

# Operational Plan

2012–13





## Your CSIRO

CSIRO – the Commonwealth Scientific and Industrial Research Organisation – is Australia's national science organisation. We are one of the largest and most diverse scientific organisations in the world and we have been solving scientific problems in Australia and internationally since 1926.

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

The Chief Executive Officer of CSIRO is also the Trustee of the Science and Industry Endowment Fund (SIEF) which is a separately constituted trust for statutory purposes under the *Science and Industry Endowment Act 1926* (SIEF Act).

## About this report

In accordance with the requirements of section 35 of the *Science and Industry Research Act 1949*, the annual Operational Plan sets out the strategies CSIRO proposes to pursue; the activities CSIRO proposes to carry out; and the resources CSIRO proposes to allocate to these activities.

### Our Vision

Our science is used to make a profound and positive impact for the future of Australia and humanity.

### Our Mission

We deliver great science and innovative solutions for industry, society and the environment.

Cover: Positive impact. Whatever we do, whatever we touch, we aim to leave a positive and lasting impact for future generations. A positive impact on the air that we breathe, on the food that we eat, on the land that we walk on, in the communities we live in and the lives that we lead.



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# Chief Executive's Foreword

I am pleased to introduce the 2012–13 Operational Plan. We are in the middle of our four-year strategy and have much to do to achieve our goals. This Operational Plan reflects the progress made already and emphasises the areas we believe will make the most significant difference.





Our four-year 2011–2015 strategy will see us fully embrace our distinct role as the nation's leading, large-scale, multidisciplinary, mission-directed science and technology organisation. It also builds roles that will differentiate us over time – our role in providing deep connections across the innovation system and our role to provide the highest integrity scientific advice to the nation.

Our first strategic pillar is to focus and increase resources invested in delivering profound impact through the National Research Flagships Program. In the coming year we will publicly launch two new Flagships, *Biosecurity* and *Digital Productivity and Services*, focusing on important challenges and opportunities for our nation. We will continue to ensure that our broader Flagship portfolio delivers profound impact for our nation, working productively with industry, government and community stakeholders to realise the full benefits.

We will continue to nurture and grow the 85-year foundation of science excellence that underpins this organisation. We will continue to invest in people and infrastructure while seeking to stimulate and support the national innovation system in building precincts of global standing. These precincts will provide a global spotlight on Australian innovation and will involve substantial collaboration with our industry, research and government collaborators. When fully realised, the precincts will change the national landscape of our innovation system.

Deep collaboration and connections are fundamental to the successful development of new ideas and concepts, and their translation to market impact. This coming year will see us expand our global networks to ensure that we are engaging with the world's very best and maximising the benefits of our work to the nation. We will be increasingly selective about our partners, and we see Asia as presenting a significant opportunity for enhanced collaboration.

How we behave and do things will be remembered for longer than what we do. Our focus on people and culture has been a key over the past three years as we continue to seek to lift our maturity as an innovation organisation. Our actions over this coming year will continue, in a consultative manner, to seek to lift further our capacity to innovate. Our focus on the health and safety of our people is unwavering, and we will continue to embed behaviours, practices and systems that support our *Zero Harm* objectives.

Our shared commitment to CSIRO's Values Compass will provide confidence to our investors, our research partners and importantly to the Australian people.

To gain full national benefit, our science must be well understood and supported by the citizens of Australia. To play a leading role in the trusted delivery of scientific evidence, advice and interpretation to the Australian Government, public and industry, we must have high quality communication techniques and skills across our Organisation. We must listen, learn and operate with transparency and integrity so that Australians regard CSIRO as a critical nation-building organisation.

This Operational Plan translates our Strategic Plan into what we will do in 2012–13. Along with the Values Compass and the Strategic Plan it charts a path to success and acts as a guide for business unit planning.

I look forward to the opportunities and challenges in the year ahead.

**Dr Megan Clark**  
Chief Executive

November 2012

# CSIRO's recent achievements

The following highlights are just a few examples of the impact science had on our lives, our industries and our environment in 2011–12.

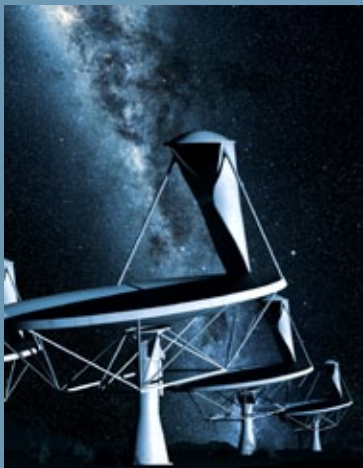


Image: SKA Organisation/Swinburne Astronomy

In May 2012, the Square Kilometre Array (SKA) Organisation announced that the \$2.5 billion Square Kilometre Array radio telescope would be deployed in Australia, New Zealand and South Africa. The SKA will be the world's largest and most sensitive radio telescope and will help address unanswered questions about our universe, including how the first stars and galaxies were formed.



Image: iStock Photo

CSIRO invented and patented wireless networking technology in the 1990s – a technology that has given us the freedom to work wirelessly in our homes, classrooms and offices, using devices such as laptops and smart phones.



The *State of the Climate 2012* report is the second report produced by CSIRO and the Australian Bureau of Meteorology. It provides a summary of observations of Australia's climate and analysis of the factors that influence it.





Air conditioning our homes and offices contribute around seven per cent to Australia's greenhouse gas emissions and places a heavy demand on our electricity supplies. To address this challenge, CSIRO's Energy Transformed Flagship has developed ground-breaking solar cooling technology.



*Image: iStock Photo*

CSIRO and partners have identified new genes that show identifiable changes in the blood of people with bowel cancer. A new cost-effective blood test is being developed that will signal the early stages of the disease. The blood test could save thousands of lives by supplementing existing screening programs and encourage those at risk to have a colonoscopy.



*Image: Bearcage*

CSIRO's Dr Ezio Rizzardo and Professor David Solomon from the University of Melbourne were recognised for their long and distinguished research careers that led to a revolution in polymer science, profoundly impacting the level of control we have over polymer structure and function.



# 1 Our commitment

CSIRO is an Australian Government statutory authority within the Industry, Innovation, Science, Research and Tertiary Education Portfolio, operating under the provisions of the *Science and Industry Research Act 1949*. CSIRO receives approximately two-thirds of its operating revenue in appropriation funding through the Federal Budget. Our commitment to the parliament and people of Australia, set out in the 2012–13 Portfolio Budget Statements<sup>1</sup>, is to contribute to the following outcome:



Innovative scientific and technological solutions to national challenges and opportunities to benefit industry, the environment and the community, through scientific research and capability development, services and advice.

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<sup>1</sup> The relevant section of the Portfolio Budget Statements can be viewed at [www.innovation.gov.au](http://www.innovation.gov.au). The Outcome is the formal legal statement of the purpose for which funds are appropriated to CSIRO.



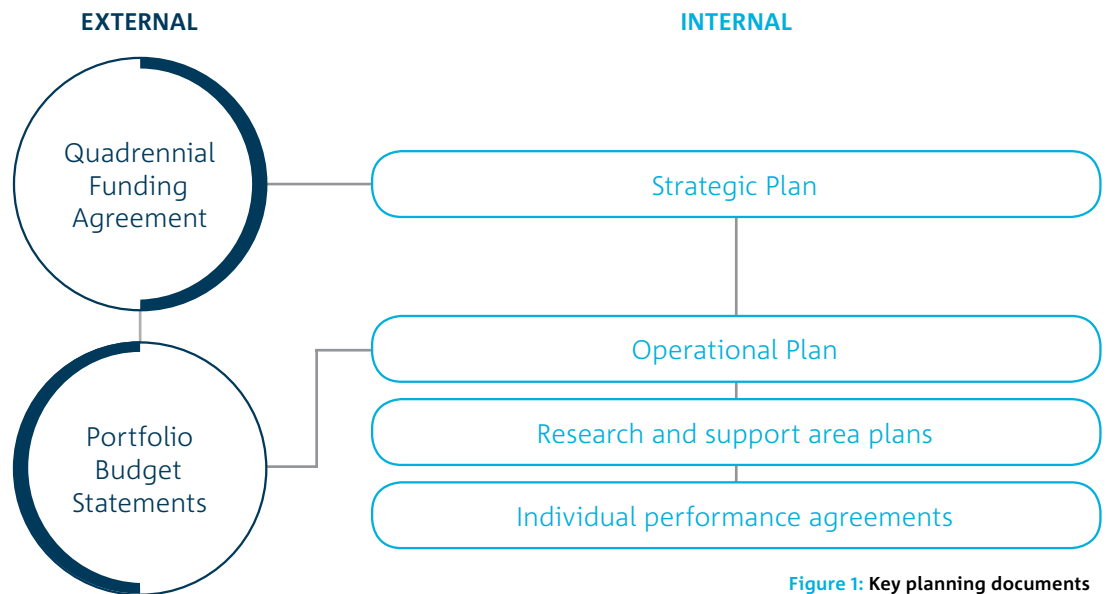


Figure 1: Key planning documents

## Planning and reporting on performance

CSIRO is accountable for the appropriate effective and efficient use of the resources entrusted to the Organisation. The major components of CSIRO's planning framework are illustrated in Figure 1.

The Strategic Plan describes a pathway for CSIRO to cement its role in the National and Global Innovation Systems. It is supported by a Quadrennium Funding Agreement (QFA) between CSIRO and the Government.

The Strategic Plan conveys the broad objectives for the Organisation, and sets out the broad policies and strategies to be pursued to achieve those objectives. The Operational Plan is the annual representation of the Strategic Plan and describes the priority actions required for successful implementation of the strategy each year.

The QFA outlines several principles in relation to the agreed level and use of CSIRO's appropriation and external revenues over the strategic planning period. The Portfolio Budget Statements (PBS) are the annual representation of the QFA and describe the program of activities that CSIRO will undertake to achieve its outcome (see Figure 1).

Each year, CSIRO reports its performance in an annual report to Parliament. The annual report includes reporting against:

- ♦ deliverables and key performance indicators in the PBS
- ♦ the implementation of strategic priorities identified in the Operational Plan.

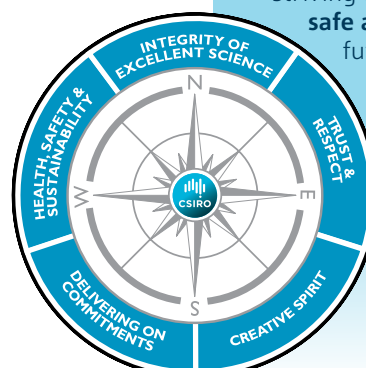
CSIRO also monitors its performance throughout the year with:

- ♦ regular reports to the Executive Team and Board to assist with their decision-making and governance responsibilities
- ♦ detailed planning and review processes operating at a range of levels, including research portfolios and Divisions, functional areas, and individuals.

## CSIRO's Values Compass

The Values Compass depicts the five value statements that guide our planning, behaviour, decisions and actions.

- ♦ Embracing **scientific excellence** and working together ethically and with **integrity** in everything we do.
- ♦ Building **trust and respect** each day with our communities, partners and colleagues, knowing that with trust comes accountability.
- ♦ Igniting our **creative spirit**, exploring new horizons and creating an environment where innovation thrives.
- ♦ Consistently **delivering on our commitments**. 'Do what we say we will do'.
- ♦ Striving towards a **healthy, safe and sustainable** future.





## 2 Our Strategy

In June 2011, a new Strategic Plan was approved by the CSIRO Board<sup>2</sup>. The strategy embraces the Organisation's distinct role as a large-scale, multidisciplinary, mission directed science and technology organisation, and as a trusted science advisor on the big issues facing the nation.

CSIRO's strategy positions the Organisation to play an active role in Australia's innovation agenda, address national and global research challenges, and contribute to Australia's productivity and competitiveness. It seeks to attract the best and brightest minds to work collaboratively nationally and internationally, and to conduct world-class research that fuels the innovation system with new knowledge and ideas.

Through the National Research Flagships, CSIRO concentrates on strategic research and knowledge and technology transfer with the potential to deliver major long-term social, economic and environmental benefits to Australia. Our strategy is to grow Flagships as the key mechanism for achieving outcomes relevant to the National Research Priorities and the National Innovation Priorities.

The capacity to deliver profound impact through the Flagships is underpinned by investing in capabilities that build strength in areas of national need, ensuring that Australia has the knowledge and skills required to respond to national and international challenges.

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<sup>2</sup> [www.csiro.au/resources/StratPlan11-15](http://www.csiro.au/resources/StratPlan11-15) .





## Strategic Objectives

The Plan establishes five Strategic Objectives for the four-year period from July 2011 to June 2015.

### **1 – National Research Flagships**

Focus and increase the Organisation's resources invested in delivering profound impact in response to national challenges and opportunities through the National Research Flagships Program.

### **2 – Science excellence and preparedness**

Invest in people and infrastructure to maintain and develop national scientific breadth and depth in support of delivering profound impact and scientific preparedness.

### **3 – Deep collaboration and connection**

Build deep connections with and among the best partners in Australia and the world to complement our science capability and accelerate impact delivery.

### **4 – Innovation organisation**

Boost our capacity to operate as one organisation to respond to the changing nature of science, deliver profound impact and build capability for the future.

### **5 – Trusted advisor**

Play a leading role in the trusted delivery of scientific evidence, advice and interpretation to the Australian Government, public and industry.

## Programs

This section provides an overview of the activities that CSIRO undertakes to fulfil its mission and deliver on its commitment to the parliament and people of Australia. Each program includes performance indicators and targets to be used to assess and monitor the performance of CSIRO in achieving the outcomes of the programs.

The budget figures reported in this section are drawn from CSIRO's 2012–13 Portfolio Budget Statements submission. These figures are established on a consolidated entity level and therefore include a program for the Science and Industry Endowment Fund (SIEF). These figures were also published in advance of the CSIRO Board endorsement of the new flagships for Digital Productivity and Services and Biosecurity.



### National Research Flagships

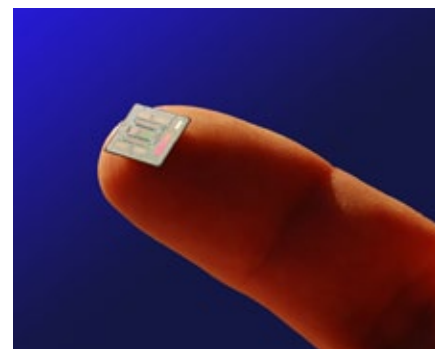
2012–13 Budget Estimates \$574.9m<sup>3</sup>

National Research Flagships and Portfolios are the way we organise our research to deliver impact across the triple-bottom-line for the Australian community. The aim of the Flagships and Portfolios is to increase the economic, social and environmental well-being in areas of complex challenge through the provision of information, advice and scientific solutions. They achieve this by defining the problem(s) to be addressed by our science, together with the strategy for delivering outcomes and impacts and working across our Divisions.

Each Flagship operates within an approved business plan which guides the path to impact. They focus on portfolio management rather than day-to-day science execution. Portfolios are made up of a number of Themes which conduct research projects directed towards clear and specific strategic goals.

Key Performance indicators to be reported in the Annual Report:

- ♦ Evidence of growing economic, social, environmental and intangible benefits through demonstrated adoption of Flagship outputs.
- ♦ Maintain or increase the number of refereed publications.
- ♦ Maintain or increase financial support by Flagship partners.
- ♦ Maintain customer satisfaction.
- ♦ Investment of the Flagship collaboration funds as per agreed guidelines.



### Core Research and Services

2012–13 Budget Estimates \$508.2m<sup>4</sup>

CSIRO's core research and services activities improve industry, the environment and community well-being across the breadth and depth of the National Innovation System. It does this 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 and new knowledge and skills. Core research groups are led by the Group Executives and supported by CSIRO Divisions and Services who are the creators and custodians of scientific capabilities and day-to-day science execution.

They deploy or allocate capabilities to meet the objectives of Portfolios. Divisions develop and deliver the science to solve problems defined at the National Research Flagships and Portfolio level. In addition to the allocation of capability to Portfolios, CSIRO also allocates resources directly to capability development through the funding of Transformational Capability Platforms; Capability Themes and the Science Team program.

Key Performance indicators to be reported in the Annual Report:

- ♦ Evidence of growing economic, social, environmental and intangible benefits through demonstrated adoption of Core Research outputs (initially demonstrated by case study impact analysis or other evaluation).
- ♦ Maintain or increase the number of refereed Core Research Publications.
- ♦ Maintain customer satisfaction.
- ♦ Maintain or increase science excellence in CSIRO research capabilities as assessed through a rolling program of rigorous peer review (percentage of capabilities rated strong/benchmark).

<sup>3</sup> Source: CSIRO Portfolio Budget Statements 2012–13.

<sup>4</sup> Source: CSIRO Portfolio Budget Statements 2012–13.





### Science Outreach: Education and Scientific Publishing

2012–13 Budget Estimates \$37.7m<sup>5</sup>

Through the science outreach programs, CSIRO promotes the importance of science and its application to students, parents, teachers and the Australian community. The outreach programs include the CSIRO Discovery Centre, CSIRO Education Programs and **CSIRO PUBLISHING**. CSIRO also supports undergraduates, postgraduates and postdoctoral researchers to boost the calibre of researchers working in the Australian community.

Key Performance indicators to be reported in the Annual Report:

- ♦ Utilisation of science outreach programs (number of participants and users, proportion of uptake within the target group).
- ♦ Awareness of science by CSIRO stakeholders.
- ♦ Evidence of success of participants of the science outreach programs (qualitative indicator – results are expected in narrative form).
- ♦ Continue to grow the international reach and impact for the 25 journals published in partnership with the Australian Academy of Science and other societies.
- ♦ Number of new book titles.
- ♦ Positive net profit outcome from **CSIRO PUBLISHING**.



### National Research Infrastructure: Facilities and Collections

2012–13 Budget Estimates \$123.6m<sup>6</sup>

CSIRO has stewardship of two types of National Research Infrastructure – the National Facilities and the National Biological Collections. Together these provide world-class infrastructure and unique resources to Australia's researchers on a shared basis.

Key Performance indicators to be reported in the Annual Report:

- ♦ Utilisation of National Research Infrastructure (the number of loans, visitor days, research days, observation time or operation time).
- ♦ All National Research Infrastructure maintained and operated to international standard (qualitative indicator).
- ♦ Proportion of collections digitised and available to the public (percentage of collection).
- ♦ Coverage of National Biological Collections (percentage of known species).
- ♦ Demonstrated response to national events (this is a qualitative indicator – narrative responses are expected).
- ♦ Demonstrated high quality scientific contributions in support of National Research Flagships, CSIRO Core Research and external users (this is a qualitative indicator – narrative responses are expected).



### Science and Industry Endowment Fund

2012–13 Budget Estimates \$23.6m<sup>7</sup>

The Science and Industry Endowment Fund (SIEF) is a separately constituted trust under the *Science and Industry Endowment Act 1926* and makes strategic investments in scientific research that address issues of national priority for Australia. The Chief Executive of CSIRO is the Trustee of the Fund.

Key Performance indicators to be reported in the Annual Report:

- ♦ Proportion of projects involving research in areas of national priority.
- ♦ Proportion of projects involving more than one organisation.
- ♦ Financial contributions of partners.
- ♦ Number of publications from SIEF projects.

<sup>5</sup> Source: CSIRO Portfolio Budget Statements 2012–13.

<sup>6</sup> Source: CSIRO Portfolio Budget Statements 2012–13.

<sup>7</sup> Source: CSIRO Portfolio Budget Statements 2012–13.



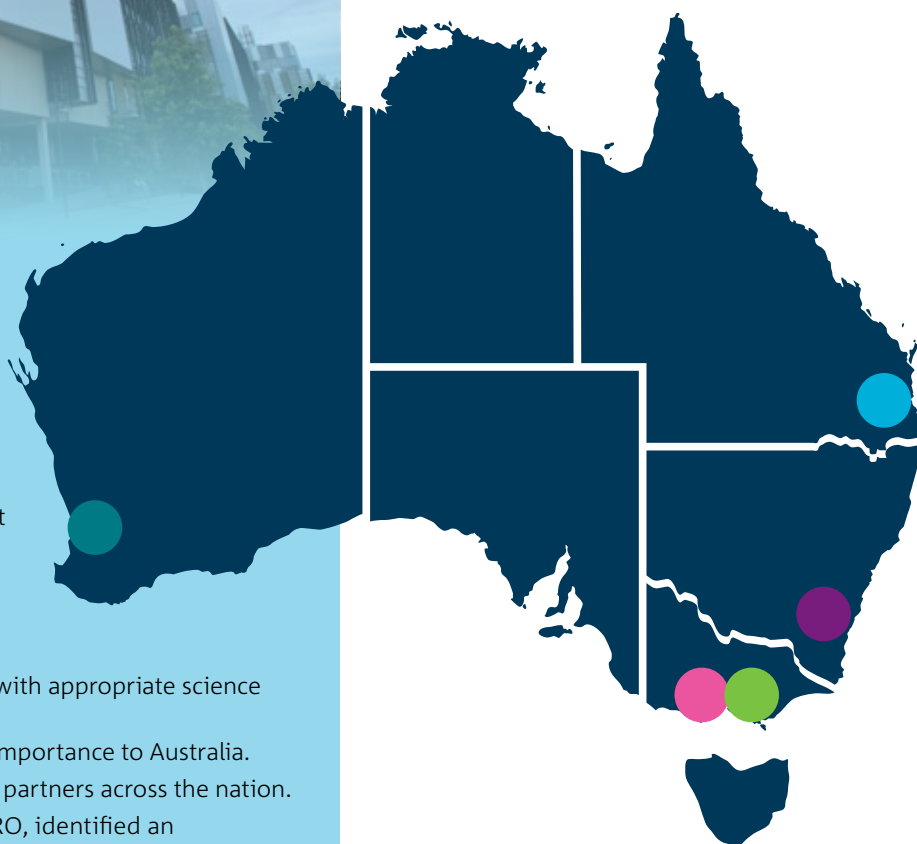
## Innovation precincts

CSIRO has developed a 20-year view of the evolution of national footprint which aligns infrastructure science directions, and partnerships. Some of the key features of the plan are:

- Consolidate capital city sites.
- Enhance vibrancy of regional sites with appropriate science agendas and connections.
- Build critical mass in R&D areas of importance to Australia.
- Develop the precinct concept, with partners across the nation.

In line with the 2011–15 Strategy, CSIRO, identified an intention to support the development of a number of global precincts. These are designed to consolidate resources and optimise opportunities to build on and integrate research and development in natural and environmental sciences, resource sciences, eco-sciences, human life sciences, and manufacturing and materials sciences, and national centres and vibrant sites in other areas of strength.

It is envisaged that when realised, these precincts will support the unleashing of Australia's innovation potential, improve Australia's international R&D competitiveness, and position our National Innovation System to better address national and global challenges.



### RESOURCE SCIENCES: PERTH

Leading minerals and energy research development centre.

### ECOSCIENCES: BRISBANE

World's largest environmental sciences hub solving the nation's critical environmental challenges and opportunities.

### NATURAL & ENVIRONMENTAL SCIENCES: CANBERRA

Focused on natural and environmental sciences. Integrate academia, applied research, government and industry.

### HUMAN LIFE SCIENCES: PARKVILLE

Integrate world-class healthcare, research and education to rapidly translate discoveries into clinical practice.

### MANUFACTURING & MATERIALS SCIENCES: CLAYTON

Enabling capability in advance materials and clean manufacturing technologies.











## 3 Strategy implementation

Each year the CSIRO Executive Team and Board identify key executive actions to implement the CSIRO Strategy. These actions are not intended to address all aspects of the strategy in the same depth each year. The aim is to plan progressively and implement change initiatives and embed these processes and practices as 'business as usual' to ensure we deliver on our strategic objectives over the life of the full strategy. Each successive annual Operational Plan will identify a small number of high priority areas that require focused executive action for successful strategy implementation.



# Key Executive Actions 2012–13

## STRATEGIC OBJECTIVE 1—NATIONAL RESEARCH FLAGSHIPS

Focus and increase the Organisations resources invested in delivering profound impact in response to national challenges and opportunities through the National Research Flagships Program.

1. Review and embed key Flagship initiatives, including:
  - a. Enhanced alignment of Flagship delivery across the energy portfolio
  - b. Embed the two new Flagships – Biosecurity and Digital Productivity and Services
  - c. Complete the integration and alignment of portfolios across Flagships and Divisions
  - d. Identify and execute upon pan-Flagship opportunities as articulated in Group strategies.
2. Embed Impact 2020 principles and methodology into CSIRO's planning and review framework, including further refinement of the model used to articulate and characterise Flagship impact.

## STRATEGIC OBJECTIVE 2 —SCIENCE EXCELLENCE AND PREPAREDNESS

Invest in people and infrastructure to maintain and develop national scientific breadth and depth in support of delivering profound impact and scientific preparedness.

3. Finalise, plan and implement the first year of an integrated program to drive our global science standing, including a global recruitment strategy.
4. Develop a shared vision with clear stakeholder commitment for each of the global Precincts which includes a resource plan that is consistent with CSIRO's capital plan.
5. Divisions to identify and/or consolidate strategic research partnerships with key global peers with the objective of complementing CSIRO capability.
6. Implement the e-Research and e-Enablement strategies including a five times increase in computing capacity, internal research cloud service, Research Data Service, upgrade to HD video collaboration facilities, advanced remote visualisation facilities and further development of mobility services.
7. Develop decadal science capability plans which will introduce game-changing, disruptive science in areas aligned with our future intended impact.

## STRATEGIC OBJECTIVE 3 — DEEP COLLABORATION AND CONNECTION

Build deep connections with and among the best partners in Australia and the world to complement our science capability and accelerate impact delivery.

8. Grow major industry, government, university and community partners alliances nationally and internationally – critical to delivery of Flagship goals
9. Leverage relationships with key global partners to establish two new cross-Flagship large-scale agreements to address global challenges relevant to Australia.
10. Deliver to project plans for major infrastructure projects including Pawsey Centre, ASKAP, SESKA, MRV, NGL and the SKA.

## STRATEGIC OBJECTIVE 4—INNOVATION ORGANISATION

Boost our capacity to operate as one organisation to respond to the changing nature of science; deliver profound impact and build capability for the future.

11. Building on the Values Compass, refresh our approach to “what it is like to work in CSIRO” to further support the maturity of an innovative environment.
12. Develop four year Divisional workforce plans aligned with future impact requirements and budget process.
13. Develop a four year Capital Expenditure Plan that prioritises infrastructure for both science competitiveness and operations effectiveness while reducing the depreciation burden in the long-term.
14. Develop future options for financial sustainability to 2016 and beyond, within the current business model and considering potential growth options.

## STRATEGIC OBJECTIVE 5 —TRUSTED ADVISOR

Play a leading role in the trusted delivery of scientific evidence, advice and interpretation to the Australian Government, public and industry.

15. Execute a systematic engagement strategy which includes both national areas of science interest and each of our outcome domains.
16. Develop and implement a marketing strategy to address the primary areas of industry, government and community.

## Monitoring our strategy

Multiple lines of evidence will be used to monitor overall achievement of our strategy, including reporting against the Enterprise Strategy Measures outlined here.

## IMPACT

1. Develop measures in 2011–12 for benchmarking our performance for delivery of triple-bottom-line impact through evaluating realised benefits. Be recognised as one of the top three global applied science organisations by 2014–15 for impact delivery as measured against our 20 global peers.
2. Develop future impact pipelines for at least 80 per cent of the Flagship Portfolio by June 2012; evaluate potential triple-bottom-line value for at least 50 per cent of the Flagship future pipeline by June 2013 and 80 per cent by June 2014. Deliver Flagship goals at a rate meeting or exceeding initial time to goal expectations.
3. Baseline customers' willingness to recommend in 2011–12 and improve our performance year-on-year over the strategy.
4. Increase community awareness of impact derived from CSIRO activities from the established baseline of 50 per cent (2010–11) to 75 per cent by 2014–15.



## SCIENCE

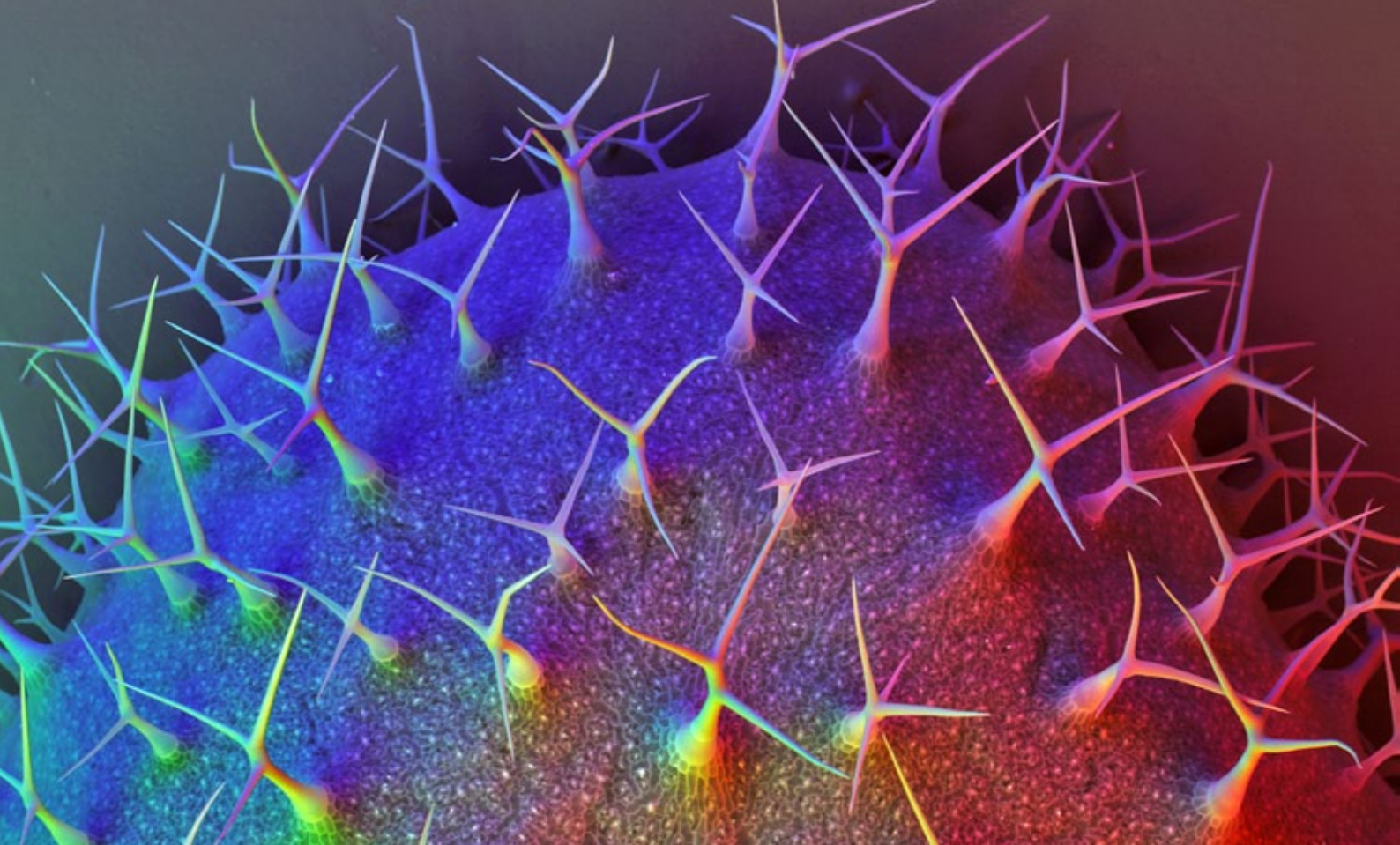
1. Science quality is maintained or improved in Environment and Ecology, Agricultural Sciences, Plant and Animal Sciences and Geosciences as measured through benchmarking against global peers (science productivity, citations per paper, collaboration). CSIRO maintains breadth in at least 14 fields in the top one per cent globally based on ISI / Thomson Reuters total citations data.
2. Progress towards establishing precincts of global standing in the Plant and Agricultural Sciences, Resource Sciences, Environmental Sciences, Materials and Manufacturing Sciences and Human Life Sciences meets Precinct Development Plans by 2014–15.

## PEOPLE

1. Number of fatalities or major injuries of CSIRO people. Lost Time Injury Frequency Rates and Medical Treatment Frequency Rate improves year-on-year and is in the top quartile of like organisations.
2. Awareness of CSIRO's Values increases year-on-year from the established baseline of 73 per cent in 2010–11 to 95 per cent in 2011–12. A baseline for the use of Values in guiding behaviours and decision-making is established by June 2012 and improves year-on-year over the strategy period.

## RESOURCES

1. CSIRO's financial, operating and capital management performance meets approved annual budget.
2. Direct investment of CSIRO challenges and opportunities through the National Research Flagships increases to 65 per cent by 2014–15.



# 4 Resourcing 2012–13 activities

This section provides an overview of the activities that CSIRO undertakes to fulfil its mission through a summary of planned allocation of resources to these activities through the CSIRO's science investment process. These figures represent expenditure and are sourced through CSIRO's Board approved budget, the detail of which was finalised in June 2012.



## CSIRO's Research Portfolios 2012–13

RESEARCH PORTFOLIO	BUDGET (\$M) <sup>8</sup>	AIM
<b>National Research Flagships</b>		
Biosecurity Flagship	25.9	Support of Australia's social, environmental and economic wellbeing by reducing the incidence of pest and disease incursions (\$7 billion) and increasing the effectiveness of incursion mitigation and eradication responses (\$14 billion) by 2042.
Climate Adaptation Flagship	43.3	To equip Australia with practical and effective options to adapt more effectively to climate change and variability and in doing so create \$3 billion a year in net benefits by 2030.
Digital Productivity and Services Flagship	31.6	Develop and deliver more efficient and innovative frontier services that unlocks the value of broadband communications to improve citizen wellbeing and prosperity, creating \$4 billion in added value per annum to the Australian economy by 2025.
Energy Transformed Flagship	43.4	To develop, demonstrate and ensure deployment by 2020 of integrated low carbon pathways for Australia and alternative stationary and transport energy solutions that realise a reduction of Australia's carbon dioxide equivalent emissions greater than 20 million tonnes per annum by 2030 and greater than 50 million tonnes per annum by 2050.
Food Futures Flagship	49.9	To transform the international competitiveness of the Australian Agrifood sector, adding \$3 billion in annual value, by applying frontier technologies to high potential industries.
Future Manufacturing Flagship	70.6	To create \$2 billion of additional annual value for Australia's manufacturing industry by 2025 through the development and application of resource efficient, clean and transformational technologies.
Minerals Down Under Flagship	89.7	Delivering science and technology options for the discovery and efficient development of Australia's mineral resource endowment that will lead to \$1 trillion in-situ value by 2030 and enable flow-on benefits to the wider national economy.
Preventative Health Flagship	40.2	To improve the health and wellbeing of Australians and save \$2 billion in annual direct health costs by 2020 through the prevention and early detection of chronic diseases.
Sustainable Agriculture Flagship	69.6	To secure Australian agriculture and forest industries by increasing productivity by 50 per cent and reducing carbon emission intensity by at least 50 per cent between 2010 and 2030.
Water for a Healthy Country Flagship	87.9	Consistent with Australia's national interest, develop science and technologies that improve the social, economic and environmental outcomes from water, and deliver \$3 billion per year in net benefits for Australia by 2030.
Wealth from Oceans Flagship	66.2	To provide Australia with the knowledge and tools to protect coastal and ocean environments, increase their value to society and create a net economic benefit of \$3 billion per annum.
<b>Enterprise Portfolios</b>		
Advanced Coal Technologies	46.8	By 2020 to increase Australian mineable coal resources by 10 billion tonnes (25 per cent) adding more than 1.5 trillion dollars in value while at the same time contributing 10 per cent of Australia's greenhouse gas reduction target through fugitive emissions control. To provide the technology pathways through higher efficiency coal technologies, fugitive emissions mitigation and CO <sub>2</sub> capture and storage to reduce greenhouse gas emissions from fossil energy use by 90 per cent by 2050 in order to reach Australia's 2050 target.
Astronomy and Space Science	14.6	To operate a world-class National Facility for radio astronomy for the Australian and international astronomical community, supported by leading-edge technical innovation and world leading astrophysical research.
Biodiversity <sup>9</sup>	13.4	Provide the data, tools and integrated knowledge to underpin a collective national effort to help halt biodiversity decline in Australia by 2020 and reverse this decline by 2035.
Animal Food and Health Sciences	97.4	To develop safe, sustainable, effective and healthy foods, diets and lifestyle strategies to help prevent, manage or delay the onset of obesity and diabetes, contain healthcare costs and improve productivity.
Marine and Atmospheric Research	44.6	To enable Australia to manage its activities in the interests of sustainable national, regional, and global earth systems through advanced understanding of atmospheric, climate, and marine systems and their interactions with human activities.
Materials, Science and Engineering	41.8	The goal is to support and create globally competitive Australian companies in the biomedical and chemical sector to manufacture new products and devices for the emerging market for improved health and wellbeing.
Petroleum and Geothermal	35.8	Support Australia and the world's transition to a safer, cleaner and secure energy future, with an emphasis on gas as the transition fuel and on the demonstration of geothermal energy use in Australia.
Plant Industry	88.5	To develop new fundamental and applied scientific solutions to ensure a viable and internationally competitive plant-based agricultural and forestry sector for Australia that has a long-term sustainable future in the face of climate change and intense global competition.

<sup>8</sup> Proposed Total Research Expenditure for 2012–13. (Source: CSIRO Finance Group).

<sup>9</sup> Excludes the Collections which are also managed within the Biodiversity Portfolio (Theme 1203) of \$14.9 million.

## CSIRO's Divisions 2012–13

DIVISION	AVERAGE STAFFING LEVELS <sup>10</sup>	DESCRIPTION
Astronomy and Space Science	257	Radio astronomy and space tracking, including operation and development of the Australia Telescope and the Canberra Deep Space Communication Complex as national facilities.
Earth Science and Resource Engineering	328	Provides technologies that support sustainable development of Australia's energy and mineral resources.
Ecosystem Sciences	438	Conducts research and development across a range of landscapes, targeting social, economic and environmental sustainability.
Energy Technology	170	Develops technologies that will reduce greenhouse gas emissions and contribute to a secure and sustainable Australian energy future.
Animal, Food and Health Sciences	514	To provide research solutions for animal and food industries in order to secure healthy, safe and sustainable food for Australia's consumers and customers.
ICT Centre	251	CSIRO's national research hub for innovative information and communication technologies.
Land and Water	386	Develops new measurement and prediction systems for assessing the availability and condition of land and water resources, to facilitate effective decision-making by government, industry and the community.
Marine and Atmospheric Research	471	Advances Australian climate, marine and earth systems science to help Australians better understand and manage effects on the Earth's systems.
Materials Science and Engineering	555	Creating world-class innovation in materials science and engineering to serve our community by helping transform Australian manufacturing.
Mathematics, Informatics and Statistics	162	Develop and apply innovative mathematical and statistical sciences so that CSIRO can deliver high-quality solutions to Australia's challenges.
Plant Industry	497	Uses a range of scientific disciplines, from the cellular level to field work, to breed better plants and build knowledge of plants and their environment to improve Australia's plant-based industries.
Process Science and Engineering	267	Develops and applies scientific and industrial research capability to support the growth and competitiveness of Australian minerals and related process industries, and related Australian technology and services sectors.

## CSIRO's Enterprise Groups

ENTERPRISE GROUP	BUDGET (\$M) <sup>11</sup>	DESCRIPTION
Development Group	5.2	The Development Group identifies future business opportunities pipeline and broadens enterprise horizons through strategic international and national relationships. The group focuses on developing strong and enduring relationships that enable the creation and uptake of CSIRO's science and technology.
Finance, Property and Procurement	94.9	The Finance group ensures that CSIRO meets its financial obligations and operates within budget. The Group also supports the purchasing of services and equipment as well as the planning, maintenance and construction of property.
Information Management and Technology	67.7	The Information Management and Technology (IM&T) group delivers up-to-date, quality information technologies and library services that support CSIRO's research activities and enterprise support functions.
Operations and Governance Group <sup>12</sup>	43.3	The Operations and Governance Group provides CSIRO with essential business support services to ensure we meet our legal obligations and have in place the correct policies and procedures to operate as an effective organisation.
Science, Strategy and People	25.1	The Science, Strategy and People group supports CSIRO through a diverse set of activities that are targeted at: the safety and health of our people; operating with environmental sustainability; supporting our people and our leaders to perform at their best; supporting enterprise strategy development and execution; targeting our science investments to the highest priorities; and measuring, reviews and reporting our performance, delivery of impact and progress against strategy and operational support goals.

<sup>10</sup> Source: CSIRO Human Resources. Based on estimated Average Staffing Level (ASL) for 2012.

<sup>11</sup> Proposed Total Research Expenditure for 2012–13 (Source: CSIRO Finance Group). These figures excludes depreciation expenses.

<sup>12</sup> Excludes CSIRO PUBLISHING, Discovery and Education.



## Staff by functional area

CSIRO looks to its staff to support its values and to work together in a collaborative and positive way to achieve the Organisation's aims. CSIRO seeks to attract the best minds and be a place where people want to work, where people are challenged and supported to achieve their full potential.

CSIRO staff are employed under section 32 of the *Science and Industry Research Act 1949*. The following table shows the number of staff employed in different job categories.

FUNCTIONAL AREA <sup>13</sup>	AVERAGE <sup>14</sup> STAFFING LEVEL
Research Projects	1776
Research Scientists / Engineers	1744
Administrative Services	861
Technical Services	583
Communication and Information	271
Research Management	155
General Management	127
Research Consulting	39
General Services	30
Senior Specialist	10
<b>TOTAL</b>	<b>5596</b>

<sup>13</sup> **Research Projects** – Staff members who perform scientific or associated works, under the broad direction of research scientists/engineers or research managers, usually by assisting with the planning and completion of more practical aspects of the work.

**Research Scientists and Engineers** – Staff members who conduct scientific research.

**Administrative Services** – Staff members who provide administrative and management services to support the effective provision of research and development activities.

**Technical Services** – Staff members who provide routine site maintenance activities.

**Communications and Information** – Staff members who provide information, editorial or industry liaison services either within or outside CSIRO.

**Research Management** – Staff members who initiate, develop, lead and promote CSIRO's research capability.

**General Management** – Staff members who manage corporate resources or corporate policy development, facilitate the strategic development of organisational capability, and/or create opportunities, matching CSIRO's capabilities to client needs.

**Research Consulting** – Staff members who initiate and deliver research services for industry.

**General Services** – Staff members who provide routine site maintenance activities.

**Senior Specialist** – Staff members whose specialist skills are in high market demand.

<sup>14</sup> Source: CSIRO Human Resources. Based on estimated Average Staffing Level (ASL) for 2012–13. Includes permanent, temporary and casual staff, and excludes staff on leave without pay.









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At CSIRO we shape the future. We do this by using science to solve real issues. Our research has a positive impact on industry, people and the planet.

As Australia's national science agency we've been pushing the edge of what's possible for over 85 years. Today we have more than 6,400 talented people working out of 57 centres in Australia and one internationally. Our people work closely with industry and communities to leave a lasting legacy. Collectively, our innovation and excellence places us in the top ten applied research agencies in the world.

At CSIRO we ask, we seek and we solve.

