Australia's National
Science Agency

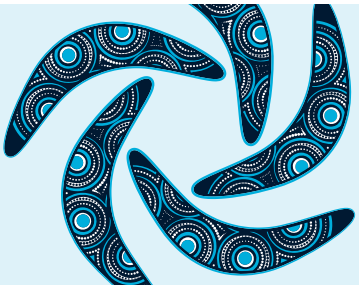
Sustainability Report

2022

Contents

Acknowledgement of Country

CSIRO would like to acknowledge the Traditional Custodians of Country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past and present.




ZONE 3
ZONE 2

Message from our Chief Executive

As Australia's national science agency, CSIRO is proud to be implementing world-class solutions to the global challenge of sustainability, through both our science, and in our operations around the country. Our inaugural Sustainability Report sets a benchmark for our progress so far and commits to transparency and accountability as we aspire to lead by example for the nation. Powered by our own excellent science and purpose-driven people, we are optimistic and confident about our strategies to continue improving our sustainability performance, while acknowledging the scale of the challenges ahead for an organisation as diverse and dispersed as CSIRO.

CSIRO's unique sustainability challenges are also our powerful opportunities. While looking for ways to run critical national research infrastructure more sustainably – ranging from the Australian Centre for Disease Preparedness in Geelong to the Pawsey Supercomputing Research Centre in Perth to our Research Vessel *Investigator* and more – as well as our more than 50 sites, we can also harness our cutting-edge scientific research to develop bespoke solutions. This year, we ran a 'sustainability shark tank' competition, where our people proposed different ways to apply their research to help reach our net zero targets, as well as a 'Labs of the Future' challenge, inviting our people to redesign their labs to embrace new and emerging technology to improve efficiency, support wellbeing, and drive scientific outcomes. This expertise is underpinned by our collaborative research to develop climate risk assessments for ourselves and for our partners, renewable energy technologies, and our 'towards net zero' mission in development, which is partnering to develop transition pathways to embed low-emission technology into Australian industry and agriculture, supporting regional communities in a low emissions future.

While our science can unlock solutions, our people are the creative and motivating force that turns them into a reality and drives change through our operations. We engage our people and our community to drive inclusive sustainability that draws on diverse backgrounds, experiences and perspectives to strengthen our organisation. For example, this year we published our third Reconciliation Action Plan, continuing to strengthen relationships with Aboriginal and Torres Strait Islander people through greater collaboration with Australia's first scientists. In addition to harnessing our research wherever we can, our people are passionate supporters of improving how we run CSIRO.

Our people are energetic adopters of sustainable practices, which will be key to our continued progress on waste management solutions and better managing our impacts through more sustainable procurement practices, among other initiatives. We have also created more opportunities for our people to collaborate in person through progress on our site consolidation strategy, which has reduced our property footprint by over 50,000 m^2 in the past year, creating fewer but far more vibrant sites that can embrace new technologies while supporting our people to have hybrid working arrangements on site and from home. These sites have reduced carbon emissions through renewable energy, with ambitious goals to use our own innovations from artificial intelligence to hydrogen fuel into the future.

Looking ahead, I'm excited by the goals we've set ourselves in sustainability. We have set ambitious targets for CSIRO to be net zero by 2030, which will be achieved in part through harnessing the world-class knowledge within CSIRO. We will seek out new opportunities to engage our people with ways to deliver further sustainability gains, particularly in continuing to tackle difficult challenges in waste management and procurement. As we continue to consolidate our footprint, we will upgrade and build new facilities that aim higher, including expanding our already considerable renewable energy. We are even exploring opportunities for our own hydrogen fuel research to power CSIRO infrastructure, like the RV *Investigator*.

CSIRO's inaugural Sustainability Report shows we have made great progress, but we have significant and exciting work ahead to realise our ambitions. Enabled by our world-class research, driven by our passionate people, and informed by our robust strategy, I look forward to CSIRO continuing to become more sustainable and inspiring Australia as it achieves its goals.

Larry Marshall
Chief Executive

Overview

This sustainability report provides a summary of our activities and performance for the financial year 2021–22 (FY22) against our Sustainability Strategy 2020–2030[1], which aims to improve our environmental, social and economic performance in ways that are meaningful and important to our stakeholders.

This is the first sustainability report published by the Commonwealth and Scientific Industrial Research Organisation (CSIRO), presenting information on the sustainability performance of our Australian operations for the financial year ending 30 June 2022. This report has been prepared in accordance with the Global Reporting Initiative[2] (GRI) Standards 2016: Core Option. A full list of disclosures can be found in the GRI Content Index.

This report outlines our approach to managing the material issues affecting our organisation and stakeholders, our sustainability performance for FY22 and our aims for FY23, and includes our progress towards the actions, initiatives and targets outlined in our Sustainability Strategy. The report has been structured around the 5 themes – foundations for a sustainable business; our people; partnerships and engagement; excellent science; and environmental and social impact. Our approach to sustainability reporting will continue to evolve over the coming years.

This report should be read in conjunction with our annual report[3] for the same reporting period. It complements our annual report, expanding disclosures on our non-financial performance and opportunities.

About us

CSIRO is an Australian Government statutory authority, with a Board and Chief Executive. We are constituted by and operate under the provisions of the *Science and Industry Research Act 1949* (SIR Act), which sets out our functions and powers. The governance, performance and accountability of our operations, including the use and management of public resources, are set out in the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and related rules.

The CSIRO Corporate Plan[4] is our key strategic planning document. The Corporate Plan directs how we will deliver on our purpose as an organisation. It shows how our key priorities align with the legislation that we adhere to, and how we measure success.

As a Commonwealth entity we are required to produce our Corporate Plan under the PGPA Act. The planning undertaken at this enterprise level informs the development of all other strategies, plans, reviews, and resource allocations.

Each year, we report on our scientific, operational and financial performance through our annual report, which provides a summary of our activities and performance for the previous financial year against the planned objectives and outcomes in our Corporate Plan and Portfolio Budget Statements. It sets out our organisational and governance structure, along with information about our business strategy and operations.

1 https://www.csiro.au/en/about/strategy/Sustainability

2 https://www.globalreporting.org/

3 https://www.csiro.au/en/about/Corporate-governance/annual-reports

4 https://www.csiro.au/en/about/Corporate-governance/Corporate-Plan/21-22-corporate-plan

FY22 highlights by theme

Foundations

Published CSIRO's
first Sustainability Report

Executive-level
Sustainability Steering Committee

Our people

>5600
employees

41.1%
female leadership

ACTIONS COMPLETED
68%
Science and Gender Equity (SAGE)

62.5%
Board positions held by women

ACHIEVED
Silver accreditation
Australian Workplace Equality Index (AWEI) to May 2022

ACHIEVED
Bronze accreditation
SAGE to 2026

PARTICIPATION IN
Sydney Gay & Lesbian Mardi Gras
(2019, 2020, 2022)

Partnerships and engagement

Published our third
Innovate Reconciliation Action Plan (RAP) 2021–23

Small to medium enterprises (SME)
collaboration initiative

Established
child safe office

Excellent science

Delivered
8.4:1 return
on investment for benefit of Australia

Released the once in a decade
Our Future World[5] Report

Launched
4 new
science missions

Conducted net zero emissions (NZE) science
'shark tank'

Environmental and social impact

97% invoices from small business suppliers paid within 20 days

Sustainable procurement working group formed

First phase **climate risk assessment** completed

Independent **modern slavery risk assessment** completed

PARTICIPATED IN
Corporate Energy Reduction Transparency (CERT) report pilot study

Reduced property footprint by
>50,000m²

>50% reduction
in greenhouse gas emissions compared to FY21

5 https://www.csiro.au/en/research/technology-space/data/Our-Future-World

Sustainability is in our DNA

At CSIRO, we solve the greatest challenges through innovative science and technology. We are Australia's national science agency and innovation catalyst, collaborating to boost Australia's innovation performance.

For over a century, CSIRO has been improving the lives of people everywhere with our science. We've advanced Australia with a range of inventions and innovations that have had significant positive impacts on the lives of people around the world. Some of these include fast WiFi, the Hendra Virus vaccine, extended wear contact lenses and the CSIRO Total Wellbeing Diet.

The work of more than 5,600 CSIRO scientists and support staff is centred around the sustainable development of our nation. Sustainability is at the heart of our purpose and is reflected throughout our science agenda. We work with industry, government and the research community to turn science into solutions to address Australia's greatest **challenges**[6], including:

- **Food Security and Quality**: Achieve sustainable regional food security and grow Australia's share of premium AgriFood markets.
- **Health and Wellbeing**: Help enhance health for all through preventative, personalised, biomedical and digital health services.
- **Resilient and Valuable Environments**: Enhancing the resilience, sustainable use and value of our environments, including by mitigating and adapting to the impacts of climate and global change.
- **Sustainable Energy and Resources**: Build regional energy and resource security and Australia's competitiveness while lowering emissions.
- **Future Industries**: Help create Australia's future industries and jobs by collaborating to boost innovation performance and STEM skills.
- **A Secure Australia and Region**: Help safeguard Australia from risks (war, terrorism, regional instability, pandemics, biosecurity, disasters and cyber-attacks).

We identified these challenges through analysis of our own trend modelling and forecasting, including the Australian National Outlook report,[7] engagement with our partners in industry, government and academia, and a review of Australian and international priorities (including the Australian Science and Research Priorities and the United Nations' Sustainable Development Goals (SDGs[8])).

How CSIRO creates value[9]

As Australia's national science agency, CSIRO plays a foundational and multifaceted role in the economy; in Australia's innovation ecosystem; and in the global research and innovation landscape. We provide the essential platforms and advice needed by a broad range of stakeholders, including conducting research pursuant to national priorities and directives. We collaborate with innovators to convert their discoveries and ideas into technologies, services, and best practices that benefit the nation.

Every 2 years independent evaluators and analysts assess the value we deliver to Australia by analysing our impact. The *Value of CSIRO Reports*[10] provide the most up-to-date information about our collective impact. The *2022 Value of CSIRO Report* calculated an 8.4:1 return on investment, indicating that for every $1 invested in CSIRO, at least $8.40 in value is returned to the Australian people. There are also many other contributions that can't be readily expressed in dollar terms, such as contributions to Australia's human capital, conservation and culture.

Our influence extends beyond Australia. We are a regional leader in international policy and development for climate, biodiversity, sustainability and food security. Many of our scientists take active and leading roles in the advancement of science knowledge as part of global deliberations[11].

6 https://www.csiro.au/en/about/challenges-missions/Challenges

7 https://www.csiro.au/en/work-with-us/services/consultancy-strategic-advice-services/CSIRO-futures/Australian-National-Outlook

8 https://www.un.org/sustainabledevelopment/

9 See Annual Report 2021–22 Objective 1 *Delivering benefits for Australia*

10 https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/Auditing-our-impact

11 https://www.csiro.au/en/work-with-us/International

United Nations' Sustainable Development Goals

These 17 SDGs provide a framework for global cooperation to achieve growth, peace, and prosperity for all nations. They address environmental health, human wellbeing, economic sustainability, and long-term profitability.

Australia is one of 193 UN Member States to adopt the SDGs, and therefore all governments, businesses, and civil society have a responsibility to support this commitment.

Research institutions play an important role in achieving the SDGs. CSIRO is a central player in Australia's progress, touching on each of the SDGs through our science.

We were a key contributor to Australia's first Voluntary National Review,[12] which outlined Australia's progress against the SDGs, and will continue to develop global partnerships that drive positive outcomes.

We have aligned the key elements of our Sustainability Strategy with the SDGs, to highlight the impact of our operations and the ways in which we work to progress the SDGs through our day-to-day activities. The case studies in this report highlight alignment of our science with the SDGs.

12 https://www.sdgdata.gov.au/sites/default/files/voluntary_national_review.pdf

Our approach

In 2020 we undertook a review of our approach to managing our sustainability impacts in line with best practice, resulting in a new sustainability strategy to take us through to 2030. The Sustainability Strategy 2020–2030 ties together existing actions and identifies opportunities to improve our sustainability performance. It includes challenging targets and initiatives and is informed by the UN Sustainable Development Goals, the GRI, and the Paris Climate Agreement[13]. A key aspect of our strategy is a commitment to improving transparency around our sustainability performance, making us more accountable to our stakeholders.

Materiality

Understanding the issues that are material to CSIRO and to our stakeholders is important for developing a comprehensive approach to managing our sustainability impacts. Defining our material issues helps to ensure that our efforts and resources are directed to activities that manage the impact of our operations and generate value for our stakeholders.

In 2020 we undertook a materiality assessment to develop a list of 20 topics[14] considered material to CSIRO. The assessment involved consideration of peer approaches to sustainability, interviews with internal and external stakeholders, a review of internal policies and strategies, industry trends and a media analysis. The topics were tested through stakeholder workshops and a validation workshop with members of CSIRO's Executive Team. The stakeholder engagement approach considered leading practice frameworks used by organisations to demonstrate leadership and performance in accountability, responsibility, and sustainability[15].

The 20 topics fall into 5 key themes (Figure 1), with the materiality matrix shown in Figure 2, and the definitions of each topic included in the Appendix. Some topics represent our organisational impact on the most critical issues of our time, mirroring the approach of our world class research, whilst others represent significant issues that impact only our organisation or stakeholders.

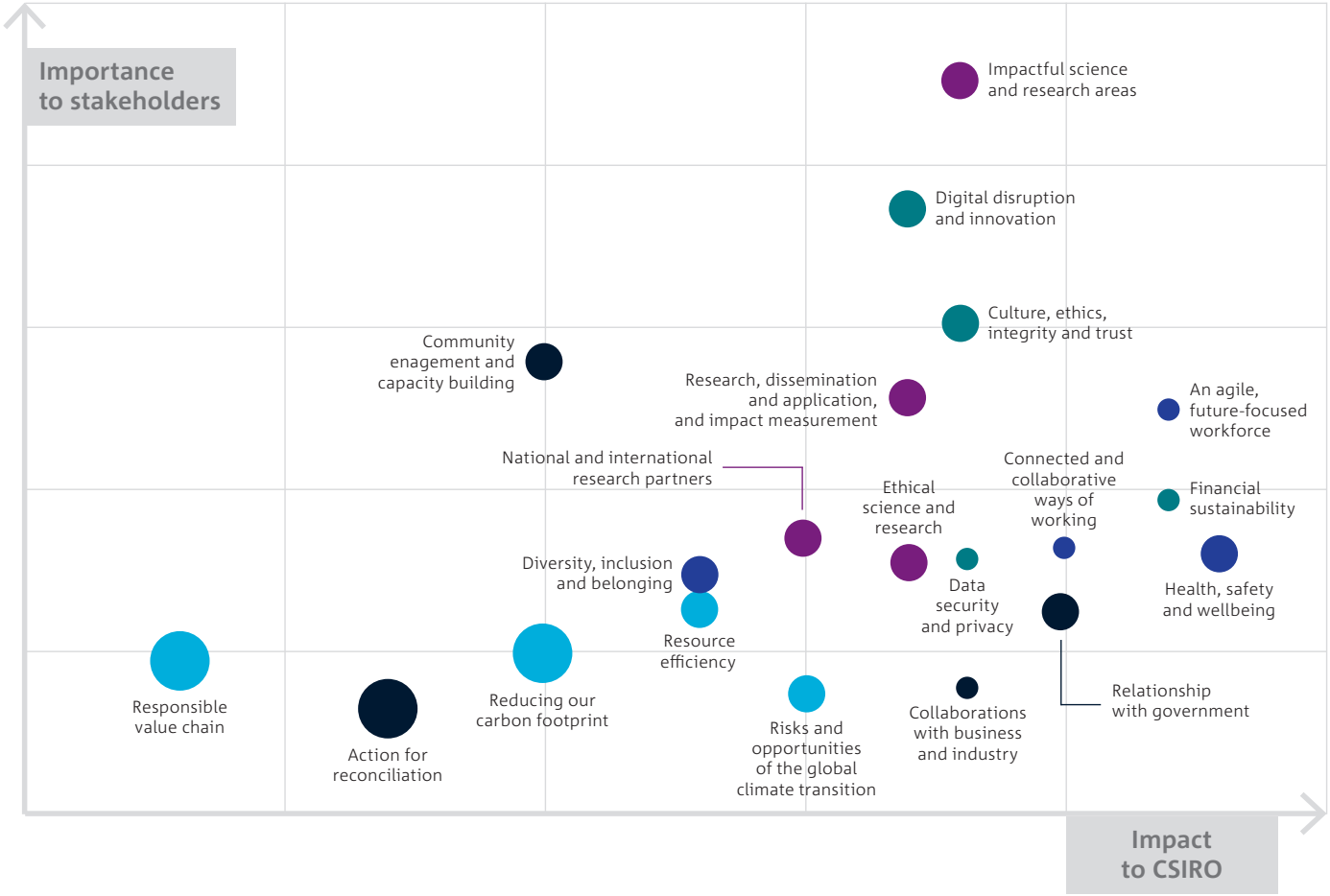
These material issues informed the development of our Sustainability Strategy, and they will continue to help us define our short, medium, and long-term sustainability goals, and direct our risk management efforts. We will regularly review these topics and refresh our materiality assessment every 3 to 5 years to identify new or emerging issues. We are also working towards expanding our engagement process with external stakeholders, including through existing channels such as business and community survey opportunities.

Figure 1: Material themes

13 https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

14 See Appendix – Material topic definitions

15 GRI Reporting Principles and AA1000APS



Time Scale

- Short term (feeling the impact now)
- Medium term (impact will become material in the next five years)
- Long term (impact felt out beyond five years)

Material topics

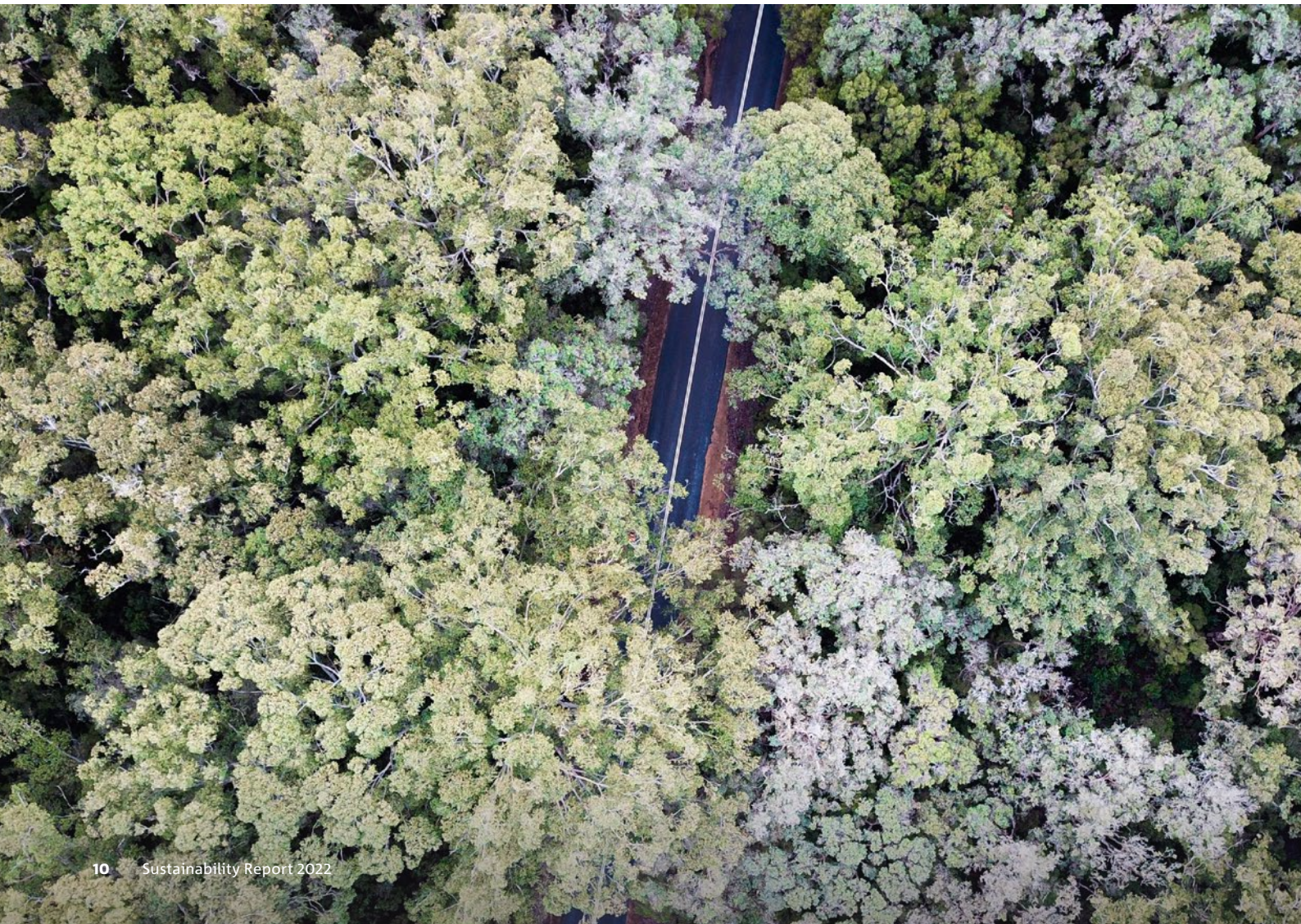
- Environmental and social impact
- Excellent science
- Foundations
- Our people
- Partnerships and engagement

Figure 2: Material topics

Strategic focus areas

The materiality assessment helped us to identify ways to improve our performance by understanding what is important to our people, wider stakeholders and our future. Through this process we identified priority actions or initiatives that form the basis of our renewed approach to sustainability and provide a platform on which to better communicate with our stakeholders on the issues that matter.

Our Sustainability Strategy focuses on 6 key areas. We believe improvements in these areas will provide the most immediate impact on our performance and will better place us to respond to sustainability issues. Improved transparency through stronger governance processes and a commitment to public reporting are key elements that will help to keep our progress on track.



1 Governance and transparency

Increase transparency around sustainability performance through improved governance processes and systems, including regular public reporting aligned to the SDGs.

2 Excellent and impactful science

Apply CSIRO's technical expertise to solve internal challenges and respond to global priorities by creating internal and external partnerships that contribute to the SDGs.

3 Our people and capacity building

Create a culture that supports our highly capable and diverse workforce on sustainable practices, and promote capacity building and understanding of sustainability issues through community and industry engagement.

4 Sustainable property portfolio

Ensure fit-for-purpose buildings, aspiring to net zero carbon impact, that stimulate excellent science and improve staff health and well-being.

5 Transition to a clean energy future

Improve energy demand management and efficiency to support the transition to net zero emissions.

6 Responsible value chain and resource use

Understand the environmental and social impacts of purchase decisions, and embed circular economy thinking and the highest standards of responsible procurement.

Priority actions

We have identified priority actions and initiatives for each focus area to drive positive improvements and sustainable outcomes, with links between the material topic themes, focus areas and the SDGs identified in Table 1. We have also developed a performance measurement framework to monitor and track these actions. This year's performance is discussed throughout this report.

Table 1: Priority actions of the CSIRO Sustainability Strategy 2020–2030

MATERIAL TOPIC THEME	TARGETS AND MEASURES	WHEN[16]	STATUS	SDGS
FOUNDATIONS FOR A SUSTAINABLE BUSINESS				
FOCUS AREA 1: GOVERNANCE AND TRANSPARENCY				
	Establish Sustainability Steering Committee	Within 6 months	●	
	Develop performance measurement framework	Year 1	●	
	Publish Sustainability Report	By FY22	●	
	Refresh materiality assessment	By 2025	●	
	Report to Board	At least annually to 2030	●	
EXCELLENT AND IMPACTFUL SCIENCE				
FOCUS AREA 2: EXCELLENT AND IMPACTFUL SCIENCE				
	Establish Sustainability Advisory Panel incorporating CSIRO science expertise	Year 1	●	
	Identify opportunities to apply CSIRO science solutions to operational challenges	Ongoing annually to 2030	●	
OUR PEOPLE				
FOCUS AREA 3: OUR PEOPLE AND CAPACITY BUILDING				
	Develop sustainability communications and engagement plan	Year 1	●	
	Develop training plan and material to build workforce capability on sustainability-related issues	Ongoing to 2025	●	

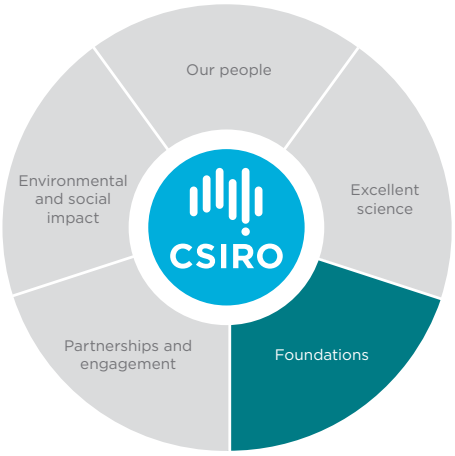
● Completed ● On track ● Planned ● Requires attention

16 Performance is measured from the date of Board approval

MATERIAL TOPIC THEME	TARGETS AND MEASURES	WHEN[16]	STATUS	SDGS
ENVIRONMENTAL AND SOCIAL IMPACT				
FOCUS AREA 4: SUSTAINABLE PROPERTY PORTFOLIO				
	Review Property Strategy Implementation Plan	Year 1	●	
	Develop Sustainable Buildings Policy incorporating Ecologically Sustainable Design principles and data capture systems	Year 1	●	
	Conduct physical climate risk assessment of property portfolio	By 2025	●	
	Ensure new buildings maximise net zero carbon impact	Ongoing to 2030	●	
	Achieve a consolidated and sustainable property portfolio	By 2030	●	
FOCUS AREA 5: TRANSITION TO A CLEAN ENERGY FUTURE				
	Define organisational emissions boundary	Year 1	●	
	Define net zero emissions (NZE) pathway	Year 1	●	
	Engage and align with CSIRO's Towards Net Zero mission team	Year 1	●	
	Undertake transitional climate risk assessment	By 2025	●	
	Achieve NZE at Newcastle demonstration site	By 2025	●	
	Use 100% renewable electricity at all CSIRO sites	By 2030	●	
	Achieve net zero scope 1 and 2 emissions	By 2030	●	
	Achieve beyond net zero material scope 3 emissions (Noting this Board-approved target extends past the Sustainability Strategy's 2030 end date)	By 2050	●	
FOCUS AREA 6: RESPONSIBLE VALUE CHAIN AND RESOURCE USE				
	Review supplier due diligence processes to ensure supply chain integrity around environmental and social considerations	By 2025	●	
	Develop water management strategy to improve efficiency	By 2025	●	
	Develop waste strategy that aligns with National Waste Policy Action Plan	By 2025	●	
	Target 80% recovery rate (by weight) for all waste streams	By 2030	●	

● Completed ● On track ● Planned ● Requires attention

Foundations for a sustainable CSIRO



Robust governance, risk management frameworks, data security, privacy and ethics are essential foundations for our business. They help us maintain our integrity and are central to our role as trusted advisor to government and the communities in which we operate. They support us to deliver on our purpose in accordance with our values. CSIRO has positioned itself over the past 5 years to ensure that we are ready to face challenges as the world transitions to a digital future. We have implemented robust systems and processes to lay the foundation for our operational and financial sustainability.

Financial sustainability

The Australian community expects commonwealth entities like CSIRO to manage public funds effectively. CSIRO's freedom to operate relies on us having a sound financial management and accountability framework[17]. Our framework is built upon effective financial management strategies, procedures and practices, delegated financial authority at the appropriate level, and robust accountability systems which support delivery of the CSIRO's science and strategy. The CSIRO Board is accountable for the delivery of financial management and accountability directives from Government. CSIRO Finance facilitates the acquittal of those financial obligations to the CSIRO Board via the Board Audit and Risk Committee.

We know we have a successful financial framework when CSIRO can live within its means, plan for a sustainable financial future, account to the public for our effective investment and expenditure decisions and deliver timely and accurate financial transactions to all stakeholders. Comprehensive information on our financial performance is provided each year in our annual report.

Culture, ethics, integrity and trust

Australia expects CSIRO to conduct its activities ethically and with integrity. Our conduct as an organisation is guided by our commitment to always act in the national interest. Maintaining our integrity is central to our culture, our scientific practice, and developing good business relationships. It ensures that we maintain public confidence in the science we undertake. Our Code of Conduct,[18] Service Charter,[19] Fraud and Corruption and Control Plan and the Public Interest Disclosure Scheme[20] provide the foundations for our management approach.

Governance

CSIRO's overall performance is supported by our system of governance, which prioritises accountable decision-making, and helps to ensure we conduct our work ethically, with integrity, and consistent with legislation. We consider and review our governance arrangements in light of public sector best practice, and also seek to ensure that lessons learned through our assurance, compliance and audit programs are used to strengthen our systems, policies and processes. Our commitment to sound governance processes reflects our organisational values, and our understanding that high-quality governance is a driver of high performance.

17 https://www.csiro.au/en/about/policies/finance-policy
18 https://www.csiro.au/en/about/Policies/Code-of-Conduct
19 https://www.csiro.au/en/work-with-us/Working-with-CSIRO/Service-Charter
20 https://www.csiro.au/en/about/Corporate-governance/Access-to-information/Public-Interest-Disclosure-Scheme

Our Sustainability Strategy includes a commitment to improving the governance processes around management of sustainability issues within CSIRO. Our Chief Operating Officer (COO) is the Executive Sponsor of the Sustainability Strategy, and our Director Business and Infrastructure Services (CBIS) is responsible for its overall implementation. We report to the Board on sustainability-related issues at least once per year.

Under the Sustainability Strategy, 2 new committees enhance oversight – a Sustainability Steering Committee, which includes members of the CSIRO Executive Team, for better oversight of organisational sustainability issues; and a Sustainability Advisory Panel (SAP) comprising CSIRO scientists, so that we can better understand how we can use our own scientific expertise to solve operational challenges. These committees are essential to ensure better visibility of sustainability issues at the executive level, aligning with broader organisational strategies and embedding a holistic approach to issues management.

The Sustainability Steering Committee is now operational, meeting 3 times over the reporting period. Establishment of the SAP was delayed due to other priorities, however we engaged significantly with our research scientists throughout the year to identify opportunities for CSIRO research to support strategy objectives. This included engaging with various research business units and our Towards Net Zero mission on net zero emissions (NZE) challenges, Ending Plastic Waste mission on solutions to single use coffee cups and our Land and Water business unit on climate risk assessments. The SAP will be established in early FY23.

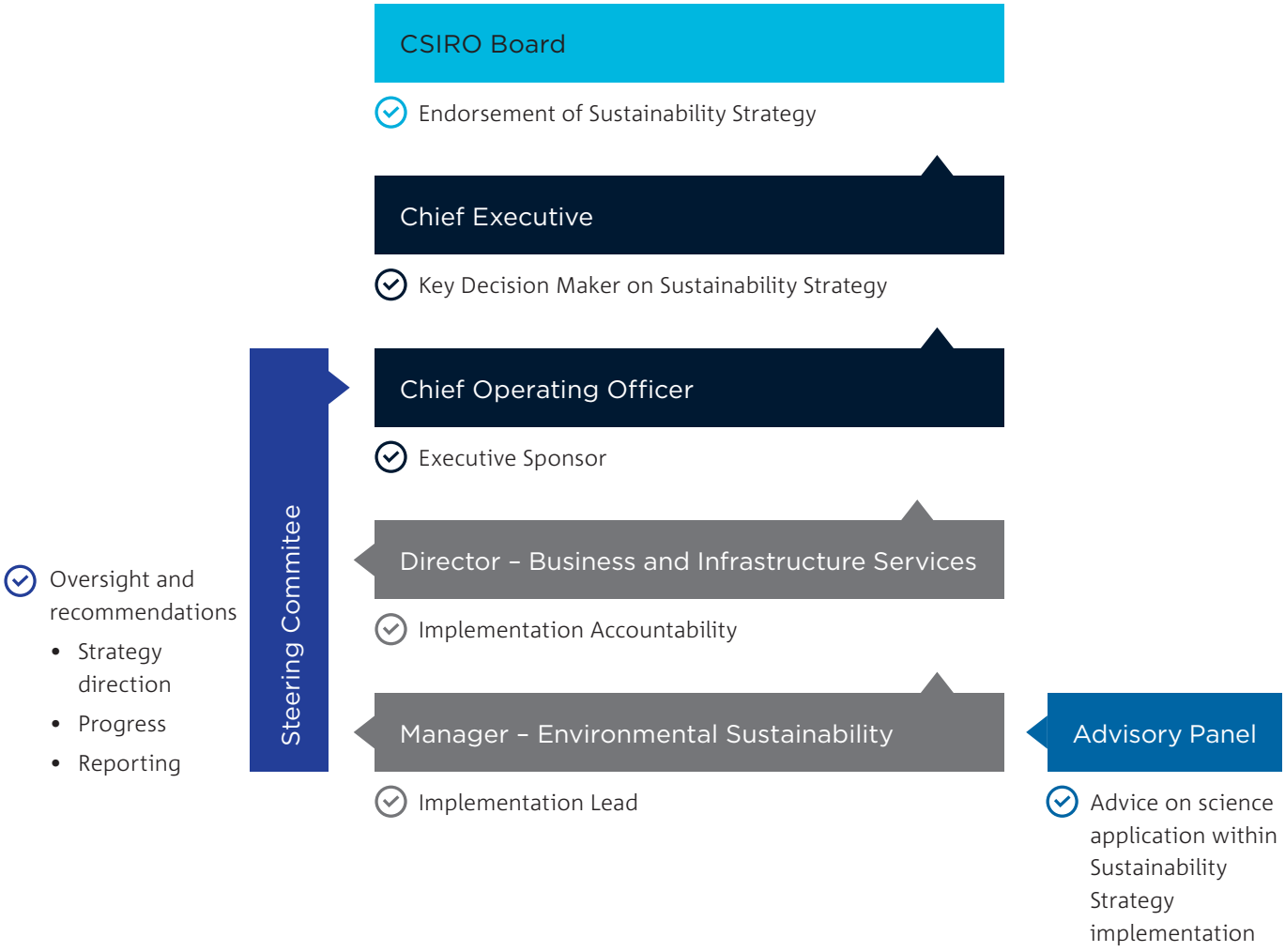


Figure 3: Sustainability governance and reporting structure

Fraud and corruption control

Fraud and corruption negatively impact the delivery of innovative science and technology. They undermine our reputation, risk public confidence and impact funding and resources. A robust fraud management framework is essential to protect our integrity and our businesses. The CSIRO fraud management framework is a three-tiered system that aligns with the risk management framework under the PGPA Act and Commonwealth Fraud Control Policy.

CSIRO takes a risk-based approach to the management of fraud and corruption, with the implementation of controls to prevent, detect, and deter incidents of fraud. Effective fraud and corruption management is critical to remain a trusted organisation and relies on:

- a strong and positive culture, and
- practical application of robust fraud awareness, stakeholder management plans, policies and processes.

Our first objective is to ensure staff, contractors, and affiliates are aware of expectations and can recognise unusual practices or issues and report them appropriately. This is achieved mainly through mandatory awareness training modules that include a specific fraud control package. The Fraud Control team supports staff and the executive through the development, review, and application of fraud control measures in line with legislation, policies, directives, and best practice. The team also offers specifically tailored fraud awareness training to meet the requirements of each business area. At every level, our staff complete Fraud Awareness and Code of Conduct training.

Compliant with Section 10 of the PGPA Fraud Rule, CSIRO has an effective fraud control framework. We adhere to the Commonwealth Fraud Control Framework 2017, and apply the Fraud Policy, Fraud Guidance, Resource Management Guide 201, and the Australian Standards AS 8001-2021 Fraud and Corruption Control in line with best practice. These are complemented by our plans, Code of Conduct, policies and procedures, systems and internal controls, financial management, assurance activities, and an Enterprise Risk Framework.

The CSIRO Fraud Corruption and Control Plan (the Plan) is consistent with the Commonwealth Fraud Control Framework. The Plan describes CSIRO's framework for identifying, deterring, detecting, investigating, and reporting fraud incidents that may arise within CSIRO and addresses the key elements:

Preparedness – governance including Code of Conduct, policies, procedures, and guidelines

Prevention – training in identifying risks and opportunities for improvement of controls

Response – accountable management of investigations and establishing appropriate channels for detection and reporting

Recovery – through administrative, civil and/or criminal processes, and lessons learned

Figure 4: Elements of effective fraud control within CSIRO

Current approaches do not make CSIRO immune to fraud. They are effective in strengthening our protective posture through fraud prevention, detection, and response, to minimise the likelihood of actual fraud consequences.

Our Fraud Control team have enhanced the collation and analysis of fraud incidents, trends, and intelligence datasets providing a higher level of engagement and reporting across the organisation. The team has established solid engagement with Commonwealth Agencies and Departments including but not limited to the Australian Government Attorney-General's Department and the Commonwealth Fraud Prevention Centre. This includes participating in their newly formed *Communities of Practice* forum for Fraud Prevention and Fraud Detection, collaborating in fraud control working groups, and supporting like agencies and organisations with learnings, experience, and opportunities in relation to science and research fraud control.

We apply an organisational fraud control program involving a cyclic Fraud Risk Assessment and Fraud and Corruption Control Plan update. The next iteration will be delivered and applied over the 2022–2024 period. These controls will be further complimented by a Fraud Pressure Testing program that will provide ongoing support to the organisation through a fraud risk management continual control program.

Risk management

The identification and management of risks and opportunities are central to delivering our purpose and making impactful decisions. At CSIRO, risk management is embedded in everything we do, from planning to performance and decision making. How we approach risks helps to articulate the way we operate as we work towards creating a better future for Australia.

To achieve our purpose, we must take measured and managed risks to ensure our organisation's enabling elements are optimised to best support our objectives. We acknowledge that breakthrough science, innovation and collaboration carry risk of technical or scientific failure, however we are committed to managing these risks and mitigating their consequences in a considered and effective way. This includes understanding key enterprise risks associated with the conduct and translation of research to outcomes and impact, people and culture, financial, digital transformation, customers and markets, health and safety, security, environmental, governance and integrity risks. By actively identifying and managing our risks, we aim to increase our effectiveness as an organisation and provide greater certainty and confidence for the Government, our people and other stakeholders in the community.

Our sustainability commitments are overseen and managed by our Board and Executive. The CSIRO Board determines the nature and extent of the risk it will accept to achieve the organisation's purpose and strategy, consistent with well organised and cost-effective use and management of public resources. The Board supports our efforts to identify and manage our risks through 3 standing sub-committees:

- Board Audit and Risk Committee
- Board People and Safety Committee
- Board Science Excellence Committee

Our risk methodology and approach take into consideration both the international standard AS/NZS ISO 31000 Risk Management Principles and Guidelines, and the Commonwealth Risk Management Policy. Our Risk Policy[21] sets out the way in which risk management is applied at CSIRO.

21 https://www.csiro.au/en/about/policies/risk-policy

Data security and privacy

Security and resilience

Security is vital to our sustainability. Protecting our people, research, national infrastructure and data ensures that the value we create fully benefits our stakeholders and the Australian people and ensures that we are trusted custodians of the resources we manage. The global security environment continues to evolve new challenges, and foreign interference and cyber insecurity pose an ever-increasing threat to the integrity of our research.

Maintaining a culture of collaboration and openness is important to our sharing of knowledge and expertise with partners around the world and to the development of science solutions and breakthroughs. Accordingly, security at CSIRO takes a risk-managed approach that balances the need for collaboration with appropriate protections for our people, research, national infrastructure and data.

This year we focused on remodelling our security approach, instigating a comprehensive review into our security governance and integration. In FY23, we will implement recommendations from the review to meet new challenges and new government expectations, to maintain our status as a trusted partner and a safe custodian of research vital to Australia's future and wellbeing.

Foreign interference

With increasing challenges in the global security environment, foreign interference is a greater threat to the research sector than ever. In FY22, we designed and rolled out the new industry-leading Research Engagement Sensitivities Tool (REST) to help manage the risk of foreign interference. The tool estimates the risk of foreign interference in a new project and directs it to a commensurate decision-maker. It was supported by a comprehensive change management campaign, providing support and education in identifying and mitigating foreign interference risks. Communication about foreign interference has the potential to impact negatively on the culture of diversity, inclusion, and international collaboration that is so fundamental to CSIRO's success.

Accordingly, we focused on carefully tailoring our communication, and making a clear distinction between welcome foreign influence from our friends and allies, and the covert, coercive and corrupting effects of foreign interference.

Our ability to remain active and agile in combating security issues will be critical to our ongoing relevance in the global science community. With that in mind, we invested in our relationships with colleagues across the Australian research sector and with allies internationally. We did this by sharing innovations and lessons learned in managing the risk of foreign interference, showing leadership in the sector on this critical issue, and improving our approach by learning from others.

Protecting our people

The safety of our people[22] is our first priority, and a critical element in supporting them to deliver the cutting-edge science Australia expects. Our physical security approach is focused on our people's safety, providing advice, and delivering solutions that protect our people from security threats in their environments. As an example, we provide protective briefings for CSIRO people working in potentially high-risk situations. These briefings explain the specifics of the threat they may face and provide ways to protect themselves and CSIRO from these eventualities.

Cyber security

The integrity and assurance of CSIRO's ICT operations and data is paramount as the organisation continues digital transformation in both the science and business spheres. Cyber security has remained in focus with significant investment by the organisation with the Cyber Security Uplift Program which will provide dedicated funding over a 3 year period to uplift the Essential 8 Maturity Level of enterprise and scientific IT services. In FY23, the program will initiate several projects that will continue over the life span of the funding and align CSIRO with the Australian Cyber Security Centre (ACSC) Essential 8.

22 For more information about the safety of our people, see *Health, safety and wellbeing* p.32.

The projects range from securing endpoints from malicious code and additional administrative access controls to providing valuable centralised insights to business and service owners on vulnerability management and logging. Securing CSIRO's sensitive data is also a priority project.

The key focus is to maintain CSIRO's ability to conduct global collaborations on secure platforms and facilities that provide the necessary confidence and assurance to our partners and customers. Cyber security is a shared responsibility within CSIRO with all parties playing key roles in maintaining overall organisational security hygiene.

Privacy

Privacy is a central feature of our work at CSIRO, and the community trust us to look after the personal information that we hold. CSIRO is bound by the *Privacy Act 1988* (Cth)[23] and the Australian Privacy Principles, and it is vital that we all are aware of, and comply with, our privacy obligations and implement good privacy practices in our day-to-day work. Our Privacy Policy[24] describes the management and protection of personal information that CSIRO collects and holds.

CSIRO continues to ensure that staff are aware of, and comply with, CSIRO's privacy obligations. All CSIRO staff are required to undertake mandatory privacy training at induction and annually. CSIRO projects must undergo privacy assessments with high privacy risk projects, that is projects that are likely to have a significant impact on the privacy of an individual, undergoing a Privacy Impact Assessment (PIA).

CSIRO also contributes to data security and privacy developments through our research[25]. For example, CSIRO's data specialist arm, Data61, collaborated with a range of partners, including the Office of the Australian Information Commissioner, the NSW Government, and others, to produce a tool[26] that allows data custodians to make informed decision when sharing datasets which contain sensitive personal or commercial information. The Re-identifier Risk Ready Reckoner (R4) tool enables systematic quantification of re-identification risks for individuals or transactions in a data set. Further technology from Data61 allows the mitigation of such privacy risks and enables access to secure and privacy-preserving personal data, such as public transport usage, which has broad and important applications, for example in planning resilient infrastructure.

23 *The Privacy Act 1988* (Cth) regulates the collection, use, disclosure, storage and security of personal information of government agencies and private organisations. *The Privacy Act* includes 13 binding Australian Privacy Principles (APPs) with which CSIRO must comply in relation to its management of personal information.

24 https://www.csiro.au/en/about/Policies/Privacy

25 https://data61.csiro.au/en/Our-Research/Focus-Areas/Cybersecurity

26 https://research.csiro.au/isp/research/privacy/r4/

Digital disruption and innovation

The pandemic has tested our ability to operate in an almost entirely digital environment and we have proven that we can successfully work this way. However, even prior to the pandemic, there was a fundamental change occurring in how CSIRO operates, with a move towards digital capability and operations. Through our digital strategy we will continue to invest in tools and ways of working that are productive and engaging for our people, customers, and stakeholders.

Innovation in our research and how we work is also a major driver in addressing Australia's greatest challenges. Digital enablement and innovation are integrated across all areas of CSIRO, including in our research streams, workforce capability and facilities.

Enterprise Services of the Future

The Enterprise Services of the Future (ESOF) program was launched last year and this year we have been transitioning from the planning to delivery phase. ESOF will help future-proof our operations by introducing smart technologies and simplified processes to all Enterprise Services functions, for the benefit of all staff. There will be fewer and simpler processes and procedures, which will result in new and improved ways of working. Our aim is to create a more connected and efficient CSIRO. Smart technologies are set to reduce the volume of manual and repetitive tasks. For example, our Robotic Process Automation project is implementing assisted and non-assisted robotic processing to make manual and repetitive tasks in Finance and People functions faster and more compliant. This will free up our people to concentrate on more complex tasks.

The plan is to make robotic processes automation available to other Enterprise Services functions that have manual and repetitive processes. The project will be officially rolled out with our Finance team early next financial year, with manual and repetitive processes within the People function (specifically Payroll and HR) to follow.

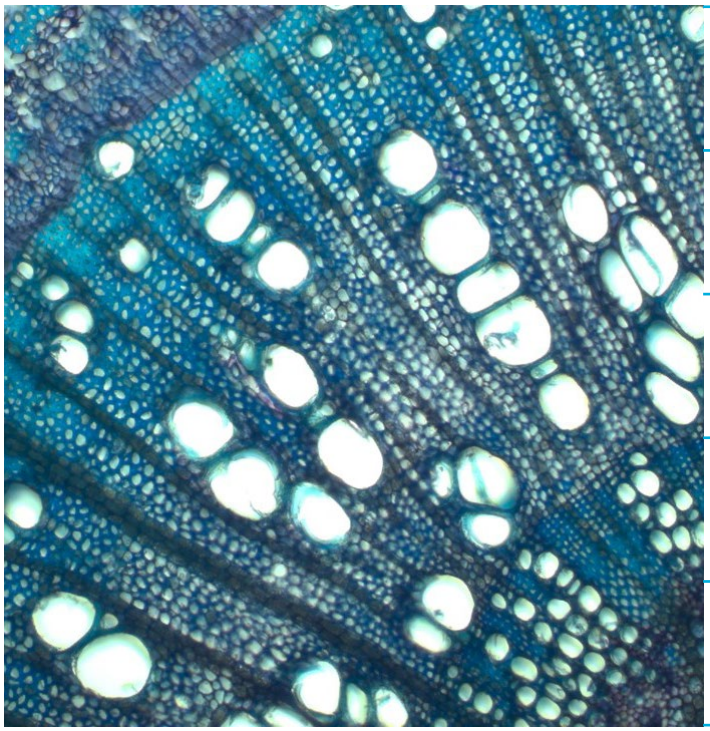
The ESOF program aims to ensure that our Enterprise Services functions are as cutting edge as our science. That's why we're leveraging smart technologies, simplifying and improving our processes and evolving our service delivery model. The ESOF program will be delivered through projects co-designed with Enterprise Services functions and Business Units. Pictured are Dianne Bedell (L) Experimental Scientist from Mineral Resources Business Unit and Jill Gipson (R), Enterprise Support Officer.

Digitalisation of science

The global digital revolution disrupts how we do science and how we deliver solutions. We need to be at the forefront of these global changes for our business sustainability.

The Science Digital Transformation (SDT) program aims to empower CSIRO researchers through leading edge digital technologies and ways of working, to create a better future for Australia.

Various program streams within SDT are working with our science business units to imagine future research technology, and then build it. The Digital Academy stream is supporting our scientists to upskill in machine learning and AI, data management and digital ways of working; while the Managed Data Ecosystem is building the complete set of hardware and software required for our digital evolution. It is a team effort between the science business units, the Information Management and Technology (IMT) support service team and the engineering and design group in Data61 to move our science into a digital future. Our digital advancement will maintain our competitive edge and enable us to continue innovating to support the sustainability of Australian industry.



- The new science we can do
- The way science is conducted
- The way science is shared (the players involved)
- Big data and analytics
- The speed of innovation

Reimagining farming

A project within our Reinvent Science stream of SDT is evolving agricultural science, robotics and AI to reimagine a more sustainable future for agriculture. While current monocultural farming methods[27] have helped ensure the stability of food supplies in developed countries, this dominant way of farming has come at a cost. Emissions from land use, largely agriculture, forestry and land clearing, make up around 21% of the world's greenhouse gas emissions[28]. Reimagine Farming is supporting the growth and development of new methods that use nature's wisdom to help farmers respond to the environmental challenges facing them today.

A move towards mixed, biodiverse farming systems could have wide-reaching benefits including safeguarding profits against crop-specific losses, reducing waste, combating chemical resistance, and expanding opportunities for trade in new economies.

However, the growth of these systems is currently blocked by existing technology. Robots and sensors used in large-scale farming operations today complete fixed, singular tasks and are not equipped to respond to change. To achieve the climate-resistant and profitable farm of the future, robots and AI need to be multiskilled, adaptive and work collaboratively with humans to manage a dynamic, changing environment.

Reimagine Farming is co-developing the technology and agricultural science needed to establish scaled farming systems that harness the power of biodiversity. The team are building new robots and teaching them to work in a mixed, dynamic ecosystem on a test site – the Farm of the Future in Pullenvale, Queensland, which features more than 50 species of trees and crops. The project aims to train autonomous robots that can adapt to environmental changes and learn on the fly. When that is achieved, farmers and the environment will be able to reap the advantages of new sustainable farm designs.

This robot is learning to adapt to a changing natural environment as it completes farming tasks at one of our Queensland sites.

27 Methods in which one crop is grown per field.

28 https://www.ipcc.ch/srccl/

Our stakeholders

Our stakeholders are essential to our success. They can be both impacted by, and influence, our decisions and their outcomes. They range from Australian government and agencies to the remote communities in which we operate. Engaging with stakeholders helps us to understand our most significant issues, and it is essential that we maintain strong engagement channels and methods for gathering important feedback. Effective and agile engagement with our stakeholders is critical to achieving impact and delivering on our purpose. It is also an important means for maintaining confidence and trust.

CSIRO has many valued stakeholders and channels for engagement.[29] We engage with our stakeholders through a multitude of mechanisms such as face-to-face meetings, outreach programs, social networks, and collaborative research programs.

Recognising the importance of our stakeholders and customers to our business, we are investing in understanding and strengthening our customers' experience of working with CSIRO, to complement the research engagements that customers have with us[30]. This customer experience program will advance our customer experience journey, with improvements across our programs and processes to support key industry sectors, including engagement with high-growth small to medium-sized enterprises. One mechanism we use each year to gauge customer satisfaction is through the Net Promoter Score (NPS)[31].

Below, we summarise which stakeholders may be most involved or impacted by our material issues and provide a summary of our response.

Table 2: Stakeholder impacts by material topic

TOPIC	KEY ASPECTS OF OUR RESPONSE IN FY22	STAKEHOLDERS MOST INVOLVED/ IMPACTED
Financial sustainability	• Continued to report financial performance in our annual report • Continued to apply our risk management framework and finance policy	G E R
Culture, ethics, integrity and trust	• Participated in *Communities of Practice* fora • Improved engagement channels with Commonwealth Government and agencies • Continued to apply CSIRO Values • Continued to apply our Code of Conduct and Fraud and Corruption Control Plan, and maintained the Public Interest Disclosure Scheme • Continued to conduct mandatory training	G E R C
Data security and privacy	• Undertook comprehensive review of security governance and integration • Designed and rolled out the Research Engagement Sensitivities Tool (REST) • Cyber Security Awareness Week 25–29 October 2021 • Invested in the Cyber Security Uplift Program • Continued to comply with the *Privacy Act 1988* (Cth) • Continued to conduct mandatory training	G E R S C
Digital disruption and innovation	• Transitioning Enterprise Services of the Future (ESOF) from planning to delivery • Continued to roll out Science Digital Transformation (SDT) program streams, investing in our people's digital capabilities • Responded to COVID-19 pandemic through deployment of digital solutions • Continued to evolve Labs of the Future initiative	E R C

G Government E Employees R Research and industry S Suppliers C Communities

29 See Appendix – *How we engage with our stakeholders*

30 See our Annual Report 2021–22 *Ensuring customer satisfaction* p.48

31 See Appendix – *Data pack Table P14*

TOPIC	KEY ASPECTS OF OUR RESPONSE IN FY22	STAKEHOLDERS MOST INVOLVED/ IMPACTED
An agile, future-focused workforce	• Launched 'Impossible without you' campaign • Continued to develop the Talent Mobility Platform • Finalised the Business Transition Program to respond to COVID-19 impacts • Enhanced our flexible working arrangements to respond to COVID-19 • Continued to provide Work from Home equipment packages • Continued the SWITCH program	E R
Connected and collaborative ways of working	• Continued to develop the Ways of Working program • Used well-established technology as an enabler to continue our important work during the pandemic	E R
Health, safety and wellbeing	• Implemented the enterprise digital HSE system • Began development of comprehensive HSE audit program • Enhanced CSIRO's Health, Safety and Environment Management System • Maintained the HSE Resource Hub • Continued to conduct mandatory training	E
Diversity, inclusion and belonging (DI&B)	• Continued to operate DI&B focused recruitment and employment programs • Progressed SAGE Action Plan and associated programs	E
Relationship with government	• Adhered to the Government's Statement of Expectations in line with our Statement of Intent • Conducted several research programs in collaboration with government	G R
Collaboration with business and industry	• Established new partnerships with business and industry • Continued to progress mission program with business and industry • Small to Medium Enterprises (SME) Collaboration Initiative • Continued to develop commercial applications of CSIRO research through industry partnerships	G E R C
Community engagement and capacity building	• Continued to operate education and outreach programs, including converting some to a virtual experience • Continued to manage the citizen science program • Developed STEM Together program • Revised Child Safe Policy and procedures • Established Child Safe Office	R C
Action for reconciliation	• Published our third Innovate Reconciliation Action Plan 2021–23 • Appointed our first Indigenous Science Program Director in FY21 • Managed the new Indigenous Science program and portal • Implemented new RAP reporting and planning processes • Implemented Weavr management program	E R C

G Government E Employees R Research and industry S Suppliers C Communities

TOPIC	KEY ASPECTS OF OUR RESPONSE IN FY22	STAKEHOLDERS MOST INVOLVED/ IMPACTED
National and international research partners	• Continued to develop new relationships and nurtured our established relationships to deliver impactful science across the CSIRO challenges • Continued to progress mission program • Participated in 12 Collaborative Research Centres (CRCs)	G E R C
Research dissemination and application, and impact measurement	• Launched 4 new mission programs • Developed the Value of CSIRO Report 2022 • Developed impact case studies • Progressed Open Access arrangements to our research outputs	G E R C
Impactful science and research areas	• Continued to implement our Planning and Performance Framework • Continued to progress research in areas responding to Australia's greatest challenges • Continued to operate national research infrastructure	
Ethical science and research	• Increased levels of mandatory training for research staff to enhance capability levels • Continued to apply the *Australian Code for the Responsible Conduct of Research* via our *Code of Conduct* and *Science and Delivery Policy* • Continued to comply with internal and external monitoring and reporting requirements with support from the Ethics and Integrity team • Continued to operate independent ethics committees for all human and live animal research • Supported adaptation of research activities in response to COVID-19 whilst maintaining best practice	G E R C
Reducing our carbon footprint	• Achieved over 50% emissions reduction compared to FY21 • Continued to implement Net Zero emissions (NZE) roadmap • Continued to manage Power Purchase Agreement (PPA) for provision of renewable energy • Conducted feasibility studies for further solar PV installations	G E S
Risk and opportunities of the global climate transition	• Completed first phase climate risk scan using *Climate Compass* tool, reporting to Executive Team • Committed to second phase of climate risk identification	G E R C
Resource efficiency	• Refined ESD Policy, commenced testing with phase 1 pilot sites • Reviewed and socialised waste audit results to inform waste roadmap • Commenced water audit program • Continued to apply Property Strategy Implementation Plan to reduce our property footprint	G E S
Responsible value chain	• Developed Sustainable Procurement Implementation Plan (SPIP) • Established Sustainable Procurement Working Group • Independent modern slavery risk assessment completed • Continued to apply Commonwealth Procurement Rules and processes	G E S

G Government E Employees R Research and industry S Suppliers C Communities

Our people

At CSIRO, people are our greatest asset and at the core of our success. We work hard to attract and retain diverse, world class talent and provide an environment that prioritises the wellbeing, safety and security of our people, together with compelling and fulfilling career experiences. CSIRO is an inclusive and equitable organisation that values diversity and invests in the future capability of our workforce.

We attract and retain great people through our compelling employee value proposition including benefits such as paid parental leave, flexible work arrangements, promotions and reward options, scholarships, and awards.

Our Enterprise Agreement 2020–2023[32] supports the success of our people through working conditions that attract and reward highly skilled and team-oriented people, support a safe and respectful workplace and enable a positive work-life balance.

Our Values are the foundation not only for the work we do, but also for the way we do it, and the way we work with our colleagues and a variety of partners every day. Our Values were developed together with our people and represent what makes CSIRO unique and special.

CSIRO values

People first

People first behaviours are respectful, caring and inclusive.

Our first priority is the safety and wellbeing of our people. We believe in, and respect, the power of diverse perspectives. We seek out and learn from our differences. We do our very best to get all this right.

Trusted

Trusted behaviours are accountable, authentic and courageous.

We're driven by purpose but remain objective. We fight misinformation with facts. We earn trust everywhere through everything we do. We trust each other and we hold each other accountable. Together our actions drive Australia's trust in CSIRO.

Further together

Further together behaviours are partnering, cooperative and humble.

We achieve more together than we ever could alone. We listen and collaborate, in teams, across disciplines, across boundaries. We embrace ambiguity and use discussion and persistence to generate unique solutions to complex problems.

Making it real

Making it real behaviours are curious, adaptive and entrepreneurial.

We do science with real impact. We thrive when taking on the big challenges facing the world.
We take educated risks and defy convention.
We celebrate successes and failures and leverage them to learn as we strive to be the force for positive change.

32 https://www.csiro.au/en/about/Policies/CSIRO-Enterprise-Agreement
The Agreement covers the CSIRO Chief Executive, all CSIRO officers (other than the Executive Team and officers covered by the CSIRO Canberra Deep Space Communication Complex (CDSCC) Enterprise Agreement 2018-2021) or any successor agreement, and those unions approved to be covered by the Agreement.

An agile, future-focused workforce

CSIRO's people are critical to achieving our purpose of solving Australia's greatest challenges through innovative science and technology. To achieve this, we must adapt and respond to the changes our environment, society and economy undergo. Building the capability of our people and collaborating well with our partners enables us to be agile in ways we deliver impact to the system.

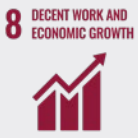
CSIRO's learning approach is designed to help our people build capability, confidence, and connections. They nurture mindsets that increase CSIRO's innovation performance and create value for customers. Learning happens every day at CSIRO, not just through formal training events. One of the key actions in our Sustainability Strategy is to build the capability of our workforce on the sustainability issues that are important to the organisation.

CSIRO offers career development opportunities in all areas of our organisation, from entry level to leadership positions. For example, our researchers can initiate, develop and promote our research capabilities by forming strategic partnerships with industry, or establishing multi-organisational, collaborative research programs.

Talent mobility

A key talent initiative for CSIRO is the Interchange platform, which enables us to mobilise our people through targeted career assignments across the organisation.

In FY21, our Interchange program delivered an internal talent marketplace for our people which provided new career opportunities, aligning our people to our most important strategic work, creating organisational flexibility, and enabling the retention of our capability and talent. In FY22, we are building this capability to a new level with a dynamic talent mobility platform facilitating, meaningful and fulfilling career experiences for all CSIRO people.



Switch program

Switch is a reciprocal program that places our people in partner organisations for a specified period, and vice versa. It provides a secondment structure for our people to gain direct experience with partner organisations. In this way, they learn about different business models, markets, and business processes and improve their knowledge of customer and industry needs. At the same time, team members from partner organisations can gain exposure to CSIRO's exceptional capabilities and skill.

Switch provides a critical pathway to supporting and enhancing our engagement and collaboration with local and international industry, government and research partners. It helps us build strategic collaborative relationships, establish new business and project leads, develop a deeper understanding of customer and industry needs, improve collaboration readiness, and expose our staff to other business models and/ or markets to enhance their thinking and perspective.

Switch is open to everyone at CSIRO and the intention is to have Switch visible on the talent mobility platform as part of Phase 2.

Connected and collaborative ways of working

CSIRO has a geographically diverse workforce with over 5,600 employees working at 50 sites across Australia. The accelerated adoption and pace of new and flexible ways of working, due in part to the pandemic, has reinforced that the 'way we work' is a key enabler of the CSIRO strategy. The Ways of Working (WoW) Program, linked to other key enterprise enabling strategic initiatives, is 'how' CSIRO will achieve its strategic vision.

We know we can rise to the challenge of overcoming our internal barriers to deliver interdisciplinary science at speed and with a focus on important shared goals – our response to the 2020 bushfires and COVID-19 demonstrates this.

Over the next 2 to 4 years, CSIRO aims to develop new ways of working that enable greater alignment of focus on impact, streamlined processes, the creation of a culture of empowerment, and better collaboration.

Anne Stevenson wins national award for contributions to library technology[33]

In June 2022, CSIRO's Anne Stevenson won the coveted VALA *Williamson Award* for leadership and innovation in library information technology. Anne has been a librarian at CSIRO for 43 years and leads the Research Data Services Team. Throughout her career, she has made unique contributions to information management, both to our organisation and to the profession.

At CSIRO, being a librarian is about helping people find the information they need to do their work, in whatever format that might take. It's about helping people manage the inputs to their research such as references to literature and data, and to manage their research outputs such as publications and software, so that they can be found and used by other people inside and outside the organisation.

Anne is a Research Data Management practitioner, a relatively new specialisation within librarianship. Her work has been key to the increasing proliferation and reuse of CSIRO's data assets amongst a cohort of international researchers, to achieve maximum impact for Australian science. She has been instrumental in the development of bespoke software that supports world-class information management at CSIRO, such as the Data Access Portal and the Research Data Planner. Anne is also recognised by her staff as an outstanding leader.

VALA's Melissa Parent (left) presenting the Williamson Award to Anne Stevenson (right).

33 https://my.csiro.au/News/IMT/2022/June/Library-innovation-award

Health, safety and wellbeing

At CSIRO, our people are key to our success and ensuring they are healthy and safe is our top priority. CSIRO's Health, Safety and Environment (HSE) Policy demonstrates our public commitment to health, safety and the environment, and these commitments are delivered through the implementation of the CSIRO HSE Management System (HSEMS).

The CSIRO HSEMS supports the HSE Policy and HSE risk framework and includes regulatory and other requirements. It applies to all CSIRO people and contractors when performing work. During the reporting period, the HSEMS was enhanced to align with industry standards ISO45001 and ISO14001, which are underpinned by the plan-do-check-act cycle. Over the next year, CSIRO will continue to improve the HSEMS with input from various levels of management and CSIRO people, to achieve best practices and desired positive HSE outcomes. A comprehensive internal HSE audit program will be developed for FY23 that will assess implementation and facilitate improvements.

At CSIRO, HSE is everyone's responsibility. There is also a dedicated HSE team to support our organisation to identify and manage HSE risks, and to provide HSE advice and support as well as health, wellbeing, injury claims and rehabilitation services to all CSIRO people.

Improvement opportunities are embedded in the 4-year strategic HSE Plan launched in 2020. The HSE Plan promotes improved systems, capabilities, and proactive care for our people. Enabling projects are currently underway, supporting delivery and strengthening HSE performance and culture in CSIRO.

One of the recent improvements was the implementation of an enterprise digital HSE system that provides an easy-to-use platform for reporting hazards, near misses and incidents; recording information from proactive HSE conversations (HSE contacts); assigning and tracking corrective actions; performing risk management activities and enabling the proactive management of risk. The information that results from the integrated incident and risk management tools provides business leaders with transparent data to monitor and improve performance.

HSE training at CSIRO begins with induction and onboarding and is mandatory for all people. Supervisors and managers participate in additional mandatory HSE training. CSIRO offers a range of health and wellbeing support services to its people, such as free flu vaccination, audiometric testing, health monitoring, counselling via an employee assistance program (EAP), injury management and rehabilitation as well as a range of initiatives to improve health. Some key initiatives are listed below.

HS-Me Day

In 2018 we introduced HS-Me Day, a day to stop work and focus on health, safety and environmental outcomes. The 2021 HS-Me Day (19th October) theme to 'reconnect with Me' took a different approach, giving staff permission to spend the day however they needed to recharge and reconnect. In the weeks leading up to the day, a series of activities and ideas focused on health, safety and environmental topics, were shared with a webcast on each topic. The day was an overwhelming success with most of our people taking time out to focus on their personal health, safety and local environment. Over 1,300 participants took part in the activities leading up to HS-Me Day and 1,355 staff attended the Re-Connect session on October 20 to share their HS-Me Day stories. The in-house social networking tool – Yammer – recorded the highest activity ever for a specific event, and 950 positive posts were reported on HS-Me Day.

Reducing over-use injuries – ergonomic assessment program

As our people began to return to working on site, a key HSE initiative was to engage external rehabilitation consultants to provide ergonomic training, advice and short workstation assessments. Over-use injuries are not uncommon at CSIRO, and the purpose of this initiative was to support our people as they returned to working on a CSIRO site. We wanted to ensure that our people had appropriately adjusted ergonomic workstation setups and received ergonomic training promoting self-management of hazards. Overall, the initiative was received positively with the majority of people requiring minimal workstation adjustments.

Fitness Passport

In FY22 we launched a new health and fitness program for our people called Fitness Passport. Fitness Passport is available at CSIRO in Queensland, New South Wales, Victoria, Tasmania, South Australia, Western Australia and the Australian Capital Territory. The program is designed to support our people and their families on their own individual health and wellbeing journey by providing access to many gyms, pools and fitness centres across the country for a reduced price compared to other gym and fitness type memberships. Members who sign up can attend facilities included on the program as many times as they like and there are many options both close to work sites and home, making it convenient to exercise. To date, we have 318 memberships across the country with many of these family memberships extending the wellbeing benefits to our people's families.

Virgin Pulse Destination Go Challenge

In FY22 we offered all CSIRO people the chance to be a part of the Virgin Pulse – Destination GO Challenge referred to as VP GO. The challenge was a great way to prioritise activity and social connection with colleagues, even when working from home. VP GO is a wellbeing program that meets individuals where they are at by assisting them in making small health changes. A mobile app was available as part of the program and individuals competed in teams, trekking their way around the world virtually over 9 weeks. We had over 1000 CSIRO people sign up to the challenge and upon conclusion of the challenge final reporting demonstrated that exercise and activity levels had increased for those taking part.

Diversity, inclusion and belonging

We believe, we can create a better future for Australia by fostering dynamic world-class teams, where our people can work seamlessly in an inclusive one-CSIRO culture. Our success is built on our ability to bring out the best from a thriving culture. In doing so, we believe in, and respect, the power of diverse perspectives and we learn from the uniqueness of our people.

As a Corporate Commonwealth entity, CSIRO is required to comply with all laws of the Commonwealth with respect to equal opportunity. Beyond compliance with the law, we actively work to create an environment where equity considerations are embedded in every facet of the career pipeline and the workplace experience.

By integrating diversity, inclusion and belonging principles into everything we do we maximise our own potential, but also recognise our responsibility to create an environment where all people can grow, contribute and succeed.
As we refresh the Diversity Inclusion and Belonging Strategy 2023–26, we will focus on empowering our people to be active bystanders and allies, understanding the role of intersectionality[34] in everyday practice, and strengthening the capabilities of our workforce, particularly around inclusive leadership.

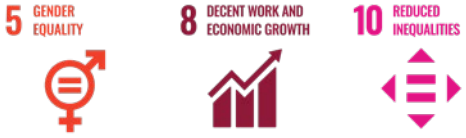
While focusing on intersectionality, we will continue to address inequities for specific communities/diverse groups at CSIRO. Our intent is to create inclusive workplaces that benefit all people by focusing on specific disadvantaged or under-represented communities.

Gender equity

CSIRO has an organisational KPI to increase the number of leadership roles held by women. We also have a range of aspirational targets aimed at fostering diversity in our recruitment pools and outcomes, as well as promotions.

Positions held by women in CSIRO in 2022:

62.5%	Board positions
50%	Executive Team positions
41.1%	Leadership positions



Science in Australia Gender Equity (SAGE)

Science in Australia Gender Equity (SAGE)[35] is a program that focuses broadly on gender equity, but increasingly emphasises gender equity and the intersection of other characteristics, through introducing action plans and measuring impact through Cygnet Awards. We began implementing our 90-point SAGE Action Plan in mid-2018. In November 2018, we were awarded Athena SWAN Bronze accreditation among 14 other research institutions for achieving our action plan targets. We are now focused on measuring the impact of our 4-year action plan through the SAGE Cygnet Award process. We continue to focus on: recruiting women into leadership positions, equitable career development and promotions process, a safe workplace for everyone to speak up, embedding inclusive practices into our workplace, inclusive practices for LGBTIQ+ people.

68%	SAGE actions completed
	SAGE Bronze accreditation (to 2026)

34 Intersectionality is the interconnected nature of identity and lived experiences a person or group of people encounter and how they overlap with other systems of discrimination or disadvantage.

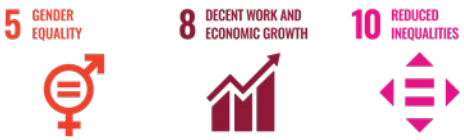
35 https://www.sciencegenderequity.org.au/

STEM Champions of Change Coalition

Our Chief Executive is a founding member of the Champions of Change Coalition (CCC) STEM group (formerly called Male Champions of Change). CCC aims to achieve gender equality, advance more and diverse women into leadership, and build respectful and inclusive workplaces for the future by taking practical action to accelerate the pace of change. We are also Champions of the Australian Academy of Science's Women in STEM Decadal Plan and contribute data to the Department of Industry, Science, Energy and Resources STEM Equity Monitor.

Disability Inclusion and Access Action Plan (DIAAP)

CSIRO respects the diversity, individual strengths and natural talent that people living with disability and carers bring to our organisation. We are currently developing our Disability Inclusion and Access Action Plan (DIAAP) to promote greater understanding of the needs of our people with a disability and carers. The DIAAP working group has a designated Executive Sponsor and is taking a holistic approach to reviewing all workplace policies, procedures, practices and training to align with best practice, for people experiencing permanent, temporary or situational disabilities and those with carer responsibilities. The DIAAP working group ran a series of focus groups and implemented a consultation process to inform the development of the action plan. We anticipate the launch of our action plan at the end of 2022.



Australian Workplace Equality Index (AWEI)

CSIRO promotes and drives the inclusion of LGBTIQ+ employees by raising awareness, supporting peers and challenging discrimination. Aligned with our SAGE Action Plan, in 2021 we achieved our second consecutive Gold Employer Status in the AWEI by implementing initiatives such as:

- Visibly championing our LGBTIQ+ community and allies by marching in the 2019, 2020 and 2022 Sydney Gay and Lesbian Mardi Gras
- Developing more LGBTIQ+ inclusive language in our systems, policies, procedures
- Raising awareness of LGBTIQ+ issues and how to be an effective ally through workplace discussions, training, and guides.

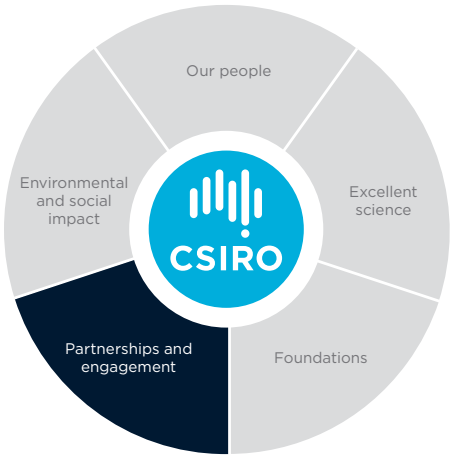
In 2022, we achieved a Silver Employer Status. We are proud of our achievements in maintaining high rankings in the AWEI and continue to build best-practice LGBTIQ+ inclusion into all aspects of our workplace and culture.

AWEI Silver Accreditation (to May 2022)

Workplace Gender Equality Act (WGEA)

From next year, all government entities will be required to participate in WGEA reporting. This year, we are participating in a voluntary trial, which includes gender pay analysis, in readiness for future reporting obligations.

Partnerships and engagement



At CSIRO we know that a collaborative approach is the key to responding to global challenges and ensuring our nation's bright future. Partnerships and collaboration are essential to stimulating innovation and unlocking value from CSIRO's research, and the national labs and research facilities we operate on behalf of the nation.

Effective and agile engagement with our external stakeholders[36] is critical to achieving impact and delivering on our purpose. Our materiality assessment underscored the importance of our stakeholders to organisational sustainability, with CSIRO's relationship with government, collaborations with business and industry and our national and international research partners specifically identified.

We review our performance each year, in our annual report[37], and explore our collaborations with small and large businesses, government bodies, international organisations, universities and others in greater detail.

Relationship with government

Our role within the Australian Government is multi-faceted and managed through various channels, from high level engagement between Board, Executive, Minister, and Departmental leadership, to agency line areas collaborating on research projects.

We provide independent, scientific information to help inform policy that will help create a better Australia, working with government. We also collaborate with state and territory governments on research partnerships and projects, and other initiatives such as innovation precincts.

As well as providing advice to government and their departments, we actively partner with state, territory and local governments to assist them in their roles as policy makers and service deliverers. We are a trusted advisor to provide evidence for policy formation, and a partner to deliver research programs that are solving the greatest national challenges.

We assist governments to leverage Commonwealth programs for the benefit of Australian industry and the Australian community.

Collaboration with business and industry

Collaboration plays an important role in creating opportunities for businesses of all sizes to shape Australia's future global advantages. CSIRO's Strategic Partnerships Program is focused on building greater resilience, connectivity, and impact through cross-organisational strategic customer relationships.

We have established new partnerships, including:

- **Global partnerships to drive local innovation:** CSIRO and Google announced a strategic relationship focused on artificial intelligence (AI) and pursuing collaborative projects in areas of national opportunity. A key outcome of the partnership has been Google's foundational membership in the National AI Centre as well as partnering with us to protect the Great Barrier Reef with AI.
- **A public-private sector initiative** with the Commonwealth Bank of Australia to develop solutions for the financial sector to manage the physical and transitional risks posed by climate change.
- **Bi-lateral relationship with the US National Science Foundation:** CSIRO has joined with the United States' National Science Foundation (NSF) to accelerate joint research, and initiatives in areas of mutual priority between Australia and the United States.
- **Tackling plastic waste and creating a circular economy** through the establishment of the Indo-Pacific Plastics Innovation Network. The Indonesian and Vietnamese nodes have been launched, with Mekong to launch in FY23.

36 See Appendix – How we engage with our stakeholders

37 Annual Report 2021–22 Part 3 *Annual performance statements*

Relationships like these provide a platform for CSIRO to work directly with industry partners to support local innovation, foster new technology development and create new market opportunities for Australian businesses. We are evolving the way we partner to bolster the trajectory of change needed to respond to global challenges and to create bold new opportunities, such as our Missions program[38].

We also collaborate with business through industry partnerships on important topics. For example, last year, our then Chair Mr David Thodey and Chief Executive Dr Larry Marshall joined the Australian Climate Leaders Coalition[39] (CLC) which is a group of cross-sectoral Australian corporate CEOs supporting the Paris Agreement commitments and setting public decarbonisation targets.

Lifting business resilience to climate change

CSIRO's Climate Resilient Enterprise team are working together with the Commonwealth Bank of Australia (CBA) to lift the climate resilience of Australian industry.

In October 2021, we launched this new partnership to solve some of the challenging science questions and barriers facing our economy, industries, and business in the face of climate change-related risks.

The financial services sector has a special role to play in catalysing climate action across the economy given their wide-reaching influence. Partnering with CBA provides a unique opportunity to lead a national climate change response across multiple sectors through bringing climate science and big data analytics together. This research will help decision makers like CBA make more meaningful, climate-aware decisions and investments.

The first phase of the partnership brings together teams from across 4 of CSIRO's business units (Agriculture and Food, Oceans and Atmosphere, Land and Water, and Energy) to address a critical business challenge: understanding Australia's transition.

At the national level, we are building global and transition pathway models relevant to the Australian economy. The project will produce transition scenarios that map the decarbonisation pathways or 'glidepaths' required for major sectors of the national economy to achieve net zero.

These glidepaths pave the way for CBA and Australian corporates (or companies) more broadly, to benchmark their exposure to climate risks using an approach that is consistent with international frameworks and targets but tailored to allow locally relevant insights.

The insights from the project will be made available to the broader finance industry such as banks, insurers, and other financial institutions to help fill sector-wide gaps in climate insights and inform organisations' climate change strategies. Climate intelligence and science-informed climate actions are a competitive advantage for Australia and will build a stronger economy, more jobs, and more resilient communities.

Products developed through this project will become available on a digital platform being developed by the Climate Resilient Enterprise initiative, established through CSIRO's mission program.

The partnership with CBA is likely to grow into the future as more complex questions emerge requiring solutions that draw upon the best available climate science and its intersection with business decision-making.

38 https://www.csiro.au/en/about/challenges-missions

39 https://www.climateleaders.org.au/

Facilitating business connections for sustainable research collaboration

Sustained relationships are key to ensuring mutually beneficial high value collaboration occurs between businesses and researchers, especially when it comes to higher risk/cost activities associated with developing new and novel products or services. Many studies show[40] that there is a high return for businesses who choose to undertake research projects with publicly funded research institutions like CSIRO.

Australia's largest survey of small to medium business (SMEs) conducted in 2021 showed that the cost of creating new collaborations compared to sustaining existing ones is perceived as a risk by SMEs[41].

Our SME Connect facilitation and program team help Australian start-ups, and small and medium businesses by creating entry-level opportunities to begin their collaboration journeys. Our programs are designed to build a pipeline of support as relationships grow.

We offer 5 programs for SMEs:

Innovation Connections (IC) is a free one-on-one facilitated service to assist small and medium-sized-businesses in establishing research priorities, locating researchers and providing access to dollar-matched funding to fast-track R&D projects. CSIRO is the National Delivery Partner for IC, funded by the Australian Government through the Department of Industry, Science and Resources.

In FY22, we facilitated 302 Innovation Connections projects for 270 Australian SMEs worth over $29 million. These projects included 239 R&D projects delivered by 35 Australian universities, CSIRO and 5 other research organisations, and 63 graduate placements in which recent graduates are employed by SMEs to work on in-house R&D projects.

CSIRO Kick-Start provides facilitation and funding support for start-ups to access CSIRO's research expertise and capabilities.

Since 2017, the program has helped over 190 companies across 220 projects, worth over $20 million. Kick-Start alumni companies have gone on to do 90 further projects and agreements with CSIRO worth over $11 million. 54 new Kick-Start projects commenced in FY22 with a total research value over $4 million.

Innovate to Grow is self-paced and virtually delivered program designed to help SMEs understand the value of R&D and assess the viability of a new idea or innovation. Since piloting in 2020, it will have been delivered to 10 cohorts with 235 SMEs trained.

The **SIEF Ross Metcalf STEM+ Business program** enables SMEs to build on successful collaborative projects by funding early career researcher placements into their business for the development of new ideas with commercial potential.

Generation STEM Links (in partnership with the NSW Government) Generation STEM provides high-quality internships and work experience for tertiary students in NSW businesses. It is designed to help students transition into STEM jobs after graduation with 325 placements available.

40 See https://www.csiro.au/en/work-with-us/services/consultancy-strategic-advice-services/CSIRO-futures/Innovation-Business-Growth/Quantifying-Australias-returns-to-innovation; https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/Auditing-our-impact

41 https://www.csiro.au/en/work-with-us/funding-programs/SME/Enablers-and-barriers. *Enablers and barriers to Industry-Research collaboration* report p.37

National and international research partners

Collaboration with national and international research partners expands the reach, robustness and impact of CSIRO's work. Collaboration is embedded within CSIRO's Corporate Plan. We focus on delivering connectivity to global science, technology, and innovation frontier, as well as accessing new markets for Australian innovation.

We have teams based in 6 countries who act as hubs for their regions, promoting Australian innovation and strengthening the bridges between Australia and the world. Our website[42] details the organisations we partner with and types of research projects we are working on in different regions.

FishPath is supporting the development of harvest strategies for a range of species, including the long-legged spiny lobster. Image: Laura Blamey

42 https://www.csiro.au/en/work-with-us/international

43 https://ecos.csiro.au/fishpath/?utm_source=Snapshot-2021-12&utm_medium=newsletter&utm_campaign=Snapshot

44 https://www.fishpath.org/home

45 https://www.awe.gov.au/abares/research-topics/fisheries/fisheries-economics

46 https://www.nature.org/en-us/

47 https://www.noaa.gov/

A digital pathway for sustainable fisheries[43]

An online tool called FishPath[44] is paving the way for the sustainable management of fisheries worldwide.

Fisheries management is a challenge, but managing fisheries effectively is critical. The industry provides livelihoods for hundreds of millions of people, and seafood is a critical protein source for nearly 3 billion people. Australia's total wild-catch fisheries have a gross value of production of $1.6 billion[45] alone.

Australia has some of the best managed fisheries in the world. But many domestic and international fisheries are data or capacity-limited, making formal management challenging. This is where an online tool called FishPath is helping.

"FishPath is an online decision support tool providing harvest strategy options that are tailored to a fishery's unique circumstances," said Natalie Dowling, Senior Research Scientist from CSIRO's Oceans and Atmosphere. "It was developed as a partnership between CSIRO, The Nature Conservancy[46] (TNC), and the US National Oceanic and Atmospheric Administration[47] (NOAA). It elicits the relevant information about a fishery and provides a vehicle for expert and local knowledge to formulate viable harvest strategies. These can be used to implement sustainable fishing practices."

Harvest strategies comprise the data collection, assessment and decision rules to inform fisheries management. FishPath provides a comprehensive, transparent and defensible platform to help fisheries identify viable harvest strategy options via an interactive questionnaire. It is also a vehicle for bottom-up stakeholder engagement as it operationalises expert and local knowledge to formulate harvest strategies. FishPath considers each fishery's unique circumstances. It provides an efficient, transparent means to navigate the universe of available options, providing customised advice that explicitly acknowledges issues confronting data-limited fisheries.

Fisheries tool for global impact

In 2018, FishPath was identified as being of high priority interest to the Seychelles Fishing Authority (SFA). The Republic of Seychelles has one of the highest per capita rates of fish consumption in the world. The fishing sector employs approximately 17% of total formal employment in the country. Around 95% of fish and fish products are exported, providing significant economic benefits. However, the Seychelles marine ecosystem is under increasing human pressures, including overfishing. Several fisheries have collapsed. This prompted the government to take stronger actions to ensure the country's fisheries remain sustainable.

The international FishPath team is now working with SFA under an International Climate Initiative-funded project[48] that includes the application of the FishPath tool to the Lobster and Spanner Crab fisheries. The SFA will be working with CSIRO, TNC and NOAA to implement FishPath to develop harvest strategies for both fisheries. This includes capacity building and training of fisheries staff in the region.

Fisheries data at home

FishPath is making a difference for Australian fisheries management too. The NSW Department of Primary Industries (DPI) has recently implemented a formal Harvest Strategy Policy. However, many of its fisheries are small-scale, multi-sector fisheries with a range of data issues. This collectively poses management challenges. NSW DPI is using FishPath as a standardised and scientifically robust platform to identify currently viable, as well as longer-term aspirational, harvest strategy options.

48 https://www.international-climate-initiative.com/en/search-project/

Community engagement and capacity building

CSIRO Education and Outreach

CSIRO Education and Outreach (CEdO)[49] delivers a suite of programs that align with CSIRO's strategic goals[50], and aim to strengthen Australia's STEM talent pipeline and equip the workforce with the skills needed for the 21st century. Working collaboratively with a range of funding partners[51], CEdO programs provide engaging and immersive STEM education and outreach activities, deliver high quality teacher professional learning, support student STEM education and career pathways, and provide access to curriculum-aligned activities and resources.

CEdO's programs aim to enhance the capability of STEM educators by connecting them with CSIRO research and STEM professionals and build connections between schools and STEM industry[52]. CEdO programs also target students directly[53], including improving STEM education outcomes for Aboriginal and/or Torres Strait Islander students and other under-represented groups[54]. Community connections and engagement underpin CEdO programs, making them inclusive and impactful[55].

Assessing social impact

Many of CEdO's programs are evaluated to assess whether short, medium, and long-term goals have been achieved, focusing primarily on social and economic impacts.

These impacts are challenging to measure because of their complexity and long-term nature, with many contributing factors. However, outcome evaluations for CEdO programs do assess contributions to social impacts such as wellbeing, access to opportunities, and social inclusion. For example, the evaluation of the Indigenous STEM Awards[56] found that they contributed to increased confidence among recipients, which had flow-on impacts to their families and communities, and greater acceptance and valuing of Aboriginal and Torres Strait Islander knowledge that went beyond education. Evaluation of other programs showed positive educational and career outcomes, while others highlighted challenges, including engaging and retaining young women in STEM.

Sourcing longer-term funding that provides certainty and stability and transitioning programs to online delivery is an ongoing goal for CEdO programs. For example, the new 5 year STEM Together program[57], delivered by CSIRO and funded by the BHP Foundation, was announced in mid-2022. The program seeks to support and increase the diversity of young people participating in STEM across Australia, particularly from under-represented groups. The program has a major focus on inclusion and partnering with industry and community sponsors to increase the sustainability of the program beyond the initial funding period. It has a robust evaluation framework that seeks to assess the social impact of the program.

49 http://www.csiro.au/en/education

50 See CSIRO Corporate Plan 2021–22 (www.csiro.au/en/about/Corporate-governance/Corporate-Plan/21-22-corporate-plan) – specifically CSIRO's response to the skill transition trend, and the vital role STEM and digital skills will play in realising Australia's innovation and productivity potential (pp. 18–19)

51 CEdO's funding partners are from the government and private sectors, including the BHP Foundation; CSL Limited; the Department of Education, Skills, and Employment; the Department of Industry, Science, Energy and Resources; GFG Foundation; National Indigenous Australians Agency; New South Wales Government through the Science and Industry Endowment Fund (https://sief.org.au/); and Northrup Grumman Australia

52 For example, STEM Professionals in Schools (www.csiro.au/en/education/programs/stem-professionals-in-schools) funded by the Department of Education, Skills and Employment; Generation STEM's STEM Community Partnerships Program (www.csiro.au/en/education/Programs/Generation-STEM) funded by the New South Wales Government through the Science and Industry Endowment Fund, and the GFG Foundation Student Programme (www.gfgfoundation.org.au/student-programme) funded by the GFG Foundation

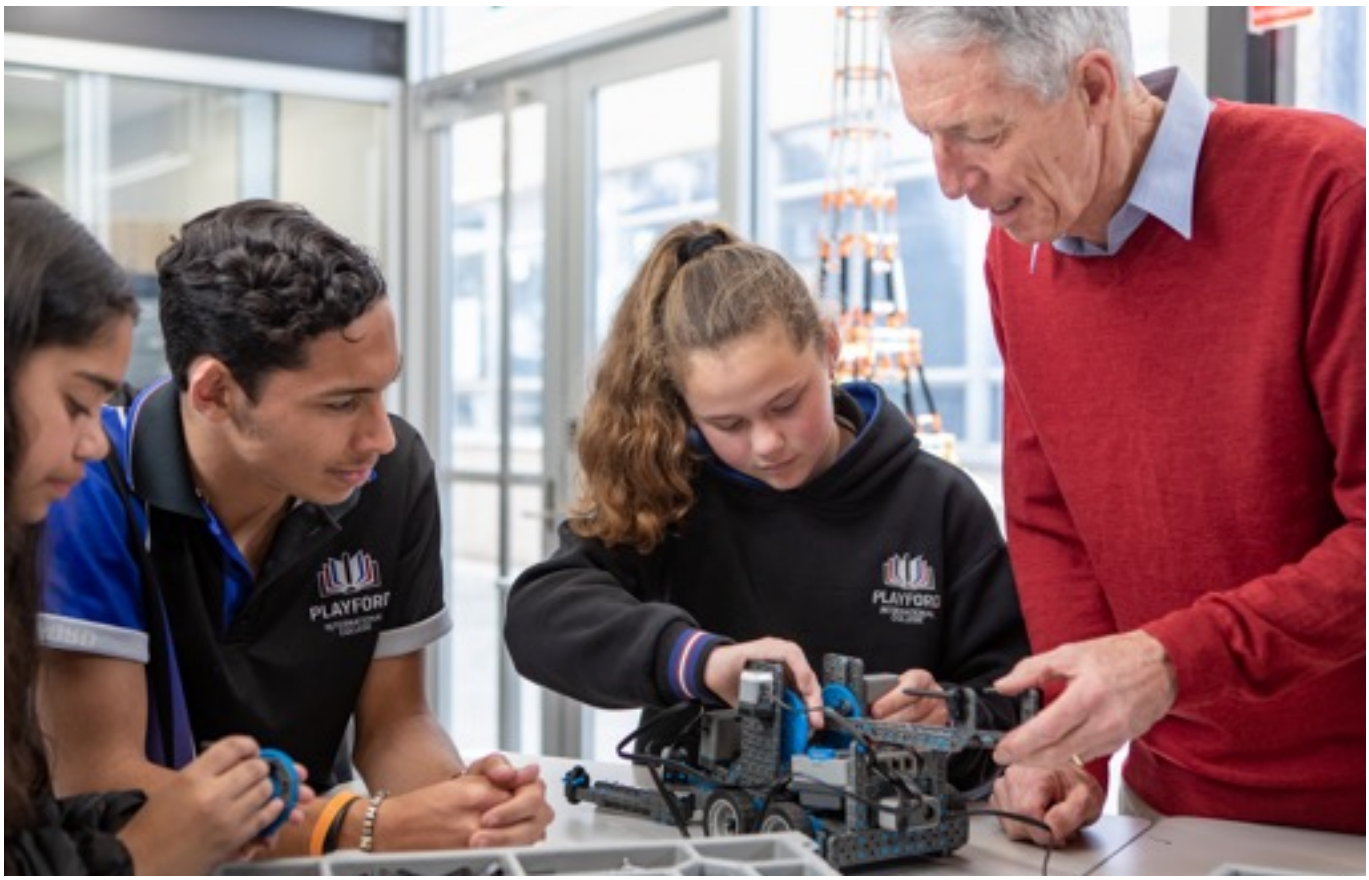
53 For example, the CSIRO Discovery Centre in Canberra (www.csiro.au/en/education/get-involved/class-excursions/discovery-centre)

54 For example, the Young Indigenous Women's STEM Academy (www.csiro.au/en/education/programs/young-indigenous-womens-stem-academy) delivered by CSIRO in partnership with CareerTrackers (www.careertrackers.org.au) and funded by the National Indigenous Australians Agency (www.niaa.gov.au).

55 For example, the place-based Deadly in Generation STEM program was developed in close consultation with communities in two regions.

56 https://www.csiro.au/-/media/Education-media/Files/Indigenous-STEM/Evaluation/21-00292_SER-EDU_REPORT_IndigenousSTEMAwardsEvaluation_WEB_210820.pdf

57 https://www.csiro.au/about-STEM-Together



STEM professional Phil Field working with students at Playford International College in Adelaide, SA.

The transition to online delivery continued in FY22, allowing CEdO to reach additional cohorts of participants, often those that are under-represented in STEM. For example, the STEM Professionals in Schools program[58], Australia's largest national skilled volunteering program for STEM professionals and classroom educators, extended a successful regional and remote pilot program to additional cohorts. This led to partnerships between STEM professionals and teachers aligned to their areas of interest from regional and remote areas in all states and territories (except the ACT).

In FY22, CEdO commenced work to collect a set of common indicators across multiple programs, to better assess the success and impact of CEdO overall. These indicators cover both outputs (e.g., reach, diversity, access) and outcomes (e.g., attitudes, knowledge, skills, and behaviours) and will inform an assessment of CEdO's achievement against a range of outcomes. In addition, work commenced on 2 data-related research projects under the Generation STEM initiative relevant to designing and assessing programs with more social impact.

The first aims to better understand what success factors and barriers contribute to STEM education outcomes among students, and the second involves the development of a STEM education outcomes framework to provide CEdO and other STEM education providers, funders, and evaluators with access to a synthesis of relevant research literature, data sources, and evaluation guidance. In 2023, CEdO plans to further embed monitoring and evaluation across more programs, and to implement the measurement of sustainability in individual programs, particularly STEM Together.

160,000+
students

1500+
schools

3300+
teachers

1300+
STEM professionals

58 www.csiro.au/en/education/programs/stem-professionals-in-schools

Supporting young Indigenous women into STEM careers[59]

Hannah McCleary is a proud Palawa woman living in Nipaluna/Hobart. She completed a CSIRO Aboriginal Summer School for Science in Year 10 and is now studying a combined Bachelor of Science and Bachelor of Law degree at the University of Tasmania.

She was inspired by others who understood her experience as a young Aboriginal person interested in STEM, and now as part of her cadetship with CSIRO, wants to inspire other young Indigenous women to study science.

Hannah is part of the committee that manages the CSIRO Indigenous Time at Sea Scholarship, which gives Aboriginal and Torres Strait Islander university students the opportunity to join a research voyage on CSIRO's RV *Investigator*. The impact of that is incredibly powerful for those students and for the elevation of Indigenous-led science, which is something we're committed to at CSIRO.

Protecting children and young people

Thousands of students and young children visit our research centres each year, engage with our work experience and education programs and connect with us on social media. As an organisation, we place the protection, safety and well-being of all children first and are committed to establishing CSIRO as a leading child-safe workplace.

In 2019, the Australian Government developed and implemented the National Principles for Child Safe Organisations and the Commonwealth Child Safe Framework to strengthen organisational standards for child-safe cultures and practices. Several states and territories have further enacted legislation that makes it mandatory for organisations like ours to implement these principles, and our funding partners have made compliance part of contractual obligations. As a result, we have revised our Child Safe Policy[60] and Procedure to align with these requirements and recently established our Child Safe Office to ensure that we are doing everything possible to prevent harm to children.

Over the next 12 months, we will expand our child safeguarding framework and increase compliance through awareness and education, screening of staff and volunteers, and improving how we respond to safeguarding concerns.

59 https://blog.csiro.au/hannah-mccleary-leading-by-example/
60 https://www.csiro.au/en/about/policies/child-safe-policy

Citizen science

CSIRO has a long history of delivering impact through citizen science. Citizen science adds value to traditional scientific research and engages the public meaningfully in science. We are embedding citizen science within our research activities, and most importantly we are building genuine partnerships with communities.

We also maintain the CSIRO Research Publications Repository[61] for all available citizen science publications. Key principles[62] which underlie good practice in citizen science have also been developed[63] to form a consistent, transparent and shared approach, and help guide program delivery.

Citizen science – BioBlitz[64]

It's been 2 years since the Black Summer 2019–20 bushfires devastated Australia. Those megafires were longer and hotter than the normal cycle of bushfires in Australia. Researchers now need data to find out how the bush is recovering.

The Atlas of Living Australia, in collaboration with the University of New South Wales (UNSW) Centre for Ecosystem Science, Minderoo Foundation's Fire and Flood Resilience Initiative, the former Department of Agriculture, Water and the Environment, and the Australian Citizen Science Association, ran three BioBlitz events in early 2022 in 3 different locations affected by the megafires.

The 3 BioBlitzes gathered important information on how species are recovering and will inform how to manage and protect the ecosystem in the future.

Experts were there on the day to help point out plants, animals, and fungi. They explained how species fit into the ecosystem and the impact of the bushfires. Plus, they provided tips on how to become a better naturalist.

The open-source data[65] collected during the BioBlitzes is available to everyone. It will be used to help researchers understand more about the biodiversity in each location, and how it is recovering from fire. For people participating, the BioBlitzes provided an opportunity to engage with nature and learn more about the local environment.

This work was supported by the Australian Government's $200 million Bushfire Recovery Program for Wildlife and their Habitat and was run in partnership with the Centre for Ecosystem Science at UNSW, the Australian Citizen Science Association and Minderoo's Fire and Flood Resilience initiative.

More than 100 citizen scientists attended the Murramarang National Park (Yuin Country) Big Bushfire BioBlitz in March 2022. Image credit: Atlas of Living Australia

61 https://publications.csiro.au/publications/search/SQCitizen%2Bscience/

62 https://www.csiro.au/en/education/Get-involved/Citizen-science

63 Developed in conjunction with Australian Citizen Science Association, Atlas of Living Australia and National Research Infrastructure for Australia.

64 https://blog.csiro.au/big-bushfire-bioblitz/

65 https://www.inaturalist.org/projects/big-bushfire-bioblitz-umbrella

Action for reconciliation

As Australia's national science agency, CSIRO is uniquely positioned to engage with Aboriginal and Torres Strait Islander peoples through science, education and employment opportunities, and through pursuing innovation outcomes that create a positive impact.

We acknowledge the importance of having Australia's first scientists walking along side CSIRO – we have much to learn from Aboriginal and Torres Strait Islander peoples and much to achieve by working together. At CSIRO we are committed to investing in Aboriginal and Torres Strait Islander knowledge in relation to science, and the participation and leadership of Aboriginal and Torres Strait Islander peoples in Australia's research and innovation landscape.

Reconciliation Action Plan

Our Innovate Reconciliation Action Plan[66] (RAP) is our key strategic document, reflecting our commitment to invest in Aboriginal and Torres Strait Islander cultural knowledge in relation to science, and the greater participation of Aboriginal and Torres Strait Islander peoples in Australia's research and innovation landscape.

The RAP outlines activities to increase partnerships, education, engagement, employment and procurement opportunities for Aboriginal and Torres Strait Islander peoples. Our RAP is championed by CSIRO's Indigenous Engagement Implementation Committee, the Office of Indigenous Engagement (OIE), the Aboriginal and Torres Strait Islander staff forum and the external Indigenous Advisory Group (IAG). It has also been endorsed by Reconciliation Australia, CSIRO's Executive Team and the CSIRO Board.

In March 2022 we launched our third Innovate RAP. Our renewed RAP 2021–2023 contains 90 deliverables and aims to embed consideration for Aboriginal and Torres Strait Islander peoples in everything we do at CSIRO. It builds on the significant body of work delivered in our previous RAPs and is aligned with our organisational strategy.

Our priority areas include:

66 https://www.csiro.au/en/about/indigenous-engagement/reconciliation-action-plan

Engagement

The OIE provides support and advice to CSIRO staff in developing and maintaining engagement with Aboriginal and Torres Strait Islander people and/or communities and companies. Our Cultural Capability Framework supports engagement activities aligned to significant events such as NAIDOC Week, as well as determining cultural protocol initiatives, such as flying the Aboriginal and Torres Strait Islander flag at our sites.

Indigenous science

CSIRO acknowledges the extraordinary contributions Aboriginal and Torres Strait Islander people have made, and continue to make, to our culture, the economy, and science. We are working with Indigenous communities and organisations to create Indigenous-driven science solutions that support sustainable futures for Indigenous peoples, cultures and Country. We have many research projects underway with Aboriginal and Torres Strait Islander collaborators that include strengthening Indigenous knowledge, managing Country through the development of tools and other methods, and supporting Indigenous-led entrepreneurships.

This year we have achieved the following outcomes aligned to Priority 6:

All esearch business units (BUs) and enterprise services (ES) across CSIRO submitted individual RAP implementation plans to the OIE in April 2022. The implementation plans were introduced as a new deliverable to support BU/ES functions to identify a tailored approached to deliver on their RAP commitments.

Appointed 8 new members to join the CSIRO Indigenous Advisory Group

The IAG met on 11 May to provide independent, external advice to CSIRO on the effectiveness of CSIRO's Aboriginal and Torres Strait Islander strategies and the appropriateness of its pathways to impact. At this meeting, CSIRO tabled the draft Indigenous Cultural and Intellectual Property Principles.

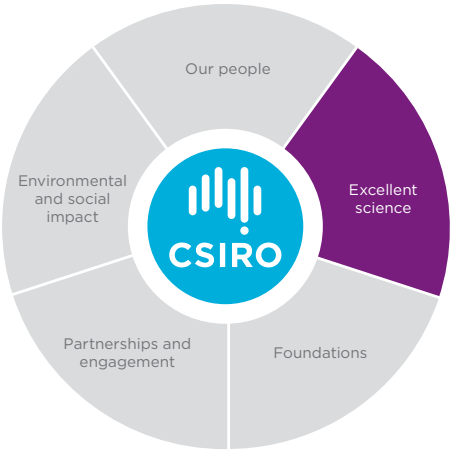
Implemented new RAP reporting and planning processes

Implemented Weavr into CSIRO

Weavr is the first Indigenous designed management program developed to support organisations to track and monitor their Indigenous strategies. Weavr was developed by LOGiT, an Indigenous owned business and in collaboration with CSIRO, Melbourne Eastern Group Training organisations and the Queensland Government through the Advance Queensland Open Innovation initiative.

The remaining priority areas are on track for delivery within the RAP period and will be progressed in FY23.

Excellent science



As Australia's national science agency, excellent science is central to our objective to deliver impact to industry, society and the environment. The Board Science Excellence Committee (BSEC)[67] supports the Board to fulfil its governance responsibilities under the *Science and Industry Research Act 1949* (SIR Act), while our Science and Delivery Policy[68] sets out our high standards of service and delivery. Each year, we conduct a 'science health check' to review and evaluate our science excellence, through our Science Excellence and Health Report.

Impactful science

The Corporate Plan clearly outlines our objective to deliver impact[69] to the nation through innovation and with purpose-driven science and technology that is aligned with our 6 challenges[70].

To optimise the impact of our research, it is important that it is effectively planned, conducted, disseminated, adopted, and evaluated. Since 2010, CSIRO has developed and implemented an organisation-wide impact framework[71] to plan, monitor, and evaluate the impact of our research in a consistent and comprehensive manner. Impact and evidence-based planning, monitoring and evaluation is an intrinsic element of CSIRO's Planning and Performance Framework.

This framework relies on engagement with all actors along the impact pathway to ensure our research is relevant and realistic, and that risks are identified and mitigated. Close engagement with our stakeholders supports effective planning for the dissemination and application of our work.

Demonstrating impact is a challenge that faces all publicly funded research in Australia (and internationally), and CSIRO has therefore publicly released its Impact Evaluation Guide[72] to foster dialogue with peers around a common approach to impact assessment and allow consistency and comparison between evaluations. We also regularly undertake independent third-party reviews of individual research applications, projects, and services through Impact Case Studies which articulate the impact and value we deliver to the nation. These Impact Case Studies are published externally[73]. Furthermore, every 2 years we commission an external assessment of the overall value we deliver to the nation, through aggregating the Impact Case Studies completed to date up to a meta-level. This assessment is published in *The Value of CSIRO*[74] report. For more information on our performance, see our Annual Report 2021–22.

67 https://www.csiro.au/en/about/corporate-governance/minister-and-board/science-excellence-committee-charter
68 https://www.csiro.au/en/about/Policies/Science-and-Delivery-Policy
69 We define impact as an effect on, change or benefit to the economy, society and/or environment, beyond those contributions to academic knowledge.
70 https://www.csiro.au/en/about/challenges-missions/challenges
71 https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/A-CSIRO-wide-approach-to-impact
72 https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/Evaluating-our-impact
73 https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/Impact-case-studies
74 https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/Auditing-our-impact

CSIRO leading the way in Open Access research

The global shift towards Open Access aims to democratise science by ensuring research is available to everyone, not just those with journal subscriptions. Making research Open Access has important implications for sustainability and the enrichment of lives globally.

As a producer, consumer and publisher of research, CSIRO, Australia's national science agency, is committed to moving to Open Access.

In 2021, we began this journey by signing transformative Read and Publish (R&P) agreements with publishers, including American Institute of Physics, Company of Biologists, Elsevier, Microbiology Society, Royal Society, and Royal Society of Chemistry. Many of these agreements were the first of their kind in Australia and meant, for the first time, readers were able to access CSIRO science for free.

The R&P agreements negotiated by CSIRO Library Services provide access for CSIRO scientists to the publishers' content. Likewise, all CSIRO articles published by those publishers are Open Access, making them available to anyone with an internet connection. As of June 2022, 323 articles have been published as Open Access under the R&P agreements.

CSIRO is also progressing Open Access through its editorially independent publishing business – CSIRO Publishing – which has established R&P deals with 45 Australian institutions, including universities, research organisations and government departments. CSIRO Publishing has now begun negotiations with overseas institutions.

Andrew Stammer, Director of CSIRO Publishing explains, "The act of publishing research creates a record that allows others to see what has been discovered. This is the foundation of scientific research which in turn, enables further research to be undertaken, discoveries are built upon, and so the body of human knowledge increases."

"For this learning process to work effectively, it is essential for researchers to have Open Access to the scientific record.

During 2021, 181 CSIRO Publishing research articles were published as Open Access under R&P deals with 25 institutions. In the 6 months to June 2022, that has grown to 183 research articles from 39 institutions transacted under R&P.

"By expanding the reach of scientific research, we can help to solve our greatest challenges through knowledge sharing across borders, industries and communities to encourage innovation, drive prosperity and deliver social benefits."

Ethical science and research dissemination

CSIRO's commitment to ensuring the integrity of our research is enshrined in the Science and Delivery Policy and supported by our Code of Conduct[75] along with a vast array of supporting principles and procedures. These policies reflect the requirements specified in the Australian Code for the Responsible Conduct of Research[76] (Code) for ensuring high-quality research, credibility and community trust in the research. The Code is a national framework developed by the National Health and Medical Research Council (NHMRC), Australian Research Council (ARC) and Universities Australia. The Ethics and Integrity Team engage with relevant stakeholders across the organisation to improve and maintain compliance with this Code, the guides and guidelines that support it and other relevant legislation, regulations and best-practice standards. Our commitment to the Code is a self-imposed obligation and requires continuous monitoring, review, and improvement across a wide range of areas related to research ethics and integrity.

Our adherence to strong ethical standards is an important part of maintaining our social licence to operate. The Ethics and Integrity Team aims to support this through the provision of advisory services to support informed and considered research planning and design, proactively identifying areas where practices can be improved and by providing targeted training and support to assist in developing skills and knowledge where it is needed. This promotes a strong and supportive ethical culture in the organisation and helps to ensure that we meet not only our own expectations, but also those of our stakeholders and the Australian people.

There are many potential risks inherent in research. CSIRO's research is often at the frontier of science where there may be no pre-existing blueprint or log of cases to draw upon when considering ethical issues. Best practice is also constantly evolving and cutting-edge research unearths new and varied ethical issues to be considered and managed. It therefore requires an emphasis on the identification and management of ethical considerations and risks in both the process of research and in the translation of research outcomes. These risks and associated mitigation measures are specific to each research activity and are considered and managed as part of the organisation's planning and approval processes and independent ethics review processes.

Ensuring that our researchers and the collaborators we undertake research with act ethically and with integrity is a whole of CSIRO responsibility, and an important part of maintaining our trusted advisor status.

In 2021 the CSIRO Board and Executive Team endorsed the development of a framework to enhance ethical decision making across CSIRO and support its connection to other organisational strategic initiatives. This framework will focus on 4 key areas:

- strengthening culture and capability, and the skills base of staff and leadership
- enhancing consideration of ethical issues within research planning and approval processes
- providing further policy and governance support for challenging areas
- clarifying risk and escalation points related to ethical issues.

75 https://www.csiro.au/en/about/Policies/Code-of-Conduct

76 https://www.nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018

Enabling excellent science

The Ethics and Integrity Team provide a range of services to support CSIRO's science excellence and innovation:

- Advisory services to support informed and considered research planning and design to ensure the ethical dimensions of research are appropriately considered.
- Assistance with strategic and project risk identification and management.
- Managing independent research ethics review processes for research projects and portfolios of work.
- Building staff and organisational capacity to manage the ethics dimensions of research through the provision of training and outreach activities.
- Promoting respectful engagement with human participants and the highest standards of animal welfare.
- Ensuring research is conducted in compliance with national ethics guidelines and Commonwealth and state legislation.
- Management of complaints, issues, adverse events and investigations regarding ethical research conduct and research integrity.
- Supporting internal stakeholders who operate other relevant internal processes such as ePublish, Conflict of Interest Declarations, and management of breaches.

CSIRO also has a supporting network of on-site Research Integrity Advisors (RIAs) to support business units, reporting to the Ethics and Integrity Team. RIAs are experienced researchers with a strong knowledge of the responsible conduct of research and CSIRO processes. They provide advice to help ensure our research achieves the highest standards of research excellence and integrity. This work plays a critical role in maintaining community trust in CSIRO research.

Animal and human research

All research which requires the involvement or study of humans (and their tissue or data) or the use of live animals requires ethical review and approval through processes prescribed by the National Statement on Ethical Conduct in Human Research (2007)[77] and the Australian Code for the Care and Use of Animals for Scientific Purposes[78] and associated animal care and welfare legislation. CSIRO has 2 independent human research ethics committees and 4 independent animal ethics committees managed and supported by the Ethics and Integrity Team that review all human and live animal research that occurs across the organisation. These committees provide review and ongoing support for several hundred research projects each year. In addition, for human and animal research we have compliance obligations to national and state-based regulators (e.g., NHMRC and the various animal welfare regulators) and legislative obligations under 29 separate legislative Acts.

The impacts of COVID-19 and associated travel restrictions created challenges during this period for the delivery of research, particularly field-based research. In response, many project teams were required to seek approval for amendments to their project design to accommodate adapted methodologies or extensions to completion dates. New guidelines and processes were developed to support research teams throughout this period, and best practice approaches regarding research integrity, participant and animal welfare were successfully maintained as a priority by all research teams and ethics committees. Ethics committee meeting processes were also adapted to occur via videoconference or a hybrid (face to face/ videoconference) format to meet government health guidelines.

CSIRO is a founding member and sponsor of the Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART). Through this body we support a number of national initiatives such as sector wide training and projects such as the development of an Openness Agreement on Animal Research in Australia for institutions that use animals in research and teaching. The purpose of the Openness Agreement is to support transparency regarding the use of animals in research and help build and maintain community trust in scientific research and institutions.

Collaboration

CSIRO collaborates extensively to support and develop best practice across the research sector. This includes the development and review of national standards and guidelines, contributions to discussion papers on ethical issues in research practice, academic publications, the development of sector wide training resources to support best practice and accreditation, active support of organisations such as the Australasian Research Management Society (ARMS) and ANZCCART and regular participation in consultations across a broad array of issues. Recently this has included providing extensive feedback on proposed revisions to the National Statement on Ethical Conduct in Human Research (2007), developing training materials for Research Integrity Advisors with ARMS, and contributing to the development of a nationally recognised online course on ethics and welfare issues relating to animal use in research and teaching with ANZCCART.

77 https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018

78 https://www.nhmrc.gov.au/about-us/publications/australian-code-care-and-use-animals-scientific-purposes

Monitoring and reporting

The Ethics and Integrity Team in conjunction with the ethics committees monitor and review research that has been granted ethical approval. This is undertaken through annual project reporting, project completion reports, project audits and ongoing interactions with research teams throughout project implementation. In the event of unexpected or adverse events during the conduct of research, the relevant ethics committees are notified. They then provide advice on any required action. This process allows us to proactively address any emerging issues and share any lessons learned through the implementation of research. These findings are reported within the organisation through our annual Science Health and Excellence Report and through regular reports to the CSIRO Executive and Board committees. There are also annual meetings with all ethics committee chairs to discuss issues, areas of best practice and emerging trends observed by these committees throughout the year.

External monitoring and reporting are carried out through annual reports submitted to state and national regulators. External audits of ethics committee processes and the conduct of approved animal research are also carried out at least once every 4 years as a condition of CSIRO's licences with state regulators. Excellence in ethical conduct is recognised through CSIRO's annual awards and through awards provided by the ethics committees. Key findings are reported in CSIRO's annual report. An audit of the governance framework surrounding research ethics and integrity processes within the organisation was also undertaken in 2021 as part of the ongoing internal audit program. Recommendations from this review to further enhance best practice across the organisation are currently being implemented by the Ethics and Integrity Team.

Training and support

A commitment to continued improvement of staff capability means we provide workforce development opportunities related to research ethics and integrity through numerous avenues. These include mandatory eLearning courses on research integrity and animal research ethics, in-depth face-to-face workshops on animal and human research ethics, webinars and guidance on specific ethical issues (available as ongoing resources), on-demand training for research groups as requested or where a need is identified, and ongoing support to researchers throughout the research process, as needed. Training and professional development is also provided to all human and animal ethics committee members to support them in their roles.

Training programs are regularly reviewed and updated in response to changes to national guidelines or emergent issues. Revisions to the National Statement on Ethical Conduct in Human Research are expected to be released in late 2022 which will initiate a further review of our human research ethics processes.

Raising concerns

Since 15 January 2014, the *Public Interest Disclosure Act 2013* (Cth) (PID Act) gives a right to Public Officials to disclose information about suspected wrongdoing in Commonwealth departments and agencies, including CSIRO. The PID Act aims to promote integrity and accountability in the Australian public sector by encouraging the disclosure of information about suspected wrongdoing, protecting people who make disclosures and requiring agencies to take action. The PID Act provides a legislative basis for the CSIRO Public Interest Disclosure (PID) Scheme [79]and associated protections. CSIRO's Public Interest Disclosure Scheme (Whistleblowing Procedure) is managed by CSIRO Governance.

The Ethics and Integrity Team and Research Integrity Advisors (RIAs) also provide information and advice to employees who have questions or concerns about research ethics and integrity. Where appropriate we also refer employees to other relevant policies and sources of support. The team also provide a conduit for external concerns to be raised and reported to the relevant decision makers.

79 https://www.csiro.au/en/about/Corporate-governance/Access-to-information/Public-Interest-Disclosure-Scheme

Excellence in Research Ethics Award

In November 2021, the CSIRO Excellence in Research Ethics Award was presented to Drs Rod McCrea, Andrea Walton, and Petina Pert from the *Trends in Community Wellbeing* project team. The annual award is presented by CSIRO's Social and Interdisciplinary Science Human Research Ethics Committee (CSSHREC) to research teams that demonstrate best practice in the ethical conduct of research.

The team was recognised for its exemplary community engagement through a series of community wellbeing projects funded through CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA).

When asked how applying ethics principles contributed positively to their work, the team said:

"Ingrained in ethics principles is the value of appreciating and respecting others. This has helped us become more trusted in local communities, as well as more widely. Having a commitment to the wellbeing of local communities has also helped us stay on track, keeping relevant and on-task, and maintaining progress."

"Because we conducted our research ethically, inclusively, and robustly we have confidence that the data speaks for itself. This allows us to be impartial when answering questions about our research. We simply say what the results show."

"Lastly, our basic aims have been to enhance understanding, survey the region representatively, and present a variety of community perspectives, with a view to maintaining and enhancing community wellbeing for local communities experiencing onshore gas development. This gives our research integrity."

From L to R, Dr Andrea Walton, Dr Petina Pert (on-screen), Dr Rod McCrea, and Associate Professor Eric Vanman (CSSHREC Chairperson), at the award ceremony for the Excellence in Research Ethics Award.

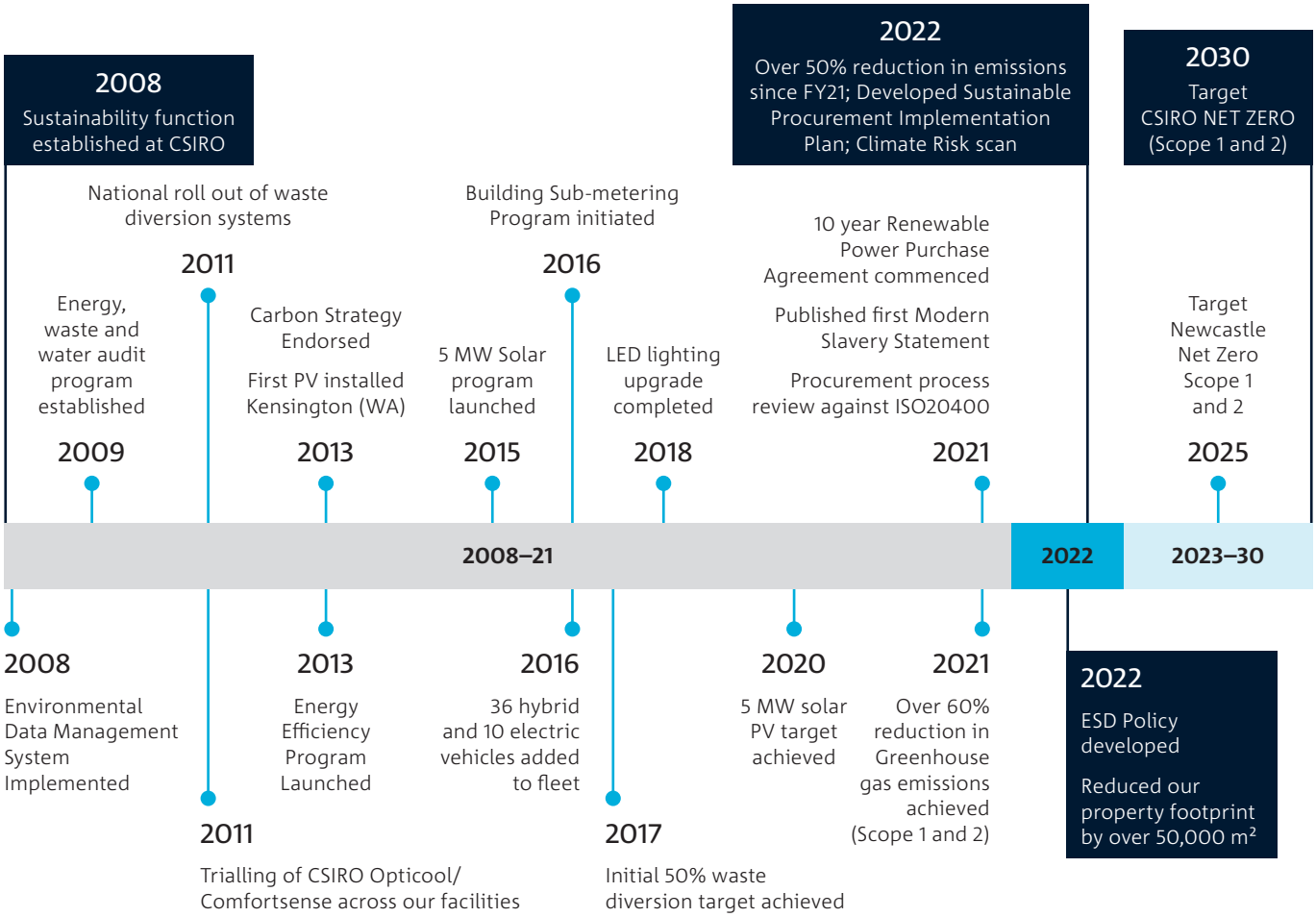
16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Environmental and social impact

Since the establishment of our first sustainability team in 2008, CSIRO has been working to improve its operational impact. The nature, scope and geographic spread of our science, facilities and workforce is diverse; from equipment and infrastructure that supports supercomputers and deep space radio telescopes, through to biosecurity level 4 laboratories and general office space, we have a presence in all states and territories in Australia and several international outposts. We also manage National Facilities and Collections on behalf of the nation to enable research by Australian and international collaborators from industry and research organisations. As a leader in sustainability research, we recognise our responsibility to ensure we have sustainable operations, sites, and infrastructure that support our science.

The Sustainability Strategy provides the framework to responsibly manage our social and environmental impacts; while a robust data management system underpins our ability to accurately monitor our performance. Since 2008, we have employed a centralised environmental data management system that continues to serve as the repository for organisational environmental performance data.

This year we continued to work towards the targets and goals set out under the Sustainability Strategy. Key programs of work centred on material issues including reducing our carbon footprint, ensuring a responsible value chain, understanding and responding to the risks and opportunities of the global climate transition, and ensuring the efficient management of our resources.



Environmental reporting

Section 516A of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires that we report annually on how we accord with and contribute to ecologically sustainable development (ESD), including our environmental performance covering the impact that our activities have on the natural environment, how these are mitigated and will be managed into the future. These are covered in detail throughout this report.

Four of our sites are required to report under the National Pollutant Inventory (National Environment Protection Measure), which is administered by state and territory-based environmental protection agencies.

As part of our annual compliance reporting obligations, we also submit energy and emissions data to the Clean Energy Regulator under the *National Greenhouse and Energy Reporting Act 2007* (NGER) and to our Federal Government portfolio Minister in line with the Energy Efficiency in Government Operations (EEGO) Policy. However, for the purposes of this report, we have adopted the EEGO boundary[80] for our energy and emissions footprint and net zero targets. All calculations are in line with the NGERs methodology, except for the boundary determination which is as per EEGO. A full breakdown of our data can be found in the environmental data pack in the Appendix.

To achieve our science goals and objectives, CSIRO has an extensive and diverse portfolio of facilities, amongst the largest within the Commonwealth Government.

In addition to many offices, laboratories and process bays, the portfolio includes national research facilities such as the Australian Centre for Disease Preparedness, Australian Telescope National Facility comprising multiple telescope sites, and the research vessel *Investigator*. CSIRO owns many of its sites across Australia, while leasing others, often co-located on university campuses or with State Government agencies for example. Table 3 outlines the types of facility arrangements in place and their treatment for the purposes of this report.

Reducing our carbon footprint

As one of the larger emitters of greenhouse gases (GHG) amongst Commonwealth government agencies, and as a leader in climate science, we recognise our responsibility to manage our carbon footprint in alignment with global targets. This includes transitioning our organisation to a clean energy future through a mixture of technologies, energy procurement decisions, and financial instruments.

Our focus on managing electricity consumption is directly related to the significant impact it has on our overall emissions profile. Electricity is our primary energy source across the organisation and accounts for approximately half of our overall energy consumption. However, the associated greenhouse gas emissions are disproportionately larger at approximately 80% of our total scope 1 and 2 emissions[81]. Therefore, our approach centres on improving energy efficiency, increasing on-site renewable electricity generation, and sourcing renewable electricity.

Table 3: CSIRO facility arrangements (EEGO boundary) for reporting purposes

FACILITY ARRANGEMENT	REPORTING BOUNDARY (EEGO BASIS)	EXAMPLE FACILITY
CSIRO-owned and operated (CSIRO staff, with or without tenants on-site)	Included, minus tenant energy use	Newcastle
CSIRO leased and CSIRO-managed (CSIRO staff, with or without tenants on-site)	Included, minus tenant energy use	Waite campus, Adelaide
CSIRO-managed (on behalf of other entities) (CSIRO staff)	Included	Tidbinbilla
CSIRO leased, site managed by landlord	CSIRO-only energy use included	St Lucia, Dutton Park
CSIRO owned, managed by third party	Included	RV *Investigator*

80 This boundary is based on the Energy Efficiency in Government Operations (EEGO) Policy boundary. It excludes tenants on CSIRO operated sites but includes sites where we are a subtenant. The *National Greenhouse and Energy Reporting Act 2007* boundary is based on operational control, and includes all tenants on CSIRO operated sites, but excludes sites where we are a subtenant and do not have operational control of the facility.

81 Prior to accounting for surrender of Large Generation Certificates (LGCs).

Net zero roadmap

CSIRO is well positioned to articulate the potential pathways to achieving net zero emissions for our operations, as well as supporting research into hard-to-abate sectors of the economy. As part of this commitment, we have established challenging targets to reduce our carbon emissions to net zero (NZE), consistent with our Towards Net Zero science mission:[82]

- NZE by 2030 (scopes 1 and 2[83])
- beyond net zero by 2050 (scopes 1, 2 and material scope 3).

Our targets, and the pathway to achieve them, were approved by our Board in December 2020. A key component of our approach to net zero is to maximise the proportion of electricity from renewable sources.

Initial phases of our NZE roadmap include laying a strong foundation through planning future projects. Focus areas for this reporting period have included the completion of:

- feasibility study to electrify the natural gas boiler at Newcastle (NSW)
- design of additional solar photovoltaic (PV) systems at Black Mountain (ACT), Newcastle (NSW), and potential for new systems at our Hobart (TAS) and Woodstock (QLD) sites
- reviewing our refrigerant use and reporting methods
- developing a strategy to guide our future use of carbon offsets
- continually reviewing and updating our NZE model and reporting tool.

Through our NZE roadmap we are exploring opportunities to trial emerging technologies and emissions reduction strategies on exemplar sites, which will inform the feasibility for broader deployment across our facility portfolio. The first facility identified to transition to net zero emissions (scopes 1 and 2) is our Energy Centre located at Newcastle (NSW), targeting NZE by 2025. Aside from the strong energy research focus, Newcastle was chosen as our first NZE exemplar site as it is a moderate-sized energy consumer in CSIRO's portfolio; has significant on-site renewable electricity generation capacity; CSIRO can combine our mini grid research to optimise the site's energy consumption and, there are good opportunities to displace the site's gas consumption through electrification.

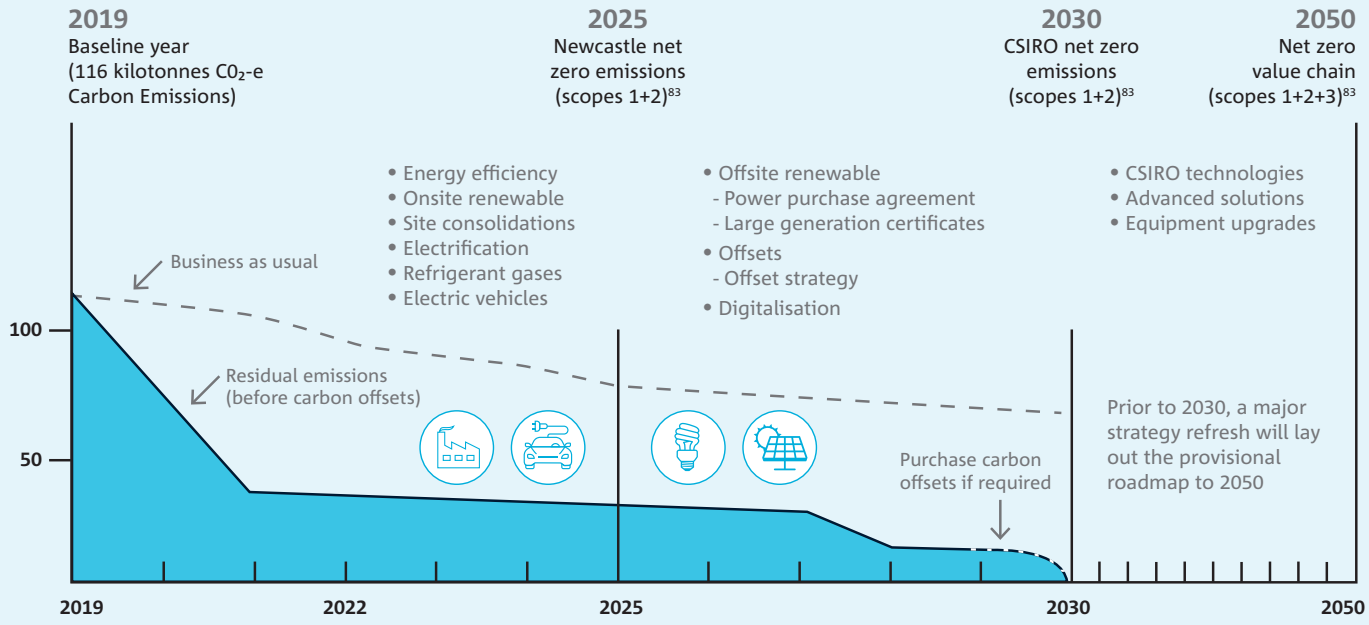


Figure 5: CSIRO pathway to net zero emissions

82 https://www.csiro.au/en/about/challenges-missions/Towards-net-zero

83 Scope 1 emissions – direct emissions that occur on-site resulting from consumption of gas, standby generation fuels and vehicle fuels; Scope 2 emissions – indirect emissions from the generation of purchased electricity; Scope 3 – indirect emissions, excluding scope 2, which occur upstream and downstream in the value chain of an entity.

Collaborating with our scientists to solve operational challenges

CSIRO's big challenges in achieving NZE include the transition away from natural gas, managing our buildings more efficiently, increasing onsite renewable energy generation and storage, and transitioning away from fossil fuels for transport and stationary energy generation. We're also investigating CSIRO-generated offsets for any emissions we can't mitigate.

In line with our strategy objective to work more closely with our scientists to apply our own expertise to operational challenges, this year the sustainability team hosted a series of NZE science workshops with the aim of identifying CSIRO science projects that can help CSIRO lower its emissions.

In June 2022 researchers from across CSIRO were invited to take part in an ideation process or 'shark tank' to identify opportunities to apply their research to CSIRO's own NZE challenges. A total of 24 teams of researchers were supported in articulating their plan to take their research through a commercialisation pathway, with 18 progressing to the second round, presenting their pitches to a judging panel. These were then short-listed, and 5 teams were given the chance to compete for funding to advance their research and to demonstrate how their research projects can assist CSIRO in reducing its own emissions. The 5 teams pitched their ideas to CSIRO's Chief Executive, Larry Marshall and several members of CSIRO's Executive and Leadership teams.

Picking a winning team was difficult, considering the impressive diversity of ideas. However, the winning pitch came from Dr. Anthony Chesman and his team of collaborators from Manufacturing and Agriculture & Food. Their idea proposed the installation of lightweight printable solar films on our glasshouses to generate power and potentially enhance growth conditions within the glasshouses through the manipulation of light waves. We look forward to seeing this inspiring idea being demonstrated at a CSIRO site in the very near future.

Corporate power purchase agreement

CSIRO's 10-year renewable electricity power purchase agreement (PPA) with Zen Energy continues to provide the strong foundation for the reduction of CSIRO's carbon emissions. The PPA accounts for approximately 70% of CSIRO's grid-fed electricity requirements. Under the agreement, CSIRO purchases renewable electricity generated from Numurkah and Nevertire solar farms equivalent to CSIRO's electricity requirements. We also purchase the associated Large Generation Certificates (LGCs) that are subsequently surrendered voluntarily to the Clean Energy Regulator (CER) to abate our electricity-related emissions. In FY22, CSIRO surrendered 56,314 LGCs, equivalent to 50.5 kilotonnes (kt) greenhouse gas emissions.

The PPA has and will continue to significantly reduce our electricity-related emissions and complements our on-site solar PV infrastructure.

Solar photovoltaics and onsite renewable energy

In 2015, we established an ambitious target to install 5 Megawatts (MW) of renewable energy generation across multiple facilities. We commenced the roll out of large-scale solar PV systems in 2017, with the first installation of solar PV at our Werribee site in Victoria. The installation program has progressed each year, with roof top solar being installed at key CSIRO sites in almost every state and territory. Last year we achieved our target, with over 13,000 solar panels installed across 12 sites.

This year, we continued to implement our on-site renewable energy program, with the installation of an additional 40 kilowatt hour (kWh) battery system at our Boorowa site in NSW, which brings the total battery capacity at Boorowa to 80 kWh. The extra battery capacity allows more of the onsite solar PV electricity generation to be stored for use when the sun isn't shining and moves the site one step closer to net zero emissions.

We continue to explore opportunities to expand our on-site renewable energy generation capacity, with several feasibility studies completed. Studies for future solar PV projects were conducted at Black Mountain (ACT), Newcastle (NSW), Hobart (TAS) and several other sites. A 1.2 MW ground mounted solar system is also planned for the Tidbinbilla site in the ACT, with construction approvals expected to be finalised early in the next reporting year.

Much of the installed solar PV capacity at our Black Mountain site was damaged in severe hailstorms in Canberra in early 2020. Repairs are underway, with the solar PV expected to be operational again by the end of FY23.

Low emissions fleet vehicles

CSIRO operates more than 740 fleet assets; of these 268 are vehicles. These vehicles include passenger, light and heavy commercial, and trucks used in a variety of research programs such as farming and marine research. Our Environmental Fleet Strategy aims to transition passenger vehicles to low emissions or no emissions vehicles.

We also monitor trends in the transition of heavy vehicles to low or no emissions. Safety and fitness for purpose are our top priorities.

There continue to be challenges in the transition to low emissions vehicles. Limited choices mean that it can be difficult to source vehicles that are fit for purpose e.g., adequate utilities; sufficient range; access to supporting infrastructure and sufficient charging points, particularly in rural areas; and additional costs to the business in setting up charging infrastructure on site.

We will continue to transition our fleet to low or no emissions wherever feasible to support our NZE targets.

CSIRO low/no emissions vehicles include:

12	52	1	7	8	11
electric cars	hybrid cars	hydrogen car	e-bikes	electric forklifts	electric golf carts

CSIRO's first hydrogen vehicle

In 2018 we test drove the first-generation Toyota Mirai, which was refuelled using ultra-high purity hydrogen produced in Queensland using CSIRO's membrane technology, which separates ultra-high purity hydrogen from ammonia while blocking all other gases.

In 2021, we leased Australia's first second-generation Toyota Mirai FCEV hydrogen vehicle for our Clayton (VIC) facility. The vehicle is being used for testing the hydrogen refuelling facility currently being developed as part of the Victorian Hydrogen Hub (VH2), with this partnership with Toyota helping to demonstrate the viability of zero-emissions fuel cell vehicles in Australia.

7 AFFORDABLE AND CLEAN ENERGY

13 CLIMATE ACTION

Left, Dr Patrick Hartley (Leader, CSIRO Hydrogen Industry Mission), right, Dr Alan Finkel (Special Adviser to the Australian Government on low emissions technology) shown with CSIRO's first hydrogen vehicle, parked in front of the *Suiso Frontier*, the world's first liquid hydrogen carrier.

Our performance[84]

In this reporting period our PPA delivered the equivalent of 69,173 Megawatt hours (MWh) of renewable electricity for CSIRO and abated 50.5 $ktCO_2e$ of emissions, through the acquisition and voluntary surrender of LGCs. In addition, our onsite solar systems generated 5.9 MWh of renewable electricity for onsite consumption.

From FY21 we have adopted a dual reporting approach, which has enabled us to claim a reduction of our overall GHG emissions inventory from our energy procurement decisions[85]. This approach is consistent with the World Resources Institute (WRI) Greenhouse Gas (GHG) Protocol Scope 2 Guidance, which requires scope 2 emissions to be calculated and reported by both location-based and market-based methods.[86] The market-based approach allows us to recognise GHG emissions reductions from the purchase and surrender of renewable energy certificates (e.g., LGCs), including LGCs surrendered under jurisdictional emission reduction policies (such as the ACT Government).

Figures 6 and 7 provide a breakdown of our FY22 energy consumption and GHG emissions[87] by fuel source; while Table 4 and Figure 8 show our scope 1 and 2 emissions over the past 6 years, with the inclusion of the scope 2 market-based figures for FY21 and FY22. A full breakdown of our environmental metrics can be found in the Data Pack in the Appendix.

Location-based reporting

Using the Location-based carbon accounting methodology, in FY22, our total greenhouse gas emissions for scope 1 and scope 2 emissions, decreased by 10% from the previous year, and 23% from the average of the previous 5 years, on a like for like basis.

Our total energy usage (including on-site-generated renewable electricity) was 648,066 GJ, down by 10% from the previous year, and down by 15% from the average of the previous 5 years.

This is partly due to COVID-19 impacts, the ongoing benefit from our PV installations and reduction in our property footprint.

Impact of jurisdictional renewable energy and emission reduction targets

At the time of reporting, there are jurisdictions that have established renewable energy and/or emissions-reduction targets. One of those is the ACT Government, which achieved 100% renewable electricity for the territory. As a result, the ACT Government purchases and surrenders LGCs on behalf of ACT-based businesses and residents, with the cost of the LGCs passed through to consumers. Hence, the ACT Government is effectively surrendering LGCs attributed to electricity consumption at CSIRO's ACT-based sites.

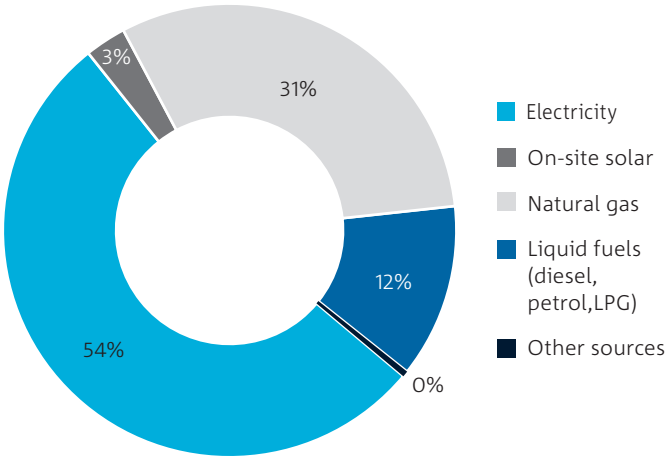


Figure 6: Energy consumption by fuel source

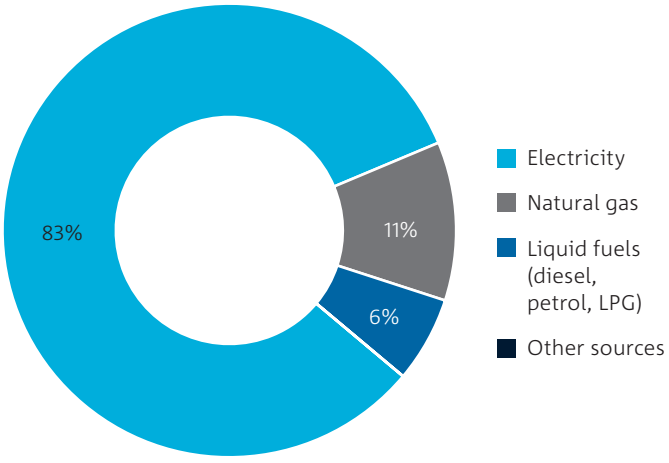


Figure 7: GHG emissions by fuel source (location-based reporting i.e., prior to surrender of LGCs)

84 As a result of earlier Annual Report printing deadlines, the environmental performance figures may differ slightly between the CSIRO Annual Report and this Sustainability Report.

85 Total greenhouse gas emissions for FY21 and FY22 have been calculated with both location-based and market-based methods, in accordance with the WRI GHG Protocol Scope 2 Guidance (An Amendment to the GHG Protocol Corporate Standard).

86 The location-based method reflects the average emissions intensity of the electricity grids on which energy consumption occurs (which in our case is the relevant State/Territory emission factor) and does not consider our procurement decisions for renewable energy. Whereas the market-based method reflects the renewable electricity in our supply from procurement decisions; for example, contractual arrangements such as our PPA with purchase and voluntary surrender of LGCs. Under the market-based emissions, the residual mix factor was used to estimate emissions from the residual grid electricity, which is in accordance with section 6.11.4 of the GHG Protocol Scope 2 guidance.

87 Our emissions portfolio is based on the methodology adopted for our Energy Efficiency in Government Operations (EEGO) boundary. This boundary considers all of CSIRO's footprint. This differs from the National Greenhouse and Energy Reporting (NGER) boundary which is based on operational control.

In accordance with the Australian Government's Climate Active protocol[88], CSIRO's market-based emissions calculations take into account the number of LGCs attributed to the electricity consumption at our ACT-based sites and surrendered by the ACT Government.

Market-based reporting

Using the Market-based methodology, in FY22 our market-based scope 2 emissions fell to approximately 4 $ktCO_2e$ through the voluntary surrender of our LGCs. For the FY22, CSIRO has also included the impact of the ACT Government's renewable energy policy, whereby the ACT Government surrenders LGCs on behalf of business and residential electricity consumers as described above. As CSIRO has several sites located in the ACT, the equivalent number of LGCs surrendered by the ACT Government based on electricity consumption at CSIRO's ACT-based sites have been included in CSIRO's emission reduction calculations.

CSIRO's total residual scope 1 and scope 2 (market-based) greenhouse gas emissions for FY22 were 20 $ktCO_2e$. This equates to a 52% reduction from the previous year and was largely due to reductions in electricity-based emissions.

In the first 2 years of the Sustainability Strategy, CSIRO has reduced its electricity-based emissions by approximately 95%[89] due to purchase of grid-fed renewable electricity and surrender of associated LGCs, ACT jurisdictional impacts and on-site renewable electricity generation. However, future step-change emission reductions will be very difficult to achieve given CSIRO will be addressing the hard-to-abate emissions attributed to natural gas, transport and non-transport fuels. CSIRO does not intend to purchase carbon offsets to abate these emissions in the short term, preferring to focus implementation of long-term emission reduction solutions first. As a result, our target for next year is a 1 to 2% reduction in our scope 1 and 2 (market-based) emissions.

Table 4: CSIRO scope 1 and 2 emissions over the last 6 years

TOTAL ENERGY (TJ) AND GHG EMISSIONS ($ktCO_2e$) (EEGO)	2016–17	2017–18	2018–19	2019–20*	2020–21	2021–22	Δ% FROM FY21**
Total Energy (TJ)	779	775	756	759	724	648	▼ 10%
Total Scope 1 GHG emissions ($ktCO_2e$)	19	18	20	21	20	16	▼ 22%
Total Scope 2 GHG emissions ($ktCO_2e$) Location-based	104	103	96	86	80	75	▼ 7%
Total Scope 2 GHG emissions ($ktCO_2e$) Market-based					21	4	▼ 80%
Total Location-Based Emissions ($ktCO_2e$)	124	121	116	107	100	90	▼ 10%
Total Market-Based Emissions ($ktCO_2e$)					41	20	▼ 52%

*FY19 is the baseline year for our net zero emissions pathway. **Percentage calculations are based on raw data.
Figures have been rounded to whole numbers for presentation purposes.

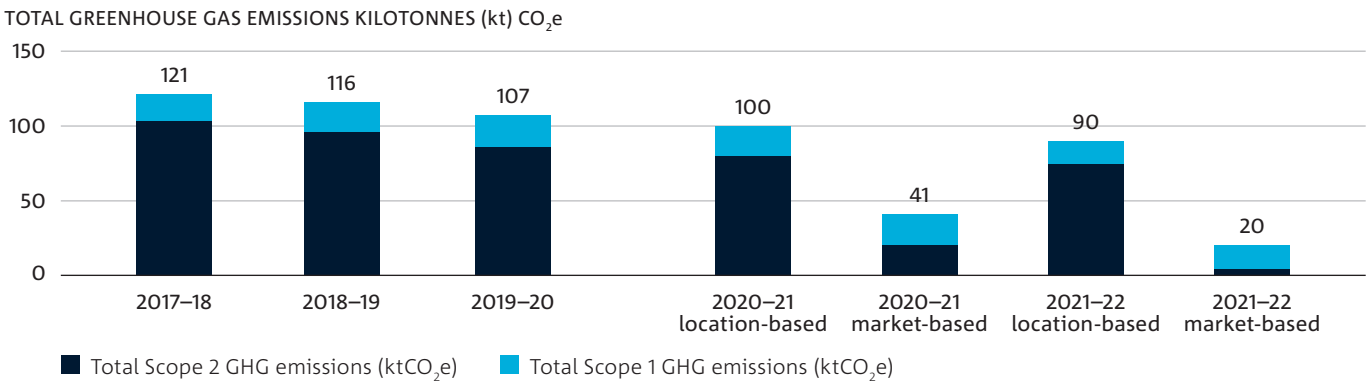


Figure 8: FY22 location-based vs market-based emissions

88 https://www.climateactive.org.au/

89 FY22 market-based emissions compared with FY19 stated emissions.

Corporate Emissions Reduction Transparency (CERT) report

In 2021, Australia's Clean Energy Regulator (CER) commenced a new pilot energy and emissions reporting program, called the Corporate Emissions Reduction Transparency (CERT) report[90]. It aims to improve the accountability and transparency of organisations with voluntary emissions reduction commitments.

To support the development of this report, CSIRO participated in stakeholder consultations, and joined the FY21 pilot program, with data to be published by the CER in early July 2022. For the purposes of this pilot report, we have adjusted our emissions performance to align to the NGER Act[91].

Table 5 outlines the commitments made by CSIRO under the CERT report for FY21, and the estimated progress towards those commitments. Over the coming year CSIRO will continue to work with the CER and other participants to optimise the CERT reporting process.

Table 5: CSIRO commitments under the pilot CERT report

	COMMITMENT 1	COMMITMENT 2
Commitment type	Net-only Commitment (progress verified) combined net and gross emissions.	Commitment (progress verified) renewable electricity consumption percentage.
Statement	Net zero scope 1 and scope 2 emissions by 2030, applies to all sites where CSIRO staff are located, including where we are a tenant[92].	100% renewable electricity supply for all CSIRO sites by 2030.
Estimated progress	61%	72%

90 https://www.cleanenergyregulator.gov.au/Infohub/Markets/cert-report

91 This has resulted in a slight variance of 4% in overall emissions between the CERT report and CSIRO's sustainability report. We have also elected to apply a market-based accounting standard for our scope 2 emissions.

92 For the purposes of the CERT report, our emissions performance has been adjusted to align with our NGER boundary. https://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Corporate%20emissions%20and%20energy%20data

Developing low emissions technologies

No single technology will take us to net zero, instead it will take a combination of existing and emerging technologies, implemented across a range of sectors. We're working with partners to develop low emissions technologies and explore their potential for uptake. Here are 3 examples.

CSIRO was a major contributor to the National Hydrogen Roadmap and is supporting Australia's National Hydrogen Strategy through our Hydrogen Industry Mission. Through our research, we're aiming to drive down the cost of hydrogen to under $2 per kilogram to help deliver a secure and resilient energy system and support our transition to a low emissions future.

Direct air capture (DAC) is a process where CO_2 is captured from air using filters or adsorbents, reducing the amount of CO2 in the atmosphere. The captured CO2 can be used in a range of applications, from making cement to carbonating beverages and helping farmers produce better yielding crops in greenhouses.

We've developed some DAC materials that are cheap, robust, and easy to make. They are low in toxicity and highly efficient at capturing CO_2. And, because they're hydrophobic, they work just as well in humidity.

CSIRO scientists, together with Meat & Livestock Australia and James Cook University, have developed a cost-effective seaweed feed ingredient called FutureFeed[93]. Adding a small amount of the supplement, made from Asparagopsis seaweed to a ruminant's existing feed can reduce their methane emissions by over 80% and also has potential to increase livestock productivity. With around 15% of the world's total greenhouse gas emissions coming from livestock production, FutureFeed is a game changer.

93 https://www.future-feed.com/

Risks and opportunities of the global climate transition

Like any other business, CSIRO is not immune to the risks posed by climate change. The impacts of climate change are already being felt globally and within Australia, and future risks are increasingly considered material and foreseeable. These risks are related to both physical impacts and the need to transition to a net zero economy in line with global trends. This is already a mandatory requirement for some countries, and Australian industry is providing leadership in responding to market demand for such reporting.

One example is the Australian Climate Leaders Coalition (CLC)[94], a group of chief executive officers (CEOs) from many of Australia's leading publicly listed and private companies, as well as government and non-government organisations. The CLC recognises that climate change will have a significant economic impact, with climate action failure considered the greatest risk for companies. The group supports the Paris Agreement[95] to limit global warming to well below 2°C compared to pre-industrial levels, to monitor and set targets for greenhouse gas emissions, to work with suppliers and customers to reduce greenhouse gas emissions, and to transition to a low-emissions economy. Our Chief Executive Dr Larry Marshall is a member of the CLC, as is CSIRO's previous Chair, Mr David Thodey.

CSIRO has long been an international research leader in developing the evidence, data and models that show how the climate is changing, and documenting government, business and societal responses to increasing climate-related risks[96]. To better understand our own exposure to climate-related risks, this year our Land and Water (L&W) research business unit undertook an initial *Scan* process outlined in *Climate Compass – A Climate Risk Management Framework for Commonwealth Agencies* (CSIRO, 2018)[97]. Climate Compass is a framework designed to help Australian public servants manage the risks of the changing climate on policies, programs and asset management. It was developed by CSIRO as part of the work plan of the Australian Government Disaster and Climate Resilience Reference Group. The *Scan* provides a starting point and focus for the more detailed *Strategy* and *Project* cycles of Climate Compass.

The Climate Compass *Scan* cycle involved a first-pass, high-level identification of the climate-related risks that CSIRO may be exposed to, describing the nature of those risks, and identifying where to prioritise effort. The process included stakeholder engagement and workshops with a broad cross-section of support staff and climate science experts within CSIRO.

Initial recommendations from the *Scan* included establishing good governance processes around climate-related risk management including Board oversight, the formation of a working group, and a deeper analysis of our exposure, as well as threats to staff health and well-being in extreme weather conditions, via climate scenario analyses. These initiatives will help to inform understanding of our transitional risks to 2050.

Next year we will continue to expand the scope of our reporting[98] on climate-related risk, aligned with the disclosure protocols outlined by the Task Force on Climate-related Financial Disclosures[99] (TCFD).

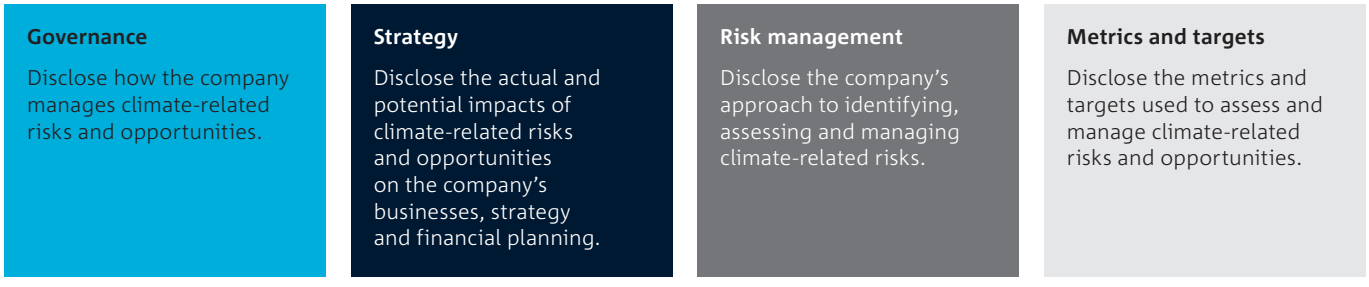


Figure 9: Disclosure protocols provided by the Taskforce on Climate-related Financial Disclosures.

94 https://www.climateleaders.org.au/

95 The Paris Agreement is an international treaty on climate change action that was adopted by 196 Parties (including Australia) at the 2015 United Nations Climate Change Conference (COP21) in Paris.

96 Climate-related risk refers to the potential negative impacts of climate change on an organisation.

97 https://research.csiro.au/compass/#:~:text=What%20is%20Climate%20Compass%3F%20Climate%20Compass%20is%20a,climate%20risk%20into%20your%20current%20risk%20management%20processes

98 See Appendix – *TCFD Reporting Index*

99 https://www.fsb-tcfd.org/

Tracking emissions and projecting our future climate

To curb human-induced climate change, governments, industries, and the community need comprehensive information about the climate system. CSIRO contributes to the Global Carbon Project[100], which develops annual global budgets for carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), the three greenhouse gases that contribute most to human-induced global warming.

CSIRO also contributes to the development of enhanced climate models, such as ACCESS, which underpin future climate projections, including the assessments produced by the Intergovernmental Panel on Climate Change (IPCC).

13 CLIMATE ACTION

Smart infrastructure: We want to have fewer and more vibrant sites and infrastructure, with world-class digitised labs and advanced facilities embracing new technologies, building our Labs of the Future, flexible workspaces, a smaller, more sustainable footprint, cutting-edge smart infrastructure shared with partners, reviewing our future workplace needs and accelerating our Property Strategy.

Resource efficiency

A sustainable property portfolio

The CSIRO 2019–29 Property Strategy provides the framework, process and governance for infrastructure decisions that underpin our science, collaboration, and solutions for Australia. It's also a key lever for ensuring our property footprint and operations are sustainable.

To complement the 10 year Property Strategy, we have a rolling annual Property Implementation Plan which helps us to pivot, adapt and create our sustainable future, and will be key to how we deliver innovative Labs of the Future, vibrant sites and dynamic work and collaboration spaces that enable our science. For example, during the pandemic, we were able to accelerate aspects of our Property Strategy including the consolidation of our property footprint and to reduce our overall footprint without compromising on our delivery of world class science. The rolling review of the Property Strategy also addresses feedback received in the Australian National Audit Office (ANAO) audit[101] of CSIRO's previous Property Investment Strategy 2012.

In line with our 2019–29 Property Strategy, we have reduced our property portfolio by over 50,000 m^2 over the reporting period. Vacating sites can bring a range of challenges and impacts, but as we reduce our property footprint and the burdens of managing ageing infrastructure, we can focus on building and refurbishing our remaining facilities for the science of the future.

In addition to reducing our ageing property footprint, we are implementing Activity Based Working (ABW) across select sites, with the intention that ABW is applied at all future refurbishments and any new builds and tenancies. In addition to improving utilisation efficiency of existing and new sites, ABW offers our people flexibility and choice in how they work by providing diverse workspace options designed to support collaborative and specialist work activities. ABW aligns with the CSIRO Ways of Working which aim to improve workplaces, add vibrancy and enable different ways of working and it also acknowledges the ongoing trend for CSIRO staff to work from home on a flexible, ongoing basis.

An office space with ABW at our Black Mountain (ACT) site.

100 https://www.csiro.au/en/research/environmental-impacts/emissions/Global-greenhouse-gas-budgets

101 https://www.anao.gov.au/work/performance-audit/implementation-the-csiro-property-investment-strategy

Labs of the Future

The Labs of the Future (LOTF) action is driven by our vision of science in 2030 and will ensure that CSIRO facilities are able to keep us at the cutting edge of science and technology.

Events since 2020 have reshaped how we work and underlined CSIRO's critical role in tackling the big challenges that face our nation. Our ability to push the boundaries of science has never been more important and it is vital our labs and workspaces equip us to do just that. Through LOTF we will ensure that our workspaces are designed to keep us at the cutting edge of science and technology.

How we undertake research, engineering and scale up is changing as we embrace automation, new visualisation and digital approaches to research. This will impact how we design and scope our projects, what our laboratory designs are, how many we need, how we use them, who works in labs and our staff mix.

A key principle of LOTF is to integrate digital technologies throughout our labs and equipment for improved safety, scientific excellence, and optimised efficiency. These may include digital assistants, augmented reality, automation and robotics, and electronic notebooks.

We have developed a set of principles to guide decision making on new laboratory projects. The principles were developed in consultation with a group of senior leaders from research business units across the organisation, along with representation from the Business and Infrastructure Services team and he Information Management and Technology team. The principles have been endorsed by the Science Council.

In early 2021, a steering committee was established to provide oversight, guidance and coordination of Labs of the Future initiatives. A technical working group has also been formed to help build on the LOTF generic vision with details for specific lab environments across CSIRO.

An artist's impressions of a future CSIRO site at Sydney's Aerotropolis.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

National Collections Building

Our new collections building will co-locate 4 of our Canberra-based collections and is expected to be complete in the latter half of 2023. Bringing these individual collections together will provide dedicated collections, storage and research space in a more functional precinct setting and allow users to be more collaborative, drive innovation and stimulate partnership for new discoveries.

The new building design will not only achieve greater efficiency than the minimum Energy Efficiency provisions of the 2019 National Construction Code, but it is also significantly more efficient than the ageing buildings that currently house the various collections.

Artist's rendition of the new National Collections Building. Credit: Hassell.

Artist's rendition of the interior the new National Collections Building. Credit: Hassell.

Ecologically Sustainable Design

Last year, CSIRO finalised an Ecologically Sustainable Design (ESD) policy that supports the CSIRO Property Strategy, to sustainably build and refurbish our buildings, adopting industry best practice to consider climate-resilience, apply circular economy principles, and future-proof our buildings.

The policy outlines strong energy, emissions, and water efficiency targets and encourages a more sustainable supply chain by setting embodied carbon and waste targets. In addition to improving our resource efficiency, the ESD policy encourages innovation and inclusion, and promotes an integrated approach between environment, building and people to ensure the best outcomes. The policy is also aligned with our Accommodation Principles Framework that embeds best practice for managing CSIRO's property portfolio.

Through CSIRO's Vacation Student Program, a sustainable design report template was developed with the help of a vacation student, to improve the transparency of the sustainable design initiatives and capture design outcomes.

The ESD policy is currently being trialled for a new building project in Black Mountain (ACT) with the support of our Capital Works team. Applying the ESD Policy requirements to the building design eliminated the use of natural gas for heating purposes, instead choosing to electrify our heating using heat pumps, as the site's electricity requirements are met through our renewable electricity PPA**,** and onsite solar generation capacity. The application of the ESD policy is expected to contribute to further reductions in our carbon footprint.

Integrated Design Studio collaboration with University of Melbourne

Laboratories are key facilities that support the frontline research undertaken to answer many of society's most pressing problems. The strict indoor environment controls required for laboratories, along with strong focus on research outcomes, often means the potentially negative environmental impacts associated with the construction and operation of new and refurbished laboratory buildings are overlooked.

Acknowledging these challenges, a concept known as 'integrated design' was developed as a key pillar of The Innovation Hub for Affordable Heating and Cooling initiative (i-Hub)[102]. i-Hub is an initiative led by the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) and funded by Australia's renewable energy agency (ARENA). The integrated design concept encourages collaboration between architects, HVAC engineers and other stakeholders at the early stages of a project to create opportunities to deliver major cost and energy savings.

As Australia's national research organisation, we collaborated with the University of Melbourne in an Integrated Design Studios (IDS) project that enabled students to enhance their design skills by integrating sustainable design features into a concept building.

Architectural and engineering students were invited to design a fictional sustainable building. Eight designs were developed in the studio, achieving reductions of approximately 50% in the building's operational energy demands, with 18% of the reduction coming from the design approach and the remaining 33% from solar energy – demonstrating the impact of sustainable design.

Some of the key considerations included passive design features, innovative cooling solutions and low embodied carbon materials.

Energy efficiency

To support our excellent science, we have continued to improve our facilities through our minor and major works programs, ranging from the implementation of zonal HVAC in our Sandy Bay (TAS) site to incorporating fault detection as business-as-usual at Black Mountain.

Our Efficiency Program 2030 was developed to deliver the estimated annual 1.8 ktCO_2e savings associated with the energy efficiency component of our NZE roadmap. The program adopts a systems-approach to unlock emission and financial savings from site-wide and cross-function building initiatives, connecting maintenance, capital works and other relevant site-based programs. Energy management plans (EMPs) have been developed for our top 10 emitting sites to guide efficiency project planning and implementation and track results. EMPs will be reviewed annually to ensure continuous energy efficiency improvements in CSIRO's buildings.

This year, the Waite (SA) Efficiency Plan began implementation, in which we refurbished and reinstated the operation of economy cycle operations, as well as optimised chilled water cooling for the site's HVAC systems. This alone is estimated to save 72 MWh annually. Further, we commenced the audit phase of the Clayton (VIC) Efficiency Plan, identifying around 1 Gigawatt hours (GWh) in potential annual energy savings in the central precinct, which consumes about 25% of the site's electricity consumption. Implementation is expected to commence next year, plus additional audits for the rest of the site.

Underpinning our drive to improve our efficiency is a commitment to continually assess and leverage digital innovation where we can that will improve our operations. Building on our collaboration with the i-Hub Data Clearing House (DCH) last year, we developed a Smart Buildings Roadmap to 2030 to promote the proactive digitalisation of our facilities, laying the foundations for the adoption of data-driven tools in our operations[103], as well as upgrading existing systems to accelerate the impact of digital technology on energy efficiency.

The roadmap will focus on developing a robust data system to enable performance reporting and identify new efficiency projects. It will also establish an iterative approach to trial, evaluate, and scale emerging technologies. The continued partnership with CSIRO's research and sustainability teams in FY22 identified an opportunity to collaboratively trial demand and response technologies that will be progressed in the coming years.

102 https://www.ihub.org.au/

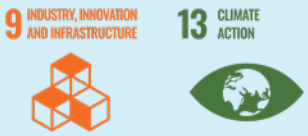
103 For example, leak detection and cooling optimisation

Harnessing the power of AI

Leveraging our DCH platform, the Sustainability team and the Energy Business Unit joined forces with Exergenics to trial an AI-based software for chiller optimisation at our Synergy Building in Black Mountain (ACT), a 16,000 m^2 mixed-use laboratory and office building.

Despite infrastructure limitations and stringent scientific requirements, the initiative is projected to reduce our emissions by an estimated 8 tCO_2e annually. Over the coming year we will continue to monitor and validate these projections.

Applying our approach of 'trial, evaluate, and scale', based on these successful trials the chiller optimisation tool will be expanded across other sites, including our Clayton (VIC) and Pullenvale (QLD) sites.



Managing our waste

With our growing population, waste generation in Australia continues to rise; whilst changing international markets have affected our ability to recycle materials overseas. Increasing consumer interest in responsible waste management, coupled with the loss of valuable materials to landfill, prompted the recognition by business and government that Australia needs to move towards a circular economy.

The diversity of CSIRO's research, our diversity of waste streams and the geographic spread of our sites makes a standardised approach to our waste management very difficult. Under the Sustainability Strategy, we have set a waste target to divert at least 80% of our waste from landfill by 2030 in alignment with the National Waste Policy Action Plan[104].

Our diversion rates have been declining in recent years and we recognise the need to reverse this trend. At the end of FY21 we instigated audits at 4 key sites to better understand our current challenges related to source separation and identify specific areas for improvement.

While the audits took place during a time when staff numbers on site were lower due to COVID-19 impacts with staff working from home, we were still able to gain sufficient insights to inform a list of key actions to improve source separation across all sites.

These included:

- improve consistency of bin inventory to eliminate confusion
- promote the use and availability of source-separated bins
- remove liners from recycling bins to prevent recyclables being potentially discarded to landfill
- review educational material to ensure accepted waste streams are listed for all relevant waste management facilities
- demand higher quality data from waste contractor to support transparency and continual improvement
- require construction waste to be managed by contractors for minor and major works on site.

In FY22 our diversion rate was 39%, a small improvement on the previous year, but highlighting that our 80% diversion target will be challenging.

Next year, the commencement of a new waste contract will bring opportunities to refresh our current waste management system and responsibilities, and will incorporate lessons from our recent audits. We will also commence the development of our road map for achieving 80% diversion of operational waste by 2030. This will involve broad engagement with staff on sites and with our Business and Infrastructure Services team to address challenges and opportunities on the ground.

104 https://www.environment.gov.au/protection/waste/publications/national-waste-policy-action-plan

Kick starting natural alternatives to plastic[105]

The plastic industry accounts for about 6% of global oil consumption. This is expected to reach 20% by 2050.

A West Australian start-up, called ULUU, is producing an alternative to petroleum-based plastic using seaweed, thanks to funding and support from Main Sequence.

ULUU is making a class of biomaterials called polyhydroxyalkanoates (PHAs). These natural polymers mimic petrochemical plastics in that they are strong and water insoluble. They are also re-usable, recyclable and compostable. Seaweed also has the benefit of absorbing carbon dioxide and minimal fossil fuels are required to farm it.

Dr Pete Cass from CSIRO Manufacturing specialises in biodegradable plastic technologies. He has been working with ULUU to analyse its product quality and define processing parameters, thanks to support from the CSIRO Kick-Start program.

"For our research, a range of testing is necessary to determine the material properties. This information will be essential for process modification so the plastic can be used for a range of applications, such as packaging." said Dr Cass.

"ULUU's quality is being assessed for purity and performance using various chemical and mechanical methods. This will direct the production of high-quality and durable products and ensure that the material can endure high temperature production."

This research will also assist ULUU on scaling up the technology and their fermentation capabilities.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Water resources

Water is a limited resource, and Australia is a drought prone nation. Water is critical to our operations in both science and research, as well as for business-as-usual activities. CSIRO is a diverse organisation, and our water use can range from generating highly purified reverse osmosis (RO) water, to irrigation, steam generation, and general usage such as the flushing of toilets where we utilise harvested rainwater where possible.

Many CSIRO regional sites are exposed to drought risk and need to take additional steps at times to secure water supply. Rainwater, river extraction and/or bore water is used for animal welfare and growing crops for scientific research. We have installed water-efficient devices at most sites, and our new ESD policy includes water efficiency criteria for new builds or refurbishments. We record and report on mains water usage for our facilities, and continue to improve water collection data, particularly on sites where direct metering is not readily available.

This year we commenced the development of a new water management strategy. We have commenced audits at major water-consuming sites to build a stronger picture of how we source and use water. This will allow us to develop site-specific water management plans for key sites, while identifying high level focus areas, such as high-water consuming processes across various sites that collectively will help inform the CSIRO-wide strategy.

In FY22 we consumed approximately 230 ML of mains water, a decrease of 17% compared to the previous year, which is largely attributable to partial relocation of staff from specific sites (e.g., North Ryde), the continued impacts of hybrid working arrangements, plus general reductions in water consumption across multiple sites.

105 https://ecos.csiro.au/could-seaweed-replace-plastic/

Air travel

Like most organisations, CSIRO's air travel reduced significantly over the last 2 years due to the global COVID-19 pandemic. From standard team and collaborator meetings, recruitment interviews, business contract negotiations, through to virtual global conferences, videoconferencing replaced many face-to-face business interactions. With the lifting of COVID restrictions, limited domestic and international travel is now taking place. However, now is an ideal time to reset old behaviours on air travel before they return and be mindful of the environmental impacts of air travel as well as the health and wellbeing impacts on the traveller.

In the past, CSIRO staff have undertaken a significant amount of air travel, resulting in over 10 $ktCO_2e$[106] of carbon emissions (excluding radiative forcing index) (see Table 6). While the global pandemic has artificially lowered our travel-related carbon emissions in FY21 and FY22, CSIRO will investigate options for travel reduction targets to better manage travel-related emissions.

Engaging with our workforce

Apart from the key programs of work outlined in this report, we also engaged with our workforce on local sustainability initiatives:

- We gathered insights from CSIRO people about sustainability challenges and opportunities in their workplaces through surveys, interviews and discussions groups, including the newly formed CSIRO Climate Action Group.
- We launched the first of our Live Energy Dashboards at the Newcastle Energy Centre to increase visibility and awareness of electricity consumption on site and to stimulate ideas for improving energy efficiency.
- We celebrated our champions, recognising the contribution they make to building a positive culture of sustainable practice at CSIRO, through our Sustainable CSIRO t-shirt and Plastic Free July competitions.
- We supported staff in saying no to single-use coffee cups through the roll out of the Green Caffeen program at onsite cafes at our Black Mountain (ACT), Clayton (VIC), Hobart (TAS) and Kensington (WA) sites.

In FY23 we'll embark on our first Green Impact program, with support from Australasian Campuses Towards Sustainability (ACTS). The program will promote and incentivise sustainable actions aligned to our strategy and the UN SDGs, while also informing future training and capacity building needs. Other major projects include staff consultation on the development of our waste roadmap and continuing the roll out of live energy dashboards at 7 sites.

CSIRO's Executive Director Future Industries and Sustainability Steering Committee member, Kirsten Rose, participating in the Green Caffeen program.

Table 6: Water, waste, and air travel over the last 5 years

RESOURCE AND OPERATIONAL METRICS	GRI	2017–18	2018–19	2019–20	2020–21	2021–22	Δ% FROM FY21
Mains Water Usage (ML)	303-5(a)	321	320	345	277	230	▼17 %
Waste Generation (tonnes)	306-3	2,380	2,370	2,085	1,721	1,384	▼20%
Recycling Rate (%)	306-4	46	49	38	36	39	▲7%
Air Travel (million passenger kilometres)		114	123	84	7	13	▲99%
Air Travel (tonnes CO_2e, domestic)	305-3	-	5,211	3,303	748	1,084	▲45%
Air Travel (tonnes CO_2e, international)	305-3	-	4,918	3,206	162	323	▲99%

Figures have been rounded to whole numbers for presentation purposes.

106 Excluding radiative forcing index.

Responsible value chain

It is widely understood that value chains comprise a large portion of an organisation's complete energy and emissions footprint. Our procurement decisions and outputs can have a material impact on environmental, social, and financial performance, not only within our organisation, but in those that we partner with. The introduction of the *Modern Slavery Act 2018* (Cth)[107] also highlights the critical role of the supply chain in addressing societal issues.

The PGPA Act requires CSIRO, as an Australian Government statutory authority, to have regard to the Commonwealth Procurement Rules[108] (CPRs) when engaged in duties related to the procurement of goods, services and construction services. The CPRs are the keystone of the Australian Government's procurement policy framework and reflect the Government's commitment to sustainable procurement practices as well as emphasising the importance of paying suppliers on time, particularly small businesses.

CSIRO has a robust procurement framework. Oversight is provided by the Strategic Procurement team under Corporate Finance, which supports our staff to plan, source and manage the procurement of goods and services (valued over $400,000 GST inclusive), ensuring compliance with both Government and CSIRO policies and procedures, and achieving value for money for the organisation. We source a broad array of procurements from construction services to scientific equipment to energy, to name a few. In line with the Senate Order for Entity Contracts, CSIRO is required to publish biannually on its website a list of all current contracts with a value of $100,000 or more.[109]

We publish an Annual Procurement Plan (APP)[110] on AusTender, which provides information on significant procurements that CSIRO plans to undertake over the coming 12 months. The APP includes a concise strategic procurement outlook statement that broadly sets out any key major or strategic initiatives from which CSIRO expects procurements to arise.

Sustainable procurement

A key focus area of our Sustainability Strategy is to better understand the environmental and social impacts of our purchase decisions. Recognising the need to better integrate sustainability considerations into our procurement processes, last year we undertook an independent review of our processes against best practice, including:

- ISO 20400[111] Sustainable procurement – Guidelines. These are international best practice guidelines which provide guidance for organisations to integrate sustainability into procurement processes.
- *Modern Slavery Act 2018* (Cth) (MSA)– the MSA aims to combat modern slavery in global supply chains. CSIRO published its first Modern Slavery Statement in 2021[112].
- UN Guiding Principles on Business and Human Rights[113] (UNGPs) – these are a set of guidelines endorsed by the United Nations Human Rights Council to help organisations and governments to prevent and address human rights abuses committed in business operations.

This review helped to set our benchmark position and identify opportunities for improvements, such as strengthening supplier due diligence processes. These identified opportunities formed the basis for our Sustainable Procurement Implementation Plan (SPIP) which is a three-stage process over a number of years, transitioning from risk mitigation through to a shared value approach. A new cross-organisational working group has been established to drive the actions under the SPIP. We recognise that building the capabilities of our workforce will be an important factor in this process.

107 https://www.legislation.gov.au/Details/C2018A00153

108 https://www.finance.gov.au/government/procurement/commonwealth-procurement-rules

109 https://www.csiro.au/en/about/Corporate-governance/Access-to-information/Contracts

110 https://www.tenders.gov.au/App/Show/4FDC9EA2-9DD7-B623-2CE6-67947907F0F0?ppId=&btnsubmit=View+Annual+Procurement+Plan

111 https://www.iso20400.org/

112 https://www.csiro.au/en/about/policies/modern-slavery-statement

113 https://www.ohchr.org/en/publications/reference-publications/guiding-principles-business-and-human-rights

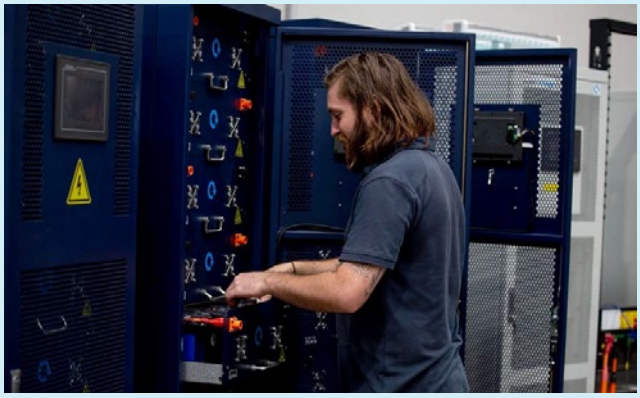
Battery manufacture a boon for Australian economy[114]

With 100% of Australia's lithium-ion battery cells currently imported from overseas, an opportunity exists for Australia to build the whole battery value chain from mining of battery minerals to processing, battery active materials and eventually cell manufacture.

This opportunity could contribute $7.4 billion annually to Australia's economy, according to the *2021 Future Charge: Building Australia's Battery Industries* report from the Future Battery Industries Cooperative Research Centre (FBICRC), and support 34,700 jobs by 2030.

CSIRO has been working with Energy Renaissance to establish Australia's first lithium battery technology Gigafactory in Tomago in the Hunter region. Called 'Renaissance One', the 4,500 square metre advanced manufacturing facility is the first to produce Australian-designed batteries and technology and will have the capacity to produce up to 1 GWh of batteries per year once operational.

The Renaissance superStorage™ batteries, made in Tomago, have been designed and developed in collaboration with CSIRO for use in stationary applications.



The Renaissance superStorage™ batteries have been developed in collaboration with CSIRO for use in stationary and transport applications.

Valuing sustainability

The Valuing Sustainability Future Science Platform[115] is developing next generation science that provides confidence that actions across supply chains lead to positive outcomes for land, water, biodiversity, and people. We will work with diverse groups in regional communities, across industries and supply chains, to co-develop and test measures of sustainability which reflect real and desirable outcomes and can guide investment and innovation for ongoing improvement. Our website contains more about CSIRO Future Science Platforms[116].

114 https://ecos.csiro.au/lithium-ion-battery-industry/

115 https://research.csiro.au/vsfsp/

116 https://www.csiro.au/en/about/strategy/Future-Science-Platforms

Addressing modern slavery risk

Risk is inherent in all procurement activities. All CSIRO employees are required to apply CSIRO's Risk Management Framework for the identification, assessment, and treatment of risks when undertaking procurements. Modern slavery risks form a critical part of the assessment of risks in relation to procurement activities over $400,000. Risks can take the form of human trafficking, forced labour, debt bondage and child labour, to name a few.

In 2021 CSIRO published its first Modern Slavery Statement. The statement reports on the risks of modern slavery in the operations and supply chains of the organisation and identifies actions to manage and where possible remove those risks. CSIRO is absolutely committed to the prevention of slavery and human trafficking in all our activities.

As part of our SPIP, we have undergone an independent review to identify opportunities to improve future modern slavery statements, as well as undergoing an independent risk assessment of our supply chain and operations. Our next Modern Slavery Statement is due to be published in December 2022.

Encouraging supplier diversity

Indigenous businesses

CSIRO aims to achieve greater Indigenous participation and is actively pursuing further opportunities to incorporate supplier diversity within the organisation through promoting the Commonwealth Government Indigenous Procurement Policy (IPP).[117] CSIRO has voluntarily supported the IPP since July 2016. The purpose of the IPP is to leverage the Commonwealth's annual, multi-billion-dollar procurement spend to drive demand for Indigenous goods and services, stimulate Indigenous economic development and grow the Indigenous business sector.

CSIRO is also a member of Supply Nation, which has been endorsed by the Australian Government as the leading directory of Indigenous businesses. Indigenous businesses are defined in the Commonwealth Procurement Rules to be small to medium enterprises with at least 50% Indigenous ownership.

CSIRO staff are encouraged to consider engaging Aboriginal and Torres Strait Islander owned businesses as part of the decision-making process when procuring goods and services, whilst also complying with CSIRO's internal procurement procedures and the CPRs, specifically the core principle of "Value for Money". This year, we spent over $3.5 million with Aboriginal and Torres Strait Islander-owned enterprises.

Small business

The Payment Times Reporting Scheme[118] (Scheme) aims to improve payment outcomes for small businesses[119]. It creates transparency on how and when large businesses pay their small business suppliers. The Scheme gives small businesses (and members of the public) access to information on large business's payment performance. This helps small businesses make informed decisions about who they do business with. Making payment information available to the public also encourages large businesses to improve their payment times. The first reporting period for businesses with common income years was 1 January 2021 to 30 June 2021.

For the FY22 reporting year, CSIRO paid 97% of small business suppliers within 20 days, and 98.6% small business suppliers within 30 days[120]. Our six-monthly government reporting obligation data for small businesses is publicly accessible via our ABN search[121].

117 https://www.niaa.gov.au/indigenous-affairs/economic-development/indigenous-procurement-policy-ipp

118 The scheme is governed by the *Payment Times Reporting Act 2020* and the *Payment Times Reporting Rules 2020*. https://paymenttimes.gov.au/

119 Small businesses are identified under the Scheme using the Small Business Identification Tool (SBI Tool). A business is identified as a small business if they carry on an enterprise in Australia, have an ABN, had annual turnover below $10 million for the most recent income year.

120 Calculated by value ($ spend) of total small business spend in the relevant period

121 https://register.paymenttimes.gov.au/

Think Indigenous first for procurement

A commitment to use Indigenous-owned suppliers for our procurement needs wherever possible is just one of the ways CSIRO is sustainably delivering as part of our Reconciliation Action Plan. Shelly Rowell, CBIS Manager Contracts and Compliance, said there were multiple reasons to consider Indigenous-owned businesses when procuring goods and services, including:

- it contributes to stimulating Indigenous entrepreneurship, business and economic development, providing Indigenous Australians with more opportunities to participate in the economy
- it creates supply chain diversity that is more sustainable for our operations and our economy, resulting in greater innovation and reducing risk
- at a local level, it supports employment opportunities and pathways as well as contributing to local community social outcomes
- it is a simple and pro-active way to contribute to broader goals of reconciliation and closing the gap.

"CSIRO has had multiple construction projects and other property services delivered by Indigenous businesses over recent years with exceptional value for money and innovative results," Ms Rowell said. "If you procure a service or item frequently it may be worth tendering for a contract that can create stability and long-term certainty for an Indigenous business. This in turn can create further benefits such as enabling employment pathways or investment by the business in a community social enterprise. Through our work we have also made connections with various communities and the contracts have, in several cases, resulted in new employment pathways within the business, along with growth and stability for those businesses and the communities they are a part of."

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

As Australia's national science agency, CSIRO naturally needs a lot of electrical equipment to operate, and that equipment must be tested and tagged regularly to maintain safe operations. Indigenous-owned Electrical Testing and Compliance Services (ETCS) has been providing test and tag services to CSIRO for the past 10 years and was recently re-engaged in a $1 million+ contract to continue to provide these services.

Rachel Molloy, owner and director of ETCS, said the long-term engagement of her business by CSIRO had a lasting impact that was only growing. "Over the next 12 months our technicians will undertake in the vicinity of 100,000 electrical compliance tests across CSIRO sites around Australia," Ms Molloy said. "Through the work we do at ETCS, we see a fantastic opportunity to increase Indigenous employment within our company. We feel this is where we can make a real difference. We're currently working with an Indigenous recruitment agency to help recruit more Aboriginal and Torres Strait Islander people into new roles at ETCS, helping to grow our company and the Indigenous economy too."

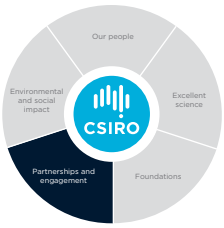
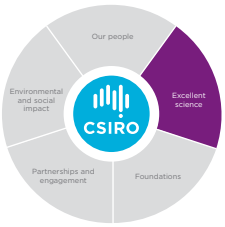
"Indigenous procurement helps businesses take meaningful action towards building equality and cultural awareness, boosting Indigenous entrepreneurship, and strengthening the Indigenous business sector. We're extremely grateful to CSIRO for the opportunity to provide our services because it's through partnerships with equally committed organisations that our Indigenous employment strategy comes to life."

Example of ETCS 'test and tag' service.

Appendix

Material topic definitions

MATERIAL TOPIC THEME	MATERIAL TOPIC	DEFINITION	RELEVANT SDGS
 **Foundations** Managing the risks and harnessing the opportunities of a digital world. Having robust systems and processes to support financial and operational sustainability	Culture, ethics, integrity and trust	Developing and maintaining a culture of continuous improvement, good governance, and ethical and moral conduct to remain Australia's most trusted research institution.	
	Financial sustainability	Developing and implementing strategies, new business models and commercialisation approaches that compliment CSIRO's strategic objectives to achieve long-term growth and sustainability.	
	Digital disruption and innovation	Continually assessing and leveraging digital innovation, to remain at the cutting edge of ways of doing research and facilitate a connected and agile workforce able to address the challenges and opportunities that arise from digital disruption.	
	Data security and privacy	Protecting the privacy of our workforce, and security of scientific data, through maintaining trust and competency in IT systems and defences against cyber security breaches.	
 **Our people** Attracting and supporting a skilful, agile, and diverse workforce, and keeping CSIRO people safe and healthy	An agile, future-focused workforce	Ensuring we have highly capable individuals with the skillsets we need now and for the future and building and sharing our people's capabilities and knowledge to support an agile workforce.	
	Connected and collaborative ways of working	Supporting our geographically diverse and skilled workforce to connect, collaborate, innovate, and work productively, maximising the impact we can create.	
	Health, safety, and wellbeing	Protecting and promoting the health, safety and wellbeing of our people, partners, infrastructure, and environments in which we operate through effective safety risk management and promoting a safety culture.	
	Diversity, inclusion and belonging	Creating and embracing an environment where each individual is included and supported and can realise their full potential and implementing business practices that leverage our diversity of talent, thoughts and ideas.	

MATERIAL TOPIC THEME	MATERIAL TOPIC	DEFINITION	RELEVANT SDGS
 **Partnerships and engagement** Collaborating with partners, businesses, industry and the community to support innovation and maximise benefits of CSIRO research	**Relationship with government**	Working with, and maintaining our positive standing with government, to fulfil our function of undertaking science in the national interest, while maintaining our independence.	
	Collaboration with business and industry	Collaborate closely with industry and business to enable more targeted and efficient delivery of technology and innovation, build capacity, and support Australia's future industries and jobs. This includes making it easier to do business with CSIRO.	
	Community engagement and capacity building	Engaging the community in an ongoing two-way conversation, to inform our research areas, share important research and innovation developments, and maintain awareness of and trust in the work we do.	
	Action for reconciliation	Engaging with Aboriginal and Torres Strait Islander peoples through science, education, and employment opportunities, and through pursuing innovation outcomes that create a positive impact for First Nations people.	
 **Excellent science** Maximising the benefit of CSIRO research through solving the greatest challenges, and conducting it in innovative and ethical ways	**Ethical science and research**	Upholding strong processes, systems, safeguards, and people that support scientific integrity.	
	Impactful science and research areas	Identifying and solving the greatest challenges facing Australia through innovative science and technology. Ensuring we take a future-focus to our research and engagement, including through exploring how megatrends may affect the challenges we aim to solve.	
	Research dissemination and application, and impact measurement	Facilitating dissemination and application of our research among communities, business, and industries, to maximise the social, environmental and economic benefits of our work. Measuring and reporting on the impact of our research and using this data to continually improve.	
	National and international research partners	Partnering with universities and publicly funded research organisations and maintaining stewardship of science infrastructure to boost innovation and capacity and ensure optimum research outcomes.	

MATERIAL TOPIC THEME	MATERIAL TOPIC	DEFINITION	RELEVANT SDGS
 **Environmental and social impact** Minimising the negative environmental and social impact of CSIRO's operations, buildings, and supply chains	Resource efficiency	Ensuring efficient waste, water, materials, and energy management to minimise the negative impact of our actions and operations on our environment. Considering and minimising the environmental footprint of our buildings and business travel.	
	Responsible value chain	Minimising the upstream environmental and social risk of the goods and services we procure through updating our procurement processes and working with key suppliers.	
	Reducing our carbon footprint	Minimising the carbon footprint of our assets and operations to contribute to global efforts to mitigate climate change.	
	Risks and opportunities of the global climate transition	Understanding and responding to the risks and opportunities of climate change and the transition to a lower carbon economy for our business and stakeholders, including adapting our research focus areas to better respond.	

Glossary

TERM	DEFINITION
AA1000APS	The purpose of the AA1000APS (2008) is to provide organisations with an internationally accepted, freely available set of principles to frame and structure the way in which they understand, govern, administer, implement, evaluate and communicate their accountability. The AA1000 AccountAbility Principles provide the basis for understanding and achieving sustainability assurance.
Challenges	The six challenges CSIRO is focused on are: • Food security and quality • Health and wellbeing • Resilient and valuable environments • Sustainable energy and resources • Future industries • A secure Australia and region. CSIRO's Corporate Plan contextualises these challenges so the solutions from science focus on these priorities into the future.
Circular economy	A circular economy is an economic system focused on eliminating waste and the continual use of resources. In circular economies, resources are recycled, re-used, shared, repaired, refurbished to create a closed-loop system, in turn reducing raw input use and the creation of waste.
EEGO	The Energy Efficiency in Government Operations Policy
Exemplar	One that serves as a model or example: such as an ideal model. A person or thing serving as a typical example or appropriate model.
Global Reporting Initiative (GRI)	The GRI Sustainability Reporting Standards (GRI Standards) are the first and most widely adopted global standards for sustainability reporting. GRI helps businesses and governments worldwide understand and communicate their impact on critical sustainability issues such as climate change, human rights, governance and social well-being.
Materiality	Materiality is a concept founded in financial accounting procedures, which has been adapted and applied to nonfinancial information. In sustainability reporting, material issues are those which are important enough to influence a stakeholder's decisions in relation to the business.
Modern Slavery Act 2018	An Act to require some entities to report on the risks of modern slavery in their operations and supply chains and actions to address those risks, and for related purposes.
Net zero emissions	'Net zero' refers to achieving an overall balance between emissions produced and emissions taken out of the atmosphere.
Responsible procurement	A procurement process that considers social, environmental and economic impacts to support sustainable development
Scope 1, Scope 2 and Scope 3 emissions	Greenhouse gas emissions are categorised into three groups or 'scopes' by the most widely used international accounting tool, the Greenhouse Gas (GHG) Protocol. Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company. Scope 3 includes all other indirect emissions that occur in an organisation's value chain.

How we engage with our stakeholders

STAKEHOLDER GROUPS	CHANNELS FOR ENGAGEMENT	KEY TOPICS OF ENGAGEMENT
Our customers		
Australian Government and its agencies; state and territory governments and their agencies	• Annual report and corporate plan • Official reporting channels, including Ministerial briefings and correspondence • Regular meetings, targeted briefings, reports, submissions to formal consultation processes • Research collaborations and partnerships • Working groups and committees	We share our research activities, listen to the needs of ministers and government departments, and provide scientific information and advice to inform policy development and program implementation.
Australian and global businesses and industries	• Surveys • Research collaborations and consortiums • Education and outreach program partnerships • Missions program • Membership of or participation in industry associations or professional groups such as the Business Council of Australia and the Australian Climate Leaders Coalition • Membership of international business networks • Multi-stakeholder fora including the Energy Efficiency Council, Australian Ocean Energy Group, Future Earth • Cooperative Research Centres (CRCs) • SME programs • Advisory services • Innovation services	We bring together our partners in industry to co-create commercialisation outcomes that deliver the greatest impact and create economic value for the nation.
Australian and international research organisations and universities	• Research collaborations • Strategic partnerships with other national science and research agencies • Membership of peak bodies such as Science & Technology Australia and Standards Australia and Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) • Multi-stakeholder fora including the Energy Efficiency Council, Australian Ocean Energy Group, Future Earth • CRCs	We partner with research institutions through co-location, co-publication, and collaborative research to boost innovation and ensure the best available research is used to solve the greatest challenges and deliver outcomes for Australia and the world.
The Australian and international community	• Website • Social media • National research infrastructure • Education and outreach programs • Publications, including through CSIRO Publishing • Citizen science program • CREST program • Community and customer surveys • Annual report • Sustainability report	We deliver learning experiences for students, teachers, and the community to equip Australians with the knowledge they need to enter the workforce and increase their science, technology, engineering, and mathematics skills.
Employees and suppliers		
Employees	• Internal communication channels, including all staff meetings • Leadership blog and communications • Employee engagement surveys • Culture and Pulse surveys • Annual reporting • Complaint's process and PID Scheme • HSE resource hub • People hub	We engage with our people on our strategic objectives, which includes delivering impact through innovation; having purpose driven science and technology; engaging and empowering talent; and building collaborative networks, as well as topics related to capabilities and sustainability.
Suppliers	• Procurement and contract management channels	COVID-19 response and business continuity, data security, modern slavery.

Data pack

This Data Pack comprises our sustainability performance for the financial year ending 30 June 2022. Our performance data and metrics have been stated at the enterprise level. In Australia, our environmental data is reported with both the Energy Efficiency in Government Operations (EEGO) boundary and *National Greenhouse and Energy Reporting Act 2007* (NGERS) operational control boundary. The basis of this data pack is our EEGO boundary, unless otherwise stated. Where data was unavailable at the time of publication, estimates have been made based on historical consumption trends or financial year activity data. As a result of earlier Annual Report printing deadlines, the environmental performance figures may differ slightly between the CSIRO Annual Report and Sustainability Report.

Environmental data

Boundary: Energy Efficiency in Government Operations

Table E1

SCOPE 1 AND 2 GREENHOUSE GAS EMISSIONS SUMMARY (EEGO)	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Total Scope 1 GHG emissions ($ktCO_2e$)	305-1	18	20	21	20	16
Total Scope 2 GHG emissions ($ktCO_2e$) Location-based	305-2	103	96	86	80	75
Total Scope 2 GHG emissions ($ktCO_2e$) Market-based	305-2/ 305-5				21	4
Total Location-Based Emissions ($ktCO_2e$)		121	116	107	100	90
Total Market-Based Emissions ($ktCO_2e$)	305-5				41	20

Notes: **1.** This boundary is based on the Energy Efficiency in Government Operations (EEGO) Policy boundary. It excludes tenants on CSIRO operated sites, but includes sites where we are a subtenant. **2.** The basis of our performance metrics and breakdowns are based on the EEGO boundary. **3.** Scope 1 and 2 emissions are for Australian sites only, and do not include our international sites. However, our international sites are immaterial to our footprint. **4.** Market-based emissions account for our renewable energy purchases, including the surrender of Large-scale generation certificates from our PPA. Under market-based emissions, the residual mix factor was used to estimate the emissions from the residual grid electricity, which is in accordance with Section 6.11.4 of the GHG Protocol Scope 2 guidance. **5.** Dual figures are reported in accordance with the WRI's Greenhouse Gas Protocol – Scope 2 guidance. **6.** FY22 figures may differ from the Annual Report due to its earlier reporting deadlines. **7.** FY19 is the base year for CSIRO's net zero calculations.

Table E2

ENERGY CONSUMPTION AND EXPORTED BY FUEL SOURCE (GJ)	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Electricity (grid)	302-1	445,881	403,044	371,773	354,283	339,835
Electricity (solar)	302-1	2,765	6,260	19,818	19,638	21,196
Electricity (off-grid)*	302-1	0	10,106	9,929	7,559	8,547
Electricity (exported to grid)	302-1	-	-	-	623	1,038
Natural gas	302-1	210,020	204,852	205,819	204,399	198,527
Diesel	302-1	90,762	116,511	138,763	125,188	68,272
Petrol	302-1	6,040	6,327	5,161	4,603	3,510
LPG	302-1	8,520	8,428	4,204	5,285	5,617
Ethanol	302-1	84	54	18	12	0
Other	302-1	10,510	767	3,292	2,910	2,563
Total Energy Consumed (GJ)		774,583	756,349	758,777	723,877	648,066

Notes: **1.** Data based on invoices. Where unavailable metered data and costs (as proxy) used . Where data has been unavailable estimates have been made based on historical usage and / or activity data. **2.** Electricity (solar) is based on energy consumed from our onsite PV systems. It is considered 'behind the meter' usage. **3.** Electricity (Horizon Power*) is based on an off-grid electricity source from a diesel power plant provided by a third party retailer. **4.** Conversion factors are based on the National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008, for each reporting year. **5.** We do not sell electricity, heating, cooling or steam. **6.** We have adopted the EEGO boundary for our energy and emissions footprint and net zero targets.

Table E3

GREENHOUSE GAS EMISSIONS BY FUEL SOURCE (TONNES CO_2e)	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Scope 1	**305-1**					
Stationary						
Natural Gas	305-1	10,782	10,499	10,606	10,533	10,230
Diesel	305-1	443	579	727	379	623
Petrol	305-1	6	83	96	92	79
LPG	305-1	516	511	255	320	326
Other	305-1	0	3	3	2	0
Transport						
Diesel	305-1	5,961	7,642	9,043	8,435	4,182
Petrol	305-1	403	345	254	220	158
Ethanol	305-1	0	0	0	0	0
LPG	305-1					14
Scope 2	**305-2**					
Electricity (off-grid*)	305-2	-	1,757	1,738	1,302	1,353
Electricity (grid, Location-based)	305-2	103,342	94,538	84,422	78,686	73,194
Electricity (grid, Market-based)	305-2	-	-	-	19,699	2,792
Total (Scope 1 and Scope 2 (location-based)		121,454	115,955	107,142	99,968	90,160
Total (Scope 1 and Scope 2 (market-based)		-	-	-	40,872	19,759

Notes: **1.** Emission factors for Scope 1 and 2 emissions are calculated based on the National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008, for each reporting year. **2.** Location-based emissions are calculated in accordance with the Greenhouse Gas Protocol, and in alignment with Australian frameworks. **3.** Electricity (Horizon Power*) emissions are calculated based on the defaut factors provided in the NGER Determination. **4.** Sum of individual energy sources may differ to "total" due to rounding. **5.** Market-based emissions have not been restated for 2019–20 and prior. No LGCs were purchased or surrendered in those years. **6.** Off-grid scope 2 calculated in accordance with Section 6 .11. 4 of GHG Protocol Scope 2 guidance.

Table E4

RESOURCE AND OPERATIONAL METRICS	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Mains Water Usage (ML)	303-5(a)	321	320	345	277	230
Waste Generation (tonnes)	306-3	2,380	2,370	2,085	1,721	1,384
Recycling Rate (%)	306-4	46	49	38	36	39
Air Travel (million passenger kilometres (pkm))		114	123	84	7	13
Air Travel (tonnes CO_2e, domestic)	305-3	-	5,211	3,303	748	1,084
Air Travel (tonnes CO_2e, international)	305-3	-	4,918	3,206	162	323

Notes: **1.** Where data was unavailable for water usage (specifically for sites where we do not readily have separate metering due to tenancy), estimates have been made. **2.** Waste data is based on sites where we have contractual arrangements, and excludes sites where we do not have control of the facility. It does not include contractor managed waste streams. **3.** Air travel data and metrics are provided by our service provider and is based on the methodology adopted by the International Civil Aviation Organisation. It does not currently take into account the radiative forcing impacts.

Table E5

RESOURCE AND OPERATIONAL METRICS BY FTE	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Greehhouse gas emissions (tonnes/per FTE)	305-4	23	22	21	8	4
Energy (GJ/FTE)	302-3	149	141	150	146*	123
Waste generation (kg/FTE)		459	442	412	348	262
Mains water usage (kilolitres/FTE)		62	59	68	61	44
Air Travel (thousand pkm/FTE)	305-3	22	23	17	1	3

Notes: **1.** FY21 and FY22 tonnes CO2-e/FTE is based on Scope 1 and Scope 2 market based emissions. **2.** All calculations based on Australian FTE figures. **3.** *FY21 figure restated, based on updated data.

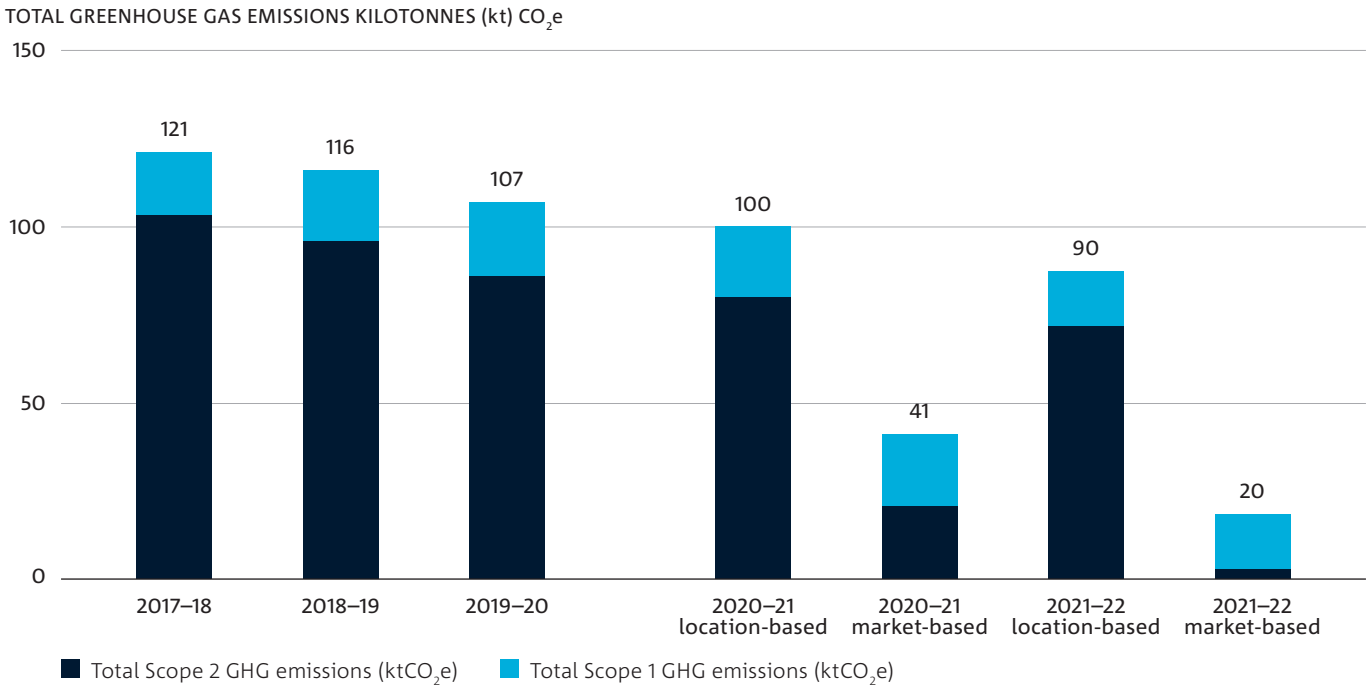


Chart E1: Scope 1 and 2 greenhouse gas emissions (EEGO) boundary

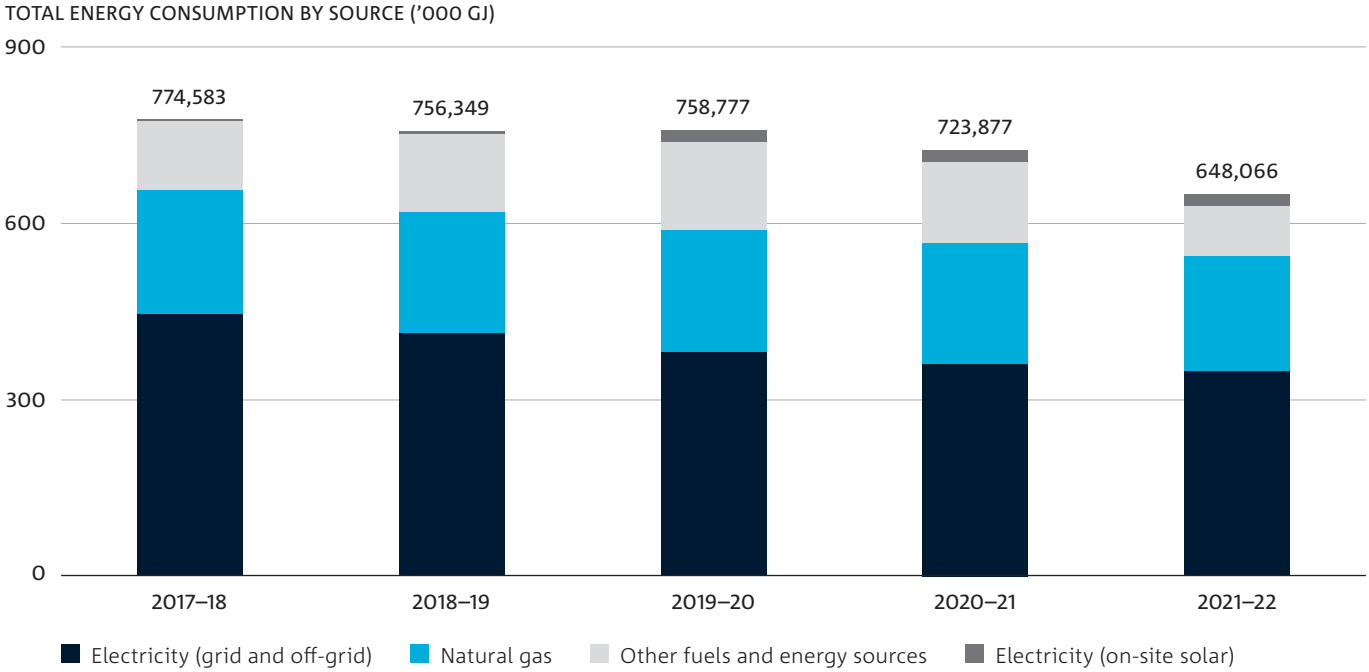


Chart E2: Energy usage by major energy sources

Our people

Note: all data excludes affiliates unless otherwise specified.

Table P1

EMPLOYEES BY GENDER	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Total employees	102-8	5767	5915	5319	5221	5672
Male (%)	405-1(b)	58.6%	57.8%	58.8%	57.9%	56.0%
Female (%)	405-1(b)	41.4%	42.1%	41.1%	42.0%	43.8%
Non-binary/ prefer not to say (%)	405-1(b)	0.0%	0.1%	0.1%	0.2%	0.2%

Note: **1.** Total employees by headcount as at 30 June. **2.** Percentages represent percentage of total employees.

Table P2

		2017–18		2018–19		2019–20		2020–21		2021–22	
EMPLOYEES BY CONTRACT TYPE	GRI	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
Permanent (ongoing) – Full Time (%)*	102-8	43.2%	21.7%	42.4%	22.7%	46.3%	25.1%	45.9%	25.6%	42.1%	24.5%
Permanent (ongoing) – Part Time (%)*	102-8	1.7%	8.0%	1.7%	7.7%	1.7%	8.4%	1.7%	8.0%	1.5%	7.5%
Temporary (non-ongoing) – Full Time (%)*	102-8	9.9%	7.0%	10.2%	7.2%	9.6%	5.9%	9.0%	6.1%	10.3%	8.2%
Temporary (non-ongoing) – Part Time (%)*	102-8	3.8%	4.7%	3.5%	4.5%	1.2%	1.7%	1.3%	2.1%	2.2%	3.7%
Employees completing Annual Performance Appraisal (%)**	404-3	96.2%	95.7%	97.2%	96.5%	97.7%	96.3%	96.3%	95.6%	-	-

Notes: **1.** Sum of percentages do not add up to 100, with remaining identifying as non-binary/prefer not to say. **2.** FY22 Annual Performance Appraisal (APA) completion not available at time of publication due to timing of reporting and timing of APA finalisation. **3.** Casual employees included in Temporary (non-ongoing) – Part Time. **4.** There are no significant seasonal variations. **5.** *represents percentage of total employees per financial year; **represents percentage of reference group in column heading.

Table P3

EMPLOYEES BY AGE, AND DIVERSITY GROUPS	GRI	2017–18		2018–19		2019–20		2020–21		2021–22	
		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
Employees < 30 years old (%)	405-1(b)	5.7%	4.7%	5.8%	4.4%	3.8%	2.7%	3.7%	2.6%	4.8%	3.6%
Employees >30 years old <50 years old (%)	405-1(b)	32.1%	23.9%	31.0%	24.2%	31.9%	24.0%	30.5%	24.3%	28.8%	25.0%
Employees > 50 years old (%)	405-1(b)	20.8%	12.8%	21.0%	13.5%	23.1%	14.4%	23.7%	15.1%	22.5%	15.3%
Employees who identify as Aboriginal and Torres Straight Islander (%)	405-1(b)	0.8%	1.1%	0.8%	1.2%	0.6%	1.0%	0.5%	1.0%	0.5%	1.2%
Employees who identify with a disability (%)	405-1(b)	2.4%	1.6%	2.4%	1.7%	2.4%	1.6%	2.4%	1.7%	2.4%	1.9%

Notes: **1.** Sum of percentages do not add up to 100, with remaining employees identifying as non-binary. **2.** Leadership positions outside of governance bodies. **3.** Percentages represent percentage of total employees per financial year.

Table P4

LEADERSHIP OF GOVERNANCE BODIES BY GENDER AND AGE	GRI	2020–21				2021–22			
		BOARD	EXECUTIVE TEAM	CLT	ALL LEADERS	BOARD	EXECUTIVE TEAM	CLT	ALL LEADERS
Gender – Male (%)	405-1 (a)	50.0%	62.5%	68.2%	62.4%	37.5%	50.0%	52.0%	58.9%
Gender – Female (%)	405-1 (a)	50.0%	37.5%	31.8%	37.6%	62.5%	50.0%	48.0%	41.1%
Age < 30 years old (%)	405-1 (a)	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.4%
Age >30 years old <50 years old (%)	405-1 (a)	12.5%	0.0%	27.3%	51.8%	12.5%	25.0%	24.0%	53.7%
Age > 50 years old (%)	405-1 (a)	87.5%	100.0%	72.7%	47.6%	87.5%	75.0%	76.0%	45.8%

Notes: **1.** Executive team includes our Chief Executive. **2.** CLT means CSIRO Leadership Team and for reporting purposes includes all employees at Director level, excluding those considered 'General Managers'. **3.** CSIRO does not currently have any leaders of governance bodies identifying as non-binary/prefer not to say. **4.** Leaders include any person whose job title contains the word 'Manager', 'Director', 'Leader' or 'Executive'; excluding 'Executive Assistant' or 'Executive officer'. **5.** Percentages represent percentage of reference group in column heading.

Table P5

EMPLOYEE CATEGORIES BY GENDER, AGE AND DIVERSITY GROUPS	GRI	2020–21 RESEARCH STAFF	2020–21 NON-RESEARCH STAFF	2021–22 RESEARCH STAFF	2021–22 NON-RESEARCH STAFF
Gender – Male (%)	405-1(b)	64.9%	46.4%	63.5%	44.3%
Gender – Female (%)	405-1(b)	34.9%	53.5%	36.3%	55.6%
Gender – Non-binary (%)	405-1(b)	0.2%	0.1%	0.2%	0.1%
Age <30 years old (%)	405-1(b)	6.3%	6.3%	8.9%	7.7%
Age >30 years old <50 years old (%)	405-1(b)	55.3%	54.3%	54.5%	52.8%
Age > 50 years old (%)	405-1(b)	38.4%	39.4%	36.6%	39.4%
Employees who identify as Aboriginal and Torres Straight Islanders (%)	405-1(b)	1.3%	1.8%	1.4%	2.1%
Employees who identify with a disability (%)	405-1(b)	4.1%	4.0%	4.2%	4.4%
Employees from non-English speaking backgrounds (%)	405-1(b)	31.5%	12.1%	32.5%	13.1%

Note: **1.** Percentages represent percentage of reference group in column heading.

Table P6

NEW HIRES AND TURNOVER BY GENDER	GRI	2017–18 MALE	2017–18 FEMALE	2018–19 MALE	2018–19 FEMALE	2019–20 MALE	2019–20 FEMALE	2020–21 MALE	2020–21 FEMALE	2021–22 MALE	2021–22 FEMALE
Number of new hires	401-1	615	568	605	553	161	138	255	249	554	628
Turnover (%)	401-1	10.9%	9.8%	11.7%	10.8%	12.8%	9.7%	10.2%	10.7%	11.1%	11.9%

Note: **1.** *represents percentage of reference group in column heading.

Table P7

WORKFORCE TRAINING BY GENDER	GRI	2017–18 MALE	2017–18 FEMALE	2018–19 MALE	2018–19 FEMALE	2019–20 MALE	2019–20 FEMALE	2020–21 MALE	2020–21 FEMALE	2021–22 MALE	2021–22 FEMALE
Average Hours of Mandatory Training (LMS) completed per employee (hours)	404-1	3.2	3.72	3.58	3.79	3.17	3.27	5.25	5.74	3.16	3.5
Mandatory training completed (%)*	404-1	-	-	-	-	-		98.3%	98.9%	97.5%	97.9%

Notes: **1.** Mandatory training completed (%) includes active staff only- excludes casuals, affilliates and staff on long term absence. **2.** New method for recording mandatory training from FY21 onwards. **3.** *represents percentage of reference group in column heading.

Table P8

ETHICS AND CORRUPTION TRAINING	GRI	2020–21	2021–22
Code of Conduct (%)	205-2	99.5%	100.0%
Security Awareness (%)	205-2	98.1%	99.7%
Fraud Awareness (%)	205-2	98.6%	99.7%
Conflict of Interest (%)	205-2	New 2022	86.6%
Privacy (%)	205-2	New 2022	83.9%
Phishing (%)	205-2	98.3%	99.7%
Percentage of researchers trained in Research Excellence (%)	102-17	99.5%	99.5%

Note: **1.** Mandatory training completed (%) includes active employees only – excludes casuals, affilliates and staff on long term absence.

Table P9

HSE TRAINING (MANDATORY AND NON-MANDATORY)	GRI	2020–21	2021–22
Starting with your safety (% completion)	403-5	99.98%	Course no longer offered
The Work Health & Safety Act: Your Legal Duties (% completion)	403-5	100.00%	Course no longer offered
HSE Induction (new in FY22)	403-5	n/a	99.83%
HSE for Supervisors & Managers (% completion)	403-5	99.98%	96.46%

Notes: **1.** Compliance rates for those assigned the training; exclude affilliates, casual staff and staff on long term absence. **2.**HSE Induction is new for FY22 and replaces the two courses referred to above no longer offered in FY22. **3.** Mandatory training completed (%) includes active staff only- excludes casuals, affilliates and staff on long term absence.

Table P10

HEALTH AND SAFETY INDICATORS	GRI	2019–20	2020–21	2021–22
Lost Time Injury (LTI)	403-9	36(2)	24	12 (1)
Medical Treatment Injury (MTI)	403-9	33(1)	24	25 (2)
Total hours (hours)	403-9	12,036,188	11,875,834	12,454,261
Total Recordable Injury Frequency Rate (TRIFR)	403-9	5.70	3.90	3.00

Notes: **1.** Lost Time Injury (LTI): A work-related injury/ illness that results in the loss of one or more complete work days/shifts. **2.** Medical Treatment Injury (MTI): A work-related injury/ illness requiring medical treatment beyond first aid or extensive therapeutic treatment prescribed by a medical practitioner but has not resulted in lost time from work. **3.** Total Hours: Work schedules of CSOF staff minus leave plus estimated hours for affiliates workers covered under the HSEMS. **4.** Total Recordable Injury Frequency Rate (TRIFR): Total Recordable Injury Frequency Rate = number of MTIs + LTIs per million hours worked. **5.** Number in parentheses is contractor injuries that are not included in the frequency rate calculations. **6.** CSIRO updated its definitions for recordable injuries from 1 July 2019 and changed the calculated hours worked to include an estimation of affiliate hours worked. **7.** Number in parenthesis is contractor injuries that re not included in the frequency rate calculations.

Table P11

WORK RELATED HEALTH INDICATORS	GRI	2019–20	2020–21	2021–22
Number of work related ill heatlh recorded	403-10	4	8	4

Note: **1.** Ill-health records are a subset of total recordable injuries.

Table P12

LEADING HEALTH AND SAFETY INDICATORS	GRI	2019–20	2020–21	2021–22
Health and Safety Actions Completed %	403-2	-	99%	88%
Proactive Hazard Reporting	403-2	521	481	771
% to target	403-2	69%	45%	71%
HSE "Contacts"	403-2	2079	2559	2315
% to target	403-2	94%	106%	97%

Note: **1.** 'Actions' means any HSE-related corrective action recorded in our reporting system. **2.** 'Contacts' are short visits or discussions by senior leaders with CSIRO team members in their work environments.

Table P13

ACTION FOR RECONCILIATION	GRI	2020–21	2021–22
Annual expenditure on Indigenous owned/operated businesses	204-1	$9,763,890	$3,966,700
Employees completing cultural awareness training (%)	404-1	98.89%	99.62%

Note: **1.** Mandatory training completed (%) includes active staff only- excludes casuals, affilliates and staff on long term absence.

Table P14

ETHICS AND TRUST SENTIMENTS	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Business sentiment survey 'extremely trustworthy' score (%)		58%	48%	Not conducted	59%	64%
Community sentiment survey 'extremely trustworthy' score (%)		43%	36%	40%	43%	60%
Customer satisfaction Net Promoter Score		+40	+45	Not conducted	+51	+47
Our people are proud to be associated with CSIRO (%)		90%	92%	95%	93%	93%

Note: **1.** Customer satisfaction and advocacy is an organisational Key Performance Indicator (KPI) measured on an annual basis using the industry benchmark of Net Promoter Score (NPS). The primary objective of the NPS methodology is to infer customer loyalty. It is calculated by deducting the percentage of low-scoring 'detractors' from the percentage of high-scoring 'promoters', in answer to the question "How likely are you to recommend CSIRO to others?".

Table F1: Economic (Financial) Impacts

SUPPLY CHAIN EXPENDITURE WITHIN AUSTRALIA	GRI	2017–18	2018–19	2019–20	2020–21	2021–22
Small business suppliers paid within 20 days (%)	204-1	n/a	n/a	n/a	n/a	97%
Small business suppliers paid within 30 days (%)	204-1	n/a	n/a	n/a	n/a	98.60%
Small business annual expenditure ($'000)	204-1	n/a	n/a	n/a	n/a	190, 450

Note: **1.** FY22 is the first full financial year of reporting on payments to small business. **2.** Small business is defined by the *Payment Times Reporting Act 2020*.

TCFD Reporting Index

An overview of the Taskforce on Climate-related Financial Disclosures recommendations. These disclosures will continue to be refined as our progress matures over the coming years.

TCFD RECOMMENDED DISCLOSURE	OUR APPROACH
Governance: Disclose the organisation's governance around climate-related risks and opportunities	
a) Describe the board's oversight of climate-related risks and opportunities	Risks and opportunities of the global climate transition p. 66
b) Describe management's role in assessing and managing climate-related risks and opportunities	Risks and opportunities of the global climate transition p. 66
Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's 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 terms	Risks and opportunities of the global climate transition p. 66
b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	Risks and opportunities of the global climate transition p. 66
c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios including a 2°C or lower scenario	Risks and opportunities of the global climate transition p. 66 Climate scenario analyses will take place in the coming year/s
Risk management: Disclose how the organisation identifies, assesses and manages climate-related risks	
a) Describe the organisation's process for identifying and assessing climate-related risk	Risks and opportunities of the global climate transition p. 66
b) Describe the organisation's process for managing climate-related risks	Risks and opportunities of the global climate transition p. 66
c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management	Risks and opportunities of the global climate transition p. 66
Metrics and targets: Disclosure 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	See Appendix – Data Tables E1 to E5; Charts E1 and E2
b) Disclose scope 1, 2 and, if appropriate, scope 3 greenhouse gas emissions, and the related risks	See Appendix – Data Tables E1 to E5; Charts E1 and E2
c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets	Sustainability Report Table 2; Reducing our carbon footprint – Our performance pp58–9; pp62–4 CSIRO Sustainability Strategy 2020–2030

Limited Assurance Statement

KPMG

Independent Limited Assurance Report to the Directors of Commonwealth Scientific and Industrial Research Organisation

Conclusion

Based on the evidence we obtained from the procedures performed, we are not aware of any material misstatements in the Information Subject to Assurance, which has been prepared by Commonwealth Scientific and Industrial Research Organisation (CSIRO) in accordance with the Global Reporting Initiative (GRI) Universal Standards 2016 and CSIRO's own basis of preparation disclosed in the CSIRO Sustainability Report 2022 for the year ended 30 June 2022 (Sustainability Report 2022).

Information Subject to Assurance

Information Subject to Assurance as presented in the Sustainability Report 2022 includes:

Information Subject to Assurance	Sustainability Report 2022 Page Reference
Materiality related disclosures covering process to determine material topics and list of material topics	pp. 8-9, 79-81
Total Energy of 648TJ	pp. 58, 62-63, 84
Total Scope 1 GHG emissions of 16kt CO_2e	pp. 58, 62-63, 84
Total Scope 2 GHG emissions of 75kt CO_2e (location based method) Total Scope 2 GHG emissions of 4kt CO_2e (market based method)	pp. 58, 62-63, 84

(collectively, the Information Subject to Assurance).

Criteria Used as the Basis of Reporting

The Information Subject to Assurance has been prepared in accordance with the GRI Universal Standards 2016 and CSIRO's own basis of preparation disclosed in the Sustainability Report 2022, specifically on pages 8, 9, 58, 62, 63 and 84.

Basis for Conclusion

We conducted our work in accordance with the Australian Standard on Assurance Engagements ASAE 3000 *Assurance Engagements Other Than Audits or Reviews of Historical Financial Information* (Standard). In accordance with the Standard, we have:

- used our professional judgement to plan and perform the engagement to obtain limited assurance that we are not aware of any material misstatements in the Information Subject to Assurance, whether due to fraud or error;
- considered relevant internal controls when designing our assurance procedures, however we do not express a conclusion on their effectiveness; and
- ensured that the engagement team possess the appropriate knowledge, skills and professional competencies.

Summary of Procedures Performed

Our limited assurance conclusion is based on the evidence obtained from performing the following procedures:

- enquiries with the relevant CSIRO personnel to understand the internal controls, governance structure and reporting process relevant to the preparation of the Information Subject to Assurance in accordance with the criteria;
- reviews of relevant documentation, including relevant CSIRO policies and management reporting to the CSIRO Board;
- analytical procedures over the Information Subject to Assurance;
- walkthroughs and testing of the Information Subject to Assurance to source documentation on a sample basis;
- evaluating the appropriateness of the criteria with respect to the Information Subject to Assurance and its alignment with the criteria; and
- review of the Sustainability Report 2022 in its entirety to ensure it is consistent with our overall knowledge of assurance engagement.

How the Standard Defines Limited Assurance and Material Misstatement

The procedures performed in a limited assurance engagement vary in nature and timing from 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.

Misstatements, including omissions, are considered material if, individually or in the aggregate, they could reasonably be expected to influence relevant decisions of the Directors of CSIRO.

Use of this Assurance Report

This report has been prepared for the Directors of CSIRO for the purpose of providing an assurance conclusion on the Information Subject to Assurance and may not be suitable for another purpose. We disclaim any assumption of responsibility for any reliance on this report, to any person other than the Directors of CSIRO, or for any other purpose than that for which it was prepared.

Management's responsibility

Management is responsible for:

- determining that the criteria is appropriate to meet their needs and the needs of other intended users;
- preparing and presenting the Information Subject to Assurance in accordance with the criteria; and
- establishing internal controls that enable the preparation and presentation of the Information Subject to Assurance that is free from material misstatement, whether due to fraud or error.

Our Responsibility

Our responsibility is to perform a limited assurance engagement in relation to the Information Subject to Assurance and to issue an assurance report that includes our conclusion.

Our Independence and Quality Control

We have complied with our independence and other relevant ethical requirements of the *Code of Ethics for Professional Accountants (including Independence Standards)* issued by the Australian Professional and Ethical Standards Board and complied with the applicable requirements of Australian Standard on Quality Control 1 to maintain a comprehensive system of quality control.

KPMG

KPMG
Melbourne
18 October 2022

Julia Bilyanska

Julia Bilyanska
Partner

GRI Content Index

GRI 102: GENERAL DISCLOSURES 2016		
Organisational profile		
102-1	Name of organisation	Commonwealth Scientific and Industrial Research Organisation (CSIRO) Sustainability Report 2022 *Overview* https://www.csiro.au/en/About
102-2	Activities, brands, products, services	Sustainability Report 2022 *About us; Sustainability is in our DNA* https://www.csiro.au/en/About Annual Report 2021–22 Part 1 *Our purpose and strategy*
102-3	Location of headquarters	https://www.csiro.au/en/Contact
102-4	Location of operations	https://www.csiro.au/en/Locations Annual Report 2021–22 Part 4 *Our Sites*
102-5	Ownership and legal form	Sustainability Report 2022 *About us* https://www.csiro.au/en/about/We-are-CSIRO Annual Report 2021–22 Part 1 *Our purpose and strategy*
102-6	Markets served	https://www.csiro.au/en/Locations https://www.csiro.au/en/About/Policies-guidelines/Working-with-CSIRO/Service-Charter
102-7	Scale of the organisation	https://www.csiro.au/en/about Annual Report 2021–22 Part 4 *Our organisation*
102-8	Information on employees and other workers	Sustainability Report 2022 *Our people*; *Appendix – Data pack Tables P1–P2*
102-9	Supply chain	Sustainability Report 2022 *Responsible Value Chain; Appendix – Data pack, Tables F1 and P13*
102-10	Significant changes to the organisation and its supply chain	There were no significant changes during the reporting period
102-11	Precautionary Principle or approach	Sustainability Report 2022 *Risk Management* Annual Report 2021–22 Part 4 *Management and accountability – Identifying and managing our risks and opportunities*
102-12	External initiatives	Sustainability Report 2022 discussed throughout *Australian Code for the Responsible Conduct of Research, National Statement on Ethical Conduct in Human Research (2007)* *Australian Code for the Care and Use of Animals for Scientific Purposes* *Australian Climate Leaders Coalition, AS ISO 20400:2018, AS ISO 31000:2018, AS/NZS ISO 45001:2018, AS/NZS ISO 14001:2016,*
102-13	Membership of associations	Sustainability Report 2022 *Appendix – How we engage with our stakeholders*
Strategy		
102-14	Statement from senior decision-maker	Sustainability Report 2022 *Message from our Chief Executive*
102-15	Key impacts, risks and opportunities	Sustainability Report 2022 *Risk management; Strategic focus areas* Annual Report 2021–22 Part 4 *Management and accountability – Identifying and managing our risks and opportunities*
Ethics and integrity		
102-16	Values, principles, standards and norms of behaviour	Sustainability Report 2022 *Our people* https://www.csiro.au/en/about/Values Annual Report 2021–22 Part 1 *Values*

GRI 102: GENERAL DISCLOSURES 2016		
102-17	Mechanism for advice and concerns about ethics	Sustainability Report 2022 *Culture, Ethics, Integrity and Trust; Appendix – Data Pack Table P8* https://my.csiro.au/Policy-Portal/Governance/Public-Interest-Disclosure-Scheme https://www.csiro.au/en/Contact/Complaints https://www.csiro.au/en/About/Policies-guidelines/Integrity-of-science/Ethical-human-research https://data61.csiro.au/en/Our-Research/Our-Work/AI-Framework https://www.csiro.au/en/About/Policies-guidelines/Integrity-of-science/Animal-Ethics-Committee-ToR https://www.oaic.gov.au/privacy-law/privacy-act/ csshrec@csiro.au Annual Report 2021–22 Part 4 *Management and accountability*
Governance		
102-18	Governance structure	Sustainability Report 2022 *About us; Governance* https://www.csiro.au/en/About/Leadership-governance https://www.csiro.au/en/about/Corporate-governance Annual Report 2021–22 Part 4 *Our organisational structure; Management and accountability*
102-19	Delegating authority	https://www.csiro.au/en/About/Leadership-governance
102-20	Executive-level responsibility for economic, environmental and social topics	Sustainability Report 2022 *Governance* Annual Report 2021–22 Part 4 *Management and accountability*
102-21	Consulting stakeholders on economic, environmental and social topics	Sustainability Report 2022 *Materiality assessment; Governance; Appendix – How we engage with our stakeholders*
102-22	Composition of the highest governance body and its committees	https://www.csiro.au/en/about/people/Board-Members https://www.csiro.au/en/about/Corporate-governance/Leadership-and-governance https://www.csiro.au/en/about/Corporate-governance/Minister-and-Board Annual Report 2021–22 Part 4 *Management and accountability*
102-23	Chair of the highest governance body	The current CSIRO Chair is Ms Kathryn Fagg AO https://www.csiro.au/en/about/people/Board-Members https://www.csiro.au/en/about/Corporate-governance/Leadership-and-governance https://www.csiro.au/en/about/Corporate-governance/Minister-and-Board Annual Report 2021–22 Part 4 *Management and accountability, Governance*
102-24	Nominating and selecting the highest governance body	Annual Report 2021–22 Part 4 *Management and accountability; Governance*
102-25	Conflicts of interest	Annual Report 2021–22 Part 4 *Disclosure of interests and related entity transactions*
102-26	Role of the highest governance body in setting purpose, values and strategy	https://www.csiro.au/en/About/Leadership-governance/Minister-and-Board/Directions-to-CEO Annual Report 2021–22 Part 4 *Management and accountability*
102-27	Collective knowledge of highest governance body	https://www.csiro.au/en/about/Corporate-governance/Minister-and-Board/Directions-to-CEO Annual Report 2021–22 *Part 4 Management and accountability*
102-28	Evaluating the highest governance body's performance	Under its Charter and Operating Guidelines, the CSIRO Board examines its performance, composition, and skill base regularly to ensure it is operating efficiently, effectively and following the principles of good corporate governance. Board performance is usually reviewed at least every 18 months, with the most recent being a self-assessment in February 2022. Annual Report 2021–22 Part 4 *Management and Accountability – Governance*

GRI 102: GENERAL DISCLOSURES 2016		
102-29	Identifying and managing economic, environmental and social impacts	Sustainability Report 2022 *Materiality assessment; Governance* https://www.csiro.au/en/about/Corporate-governance/Minister-and-Board/Directions-to-CEO
102-30	Effectiveness of risk management processes	https://www.csiro.au/en/about/Corporate-governance/Minister-and-Board/Directions-to-CEO
102-31	Review of economic, environmental and social topics	Sustainability Report 2022 *Governance* Corporate Plan 2022 from p.14
102-32	Highest governance body's role in sustainability reporting	The Annual Report 2021–22, containing sustainability information, is approved by the CSIRO Board. The Sustainability Report 2022 is approved by CSIRO's Chief Operating Officer
102-35	Remuneration policies	Annual Report 2021–22 Part 5 *Financial statements* Annual Report 2021–22 Part 4 *Management and accountability – Remuneration of key management personnel*
102-36	Process for determining remuneration	Annual Report 2021–22 Part 4 *Management and accountability – Remuneration*
Stakeholder engagement		
102-40	List of stakeholder groups	Sustainability Report 2022 *Our stakeholders; Partnerships and engagement; Appendix – How we engage with our stakeholders* https://www.csiro.au/en/work-with-us/Working-with-CSIRO/Service-Charter
102-41	Collective bargaining agreements	Sustainability Report 2022 *Our People* https://www.csiro.au/en/about/Policies/CSIRO-Enterprise-Agreement
102-42	Identifying and selecting stakeholders	Sustainability Report 2022 *Our stakeholders; Partnerships and engagement; Appendix – How we engage with our stakeholders*
102-43	Approach to stakeholder engagement	Sustainability Report 2022 *Our stakeholders; Partnerships and engagement; Appendix – How we engage with our stakeholders*
102-44	Key topics and concerns raised	Sustainability Report 2022 *Our stakeholders; Partnerships and engagement; Appendix – How we engage with our stakeholders*
Reporting practice		
102-45	Entities included in the consolidated financial statements	Annual Report 2021–22 Part 5 *Financial statements*
102-46	Defining report content and topic boundaries	Sustainability Report 2022 *Our approach; Material topics; Appendix – Material topic definitions*
102-47	List of material topics	Sustainability Report 2022 *Our approach; Material topics; Appendix-Material topic definitions*
102-48	Restatements of information	Not applicable – this is CSIRO's first sustainability report
102-49	Changes in reporting	Not applicable – this is CSIRO's first sustainability report
102-50	Reporting period	Sustainability Report 2022 *Overview*
102-51	Date of most recent report	Sustainability Report 2022 *Overview*
102-52	Reporting cycle	Sustainability Report 2022 *Overview*
102-53	Contact point for questions regarding report	sustainability@csiro.au
102-54	Claims of reporting in accordance with the GRI Standards	This report has been prepared in accordance with the GRI Standards 2016–20: Core option
102-55	GRI content index	Sustainability Report 2022 *Appendix*
102-56	External assurance	This report has limited assurance – see the Limited Assurance Statement in the *Appendix*.

GRI 103: MANAGEMENT APPROACH 2016			
103-1	Explanation of the material topic and its boundary	Sustainability Report 2022 *Materiality assessment; Our stakeholders Table 2; Appendix – Material topic definitions*	
103-2	The management approach and its components	Culture, ethics, integrity and trust	Sustainability Report 2022 p. 15 Annual Report 2021–22 Part 3 *Enabling capabilities*
		Financial sustainability	Sustainability Report 2022 p. 15 Annual Report 2021–22 Part 5 *Financial statements*
		Digital disruption and innovation	Sustainability Report 2022 p. 21 Annual Report 2021–22 Part 3 *Enabling capabilities*
		Data security and privacy	Sustainability Report 2022 p. 19 Annual Report 2021–22 Part 3 *Sustainable operations, sites and infrastructure*
		An agile, future-focused workforce	Sustainability Report 2022 p. 30
		Connected and collaborative ways of working	Sustainability Report 2022 p. 31
		Health, safety and wellbeing	Sustainability Report 2022 p. 32 Annual Report 2021–22 Part 3, Enabling capabilities, *Health and Safety Performance*
		Diversity, inclusion and belonging	Sustainability Report 2022 p. 34 Annual Report 2021–22 Part 3 *Our people*
		Relationship with government	Sustainability Report 2022 p. 37 Annual Report 2021–22 Part 4 *Management and accountability, Government engagement*
		Collaboration with business and industry	Sustainability Report 2022 p. 37 Annual Report 2021–22 Part 3 *Annual performance statements*
		Community engagement and capacity building	Sustainability Report 2022 p. 42 Annual Report 2021–22 Part 2 *Empowering tomorrow's science-driven industries*
		Action for reconciliation	Sustainability Report 2022 p. 46
		Ethical science and research	Sustainability Report 2022 p. 51 Annual Report 2021–22 *Part 4 Management and accountability, Ethics and Code of Conduct*
		Impactful science and research areas	Sustainability Report 2022 p. 49 Annual Report 2021–22 Part 3, *Annual performance statements*
		Research dissemination and application and impact measurement	Sustainability Report 2022 p. 49–50 Annual Report 2021–22 *Part 3 Annual performance statements*
		National and international research partners	Sustainability Report 2022 p. 40 Annual Report 2021–22 *Part 3, Annual performance statements*
		Resource efficiency	Sustainability Report 2022 p. 67
		Responsible value chain	Sustainability Report 2022 p. 74
		Reducing our carbon footprint	Sustainability Report 2022 p. 58
		Risks and opportunities of the global climate transition	Sustainability Report 2022 p. 66
103-3	Evaluation of the management approach	Per material topic. Refer to page references in 103-2	

TOPIC SPECIFIC DISCLOSURES		
ECONOMIC		
GRI 201: Economic performance 2016		
201-1	Direct economic value generated and distributed	Sustainability Report 2022 *How CSIRO Creates Value; Appendix – Data pack – Table F1* Annual Report 2021–22 *Part 5 Financial statements*
201-2	Financial implications and other risks and opportunities due to climate change	Sustainability Report 2022 *Risks and opportunities of the global climate transition; Appendix – TCFD Reporting Index*
201-4	Financial assistance received from government	Annual Report 2021–22 *Part 5 Financial statements*
GRI 203: Indirect economic impacts 2016		
203-2	Significant indirect economic impacts	Sustainability Report 2022 *How CSIRO Creates Value; Impactful science and research dissemination; Community engagement and capacity building* https://www.csiro.au/en/about/Corporate-governance/Ensuring-our-impact/Auditing-our-impact Annual Report 2021–22 *Part 3 Delivering benefits to Australia*
GRI 204: Procurement practices 2016		
204-1	Proportion of spending on local suppliers	Sustainability Report 2022 *Responsible Value Chain; Appendix – Data pack, Tables P14, F1* Annual Report 2021–22 *Part 5 Financial statements*
GRI 205: Anti-corruption 2016		
205-2	Communication and training about anti-corruption policies and procedures	Sustainability Report 2022 *Culture, ethics, integrity and trust; Appendix – Data pack Table P8*
ENVIRONMENTAL		
GRI 302: Energy 2016		
302-1	Energy consumption within the organisation	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Tables E2, Chart E2* 302-1d – CSIRO does not sell electricity, heating, cooling or steam
302-3	Energy intensity	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Table E5*
GRI 303: Water and effluents 2018		
303-5	Water consumption	Sustainability Report 2022 *Resource efficiency; Appendix – Data Pack Table E4*
GRI 305: Emissions 2016		
305-1	Direct (scope 1) GHG emissions	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Tables E1, E3, Chart E1*
305-2	Energy indirect (scope 2) GHG emissions	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Tables E1, E3, Chart E1*
305-3	Other indirect (scope 3) GHG emissions	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Table E4*
305-4	GHG emissions intensity	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Table E5*
305-5	Reduction of GHG emissions	Sustainability Report 2022 *Reducing our carbon footprint; Appendix – Data Pack Chart E1*

TOPIC SPECIFIC DISCLOSURES		
GRI 306: Waste 2020		
306-1	Waste generation and significant waste-related impacts	Sustainability Report 2022 *Resource efficiency*
306-2	Management of significant waste-related impacts	Sustainability Report 2022 *Resource efficiency*
306-3	Waste generated	Sustainability Report 2022 *Resource efficiency; Appendix – Data Pack Table E4*
306-4	Waste diverted from disposal	Sustainability Report 2022 *Resource efficiency; Appendix – Data Pack Table E4*
306-5	Waste directed to disposal	Sustainability Report 2022 *Resource efficiency; Appendix – Data Pack Table E4*
GRI 307: Environmental compliance 2016		
307-1	Non-compliance with environmental laws and regulations	There were no reported incidents of non-compliances under Australian environmental laws or regulations that required external notification to an environmental regulatory authority.
SOCIAL		
GRI 401: Employment 2016		
401-1	New employee hires and employee turnover	Sustainability Report 2022 *Appendix – Data Pack Table P6*
GRI 403: Occupational health and safety 2018		
403-1	Occupational health and safety management system	Sustainability Report 2022 *Health, safety and well-being*
403-2	Hazard identification, risk assessment and incident investigation	Sustainability Report 2022 *Health, safety and well-being; Appendix – Data Pack Table P12*
403-3	Occupational health services	Sustainability Report 2022 *Health, safety and well-being*
403-5	Worker training on occupational health and safety	Sustainability Report 2022 *Health, safety and well-being; Appendix – Data Pack Table P9*
403-6	Promotion of worker health	Sustainability Report 2022 *Health, safety and well-being*
403-8	Workers covered by an occupational health and safety management system	Sustainability Report 2022 *Health, safety and well-being*
403-9	Work-related injuries	Sustainability Report 2022 *Health, safety and well-being; Appendix – Data Pack Table P10*
403-10	Work-related ill health	Sustainability Report 2022 *Health, safety and well-being; Appendix – Data Pack Table P11* *Note:* Ill-health records are a subset of total recordable injuries

TOPIC SPECIFIC DISCLOSURES		
GRI 404: Training and education 2016		
404-1	Average hours of training per year per employee	Sustainability Report 2022 *Appendix – Data Pack Table P7*
404-3	Percentage of employees receiving regular performance and career development reviews	Sustainability Report 2022 *Appendix – Data Pack Table P2*
GRI 405: Diversity and equal opportunity 2016		
405-1	Diversity of governance bodies and employees	Sustainability Report 2022 *Diversity, inclusion and belonging; Appendix – Data Pack Tables P1, P3, P4, P5*
GRI 407: Freedom of association and collective bargaining 2016		
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Sustainability Report 2022 *Our people; Responsible supply chain* *https://www.csiro.au/en/about/Policies/CSIRO-Enterprise-Agreement* *https://www.csiro.au/en/about/Policies/modern-slavery-statement*
GRI 408: Child labour 2016		
408-1	Operations and suppliers at significant risk for incidents of child labour	Sustainability Report 2022 *Community engagement and capacity building – protecting children and young people; Responsible supply chain* *https://www.csiro.au/en/about/policies/child-safe-policy* *https://www.csiro.au/en/about/Policies/modern-slavery-statement*
GRI 411: Rights of indigenous peoples 2016		
411-1	Incidents of violations involving rights of indigenous peoples	There were no known incidents of violations involving rights of Indigenous peoples during the reporting period
GRI 412: Human rights assessment 2016		
412-1	Operations that have been subject to human rights reviews or impact assessments	Sustainability Report 2022 *Responsible supply chain* *https://www.csiro.au/en/about/Policies/modern-slavery-statement*
GRI 414: Supplier social assessment 2016		
414-1	New suppliers that were screened using social criteria	Sustainability Report 2022 *Responsible supply chain* *https://www.csiro.au/en/about/Policies/modern-slavery-statement*
GRI 418: Customer privacy 2016		
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	CSIRO has measures in place to manage compliance including our Privacy Management Plan and Data Breach Response Plan. During FY22 CSIRO had no Notifiable Data Breaches under the Notifiable Data Breaches Scheme. Sustainability Report 2022 *Data security and privacy* *https://www.csiro.au/en/about/policies/privacy* Annual Report 2021–22 Part 4 *Management and accountability – Archives, privacy and administrative decisions* privacy@csiro.au

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Contact us
1300 363 400
csiro.au/contact
csiro.au

For further information
CBIS Sustainability
sustainability@csiro.au

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