2019-20 equity Scope 1 and 2 emissions baseline of 5.9 MtCO₂e representing a reduction to 4.1 MtCO₂e or lower by 2030
³⁰ 40 per cent intensity reduction is of Santos' equity Scope 1 and 2 emissions intensity from a 2019-20 baseline of 55 ktCO₂e/mmbse representing a reduction to 33 ktCO₂e/mmbse or lower by 2030

Accelerated delivery of 2025 targets set in 2018

Santos is on track to achieve all three 2025 targets by the end of 2022, enabling us to focus on our new 2030 targets.³¹



Target met:

Grow liquefied natural gas exports to at least 4.5 million tonnes per annum by 2025

- + Santos' equity LNG exports were 4.56 million tonnes in 2021, a six per cent increase on 2020 volumes.
- + Gladstone LNG in Queensland achieved LNG sales of over 6.4 million tonnes in 2021. With capacity of 8.6 million tonnes per annum there is potential for sales growth of 2.2 million tonnes above 2021 LNG sales.
- + Santos continues to focus on sustaining our existing infrastructure in Australia and PNG to meet ongoing customer demand, taking a final investment decision on the Barossa offshore natural gas project in northern Australia in March 2021 to backfill Darwin LNG. The decision followed a binding long-term LNG Supply and Purchase Agreement with Diamond Gas International, a wholly-owned subsidiary of Mitsubishi, for the supply of 1.5 million tonnes per annum of LNG from the Barossa project for 10 years with extension options. The agreement delivered a firm LNG offtake arrangement which represents over 80 per cent of Santos' equity Darwin LNG.
- + The Bayu-Undan gas field will come to the end of its field life in 2022-23 resulting in a reduction of LNG sales until the Barossa backfill project comes online in 2025.
- + At current equity levels across Santos' three LNG projects, forecast LNG production for 2025 will be approximately 7.15 million tonnes per annum.



Target met:

Assess the feasibility and, if feasible, invest in technology and innovation which can deliver a step-change in emissions

- + Santos' assessment and investment in step-change technology has been, and continues to be, focused on CCS. Santos achieved this target by taking a final investment decision on the Moomba CCS project in 2021.
- + To date Santos has invested over US\$24 million (equity share) in developing the Moomba CCS project.
- + Moomba CCS will be one of the world's largest and lowest-cost CCS projects, storing up to 1.7 million tonnes of CO₂ per annum at a lifecycle cost of less than US\$24 per tonne. Costs are expected to decrease with scale and previous studies have concluded that the Cooper/Eromanga Basins have the potential to store more than 20 million tonnes of CO₂ per annum.
- + Santos has also entered into a research and collaboration agreement with Australia's national science agency, CSIRO, to trial direct air capture and post-combustion capture technologies at Moomba.



Target to be met in 2022:

Economically reduce emissions by more than five per cent across operations in the Cooper Basin and Queensland from the 2016-17 baseline by 2025

- + Performance to the end of 2021 saw projects implemented by the Santos Energy Solutions group deliver approximately 260,000 tonnes of CO₂e per annum of reduction since 2018 (4.4 per cent reduction), with over 100,000 tonnes of CO₂e reduction delivered in 2021. These projects included solar and battery conversions of beam pumps on oil wells, incorporation of solar energy in facilities and integration of a heat-recovery steam generator at Moomba.
- + Projects continued throughout 2021 and into 2022 will reduce fuel, flare and vent emissions by over 150,000 tonnes of CO₂e per annum. These include:
 - 24 more wells converted to solar and battery
 - Solar and battery-powered microgrid at the Charo field in the Cooper Basin
 - Recovery of flared gas at Moomba, Fairview and Roma

³¹ The 2025 targets are heritage Santos (non-Oil Search) targets set in 2018

Metrics

Transparency and integrity

Emissions sources

Emissions calculation and reporting

Scope 1 emissions

Scope 2 emissions

Scope 3 emissions

Emissions sources

Santos' operations are conducted under a range of joint venture arrangements and include full value chain activities from exploration to production, processing and transport of products to customers.

We report our greenhouse gas emissions in accordance with the global standards established in the Greenhouse Gas Protocol. There are three categories of emissions recognised in the Greenhouse Gas Protocol:

- + Scope 1 emissions are direct emissions from sources that are owned or controlled by the company. In Santos' case, these are emissions from the activities we undertake or those in which we are a non-operating joint venture participant.
- + Scope 2 emissions are indirect emissions, including from the generation of purchased or acquired electricity, steam, heating or cooling consumed in the conduct of activities.
- + Scope 3 emissions are also indirect emissions. They occur at sources owned or controlled by other entities. In Santos' case, these are primarily customers purchasing the products we supply. It should be noted that Scope 3 emissions are the Scope 1 and 2 emissions of other entities.

Overview of Santos' reported greenhouse gas scopes and emissions



Emissions calculation and reporting

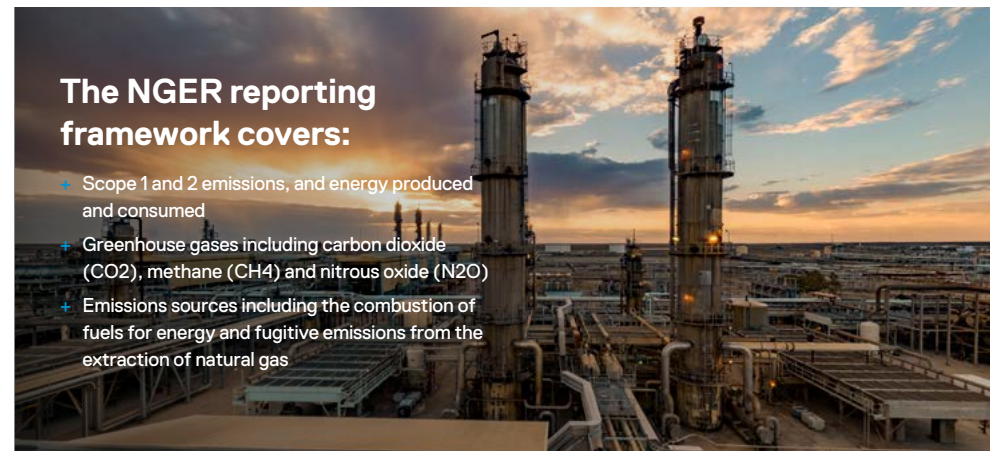
In December 2021, a merger between Santos Limited and Oil Search Limited was completed. The information in this section provides an overview of emissions sources for both the Santos and Oil Search assets and disclosure of greenhouse gas emissions for the 2020-21 financial year includes the Oil Search assets.

Santos operates 52 facilities, 45 of which are in Australia. Core operated facilities outside Australia include the Bayu-Undan gas field in Timor-Leste and five facilities in PNG that feed into the PNG LNG project (operated by ExxonMobil).

With the majority of our assets in Australia, Santos' principal reporting framework for emissions is Australia's comprehensive greenhouse gas reporting scheme established under the National Greenhouse and Energy Reporting Act 2007 (NGER). NGER is supported by the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Determination), which specifies methods for calculating greenhouse gas emissions and energy data. Santos applies NGER methodologies to emissions calculation and disclosure for all operated assets.³²

Santos has been transparently reporting under the NGER framework since its inception in 2008. In addition, our operated Australian Scope 1 and 2 greenhouse gas emissions are independently audited each year.

Under the NGER framework, emissions are reported by Australian entities that have operational control over an emitting asset or facility.



³² For assets that were operated by Oil Search, the emissions inventory has been historically compiled using the American Petroleum Institute: Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry (2009). In future years emissions from these operated assets will be calculated using the Australian NGER framework

Scope 1 emissions

Scope 1 emissions include those from our operating facilities due to fuel combustion, flaring, venting, CO₂ removal and fugitive emissions.

Fuel is required to run our operating facilities. Flaring and venting are integral to managing our process safety and ensuring stable operating parameters are maintained. CO₂ is a naturally occurring by-product of natural gas and its extraction is required to meet customer specifications for our energy products. Within the oil and gas industry, the term fugitive emissions refers specifically to minor natural gas losses that occur in operational environments. More information about the company's fugitive emissions can be found on page 24.

Consistent with industry practice, Santos primarily adopts the default emissions factor prescribed in the NGER Determination to calculate greenhouse gas emissions:

- + Fuel emissions – quantity of fuel is measured, then multiplied by the prescribed emissions factor from the NGER Determination.
- + Flare, vent, CO₂ removal emissions – quantity of gas flared or vented is measured, then multiplied by the prescribed emissions factor from the NGER Determination.
- + Fugitive emissions – prescribed activity driver (throughput / equipment count / length of pipeline) multiplied by a prescribed emissions factor under the NGER Determination.



Equity Scope 1 emissions from operated and non-operated facilities

Santos' Scope 1 emissions

Santos' 2020-21 equity Scope 1 emissions were 5.74 MtCO₂e comprising:

- + Scope 1 emissions from operated assets of 4.46 MtCO₂e. The increase in Scope 1 emissions of approximately 1 MtCO₂e from the prior year is primarily due to the higher equity interest in the Darwin LNG project and associated Bayu-Undan gas field following the acquisition of the ConocoPhillips ABU-West business in 2020.³³
- + Scope 1 emissions from non-operated activities of 0.4 MtCO₂e.
- + Scope 1 emissions from Oil Search assets integrated into the portfolio following the 2021 merger of 0.88 MtCO₂e.

Australian emissions

Santos' 2020-21 Scope 1 emissions from Australian operated assets were 4.14 MtCO₂e and from Australian non-operated assets were 0.11 MtCO₂e.

International emissions

Santos' 2020-21 Scope 1 emissions from activities outside Australia include 0.31 MtCO₂e from the Santos-operated Bayu-Undan gas field in Timor-Leste and 1.17 MtCO₂e from the non-operated PNG LNG project.

Gross Scope 1 emissions from operated facilities

As an Australian-based company, emissions from all the assets and activities Santos operates, regardless of operating jurisdiction, are disclosed by us using the Australian Government NGER framework.³⁴ This means Santos reports 100 per cent of emissions from the facilities we operate rather than our equity share of those emissions. In other words, our NGER reporting includes emissions attributable to joint venture partners on an equity basis.

Approximately 60 per cent of total gross Scope 1 greenhouse gas emissions came from equipment and vehicle fuel combustion and 38 per cent from venting, flaring and CO₂ removal. Minor losses, referred to as fugitive emissions, accounted for less than two per cent of gross Scope 1 greenhouse gas emissions. As a proportion of our overall production volume, methane emissions are well below the Oil and Gas Climate Initiative 2025 intensity target of less than 0.2 per cent.³⁵

³³ In the prior reporting period Santos had an 11.5 per cent working interest from 1 July 2019 and then a 68.4 per cent working interest from 28 May 2020. In the latest reporting period, Santos' working interest was 68.4 per cent from 1 July 2020 and then 43.4 per cent from 30 April 2021

³⁴ For assets that were operated by Oil Search, the emissions inventory has been historically compiled using the American Petroleum Institute: Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry (2009). In future years emissions from these operated assets will be calculated using the Australian NGER framework

³⁵ Oil and Gas Climate Initiative (OGCI) 2025 methane intensity target, <https://www.ogci.com/action-and-engagement/reducing-methane-emissions/#methane-target>

Gross operated emissions and Australia's Safeguard Mechanism

Our Australian assets are subject to the emissions reduction policy known as the Safeguard Mechanism, which places a cap (baseline) on emissions from facilities emitting greater than 100,000 tonnes of CO₂ equivalent annually. Under this policy, annual emissions for each facility are compared against the facility's baseline and responsible entities must purchase and surrender Australian Carbon Credit Units (ACCUs) for any emissions above the baseline for the year. The Safeguard Mechanism does not apply to our international assets.

Ten Santos-operated facilities, comprising approximately 90 per cent of Santos' gross operated emissions, are covered by the Safeguard Mechanism. The Clean Energy Regulator granted Santos new baselines for each of these facilities throughout 2020 and 2021, as required under amended Safeguard legislation in 2019. These facilities are the Darwin LNG Plant, Gladstone LNG Plant, Moomba Gas Plant, Port Bonython Processing Plant, Ningaloo Vision Floating Production Storage and Offtake Facility, the Fairview, Roma, Ballera and Arcadia Gas Plants, and the Varanus Island Gas Processing Facility. Each of these facilities is operating below their designated facility baseline.

Santos operates another 35 Australian facilities that emit only 10 per cent of gross operated emissions and these facilities each operate below the 100,000 tonnes CO₂e per annum Safeguard Mechanism threshold.

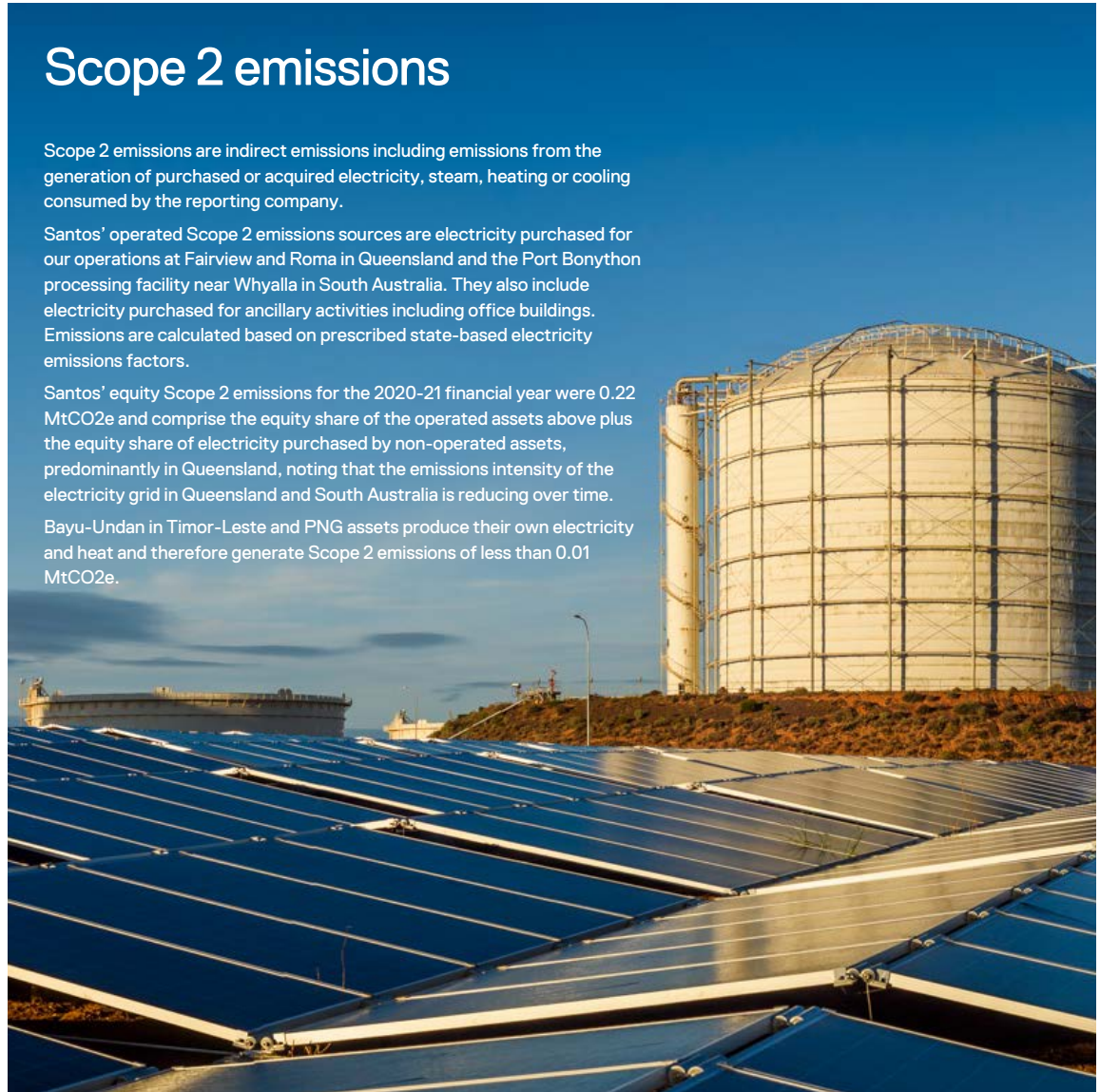
Scope 2 emissions

Scope 2 emissions are indirect emissions including emissions from the generation of purchased or acquired electricity, steam, heating or cooling consumed by the reporting company.

Santos' operated Scope 2 emissions sources are electricity purchased for our operations at Fairview and Roma in Queensland and the Port Bonython processing facility near Whyalla in South Australia. They also include electricity purchased for ancillary activities including office buildings. Emissions are calculated based on prescribed state-based electricity emissions factors.

Santos' equity Scope 2 emissions for the 2020-21 financial year were 0.22 MtCO₂e and comprise the equity share of the operated assets above plus the equity share of electricity purchased by non-operated assets, predominantly in Queensland, noting that the emissions intensity of the electricity grid in Queensland and South Australia is reducing over time.

Bayu-Undan in Timor-Leste and PNG assets produce their own electricity and heat and therefore generate Scope 2 emissions of less than 0.01 MtCO₂e.



Scope 3 emissions

Santos has a policy position to only sell to customers from countries that have a net-zero commitment or are signatories to the Paris Agreement.

We maintain an active dialogue with our customers and are committed to working constructively with them to help them achieve emissions reduction and energy transition goals. Our target is to reduce customer Scope 1 and 2 emissions by over 1.5 million tonnes per year by 2030 through supply of clean fuels. In addition, we are in active discussions with some customers regarding CCS opportunities and high-quality offsets for residual emissions.

Australian and international carbon accounting rules mean that each country and each emitter reports their own Scope 1 and 2 emissions. Santos is not required to report Scope 3 emissions under the Australian NGER framework because they are the Scope 1 and 2 emissions of other emitters. However, we disclose these emissions in our Climate Change Report observing the World Resources Institute Greenhouse Gas Protocol Technical Guidance for Scope 3 Emissions.

There are a range of categories by which Scope 3 emissions can be classified under the Greenhouse Gas Protocol.³⁶ These categories cover activities upstream and downstream of Santos' emissions reporting boundaries. The vast majority of Scope 3 emissions from Santos' activities are in Category 11 being emissions from the Use of Sold Products. Therefore, this is the category of Scope 3 emissions that Santos reports. It is assumed that all products sold are used in combustion applications, which results in the most conservative estimate of emissions resulting from the use of these products. In other words, if other assumptions were made, emissions would be lower. Realistically, not all of Santos' products are combusted, instead providing essential feedstock for the manufacturing of other products, for example, polyethylene and fertilisers. From oil and gas feedstocks, more than 60 per cent of the world's clothing fibres are made along with many other essential products, including the gloves, masks, gowns, face shields, hand sanitisers, injection vials and medical devices so vital during the global coronavirus pandemic.

Santos' pre-merger equity Scope 3 emissions in 2020-21 were 30.3 MtCO₂e and equity Scope 3 emissions attributable to Oil Search were 8.8 MtCO₂e, resulting in total equity Scope 3 emissions of 39.1 MtCO₂e, based on the conservative assumptions described above.



Case study

Working with customers to help them reduce their emissions

Australian-based manufacturer and supplier of plastics, Genos, has partnered with Santos to conduct a feasibility study into the use of hydrogen to dramatically reduce carbon emissions at Genos' Port Botany operations. The study will explore opportunities for Santos to provide clean energy solutions to Australia's sole manufacturer of polyethylene and leading supplier of world-class polymers which are the building blocks of essential everyday products in key packaging, agriculture, water, mining and waste management industries.

The study will investigate the use of up to two petajoules of hydrogen per annum as a clean burning fuel for process energy, complementing the ethane feedstock that has underpinned the Port Botany operations for the past 25 years. It will also assess using hydrogen in an advanced recycling project that Genos is currently progressing to help solve Australia's plastic waste problem and will put Santos and Genos at the leading edge of the circular economy in Australia.

Genos Chief Executive Officer Stephen Bell said the study was an important step in Genos' plans to eliminate carbon emissions and deliver a more sustainable business.

“Our advanced recycling project will put us on the path to a circular economy, using plastic waste as a feedstock in addition to ethane. The potential to use clean-burning hydrogen in this project is also very exciting,” Mr Bell said.

“This partnership is a great example of collaboration across the value chain to deliver better outcomes for our customers. With plastic use in Australia set to double by 2050, I am delighted Santos and Genos are working together to explore new supply arrangements and ways of reducing emissions within Australia's manufacturing industry.”

Santos Managing Director and Chief Executive Officer Kevin Gallagher said, “Santos is proud to be playing our part in assisting manufacturers to reduce their emissions. We will continue to work with our customers along all parts of the value chain to help them reduce their emissions through new technologies and cleaner fuels.”

³⁶ The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard (Revised Edition): <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

Delivery

Investing today to deliver cleaner fuels tomorrow

Climate Transition Action Plan

Operational efficiencies

Carbon Capture and Storage

Carbon solutions

Clean fuels hubs

Supply chain collaboration

Aligning capital allocation with our Climate Transition Action Plan

Supporting a sustainable and just transition

Climate Transition Action Plan

The decarbonisation initiatives set out in our Climate Transition Action Plan provide a pathway for Santos to achieve our climate change targets and grow our business through CCS and clean fuels projects.



Higher shareholder returns, lower carbon – our job is to deliver both. Through the energy transition, we must maintain a strong balance sheet and deliver more cash by reducing costs, efficiently allocating capital, sustaining our natural gas business to meet ongoing customer demand and generating new revenue streams from cleaner energy products, clean fuels and carbon solutions.”

Kevin Gallagher
Managing Director and Chief Executive Officer

Santos’ carbon mitigation hierarchy is avoidance first, followed by reduction and offsetting.

The Climate Transition Action Plan sets out how we envisage materially reducing emissions within our operational control and delivering value for shareholders through the energy transition by offering carbon solutions and partnering across our supply chain to produce cleaner energy and clean fuels that will reduce our customers’ emissions.

Capital will be allocated to fund delivery of our climate transition initiatives. Potential capital investment in the period 2022 to 2030 includes US\$110 million for the sanctioned Moomba CCS project, a cumulative US\$400 million for a series of proposed energy efficiency projects, and potentially US\$3.1 billion to US\$5 billion for other CCS and clean fuels hubs (depending on final equity interest, customer demand and value accretion).

The Climate Transition Action Plan includes forecasts that are necessarily based on assumptions, contingencies and commercial judgement. The estimates included do not take into account customer demand or any future sell-downs, partnering arrangements or infrastructure funding. The Climate Transition Action Plan is over a forward-looking period of approximately 20 years. It is important to recognise that carbon and clean fuels markets are dynamic and still evolving, with high levels of uncertainty, including customer demand.

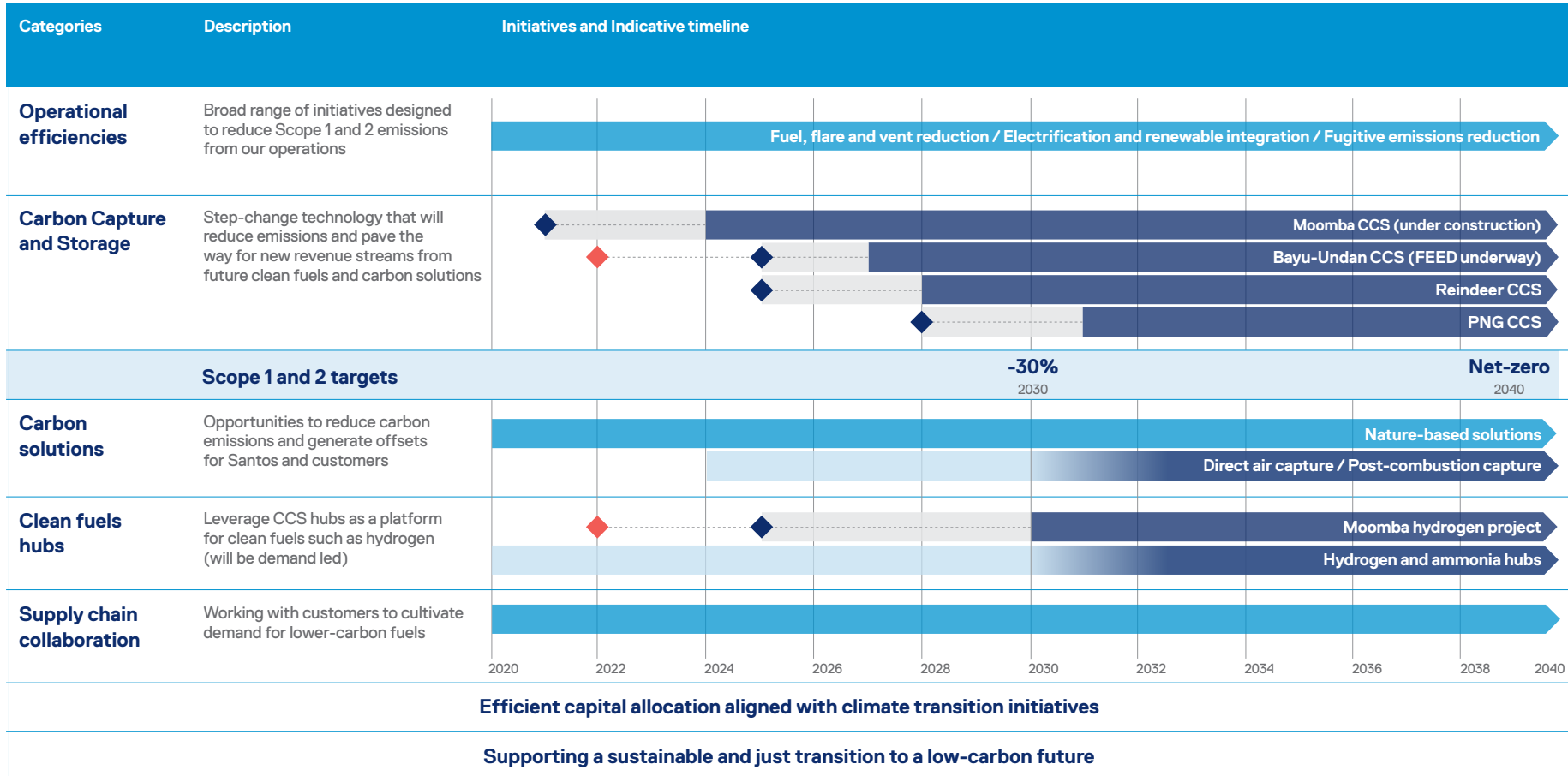
We will continue to adapt the Climate Transition Action Plan to take account of the evolving energy transition environment between now and 2040 and apply our disciplined economic and commercial criteria to inform investment decisions which create value for shareholders as we embark upon our decarbonisation and clean fuels journey.

All material investment decisions, including those within the Climate Transition Action Plan, are required to meet a stringent set of investment hurdles, including economic and commercial criteria commensurate with sector benchmarking, to ensure that the company’s capital allocation provides a return on investment in line with the company’s low-cost, disciplined operating model and our corporate strategy. Carbon market, public policy and regulatory trends inform the company’s carbon and clean fuels pricing assumptions and assumptions relating to generation, procurement and trading of carbon credit units. In addition, investments will be demand and customer driven, with offtake or other commercial marketing arrangements a key factor in investment screening.

Santos also has regard to our broader prudential obligations, which require us to balance shareholder returns, debt repayment and balance sheet strength with sustaining our natural gas business to meet ongoing customer demand and safely manage our assets as well as investing in climate transition activities. It is expected that capital investment in sustaining low emissions-intensity natural gas activities will predominate in the earlier part of the decade. Investment in our transition activities will initially focus on decarbonisation projects, including CCS, laying the foundation to support increased investment in clean fuels projects towards the latter part of the decade.

As demonstrated in the scenario analysis in this report, there are a wide range of possible pathways for the energy transition. While the scenarios provide useful guard rails for our investment planning, they should not be treated as deterministic and the real world will not follow any particular scenario.

Climate Transition Action Plan



Disclaimer: This Climate Transition Action Plan is designed to be read in conjunction with the explanatory text on page 21.

- Studies/Research and development
- Online
- ◆ FEED
- ◆ FID

Operational efficiencies

Santos' priority is to avoid and minimise emissions from our operations by improving operational efficiency.

In 2022 we will meet our 2025 target to reduce operational emissions by five per cent from 2016-17 levels in the Cooper Basin and Queensland and we will continue to implement efficiency projects across our entire portfolio to reduce the Scope 1 and 2 emissions intensity of our operations.

Further energy efficiency projects include increased integration of renewables and batteries into our power mix, converting flare purge gas to nitrogen, deploying new process technologies such as LoHeat™ and capturing and recovering gas that is currently flared or vented.³⁷

The LoHeat™ technology is being deployed at Moomba on one of the CO2 processing trains and the feasibility of utilising the technology on remaining CO2 processing trains at Moomba is currently being assessed.

In recent years, Santos has conducted independent plant efficiency opportunity studies for Moomba, Port Bonython, GLNG, Varanus Island, Devil Creek, Ningaloo Vision, Bayu-Undan and DLNG.

Stakeholders across our operations were engaged to understand areas of potential improvement in operational efficiencies, developing a list of potential initiatives and conducting high-level screening to determine the most promising ones. High-graded initiatives are then further assessed and projects that meet our economic and commercial hurdles are then proposed for funding.

New operational efficiency projects implemented in 2021 and 2022 are reducing fuel, flare and vent volumes by over six terajoules per day and CO2 emissions by 150,000 tonnes per year.

Fuel, flare and vent

In the 2020-21 financial year Australia's emissions from oil and gas and LNG decreased by 5.5 per cent (2.5 MtCO2e), largely due to reduced flaring and fuel combustion.³⁹

Santos has a policy position to avoid any unnecessary flaring and reduce flaring required for the safe conduct of our operations to as low as reasonably practicable. We are constantly seeking ways to reduce emissions as part of standard operations.

In 2021 we undertook a range of projects and initiatives across our operated assets at Moomba, Fairview and Roma to recover natural gas that was previously unable to be captured and beneficially used. These included optimising safety relief system performance at Moomba and improving dehydration systems to increase gas recovery at Fairview and Roma.

In 2022 we are assessing projects to enhance our over-pressure protection systems to further reduce emissions.

Emissions intensity

Operational efficiencies and strategic investments have enabled Santos to reduce the emissions intensity of our portfolio by 20 per cent from 2016-17 levels.

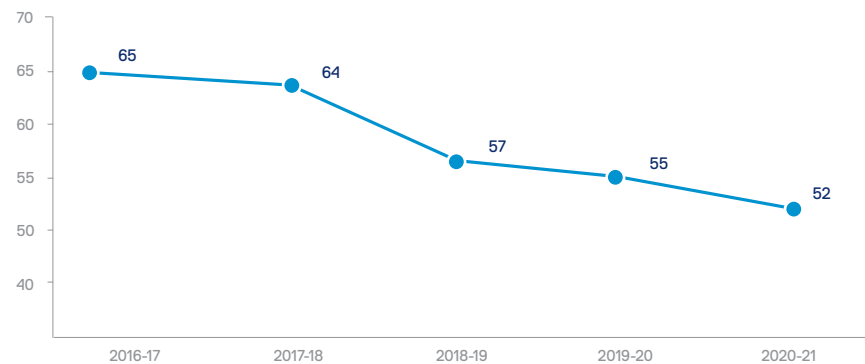
Emissions and production have a direct relationship - emissions increase with higher production. However, emissions reductions that do not impact production, such as operational efficiencies and CCS, work to drive down the ratio of emissions to production (emissions intensity). While absolute emissions are important, they do not indicate the underlying emissions reduction trend when energy production increases. Comparing emissions to production through an intensity metric is therefore important to provide insight into underlying emissions reduction trends.

Santos' objective is to continue to develop natural gas supply to sustain existing infrastructure and meet ongoing customer demand for this essential product as the world transitions to a lower-carbon economy. We are striving to reduce our emissions at the same time. Implementing emissions reduction projects and investing in assets with lower emissions-intensity are helping Santos to reduce our emissions per unit of energy produced, enabling us to supply critical fuels to meet customer demand more sustainably.

Prior to the Oil Search merger, Santos' Scope 1 and 2 emissions intensity reduced by 20 per cent to 52 ktCO2e/mmboe over the period from 2016-17 to 2020-21.

The merger with Oil Search is consistent with the company's efforts to reduce emissions intensity across our portfolio. While the merger occurred after this time, the Scope 1 and 2 emissions intensity of the combined entity in the 2020-21 period would have been 47 ktCO2e/mmboe.

Scope 1 and 2 emissions intensity³⁸
ktCO2e/mmboe



³⁷ LoHeat™ Technology is a process technology licensed by Honeywell UOP which improves the energy efficiency of the CO2 processing at Moomba. FID of the LoHeat™ project is subject to confirmation of eligibility for ACCUs

³⁸ Equity share, pre-merger. Santos' 2019-20 emissions include post-ConocoPhillips ABU West asset acquisition equity of the Bayu-Undan asset for the full financial year.

³⁹ National Greenhouse and Energy Reporting Australia 2021-21 published data highlights: <http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Data-highlights/2020-21-published-data-highlights>

Electrification and renewables integration

By centralising compression and power generation in our facilities we can decrease fuel gas usage through elimination of spinning reserve and enable greater penetration of renewables in our energy mix.

Santos has budgeted plans for electrification activities in the Cooper Basin and at Gladstone LNG.

In 2022 we are progressing front end engineering design (FEED) for our Cooper Gas Electrification Project, which will electrify upstream gas satellite compression in the Cooper Basin. We plan to then target integration of more renewables into power generation activities.

At Gladstone LNG in Queensland, a feasibility study is underway to assess the partial electrification of Curtis Island by replacing gas-fired power generation units with grid-connected electricity.

In the Cooper Basin we have already incorporated solar and battery-powered microgrids and beam pumps into our operations and continue to build on the more than ten megawatts of solar electricity and ten megawatts of battery storage already installed. Santos also has current and upcoming projects to integrate more renewables into our facilities. In 2021 solar and battery power was installed at Arcadia in Queensland's Bowen Basin and in 2022 at Watson in the Cooper/Eromanga Basins in southwest Queensland.

Fugitive emissions and methane

Fugitive emissions

Within the oil and gas industry, the term 'fugitive emissions' refers specifically to minor natural gas losses from operations, for example, from valves on pipelines, well or gas plant equipment.

Fugitive emissions comprise less than two per cent of Santos' operated emissions. Santos is committed to minimising their occurrence in our operations. As a proportion of our overall production volume, methane emissions are well below the Oil and Gas Climate Initiative 2025 intensity target of less than 0.2 per cent.

Establishing natural gas (methane) levels

Santos undertakes surveys to enable us to assess whether there are changes in ambient methane levels as a result of our operations.

Santos is working with CSIRO to assess the emissions contribution from our onshore operations in Australia against background emissions occurring from geological and biological sources such as wetlands, soils, rivers and agriculture. Baseline studies have been conducted in New South Wales, the McArthur and Amadeus Basins in the Northern Territory and Arcadia, Fairview, Roma and Scotia in the Surat/Bowen Basins in Queensland. The results of all studies to date have shown that the average methane concentration in each of the surveyed areas is in line with expected background levels.

Further background methane studies are being conducted across our existing onshore operations this year with all onshore operations to be surveyed by 2030.

Case study

Operational efficiencies in PNG

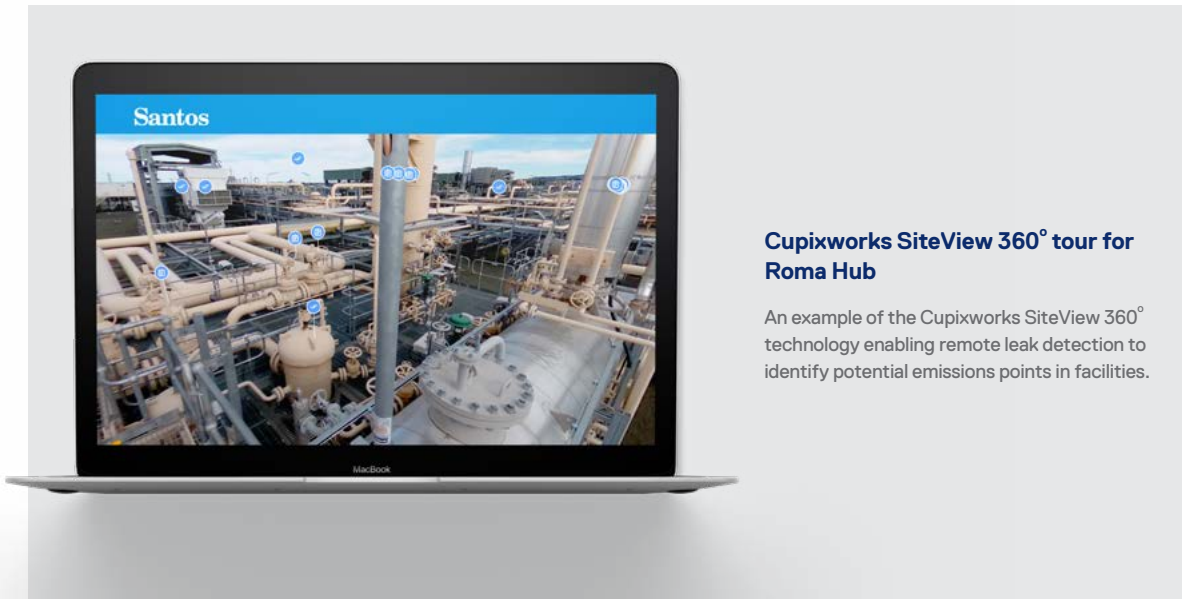
In PNG operations, a targeted program is underway to reduce the emissions intensity of our assets. In the short-term, we are focused on minimising flaring and improving operational efficiencies to enable lasting and sustainable emissions reduction.

Through a thorough decision-making process, including consideration of a marginal abatement cost curve, the company is investing capital in the emissions reduction opportunities with the largest benefit. Importantly, many of the opportunities have co-benefits such as improving efficiency in operations, reduced maintenance and other costs, improved health and safety and/or increased production.

Ten projects that will reduce emissions are currently under assessment across the PNG assets. If they proceed, the projects have the potential to cumulatively reduce operated emissions by 85,000 tonnes of CO₂ equivalent per year.

This represents approximately 11 per cent of PNG operated emissions. The projects include compressor replacement, electrical upgrades, replacement of diesel generators, optimisation of safety relief systems and additional control valves.





Cupixworks SiteView 360° tour for Roma Hub

An example of the Cupixworks SiteView 360° technology enabling remote leak detection to identify potential emissions points in facilities.

Finding and fixing

Santos has leak detection and repair programs in place and monitors gas field infrastructure, including wellheads, pipe joints and flanges, using technology such as gas leak detectors and infrared cameras.

Our well integrity process is designed to ensure that hydrocarbons do not leak from wells. We conduct frequent well integrity assessments and well emissions are measured or estimated in accordance with regulatory requirements, which are among some of the most stringent in the world.

Methane as a greenhouse gas

Methane (CH₄) currently represents approximately six per cent of Santos' total greenhouse gas emissions with around 94 per cent being carbon dioxide (CO₂). As a proportion of our overall production volume, methane emissions are well below the Oil and Gas Climate Initiative 2025 intensity target of less than 0.2 per cent.

Methane and CO₂ are both greenhouse gases. Methane has a higher long-term global warming potential compared to CO₂. Methane emissions are generated through the CO₂ removal process, from field venting for safety or as part of the water removal process, minor leaks and assumed emissions from incomplete combustion/flaring. Methane emissions are calculated in accordance with regulatory-defined emissions factors.

A number of top-down and bottom-up studies have been conducted by CSIRO at natural gas operations in the Surat Basin in Queensland where Santos has been producing natural gas for more than 50 years. These studies concluded that reported methane emissions in the national inventory are comparable to actual measured emissions and that the methane loss rates for the Surat Basin were among the lowest in their sample of 19 fields from around the world.⁴⁰

⁴⁰ Quarterly Update of Australia's National Greenhouse Gas Inventory, June 2021: <https://www.industry.gov.au/sites/default/files/November%202021/document/nggi-quarterly-update-june-2021-data-sources.pdf>

Case study

Technological developments increasing efficiency

In 2021, Santos-operated Gladstone LNG (upstream) commenced a ten-year leak detection and repair (LDAR) program to find and fix fugitive emissions sources across our production facilities.

LDAR programs have been part of our business for a number of years with technology and processes improving year-on-year. In 2021 the program included the use of conventional leak detection equipment in conjunction with advanced Cupixworks SiteView 360° imaging. This technology is designed to assist engineers and operators to assess risk, scope and plan repairs remotely. It creates a digital twin of our facilities enabling us to produce a 360° remote tour (like Google Streetview) and identify potential emissions points for each facility. The system accelerates identification and analysis of potential leak points and assists in maintenance planning.

This advanced imaging technique was used in 2021 to survey five Santos production facilities, resulting in the identification and prompt repair of identified fugitive emissions sources.

Santos is working on further initiatives to ensure the continued success of the program including:

- + Purchasing in-field leak detection equipment so that our operators can monitor and confirm the effectiveness of repairs.
- + Working with the Queensland Petroleum and Gas Inspectorate to revise and modernise the Code of Practice for Leak Detection, Management and Reporting for Petroleum Operating Plant.

Carbon Capture and Storage

CCS is a critical technology to meet the goals of the Paris Agreement. Santos will use CCS technology to accelerate the economic feasibility of hydrogen and deliver a step-change in emissions reduction by 2030.

In February 2022, Santos announced a booking of 100 million tonnes of CO2 resource in the Cooper Basin in South Australia. It is our understanding that this is one of the first bookings in the world in accordance with the Society of Petroleum Engineers' CO2 Storage Resource Management System (SRMS). CCS is the process whereby CO2 is captured from a facility, then dehydrated and compressed for transportation via pipeline to a storage site. The CO2 is then injected into a geological formation that provides safe and permanent storage deep underground. Santos plans to inject CO2 into depleted reservoirs that have previously held oil and gas safely in place for tens of millions of years.

CCS is expected to play a critical role in global decarbonisation efforts by providing the opportunity to achieve low-cost and large-scale emissions reduction. The IEA's Executive Director Fatih Birol has stated that reaching net-zero goals without CCS will be almost impossible.⁴¹ Today, there are more than 27 commercial CCS facilities operating around the world, with a storage capacity of over 36 million tonnes of CO2 per year.⁴² CCS is proven technology and the IEA's Net Zero by 2050 Roadmap envisages Carbon Capture, Utilisation and Storage growing to 7.6 billion tonnes of CO2 per year by 2050.⁴³

Santos already operates natural gas storage facilities in Queensland and South Australia where gas is injected into reservoirs for later production to meet peak demand periods such as on cold days in winter. This, together with experience in the use of gas injection to enhance production in some wells gives us confidence that we can now safely inject and permanently store CO2 to reduce our own emissions and potentially those of others, including customers. Santos has developed a CCS hub strategy across our core asset areas with the potential to create more than 30 million tonnes per annum of CO2 storage capacity and with line of sight to 10 million tonnes per annum of online carbon storage capacity by 2030.

The table below outlines the CCS hubs that Santos is working on including indicative status (project phase) and timelines⁴⁴

Initiatives	Description	Project phase	Indicative Timeline
Moomba CCS (South Australia)	Santos has taken a final investment decision on phase 1 of our Moomba CCS project, a commercial-scale project which will store approximately 1.7 million tonnes per annum of CO2 captured at the Moomba Gas Plant. If new sources of CO2 are made available, the potential exists to store approximately 20 million tonnes per annum across the Cooper and Eromanga Basins for up to 50 years. As the Moomba CCS project is designed to utilise existing processing capability at Moomba and existing infrastructure associated with depleted reservoirs in the Cooper Basin, Santos expects that it will be one of the lowest-cost CCS projects globally with full lifecycle cost of less than US\$24 per tonne of CO2.	Under construction	Current and ongoing 2021 FID 2024 online
Bayu-Undan CCS (Northern Australia / Timor-Leste)	In March 2022 front end engineering design (FEED) commenced for the Bayu-Undan CCS project. Santos is working with both the Australian and Timor-Leste governments with a view to progressing the development of this project, with initial injection and storage of approximately 2.3 million tonnes of CO2 per annum once natural gas production from the field ceases. The project has storage capacity of around 10 million tonnes of CO2 per annum and will look to capture CO2 from nearby projects up to its potential. The Bayu-Undan CCS project will utilise the existing Bayu-Undan to Darwin pipeline and the offshore Bayu-Undan facilities to minimise the cost of the project. Potential CO2 sources include natural gas developments and industrial sources in northern Australia with customers and investors in Korea and Japan also interested in the project for emissions reduction from their activities.	FEED underway	2025 FID 2027 online
Reindeer CCS (Western Australia)	The Reindeer CCS project has the potential to store up to 2.4 million tonnes of CO2 per annum for approximately 20 years, with availability for third party CO2 and with potential CO2 sources including industrial sources and natural gas developments in the Pilbara region of Western Australia.	Under assessment	2025 FID 2028 online
PNG CCS	PNG CCS would potentially support the LNG industry, with potential storage of approximately 0.3 million tonnes of CO2 per annum.	Under assessment	2028 FID 2031 online

⁴¹ IEA Energy Technology Perspectives, Special Report on Carbon Capture Utilisation and Storage – CCUS in Clean Energy Transitions: https://iea.blob.core.windows.net/assets/181b48b4-323f-454d-96fb-0bb1889d96a9/CCUS_in_clean_energy_transitions.pdf

⁴² The Global Status of CCS 2021 Report: <https://www.globalccsinstitute.com/wp-content/uploads/2021/11/Global-Status-of-CCS-2021-Global-CCS-Institute-1121.pdf>

⁴³ IEA, Net Zero by 2050 - A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>

⁴⁴ With the exception of Moomba CCS, which has already received a final investment decision to proceed, the timeline and details relating to for other CCS projects are preliminary only and subject to change

Case study

Moomba CCS project

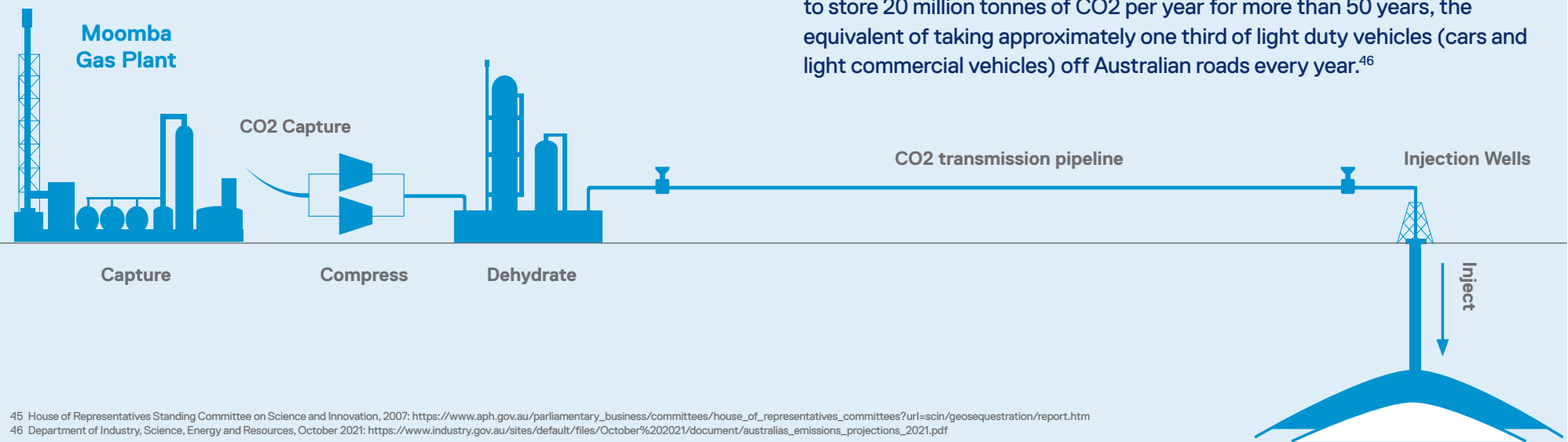
Centred around the Moomba Gas Plant, the Moomba CCS project is a commercial large-scale hub for the capture and geological storage of CO2. The project will deliver material greenhouse gas emissions reduction at the Moomba facility of approximately 1.7 million tonnes per annum.

The Moomba CCS project is a global leader on full lifecycle emissions reduction cost when benchmarked against other CCS projects. The projected cost per tonne of CO2 is less than US\$24 per tonne. Moomba CCS has inherent advantages that make it an ideal site for capturing and storing CO2, including:

- + **Concentrated CO2 emissions source enables low-cost capture:** The capture component of a CCS project can typically be up to 70-80 per cent of total project cost.⁴⁵ This is because the CO2 being sequestered usually contains a high proportion of impurities, requiring capital-intensive technology for removal. The Moomba Gas Plant has established facilities for natural gas processing from which concentrated CO2 is a by-product. This removes the need for the project to deploy capture technology.

- + **Short distance to high-capacity, well known geological systems:** The use of depleted oil and gas reservoirs distinguishes the Moomba CCS project from others in operation globally. Most other dedicated CCS projects store CO2 in deep saline aquifers. The Cooper Basin is the geological system in which CO2 will be stored. Having been a petroleum-producing basin for more than 50 years, there is a high level of understanding of the basin geology. Vast amounts of data and knowledge acquired through production operations have been used to select the best sites for CO2 storage. The geology, production history and underground gas storage history provides confidence in injectivity and storage capacity as well as our ability to safely and permanently store CO2. These are all important factors in selecting cost-effective and suitable storage reservoirs.
- + **Regulatory framework:** The Moomba CCS project has the advantage of being in South Australia, a state which has legislation and regulations in place to enable CCS projects. This provides confidence to make a long-term, long-life investment. In addition, the Australian Government has approved a new CCS method to enable CCS projects to generate Australian Carbon Credit Units (ACCUs) through the Emissions Reduction Fund. Australia's Clean Energy Regulator will oversee the method, guaranteeing the integrity of ACCUs. The Moomba CCS project is the first CCS project registered with the Regulator.

Diagrammatical representation of Moomba CCS



The Cooper-Eromanga basins, where Moomba is located, have the potential to store 20 million tonnes of CO2 per year for more than 50 years, the equivalent of taking approximately one third of light duty vehicles (cars and light commercial vehicles) off Australian roads every year.⁴⁶

⁴⁵ House of Representatives Standing Committee on Science and Innovation, 2007: https://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=scin/geosequestration/report.htm
⁴⁶ Department of Industry, Science, Energy and Resources, October 2021: https://www.industry.gov.au/sites/default/files/October%202021/document/australias_emissions_projections_2021.pdf

Case study

Bayu-Undan CCS

Santos' Memorandum of Understanding (MOU) with Timor-Leste's National Petroleum and Minerals Authority (ANPM) details the areas the Bayu-Undan Joint Venture and the ANPM, with the support of the Timor-Leste Government, will work on collaboratively to test the viability of repurposing the existing Bayu-Undan facilities and using the Bayu-Undan reservoir for CCS. These include sharing technical, operational and commercial information, assessing the regulatory framework, evaluating local capacity opportunities and establishing a decision timeline.

Santos Managing Director and Chief Executive Officer Kevin Gallagher said: "We believe the Bayu-Undan reservoir and facilities have the potential to be a world-leading CCS project and we are delighted to be working together with the ANPM and the Timor-Leste Government to progress this opportunity.

"CCS at Bayu-Undan has potential capacity to safely and permanently store approximately 10 million tonnes per annum of CO₂ and could build a new job-creating and revenue-generating industry for Timor-Leste.

"This has the potential to be a win-win; good for the environment, good for industry and opening up an exciting opportunity for the people of Timor-Leste, so we look forward to progressing this MOU in partnership with the ANPM."

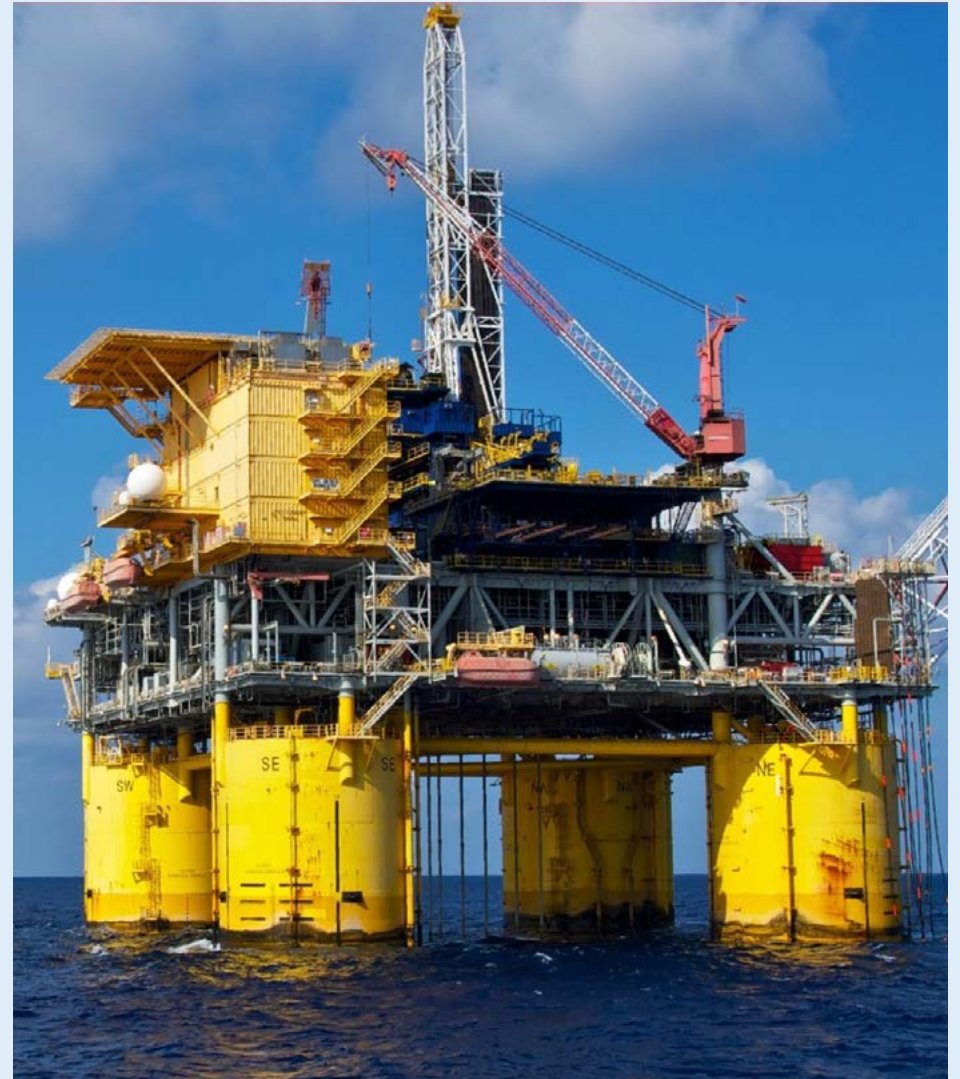
ANPM President Florentino Soares Ferreira said: "This is a milestone for Timor-Leste. With the signing of the CCS MOU between Santos (representing its Joint Venture partners) and ANPM proves that Timor-Leste is proactively taking the lead in integrating its oil and gas sector towards Timor-Leste's commitment of accelerating decarbonization and meeting the U.N. net zero target by 2050.

"Despite Timor-Leste being one of the lowest emission countries in the world, and that the Paris Agreement provides waiver or concession to the developing and less developed nations such as Timor-Leste; we understand that carbon trading or carbon credits market is an integral part of our future economy. We don't want to miss this opportunity; and I believe this will become one of the largest CCS projects in the Southern Hemisphere. This will enable both Timor-Leste and Australia to exploit its untapped resources in meeting energy demands as well as offsetting its carbon emissions and transitioning towards carbon neutral economies."

Also in support of progress towards Bayu-Undan CCS, Santos, SK E&S, K-CCUS Association, CO₂CRC and Korea Trade Insurance Corporation have signed an MOU to collaborate in the development of CO₂ storage facilities.

Santos Managing Director and Chief Executive Officer Kevin Gallagher said the MOU highlights growing momentum and action to reduce carbon emissions in the Asia-Pacific.

"This agreement opens the potential for broader bilateral partnership and cooperation on CCS between Australia and Korea. We look forward to progressing this partnership to develop and commercialise CCS projects in our region on our path to a lower-emissions future."



Carbon solutions

In addition to operational efficiencies and CCS, Santos is committed to developing carbon solutions that can create a new revenue stream and be utilised to generate carbon credits to offset the emissions of Santos and our customers. This includes the expansion of high-quality nature-based solutions and the development of new technologies such as direct air capture.

We plan to develop a portfolio of carbon offsets to generate a new revenue stream and offset residual production emissions and Scope 3, or customer, emissions resulting from use of our products.

Nature-based solutions

While not the primary means of reducing our carbon intensity, offsets will be needed to help us achieve our net-zero goal. We will generate credits that are real, measurable and verifiable, and as customer demand grows, we're aiming to establish a portfolio of offsets that can generate revenue and support the sale of lower or no-carbon products. Santos already generates carbon credit units from nature-based projects and we continue to evaluate further opportunities.

Examples include:

- + The Chinchilla White Gum plantation near Injune in Queensland, a 1,250 hectare plantation of native tree species that generated its first tranche of approximately 30,000 ACCUs in 2018.
- + The UN-recognised West Arnhem Land Fire Abatement Project, a savanna burning fire management project in the Northern Territory. Indigenous rangers from the region practice traditional fire management across 28,000 square kilometres of land. This project accrues ACCUs annually and has so far delivered abatement of more than 1.8 million tonnes of CO₂, making it one of the largest nature-based greenhouse gas offset programs in Australia.

With access to approximately 50,000 hectares of land across our operations in Australia, we are undertaking assessments and feasibility studies across a range of nature-based opportunities within our business and in collaboration with others. These include afforestation and reforestation, improved productivity of beef cattle herds, building the organic content of soil in grazing systems and introducing new land management practices to allow native forests to regenerate.

Our focus is on nature-based programs that provide both positive biodiversity emissions reduction impacts while also creating additional revenue, employment opportunities and other co-benefits for landholders, local and Indigenous communities. These high-quality carbon credit units can be used in pursuit of our net-zero target or to generate revenue through voluntary carbon trading schemes.

Direct air capture and post-combustion capture

Santos is advancing the development of direct air capture and post-combustion capture technology to generate carbon credits to help meet Scope 1 and 2 emissions reduction targets and develop carbon solutions for customers, potentially creating a new revenue stream for the company.

Santos is well positioned to develop direct air capture and post-combustion capture due to the low-cost CCS resources and capability available in the Cooper Basin. If successful, these technologies will remove the need to transport CO₂ over hundreds or thousands of kilometres from industrial sources to a CCS site. Instead, CO₂ will be removed from the atmosphere, close to the CCS site.

Santos is actively working with existing domestic and export LNG customers to develop post-combustion capture solutions paired to CCS activities and is collaborating with Australia's national science agency, CSIRO, to test their ground-breaking direct air capture and post-combustion carbon capture technologies at Moomba.

The collaboration will continue to develop CSIRO's CarbonAssist™ technology which removes CO₂ directly from the atmosphere and higher-concentration post-combustion scenarios. The CO₂ can then be safely and permanently stored as part of a CCS project or used to make carbon-based products. The development program involves field demonstration trials designed to support commercialisation.

Santos has committed US\$7.35 million towards the development of CarbonAssist™ technology with CSIRO in 2022.



Example of a CarbonAssist™ direct air capture unit

Clean fuels hubs

Hydrogen and ammonia production

Santos' commitment to CCS is the first step in establishing the infrastructure to support the growth of hydrogen and ammonia markets in Australia and Asia. Santos will use CCS technology to accelerate the development of affordable hydrogen production from natural gas and support the evolution of hydrogen markets.

Santos has invested over US\$15 million in the last two years to develop a cost-competitive solution to deliver clean hydrogen from natural gas, combined with CCS. In 2022 Santos plans to move to front end engineering design (FEED) on our first hydrogen project at Moomba. Santos has partnered with leading technology providers and is moving forward with studies of three hydrogen transport technologies with a view to securing commercial offtake agreements.

Hydrogen made from natural gas in combination with CCS is cost-competitive and sustainable. Hydrogen produces no CO2 emissions when combusted with the only by-product being water vapour. While generating hydrogen from natural gas produces CO2, it can be captured and stored in Santos CCS hubs.

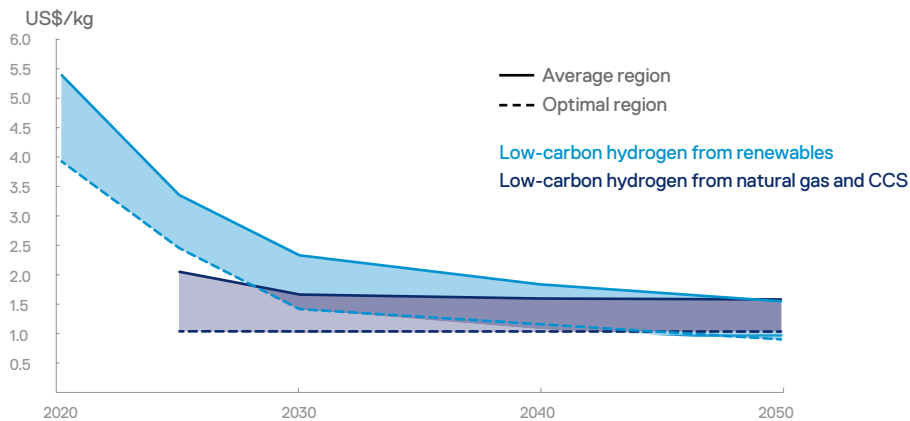
If used in conjunction with emissions-neutral processing and CCS, hydrogen produced from natural gas has the potential to achieve net-zero Scope 1, 2 and 3 emissions.

Hydrogen produced from natural gas, combined with CCS, is currently half the cost of generating hydrogen from water and electricity.⁴⁷

Even in the IEA Net Zero by 2050 scenario hydrogen production from natural gas would still account for about 40 per cent of the world's hydrogen in 2050 and 50 per cent of natural gas produced would be used to make hydrogen in 2050.⁴⁸

Hydrogen production from natural gas and CCS can have life cycle emissions of 1.2kg CO2 per kilogram of hydrogen, which is much lower than conventional hydrogen production and has a comparable level of emissions to hydrogen produced from renewables, nuclear or waste biomass technologies.⁴⁹

Production cost of hydrogen⁵⁰



Governments support development of hydrogen industry

Carbon capture and hydrogen are essential for decarbonising 'hard to abate' sectors (industrial processes, buildings and transport, including aviation) which comprise 54 per cent of global emissions.⁵¹ In May 2020, following a rigorous review process by an expert technical panel, the Australian Government announced low-cost hydrogen and CCS as two of five investment priorities for its 'Low Emissions Technology Roadmap'.

Australian federal and state governments have provided A\$150 million in funding for hydrogen projects since 2015 to help the private sector grow a clean, innovative, safe and competitive hydrogen industry.⁵²

Australia's strategic support for CCS and hydrogen mirrors the international movement to progress these technologies to meet climate change goals. For example, the Norwegian Government in July 2020 earmarked US\$1.8 billion for the US\$2.9 billion 'Longship' CCS project and governments around the world are committing billions of dollars towards producing and utilising hydrogen with Germany, France, Korea, Japan and China at the forefront.

47 IEA, Global Hydrogen Review 2021: <https://hydrogencouncil.com/en/hydrogen-insights-2021/>

48 IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021>; IEA, Net Zero by 2050, A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>

49 Hydrogen Council, Hydrogen Decarbonization Pathways, 2021: https://hydrogencouncil.com/wp-content/uploads/2021/04/Hydrogen-Council-Report_Decarbonization-Pathways_Part-1-Lifecycle-Assessment.pdf

50 Hydrogen Council, Hydrogen Insights, February 2021: <https://hydrogencouncil.com/en/hydrogen-insights-2021/>

51 IEA, Global CO2 emissions by sector, 2019: <https://www.iea.org/data-and-statistics/charts/global-co2-emissions-by-sector-2019>

52 Commonwealth of Australia, Australia's National Hydrogen Strategy, 2019. <https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf> and Government of South Australia, South Australia's Hydrogen Action Plan, 2019. <https://www.renewables.sa.gov.au/documents/hydrogen-files/>



Hydrogen production is a natural extension of what Santos already does

Santos has been producing natural gas and liquids for more than 50 years. Our experience and access to resources makes hydrogen production a natural adjacency:

- + Skills and knowledge of geology gained from petroleum exploration and production is directly transferable to CCS development and operations
- + Resource licences over petroleum acreage provide access, or can be converted to provide access for CCS and CCS resources
- + Petroleum production, processing, transport and storage capability is directly transferable to hydrogen activities, including the safe handling and management of flammable gases
- + In many cases existing infrastructure can be utilised, or converted for hydrogen activities, extending its useful life and reducing costs of hydrogen production and supply
- + The hydrogen customers of tomorrow are our natural gas customers today and Santos has existing relationships and knowledge of customer businesses and energy/decarbonisation needs
- + Santos has a highly skilled workforce with a similar skills base to that required for hydrogen activities, extending the life of jobs for people currently working on petroleum activities

Natural gas combined with CCS technology could support the acceleration of a future hydrogen economy until the cost of hydrogen made from renewable sources comes down. It would also provide additional diversified hydrogen supply as demand grows and renewable hydrogen projects overcome challenges such as water and land requirements. The Cooper Basin has the potential to become a large-scale, commercial CCS hub enabling low-carbon, cost-competitive hydrogen production in Australia.

In the future, Santos plans to expand its natural gas to hydrogen infrastructure by integrating hydrogen from renewable energy and electrolysis as economic viability improves over time.

53 Media Release 4 November 2021: <https://www.santos.com/news/santos-partners-with-csiro-on-development-of-new-technology-to-negate-carbon-emissions/>

Case study

Collaborating with CSIRO on step-change emissions reduction technology

“At Santos, we have an industry-leading target of achieving net-zero Scope 1 and 2 emissions by 2040 and we are committed to looking at new technologies and finding cost-effective ways to reduce our emissions so that we can continue to supply affordable and cleaner energy to meet customer demand and generate new revenue streams,” Santos Managing Director and Chief Executive Officer Kevin Gallagher said.

Santos is actively participating in the development of technologies with leading agencies and project partners, including GHD on a hydrogen concept study and Australian’s national science agency, CSIRO on the development of direct air capture technology.

In a statement on the CSIRO research and collaboration agreement with Santos in November 2021, the CSIRO Energy Director said that CO2 capture technologies will play a vital role in the transition to net-zero emissions.

“By collaborating with industry, we can demonstrate key technologies at scale, ensuring superior performance and economics. CSIRO has invested in CCS research for over 20 years, because of its potential for large-scale decarbonisation leading to emissions reduction and the creation of new industries.”⁵³

Santos’ recent partnerships include:

- + Concept study with GHD on CCS and hydrogen production in the Cooper Basin
- + Memorandum of Understanding with global oil and gas company ENI to cooperate on opportunities in northern Australia and Timor-Leste, including CCS
- + Memorandum of Understanding with Synertec to develop a renewable energy power system based on solar and batteries for sustainable well de-watering
- + Memorandum of Understanding with Timor-Leste regulator ANPM to progress CCS at Bayu-Undan
- + Feasibility study with Genos on supply of hydrogen to reduce emissions from polyethylene manufacturing
- + Direct air capture technology research and collaboration agreement with CSIRO
- + Memorandum of Understanding with our Korean joint venture partner SK E&S, K-CCUS Association (Korea), Australia’s CO2CRC and Korea Trade Insurance Corporation to support and collaborate in the development of CO2 storage facilities, including Bayu-Undan

Supply chain collaboration

We will actively work with customers to reduce their emissions by at least 1.5 million tonnes CO₂ per annum by 2030 from the supply of clean fuels

Santos has committed to work with our customers to reduce their emissions by more than 1.5 million tonnes annually by 2030 through the supply of clean fuels, enabling them to reduce their Scope 1 and 2 emissions compared to alternative options. This includes switching from products like coal and diesel to natural gas, and in the future, hydrogen.

Santos will work with customers and partners to build demand for clean fuels like hydrogen and ammonia. Our gas and LNG customers of today will be the hydrogen customers of tomorrow and they are increasingly demanding lower-carbon products. Their timeframes for investing in conversion of, or new technology, will set the timeframe for commercial use of clean fuels like hydrogen. Producers, manufacturers, infrastructure operators, consumers, governments and regulatory bodies will need to work together to help build a future hydrogen market.

The IEA estimated US\$750 billion was spent on clean energy investments in 2021. Although this is an increase from the 2019 level of US\$600 billion, the IEA estimates investment in clean energy would need to double through to 2030 to enable the world to meet its climate goals.⁵⁴ Within this landscape, Santos aspires to help build clean fuels markets in Australia and Asia.

Japan and Korea have announced Net Zero by 2050 targets, including hydrogen for transport and mobility, and use in power generation as key levers to achieve this. Through our established relationships with investors and customers from Japan and Korea, developed over years of supplying LNG into Asia, Santos is well positioned to contribute to Australia's hydrogen export market.

Domestically in Australia, Santos is focused on the opportunity to displace liquid fuels with hydrogen in mining and heavy transport applications as well as decarbonising mining operations through CCS.



⁵⁴ Clean energy includes renewables, energy efficiency, low-carbon fuels, nuclear power, battery storage, CCUS. IEA, World Energy Investments, 2021: <https://www.iea.org/reports/world-energy-investment-2021>

Aligning capital allocation with our Climate Transition Action Plan

Santos has been incorporating greenhouse gas emissions and carbon pricing into our annual and longer-term strategic and financial planning processes for over 10 years

Capital allocation and our balance sheet are managed to ensure we can deliver returns to shareholders, repay debt, fund our base business, build around our existing infrastructure by developing natural gas projects for backfill and grow through CCS, and clean fuels projects. Our merger with Oil Search resulted in an even stronger investment grade balance sheet with more than US\$5.6 billion of liquidity, positioning the company well to fund these activities through the energy transition.⁵⁵

Santos has been incorporating greenhouse gas emissions and carbon pricing into our annual and longer-term strategic and financial planning processes for over 10 years and we regularly stress-test our portfolio across a range of carbon price assumptions. Santos' carbon planning price assumption projects a carbon price of \$US50 per tonne of CO₂e (nominal) from 2030. The carbon price assumptions are refreshed annually along with other corporate economic assumptions.

Our investment screening and decision-making processes consider the greenhouse gas emissions from all projects and the economic impact that a carbon price would have on our business. Our analysis includes sensitivity assessment to consider the impacts of a range of energy mix and policy scenarios. These scenarios are used to understand the demand for Santos' products and how it may change under different emissions reduction policies. In 2021, our scenario analysis was updated to include two climate scenarios focused on limiting temperature rise to 1.5 degrees Celsius by 2100.

Investment screening for our transition activities will be subject to rigorous economic and commercial criteria to ensure the company's capital allocation provides a return on investment in line with the company's disciplined low-cost operating model and corporate strategy. Carbon and energy market, public policy and regulatory trends inform the company's carbon and clean fuels pricing assumptions, and assumptions relating to generation, procurement and trading of carbon credit units. In addition, investments will be demand and customer driven, with offtake or other commercial marketing arrangements a key factor in investment screening.

In looking to deploy capital to our Climate Transition Action Plan, Santos will also have regard to our broader prudential obligations, which require us to balance shareholder returns, debt repayment and balance sheet strength with sustaining our natural gas business to meet ongoing customer demand and safely manage our assets as well as investing in climate transition activities. It is expected that capital investment in sustaining low emissions-intensity natural gas activities will predominate in the earlier part of the decade. Investment in our transition activities will initially focus on decarbonisation projects, including CCS, laying the foundation to support increased investment in clean fuels projects towards the latter part of the decade.

⁵⁵ Santos 2021 Full-year results: <https://www.santos.com/news/2021-full-year-results/>

⁵⁶ Subject to the considerations outlined on page 21 of this report

Santos' projected capital investment in initiatives included in our Climate Transition Action Plan is consistent with Paris-aligned pathways.

The Paris Agreement seeks to hold the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels. Santos supports this objective and our Climate Transition Action Plan sets out the steps we are aiming to take toward the achievement of our target of net-zero Scope 1 and 2 emissions by 2040. Not only is this target more ambitious than widespread targets for Net Zero by 2050, it is underpinned by planned projects and associated capital investment.

Under two well-below 2 degrees Celsius IEA scenarios, the Sustainable Development Scenario and Net Zero by 2050 scenario, the proportion of global capital investment envisioned in hydrogen and hydrogen-based fuels is 3.7 per cent and 4.8 per cent respectively, when compared to conventional oil and gas. In the period to 2030, Santos' projected capital investment in clean fuels projects (hydrogen and ammonia hubs), ranges from US\$1.9 billion to US\$3.8 billion (depending on equity interest, customer demand and value accretion).⁵⁶ **Even at the lower end of this range, Santos' projected investment in hydrogen and hydrogen-based fuels relative to planned sustaining natural gas and associated liquids investment, is in line with the level envisioned in Paris-aligned scenarios.**



Supporting a sustainable and just transition

When examining our climate-related risks and the pace of the energy transition, we are also mindful of a ‘just transition’. As a result, we take into account not only business issues, but the implications of our actions for customers, employees and the communities where we operate.

The IEA Gas Market Report for the first quarter of 2022 reported that global natural gas consumption rebounded by 4.6 per cent in 2021, more than double the decline seen in 2020.⁵⁷ This strong demand growth was driven by economic recovery as pandemic restrictions eased and some extreme weather events. When supply did not keep pace with demand, tight markets and steep price increases occurred. Resulting high gas and electricity prices hurt consumers and, as the IEA has said, are likely to have a lasting negative impact beyond the current seasonal environment with emerging economies particularly vulnerable and already experiencing power cuts, industrial demand destruction and potential food supply issues in the absence of affordable gas-based fertilisers.⁵⁸

High prices have also exacerbated a reversal of global progress towards universal access to electricity and clean cooking brought on by the pandemic.⁵⁹ The IEA estimates that in 2021 the number of people without access to electricity increased by about two per cent. For clean cooking, the pandemic increased the number of people without access by 30 million between 2019 and 2021, a rise of one per cent.⁶⁰ This was the result of a deterioration in sub-Saharan Africa and a slowdown in progress in developing Asia, where many people reverted to dirtier fuels during the pandemic for financial reasons. Governments in both regions intervened to maintain affordability for some of the world’s poorest people. The IEA has noted that the current market situation is a stark reminder of the importance of security of supply measures.

Over the next 30 years, the energy transition demands a structural shift in the way that the world generates energy, but a just transition also requires attention to energy security and affordability. Further, the Paris Agreement acknowledges the need to balance the reduction in emissions with “the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities.”⁶¹

As we transition to the delivery of lower-carbon energy, Santos recognises that new technologies and alternate approaches will change the way we currently conduct our business. We are committed to ensuring a just transition for our customers, our employees and the communities where we operate and who benefit from our operations.

As our business evolves and adapts to change, the effects on assets, people and contribution to local community are key considerations in our strategy and approach. Throughout the energy transition, we are seeking to repurpose infrastructure and facilities wherever possible to support decarbonisation through CCS, which will also provide the platform for clean fuels projects such as hydrogen. In this way Santos is not only extending the life of existing infrastructure, but also extending the life of existing jobs and creating new jobs with similar and adjacent skills. This also applies to local business opportunities and our presence in and contribution to the communities where we operate.

Santos seeks to attract and retain the brightest and best personnel and aims to facilitate the movement and retraining of our employees in circumstances where our business undergoes change. This philosophy provides a solid foundation for ensuring continued opportunity and growth. Our efforts to ensure diversity and equal opportunity in recruitment, ongoing career development, training and a wide range of role opportunities ‘include consideration of the energy transition.

We continue to engage with employees, employee representative bodies and relevant government bodies at a local level, keeping them informed about our plans and listening to any feedback. Working with our employees to build their interest, and develop the skills needed, to meet the needs of our changing business is a priority. We also engage with the many, and often remote, communities that have supported our business for more than 65 years, and consider their views in our transition planning processes.

We acknowledge that there are situations where we must eventually retire infrastructure. By means of sustainable development plans, we work to ensure communities transition successfully to a post-project environment and that our employees are offered alternative job options or assisted through retraining or other programs to support their future employability.



57 IEA, Gas Market Report, Q1 2022: <https://www.iea.org/reports/gas-market-report-q1-2022>

58 IEA, Gas Market Report, Q1 2022: <https://www.iea.org/reports/gas-market-report-q1-2022>

59 IEA, The pandemic continues to slow progress towards universal energy access, 2021: <https://www.iea.org/commentaries/the-pandemic-continues-to-slow-progress-towards-universal-energy-access>

60 IEA, The pandemic continues to slow progress towards universal energy access, 2021: <https://www.iea.org/commentaries/the-pandemic-continues-to-slow-progress-towards-universal-energy-access>

61 Paris Agreement preamble: https://unfccc.int/sites/default/files/english_paris_agreement.pdf

Scenario analysis

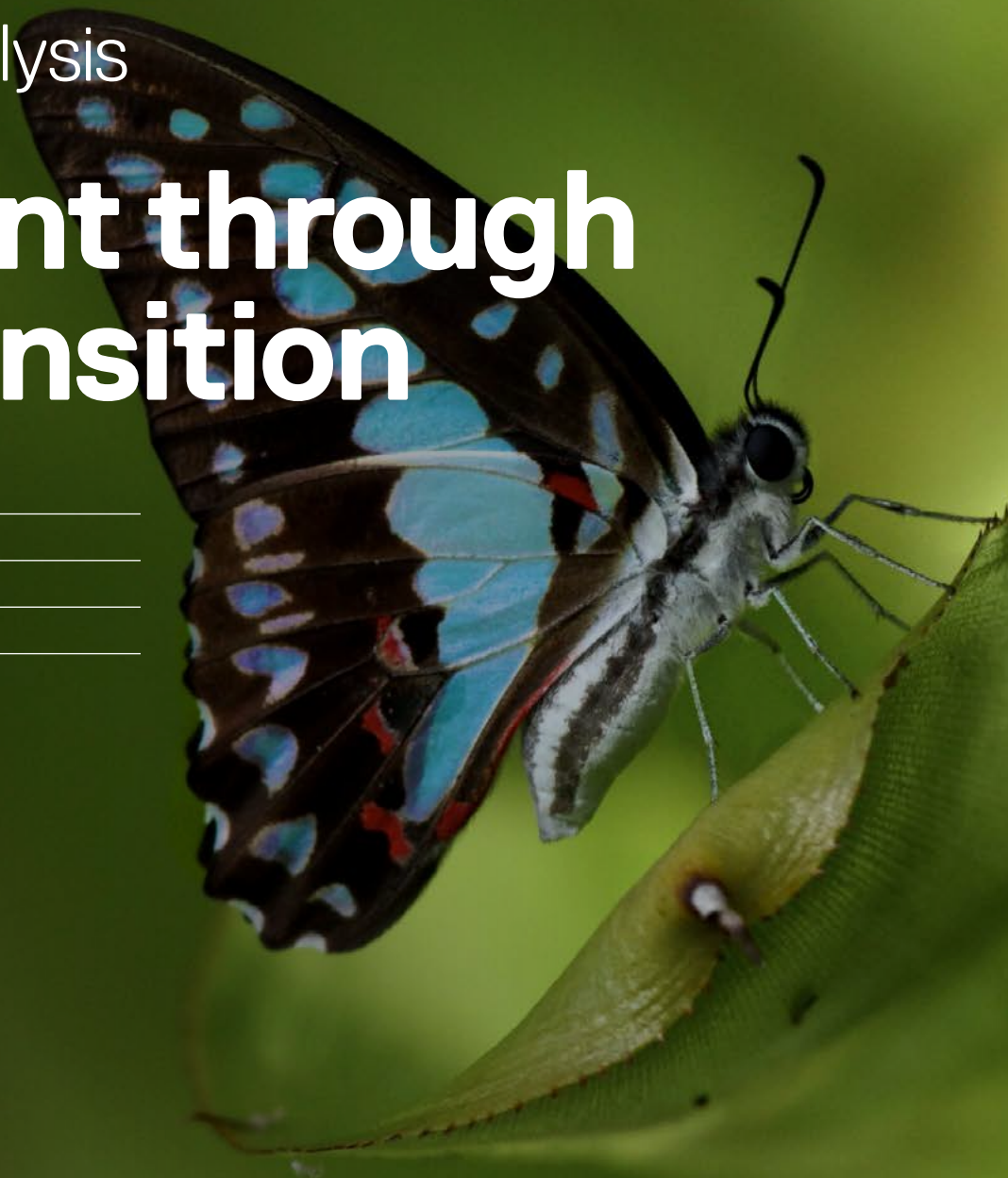
Resilient through the transition

Scenarios modelled

Scenario inputs

Key insights from scenario analysis

Risks and opportunities



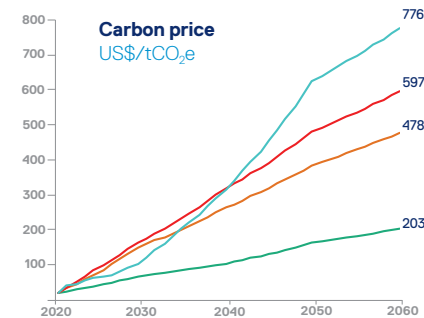
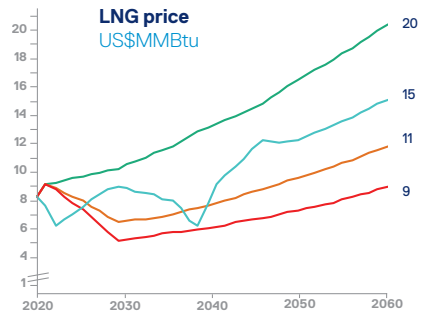
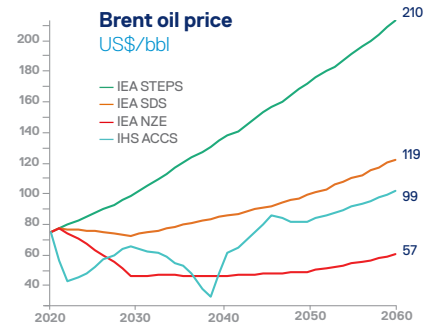
Scenarios modelled

Limitations on analysis: Scenario analysis allows a company to understand how it might perform under a range of hypothetical situations. Scenarios should not be treated as deterministic but are useful to provide guide rails for investment planning and to test the sensitivity of investments to various assumptions. They are not suitable for use to make forecasts or predictions about the future outlook.

To assess Santos' portfolio impacts, commodity price assumptions for oil, natural gas and carbon have been obtained from the IEA STEPS, SDS and NZE scenarios, as well as the IHS Markit ACCS scenario. The value of LNG is assumed to be equal to the Japan natural gas price minus US\$0.50/MMBtu for LNG shipping in real terms, while the price of carbon for advanced economies is assumed to apply. Under the Safeguard Mechanism, only emissions above the agreed baseline for each facility incur a carbon offset cost. Therefore, Santos' portfolio has assumed a carbon offset cost is realised only for emissions that exceed a facility baseline.

To reflect the changes in market conditions since the development and release of the IEA scenarios, 2021 and 2022 commodity prices for oil, gas and carbon were updated with observed or expected prices as of Q4 2021. Where annual price assumptions were not available, prices were either interpolated between those years available or escalated by 2.2 per cent per year from the final published year.

The oil, gas and carbon price assumptions under the IEA 2021 World Energy Outlook STEPS, SDS and NZE scenarios with 2021 in nominal terms, updated to reflect realised market prices, as well as the IHS Markit Accelerated CCS scenario, all escalated by 2.2 per cent per year from the final published year.⁶²



Scenarios modelled	
Scenarios based on current conditions	
1 Santos benchmark portfolio	Reference case scenario consistent with current corporate assumptions
2 The IEA 2021 World Energy Outlook Stated Policies scenario (STEPS)	Scenario reflective of 2021 policy settings and announcements
Accelerated energy transition scenarios	
Three scenarios demonstrating possible paths towards an accelerated transition, including two scenarios aimed at limiting temperature rise to 1.5 degrees Celsius and achieving Net Zero by 2050	
3 The IEA 2021 World Energy Outlook Sustainable Development scenario (SDS)	Scenario delivering sustainable development in line with the Paris Agreement limiting global temperature increase to approximately 1.65 degrees Celsius by 2100
4 The IEA Net Zero by 2050 scenario (NZE)	Scenario achieving net-zero emissions from the global energy sector by 2050 while limiting global temperature increase to 1.5 degrees Celsius
5 The IHS Markit 2021 Accelerated CCS scenario (ACCS)	Scenario achieving net-zero emissions by 2050 from the combined global energy and non-energy sectors while limiting global temperature increase to 1.5 degrees Celsius

⁶² STEPS and SDS scenarios from IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021>; NZE scenario from IEA, Net Zero by 2050, A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>; ACCS scenario from the IHS Markit 2021 Net Zero cases: <https://ihs.com/products/energy-climate-scenarios.html>

Scenarios based on current conditions

1. Reference case: Santos benchmark portfolio

Santos' reference case considers the impact of a changing energy mix over time and is consistent with current corporate price assumptions for oil, LNG and carbon, which are more conservative than the IEA STEPS oil and LNG price assumptions.

2. IEA STEPS scenario

Strong commodity prices deliver higher value than the reference case.

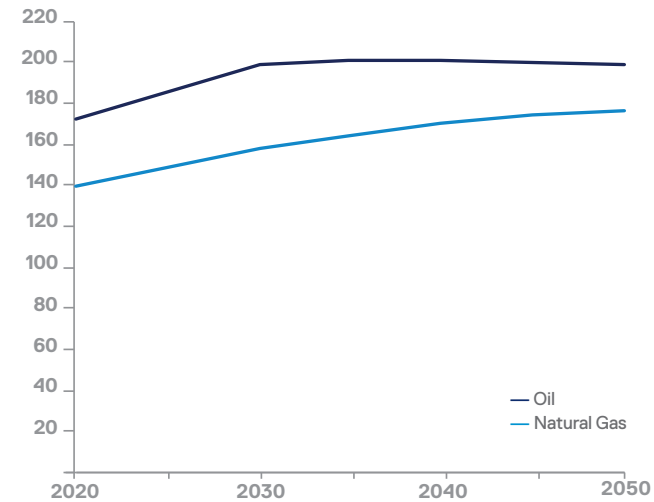
Under the STEPS scenario, growth in oil and gas demand compared to 2020, combined with the need to replace production from depleting fields, maintains elevated oil and LNG prices in order to promote investment in new supply.

In STEPS, global oil demand grows from today's level through to 2030 and gas demand grows through to 2050. The oil price is projected to increase to US\$77/bbl in real terms by 2030 before increasing to US\$88/bbl in real terms by 2050. The price for gas delivered into Japan is projected to maintain approximately US\$8-9/MMBtu in real terms through to 2050. The carbon price gradually increases to reach an average of US\$85/tonne of CO₂e in real terms by 2050 within advanced economies.

In this scenario, Santos would continue seeking to supply the energy needs of its customers, maximising value from our base business, developing natural gas for backfill and growing through decarbonisation and clean fuels projects in line with our net-zero Scope 1 and 2 emissions by 2040 target. In this way, Santos would continue contributing to the decarbonisation of the global energy sector, while providing affordable and reliable energy to regional economies, and with a valuation more than 35 per cent higher than the benchmark portfolio.

Oil and natural gas supply under the IEA World Energy Outlook 2021 Stated Policies scenario (STEPS)⁶³

IEA Stated Policies – Total energy supply EJ



⁶³ STEPS scenarios from IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021>

Accelerated energy transition scenarios

Santos' clean fuels strategy is well placed to meet Australian and regional demand growth in CCS, hydrogen and/or ammonia.

Under accelerated transition scenarios such as the IEA SDS, NZE and the IHS ACCS, the demand for oil and natural gas declines after 2030 as transport and heating is electrified and an increasing proportion of electricity is generated from renewables. The extent and timing of the demand decline depends on specific scenario assumptions relating to policy and technology developments, however, each scenario still requires investment in oil and gas production to maintain sufficient supply through the energy transition. Natural gas demand is particularly robust, with demand increasing through to 2030 under the SDS and ACCS scenarios due to its role as an affordable, lower-carbon fuel for the industrial and electricity sectors, particularly for developing countries within the Asia Pacific region.

Offsetting the decline in oil and natural gas demand is the increasing demand for CCS and hydrogen technologies, which experience significant growth under accelerated energy transition scenarios due to their ability to decarbonise sectors which are difficult to electrify.

Santos is resilient under all three accelerated energy transition scenarios, with valuation ranging from ten per cent lower than the benchmark portfolio case up to 16 per cent higher than the benchmark portfolio case.

3. IEA SDS scenario

The SDS requires rapid improvement and deployment of technology, including significant growth of low-carbon hydrogen and large-scale CCS. Carbon price reaches US\$200/tCO₂e in real terms by 2050. Oil price steadily reduces in real terms to US\$50/bbl by 2050. Gas prices delivered into Japan similarly reduce to US\$5.40/MMBtu in real terms by 2030 and then stabilise, reaching US\$5.30/MMBtu by 2050.

4. IEA NZE scenario

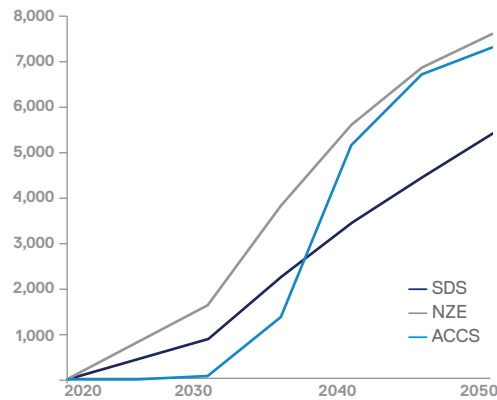
The new NZE 1.5 degree Celsius scenario is a scenario that has the energy sector achieving net-zero emissions by 2050. In the NZE, oil and LNG prices are suppressed to reflect lower modelled demand and the carbon price reaches US\$250/tCO₂e in real terms by 2050. Under this scenario, oil price reduces in real terms to US\$35/bbl by 2030 and US\$24/bbl by 2050, while gas delivered into Japan decreases in real terms to US\$4.40/MMBtu by 2030 before stabilising at US\$4.10/MMBtu by 2050. Notably, in the NZE scenario the share of Organization of the Petroleum Exporting Countries (OPEC) members and Russia in global oil production rises considerably from 47 per cent in 2021 to 61 per cent in 2050.⁶⁴

5. IHS ACCS scenario

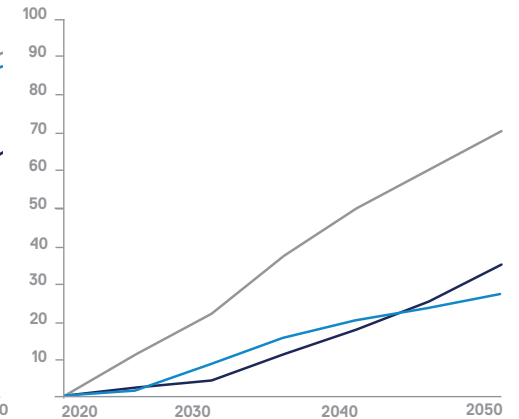
The IHS Markit ACCS scenario considers the implications of reaching net-zero global emissions by 2050 and limiting average global temperature rise to 1.5 degrees Celsius by 2100. It uses a market-focussed approach with widespread use of CCS and the consideration of land use, land use change and forestry offsets. Oil and LNG prices are suppressed with assumed decline in demand but remain cyclical due to periods of over and under investment as the markets transition, reaching US\$40/bbl for oil and US\$6.00/MMBtu for term LNG in real terms by 2050. Carbon prices increase to incentivise deep decarbonisation of industry, with the emergence of a global carbon market by the mid-2030s. The carbon price reaches US\$320/tCO₂e in real terms by 2050.

Carbon capture and hydrogen under accelerated energy transition scenarios – IEA World Energy Outlook 2021 Sustainable Development (SDS) and Net Zero by 2050 (NZE) scenarios and the IHS Markit Accelerated CCS scenario (ACCS)⁶⁵

Total CO₂ captured Mt

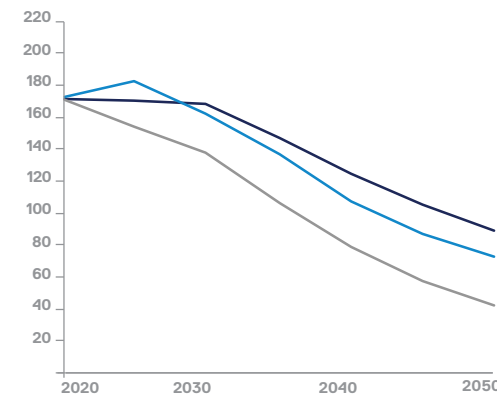


Hydrogen production (Growth) EJ

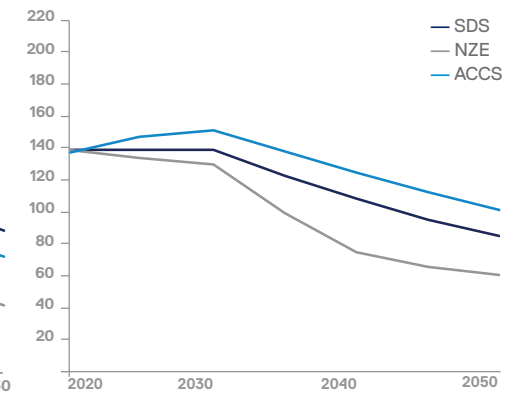


Oil and natural gas supply under accelerated energy transition scenarios – IEA World Energy Outlook 2021 Sustainable Development (SDS) and Net Zero by 2050 (NZE) scenarios and the IHS Markit Accelerated CCS scenario (ACCS)⁶⁶

Oil EJ



Natural gas EJ



⁶⁴ IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021>

⁶⁵ SDS scenario from IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021>; NZE scenario from IEA, Net Zero by 2050, A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>; ACCS scenario from the IHS Markit 2021 Net Zero cases: <https://ihsmarket.com/products/energy-climate-scenarios.html>

⁶⁶ SDS scenario from IEA, World Energy Outlook 2021: <https://www.iea.org/reports/world-energy-outlook-2021>; NZE scenario from IEA, Net Zero by 2050, A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>; ACCS scenario from the IHS Markit 2021 Net Zero cases: <https://ihsmarket.com/products/energy-climate-scenarios.html>

Scenario inputs

Santos routinely models our benchmark portfolio case against prevailing market conditions. The Santos benchmark portfolio case includes existing producing assets within our core asset areas and sustaining natural gas and associated liquids developments contributing to production growth and decarbonisation, including Barossa, Dorado, Narrabri, P'nyang to backfill PNG LNG, Papua LNG, Moomba CCS Phase 1 and Bayu-Undan CCS. For the purposes of modelling only, Pikka, a low emissions intensity oil project in Alaska that was acquired through the Oil Search merger, has also been included, although value from this project may be delivered through sell-down processes and/or project development.

Under the accelerated transition scenarios of SDS, NZE and IHS ACCS, demand for Santos' developing CCS and clean fuels products accelerates, offering significant additional value to the benchmark portfolio. For this reason, additional CCS and clean fuels initiatives have been included under these scenarios.

Projects modelled include supply of third party CO₂ to Santos' CCS hubs, which generate revenue through a carbon processing and storage toll at a discount to the modelled carbon price. In the case of direct air capture, enabled by the potential expansion of Cooper Basin CCS, the sequestration of CO₂ generates a tradable carbon credit valued at the scenario's carbon price, providing a revenue stream once Santos' net-zero emissions target has been achieved.

Santos has necessarily been required to make legislative, policy and equity ownership assumptions in undertaking scenario analysis. The legislative and policy environment at the time of conducting the analysis, including the Australian NGER Act, Safeguard Mechanism and Emissions Reduction Fund, has been applied to relevant operated assets. This includes the ability for Australian facilities to sell eligible generated Australian Carbon Credit Units to the Government under an Emissions Reduction Fund contract and reduce net emissions.⁶⁷ Where this has been assumed, an adjusted carbon price relative to government abatement contract pricing has also been assumed. Where clean fuels projects are anticipated and ownership levels are yet to be optimised, 100 per cent Santos ownership has been assumed for the purposes of the scenario analysis.

All accelerated scenarios model significant demand growth for hydrogen from natural gas and CCS, but do not provide hydrogen price assumptions. Given this, and today's absence of an established market for hydrogen, the modelling methodology assumes that hydrogen projects from natural gas with access to low-cost CCS would be in demand and a sufficient hydrogen price would be realised to provide a fixed rate of return for these projects. Modelling methodology assumes hydrogen projects are integrated with Santos' existing infrastructure and asset base enabling low-cost CCS projects that provide a competitive advantage.

⁶⁷ All scenarios reflect reserves and resources at 31 December 2021. This analysis includes former Oil Search assets
⁶⁸ Pursuant to Section 22XN of the National Greenhouse and Energy Reporting Act 2007

Santos' base business and sustaining natural gas and associated liquids projects plus CCS and clean fuels opportunities included in the scenario analysis.⁶⁷

Sanctioned projects	Capacity (Gross)	Benchmark portfolio case	Scenario 1 STEPS	Scenario 2 SDS	Scenario 3 IEA NZE	Scenario 4 IHS ACCS 1.5
Barossa to Darwin LNG	3.5 Mtpa LNG	✓	✓	✓	✓	✓
Moomba CCS Phase 1	1.7 MtCO ₂ e	✓	✓	✓	✓	✓

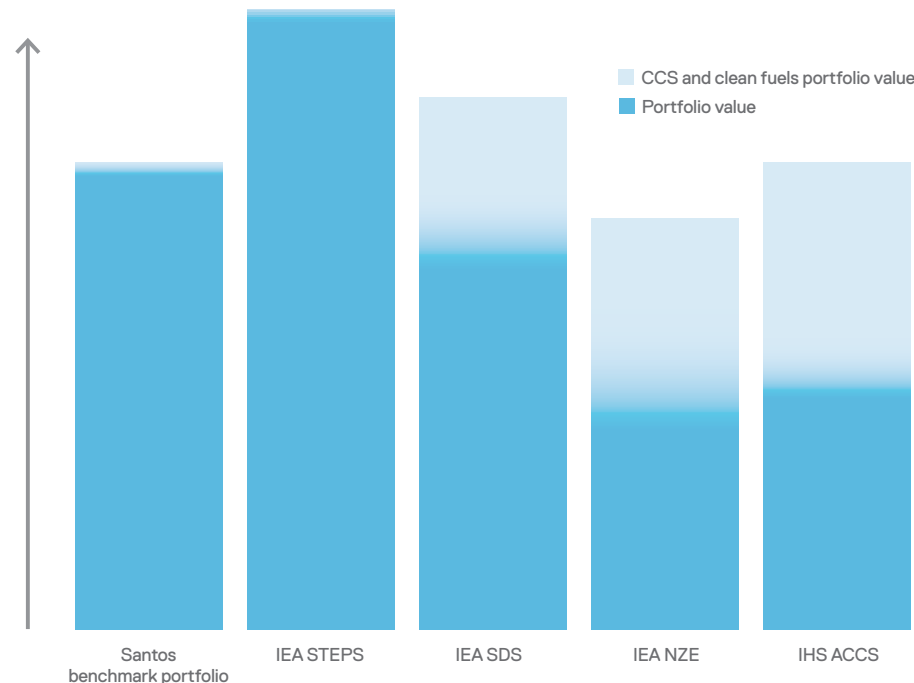
Potential projects	Capacity (Gross)	Benchmark portfolio case	Scenario 1 STEPS	Scenario 2 SDS	Scenario 3 IEA NZE	Scenario 4 IHS ACCS 1.5
P'nyang backfill	3.8 Mtpa LNG	✓	✓	✓	✓	✓
Papua LNG	5.0 Mtpa LNG	✓	✓	✓	✓	✓
Narrabri gas project	80 TJ/d in Phase 1	✓	✓	✓	✓	✓
Dorado oil project	75-100 kbbbl/d	✓	✓	✓	✓	✓
Pikka oil project	70-80 kbbbl/d	✓	✓	✓	✓	✓
Moomba clean fuels hub	0.14 Mtpa H ₂ / 0.88 Mtpa NH ₃			✓	✓	✓
Cooper Basin CCS expansion via direct air capture	15-20 MtCO ₂ e pa			✓	✓	✓
Bayu-Undan CCS Phase 1	6.2 MtCO ₂ e	✓	✓	✓	✓	✓
Bayu-Undan CCS expansion to 10 Mtpa	3.8 MtCO ₂ e pa	✓	✓	✓	✓	✓
Reindeer CCS	2.4 MtCO ₂ e pa			✓	✓	✓
Darwin clean fuels hub	0.14 Mtpa H ₂ / 0.88 Mtpa NH ₃			✓	✓	✓
Gross CCS injection capacity (MtCO₂e pa)		11.7	11.7	32.4	32.4	32.4
Gross hydrogen (Mtpa H₂) and ammonia (Mtpa NH₃) production capacity (Mtpa H₂)				0.28 Mtpa H₂ / 1.76 Mtpa NH₃	0.28 Mtpa H₂ / 1.76 Mtpa NH₃	0.28 Mtpa H₂ / 1.76 Mtpa NH₃

Key insights from scenario analysis

Santos’ scenario analysis indicates that our combination of high-quality, long-life, low-cost natural gas assets, CCS capacity and capability, and prospective clean fuels opportunities, position the company well to deliver ongoing value for shareholders across a wide range of potential macroeconomic environments.

Importantly, the company is resilient through the energy transition with potential for significantly higher value outcomes compared to the benchmark portfolio case.

Relative value of current portfolio and CCS and clean fuels opportunities under modelled scenarios



In all scenarios modelled, Santos achieves our 2030 emissions reduction targets and net-zero 2040 target.

The Stated Policies Scenario is more than 35 per cent value accretive compared to the benchmark portfolio case.

In a scenario like the IEA STEPS which is based on 2021 climate change policy setting and announcements, where Brent oil and LNG prices remain strong, Santos could continue to maximise value from its base business and build around existing infrastructure by developing natural gas projects for backfill. Oil and gas would continue to be in demand after 2050 and have the potential to deliver significant value, being more than 35 per cent value accretive relative to the benchmark portfolio case.

In accelerated energy transition scenarios, Santos’ CCS and clean fuels portfolio opportunities have the potential to unlock new value.

The value of the benchmark portfolio remains cash generative in these scenarios, supporting the funding of CCS and clean fuels projects:

- + Much of the incremental value created above the Santos benchmark portfolio case is derived from CCS projects. Value is driven by large-scale, low-cost CCS providing our customers with a preferable carbon abatement solution to the carbon market price.
- + CCS further enables the production of hydrogen from two new facilities adjacent to existing assets, providing a long term, low-carbon commercialisation path for Santos natural gas resources and depleted gas reservoirs.

In the IEA SDS, Santos would balance both delivery of the current portfolio with CCS and clean fuels opportunities, leveraging higher carbon prices to offset lower assumed Brent oil and LNG prices. In such macroeconomic conditions, Santos’ strength is in the combination of natural gas, CCS, and clean fuels development.

In both 1.5 degree Celsius scenarios, carbon becomes the commodity of focus, with nominal prices above US\$300/t by 2040, underpinning an expansion of the benchmark portfolio to pursuing value-accretive CCS and clean fuels opportunities. Santos will continue to monitor and participate in the development of emissions reduction technologies and commodity markets, including demand for hydrogen both domestically and in our export markets.

Accelerated technology and market development will be critical to enable 1.5 degree Celsius pathways like the two scenarios Santos has modelled. Our infrastructure position, natural gas and carbon storage resources, and access to good renewable resources (solar, wind, water) in our asset areas position Santos well to develop CCS and hydrogen projects. Combined with our existing, adjacent customer base and the adjacent skills of our workforce, contractors and suppliers, Santos is in a very strong position to be a leader in the energy transition and deliver superior shareholder returns in the future.

In the 1.5 degree scenarios the Santos valuation remains strong, ranging from 10 per cent below to value-neutral with the benchmark portfolio case.

Opportunities and risks

Key opportunities and risks identified from the scenario analysis are outlined in the following table. Further detail in relation to the management of material climate risks is provided on pages 44 to 47.

Key opportunities and risks identified through scenario analysis

STEPS	SDS	IEA NZE and IHS ACCS
Opportunities		
Global demand for natural gas and oil remains strong and this scenario delivers significant value relative to the benchmark portfolio case in line with the higher Brent oil and LNG prices modelled.	The accelerated transition creates demand for low-carbon hydrogen, while the increased carbon price supports significant value creation potential from CCS.	Both 1.5 degree Celsius scenarios modelled have strong demand growth for CCS and low-carbon hydrogen, in line with or above, the IEA SDS scenario. Santos would be well positioned under these scenarios with a competitive advantage in infrastructure position, natural gas and carbon storage resources, existing customer base and organisational skills and experience.
Risks		
Despite robust demand for natural gas and oil, global focus on decarbonisation continues, potentially limiting access to capital markets. This is mitigated by balance sheet strength to self-fund growth and pursue the company's Climate Transition Action Plan.	Company valuation ranges from 10 per cent below to 16 per cent above the benchmark portfolio case in these scenarios. Santos remains cash generative, supporting funding of CCS and clean fuels projects. The pace and impact of the energy transition is uncertain, being dependent on policy, technology and market development. Key controls with respect to policy, technology and market risks are outlined on pages 44 to 47.	

Understanding scenario analysis and the NZE scenario

Scenario analysis provides hypothetical outcomes based on a range of theoretical assumptions. The outcomes should not be treated as deterministic, but can inform planning for the energy transition, providing ranges of valuation in various macro-economic circumstances and allowing sensitivity testing of assumptions and their impact on valuation outcomes. The only certainty is that the actual pathway to Net Zero will be different from any one scenario.

Scenario modelling and sensitivity testing helps inform corporate strategy, risk-based decision making and financial planning. The scenarios modelled in this report are not, and do not purport to be, forecasts or set outcomes based on the prevailing social and economic conditions in the world today.

For example, the IEA's NZE scenario, a 1.5 degree Celsius scenario, is one of four IEA scenarios outlined in the 2021 World Energy Outlook. By way of contrast, the IPCC has 90 1.5 degree scenarios, including 18 with the NZE scenario's objective to also achieve net-zero emissions from the energy sector by 2050.⁶⁹ The NZE, therefore, provides just one of many hypothetical pathways to limit global temperature rise in accordance with the Paris Agreement.

It is also worth noting that under the NZE scenario more than half of the greenhouse gas emissions reductions depend on global consumer choices, such as buying electric vehicles, installing solar PV, foregoing long-haul travel, speed limits of 100 kmph and ridesharing for all urban car trips. Further, almost half the emissions reduction in 2050 comes from technologies that are currently at the demonstration or prototype phase. Total global energy demand is assumed to be eight per cent less than today with two billion more people and a global economy double the size of today.

On the supply side, under the NZE scenario, the world becomes much more reliant on OPEC and Russia with their share of oil production rising from 47 per cent in 2021 to 61 per cent in 2050.

The oil and gas price assumptions in the NZE scenario also vary dramatically from those the market is experiencing in reality – in 2021 the average realised price for Brent oil was US\$72 per barrel (and was US\$103 on 28 February 2022), whereas the 2021 price under the NZE was US\$38.⁷⁰

Under all the IEA 2021 World Energy Outlook scenarios, including the NZE, demand for oil and gas continues for decades to come. Global investment of US\$10 trillion in oil and gas supply would be needed to meet the world's energy needs between now and 2050. Oil consumption would still be about 26 per cent of 2020 levels and gas consumption would decline more slowly to about 45 per cent of 2020 levels. Half the natural gas produced in 2050 would be used to make hydrogen (with CCS attached) and around 40 per cent of hydrogen produced would be made from natural gas.⁷¹

Responding to debate about the NZE, IEA Executive Director Fatih Birol stated in relation to ongoing investment in oil and gas: "If the demand of oil goes down, there wouldn't be a need to invest in additional oil, [in] new fields, but investment in the already approved fields and existing rates will continue. So once again, we do not say 'no new oil investments.' What we are saying is that if the demand goes down in line with the net-zero targets of the countries, there wouldn't be a need for investments beyond the fields which are already approved."⁷²

69 IEA, Net Zero by 2050 – A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>

70 Historical Brent data sourced from IHS Markit Crude Oil Long Term Outlook Quarter 4 2021; current price as of 28 February 2022; NZE price for 2021 extrapolated from NZE scenario in the IEA Net Zero by 2050 – Roadmap for the Global Energy Sector, on a nominal basis from price points provided, escalated at 2.2 per cent per year

71 IEA, Net Zero by 2050 – A Roadmap for the Global Energy Sector: <https://www.iea.org/reports/net-zero-by-2050>

72 Energy Intelligence, IEA's Birol: Energy Transition will be 'No Rose Garden' Thursday October 21, 2021

Risk management

Responsibly managing through the transition

Integration of climate risk management

Material climate risks

Managing material climate risks – Transition and Physical

Integration of climate risk management

With a focus on ensuring the resilience of Santos within the changing climate, all risks are considered and managed with priority across our business.

Santos' Risk Management Policy forms part of our Risk Management Framework and sets out the requirements for managing risks at Santos. It is supported by a Risk management Operating Standard along with processes that enable the identification, assessment, and treatment of risks relevant to Santos' business activities.

Climate change risk is a specific focus for both the Environment, Health, Safety and Sustainability (EHSS) and Audit and Risk Committees of the Santos Board. In addition, management of climate risk, incorporating both transition and physical risk, is included in our enterprise material risk profile, reviewed twice annually by the full Santos Board.

Materiality of risks is determined in accordance with the Santos Risk Matrix, which is part of our Risk Management Framework. The Risk Matrix supports determination of the level of risk by considering the probability or likelihood of an identified risk against the consequence severity of the risk. Risks are considered across short-term (to 2030), medium-term (2030-2040) and long-term (2050 and beyond) time horizons. Materiality is considered both on an uncontrolled and controlled basis to ensure that extreme risks are visible, even when considered to be effectively controlled.



Material climate risks

The company's material risks relating to climate change can be placed in two broad categories of climate related risk – transition and physical.

Transition risks arise from the move to a low-carbon economy and stem from policy and legal, technological, market, reputational and societal responses to the challenges posed by climate change. Consequences of adverse impacts may be increased cost, low profitability, insufficient access to capital and technology, lack of product demand and revenue disruptions. Transition risks also include consideration of 'just transition' which, under the Paris Agreement means "taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities".⁷³

Physical risks relate to acute and chronic effects of climate change, ranging from the increased severity of weather events through to the longer-term influences of rising sea levels, annual rainfall changes, higher average global temperatures and the risk of increased incidence of natural disasters.

Climate risk appetite

The primary objective of the Santos Risk Management Framework is to facilitate risk-based decision making. In addition to the Risk Matrix used in the assessment and prioritisation of risks, Santos also maintains a well-considered Risk Appetite which sets out risk thresholds and outcomes for which it has no-tolerance across all established material risk categories.

The Risk Appetite is an evergreen document required to be applied to all material activities and decisions requiring Chief Executive Officer and/or Board approval. The Risk Appetite complements the company's Delegation of Authority.

During 2021, the Risk Appetite was updated to include additional emphasis on climate change, through the inclusion of carbon emissions thresholds referencing the company's emissions reduction targets.

Any activity or decision requiring Chief Executive Officer and/or Board approval must consider any current or future potential impact on carbon emissions. In that case a project or activity will be assessed against existing approved facility baselines or the approved Santos emissions reduction target trajectory. Any potential adverse impact must be disclosed along with corresponding mitigating actions before any approval can be given.

The Risk Appetite serves to not only create visibility of climate risk in material decision making but also ensures a portfolio-wide focus on delivery of the company's short, medium and long-term emissions reduction targets.

⁷³ Paris Agreement, 2015: https://unfccc.int/sites/default/files/english_paris_agreement.pdf

Climate transition risks

The transition to a low-carbon economy presents both a challenge and opportunity for Santos. As outlined in prior sections of this report, we are well placed to tackle the challenges and identify and leverage the opportunities arising from the transition to a lower-carbon economy. We are positioned for resilience as a strong and agile business because of our robust strategy, governance and commitment to the delivery of our targets.

Under our Risk Management Framework we consider all of the following climate transition risks to be material risks if uncontrolled.

Climate transition risk overview

Risk type	Climate-related risks and potential impacts	Key time horizon	Control category
Policy risks	Carbon pricing policies, including a carbon tax, emissions trading scheme or any other regulatory carbon pricing mechanism may increase operating costs or impact the international competitiveness of Santos projects where carbon pricing is not policy in competitor countries.	Short	<ul style="list-style-type: none"> + Strategic and commercial + Low cost base + Advocacy + Emissions targets⁷⁴
Legal risks	Litigation against governments and companies for compensation for climate change impacts may adversely affect Santos' reputation, development or operating costs.	Short-medium	<ul style="list-style-type: none"> + Strategic and commercial + Advocacy + Emissions targets + Legal risk framework to capture current litigation trends and regulatory updates
Technology and market risks	Innovation in oil and gas could occur at a slower pace than coal, while technological breakthroughs could allow coal to significantly decrease emissions or manage intermittency issues of renewables. Natural gas and/or hydrogen could be displaced by more rapid advances in other low-emissions energy technologies.	Short-medium	<ul style="list-style-type: none"> + Technology + Low cost base + Access to domestic and export markets
Reputational risks	Increased public and consumer activism on climate change and alternate views about the role of natural gas in supporting a lower-carbon future present a risk to Santos' reputation, with the potential to impact project approvals and license to operate.	Short	<ul style="list-style-type: none"> + Strategic and commercial + Advocacy + Emissions targets
Funding risks	Reduced access to capital markets potentially limiting the ability to fund future growth projects and increase the cost of capital.	Short-medium	<ul style="list-style-type: none"> + Financial + Emissions targets
Workforce and community risks	Projects not advancing and workforce reduction, reduction of decent work and quality jobs, and no community renewal.	Short-medium	<ul style="list-style-type: none"> + Strategic and commercial + Advocacy

⁷⁴ Santos' emissions targets frame the company's risk appetite, strategic and financial processes, forming a range of controls in short, medium and long-term planning processes and decisions, as outlined in the Aligning capital allocation with our Climate Transition Action Plan section of this report

Physical climate risks

With a focus on ensuring the resilience of Santos in a changing climate, physical risks are considered and managed across our business.

Santos has previously assessed physical climate scenarios for the short to medium-term (2011 to 2030) and long-term (2080 to 2099) horizons. More recently, Santos has updated this assessment to identify and assess risks associated with acute and chronic changes in the physical climate with potential impacts including injuries, damage to facilities and infrastructure, and the disruption of operations.

In 2021 Santos undertook an updated physical climate risk assessment of our Australian and offshore Timor-Leste operated assets in partnership with Deloitte. This assessment used current global climate models with a range of climate scenarios across three future time horizons. As a result of this assessment, the projected physical climate exposure has been determined for Santos' onshore and offshore operated areas in two future states:

- + All current emissions targets and pledges and/or the Paris Agreement are met in 2030.
- + 'No climate action' by 2050. The 'no climate action' case was included in order to understand how detrimental ramifications could be if no mitigation action occurs. The specific detail of the assessment is outlined in the Case Study on page 48.

Also in 2021, a Physical Climate Change Scenario and Risk Assessment of operated PNG assets was undertaken to help assess and quantify physical risks. The PNG assets are exposed to future physical impacts of climate change such as floods, landslides and drought. Understanding the location, nature and scale of these events potentially enables us to mitigate their impact. The assessment included Geographic Risk Screening using reputable climate change models and data for PNG. The analysis demonstrated that under a high-emissions scenario, climate change is unlikely to have a material impact on our PNG assets or production.

To ensure projects consider physical climate risk, we embed physical climate risk considerations into design decisions. All new projects must identify and assess potential impacts from climate variability on new facilities and infrastructure as part of the engineering risk management process.



Under our Risk Management Framework, we consider all of the physical climate risks detailed to be material risks if uncontrolled, with higher temperatures, extreme rainfall, severe fire days and cyclone exposure of particular focus due to the locations of our operated assets.

Physical climate risk overview

Risk type	Climate-related risks and potential impacts	Time horizon	Control category
Higher temperatures - extreme heat; hotter and more frequent hot days	Cooper Basin and northern Australia experience increases in days above 40 degrees Celsius Australia – potential for increased heat-related illnesses in field-based workers and production impacts due to high ambient temperatures	Long (2050 and beyond)	+ Operational and project risk management + Emissions targets
Extreme wet - more intense rainfall events	Projected increase of 5-10 per cent for extreme wet in northern and central Australia, and our Bayu-Undan asset in Timor-Leste waters. Minimal impact across Western Australian assets, potential for flood events to impact on production operations. Projected increase in PNG of extreme weather events, potential for flooding and landslide impacts.	Short-medium (2030 and beyond)	+ Operational and project risk management + Access to infrastructure and storage + Emissions targets
Severe fire days	Projected additional severe fire rating days in the Surat Basin. Potential impact of grass fires and bush fires to production assets.	Long (2050 and beyond)	+ Operational and project risk management + Crisis and incident planning and training + Emissions targets
Cyclone exposure	Modelling results for Western Australian frequency are uncertain, however, there is a decrease predicted for eastern Australia at sites such as Curtis Island. Elsewhere in Australia and our Bayu-Undan asset in Timor-Leste waters threat of cyclone wind damage is predicted to decrease over time, however, there is an increase in landfall rain by up to 20 per cent.	Long (2050 and beyond)	+ Operational and project risk management + Crisis and incident planning and training + Access to infrastructure and storage + Emissions targets
Harsher fire weather	In Australia the threat of storm activity is predicted to increase, with electrical/lightning risk potentially impacting the environments surrounding Santos assets.	Short-medium (2030 and beyond)	+ Operational and project risk management + Crisis and incident planning and training + Emissions targets
Other physical - rising sea level; more frequent sea level extremes	In Australia models predict rises of 0.24 – 0.32 m for some scenarios, which is not a material threat to any of Santos' assets.	Long (2050 and beyond)	+ Operational and project risk management + Access to infrastructure and storage + Emissions targets
Extreme dry - more drought	In Australia water availability and management will be important. In PNG, potential for episodes of drought triggered by El Niño Southern Oscillation events.	Short-medium (2030 and beyond)	+ Strategic and commercial + Operational and project risk management + Emissions targets

Managing material climate risks

Santos has a range of controls in place to prevent and mitigate identified climate risks. An overview of the key controls relevant for the management of our identified climate transition and physical climate risks is provided in the following table.

Prevention and mitigation of climate risks overview

Control category	Outline of controls employed to prevent and mitigate identified risks
Strategic and commercial	Modelling of scenarios and inclusion of carbon prices in key planning and decision-making processes. Carbon prices are included in planning assessments of all assets and projects.
Access to domestic and export markets	Santos continues to monitor carbon and energy policies in Australia and export markets, including Japan, Korea and China. These markets are highly supportive of natural gas, due to both lower greenhouse gas emissions than coal and air quality benefits.
Operational and project Risk management	Robust Risk management practices are embedded across Santos' operations under our portfolio-wide Risk management Framework and controls are tested through our assurance activities at all levels.
Advocacy	Through direct engagement with policy makers and industry associations, Santos advocates for environmentally, socially and economically effective and responsible energy and carbon policies. Santos is proactive in supporting awareness of the availability, responsible extraction, demand for and advantages of natural gas, CCS, and clean fuels such as hydrogen to achieve a lower-carbon future in Australia and our region.
Technology	Investment in CCS, new low-emissions technology trials such as for direct air capture, energy efficiency and increased use of renewables in our operations are key examples of how we apply, leverage and identify technologies to manage our risks and support the implementation of our strategy, plans and targets.
Low cost base	In recent years, Santos has been able to significantly reduce costs of development and production of natural gas under our disciplined, low-cost operating model.
Access to infrastructure and storage	Santos has access to significant storage facilities due to our acreage and infrastructure position, enabling the company to minimise disruption to customers in the event of physical events which may impact operations.
Crisis and incident planning and training	Santos includes climate-related physical risks, such as flooding and other extreme weather events in our crisis and incident framework, planning and training.

Case study

2021 Australian and Timor-Leste operations physical risk assessment

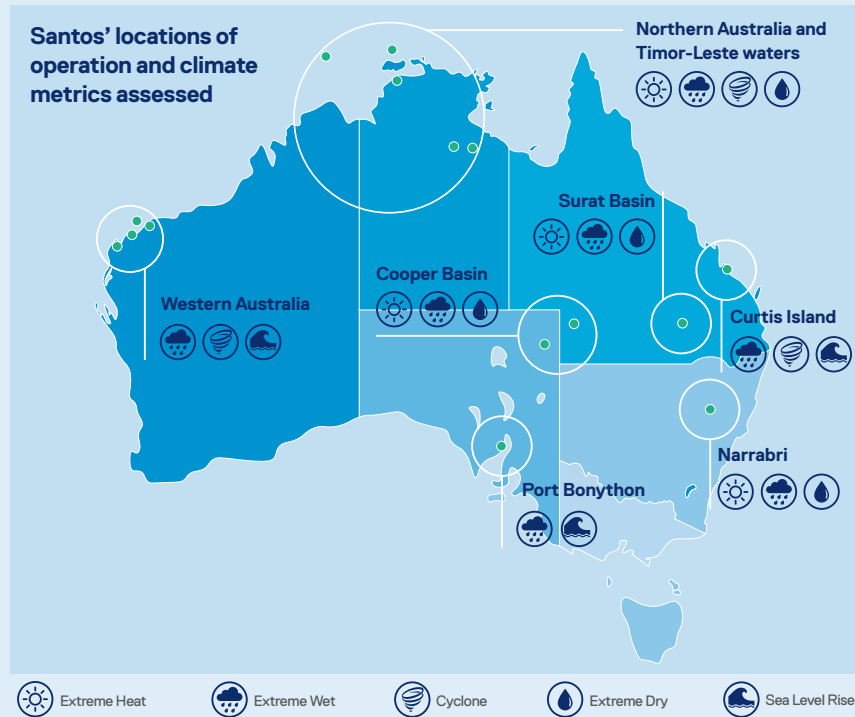
In 2021 Santos partnered with Deloitte to conduct a thorough physical climate risk assessment across our Australian and Timor-Leste asset areas. The purpose was to update a previous risk assessment based on global climate models from the Intergovernmental Panel on Climate Change (IPCC).

This assessment referenced three IPCC future climate scenarios with global warming impacts by 2100: no climate action (~4 degree Celsius increase), insufficient climate action (~3.1 degree Celsius increase) and aggressive climate action (~1.7 degrees Celsius increase).

The climate risk assessment focused on four physical risk themes:

- + Extreme heat
- + Extreme wet
- + Extreme dry
- + Sea level rise

The assessment provided a description of potential impacts to both people and operating assets over a range of time horizons. Santos' locations of operation examined in the assessment are shown in the diagram on the right.



Zone	Sites
Cooper Basin	Ballera Gas Plant Moomba Gas Plant
Curtin Island	Gladstone LNG
Narrabri	Narrabri Gas Project
Northern Australia and Timor-Leste	Bayu-Undan LNG Barossa Project Darwin LNG McArthur Basin Beetaloo Basin
Port Bonython	Port Bonython
Surat Basin	Roma Hub
Western Australia	Exmouth Macedon Devil Creek Barrow Island

The assessment demonstrated the most significant potential impact to Santos' physical assets was extreme heat, considering the large geographical footprint located in central Australia. Results are presented as additional exposure duration from current exposure levels, as shown in the Extreme heat matrix.

Extreme heat matrix

Region	Current exposure	RCP4.5 projected additional days over 40°C per year			RCP8.5 projected additional days over 40°C per year		
		2030	2050	2070	2030	2050	2070
Cooper Basin	34 days over 40°C	14	20	27	15	32	47
South Eastern Queensland	5 days over 40°C	5	8	11	6	16	26
Northern NSW	4 days over 40°C	4	5	9	4	11	19
Northern Australia and Timor-Leste	17 days over 40°C	9	15	22	4	25	38

0 additional days 1-10 additional days 11-20 additional days Over 20 additional days

Despite these increases, the residual risk to the business is managed to a low-to-medium level, given Santos currently operates in these regions, and has well established practices and controls in place for operating in high ambient temperature environments. For previous case studies on management of physical climate risks, including management of flooding and heat stress risks, please refer to page 16 of our 2018 Climate Change Report.

Governance

Embedded accountability

Climate oversight, skills and experience

Executive remuneration

Climate advocacy

Disclosure frameworks



Climate oversight, skills and experience

The Board of Santos has ultimate responsibility for the approval and oversight of strategy. This includes approval of our Climate Change Policy and oversight of its implementation. Board members bring a diversity of skills and experience, including consideration of climate change risks.



The Board has a process to ensure directors are kept informed on climate change issues via input from the senior leadership of the company as well as through independent advice when considered appropriate. The Environmental, Health, Safety and Sustainability Committee (EHSS Committee) supports the Board in overseeing Santos' climate change program and performance.

The EHSS Committee Charter is available on the company's website at Santos.com and further detail about the Board and its Committees are outlined in the company's [2021 Corporate Governance Statement](#) and [Directors Report](#). Climate change, management of emissions and performance toward targets are standing agenda items for the EHSS Committee which met five times in 2021.

The EHSS Committee is chaired by Peter Hearl with other members being Chief Executive Officer Kevin Gallagher and independent non-executive Directors Hock Goh, Vanessa Guthrie and Janine McArdle. Hock Goh and Janine McArdle are also members of the Audit and Risk Committee. Peter Hearl and Vanessa Guthrie are also members of the People, Remuneration and Culture Committee. Committee cross memberships support sound consideration and communication of climate issues with all three committees having specific climate-related responsibilities.

Management, under the leadership of the Chief Executive Officer, is responsible for delivering the strategic direction and goals approved by the Board. These include implementation of climate-related targets and policy positions, identification and management of risks and opportunities, and reporting on these topics to the Board directly and/or through the relevant Board Committees. Santos has also established the role of Executive Vice President ESG. Reporting to the Chief Executive Officer, the role has accountability for oversight of climate targets and climate-related matters across the company, including setting standards, monitoring and auditing performance across the business, maintaining a risk register, and internal and external reporting.

Santos' governance at a management level includes formalised processes within the business, including weekly working and steering groups across the corporate carbon and sustainability, portfolio, clean fuels, carbon solutions and energy solutions business groups and monthly Operations Committee and Executive Committee meetings.

In 2021 the EHSS Committee and the Board reviewed and updated the company's existing Climate Change Policy to include specific reference to the goals of the Paris Agreement and further detail actions, including those relating to:

- + Working with our customers to reduce their greenhouse gas emissions and selling the products we generate only to customers from countries that have a net-zero commitment or are signatories to the Paris Agreement.
- + Final investment decisions on new offshore greenfield projects from 2025 requiring abatement or offset of reservoir CO2 emissions.
- + The avoidance of unnecessary flaring in the conduct of our activities.
- + Identifying and implementing cost-effective opportunities to sequester carbon, integrate new technologies and offset greenhouse gas emissions, in pursuit of emissions reduction targets.
- + Reporting annually in line with the TCFD recommendations.
- + Providing shareholders with an advisory 'say on climate' vote at regular intervals.

Santos' governance of climate-related risks and opportunities

The Board

Responsible for overseeing the performance and operations of the company

Approves Santos' values and monitors company performance in line with the values

Take advice from Audit and Risk Committee reviews of climate change material enterprise risk

Take advice from the EHSS Committee on climate-related issues and the company's performance in managing climate change risks

Board Committees

All Board committees have procedures and practices in place to ensure they effectively communicate in relation to matters of shared responsibility. They assist the Board to discharge its responsibilities in relation to:

People, Remuneration and Culture

Including the remuneration framework and people and culture strategies and initiatives

Audit and Risk

Including risk management, internal audit and financial reporting

Environment, Health, Safety and Sustainability (EHSS)

Including climate change, anti-slavery, land access and Indigenous engagement and cultural heritage and community engagement

Nomination

Including delivering nomination criteria for, and reviewing membership and nominations to, the Board

Regularly monitors the Risk Management Framework including the Risk Management Policy and material changes in risk appetite

Responsible for regular monitoring and review of the company's Policy and approach to climate change including management of climate change risk

Receive updates on climate change developments from subject matter experts including information about risks, risk mitigation measures, opportunities and the financial impacts for the company arising from climate-related issues

Santos Management System – Company policies, management reporting, management/operating standards, and procedures, including Risk Appetite and the Risk Management Framework

Management under the leadership of the Chief Executive Officer

Responsible for delivering the strategic direction and goals approved by the Board

The Chief Executive Officer is responsible for instilling a culture that aligns with the Santos values

Supported by teams who continually monitor and assess trends and changes in Australian and international energy markets, assess and model a range of energy mix scenarios based on varying policy and technology drivers, and conduct portfolio and asset reviews of our business and strategy.

Executive remuneration

The People, Remuneration and Culture Committee of the Board is responsible for determining and approving remuneration packages for the senior leadership team. Since 2019 the short-term incentive has included measures that reward key management personnel for emissions reduction as well as advancement of carbon capture and storage projects. This will strengthen the link between the outcomes of performance pay and the effective implementation of our Climate Change Policy.

In 2020, climate measures had a weighting of five per cent of the short-term incentive. These measures related to reducing the company's emissions from operated assets. In 2020 Santos also announced revised targets in pursuit of accelerated emissions reduction over a shortened time, releasing detailed 2030 and 2040 targets, including achieving net-zero Scope 1 and 2 emissions by 2040.

In 2021 the Board further strengthened the link between executive remuneration and climate by allocating an additional weighting of 7.5 per cent of the short-term incentive to the delivery of initiatives to achieve the company's target of net-zero emissions by 2040. This means that a total of 12.5 per cent of the 2021 short-term incentive was weighted directly to climate measures. Reward on these measures required a reduction in absolute emissions from operated assets and the delivery of initiatives critical to the company's ambition to drive sustainable shareholder returns in a lower carbon future.

To further align the Chief Executive Officer's remuneration structure with Santos' transition plans, as disclosed in the [2021 Remuneration Report](#), the Santos Chief Executive Officer participated in the Growth Projects Incentive, involving a one-off grant of Share Acquisition Rights, with a performance period of five years ending on December 31, 2025 and a weighting towards climate-related metrics of 40 per cent. Details of the Growth Projects Incentive are on pages 50 - 51 of the [2021 Annual Report](#). The climate-related metrics include:

- + CCS operational targets
- + Progress towards net-zero Scope 1 and 2 emissions
- + New energy business development which supports the company's energy transition
- + Achievement of significant progress on a commercial-scale hydrogen or downstream clean fuels project

Climate advocacy

Pursuant to our Climate Change Policy, Santos actively works with governments and stakeholders in the design of climate change regulation. We do this in pursuit of decarbonisation goals consistent with the Paris Agreement, striving for a policy and regulatory framework that supports lowest-cost abatement, innovation and investment in low-emissions technologies, while continuing to ensure access to reliable and affordable energy in Australia and Asia.

Santos' constructive approach to climate policy has been recognised with Santos Managing Director and Chief Executive Officer Kevin Gallagher invited by the IEA's Executive Director Fatih Birol to participate in the 2022 IEA Ministerial. This important ministerial meeting involving energy ministers of member countries and around 30 global business leaders focused on accelerating global action on clean energy without compromising energy security. Mr Gallagher participated in a panel which discussed barriers to the uptake of low-emissions technologies. Santos is recognised in particular for our leadership on CCS, which the IEA has identified as a critical technology to enable net-zero emissions.

Santos also participated in the COP26 Climate Summit in November 2021 with a focus on Carbon Capture and Storage and Australia's competitive advantage in this technology because of the nation's vast carbon storage resources.

In addition to direct engagement with governments, customers and other stakeholders, Santos is an active participant in a range of industry associations. Santos' membership of these associations enables valuable participation in industry forums to share best practice, develop standards and influence policy development. In 2020 and 2021 Santos undertook reviews of the climate policy positions of the industry associations of which we are a member, focused on alignment of our climate-related policy positions with those of the associations. These reviews and additional information in relation to climate advocacy are available on our company website at Santos.com.

Disclosure frameworks

Santos has a policy position to report annually on the company's climate change governance, strategy, risk management and targets and metrics in a transparent manner aligned with recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). This is Santos' fifth Climate Change Report referencing these disclosure recommendations. EY has provided assurance over disclosures in relation to the TCFD, recommendations presented in this report, including the assumptions and approach supporting the scenario analysis. The Assurance Statement can be found on page 63 of this report.

Climate Action 100+ includes Santos as a focus company for its annual Benchmark assessment. In 2021 Santos' assessment demonstrated leading performance in our sector, with full alignment on Indicator 5 relating to our company's decarbonisation strategy. Santos engages proactively with Climate Action 100+ representatives, including the Transition Pathway Initiative. We strive for continuous improvement in our climate-related disclosures and aim to work constructively with Climate Action 100+ to also continuously improve the transparency and insight provided by the Benchmark.

Santos will also seek to continue engagement with the Science Based Targets Initiative on the development of reporting, accounting and target-setting frameworks for the oil and gas sector. The Science Based Targets Initiative has not yet published sector guidance for the oil and gas sector, meaning it is unable to validate targets for companies in our sector at the current time.⁷⁵

Santos undertakes sustainability reporting which addresses the company's approach to broader sustainability and ESG matters including health and safety, environmental management, Indigenous partnerships, community and supply chain, and diversity and inclusion. The [2021 Sustainability Report](#) includes reference to the UN Sustainable Development Goals and can be found at Santos.com.

⁷⁵ Science Based targets initiative, February 2022: <https://sciencebasedtargets.org/sectors/oil-and-gas>

Additional information

Data, definitions and assurance

Data

Definitions

TCFD recommendations

Assurance

Greenhouse gas emissions data

In December 2021, a merger between Santos Limited and Oil Search Limited was completed. For completeness, the information in this section provides historical greenhouse gas emissions data for Santos pre-merger, both Santos and Oil Search greenhouse gas emissions data for the 2020-21 financial year, and totals for the merged entity for the 2020-21 period, noting that the companies were separate entities within the period.

Scope 1, 2 and 3 emissions

Scope 1 emissions			Units	2016-17	2017-18	2018-19	2019-20	2020-21
Gross operated emissions	Santos pre-merger	MtCO ₂ e	5.82	5.49	5.83	7.74	7.97	
	Former Oil Search	MtCO ₂ e					0.69	
	Total	MtCO ₂ e					8.67	
Equity share emissions	Santos pre-merger	MtCO ₂ e	3.79	3.57	3.65	3.85	4.86	
	Former Oil Search	MtCO ₂ e					0.88	
	Total	MtCO ₂ e					5.74	
Equity share intensity	Santos pre-merger	ktCO ₂ e/mmboe	63	62	54	50	50	
	Former Oil Search	ktCO ₂ e/mmboe					32	
	Total	ktCO ₂ e/mmboe					46	
Scope 2 emissions (Purchased electricity)								
Gross operated emissions	Santos pre-merger	MtCO ₂ e	0.31	0.39	0.53	0.57	0.61	
	Former Oil Search	MtCO ₂ e					0.00	
	Total	MtCO ₂ e					0.61	
Equity share emissions	Santos pre-merger	MtCO ₂ e	0.13	0.16	0.20	0.22	0.22	
	Former Oil Search	MtCO ₂ e					0.00	
	Total	MtCO ₂ e					0.22	
Scope 1 & 2 emissions								
Equity share emissions	Santos pre-merger	MtCO ₂ e	3.92	3.73	3.85	5.04	5.08	
	Former Oil Search	MtCO ₂ e					0.88	
	Total	MtCO ₂ e					5.96	
Equity share intensity	Santos pre-merger	ktCO ₂ e/mmboe	65	64	57	55	52	
	Former Oil Search	ktCO ₂ e/mmboe					32	
	Total	ktCO ₂ e/mmboe					47	
Scope 3 emissions (Use of Sold Products)								
Equity share emissions	Santos pre-merger	MtCO ₂ e	19.2	18.4	21.6	24.3	30.3	
	Former Oil Search	MtCO ₂ e					8.8	
	Total	MtCO ₂ e					39.0	

Emissions by operated and non-operated status and location

Operated and non-operated emissions (Equity share)		Units	2016-17	2017-18	2018-19	2019-20	2020-21
Scope 1	Santos pre-merger operated	MtCO ₂ e					4.46
	Santos pre-merger non-operated	MtCO ₂ e					0.40
	Former Oil Search operated	MtCO ₂ e					0.26
	Former Oil Search non-operated	MtCO ₂ e					0.62
	Total operated	MtCO ₂ e					4.72
	Total non-operated	MtCO ₂ e					1.02
Scope 2	Australia operated	MtCO ₂ e					0.17
	Australia non-operated	MtCO ₂ e					0.05
Scope 3	Santos pre-merger	MtCO ₂ e					22.7
	Former Oil Search	MtCO ₂ e					2.6

Emissions by location (Equity share)		Units	2016-17	2017-18	2018-19	2019-20	2020-21
Scope 1	Australia	MtCO ₂ e					4.26
	Timor-Leste	MtCO ₂ e					0.31
	PNG – Santos pre-merger	MtCO ₂ e					0.29
	PNG – former Oil Search	MtCO ₂ e					0.88
	PNG – Total	MtCO ₂ e					1.17
Scope 2	Australia	MtCO ₂ e					0.22
Scope 3	Australia	MtCO ₂ e					25.4
	Timor-Leste	MtCO ₂ e					1.0
	PNG – Santos pre-merger	MtCO ₂ e					3.9
	PNG – former Oil Search	MtCO ₂ e					8.8
	PNG – Total	MtCO ₂ e					12.7

Scope 1 emissions in detail

Further details of Scope 1 emissions (Gross operated)		Units	2016-17	2017-18	2018-19	2019-20	2020-21
Santos pre-merger	Emissions of CO ₂	MtCO ₂ e	5.09	4.99	5.35	7.29	7.53
	Emissions of CH ₄	MtCO ₂ e	0.72	0.49	0.47	0.44	0.44
	Emissions of N ₂ O	MtCO ₂ e	0.01	0.01	0.01	0.01	0.01
Former Oil Search	Emissions of CO ₂	MtCO ₂ e					0.57
	Emissions of CH ₄	MtCO ₂ e					0.12
	Emissions of N ₂ O	MtCO ₂ e					0.00
Total	Emissions of CO ₂	MtCO ₂ e					8.10
	Emissions of CH ₄	MtCO ₂ e					0.56
	Emissions of N ₂ O	MtCO ₂ e					0.01
Santos pre-merger	Emissions from Fuel	MtCO ₂ e	3.19	3.18	3.37	4.64	4.80
	Emissions from Flare	MtCO ₂ e	0.25	0.18	0.29	0.45	0.38
	Emissions from Vent	MtCO ₂ e	0.31	0.24	0.15	0.13	0.07
	Emissions from CO ₂ Removal	MtCO ₂ e	2.03	1.85	1.98	2.45	2.66
	Emissions from Fugitives	MtCO ₂ e	0.04	0.04	0.04	0.06	0.08
	Former Oil Search	Emissions from Fuel	MtCO ₂ e				
Emissions from Flare	MtCO ₂ e					0.14	
Emissions from Vent	MtCO ₂ e					0.03	
Emissions from CO ₂ Removal	MtCO ₂ e					0.02	
Emissions from Fugitives	MtCO ₂ e					0.07	
Total	Emissions from Fuel	MtCO ₂ e					5.23
	Emissions from Flare	MtCO ₂ e					0.52
	Emissions from Vent	MtCO ₂ e					0.10
	Emissions from CO ₂ Removal	MtCO ₂ e					2.67
	Emissions from Fugitives	MtCO ₂ e					0.15

Section notes:

- Greenhouse gas emissions are reported on an Australian financial year basis in accordance with the National Greenhouse and Energy Reporting Act 2007.
- Scope 1 and 2 emissions for Australian operated assets are independently audited each year.
- The merger between Santos Limited and Oil Search Limited took place on 10 December 2021 and Santos was therefore not the controlling entity of the former Oil Search assets until the 2021-22 financial year. Data for former Oil Search assets is based on information provided by Oil Search.
- Scope 1 emissions occur from sources controlled by the Company, for example emissions from fuel, flare and vent.
- Scope 2 emissions are indirect, mainly electricity consumption. Assets in PNG and Timor-Leste generate their own electricity and heat and therefore produce Scope 2 emissions of less than 0.01 MtCO₂e and are not included in the data tables.
- Scope 3 emissions represent indirect emissions when our products are combusted by our customers to produce energy.
- Scope 1 and 2 emissions are rounded to two decimal places, Scope 3 emissions are rounded to one decimal place, and intensity is rounded to the nearest whole number. The sum of individual rows in the table may not equal the aggregated totals due to rounding.
- The 2019-20 combined Scope 1 and 2 emissions and intensity of 5.04 MtCO₂e and 55 ktCO₂e/mmboe respectively are grossed up for post ConocoPhillips acquisition equity in acquired assets for that full year, as per representation in the 2021 Climate Change Report.
- Non-operated emissions data is based on information provided by the respective operator.

Definitions and abbreviations

Absolute	When used in reference to emissions reduction targets means reduction against the total emissions at the relevant point in time, rather than a relative or fixed amount
ACCU	Australian Carbon Credit Unit. Each ACCU issued represents one tonne of carbon dioxide equivalent (tCO ₂ e) stored or avoided by a project
bbl	Barrel: the standard unit of measurement for all oil and condensate production: one barrel equals 159 litres or 35 imperial gallons
Biodiversity	The number and diversity of plants, animals and microorganisms on earth; it refers to genetic variations between members of the same species, which are essential to their ongoing survival, as well as the assemblage of ecosystems
boe	Barrels of oil equivalent
Carbon Capture and Storage (CCS)	Carbon Capture and Storage (CCS) is a process in which carbon dioxide (CO ₂) from industrial and energy-related sources is separated (captured), conditioned, compressed, transported and injected into a geological formation that provides safe and permanent storage deep underground
Clean fuels	Clean fuels refer to fuels which have the potential to materially reduce Scope 1, 2 and/or 3 greenhouse gas emissions. Hydrogen is an example of a clean fuel with no end-use combustion emissions and the potential for low Scope 1 and 2 emissions when produced from natural gas combined with CCS or when produced from renewable sources
Clean and/or low-emissions hydrogen	Hydrogen with low Scope 1 and 2 emissions when produced from natural gas combined with CCS or when produced from other low-emissions production technologies, including renewable sources
Cleaner energy / cleaner fuels	Cleaner energy / fuels refer to energy sources that are used for power generation, transport, industrial processes or heating which have lower emissions of greenhouse gases or air pollutants (NO _x , SO _x and particulates) than other fuel sources. Natural gas is an example of a cleaner fuel and energy source, as it has lower greenhouse gas emissions than coal when used in power generation
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent, being a measure of greenhouse gases (e.g. carbon dioxide, methane, nitrous oxide) with the equivalent global warming potential as carbon dioxide when measured over a specific time
company	Santos Ltd and all its subsidiaries
Critical fuels	Oil and natural gas, being hydrocarbon fuels that supply around 80 per cent of the world's primary energy supply. Hydrocarbon fuels are critical to meet current and forecast energy demand and to the manufacturing of everyday products
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Decarbonise	To decarbonise is the process of avoiding, reducing or offsetting anthropogenic greenhouse gas emissions through operational activities or efficiencies, technology deployment, use of generated or acquired carbon credit units, and/or other means
Emissions	Greenhouse gas emissions, unless otherwise specified
FEED	Front-end engineering design
FID	Final investment decision
Gas	Natural gas
GJ	Gigajoule (1 billion joules)

IEA	International Energy Agency
IHS ACCS	The IHS Markit Accelerated Carbon Capture and Storage scenario
Joules	Joules are the metric measurement unit for energy
kt	Thousand tonnes
Liquid hydrocarbon (liquids)	A sales product in liquid form for example, condensate and LPG
LNG	Liquefied natural gas, being natural gas that has been liquified by refrigeration or pressure to store or transport it
mmboe	Million barrels of oil equivalent
MMBtu	Million British thermal units
MtCO₂e	Million tonnes of carbon dioxide equivalent
Mtpa	Million tonnes per annum
Net Zero	Also referred to as carbon neutral, is achieved when anthropogenic emissions of greenhouse gases are balanced by anthropogenic removal of greenhouse gases through means such as operational activities or efficiencies, technology (e.g. CCS) or offset through the use of carbon credit units, or other means
Net-zero emissions	Net Zero Scope 1 and Scope 2 greenhouse gas emissions; when referring to Santos, meaning net-zero equity share of these emissions
Net-zero Scope 1 and 2 emissions	Santos' equity share of net-zero Scope 1 and 2 greenhouse gas emissions
NZE	The IEA Net Zero by 2050 scenario
Oil	A mixture of liquid hydrocarbons of different molecular weights
Residual emissions	Any greenhouse gas emissions which remain after an organisation has implemented all technically and economically feasible emissions reduction opportunities
PJ	Petajoule (1 million billion joules)
Sustainable / sustainably	At Santos, sustainability is about striving to ensure safe operations, minimising environmental harm and greenhouse gas emissions, and creating long term value for our stakeholders, including our customers, community, employees, partners and shareholders; balancing the needs of today without undermining the ability to meet the demands of tomorrow
SDS	The Sustainable Development Scenario from the IEA 2021 World Energy Outlook
STEPS	The Stated Policies Scenario from the IEA 2021 World Energy Outlook
t	Tonnes
TCFD	Task Force on Climate-related Financial Disclosures
TJ	Terajoule (1 trillion joules)

TCFD recommendations reference guide

TCFD Reference Guide

	Recommended disclosure	Guidance for energy group	Section disclosed in climate change report	Page	
Governance Disclose the organisation's governance around climate related risks and opportunities	a) Describe the board's oversight of climate-related risks and opportunities.	(i) Processes and frequency by which the board and/or board committees (eg audit, risk, or other committees) are informed about climate-related issues).	+ Integration of climate Risk management + Climate risk appetite + Climate oversight, skills and experience	43 43 50	
		(ii) Whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, Risk management policies, annual budgets, and business plans as well as setting the organisation's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures.	+ Aligning capital allocation with our Climate Transition Action Plan + Integration of climate Risk management + Climate risk appetite + Climate oversight, skills and experience	33 43 43 50	
		(iii) How the board monitors and oversees progress against goals and targets for addressing climate-related issues.	+ Integration of climate Risk management + Climate risk appetite + Climate oversight, skills and experience	43 43 50	
	b) Describe management's role in assessing and managing climate-related risks and opportunities	(i) Whether the organisation has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues.	+ Climate oversight, skills and experience + Executive remuneration + Integration of climate Risk management + Climate risk appetite	50 52 43 43	
		(ii) A description of the associated organisational structure(s).	+ Climate oversight, skills and experience	50	
		(iii) Processes by which management is informed about climate related issues.	+ Climate oversight, skills and experience	50	
		(iv) How management (through specific positions and/or management committees) monitors climate-related issues	+ Climate oversight, skills and experience	50	
	Strategy Disclose the actual and potential impacts of climate related risks and opportunities on the organisations businesses, strategy, and financial planning where such information is material	a) Describe the climate-related risks and opportunities the organisation has identified over the short-, medium-, and long-term.	(i) A description of what they consider to be the relevant short-, medium-and long-term horizons, taking into consideration the useful life of the organisation's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms.	+ Risk management: Responsibly managing through the transition + Delivery: Investing today to deliver cleaner fuels tomorrow	42 20
			(ii) Specific climate-related issues for each time horizon (short-, medium-and long-term) that could have a material financial impact on the organisation and distinguish whether the climate-related risks are physical or transition risks	+ Risk management: Responsibly managing through the transition	42
			(iii) A description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organisation.	+ Risk management: Responsibly managing through the transition + Scenarios: Resilient through the transition	42 35
(iv) Organisations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organisations should refer to Tables 1 and 2.			+ Risk management: Responsibly managing through the transition	42	

	Recommended disclosure	Guidance for energy group	Section disclosed in climate change report	Page
		<p>(i) Organisations should disclose how identified climate-related issues have affected their businesses, strategy, and financial planning. Organisations should consider including the impact on their businesses and strategy in the following areas:</p> <ul style="list-style-type: none"> – Products and services, – Supply chain and/or value chain, – Adaptation and mitigation activities, – Investment in research and development, – Operations (including types of operations and location of facilities). 	<ul style="list-style-type: none"> + Delivery: Investing today to deliver cleaner fuels tomorrow + Scenarios: Resilient through the transition 	<p>20</p> <p>35</p>
		<p>(ii) Organisations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritised. Organisations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time. Organisations should also consider including in their disclosures the impact on financial planning in the following areas:</p> <ul style="list-style-type: none"> – Operating costs and revenues, – Capital expenditures and capital allocation, – Acquisitions or divestments, – Access to capital. <p>If climate-related scenarios were used to inform the organisation's strategy and financial planning, such scenarios should be described.</p>	<ul style="list-style-type: none"> + Scenarios: Resilient through the transition + Delivery: Investing today to deliver cleaner fuels tomorrow 	<p>35</p> <p>20</p>
		<p>(iii) Supplemental Guidance for Non-Financial Groups Consider discussing how climate-related risks and opportunities are integrated into their (1) current decision-making and (2) strategy formulation, including planning assumptions and objectives around climate change mitigation, adaptation, or opportunities such as:</p> <ul style="list-style-type: none"> – R&D and adoption of new technology, – Existing and committed future activities such as investments, restructuring, write-downs, or impairment of assets, – Critical planning assumptions around legacy assets, for example, strategies to lower-carbon, energy, and/or water intensive operations, – How GHG emissions, energy, and water issues, if applicable, are considered in capital planning and allocation; this could include a discussion of major acquisitions and divestments, joint-ventures, and investments in technology, innovation, and new business areas in light of changing climate-related risks and opportunities, – The organisation's flexibility in positioning/repositioning capital to address emerging climate-related risks and opportunities. 	<ul style="list-style-type: none"> + Scenarios: Resilient through the transition + Delivery: Investing today to deliver cleaner fuels tomorrow + Santos 2021 Sustainability Report 	<p>35</p> <p>20</p>
	c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including 2°C scenario	<p>Organisations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with increased physical climate-related risks.</p> <p>Organisations should consider discussing:</p> <ul style="list-style-type: none"> – where they believe their strategies may be affected by climate related risks and opportunities; – how their strategies might change to address such potential risks and opportunities; and – the climate-related scenarios associated time horizon(s) considered. 	<ul style="list-style-type: none"> + Scenarios: Resilient through the transition + Delivery: Investing today to deliver cleaner fuels tomorrow 	<p>35</p> <p>20</p>

	Recommended disclosure	Guidance for energy group	Section disclosed in climate change report	Page
		<p>Supplemental Guidance for Non-Financial Groups Organisation's with more than one billion USD in annual revenue should consider conducting more robust scenario analysis to assess the resilience of their strategies against a range of climate-related scenarios, including a 2o C or lower scenario and, where relevant to the organisation, scenarios consistent with increased physical climate-related risks. Organisations should consider discussing the implications of different policy assumptions, macro-economic trends, energy pathways, and technology assumptions used in publicly available climate-related scenarios to assess the resilience of their strategies. For the climate-related scenarios used, organisations should consider providing information on the following factors to allow investors and others to understand how conclusions were drawn from scenario analysis:</p> <ul style="list-style-type: none"> – Critical input parameters, assumptions, and analytical choices for the climate-related scenarios used, particularly as they relate to key areas such as policy assumptions, energy deployment pathways, technology pathways, and related timing assumptions, – Potential qualitative or quantitative financial implications of the climate-related scenarios, if any. 	+ Scenarios: Resilient through the transition	35
Risk management	a) Describe the organisation's processes for identifying and assessing climate-related risks.	(i) Organisations should describe their Risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organisations determine the relative significance of climate-related risks in relation to other risks. <ul style="list-style-type: none"> – Climate Risk management 	+ Scenarios: Resilient through the transition	35
		(ii) Organisations should describe whether they consider existing and emerging regulatory requirements related to climate change (eg limits on emissions) as well as other relevant factors considered. <ul style="list-style-type: none"> – Climate Risk management 	+ Scenarios: Resilient through the transition	35
		(iii) Organisations should also consider disclosing the following: processes for assessing the potential size and Scope of identified climate-related risks and, definitions of risk terminology used or references to existing risk classification frameworks used. – Climate Risk management	+ Risk management: Responsibly managing through the transition	42
	b) Describe the organisation's processes for managing climate-related risk	Organisations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organisations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organisations.	+ Risk management: Responsibly managing through the transition	42
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall Risk management.	Organisations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall Risk management.	+ Risk management: Responsibly managing through the transition	42
Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material	a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and Risk management process.	<p>(i) Organisations should provide the key metrics used to measure and manage climate-related risks and opportunities. Organisations should consider including metrics on climate-related risks associated with water, energy, land-use, and waste management where relevant and applicable. Where climate-related issues are material, organisations should consider describing whether and how related performance metrics are incorporated into remuneration policies. Where relevant, organisations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy.</p> <p>Metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organisations should provide a description of the methodologies used to calculate or estimate climate-related metrics.</p>	+ Risk management: Responsibly managing through the transition + Santos 2021 Sustainability Report	42

Recommended disclosure	Guidance for energy group	Section disclosed in climate change report	Page
	<p>Supplemental Guidance for Non-Financial Groups</p> <p>(ii) For all relevant metrics, Energy Group organisations should consider providing historical trends and forward-looking projections (by relevant country and/or jurisdiction, business line, or asset type).</p> <p>(iii) Organisations should also consider disclosing metrics that support their scenario analysis and strategic planning process and that are used to monitor the organisation's business environment from a strategic and Risk management perspective.</p> <p>(iv) Energy Group organisations should consider providing key metrics related to GHG emissions, energy, water, land use and, if relevant, low-carbon alternatives that address potential financial aspects of shifting demand, cost of supply, reserves, and capital allocation.</p>	<p>+ Risk management: Responsibly managing through the transition</p> <p>+ Metrics: Transparency and integrity</p> <p>+ Strategy: Transform, build, grow</p> <p>+ Metrics: Transparency and integrity</p> <p>+ Santos 2021 Sustainability Report</p>	<p>42</p> <p>15</p> <p>10 15</p>
<p>b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p>	<p>Organisations should provide their Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks. GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organisations and jurisdictions. As appropriate, organisations should consider providing related, generally accepted industry-specific GHG efficiency ratios.</p>	<p>+ Metrics: Transparency and integrity</p> <p>+ Scenarios: Resilient through the transition</p> <p>+ Delivery: Investing today to deliver cleaner fuels tomorrow</p>	<p>15 35 20</p>
<p>c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.</p>	<p>Organisations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., in line with anticipated regulatory requirements or market constraints or other goals.</p> <p>Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy. In describing their targets, organisations should consider including the following: whether the target is absolute, or intensity based; time frames over which the target applies; base year from which progress is measured and key performance indicators used to assess progress against targets. Where not apparent, organisations should provide a description of the methodologies used to calculate targets and measures.</p>	<p>+ Strategy: Transform, build, grow</p> <p>+ Metrics: Transparency and integrity</p> <p>+ Scenarios: Resilient through the transition</p> <p>+ Delivery: Investing today to deliver cleaner fuels tomorrow</p> <p>+ Santos 2021 Sustainability Report</p>	<p>10 15 35 20</p>

Assurance statements

Presented in this report are two separate assurance statements from EY.

On pages 61 and 62 is the concise Assurance Report for voluntary reasonable assurance over Santos Limited's Scope 1 and 2 greenhouse gas emissions for the period 1 July 2020 to 30 June 2021.

On pages 63 and 64 is the Independent Limited Assurance Report for voluntary assurance over the disclosures outlined in the report in relation to Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), including the reasonableness of assumptions and approach supporting scenario analysis.

Independent Reasonable Assurance Report to the Management and Directors of Santos Limited

To the Management and Directors of Santos Limited

We have conducted a reasonable assurance engagement in relation to Santos Limited's ("Santos") Energy and Emissions Report for the period 1 July 2020 to 30 June 2021 (the "Energy and Emissions Report"), prepared in accordance with section 19 of the National Greenhouse and Energy Reporting Act 2007.

Details of the audited body

Name of audited body:	Santos Limited
Address	60 Flinders Street, Adelaide SA 5000
ABN	80007550923

Subject Matter

The subject matter for our assurance engagement is reported within Santos' Energy and Emissions Report for the period 1 July 2020 to 30 June 2021.

The amounts within the Energy and Emissions Report being audited are the following:

- ▶ Scope 1 and 2 greenhouse gas emissions, expressed in tonnes of carbon dioxide equivalent of 8,108,343 tCO₂-e
- ▶ Energy consumption, expressed in gigajoules of [redacted] GJ
- ▶ Energy production, expressed in gigajoules of [redacted] GJ

Criteria

The criteria are:

- ▶ Section 19 of the National Greenhouse and Energy Reporting Act 2007 ("the NGER Act")
- ▶ National Greenhouse and Energy Reporting Regulations 2008 ("NGER Regulations")
- ▶ National Greenhouse and Energy (Measurement) Determination 2008, incorporating amendments up to the National Greenhouse and Energy Reporting (Measurement) Amendment (2020 Update) Determination 2018 ("the NGER (Measurement) Determination")

Management's responsibility

Management of Santos is responsible for the preparation and presentation of the Subject Matter in accordance with the Criteria, and in compliance with Section 19 of the NGER Act. This includes establishing and maintaining internal controls relevant to the preparation and presentation of the Subject Matter that are free from material misstatement, whether due to fraud or error. Management of Santos is responsible for the interpretation and application of the requirements of the NGER Act and the NGER (Measurement) Determination in determining operational control and quantifying emissions and energy, which are reflected in Santos' "Basis of Preparation" which has been provided to us. Independence and quality control In conducting our assurance engagement, we have met the requirements of the APES 110 Code of Ethics for Professional Accountants and have complied with the relevant ethical requirements relating to assurance engagements, which include independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence, due care, confidentiality and professional behaviour. These include all of the requirements defined in the NGER Regulations regarding the Code of Conduct, independence and quality control. We have the required competencies and experience to conduct this assurance engagement.

Furthermore, in accordance with Auditing Standard ASQC 1 Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information and Other Assurance Engagements, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Auditor's responsibility

Our responsibility is to express a reasonable assurance conclusion as to whether the Subject Matter, has been prepared, in all material respects, in accordance with the Criteria.

We have conducted our reasonable assurance engagement in accordance with:

- ▶ National Greenhouse and Energy Reporting (Audit) Determination 2009 ("NGER (Audit) Determination")
- ▶ ASAE 3000 Assurance Engagements Other than Audits or Reviews of Historical Financial Information
- ▶ ASAE 3410 Assurance Engagements on Greenhouse Gas Statements
- ▶ ASAE 3100 Compliance Engagements

The NGER (Audit) Determination and above relevant national and international standards require that we plan and perform this engagement to obtain reasonable assurance about whether the Energy and Emissions Report is free from material misstatement.

A reasonable assurance engagement involves performing procedures to obtain assurance evidence about the Subject Matter being audited. The procedures selected depend on the audit team leader's judgement, including an assessment of the risks of material misstatement or material non-compliance of the matter being audited, whether due to fraud or error. In making those risk assessments, we consider internal controls relevant to Santos' determination of the amounts and disclosures in the matter being audited in order to design assurance procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Santos' internal controls. A reasonable assurance engagement also includes evaluating the reasonableness of emissions and energy estimates made by management of the company as well as evaluating the overall presentation of the Subject Matter.

Ernst & Young
121 King William Street
Adelaide SA 5000 Australia
GPO Box 1271 Adelaide SA 5001



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

Summary of Procedures undertaken

The procedures we conducted in our reasonable assurance engagement included, but were not limited to the following:

- ▶ Gaining an understanding of the greenhouse gas and energy reporting processes supporting the business activities of Santos
- ▶ Conducting virtual site tours of selected sites (Roma Hub, Ningaloo Vision FPSO, Fairview, Ballera, Arcadia and Varanus Hub) to confirm the existence of and identify sources of greenhouse gas emissions, energy consumption and energy production and understand the basis for measurement and preparation of the Energy and Emissions Report
- ▶ Conducting interviews and collating evidence to understand processes and controls supporting preparation and presentation of the Energy and Emissions Report
- ▶ Checking documentation in support of operational control decisions
- ▶ Checking that methodologies have been correctly applied in accordance with the requirements in the NGER (Measurement) Determination
- ▶ Testing the aggregation of applicable data by emission stream and disaggregation of data by reporting category
- ▶ Conducting completeness and analytical checks over Santos' new production accounting system
- ▶ Undertaking analytical review procedures to consider any anomalies in data presented
- ▶ Identifying and testing assumptions supporting the calculations
- ▶ Testing reported data, on a sample basis, to underlying source information to check completeness and accuracy of the Energy and Emissions Report
- ▶ Reviewing the appropriateness of the presentation of the information.

Use of our reasonable assurance engagement report

This Report has been prepared for the Management and Directors of Santos for the sole purpose of reporting on Santos' Energy and Emissions Report and its compliance with the NGER Act. We disclaim any assumption of responsibility for any reliance on this assurance report to any persons other than Management and the Directors of Santos Limited, or for any purpose other than that for which it was prepared.

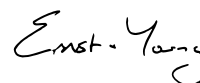
Inherent limitations

There are inherent limitations in performing assurance – for example, assurance engagements are based on selective testing of the information being examined – it is possible that fraud, error or non-compliance may occur and not be detected. A reasonable assurance engagement is not designed to detect all instances of non-compliance with the Criteria, as a reasonable assurance engagement is not performed continuously throughout the period and the procedures performed in respect of compliance with the Criteria are undertaken on a test basis. The conclusion expressed in this Report has been formed on the above basis.

Additionally, non-financial data may be subject to more inherent limitations than financial data, given both its nature and the methods used for determining, calculating and sampling or estimating such data. We specifically note that Santos has used estimates or extrapolated underlying information to calculate certain amounts included within the greenhouse gas and energy information.

Our conclusion

In our opinion the subject matter as set out in Santos' Energy and Emissions Report for the period 1 July 2020 to 30 June 2021 has been prepared in accordance with section 19 of the NGER Act, in all material respects.



Ernst & Young
Adelaide
27 October 2021

Per the Reporting energy production and consumption guideline Changes for 2020-21 reporting: <http://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Reporting%20energy%20production%20and%20consumption%20guideline.pdf>

The NGER legislation definitions of 'energy', 'energy production' and 'energy consumption' differ from the common uses of these terms. Under the NGER legislation, the production and consumption of energy are treated as the production and consumption of any of the fuel or energy commodities listed in the NGER Regulations. This differs from other concepts of energy. This information is required to be provided to the Clean Energy Regulator so that data on energy flows and transformations occurring throughout the economy can be captured. This includes the initial extraction and own-use of energy, and the transformation of energy occurring within and between facilities. For this reason this data can be misunderstood and is redacted from public reporting.

Independent Limited Assurance Report to the Directors and Management of Santos Limited

Report on the review of the Climate Change Report

Ernst & Young
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Melbourne VIC 3000 Australia
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Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that suggests that the Select Disclosures detailed in Table 1 and as presented in Santos' 2022 Climate Change Report ('the Report'), have not been prepared and presented fairly, in all material respects, in accordance with the criteria set out below.

What our review covered

Ernst & Young (EY) was engaged by Santos Limited ('Santos') to provide limited assurance over the Select Disclosures in Table 1 against the Recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD), including the reasonableness of assumptions and approach supporting Santos' scenario analysis.

Table 1

The Subject Matter also included:

Select disclosures	Report pages	Select disclosures	Report pages
Our approach to climate change	8	Scenarios: Resilient through the transition	38 - 46
Our targets	15	Risk management	47 - 51
Scope 1 emissions:		Governance	54 - 56
<ul style="list-style-type: none"> Santos' equity Scope 1 emissions Australian emissions International emissions 	18	Greenhouse gas emissions data:	
Scope 2 emissions:		Scope 1 emissions	
<ul style="list-style-type: none"> Total Scope 2 equity emissions 	19	<ul style="list-style-type: none"> Total gross operated emissions Total equity share emissions Total equity share intensity 	57
Scope 3 emissions:		Scope 2 emissions	
<ul style="list-style-type: none"> Total Scope 3 equity emissions 	19	<ul style="list-style-type: none"> Total gross operated emissions Total equity share emissions 	
Climate Transition Action Plan	21	Scope 3 emissions	
Operational efficiencies	23	<ul style="list-style-type: none"> Total equity share emissions 	
Carbon reduction solutions	30		

- ▶ The reasonableness of the process undertaken by Santos to conduct its scenario analysis, including:
 - ▶ Transparency – that the assumptions and inputs into the scenario analysis are appropriately documented and verifiable
 - ▶ Accuracy – that the assumptions utilised in the scenario analysis include the most relevant and reliable inputs available
 - ▶ Relevance – that the external climate scenarios referenced are relevant and the assumptions and inputs forming the basis of Santos' scenario analysis do not omit relevant, well-established and publicly available inputs that could reasonably be expected to affect decisions of the intended users made on the basis of that subject matter information.

Criteria applied by Santos:

The criteria for our assurance engagement ('Criteria') include the following:

- ▶ Recommendations of the TCFD
- ▶ World Resources Institute/ World Business Council for Sustainable Development (WRI/WBCSD) Greenhouse Gas Protocol.
- ▶ Santos' internally developed reporting criteria.

Key responsibilities

EY's responsibility and independence

Our responsibility was to express a limited assurance conclusion on the noted subject matter under "What our review covered".

We were also responsible for maintaining our independence and confirm that we have met the requirements of the APES 110 Code of Ethics for Professional Accountants including independence, and have the required competencies and experience to conduct this assurance engagement.

Santos' responsibility

Santos' management was responsible for selecting the Criteria and preparing and fairly presenting the Subject Matter in the Report in accordance with that Criteria. This responsibility includes establishing and maintaining internal controls, adequate records and making estimates that are reasonable in the circumstances.

Our approach to conducting the review

We conducted this review in accordance with the International Federation of Accountants' International Standard on Assurance Engagements Other Than Audits or Reviews of Historical Financial Information (ISAE 3000), Assurance Engagements on Greenhouse Gas Statements (ISAE 3410) and the terms of reference for this engagement as agreed with Santos on 2 February 2022.

Summary of review procedures performed

A review consists of making enquiries, primarily of persons responsible for preparing the Report and related information, and applying analytical and other review procedures.

Our procedures included:

- ▶ Interviewing key personnel to understand the reporting process, including management's processes to identify Santos' material climate-related risks and opportunities
- ▶ Checking the Report to understand how Santos' identified material climate-related risks and opportunities are reflected in the qualitative disclosures
- ▶ Evaluating the suitability of the Criteria and that the Criteria have been applied appropriately to the Subject Matter
- ▶ Checked if the assumptions and approach supporting Santos' scenario analysis and portfolio assessment were consistent with the principles specified in the Criteria
- ▶ Undertaking analytical procedures of the Metrics disclosed in the Report
- ▶ On a sample basis, based on our professional judgement, agreeing claims and metrics to source information to check the accuracy and completeness of the claims
- ▶ Identifying and testing the reasonableness of assumptions and approach supporting Santos' climate scenarios.

We believe that the evidence obtained is sufficient and appropriate to provide a basis for our limited assurance conclusions.

Other Matters

We have not performed assurance procedures in respect of any information relating to prior reporting periods, including those presented in the Report. Our review does not extend to any disclosures or assertions made by Santos that do not relate to the TCFD Recommendations or Santos' scenario analysis.

While we considered the effectiveness of management's internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems.

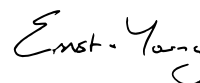
Limited Assurance

Procedures performed in a limited assurance engagement vary in nature and timing, and are less in extent than for a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Our procedures were designed to obtain a limited level of assurance on which to base our conclusion and do not provide all the evidence that would be required to provide a reasonable level of assurance.

Use of our Assurance Statement

We disclaim any assumption of responsibility for any reliance on this assurance report to any persons other than management and the Directors of Santos, or for any purpose other than that for which it was prepared.

Our review included web-based information that was available via web links as of the date of this statement. We provide no assurance over changes to the content of this web-based information after the date of this assurance statement.



Ernst & Young, Mathew Nelson
Melbourne, Australia, Partner
29 March 2022

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STO

Santos website

To view our Annual Reports, shareholder and company information, news announcements and presentations, quarterly activities reports and historical information, please visit our website at Santos.com

Annual reports

You can view our Annual Report online at Santos.com

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