

We imagine we collaborate we innovate

Corporate Plan 2016–17



**Our people are
focused on delivering
innovation to
fuel the future.**



Innovation catalyst – it's underway

The Chief Executive

Last year the introduction to the Corporate Plan was titled *'The future, today'* as it was clear that CSIRO was already delivering excellent, future-gazing science to reinvent the impossible and position us as Australia's innovation catalyst.

The actions outlined in this plan directly address the big challenges of digital disruption, rising costs of healthcare, environmental change, the reinvention of existing industries, and amplifying Australia's competitiveness in responding to accelerating global change. CSIRO is addressing these challenges from our foundation of excellent science, leveraging dynamic partnerships and a solid understanding of Australia's future needs.

Under Strategy 2020 we are becoming more agile and better equipped to get our science into people's hands as quickly as possible to improve Australia's sustainability and prosperity. Our decision frameworks support a consistent, organisation-wide approach to building capability and partnerships, and demonstrating their real-world value.

This year saw two critical initiatives realised. We officially merged CSIRO's Digital Productivity Business Unit and NICTA to create Data61 – an unmatched force that will support each part of our organisation as we respond to digital disruption. We've also enhanced our collaboration with universities and partnerships with industry through the launch of Lab 22, our advanced 3D printing facility, the Food Innovation Centre, the Climate Science Centre, the ON Innovation and Entrepreneurship program and the \$200m Innovation Fund.

Through the National Innovation and Science Agenda the government has invested an additional \$118 million over four years for the CSIRO Accelerator program and Data61, backing our Strategy 2020 mission to be Australia's innovation catalyst and collaboration hub.

We will take the ON innovation program national, working with Australia's 41 universities to accelerate the delivery of impact for national benefit. We have increased our investment in future science areas to build our core capabilities, to deliver excellent science where it is most needed and help shape the CSIRO agenda for years to come.

With our partners, we use science to transform our nation's challenges into opportunities; we deliver innovative solutions that make life better for all Australians.

Science in the national interest is absolutely our mandate, and we are not changing this. We test everything we do and if it doesn't directly benefit Australia, we don't do it.



We will catalyse innovation by collaborating with the collective power of the national R&D system to address challenges like cyber security and water management. We will create unique opportunities for Australia and support the development of new industries to help reinvent Australia's economy.

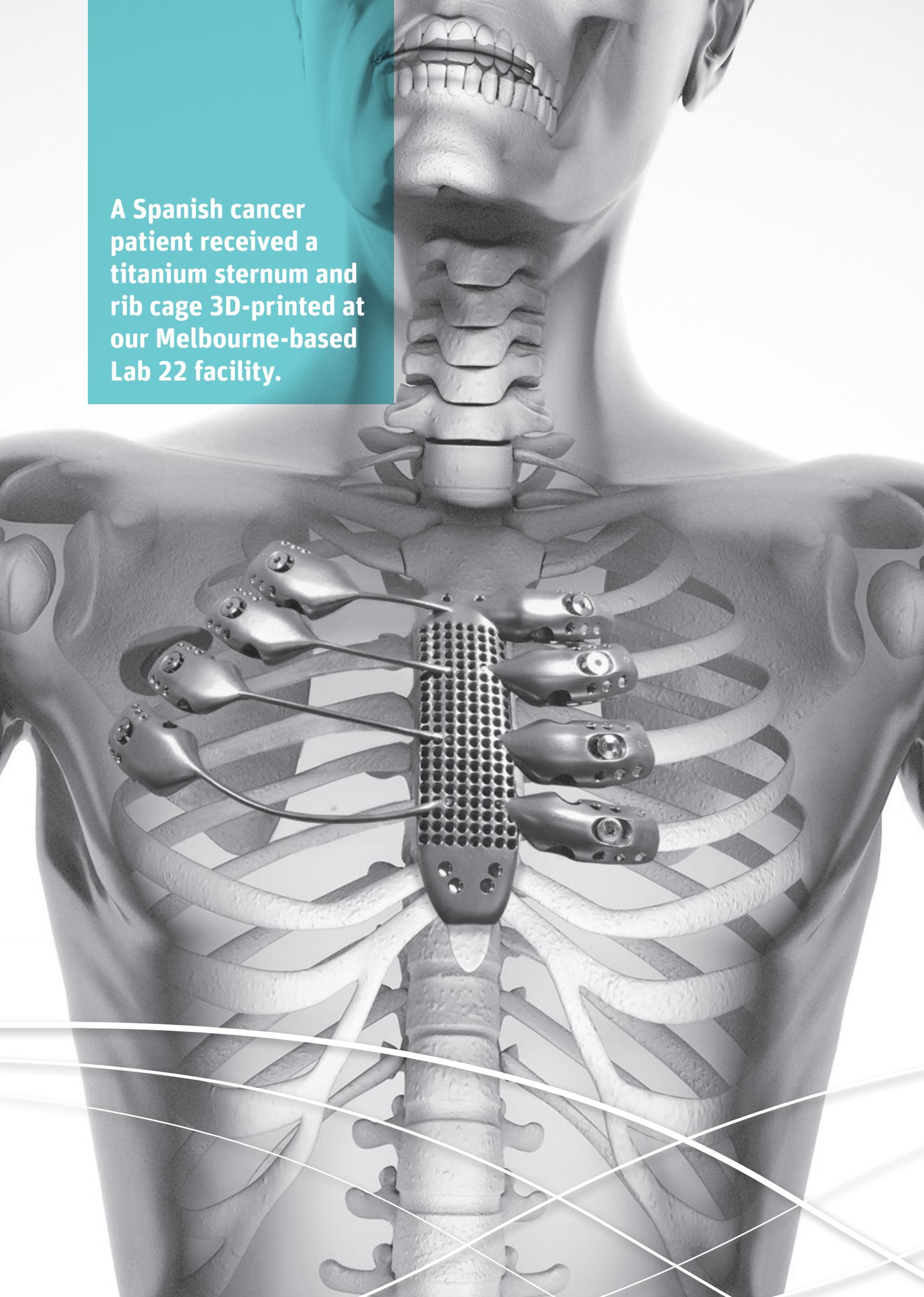
This mandate is built on CSIRO's core of science excellence created and renewed by our amazing people. I believe our people are best placed to map Australia's path to prosperity, sustainability and societal benefit through science and innovation.

CSIRO science will transform the nation's biggest challenges into opportunities, and as we celebrate 100 years of Australian government investment in innovation I'm more excited than ever to see us drive and unleash Australia's innovation potential.

A handwritten signature in dark ink, reading "Larry Marshall". The signature is fluid and cursive, with a large, looping initial "L".

Dr Larry Marshall
Chief Executive

A Spanish cancer patient received a titanium sternum and rib cage 3D-printed at our Melbourne-based Lab 22 facility.



Contents

| | |
|-----------|--|
| 1 | Chief Executive's message |
| 5 | Organisational structure |
| 6 | Our purpose |
| 9 | Our strategy |
| 13 | Our operations |
| 13 | CSIRO investment and workforce plan |
| 14 | Scope of Business Unit reviews |
| 15 | Program 1.1 Research – Science, Services and Innovation Fund |
| 18 | Future Science Platforms |
| 21 | Program 1.2 National Research Infrastructure – National Facilities and Collections |
| 22 | Program 1.3 Science and Industry Endowment Fund (SIEF) |
| 24 | Managing our risks |
| 26 | Governance |

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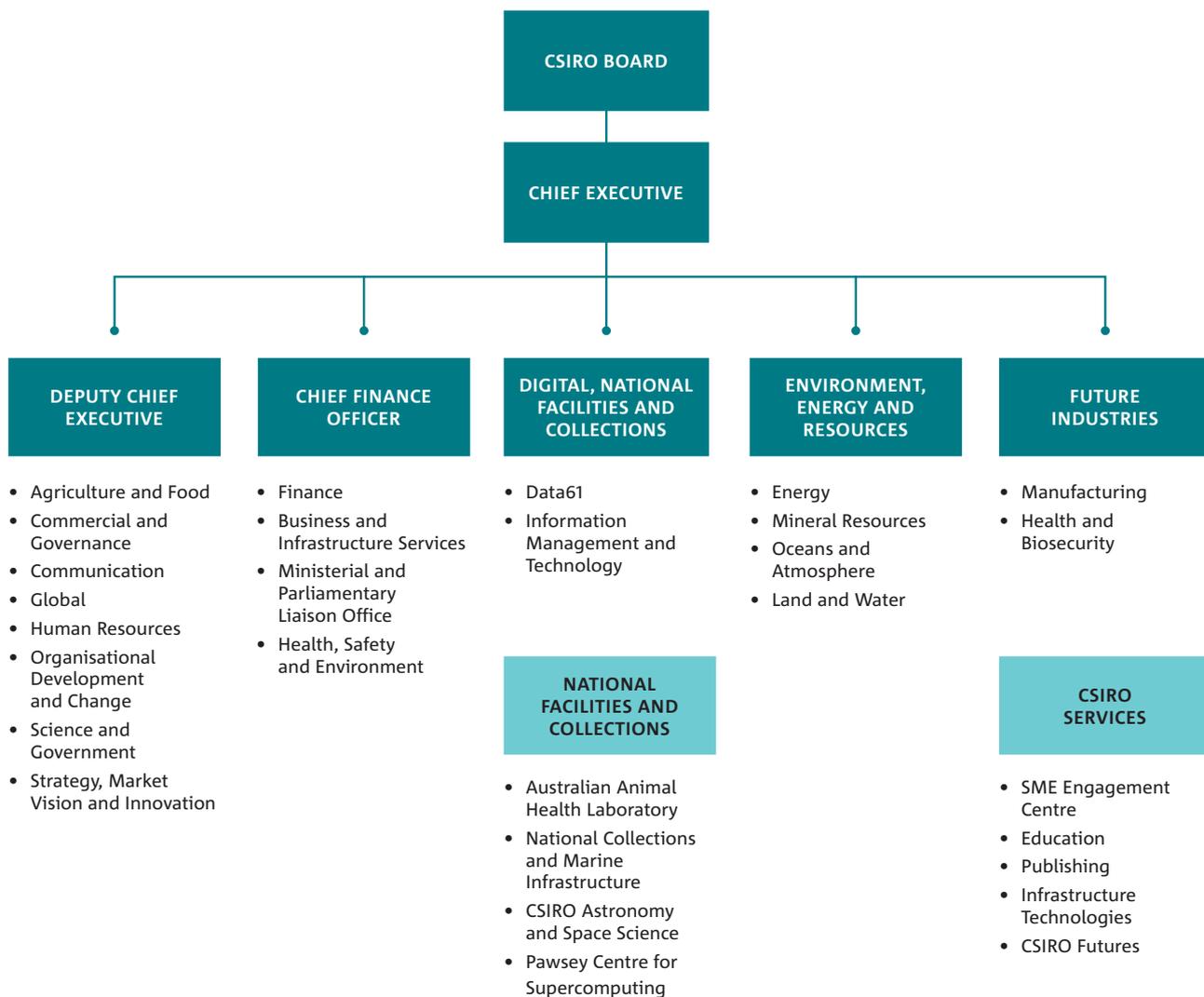
Now, more than ever, Australia needs science and technology. We must continue to collaborate across industry, government and academia, and the CSIRO strategy focusses on this. CSIRO already partners with 39 Australian universities, and together we can meet the science and research needs facing our nation.

DAVID THODEY, BOARD CHAIRMAN

We, the CSIRO Board, as the accountable authority of CSIRO present the CSIRO Corporate Plan 2016–17 as required under paragraph 35(1(b)) of the Public Governance, Performance and Accountability Act 2013 (PGPA Act). The plan is prepared in accordance with the Public Governance, Performance and Accountability Rule 2014.

The Plan is prepared for the financial year 2016–17 and covers the reporting periods 2016–17 to 2019–20. It sets out the strategies CSIRO proposes to pursue to fulfil its purpose, the activities CSIRO proposes to carry out and how it will measure its performance, and the resources CSIRO proposes to allocate to these activities.

Organisational structure (as at 1 July 2016)



Our purpose

CSIRO is an Australian Government statutory authority within the Industry, Innovation and Science Portfolio, operating under the provisions of the *Science and Industry Research Act 1949* (SIR Act)¹.

Our primary purpose is to conduct scientific research and provide services to address the problems facing industry and the nation. CSIRO is charged with hosting National Research Infrastructure on behalf of the scientific community to assist with the delivery of research. CSIRO is also required to assist in the uptake and use of scientific results to achieve national objectives and responsibilities.

Additionally, CSIRO is tasked to act as an effective catalyst within the innovation system, with a focus on:

- connecting individuals, associations and industry across the world around scientific research;
- contributing in the development of the next generation of scientists;
- providing opportunities and financial support for partnerships and mentoring; and
- disseminating knowledge.

PURPOSES

- 1(a) To carry out scientific research for:
 - (i) assisting Australian industry,
 - (ii) furthering the interests of the Australian community,
 - (iii) contributing to the achievement of the Australian national objectives or the performance of the national and international responsibilities of the Commonwealth, and
 - (iv) any other purpose determined by the Minister
 - (b) To encourage or facilitate the application or utilisation of the results of such research
 - (ba) To encourage or facilitate the application or utilisation of the results of any other scientific research
 - (bb) To carry out services, and make available facilities, in relation to science
 - (c) To act as a means of liaison between Australia and other countries in matters connected with scientific research
 - (d) To train, and to assist in the training of, research workers in the field of science and to co-operate with tertiary-education institutions in relation to education in that field
 - (e) To establish and award fellowships and studentships for research, and to make grants in aid of research, for a purpose referred to in paragraph (a)
 - (f) To recognize associations of persons engaged in industry for the purpose of carrying out industrial scientific research and to co-operate with, and make grants to, such associations
 - (h) To collect, interpret and disseminate information relating to scientific and technical matters; and
 - (j) To publish scientific and technical reports, periodicals and papers.
- 2 The Organisation shall:
 - (a) treat the functions referred to in paragraphs (1)(a) and (b) as its primary functions; and
 - (b) treat the other functions referred to in subsection (1) as its secondary functions.

¹ <https://www.legislation.gov.au/Details/C2012C00352>

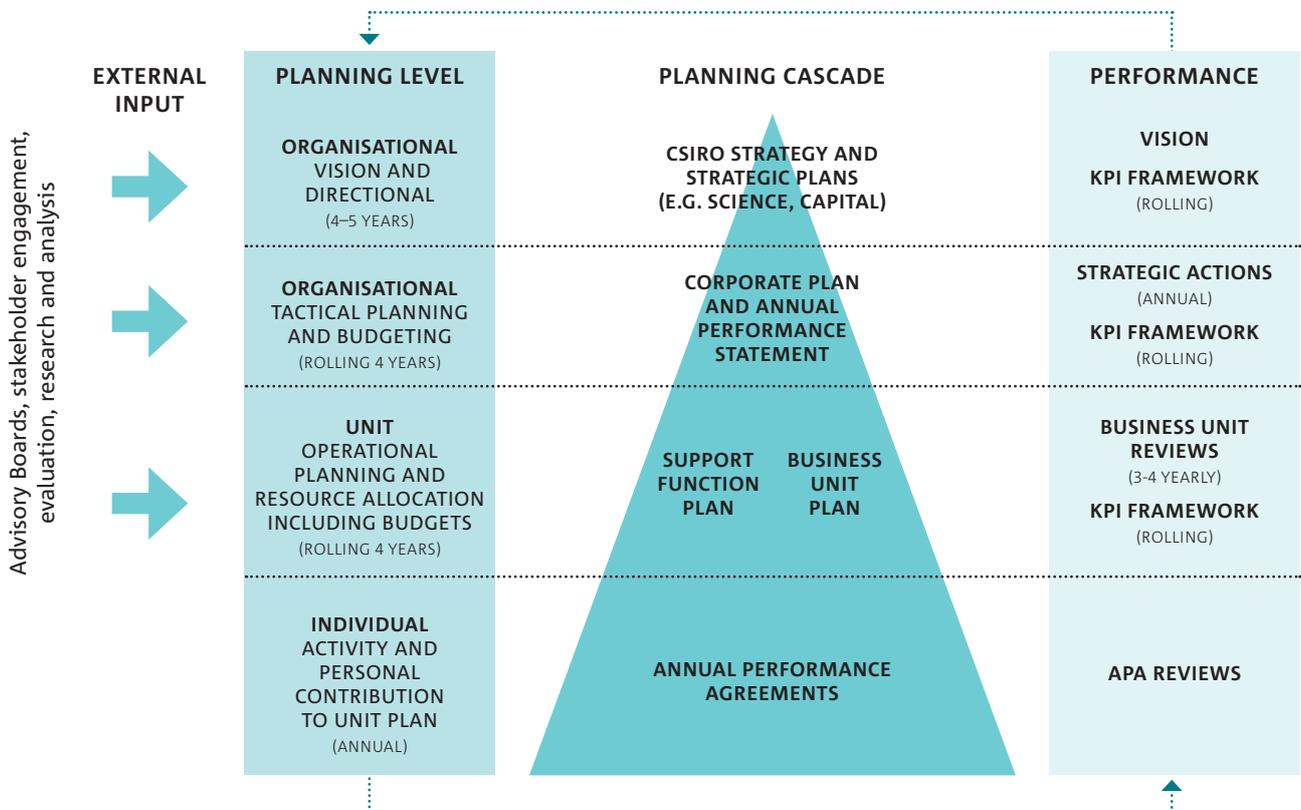
Our mission

Based on our purpose, CSIRO’s mission is to create benefit for Australia through impactful science and innovation. This is underpinned by excellent science and expansive national international collaborations. Therefore, CSIRO has an abiding interest in better understanding the pathways needed to engage customers in our activities and to articulate the intended and delivered impact from our research.

Through our Planning and Performance Framework (see figure below) we are able to have a consistent, organisation-wide approach to planning activities as well as managing, evaluating and reporting their outcomes,

which promotes understanding and demonstrates real-world value. The Framework also places particular emphasis on the requirement to improve clarity around performance and accountability. This process informs our decision-making and provides opportunities to evaluate the appropriate, effective and efficient use of the resources entrusted to us.

The aim of this Corporate Plan is to provide details on how we intend to operationalise our planning and review activities from the organisational through to Business Unit levels, over the 2016–17 to 2019–20 period.



**We harness the
opportunities of
digital disruption.**



Our strategy

CSIRO's vision is to be Australia's innovation catalyst, collaborating to boost Australia's innovation performance.

In order to support this goal, we have established clear objectives and key actions to implement and achieve our Strategy 2020 plan. These activities are carried out across our entire organisation (Science, Services, National Facilities and Collections) as well as undertaken and supported by Enterprise Support Services.

| OBJECTIVES | KEY PERFORMANCE INDICATORS ² | KEY STRATEGIC ACTIONS ³ (2016–17 TO 2019–20) |
|------------|---|---|
|------------|---|---|



Customer first

To create deeper innovation relationships with our customers and prioritise the highest value investments.



Collaboration hub

To integrate the best solutions for our customers, increase our flexibility and enhance Australia's innovation performance.



Global outlook, national benefit

To deliver connectivity to the global science, technology and innovation frontier as well as access new markets for Australian innovation.



Deliver on commitments

To enhance our agility, financial sustainability and capacity to respond at the speed of business.

- Evidence of progress towards, and delivery of impact objectives based on mixed method evaluation, including external review outcomes, independently validated impact studies, verifiable evidence of uptake and adoption, and periodical whole of CSIRO impact assessments.
- Maintain our customer satisfaction using our customer 'willingness to recommend' net promoter score.

- Increase internal and external collaboration through the assessment of staff mobility across Business Units and our external engagement with industry and other stakeholders.
- Increase the number of active technology licences from our research over base year 2014–15.
- Achieve budget as approved by the Board and consistent with the Portfolio Budget Statements.

- Continually developing and improving the end to end customer experience and our capacity to deliver innovative solutions to customers.
- Embed a rigorous impact and investment planning, monitoring and evaluation framework into our business and employ it to continually optimise our portfolio.
- Deliver and act upon market and technology roadmaps to support national challenges and industry innovation.
- Increasing our contribution to the mobility and exchange of people and know-how between research, industry and government.
- Deepen our partner relationships with universities and other research organisations to access a broader pool of external capability.
- Developing a more compact, vibrant and efficient property footprint through capital city consolidation and increased co-location.
- Increasing our engagement in education and training from school age to PhD level and the workplace to help build and equip Australia's future science, technology, engineering and mathematics (STEM) and innovation capable workforce.
- Accelerate our overall rates of international engagement, operations and collaboration where there is a higher potential impact value return to Australia than available domestically.
- Prioritise three key regions for sustained presence and development where there is clear intersection with our impact objectives and sustainable business opportunity.
- Grow our overall external revenue ratio, focus on growing our industry, international and IP business, and reduce our overhead costs.
- Continually streamline and improve our processes and systems to support efficient and effective commercial engagement and project delivery.
- Continually increase the transparency, availability and utility of relevant information through whole of CSIRO knowledge management systems.

² KPIs may be shared across a number of strategic actions.

³ Performance measures for these key strategic actions can be found in the Our Operations section.

| OBJECTIVES | KEY PERFORMANCE INDICATORS ² | KEY STRATEGIC ACTIONS ³ (2016–17 TO 2019–20) |
|---|---|--|
|  <p>Breakthrough innovation</p> <p>To increase our capacity to help reinvent existing industries and create new industries for Australia and deliver public good.</p> | <ul style="list-style-type: none"> • Increase our innovation capacity across all staff cohorts over the base year of 2015–16. | <ul style="list-style-type: none"> • Implementing a transformative innovation program, new investment models and funding to accelerate our entrepreneurial capacity and provide new models for our customers to adopt technology, knowledge and services. • Deepen our direct support for Australian technology start-ups and SMEs in areas of national growth priority. • Creating a world class digital innovation capability for Australia. • Supporting, developing and incentivising our people to take commercial and scientific risk, tolerate positive failure and promote a learning culture. |
|  <p>Excellent science</p> <p>To create breakthrough technology and knowledge and be a trusted advisor for Australia.</p> | <ul style="list-style-type: none"> • Increase our investment in future science and technology platforms, including capability development and central competitive funds • Maintain or increase the number of refereed publications. | <ul style="list-style-type: none"> • Invest only in the science and engineering that is aligned to impact objectives and that CSIRO is best placed to do. • Increase the value from, and investment in, a portfolio of Future Science Platforms with higher technical risk and the potential to help reinvent and create new industries for Australia. • Continue to ensure our brand is a guarantee of the highest quality scientific standards and trusted advice. |
|  <p>Inclusion, trust and respect</p> <p>To fully enable and support the innovation capacity of our creative people and teams to take risk and deliver to customers.</p> | <ul style="list-style-type: none"> • Increase the diversity of our leadership cohort including gender, non-English speaking background, and Aboriginal and Torres Strait Islanders. | <ul style="list-style-type: none"> • Promote inclusion and diversity as a key driver of innovation, specifically increasing gender and cultural diversity in middle and senior leadership positions, and the number of Aboriginal Australians and Torres Strait Islanders in CSIRO over the strategy period. • Empower frontline teams with autonomy, performance and accountability – maximising frontline capacity for action and providing clear performance goals. • Promote seamless collaboration across boundaries, internally and externally. • Promote a culture of open sourcing, information sharing and transparency of decision making. |
|  <p>Health, safety and environment</p> <p>To enhance staff safety and wellbeing and to further our aspiration towards zero harm.</p> | <ul style="list-style-type: none"> • Increase staff safety via zero harm policy of continuous improvement of Recordable Injury Frequency Rate. | <ul style="list-style-type: none"> • Continue to strengthen our innovation culture and operations in key areas that enhance the wellbeing of our people and improve in areas that detract from wellbeing. • Equip our people with the knowledge and skills to support the physical and psychological health of their teams across a diverse range of operating environments, proactively learn from staff and customer experience, and provide efficient safety systems. • Deepen integration of environmental sustainability principles throughout the business areas to reduce consumption of resources and carbon emissions. |

**We work closely
with communities
and industries for a
lasting legacy.**



Our operations

Our operating model underpins the successful execution of our strategy and delivery of our goals. CSIRO's operational arrangements recognise our differentiation as a large scale, multidisciplinary impact organisation and enables growth opportunities in each of our major roles in the national innovation system.

The table below summarises our planned investment and staff allocation required to achieve our activities. The majority of revenue for the organisation is sourced from the Australian Government, with additional funding obtained from the private sector, Rural Industry R&D Corporations, Cooperative Research Centres, and overseas entities. It is expected that no significant changes to these sources will occur in the forward estimates.

CSIRO's workforce plan sets out strategies to ensure that CSIRO staff have the skill sets required to deliver against the organisation's purpose, and includes initiatives aimed at enhancing workforce flexibility and mobility, including increased overseas posting of staff, increased use

of locally engaged overseas staff and secondment from industry into CSIRO and for researchers into industry. We will also maintain our commitment to developing the next generations of researchers through our co-supervision with Australian and international universities of 1,200 students.

CSIRO will also be seeking to enhance our performance against diversity and inclusion goals, including increasing the participation of women and culturally and linguistically diverse staff in leadership roles. CSIRO will also increase the participation of Indigenous staff in our workforce.

CSIRO's Average Staffing Level is anticipated to remain within a narrow variation range over the strategy period.

CSIRO investment and workforce plan⁴



| TOTAL PROGRAM EXPENSES (\$M) | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
|--|--------------|--------------|--------------|--------------|
| Program 1.1 Research –Science, Services and Innovation Fund | 1,179 | 1,202 | 1,285 | 1,310 |
| Program 1.2 National Research Infrastructure – National Facilities and Collections | 148 | 154 | 150 | 150 |
| Program 1.3 Science and Industry Endowment Fund (SIEF) | 23 | 22 | 10 | 5 |
| TOTAL EXPENSES | 1,351 | 1,380 | 1,445 | 1,465 |



| AVERAGE STAFFING LEVEL | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
|--|-------------|-------------|-------------|-------------|
| Research Business Units | 3416 | 3377 | 3484 | 3589 |
| CSIRO Services | 138 | 136 | 140 | 145 |
| National Facilities and Collections | 472 | 466 | 481 | 496 |
| Enterprise Support Services | 1052 | 1040 | 1073 | 1105 |
| TOTAL AVERAGE STAFFING LEVEL⁵ (NUMBER) | 5078 | 5019 | 5178 | 5335 |

⁴ Source: CSIRO Portfolio Budget Statement 2016-17

⁵ Source: CSIRO Human Resources. Based on estimated Average Staffing Level (ASL) for 2016-17 to 2019-20.

In addition, CSIRO will undertake Business Unit Reviews in the 2016–17 and forward periods following a pause in reviews in the past few years. Business Units have been created to integrate capability, science, project delivery and partnerships to deliver impact in the context of their stated Business Unit goals. External Review Panels undertake Business Unit Reviews on a four year cycle and discuss, examine, assess and make recommendations to improve the impact, science and innovation capacity across each Business Unit (see Table below for assessment scope).

The following section provides details of the Programs, which we intend to undertake to fulfil our purpose, along with an overview of their environments, performance measures and allocated resources.

Key to enabling our Programs to fulfil our purpose are the Enterprise Support Services, including:

- Finance, Business and Infrastructure Services ensure that CSIRO meets its financial obligations, operates within budget and supports the maintenance of CSIRO's facilities.

- Information Management, which delivers information technologies and library services that support CSIRO research activities and enterprise support functions
- Human Resources, Health Safety & Environment and Organisation Development support CSIRO through a diverse set of activities that are targeted at the safety and health of our people, operating environmentally sustainably and supporting our people and leaders to operate at their best.
- Commercial & Governance support researchers and the business with research contracts and ensure we meet our legal obligations and have in place the policies and procedures to operate effectively, as well as identifying future business opportunities and developing the relationships that enable the creation and uptake of CSIRO's science and technology.
- Ministerial and Parliamentary Liaison manages and supports CSIRO's relationship with its Minister, and engagement with the Parliament.
- Strategy, Market Vision and Innovation, and Science & Government support the targeting of our science investments to the highest priorities, and measuring and reporting our science and organisational performance.

Scope of Business Unit reviews

| PERFORMANCE DIMENSION | OBJECTIVE | REVIEW SCOPE |
|-----------------------|---|---|
| Impact | To deliver profound economic, environmental and social impact to the nation. | <ul style="list-style-type: none"> • Appropriateness • Benefits • Impact management • Path to impact • Uptake and adoption |
| Science | Maintain high quality science capacity and resources to support multidisciplinary, impact focused research. | <ul style="list-style-type: none"> • Research prospectivity • Research output quality • Capabilities and resources • Capability development |
| Innovation capacity | Enhance our innovation capacity and culture. | <ul style="list-style-type: none"> • Leadership • Operational approach • Resources • Connectedness • Environment • People |

Program 1.1 | Research – Science, Services and Innovation Fund

Objective

To deliver economic, social and environmental impact to the nation through the provision of advice, information and solutions including the delivery of new and improved technologies, management systems, intermediate and final products, catalyst services for business, advice relevant to policy development, new knowledge and skills, and investment in early stage ventures founded in Australian research.

Environment

CSIRO science, services and integrative activities have a critical role to play in Australia's innovation agenda, and to address national and global research challenges.

Today, CSIRO is a more successful, integrated, globally competitive, and distinctive applied research organisation than it was in the year 2000. However, by 2020 it will be challenging to sustain CSIRO's breadth of impact domains and science capabilities. The innovation system has been recognised as critical to the future prosperity of the nation. We will continue to build systematic, larger scale and deeper collaborations that will promote industry and international growth. Our ON Program focuses on improving Australia's innovation performance by collaborating more with customers, universities and other publicly funded research agencies to understand and address national challenges.

The National Innovation and Science Agenda (NISA) endorses our Strategy 2020 with our own vision to be Australia's innovation catalyst reflected in the Government's desire to use innovation to drive growth, productivity, export and jobs. Specifically, endorsed under NISA is an early stage innovation fund to support co-investment in new spin-out or startup companies, products and services created by Australian research institutions. The fund will comprise \$70 million in new government funding, as well as private sector investment and new revenue from CSIRO's WLAN program and a \$20 million expansion to CSIRO's Accelerator program to include other publicly funded research organisations to more rapidly prepare their research for commercial adoption.

Productivity is critical, driven by rapid technological innovation. Australia has strengths in innovation inputs, but does not compare well internationally in translation mechanisms that bring innovations to market. At the same time Australia is experiencing a significant shift in global R&D investment and output to the Asia-Pacific region. This presents both industry and science collaboration opportunities for CSIRO which will in turn provide national benefit.

The world is becoming faster and more open. Data underpins the new economy, and is essential for

solving the world's problems and providing prosperity for Australia. Through Data61 we will focus on building the technologies and businesses that revolve around, feed on, and deal with data in all its forms. This includes the intersection of hardware, software, services and users.

Performance measures

SCIENCE AND SERVICES

| KPI METRIC | PERFORMANCE INDICATOR |
|------------------------------------|---|
| Impact return on investment | Evidence of (economic, social and environmental) impacts through validated uptake and adoption of research outputs and science excellence |
| Customer satisfaction | Customer and user satisfaction as measured through satisfaction and willingness to recommend surveys and other feedback mechanisms |
| External earnings | Maintain or grow proportion of external revenue, particularly from industry and international |
| Engagement and innovation capacity | Improve the innovation capacity, diversity and inclusion of staff with a focus on leadership |

INNOVATION FUND

| KPI METRIC | PERFORMANCE INDICATOR |
|---|---|
| Sustainable pipeline of fundable opportunities | The Fund has a strong pipeline of investible propositions across deep science based technology from the catchment of publicly funded research institutions from each of the eligible participant stakeholder groups |
| Alignment with national and industry priorities | Investment portfolio aligns with key industry sectors including the Government's Science and Research Priorities, and Industry Growth Centres |

Resources and capability

| | |
|-----------------------------------|--------------|
| OVERALL PROGRAM EXPENDITURE (\$M) | 1,179 |
| + AVERAGE STAFFING LEVEL | 3554 |



Agriculture and Food

TOTAL EXPENDITURE (\$M)⁶ **227**

By 2030, CSIRO Agriculture and Food's technologies, management and knowledge systems will generate a sustainable gain in profitability of >\$2 billion per annum with multiple benefits to the economy, environment and society of Australia. Our research on food and fibre production and processing will capture growing regional export markets for Australian industries and be integral to the global response to food security for the world's growing population.

PROGRAMS:

- Agriculture and Global Change
- Breakthrough Genetic Technologies
- Breeding Higher Value Food Crops
- Crop Improvement for Novel Plant Products
- Food
- Integrated Agricultural Systems
- Integrated Sustainable Aquaculture Production
- Productive and Adaptive Livestock Systems
- Sustaining Agricultural Soils and Landscapes



Health and Biosecurity

TOTAL EXPENDITURE (\$M)⁶ **55**

Provide leadership and deliver measurable improvement in Australia's one-Health system: enhancing health, social, environmental and economic wellbeing in the face of increased healthcare pressures and global biosecurity threats.

PROGRAMS:

- Combating Emerging Infectious Diseases
- eHealth
- Managing Invasive Species Impacts
- Nutrition and Health
- Risk Evaluation and Preparedness



Land and Water

TOTAL EXPENDITURE (\$M)⁶ **118**

Deliver solutions for sustainable development and stewardship of land, water, ecosystems and communities, valued at over \$12 billion per annum in triple bottom line benefits.

PROGRAMS:

- Adaptive Social and Economic Systems
- Basin Management Outcomes
- Biodiversity Ecosystem Knowledge and Services
- Environment Contamination Mitigation and Technology
- Landscape Intensification
- Water Resource Management

⁶ Total Expenditure for 2016-17 as per CSIRO internal budget.



Data61

TOTAL EXPENDITURE (\$M)⁶ **108**

Creating Australia's data driven future by capturing 0.1% of Global R&D spend within the Data61 Network delivering economic impact for collaborators (ROI), and positive impact on Australia's innovation system and society.

PROGRAMS:

- Analytics
- Cyber Physical Systems
- Decision Sciences
- Software and Computational Systems
- Engineering and Design
- Product, Program and Marketing



Energy

TOTAL EXPENDITURE (\$M)⁶ **121**

Deliver solutions that will enhance Australia's economic competitiveness and regional energy security while enabling the transition to a lower emissions energy future.

PROGRAMS:

- Coal Mining
- Grids and Energy Efficient System
- Low Emissions Technology
- Oil, Gas and Fuels
- Onshore Gas



Manufacturing

TOTAL EXPENDITURE (\$M)⁶ **126**

Develop the scientific and engineering innovations to transition Australian manufacturing into a globally connected, economically viable, high-technology sector; creating the jobs of the future, export growth, and investment in the nation's manufacturing industry and increasing the value of the sector.

PROGRAMS:

- Advanced Fibres and Chemical Industries
- Bio Medical Manufacturing
- High Performance Metal Industries
- Industrial Innovation



Mineral Resources

TOTAL EXPENDITURE (\$M)⁶ **89**

Deliver science and technology options for the discovery and efficient development of Australia's mineral resource endowment that enable flow-on benefits to the wider national economy.

PROGRAMS:

- Discovering Australia's Mineral Resources
- Hard Rock Mining
- Intelligent Mining and Resource Management
- Processing Australian Ores
- Resources Characterisation
- Resources, Community and Environment



Oceans and Atmosphere

TOTAL EXPENDITURE (\$M)⁶ **108**

Boost Australia's prosperity and wellbeing through solutions that enable the sustainable economic, social and environmental use of Australia's marine estate and management of the atmospheric environment.

PROGRAMS:

- Climate Science Centre
- Coastal Development and Management
- Earth System Assessment
- Engineering and Technology
- Marine Resources and Industries
- Ocean and Climate Dynamics



CSIRO Services

TOTAL EXPENDITURE (\$M)⁶ **39**

Provide value for customers and the nation through effective and efficient innovation enabling products and services.

PROGRAMS:

- Education and Outreach
- Futures Advisory Services
- Infrastructure Technologies
- Publishing
- SME Engagement

Future Science Platforms

CSIRO's Future Science Platforms (FSPs) represent an investment in science that underpins innovation and has the potential to help reinvent and create new industries for Australia. The Platforms offer new opportunities for staff to work on frontier science and will help increase internal and external collaboration by attracting the best students and researchers to work with us. The FSPs enable direct investment in CSIRO's research capabilities. We have six FSPs working across the organisation in 2016–17, representing a total investment of \$15M

| TITLE | SUMMARY |
|--------------------------|--|
| Active Integrated Matter | A new technology platform combining materials, processing and sensing technologies and autonomous science to lead ground-breaking advances at the interface of big data, advanced autonomous systems, and materials science. Inventions and advances at these interfaces will drive the i-manufacturing or manufacturing 4.0 revolution and put early adopter industries ahead of the competition. |
| Environomics | This platform aims to reinvent how we measure and monitor ecosystem health, predict biodiversity responses to environmental change, manage biological resources, detect biosecurity threats and more. This next generation of environmental science will be based on genomics, phenomics, big data informatics and simulation. |
| Digiscape | We're developing the next generation decision support tools which will transform our agricultural industries and environmental planning, policy and implementation. With these advances, we will open up new partnerships, generate new revenue streams and provide a new way to recognise and manage risk and uncertainty. We will mix cutting edge science and technology, innovation in integration and anchor the research in end-user experience and feedback. |
| Probing Biosystems | A revolution in healthcare and agriculture through devices and systems to obtain real-time information from living organisms about their health and well-being. This will lead to the ability to provide health and medical interventions that are timely, customised and highly specific. |
| Synthetic Biology | The design, fabrication, and construction of new biological parts, devices, systems, and machines, as well as the re-design of existing, natural biological systems for useful purposes. Synthetic biology enables revolutionary advances in cellular factories, designer organisms and biological devices. We will also develop frameworks for appropriate risk management and regulation of synthetic biology. |
| Deep Earth Imaging | In the future, Australia's minerals, energy and water resources will come from far greater depths in the Earth and from deep offshore plays, but our ability to find and exploit these resources is limited by the deep and complex cover of sediments and weathered material that covers 80% of Australia's land mass. The science of Deep Earth Imaging will help us more precisely image subsurface rock properties to unlock the potential of this vast and relatively underexplored area. |



**Our research opens
up avenues of
discovery, increasing
national knowledge.**

TRIP

6.00x2.20

**Our people are
custodians of knowledge
and facilities for
the nation.**



Program 1.2 | National Research Infrastructure – National Facilities and Collections

Objective

CSIRO hosts National Research Infrastructure on behalf of the scientific community to assist with the delivery of research. These facilities and collections are not restricted to CSIRO personnel. There are two types of National Research Infrastructure:

- National Facilities that provide large-scale specialised facilities and equipment, and
- National Collections, which are storehouses of information on Australia's biodiversity and other aspects of the environment.

Environment

The national research infrastructure CSIRO hosts is of global significance, used by the international and Australian research communities. Increasingly, major instruments and facilities are beyond the capacity of a single entity to run, resulting in the rise of multi-national, multi-disciplinary, applied, research institutions collaboratively managing and co-investing in resources. These arrangements present opportunities to be more efficient, effective and sustainable, yet can also present challenges in regards to utilisation.

Additionally, science is experiencing rapid growth in the application of digital technologies and data digitisation in international natural history collections. CSIRO will continue to manage the national collections in a manner that utilises the power of digital and genomic technologies to provide rapid access to comprehensive and reliable data.

The 2016 National Research Infrastructure Roadmap currently under development under the leadership of the Chief Scientist will set out Australia's long term research infrastructure needs and propose future areas of investment so that Australia continues to maintain its research excellence and increases innovation across the economy to the benefit of the nation.

Performance measures⁷

| KPI METRIC | PERFORMANCE INDICATOR |
|-------------------------------|--|
| Maintenance of infrastructure | National Research Infrastructure and Collections maintained and operated to appropriate standards |
| Accessibility of collections | Maintain or increase the proportion of collections available and utilised by researchers and the public, including digitised and non-digitised collections |

Resources and capability

| | |
|--|------------|
| OVERALL PROGRAM EXPENDITURE (\$M) ⁸ | 148 |
| + AVERAGE STAFFING LEVEL | 472 |



National Facilities and Collections

Manage Australia's state-of-the-art infrastructure and biological collections to accelerate the delivery of benefits and impacts to the Australian people, research and industry.

PROGRAMS:

- Australian Animal Health Laboratory
- Australia Telescope National Facility
- Pawsey Centre
- National Collections and Marine Infrastructure

⁷ These indicators may be tailored to the specific activities at each National Research Infrastructure (facility or collection).

⁸ Total Expenditure for 2016–17 as per CSIRO internal budget.

Program 1.3 | Science and Industry Endowment Fund (SIEF)

The Chief Executive of CSIRO is also the Trustee of the SIEF, which is a separately constituted trust for statutory purposes under the *Science and Industry Endowment Act 1926* (SIEF Act). SIEF's primary purpose means that grants must be for:

- activities in the fields of natural or applied science for the extension of knowledge, including the practical application of such knowledge; and
- national benefit for the purposes of assisting Australian industry, furthering the interests of the Australian community or contributing to the achievement of Australian national objectives.

Objective

Recognising that science has been, and will be, a key driver of the economic, industrial, environmental, and cultural development of Australia, the Fund makes strategic investments that will contribute to the sustainable growth and address issues of national priority for Australia, such as:

- fundamental research into new paradigms for sustainable resource use, environmental protection and community health;
- tactical research to fast-track solutions to national challenges;
- collaborative research that brings together organisations capable of working together on solutions to national challenges; and
- scholarships that create and sustain young researchers capable of addressing national challenges.

Environment

SIEF is able to provide funding across the national innovation system via a comprehensive portfolio of activities, while maintaining independence and transparency. The monies gifted to SIEF in 2009–10 are finite, and at present the majority of these funds have already been committed. Projects that are now drawing to the end of their SIEF funding will need to identify ongoing and alternative resources to take their work to the next stage of development. Across the national innovation system there is a noticeable increase in universities, as well as other entities, establishing innovation funds in order to support researchers in accessing resources which can accelerate their ideas forward.

The SIEF Trustee, guided by the independent SIEF Advisory Council, has a role in identifying gaps in funding availability across the NIS. For instance, the SIEF has recently established the SIEF Experimental Development Program which is designed to address a significant gap in current funding options available for progressing technology development to a stage suitable for attracting commercial investment and market uptake. This new program will not totally address the challenges, but is one of the pathways available to the publicly funded research agencies in the Industry, Innovation and Science Portfolio, which share the goal of increasing the commercialisation of research.

Performance measures

| KPI METRIC | PERFORMANCE INDICATOR |
|----------------------------------|---|
| Alignment to national priorities | Proportion of newly funded projects that align with the Government's Science and Research Priorities |
| Collaboration | Proportion of projects involving more than one organisation |
| Co-investment | Financial contributions of partners |
| Excellent science | Number of publications from SIEF projects |
| Building critical mass | Number of Early Career Researchers (ECR) funded through SIEF projects |
| Impact return on investment | Evidence of outcomes and impacts of funded projects as demonstrated by case study impact assessment, independent reviews and or evaluations |

Resources and capability

OVERALL PROGRAM EXPENDITURE (\$M) **23**
 + AVERAGE STAFFING LEVEL **3⁹**

⁹ Under the Service agreement between CSIRO and the Trustee, CSIRO manages the SIEF on behalf of the Trustee. ASL represents the number of CSIRO staff seconded to managing the Fund.

Developing the
next generation
of researchers.

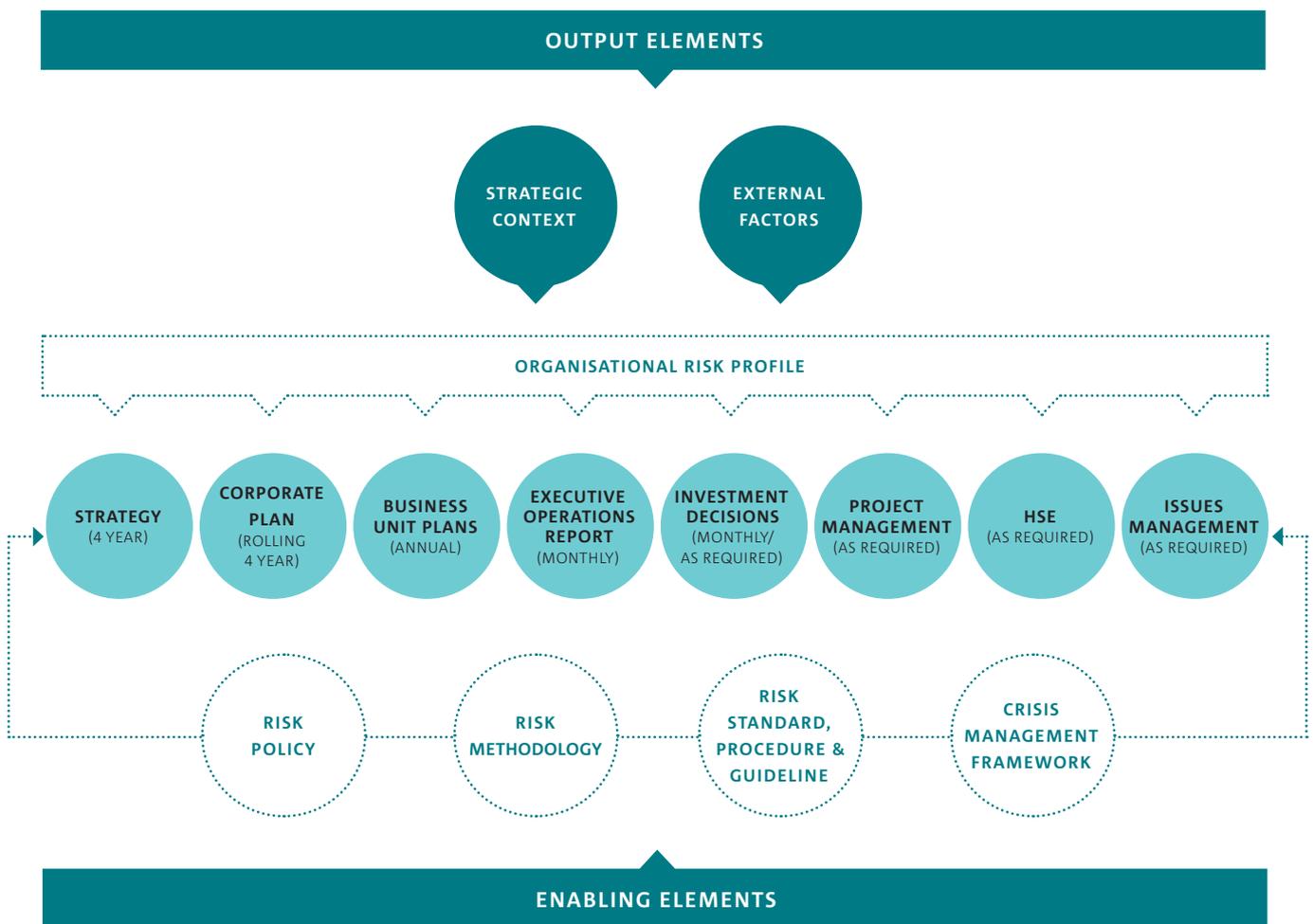


Managing our risks

Accepting and managing risk – especially the technical and commercial risk associated with achieving innovation through science and technology is vital to delivering on our purpose as an organisation. That is why CSIRO is committed to the effective identification and management of risk.

The management of risk is the responsibility of all our people. It is enabled by CSIRO’s Risk System, a comprehensive framework that supports the identification and assessment of risk across the organisation within strategic, operational and tactical contexts.

CSIRO risk system



At the enterprise level, CSIRO develops and maintains an Organisational Risk Plan, in alignment with our Strategy 2020, which reflects CSIRO's approach and posture in managing risks that threaten the achievement of our goals and objectives. CSIRO manages the following key areas of risk:



Science excellence and innovation

Delivering innovative and impactful solutions for our customers requires challenging science with a high inherent risk of failure. To manage these challenges we have robust processes for science quality and integrity and focused capability development activities to enhance the skills of our people.



People and culture

People are at the heart of CSIRO's capability and capacity to deliver innovative solutions for our customers. We manage risks associated with the development and well-being of our people through a values based approach supported by processes and initiatives relating to recruitment, learning and development, workforce and succession planning and staff wellbeing.



Customers, partnerships and collaboration

CSIRO's role as an innovation catalyst and connector requires us to establish and manage deep partnerships and collaborations across the innovation system. It is through these deep connections that we enhance Australia's overall innovation performance whilst creating impact and value for our customers. At a whole of innovation system level, failure to address fundamental productivity and innovation system challenges is a critical risk not just for CSIRO but for Australia that we are addressing through strategic initiatives such as the Accelerator Program, CSIRO Fund and Future Science Platforms. For our customers, failure to identify and then deliver impact and value is a fundamental risk. We manage this through continually developing and improving the end to end customer experience, applying a rigorous impact and investment planning, monitoring and evaluation framework and identifying, to ensure that we integrate the best solutions for our customers.



Governance and compliance

CSIRO's reputation hinges upon the integrity and quality of our science and ability to deliver positive impact for Australia. This risk is managed across all levels of the organisation in ways that include establishing rigour in our scientific processes, effective governance processes to ensure transparency of decision making, financial management practices to ensure efficient use of resources and values based engagement and commercial dealings with customers and stakeholders.

CSIRO recognises its obligations as a government entity conducting a broad range of activities across multiple highly regulated environments. Compliance risk is managed systematically across our Lines of Business, enabled and supported by Enterprise Support functions.

Governance

CSIRO, as an Australian Government agency, is obligated to adhere to all reporting, accountability and other rules of operation as set out in the SIR and PGPA Acts, as well as other relevant legislation, including:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Freedom of Information Act 1982*
- *Equal Employment Opportunity (Commonwealth Authorities) Act 1997*
- *Workplace Health and Safety Act 2011*
- *Privacy Act 1988*
- *Public Interest Disclosure Act 2013*

Therefore, the organisation is required to submit to or participate in processes, such as:

- The responsible Minister's Statement of Expectations;
- Parliament accountability and review process (e.g. Senate Standing Committee on Economics);
- Reviews by external bodies (e.g. audits conducted by the Australian National Audit Office);
- Any judicial or tribunal decisions; and
- Requests to access documents held by an Australian Government agency.

Enterprise Governance provides a framework for direction, control and accountability which enables CSIRO to achieve its objectives. CSIRO's Governance Framework provides for structures and processes to support:

- the ways in which CSIRO is organised, directed and managed;
- CSIRO's compliance with legislation;
- the successful execution of the CSIRO strategy and delivery of objectives;
- planning, investment review and reporting;
- how CSIRO engages with the outside world;
- how CSIRO monitors its performance; and
- the ways CSIRO is held accountable for its decisions and actions.

CSIRO recognises that good governance cannot be measured in purely financial terms. As a public sector body, CSIRO's performance is measured against broader national, social and community objectives.

CSIRO Board and Committees

The CSIRO Board is responsible to the Australian Government for the overall governance, strategy and performance of the Organisation. CSIRO is accountable to the Minister for Industry and Science as part of the Industry, Innovation and Science Portfolio.

The primary functions of the Board are to:

- ensure the proper and efficient performance of the functions of the Organisation;
- determine the policy of the Organisation with respect to any matter; and
- give directions to the Chief Executive.

The Board is also accountable for the controlled entities of CSIRO that are an integral part of our strategy:

- Science and Industry Endowment Fund (SIEF)
- WLAN Services Pty Ltd
- Fundación CSIRO Chile Research
- National ICT Australia (NICTA).

The Board operates in part through two standing committees:

1. **People, Health and Safety Committee** which assists the Board to fulfill its governance responsibilities in relation to organisational development, people-related activities and health and safety.
2. **Audit and Risk Committee** which assists CSIRO and its Board in the areas of financial management, risk management, internal control and compliance.

The Board comprises a non-executive Chairman, up to eight other non-executive Members and a full-time Chief Executive. Current Board Members as of 1 July and their appointment dates are:

- Mr David Thodey: CSIRO Board Chairman (15.10.15 to 14.10.20)
- Dr Larry Marshall: Chief Executive and CSIRO Board member (01.01.15 to 31.12.16)
- Ms Shirley In't Veld: CSIRO Deputy Chair (28.06.15 to 27.06.20 and Deputy Chair 14.04.16 to 27.06.20)
- Dr Michele Allan (05.05.16 to 04.05.19)
- Professor Edwina Cornish (26.11.15 to 25.11.20)
- Mr David Knox (05.05.16 to 04.05.19)
- Professor Tanya Monro (25.02.16 to 24.02.21)
- Mr Hutch Ranck (01.05.11 to 30.04.16 reappointed 05.05.16 to 04.05.18)
- Dr Peter Riddles: CSIRO Board Member (24.04.14 to 23.04.17)
- Mr Brian Watson (14.09.15 to 13.09.20)

CSIRO Chief Executive

The Chief Executive is responsible to the Board for the overall development of strategy, management and performance of CSIRO.

They are responsible for the affairs of CSIRO subject to any policies determined by the Board and any directions given to them by the Board, to achieve the organisation's objectives.

The Chief Executive is supported to lead, direct, coordinate and control the operations and performance of CSIRO.

CSIRO Executive Team and Committees

Our Executive Team (ET) comprises the:

- Chief Executive
- Deputy Chief Executive
- Chief Finance Officer
- Executive Directors

The Executive Team's role is to determine matters, or make recommendations to the Chief Executive and through the Chief Executive to the Board, regarding the direction and operations of the Organisation.

The ET is supported by two committees:

1. **Science, Strategy, Investment and Impact Committee** which supports the ET in directing and controlling the CSIRO's strategic science, capability, capital, support and impact planning, investment and performance management.
2. **Major Transactions Committee** which supports the ET in directing and controlling CSIRO's involvement in major transactions and related matters and investment.

Advisory Committees under s24 of the Science and Industry Research Act 1949

AUSTRALIA TELESCOPE STEERING COMMITTEE

The Australia Telescope Steering Committee provides independent advice to the Director of the Australia Telescope National Facility (ATNF) on the scientific and technical operations of the ATNF. The committee advises the ATNF Director on the broad directions of the ATNF's scientific activities and longer term strategies for the development of the ATNF and are advocates to develop the Australian Telescope as a world class national facility for use by Australian and international researchers.

Committee members are both academic and industry stakeholders.

MARINE NATIONAL FACILITY STEERING COMMITTEE

The Marine National Facility Steering Committee provides independent advice to the Director Marine National Facilities (MNF) on strategic issues such as maximising the use of the RV Investigator and ensuring all science undertaken through the RV Investigator has a national benefit. They act as advocates for the MNF and for CSIRO's marine based research capability with its many stakeholders within Australia and internationally.

Committee members are from academic, industry and government backgrounds.

Internal Consultative and Advisory Mechanisms under s56 of the Science and Industry Research Act 1949

CONSULTATIVE COUNCIL

The Consultative Council is to consider and report to the Board on any matter affecting or of general interest to the officers of the Organisation, including any matters that are referred to the Council by the Board.

The Consultative Council comprises of a Chairperson and up to seven Management Members, all appointed by the Board. The Council appoints a Deputy Chairperson each year on the nomination of the representatives of the Staff Association and unions. At present there are also six staff representatives on the Council from organisations of officers.

CSIRO BUSINESS ADVISORY COMMITTEES

The CSIRO Business Advisory Committees provide independent, external advice to CSIRO through the Business Unit Director on how to maximise the effectiveness of the Business Unit portfolio to achieve its goals. They also assist CSIRO on broader strategic issues relevant to the sectors in which the Business Unit operates.

Committee members are from industry and other stakeholder groups.

**Our people are
focused on delivering
innovation to
fuel the future.**





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WE DO THE EXTRAORDINARY EVERY DAY

We innovate for tomorrow and help improve today – for our customers, all Australians and the world.

Our innovations contribute billions of dollars to the Australian economy every year. As the largest patent holder in the nation, our vast wealth of intellectual property has led to more than 150 spin-off companies.

With more than 5,000 experts and a burning desire to get things done, we are Australia's catalyst for innovation.

WE IMAGINE
WE COLLABORATE
WE INNOVATE

FOLLOW US



COVER – The Infinity swing:
a massive eight-person energy
generating swing to kick start
a conversation about energy
sustainability in Australia.